

# WHA STANDS

FOR WORLD, HUMAN,  
ACCOUNTABILITY



WHA WITH  
ACCOUNTABILITY



# INDUSTRIAL DEVELOPMENT BUSINESS



# DIGITAL PLATFORM BUSINESS



# LOGISTICS BUSINESS



# UTILITIES & POWER BUSINESS



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A woman with long, wavy brown hair, smiling, wearing a vibrant blue double-breasted suit with a wide lapel and a matching belt. She has her arms crossed and is standing against a solid blue background. She is wearing a ring on her left hand and a watch on her right wrist. Her fingernails are painted in a colorful pattern.

# CEO MESSAGE



## CEO MESSAGE

2021 was considered as a year with many important incidents affecting the world including Thailand. The incidents included the COVID-19 pandemic that has occurred since the previous year. There were also the climate changes that are being more severe. There are various factors driving the incidents in 2021 such as the 26th Conference of the Parties on Climate Change (COP26) with the representatives from various countries for quickening operations and meeting the goal to limit the global temperature rise to 1.5 degree Celsius according to the Paris Agreement and the United Nations Framework Convention on Climate Change: UNFCCC. Thailand set a goal to achieve net zero greenhouse gas emission by 2065. Moreover, our society has to regularly face changes leading to business risks and opportunities in all sectors since economic, social and environmental trends are leading to innovation and digital system developments.

The changes and the steps to the mentioned digital era are considered as the important opportunities for WHA Group as a leader in the Logistics Property, Industrial Estates development, Utilities and Power and Digital Platform business in Thailand since business plans are made in order to handle the disruptions and the challenges from internal and external factors. The group focuses on developing value-added products and services as well as improving the four main businesses by using innovations for integrating technological platforms and the group's infrastructures in order to become a technology company with the responsibilities for environmental effects. The group is dedicated to involve in solving the problems caused by the climate changes. According to the continuous implementations of the plans to improve the solar power generation and distribution from the solar rooftops of the group, the greenhouse gas emission could be reduced for over 26,378 tons of carbon dioxide equivalent in the last year. By comparing it to the greenhouse gas emission of 19,250 tons of carbon dioxide equivalent from the activities of the group in the same period, it could be considered that the group achieved the carbon neutrality by 2021. However, the company is still dedicated to minimizing environmental effects and involving in solving the problems from the climate changes in order to achieve the net zero.

The company is still dedicated to the intention to promote sustainable developments, responsibilities and respects for all stakeholders in environmental, social and governance terms in order to securely improve businesses without leaving anyone behind. These are the results of the clear business policies, strategies and, the governance and the financial plans as reflected from the business operations of the group that value natural resource conservation, potential development, motivations, governance development, business growth, good performances and strong financial status.

The group is also dedicated to developing projects for sustainably improving business operations. The projects in 2021 included Solar PV ECO System in the factory(ies) of Continental Tires (Thailand) Company Limited, a globally leading tire manufacturer and distributor from Germany. The mentioned project is the WHA Industrial Estate Eastern Seaboard 4. This project collects modern renewable energy technologies comprising of solar rooftop, solar car park and solar floating with the total productivity in power generation of 4.2 megawatts. These reflected the company's responsibilities for environments by reducing the economic effects in the business value chain and promptly handling the climate changes. The mentioned project is a part of the goal to improve the renewable energy services. In 2021, the group signed new solar rooftop contract for an additional 41 megawatts, bringing outstanding signed contracts to 92 megawatts. The group also started developing other renewable energy solutions by using new technologies and innovations such as the peer-to-peer (P2P) power trading system and the Smart Microgrid Industrial Estate. Furthermore, the group has valued and improved water management in order to minimize the uses of natural water resources by developing the demineralized wastewater reclamation as an alternative water resource for sustainably industrial developments in the country. This is considered as the improvement of the existing wastewater treatment technology by providing the demineralized water. For this project, WHAUP also received the Outstanding Innovative Company Awards from the SET Awards in 2021.

Additionally, the group supports and produces positive results to the communities and societies regarding education, occupations and good life qualities through the projects that have been conducted by the group, the controls of business operations without negative effects in the terms of environments and safety. The group is also dedicated to supporting the societies with all of its abilities in order to ensure that the people in the communities have good hygiene. These are considered as the main factors driving the communities and societies to growths with the business operations of the group. The last year was also considered as a challenging year for handling the COVID-19 pandemic. The group really hopes that it will be one of the gears supporting the societies to minimize the effects from this crisis. The group supports the warehouse areas over 10,000 square meters. The WHA Mega Logistics Center was where a field hospital with 1,300 beds situated and turned the factory area in the WHA Industrial Area Saraburi into a field hospital with 400 beds and complete facilities in order to treat patients without symptoms and those with mild symptoms. The group also coordinated with Charoen Pokphand Group and Chularat Hospital Group for establishing a field hospital with 600 beds for treating the patients with COVID-19 in the yellow and orange groups in the building area over 15,000 square meters in order to control the pandemic in the communities and to reduce hospitalizations. The group also established a vaccination point in the industrial estate of the group for preventing the pandemic. Moreover, the group values operation developments by focusing on using innovations and technologies for strengthening the ecosystem of the group. For example, the Unified Operations Center (UOC) at WHA Tower, the head office of the group, can monitor the operations of systems including the environmental indices of the logistic projects and the industrial estate of the group in real time such as air quality, wastewater, water level, traffics and safety. Smart logistics projects are also developed by focusing on using artificial intelligence, robots and automatic systems for warehouse management. There are also investments in startups in order to gain business opportunities and to drive these startups to securely grow with the group.

Additionally, the group is aware that the good governance is the core of sustainable business growths. So, we promised that we will conduct businesses with the good governance, transparency and social responsibilities in order to promote the “good governance” in the group and focus on risk management that is a foundation of the good governance in the organization. Regarding the human resource strategies, the goal to the “Future of Work” reflects the identities of the group by efficiently recruiting and maintaining

people with skills and potentials while developing skills useful in the modern era, supporting work-life balances through “WHAppy” project that regularly conducts activities for the members of the organization and promoting innovative and technological concepts for the employees who are parts of the digital transformation of the group.

With the successes of the operations, the group is accepted and it has received various rewards such as the Corporate Governance Report of Thai Listed Companies or CGR with the Sustainability Excellence of the Rising Star Sustainability Awards from the Stock Exchange of Thailand and the “CSR Excellent Recognition” Reward at the “Platinum” level from the American Chamber of Commerce (AMCHAM) in the 12th year.

As the chief executive officer and the chairperson of WHA Corporation Public Company Limited, I would like to be the representative of committees to appreciate all stakeholders who have supported the businesses of the group, trusted in and cooperated with driving the businesses to sustainable growths. These are the opportunities us to work together and deliver values to the societies, the country and the world. The group will continue developing businesses and maximizing the benefits from technologies in order to create sustainable values, to balance business operations and to be a leader driving Thailand to achieve the goals about handling climate changes as announced in the international conferences and driving the Thai economy by being responsible for the environments and the societies and having the good governances for maximizing the benefits of all stakeholders.



**Ms. Jareeporn Jarukornsakul**

Chairman and Group CEO  
WHA Corporation PCL



# “YOUR ULTIMATE SOLUTION PARTNER”



## AWARDS AND MEMBERSHIP

### AWARDS



### RISING STAR SUSTAINABILITY AWARD

WHA Corporation PCL or WHA Group was granted “Rising Star Sustainability Award” in Sustainability Excellence category of SET Awards 2021.



### OUTSTANDING INNOVATIVE COMPANY AWARD

WHA Utilities and Power Public Company Limited (WHAUP) receives the “Outstanding Innovative Company Award” for its innovative “Demineralized Reclaimed Water” project. The Outstanding Innovative Company Awards is a prestigious distinction that reflects WHAUP’s DNA and shows its commitment and determination to initiate quality innovative works that can bring positive changes to society. WHAUP is considered a model organization that helps lift the standards and bring sustainable growth to the country’s economy and society in the long run.





## SUSTAINABLE STOCKS

WHA and WHAUP were also selected by the SET as “Sustainable Stocks” companies and remained in the 2021 Thailand Sustainability Investment (THSI). This ensures that WHA and WHAUP continue to align with changing sustainability trends at the international and national levels.



## AMCHAM CSR EXCELLENCE RECOGNITION AWARD

WHA Group received AMCHAM CSR Excellence Recognition Award 2021 for its 12th consecutive year and its 3<sup>rd</sup> Platinum level. This reflects the company’s commitment to the sustainable social responsibility and community development.



## SIX ECO INDUSTRIAL TOWN AWARDS

WHA Eastern Industrial Estate (Map Ta Phut) (WHA EIE) received Eco Industrial Town Awards in the Eco Excellence category during the recent ECO Innovation Forum 2021 , and five of WHA Industrial Estates received Eco Industrial Town Awards in the Eco Champion category.

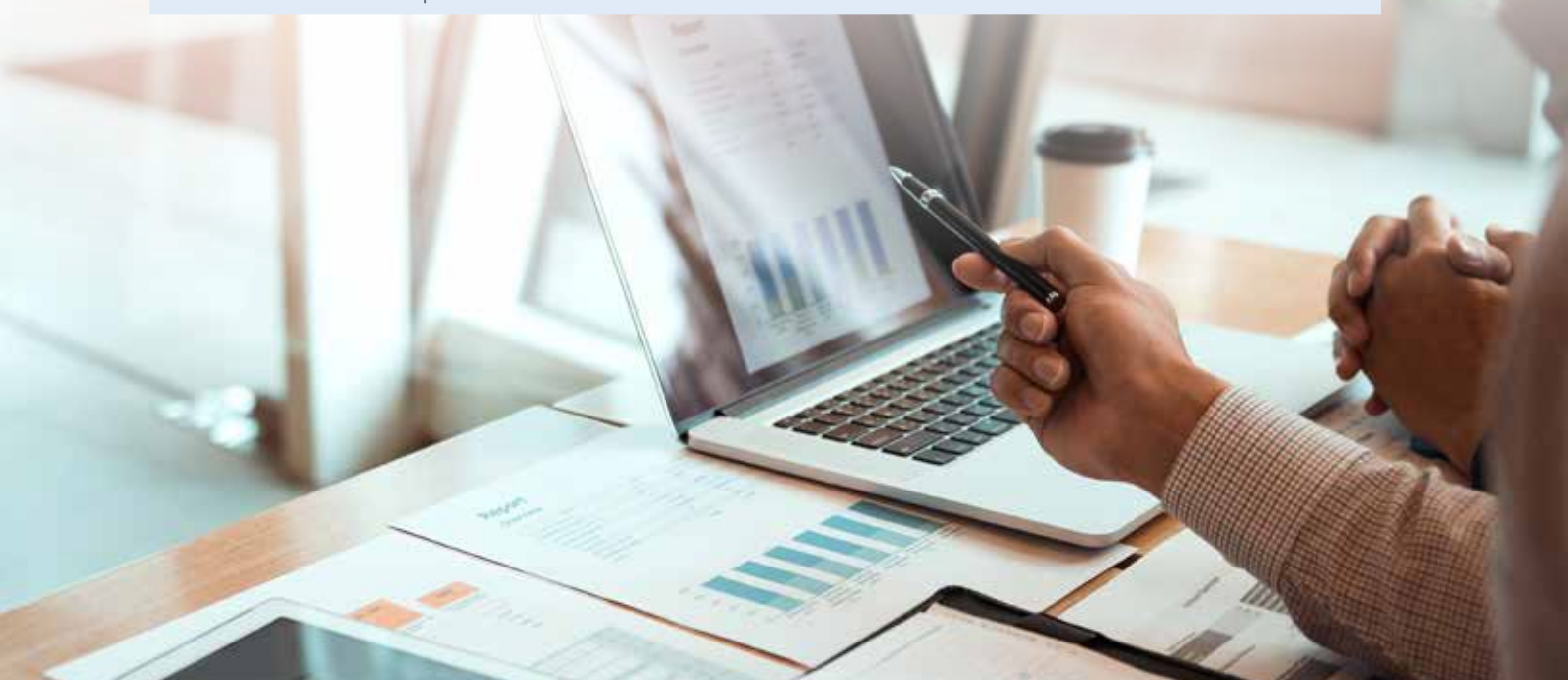


## ACCIDENTS REDUCTION PROJECT AT WHA SIL

WHA Group received an award from the project of accidents reduction at WHA Saraburi Industrial Land (WHA SIL) for the year 2021 from Saraburi Department of Labour Protection and Welfare.

## MEMBERSHIP OF ORGANIZATION

1. American Chamber of Commerce (AMCHAM)
2. The Australian-Thai Chamber of Commerce
3. British Chamber of Commerce Thailand
4. German-Thai Chamber of Commerce
5. European Association for Business and Commerce (EABC)
6. Franco-Thai Chamber of Commerce
7. Japanese Chamber of Commerce
8. Malaysian-Thai Chamber of Commerce
9. New Zealand-Thai Chamber of Commerce
10. Singapore-Thai Chamber of Commerce
11. South Africa-Thai Chamber of Commerce
12. The Thai Chamber of Commerce
13. Thai-Vietnam Business Council
14. Thai-Chinese Chamber of Commerce
15. Thai-Italian Chamber of Commerce
16. The Danish-Thai Chamber of Commerce
17. The Federation of Thai Industries, Saraburi
18. Thai-European Business Association
19. Thai Industrial Estate and Strategic Partner Association
20. The Federation of Thai Industries
21. The Federation of Thai Industries, Rayong
22. Thai Autoparts Manufacturers Association





## ABOUT THIS REPORT

WHA Corporation Public Company Limited (WHA Group) has published a sustainability report annually since 2019 to communicate the Group's management approach to stakeholders as well as to demonstrate practices of running business in a sustainable manner in terms of the governance/ economic, social and environment. This report is WHA Group's 3<sup>rd</sup> sustainability report, which covers the period from 1<sup>st</sup> January to 31<sup>st</sup> December 2021.

The report has been prepared in accordance with Global Reporting Initiatives (GRI) Standards: Core option. In 2021, WHA Group has improved the materiality assessment to be more efficient and comprehensive, in which 19 material topics were identified, similar and some renamed compared with those disclosed in the previous report such as Responsible Investment to Market Opportunity & Innovation Management and Community Development to Community Development & Social Integration. WHA Group has adopted United Nations Sustainable Development Goals (UN SDG) as a framework for

the Group's progress and performance report. The information in this report disclose all business operations of WHA Group and its subsidiaries in Thailand, and that WHA Group holds the total share of 50% and is able to exert operational control.

This report did not receive external party verification, but the contents and data were reviewed and approved by top executives from relevant functions to ensure its accuracy and completeness.

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WHA Corporation Public Company Limited (WHA)  
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Bang Kaeo, Bang Phli, Samut Prakarn 10540  
Tel: (662) 719-9555  
E-mail : Sustainability@wha-group.com



# GETTING TO KNOW WHA GROUP

## VISION

BE RECOGNIZED AS A MARKET LEADER IN ALIGNING VERTICAL INTEGRATED LOGISTICS FACILITIES PROVIDER, TOTAL SOLUTION INDUSTRIAL ESTATES, UTILITIES, POWER, AND DIGITAL INFRASTRUCTURE PLATFORMS OF HIGH QUALITY CAPTURING THROUGHOUT VALUE CHAIN IN ASIA.

## MISSION

- 1 Fulfill requirement of the key major business partners, shareholders and stakeholders
- 2 Focused on innovative and effective strategic, business, finance, service quality, safety, environment, community, and good governance disciplines
- 3 Create a last-long relationship with strategic alliance
- 4 Provide unrivalled quality products with knowledge and expertise leading to win-win-win solution

- 5 Maintain financial discipline to maximize return on equity

- 6 Develop world class logistics facilities, industrial estates, utilities, power and property customer solutions

- 7 Differentiate a comprehensive platform for both infrastructure data center as well as customized service solutions for leading MNCs and Thai conglomerates

- 8 Develop, engage talent and experience team and enhance organizational core competency

## VALUES & CULTURE

### WHA GROUP CORPORATE CULTURE

#### ADVANCED

To be initiative and proactively work to inspire, create, or adjust practical concept, means, or be innovative in order to fulfill customers' requirement and organizational goal.

#### CHAMPION

To achieve success, which results in business excellence.

#### RESOURCEFUL

To build relationship with customers as a consultant and provide professional advice.

#### PARTNERSHIP

To reinforce lasting relationship and build trust as a business alliance with customers and partners, and reinforce internal favorable relationship in order to attain the organizational goal together.

#### INTEGRITY

To cultivate and develop trust and confidence from customers with transparent working culture, adhere to promise, sincerity, diligent, ethical and socially responsible.



Established in 2003 by a group of forward-thinking entrepreneurs involved in industrial property development, WHA Group is now a leading player in logistics, industrial estates, utilities and power and digital services not only in Thailand, but also in the Southeast Asia region. Committed to support Thailand's national policies to foster economic growth, WHA Group established industrial clusters in the automotive, electronics and petrochemical sectors in Eastern Seaboard which has now become a key player in the development of Eastern Economic Corridor (EEC) with the goal to create new high-tech cluster industries. WHA Group abides by the regional regulations prescribed under the Ministry of Industry, Industrial Estate Authority of Thailand (IEAT), Stock Exchange of Thailand, Ministry of Natural Resources and Environment as well as international standards such as the UN SDGs. WHA Group has been listed on the Stock Exchange of Thailand (SET) since 2012, while WHA Utilities and Power Public Limited Company (WHAUP) has been listed on SET since 2017, respectively.

As Thailand's leader in fully integrated logistics and industrial facilities, WHA Group has mapped out a business strategy to become the most desirable partner, "Your Ultimate Solution Partner", for companies that would like to start or expand their businesses in the country, or elsewhere in Southeast Asia. Its core competency lies in best-in-class facilities, prime logistics locations, and its ability to provide dedicated services that are tailor-made for specific needs. WHA Group now offers integrated services and provides customers with turn-key solutions through the Group's four major business hubs: WHA Logistics, WHA Industrial Development (WHAID), WHA Utilities and Power (WHAUP) and WHA Digital Platform.







## LOGISTICS & INDUSTRIAL PROPERTIES

THE COMPANY IS COMMITTED TO BE A LEADING COMPANY AS A WAREHOUSE PROJECT DEVELOPER, DISTRIBUTION CENTER, AND HIGH-QUALITY FACTORY LOCATED IN A STRATEGIC LOCATION AROUND BANGKOK, EASTERN ECONOMIC CORRIDOR, AND OTHER PROVINCES. THE COMPANY IS ABLE TO FULLY MEET THE NEEDS OF ITS CUSTOMERS DUE TO ITS PROJECT LOCATION, PROJECT DESIGN WITH INTERNATIONAL STANDARDS AND QUALITY OF CONSTRUCTION. THIS COULD REDUCE THE COST OF CUSTOMER OPERATIONS AND INCREASE LONG-TERM COMPETITIVE ADVANTAGES.

# #1 LOGISTICS FACILITIES DEVELOPER

OFFERING A VARIETY OF PREMIUM FACILITIES UNIQUELY SERVICING OUR CLIENTS' NEEDS

## 2.55

Million Sq.m.

UNDER  
OWNERSHIP &  
MANAGEMENT

## 200<sup>+</sup>

WELL-KNOWN  
TENANTS PROFILE ON

## 45

WELL-KNOWN  
STRATEGIC LOCATIONS

**NEW LAUNCH WHA MEGA LOGISTICS** CENTER THEPARAK KM. 21", THE COMPANY'S **LARGEST WAREHOUSE** FACILITY WITH A TOTAL BUILDING AREA OF APPROX.

## 400,000

SQ.M

SUCCESSFUL ASSET MONETIZATION INTO  
**WHART**

EXPANDING TO NEW BUSINESS  
**"WHA Office Solutions"**

PARTNERSHIP WITH  
**STARTUPS**













## INDUSTRIAL DEVELOPMENT

INDUSTRIAL DEVELOPMENT HUB IS OPERATED THROUGH THE COMPANY'S SUBSIDIARY, WHAID GROUP, RESPONSIBLE FOR DEVELOPING INDUSTRIAL ESTATES AND/ OR ZONES AND SELLING OF LAND TO ENTERPRISES WHO DEMAND TO MAKE THEIR INVESTMENT IN INDUSTRIAL ESTATES / ZONES AND INDUSTRIAL PROMOTIONAL ZONES. ENTERPRISES CAN GAIN SPECIAL PRIVILEGES PROVIDED BY INDUSTRIAL ESTATE AUTHORITY OF THAILAND AND / OR THAILAND BOARD OF INVESTMENT. ANOTHER CRUCIAL ROLE OF WHAID GROUP IS TO ACT AS A CENTER FOR PROVIDING UTILITIES AND FACILITIES FOR CLIENTS INSIDE THE INDUSTRIAL ESTATES/ ZONES E.G. ELECTRICITY, WATER SUPPLY, WASTEWATER TREATMENT, WASTE DISPOSAL, TELEPHONE, INTERNET AND COORDINATING WITH THE AUTHORITY ON ENVIRONMENTAL CONTROL.

# NUMBER 1 INDUSTRIAL ESTATE DEVELOPER

DELIVERING WORLD-CLASS  
SOLUTIONS TO INDUSTRIAL  
CUSTOMERS

**12** OPERATING  
INDUSTRIAL ESTATES /  
ZONES AND OTHERS  
IN PIPELINE

REAL ESTATE  
DEVELOPMENT OVER  
**68,000** <sup>/1</sup>  
rai

/1 Including operate and under  
development in Thailand and Vietnam.

**BIG WHA  
INDUSTRIAL  
GAS NITROGEN**

SUPPLY BY PIPELINE ALREADY  
IN OPERATION IN ESIE AND  
MORE TO COME

2 NEW UPCOMING INDUSTRIAL  
ZONES IN VIETNAM  
(THANH HOA PROVINCE)  
TOTAL

**7,200** Rai

OFFICIALLY LAUNCHED  
“**WHA RAYONG 36**”  
WITH TOTAL AREA OF

**1,280** Rai

**TUS PARK WHA**

PARTNERS WITH SCII<sup>/2</sup>  
AND NIDA FOR RESEARCH  
& DEVELOPMENT  
COLLABORATION,  
AND TRAINING COOPERATION

/2 Chulalongkorn School of Integrated Innovation



## UTILITIES & POWER

UTILITIES & POWER HUB IS OPERATED THROUGH THE COMPANY'S SUBSIDIARY, WHAUP GROUP, THE PROVIDER OF UTILITIES IN THE WHAID GROUP'S INDUSTRIAL ESTATES/ ZONES I.E. RAW WATER, INDUSTRIAL WATER, AND WASTEWATER TREATMENT. WHAUP GROUP ALSO HAS INVESTMENTS IN POWER BUSINESSES, THROUGH JOINT VENTURES WITH BOTH DOMESTIC AND FOREIGN POWER PLANTS, WHO HAVE EXPERTISE IN THE POWER BUSINESS FIELD. OUR POWER PLANTS INCLUDE BOTH CONVENTIONAL FUEL AND RENEWABLE ENERGY POWER PLANTS.

# INTEGRATED INDUSTRIAL UTILITIES & PROVIDER WITH SOLID BUSINESS GROWTHPOWER

**135** Million m<sup>3</sup>

WATER UTILITIES  
SALES AND  
MANAGEMENT

SECURE WATER PURCHASE  
AGREEMENT OF  
**PREMIUM CLARIFIED  
WATER WITH GULF**

**1.4**

MILLION M<sup>3</sup>/YEAR

PARTNERSHIP WITH ASIA INDUSTRIAL  
ESTATE (AIE) TO PROVIDE  
**RECLAMATION AND  
DEMINERALIZED WATER**  
TO CUSTOMERS IN ASIA INDUSTRIAL  
ESTATE (MAP TA PHUT)

LAUNCHED THE LARGEST  
**SOLAR ROOFTOP  
PROJECT IN ASEAN**

**19.44** MW

**607**

INSTALLED  
EQUITY MW  
POWER

**P2P** ENERGY

PLATFORM  
DEVELOPED &  
READY TO  
SCALE-UP

**SOLAR WITH ESS  
ON WATER PLANT  
IN ESIE**













## DIGITAL PLATFORM

DIGITAL PLATFORM HUB IS OPERATED THROUGH THE COMPANY'S SUBSIDIARY, WHA INFONITE COMPANY LIMITED, WHICH WAS GRANTED NBTC INTERNET SERVICES (TYPE 1), PROVIDING CO-LOCATION DATA CENTERS, FIBER OPTIC NETWORK (FTTX) AND ALSO MANAGED SERVICES.

# DIGITAL PLATFORM

## PROVIDING A DIGITAL PLATFORM SOLUTION FOR LEADING COMPANIES.

THIS FULLY-INTEGRATED AND SUPPORTED INITIATIVE ADDS VALUE TO WHA GROUP.

### 3 DATA CENTERS

WITH **TIER III** AND IV  
STANDARD COMMENCED  
OPERATION  
WITH **373 EQUITY**  
RACKS

### FTTX SERVICE COVERING

# 9

INDUSTRIAL  
ESTATES

SPEARHEAD

## DIGITAL TRANSFORMATION AND IMPLEMENTATION OF DIGITAL INNOVATIONS AND TECHNOLOGIES

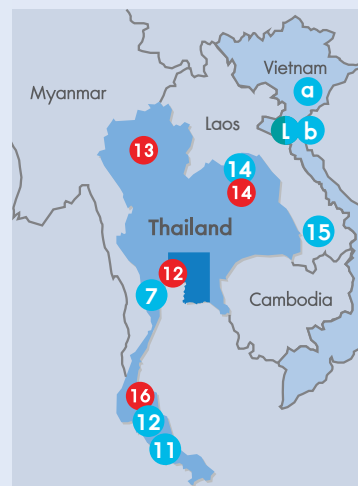
PROVIDING INFRASTRUCTURE FOR  
WIRELESS TELECOM NETWORK INSIDE

## WHA'S INDUSTRIAL ESTATES



## WHA 50+ STRATEGIC LOCATIONS IN THAILAND AND VIETNAM

WHA is a key player in the development of the Eastern Economic Corridor (EEC).



### 1 Warehouse Farm

1. WHA Mega Logistics Center Bangna-Trad km.18
2. WHA Mega Logistics Center Bangna-Trad km.19
3. WHA Mega Logistics Center Bangna-Trad km.23 (Project 1, 2 & 3)
4. WHA Mega Logistics Center Chonlahampichit km.3 (Project 1 & 2)
5. WHA Mega Logistics Center Chonlahampichit km.4
6. WHA Mega Logistics Center Chonlahampichit km.5
7. WHA Mega Logistics Center Ladkrabang
8. WHA Mega Logistics Center Wangnoi 61
9. WHA Mega Logistics Center Saraburi
10. WHA Mega Logistics Center Panthong, Chonburi (Project 1 & 2)
11. WHA Mega Logistics Center Laemchabang (Project 1 & 2)
12. WHA Mega Logistics Center Rama II, km.35
13. WHA Mega Logistics Center Lampoon
14. WHA Mega Logistics Center Khon Kaen
15. WHA Mega Logistics Center Kabinburi
16. WHA Mega Logistics Center Suratthani
17. WHA Mega Logistics Centers Wangnoi 62
18. WHA CENTRAL Mega Logistics Center Wangnoi 63
19. WHA Mega Logistics Center Lum Luk Ka
20. WHA E-Commerce Park
21. WHA Mega Logistics Center Theparak KM. 21

### 2 Built-to-Suit Factories and Warehouses

1. Consumer Goods Distribution Center
2. Healthcare Air-Con Distribution Center
3. Hazardous Goods Distribution Center
4. Ladkrabang Logistics Center (2 Phases)
5. Manufacturing in WHA SIL
  - Diaper Manufacturing
  - Camera Part Manufacturing
6. Consumer Goods Distribution Center
7. Manufacturing in Industrial Estate
  - Aerospace Manufacturing
  - Motorbike Manufacturing
8. WHA Ready Built Factory Park 1 @Hi-tech Kabin
9. Manufacturing in WHA CIE1
  - Automotive Part Manufacturing
10. Factory in WHA ESIE 1
  - Automotive Part Factory

### 3 Industrial Estates/Lands

- A. WHA Chonburi Industrial Estate 1 (WHA CIE 1)
- B. WHA Chonburi Industrial Estate 2 (WHA CIE 2)
- C. Eastern Seaboard Industrial Estate (Rayong) (ESIE)
- D. WHA Eastern Seaboard Industrial Estate 1 (WHA ESIE 1)
- E. WHA Eastern Seaboard Industrial Estate 2 (WHA ESIE 2)
- F. WHA Eastern Seaboard Industrial Estate 3 (WHA ESIE 3)
- G. WHA Eastern Seaboard Industrial Estate 4 (WHA ESIE 4)
- H. WHA Eastern Industrial Estate (Map Ta Phut) (WHA EIE)
- I. WHA Rayong Industrial Land (WHA RIL)
- J. WHA Rayong 36 Industrial Estate (WHA RY36)
- K. WHA Saraburi Industrial Land (WHA SIL)
- L. WHA Industrial Zone 1 - Nghe An Vietnam

### 4 WHA Utilities & Power

WHAUP's water treatment plants and wastewater treatment plants are located in all WHA's Industrial Estates and also projects in Ha Noi and Nghe An, Vietnam

a. Ha Noi  
b. Nghe An

WHAUP's power projects are located in the following provinces:

1. Ayudhya
2. Bangkok
3. Chachoengsao
4. Chonburi
5. Nakhon Nayok
6. Pathum Thani
7. Petchaburi
8. Prachinburi
9. Samut Prakarn
10. Saraburi
11. Songkhla
12. Suratthani
13. Rayong
14. Udonthani
15. Attapeu, Laos

### 5 WHA Logistics Parks

1. WHA Logistics Park 1 (WHA LP 1)
2. WHA Logistics Park 2 (WHA LP 2)
3. WHA Logistics Park 3 (WHA LP 3)
4. WHA Logistics Park 4 (WHA LP 4)

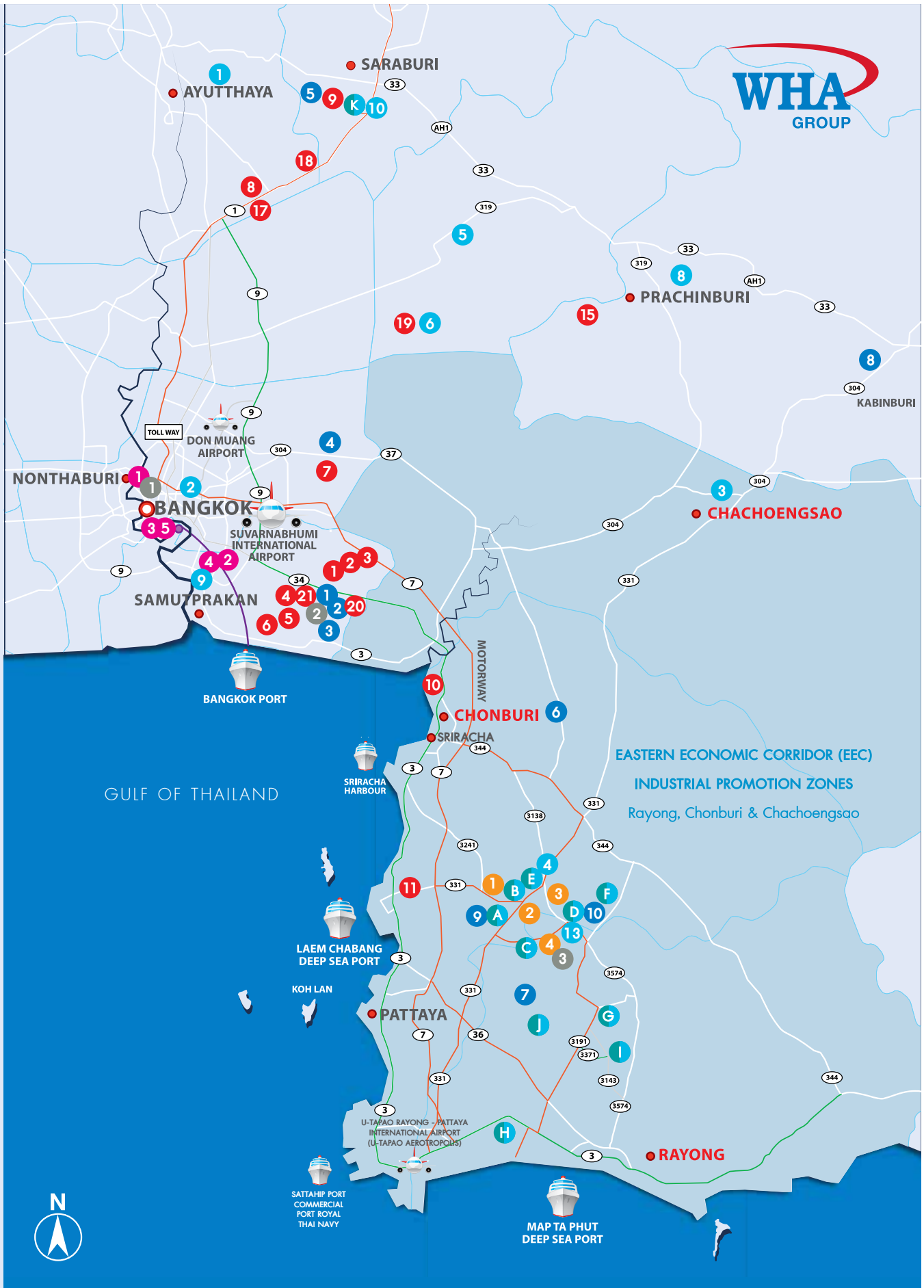
### 6 Digital Platform

1. WHA Mega Center Vibhavadi-Rangsit
2. WHA Mega Center Bangna-Trad
3. WHA Mega Center Eastern Seaboard

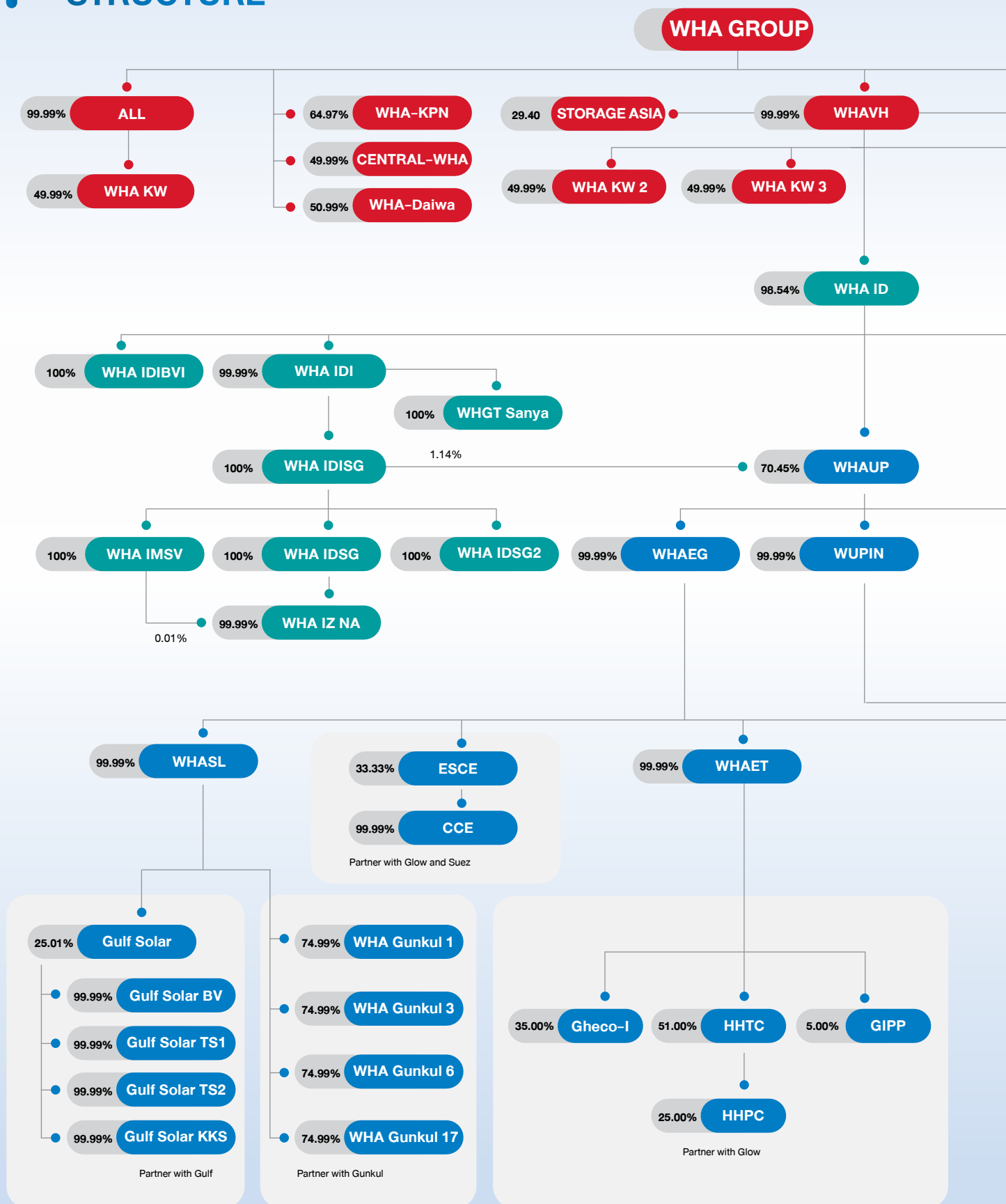
### 7 Business Complex

1. SJ Infinite I
2. WHA Tower and WHA Bangna Business Complex
3. TusPark WHA Incubation Center
4. @Premium
5. WHA KW



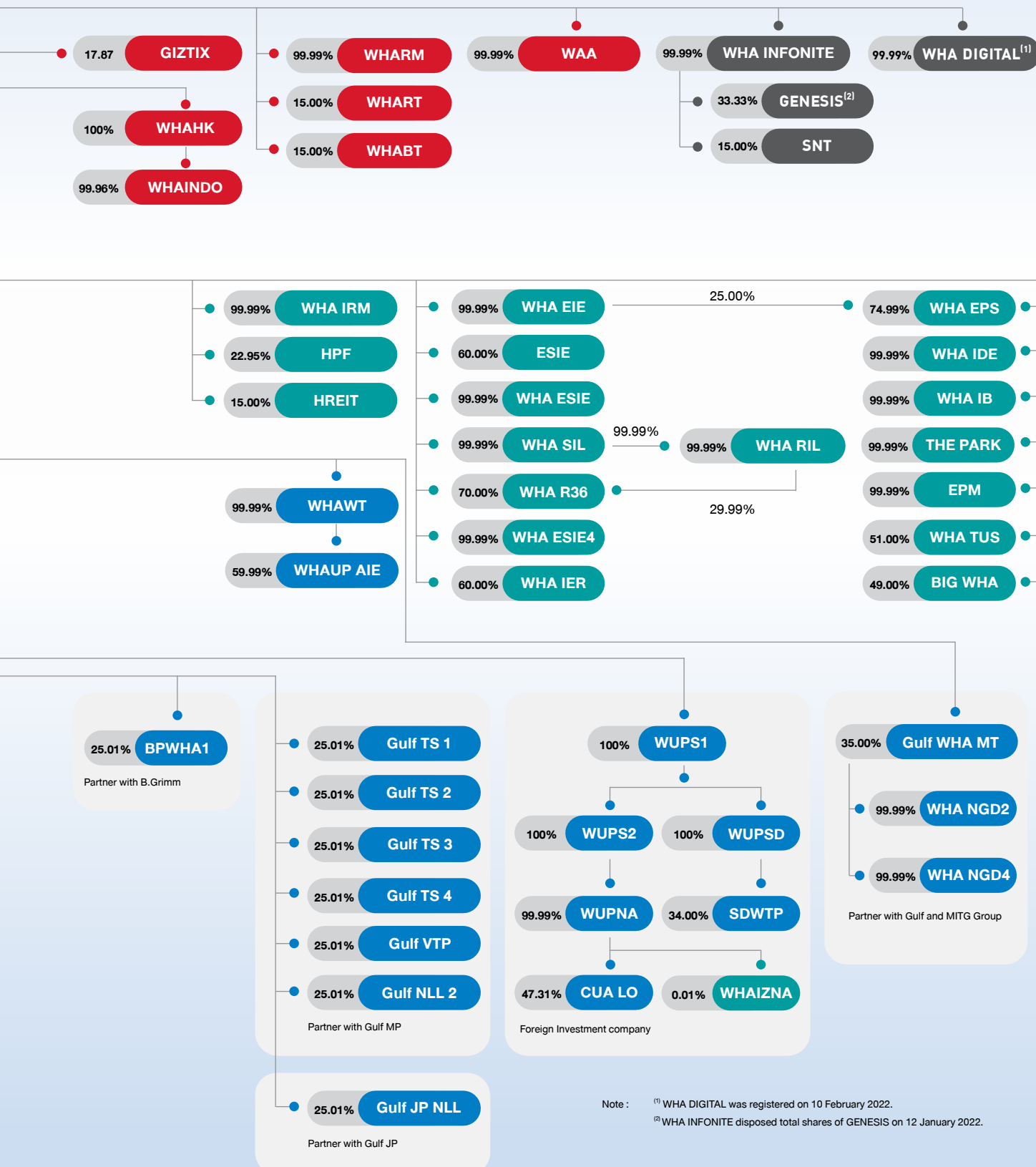


# WHA GROUP SHAREHOLDING STRUCTURE



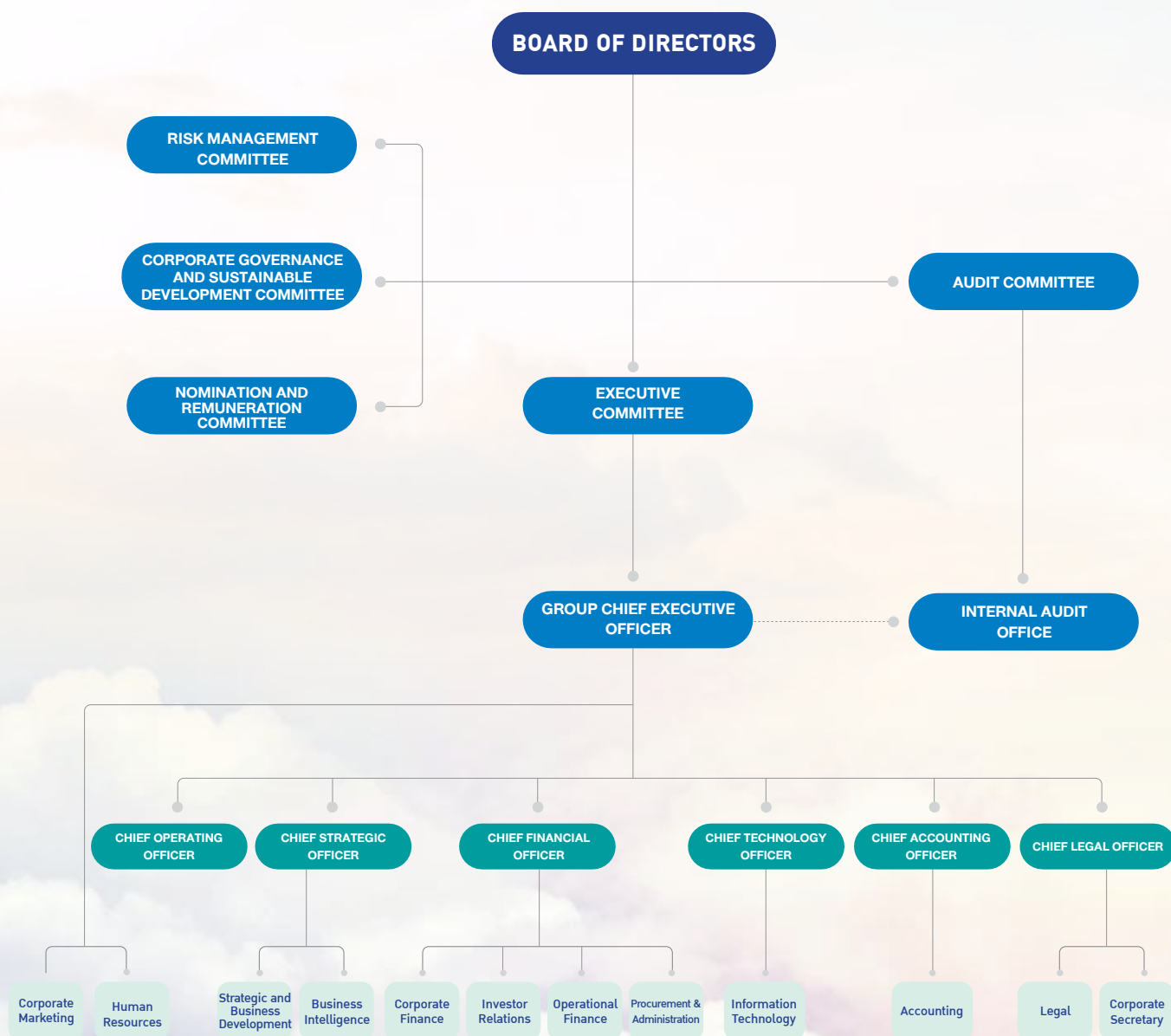


As of 31 December 2021







# ORGANIZATION CHART

As of 31 December 2021, the Company's structure management is as below:





# WHA GROUP VALUE CHAIN

Business Hubs	Upstream	Operations	Downstream
<b>Logistics Hub</b> 	<ul style="list-style-type: none"> <li>• Land acquisition</li> <li>• Property development</li> </ul>	<ul style="list-style-type: none"> <li>• Warehouse leasing and sale</li> <li>• Asset management</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance</li> <li>• Customer service</li> </ul>
<b>Industrial Development Hub</b> 		<ul style="list-style-type: none"> <li>• Industrial plot sale</li> <li>• Asset service management</li> </ul>	
<b>Utilities &amp; Power Hub</b> 	<ul style="list-style-type: none"> <li>• Raw Water Procurement</li> <li>• Fuel and solar panel procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Water production</li> <li>• Wastewater treatment</li> <li>• Power production</li> <li>• Solar rooftop installation</li> </ul>	
<b>Digital Platform Hub</b> 	<ul style="list-style-type: none"> <li>• IT product and service procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Data Center service and solution management</li> <li>• Network service management</li> <li>• Managed services and solutions management</li> </ul>	

# SUSTAINABILITY AT WHA GROUP

In 2021, WHA Group has rolled out its 5-Year Sustainability Framework, endorsed by the Executive Committee, to drive corporate sustainability actions to build upon, and align with the Group's business direction to become "Your Ultimate Solution Partner". To achieve its aspiration, the Framework is built on the foundation of good corporate governance, human capital as strategic enabler and key driving forces including digitization and natural resources. The long-term corporate sustainability goals address the Group's material topics that are important to WHA Group and the key stakeholders. Furthermore, the Group ensures to stay ahead by taking into consideration the risks and opportunities analyzed from global existing and emerging trends.

## BUSINESS DIRECTION

"Your Ultimate Solution Partner"



Corporate Value



Corporate Value

### NATURAL RESOURCES

- Double the reclaimed industrial water for industrial use from 30,200 cubic meter/day in 2020 to 60,400 cubic meter/day by 2025
- Optimize proportion of waste to landfill and incineration approach by 2025



Corporate Value

### DIGITIZATION

- Revenue generation and cost reduction from innovation projects
- 100% data breach prevention in terms of data leaks, thefts or losses of both inbound and outbound data are achieved in 2025



### HUMAN CAPITAL

- Maintain Human Capital Return on Investment at 14% by 2025
- 7.2% overall turnover rate in 2025
- 5% talent turnover rate in 2025



Corporate Value



### GOVERNANCE

- 100% acknowledgement and communication of Code of Conduct to subsidiary, employees and suppliers/contractors by 2025
- 100% employees at all levels are trained on risk management by 2022
- Maintain market share for industrial development at 32%
- 90% customer satisfaction score in 2021



Corporate Value





# SUSTAINABILITY MATERIALITY ISSUES

WHA Group conducts annual materiality assessment to consider issues that have impacts or influences toward the stakeholders and the Group's operations. Considering internal and external factors, material topics are identified in three aspects: governance/economic, social, and environment.

The materiality assessment process is based on the Global Reporting Initiative (GRI) Standard framework. This allows the Group to address the corporate risk management and global trends as well as manage the stakeholders' expectations in a balanced and effective manner.

## MATERIALITY ASSESSMENT PROCESS



### 1. IDENTIFICATION

Identify relevant material topics by considering internal and external factors: business strategic direction, corporate risk profile, relevant standards and requirements (e.g., United Nation Sustainable Development Goals (UN SDGs)), global trends relevant to WHA Group's four main businesses, COVID-19 pandemic impacts and the needs and expectations of WHA Group's stakeholders.



### 2. PRIORITIZATION

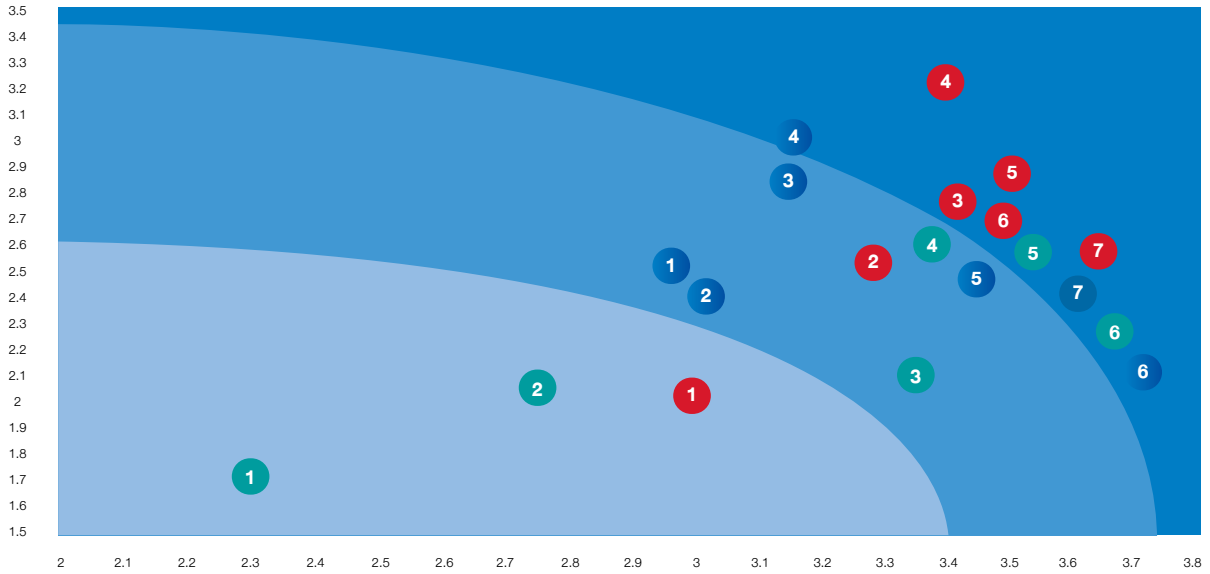
The material topics were prioritized on the basis of two criteria:

- 1) the significance of the topic to WHA Group's governance/economic, environmental, and social impacts, through WHA executive level workshop and
- 2) the topic's importance to stakeholders. Base on a process for reviewing research-led data to determine its importance from a stakeholder perspective.



### 3. VALIDATION

WHA Group conducted a materiality endorsement meeting consisting of Executive Committee with senior management from all business hubs and chaired by the Group CEO. The management took the responsibilities for reviewing and validating the proposed materiality assessment results, and provided approval for information disclosure.



SIGNIFICATION ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACTS

### Medium Importance

- 1 Biodiversity
- 4 Climate Change

### High Importance

- 2 Air Emission
- 5 Water Mgt.

### Very High Importance

- 3 Energy Mgt.
- 6 Waste Mgt.

- 1 Labor Practice Indicators
- 4 Stakeholder Engagement
- 7 Human Capital Development

- 2 Human Rights
- 5 OHS

- 3 Community Development
- 6 Talent Attraction & Retention

- 1 Supply Chain Mgt.
- 4 Codes of Business Conducts
- 7 Innovation Mgt.

- 2 Responsible Investment
- 5 Customer Relationship Mgt.




- 3 Risk & Crisis Mgt.
- 6 Data Security



# SUSTAINABILITY MATERIALITY ISSUES AND IMPACT BOUNDARY

Report Dimension	Material Issues	Corresponding GRI Aspects	Key Stakeholders and Impact Boundary		SDGs	Page
			Internal	External		
GOVERNANCE/ECONOMICS	Stakeholder Engagement	GRI 102-43 Approach to Stakeholder Engagement,	Employee	<ul style="list-style-type: none"> <li>Community</li> <li>Government/Regulator</li> <li>Shareholder/Investor</li> <li>Media</li> <li>Financial Institution</li> <li>Supplier/Creditor</li> <li>Customer</li> </ul>		031-037
	Codes of Business Conduct	Disclosure 205-3 Confirmed incidents of corruption and actions taken	Employee	<ul style="list-style-type: none"> <li>Supplier/Creditor</li> <li>Government/Regulator</li> <li>Financial Institution</li> <li>Customer</li> </ul>		031-037
	Risk and Crisis Management	GRI 102-31 Review of economic, environmental and social topics,	Employee	<ul style="list-style-type: none"> <li>Financial Institution</li> <li>Government/Regulator</li> <li>Customer</li> <li>Shareholder/Investor</li> </ul>		045-053
	Supply Chain Management	GRI 308-1 New Suppliers that were screened using environmental criteria, GRI 308-2 Negative environmental impacts in the supply chain and actions taken, GRI 414-1 New Suppliers that were screened using social criteria, GRI 414-2 Negative social impacts in the supply chain and actions taken, and	Employee	<ul style="list-style-type: none"> <li>Supplier/Creditor</li> <li>Customer</li> </ul>	   	054-060
	Customer Relationship Management	GRI 102-43 Approach to Stakeholder Engagement,	Employee	<ul style="list-style-type: none"> <li>Customer</li> <li>Supplier/Creditor</li> </ul>		061-071
	Data Security	Disclosure 203-1 Infrastructure investments and services supported	Employee	<ul style="list-style-type: none"> <li>Customer</li> <li>Financial Institution</li> <li>Shareholder/Investor</li> <li>Supplier/Creditor</li> </ul>	  	097-103
	Market Opportunity & Innovation Management	Disclosure 203-1 Infrastructure investments and services supported		<ul style="list-style-type: none"> <li>Financial Institution</li> <li>Media</li> <li>Shareholder/Investor</li> </ul>		084-096
	Human Rights	GRI 412-1 Human rights Assessment, GRI 405-1 Diversity and Equal Opportunity, GRI 406-1 Non-discrimination	Employee	<ul style="list-style-type: none"> <li>Community</li> <li>Government/Regulator</li> <li>Media</li> <li>Supplier/Creditor</li> <li>Customer</li> </ul>		108-116



Report Dimension	Material Issues	Corresponding GRI Aspects	Key Stakeholders and Impact Boundary		SDGs	Page
			Internal	External		
SOCIAL	Labor Practice Indicators	GRI 401-1 Employment,	Employee	• Media • Supplier/Creditor	 	117-120
	Talent Attraction and Retention	GRI 402 -1 Labor/Management Relations	Employee	• Supplier/Creditor	 	121-130
	Human Capital Development	GRI 404-1 Training and Education,	Employee	• Shareholder/Investor • Supplier/Creditor	  	127
	Occupational Health and Safety	Disclosure 403-9 Work-related injuries	Employee	• Customer • Community • Supplier/Creditor		257
	Community Development & Social Integration	GRI 413-1 Local Communities	Employee	• Community • Government/Regulator • Shareholder/Investor • Media • Customer	       	255-256
	Biodiversity	Disclosure 304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Employee	Customer Supplier/Creditor Government/Regulator Community Financial Institution Shareholder/Investor Media		272
ENVIRONMENT	Water Management	Disclosure 303-3 Water withdrawal	Employee	Customer Supplier/Creditor Government/Regulator Community	  	199-204
	Waste Management	Disclosure 306-2 Waste by type and disposal method	Employee	Customer Supplier/Creditor Government/Regulator Community		206-212
	Air Emission	Disclosure 305-7 Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Employee	Customer Supplier/Creditor Government/Regulator Community Financial Institution	 	266-271
	Climate Change (Physical and Transition risks)	Disclosure 305-1 Direct (Scope 1) GHG emissions Disclosure 305-2 Energy indirect (Scope 2) GHG emissions Disclosure 305-5 Reduction of GHG emissions	Employee	Customer Supplier/Creditor Government/Regulator Community Financial Institution Shareholder/Investor	   	230,259
	Energy Management	Disclosure 302-1 Energy consumption within the organization	Employee	Customer Supplier/Creditor Government/Regulator Community Financial Institution Shareholder/Investor	   	234-240

# STAKEHOLDER ENGAGEMENT

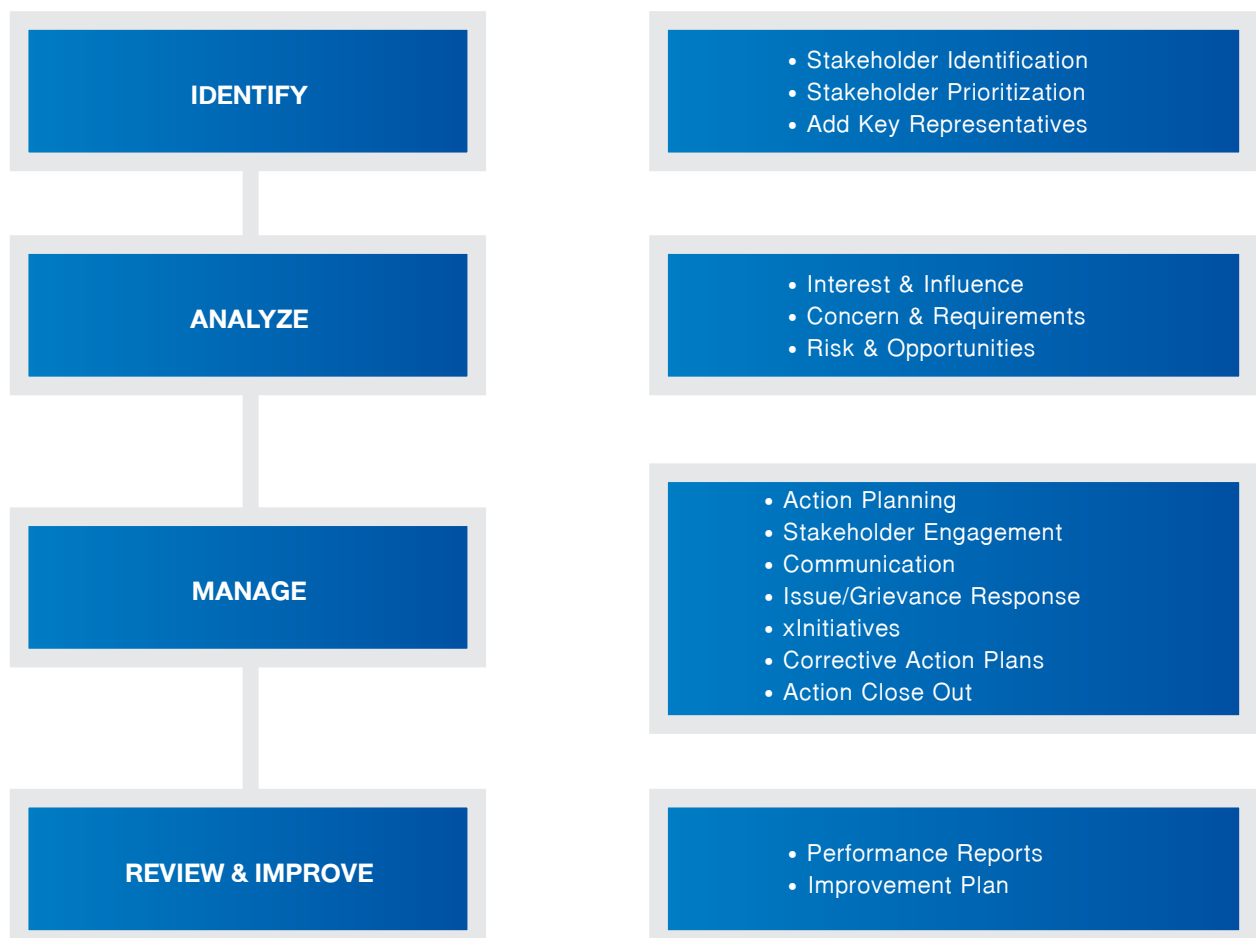
Strong engagement and effective communication are essential components of any business's success. Striving to become the ultimate solution partner, WHA Group honors all stakeholders' views in order to build good relationships with transparency, leading to a strong foundation for sustainable business growth. Stakeholder engagement is a critical activity that enables the Group to be kept informed of the stakeholders' expectations and concerns. WHA Group's four business hubs are strategically operated to play their roles in offering integrated solutions to the Group's customers, driven by the commitment to be "Your Ultimate Solution Partner." Therefore, WHA Group has implemented stakeholder engagement guideline/ process . The objective is to manage stakeholder expectations, to analyze and prioritize stakeholders in order to identify appropriate

stakeholders who have an impact on the company's projects or operations . Thus, the stakeholder engagement procedure allows WHA Group to be able to proactively and effectively mitigate negative impacts and maximize positive impacts. Furthermore, WHA Group reaffirms the trust of all stakeholders along the value chain.

## MANAGEMENT APPROACH

### • STAKEHOLDER MANAGEMENT

Stakeholder management is important for reducing negative impacts and creating positive impacts on society for WHA Group's operations. WHA Group has created a Stakeholder Management Guideline for group-wide implementation, which provides guidance to all business units.





WHA Group has implemented the Corporate Governance Policy, which covers all groups of stakeholders, as part of stakeholder engagement. The company has received complete support from a wide range of stakeholders, allowing it to compete and generate profits. As a result, it is expected to add long-term value to the company. Establishing and strengthening relationships with stakeholders is one of the most important success factors for WHA Group. As a result, the WHA Group implemented the stakeholder engagement framework as a proactive system with guidelines for identifying, analyzing, managing, reviewing, and improving stakeholders.

The stakeholder engagement framework includes:

1. Identify and prioritize key stakeholders: to plan the identification engagement approach process.
2. Analyze: evaluate and analyze the topics that cover all stakeholders' interests, concerns, risks, and opportunities in order to prepare for the stakeholder engagement process.
3. Manage: monitor and implement the stakeholder engagement process by communicating with all stakeholders and responding to issues via the grievance mechanism.
4. Review and Improve: review the efficiency and effectiveness of stakeholders and communicate the findings to WHA Group stakeholders in order to foster trust .

Creating an effective stakeholder engagement at WHA Group initiates with a group-level stakeholder identification and prioritization on an annual basis. The stakeholders are defined as individuals, groups of individuals or organizations in the Group's value chain that could potentially be affected by WHA Logistics, WHA Industrial Development, WHA Utilities and Power and WHA Digital Platform's activities, products or services and associated performances. The identified stakeholders are prioritized based on the extent of their dependency, directly or indirectly, towards the Group's activities, products, performances or services, and their influence or impacts to the Group's strategy or operational decision-making.

In 2021, the Group identify all stakeholders with the capacity to affect and/or who are likely to have an interest in the operation and also determine eight equally prioritized key stakeholders including, employee, shareholder/investor, customer, supplier/creditor, government/regulator, community, financial institution, and media .



The engagement review process are as follows:

- The stakeholders' opinions and concerns were attained via various engagement approaches and available channels as described in the following subsections of this Report.
- Concerns received from the engagements were further reported to the Group's Supervisor and the CSR Steering Committee, comprising of manager levels and responsible personnel from relevant departments, to acknowledge, assess and strategize efficient and suitable responses to ensure that the stakeholders' expectations are met.
- The results of stakeholder engagement process were then subsequently reported to the executives as inputs for maturing business decisions.
- The briefings on stakeholder engagement to the Board of Directors occurred quarterly, with the person ultimately responsible for stakeholder engagement at group level being the Executive Committee (COO) of WHA Group,



## RESULTS FROM STAKEHOLDER ENGAGEMENT

### • EMPLOYEE

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Various all time communication channels (email, supervisor, intranet etc.)</li> <li>Annual CEO Town Hall</li> <li>Quarterly Executive Sharing</li> <li>Annual employee satisfaction and engagement survey</li> <li>Suggestion box</li> <li>Whistle blowing channel</li> <li>Monthly management meeting</li> </ul>	<ul style="list-style-type: none"> <li>WHA Group outlook</li> <li>Business trends and updates</li> <li>Update on news and knowledge sharing</li> <li>Training and career development program</li> <li>Work environment</li> <li>Compensation, welfare, and benefits</li> <li>Management of occupational health and safety</li> <li>Business continuity plan</li> </ul>	<ul style="list-style-type: none"> <li>Update the performance and business outlook</li> <li>Share business trends and updates via WHA's communication channels</li> <li>Communicate and share updated situations and Executive knowledge</li> <li>Develop and provide suitable training programs</li> <li>Communicate on corporate values and strategy</li> <li>Regularly review and improve employees' compensation and benefits</li> <li>Promote good occupational health and safety culture</li> <li>Regular communication of COVID-19 related news via internal SharePoint and emails</li> <li>Implementation of management approaches to prevent COVID-19 impacts (e.g. Work from Home, sanitation as per best practices and regulations)</li> <li>Update and communicate business continuity plan via various communication channels in a timely manner</li> <li>Conduct business continuity plan rehearsals to ensure practices and requirements are strictly and effectively followed</li> </ul>

### • SHAREHOLDER/ INVESTOR

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Annual general meeting</li> <li>Annual Report and Sustainability Report</li> <li>Roadshow</li> <li>Analyst meeting</li> <li>Outlook meeting</li> <li>Investor site visit</li> <li>Opportunity Day</li> <li>Various all time communication channels (e.g. telephone, email, website etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Business performance, such as returns, benefits and profits</li> <li>Business transparency</li> <li>Changes in business management and business risks</li> <li>Sustainability performance</li> </ul>	<ul style="list-style-type: none"> <li>Improve business competitiveness and business directions to be up-to-date</li> <li>Respond to all received inquiries regarding COVID-19 impacts to financial portfolio via email, Group's website and public relations media</li> <li>Communicate about the insignificant impacts due to COVID-19 on the Group's business performance via Microsoft Teams and Zoom platforms</li> <li>Ensure good corporate governance</li> <li>Take part in Thai Private Sector Collective Action Against Corruption (CAC)</li> <li>Conduct enterprise risk management and establish short and long-term plan</li> <li>Provide information on flooding risk prevention</li> <li>Manage sustainability material topics</li> <li>Ensure environment and social compliance</li> <li>Promote innovation and sustainability initiatives</li> </ul>

## • CUSTOMER

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Roadshow/ marketing events/ webinar</li> <li>Quarterly business meeting/ video conference</li> <li>Annual customer satisfaction survey</li> <li>Quarterly customer clubs</li> <li>Quarterly WHA Connect magazines</li> <li>Various all time communication channels (i.e. telephone, email, key contact personnel, social media etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Product and service inquiry</li> <li>Quality of after sale services</li> <li>Environment management, compliance and standards</li> <li>Risk and crisis management</li> </ul>	<ul style="list-style-type: none"> <li>Provide product and service information on website and other media</li> <li>Provide prompt response to customers' inquiry</li> <li>Establish effective customer relationship management</li> <li>Continuously improve customer relationship management from customer's comments / suggestions</li> <li>Strictly comply with related laws and regulations and apply international environmental management standards where possible</li> <li>Conduct risk and crisis assessment and implement appropriate mitigation actions</li> <li>Inform customers of relevant risks and crisis management plans and measures</li> <li>Communicate about the COVID-19 response procedures and appointment of emergency contact personnel</li> <li>Reduction of Management Fee attained from WHA Industrial Development's customers during 2<sup>nd</sup> - 3<sup>rd</sup> Quarters of 2020 to help with challenges from COVID-19 impacts</li> </ul>

## • SUPPLIER/ CREDITOR

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Supplier event</li> <li>Supplier site visit</li> <li>Telephone and Email</li> <li>Self-evaluation and onsite visits</li> </ul>	<ul style="list-style-type: none"> <li>Transparency in procurement process</li> <li>Business opportunities and collaboration</li> <li>Compliance with WHA Group's standard</li> <li>On-time payment and following the contract agreement</li> <li>Environment, social and governance management</li> <li>Material quality and its environmental impacts</li> <li>Labor conditions (i.e. human rights)</li> </ul>	<ul style="list-style-type: none"> <li>Developed procurement policy and procedure</li> <li>Conduct Suppliers-meet- Customers day</li> <li>Communicate on WHA Group's procurement policy</li> <li>Conduct supplier assessment and provide feedback/ corrective action plans to guide suppliers for improvement</li> <li>Follow the contract agreement</li> <li>Disclose information according to the agreed condition</li> <li>Communicate concerns related to environment, social and governance criteria</li> <li>Communicate about the COVID-19 response procedures</li> <li>Communicate about the insignificant impacts due to COVID-19 on the Group's business performances to assure suppliers' confidence and trust</li> <li>Reduce face-to-face meetings to reduce COVID-19 risks</li> <li>Evaluate supplier criteria to ensure that environmental, social and governance concerns are limited</li> <li>Ensure environmental management compliance are strictly followed</li> <li>Develop screening process to ensure that it complies with the Supplier Code of Conduct</li> <li>Ensure there is no violations of labor conditions or human rights issues</li> </ul>



## • STAKEHOLDERS

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Meeting on occasion</li> <li>Various all time communication channels (i.e. telephone, email and Line application)</li> </ul>	<ul style="list-style-type: none"> <li>Regulatory compliance</li> <li>Stakeholder impact management</li> <li>Corporate governance and transparency</li> </ul>	<ul style="list-style-type: none"> <li>Strictly comply with relevant laws and regulations</li> <li>Develop effective stakeholder engagement plans</li> <li>Corporate governance and transparency Ensure good corporate governance and implementation of business code of conduct</li> </ul>

## • COMMUNITY

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Public hearing and meeting</li> <li>Community activities</li> <li>Community engagement survey</li> <li>Local community representatives</li> <li>Site visits</li> </ul>	<ul style="list-style-type: none"> <li>Business operations' impacts on communities' well-being (i.e. traffic jam, safety, water withdrawal, etc.)</li> <li>Environmental management performance</li> <li>Community development and support</li> <li>Community engagement</li> </ul>	<ul style="list-style-type: none"> <li>Conduct regular community feedback survey to ensure there is no impact on local community</li> <li>Implement mitigating actions where business operation activities affect community's well-being (i.e. use of smart traffic management to improve traffic problem)</li> <li>Involve surrounding communities in crisis management and emergency drill</li> <li>Ensure compliance with environmental related laws and standards</li> <li>Initiate community development programs regularly</li> <li>Share WHA Group's expertise with local communities</li> <li>Implement community development initiatives that support the communities to tackle COVID-19 impacts</li> <li>Provide effective and prompt response to community complaints</li> <li>Conduct community meeting to understand communities' needs and suggestions</li> </ul>

## • FINANCIAL INSTITUTION

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>Various all-time communication channels (i.e. email, phone, line application, conference, etc.)</li> <li>Annual greetings</li> <li>Quarterly analyst meetings</li> </ul>	<ul style="list-style-type: none"> <li>Business performance and outlook</li> <li>Business transparency</li> <li>Changes in business management and business risks</li> <li>Sustainability performance</li> <li>Green initiative</li> </ul>	<ul style="list-style-type: none"> <li>Improve and keep business competitiveness and business directions up-to-date</li> <li>Respond to all received inquiries regarding COVID-19 impacts to financial portfolio via email, Group's website and public relations media</li> <li>Communicate about the insignificant impacts due to COVID-19 on the Group's business performance via Microsoft Teams and Zoom platforms</li> <li>Ensure good corporate governance</li> <li>Strictly comply with Disclosure Policy</li> <li>Notify significant updates or changes in a timely manner</li> <li>Manage sustainability material topics</li> <li>Promote innovation and sustainability initiatives</li> <li>Assess sustainability issues along with investment decision process</li> <li>Seeking out new funding that concerns with green issues and related aspects</li> </ul>

- **MEDIA**

Engagement Approach	Stakeholders' Expectation	2021 Performance Summary
<ul style="list-style-type: none"> <li>• Various weekly or bi-weekly communication channels (i.e. press release, photo captions, executive interview and news article)</li> <li>• Annual press conference, press tour/visits and annual greetings</li> <li>• Quarterly Group interviews</li> <li>• Bi-annual press briefings</li> </ul>	<ul style="list-style-type: none"> <li>• Business outlook/ Business direction</li> <li>• Strengthening relationships</li> <li>• Updates on products and services</li> <li>• New customers</li> <li>• CSR initiatives and environmental management</li> <li>• Business outlook</li> <li>• Financial results</li> <li>• Technological advancements</li> </ul>	<ul style="list-style-type: none"> <li>• Hold annual press conference to update business plan and directions</li> <li>• Frequently update on the development of company's activities through media channels</li> <li>• Disclose accurate information on the basis of facts</li> <li>• Maintain good and long-term relationships with the media</li> <li>• Communicate through online platforms to reduce COVID-19 impacts from face-to-face meetings</li> </ul>

## GRIEVANCE MECHANISM

In order to identify the issues and implement effective measures to properly address the issues and concerns from stakeholders, WHA Group implemented, a group-wide grievance mechanism.

There are channels for employees and external stakeholders to confidentially report and inform on clues, suspicions, advice, grievances, or complaints. Employees and external stakeholders who report wrongdoing are protected as whistleblowers.

The report channel as below,

Reporting Channels	
<b>Channels for Employees</b> <ul style="list-style-type: none"> <li>• <a href="https://www.wha-group.com/en/corporate-governance/corporate-governance">https://www.wha-group.com/en/corporate-governance/corporate-governance</a></li> <li>• Human Resource Department</li> <li>• Comment Box</li> <li>• Ceo_office@wha-group.com    auditcommittee@wha-group.com</li> </ul>	<b>Channels for External Stakeholders</b> <ul style="list-style-type: none"> <li>• <a href="https://www.wha-group.com/en/corporate-governance/corporate-governance">https://www.wha-group.com/en/corporate-governance/corporate-governance</a></li> <li>• Ceo_office@wha-group.com</li> <li>• auditcommittee@wha-group.com</li> </ul>



# GOVERNANCE/ ECONOMIC DIMENSION





# CODES OF BUSINESS CONDUCT

With the world moving toward a more sustainable economy, good corporate governance is the long-term foundation for long-term business growth. It serves as the foundation for ensuring that a company's management is accountable and ethical. Transparency, accountability, responsibility, and fairness serve as the foundation for the development of core corporate governance principles. As a result, the Board of Directors under WHA Group is responsible for the Group's operations. Stakeholders can see from the encapsulated good corporate governance that WHA Group is well managed and that stakeholders' interests are aligned with management's perspectives.

## MANAGEMENT APPROACH WHA GROUP CODE OF CONDUCT

WHA Group commits to be a successful and efficient business by aligning its good corporate governance management approach with the Thai Securities and Exchange Commission's national guidelines as well as international approaches such as the United Nations Global Compact.

A group-wide Code of Conduct was consented by the Corporate Governance and Sustainable Development Committee and approved by the Board of Directors to ensure that business operations are conducted in accordance with the principles of integrity, lawful behavior, ethics, and responsibility towards the environment, society, and governance (ESG). The Code of Conduct governs all employees, suppliers, contractors, subsidiaries and joint ventures across all four business hubs. To ensure widespread understanding and transparency for all local and foreign stakeholders, the Code of Conduct is available in both Thai and English languages. The Code of Conduct is reviewed annually, and the most recent revision is publicly disclosed on WHA Group's website and intranet, allowing employees and external stakeholders to access to the information easily. The WHA Group's Code of Conduct is available at [this link](#)



1	CORPORATE ETHICS	5	ANTI-CORRUPTION	9	HUMAN RIGHT
2	UNDESIABLE PRACTICES	6	PROTECTION THE COMPANY'S ASSETS	10	PRACTICES TOWARDS THE STAKEHOLDERS
3	CONFLICT OF INTERESTS	7	PREPARATION AND KEEPING OF THE INFORMATION	11	SAFETY, HEALTH, HYGIENE AND ENVIRONMENT AT THE WORKPLACE
4	USE OF THE INSIDER INFORMATION	8	INTELLECTUAL PROPERTY AND USE OF THE IT	12	WHISTLEBLOWING OR COMPLAINTS

To ensure compliance with WHA Group's Code of Conduct, the Group has implemented a process for digital acknowledgement on the Code of Conduct and provided training programs in order to communicate the Code of Conduct to all employees, suppliers, contractors, subsidiaries and joint ventures.



100%

OF EMPLOYEES HAVE BEEN  
COMMUNICATED ON THE CODE  
OF CONDUCT

WHA Group used its appropriate performance management system to ensure that all employee can completely perform in compliance with the Group's Code of Conduct, whereby there is no any complaint about the conduct violating the Code of Conduct in the year 2021.

## ANTI-CORRUPTION

WHA Group strives to empower all employees to act with integrity in order to make a positive impact throughout the Group's business operations. All forms of corruption are considered unacceptable practices, therefore, WHA's anti-corruption policy was established and updated to obviously and vigorously protect against corruption, and it was enforced to all employees, suppliers, contractors, subsidiaries and joint ventures. The Policy's objective is to prevent misuse of power, to prohibit any form of fraud or bribery, and to operate a business in a lawful manner. As a result, the Company's anti-corruption stance is fully encapsulated in the Group's Code of Conduct and Anti-Corruption Policy.

WHA Group provide a training program to all employees in order to communicate the Anti-Corruption Policy. There have been 1 Anti-Corruption trainings in 2021 through a "self-learning program" for current employees via the Group's SharePoint System, with 100 % of employees participating.

Regarding that, the Audit Committee was established to oversee and ensure that WHA Group's performance is in accordance with the enforced policy. The Committee is charged with monitoring and mitigating risks from illegal activities and any fraudulent actions, as well as preventing corruption within the Group. In addition, the Internal Audit Office is established to assess potential corruption risks and devise mitigation measures. The scope of work of the Internal Audit Office extends to external stakeholders, including the Group's interactions with customers and business partners.



WHA Group provide a training program to all directors through the director orientation program in order to communicate the Anti-Corruption Policy. There are 4 new directors have been trained the Anti-Corruption Policy in the year 2021, resulting in 100 % of directors have been communicated this policy.

WHA Group remains a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) of the Anti-Corruption Organization, demonstrating its commitment to anti-corruption and bribery for business interests (Thailand). WHA Corporation Public Company Limited has been certified by the Thai Institute of Directors (IOD) since 2014 and recertified on June 30, 2020; WHA Utilities and Power Public Company Limited (WHAUP), the subsidiary, has been certified by IOD since 2019. Furthermore, in November 2021, the Group recommunicated to managing directors, suppliers, and business partners about the "No Gift Policy" in order to elevate good corporate governance practices and standardize transparency throughout all business operations. The WHA Group's No Gift Policy is available at this link

WHA Group has established anti-corruption policies and practices, including guidelines of practice for accepting articles or giving articles or any other advantage, guidelines of practice for charitable donation or support money, guidelines for entertainment, guidelines for political assistance, and guidelines for procurement, as well as various matters related to separating policies and guidelines from the Code of Conduct.

When an employee breaches the rules, regulations, orders, practical rules, or minor flaws that are intended for the employee who can improve, they will get a verbal warning with a file record that is used for a first light offense.

## COMPLIANT MANAGEMENT

A whistling blowing process has been established to demonstrate WHA Group's transparent corporate environment. This provides a confidential channel for employees and external stakeholders to report and inform on clues, suspicions, advice, grievances, or complaints about misconduct, corruption, or violations of

the law, regulatory requirements, corporate governance principles, or the Group's Code of Conduct and Anti-Corruption Policy. Employees and external stakeholders who report wrongdoing are protected as whistleblowers.

## REPORTING CHANNELS

### CHANNELS FOR EMPLOYEES

- <https://www.wha-group.com/en/corporate-governance/corporate-governance>
- Human Resource Department
- Comment Box
- [Geo\\_office@wha-group.com](mailto:Geo_office@wha-group.com)
- [auditcommittee@wha-group.com](mailto:auditcommittee@wha-group.com)

### CHANNELS FOR EXTERNAL STAKEHOLDERS

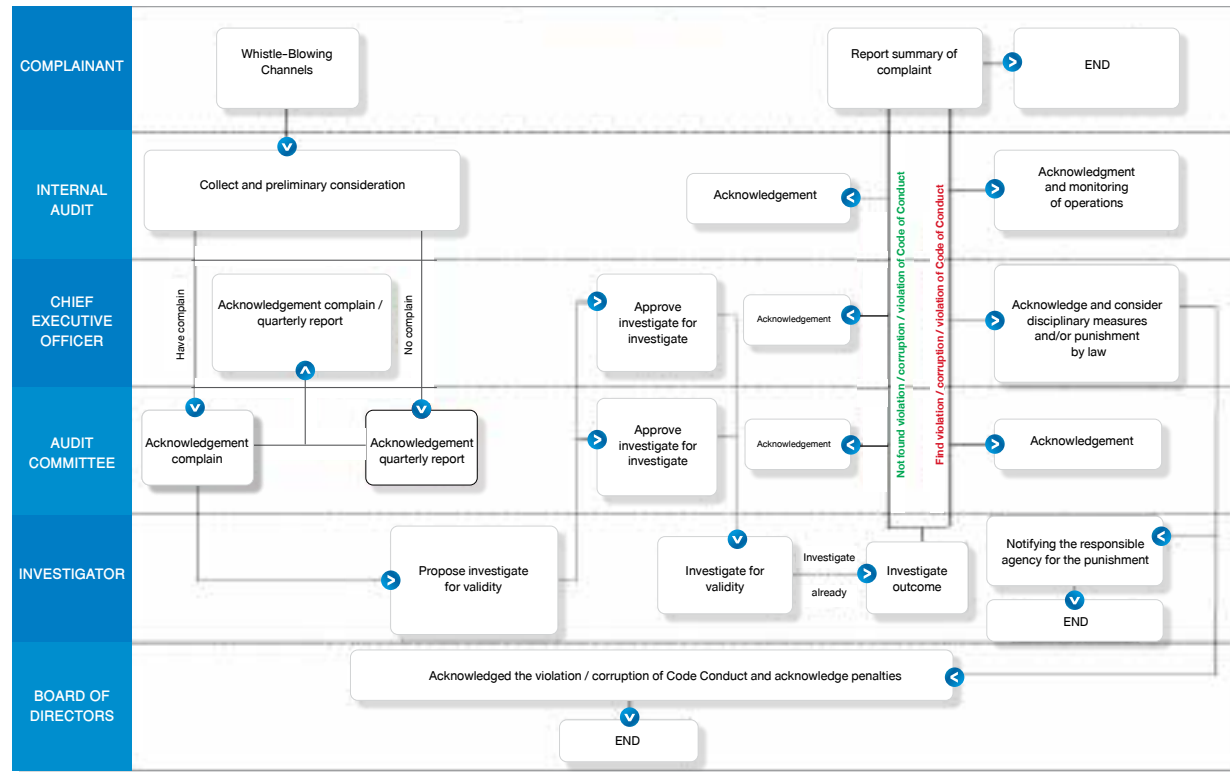
- <https://www.wha-group.com/en/corporate-governance/corporate-governance>
- [Geo\\_office@wha-group.com](mailto:Geo_office@wha-group.com)
- [auditcommittee@wha-group.com](mailto:auditcommittee@wha-group.com)

If the WHA Group receives a report of corruption, it is the responsibility of the Audit Committee to report and conduct an investigation, as appropriate. Depending on the outcome of the investigation, appropriate disciplinary actions will be taken. In cases where applicable laws are violated, the Group will take all necessary legal action. In 2021, the Group had conducted internal audits, and if complaints are received, the case will be quarterly reviewed by the Audit Committee and reported to the Board of Directors as a part of Audit Committee's Report. As a result, this procedure ensures that potential cases do not reoccur.

Nonetheless, no violations of regulatory requirements or WHA Group policy were discovered in 2021. Furthermore, no reports or complaints about corporate governance or corruption were submitted through the established channels.



## WHISTLE-BLOWING PROCESS



## ENHANCE AND AWARENESS RAISING FOR GOOD CORPORATE GOVERNANCE

Corporate governance and WHA Group's corporate value of 'integrity' are inextricably linked. Maintaining the integrity value throughout business operations enables the Group to cultivate trust and increase stakeholders' confidence that the company follows good corporate governance principles.

### INTEGRITY

"To instill mutual trust and confidence, establish a culture that promotes transparency and work ethics while also demonstrating a sense of corporate responsibility."



ADVANCED



CHAMPION



RESOURCEFUL



PARTNERSHIP




INTEGRITY

To raise employee awareness of WHA Group's good corporate governance, the following trainings and activities were implemented:


- As part of their orientation program, all new employees are required to complete mandatory trainings on the Code of Conduct and Anti-Corruption Policy.
- In 2021, the Company Secretary Division in collaboration with Human Resources Department implemented mandatory online refresher training on WHA Group's Code of Conduct and Anti-Corruption Policy through a "self-learning program" for current

employees via the Group's SharePoint System. At the end of each individual online session, the employees' comprehension was assessed using mandatory questionnaires. Those who are unable to complete the online training will be required to attend an in-person refresher course in 2022. This online training is a continuing refresher program that will be conducted annually or whenever corporate governance policies are revised. WHA used a questionnaire to assess employees' understanding of good corporate governance in 2021. As a result, it appears that the average employee perception is 100 %.



## CODE OF CONDUCT AND PRACTICES

### จรรยาบรรณธุรกิจและแนวทางปฏิบัติ



บริษัท ดับบลิวเอชเอ คอร์ปอเรชั่น จำกัด (มหาชน) และบริษัทในกลุ่ม ("กลุ่มบริษัทดับบลิวเอชเอ") ยึดมั่นในการดำเนินธุรกิจด้วยความซื่อสัตย์โปร่งใส ตามเป็นไปตามจรรยาบรรณธุรกิจและหลักการกำกับดูแลกิจการที่ดี รวมถึงการปฏิบัติตามกฎหมาย กฎระเบียบที่เกี่ยวข้องกับการดำเนินธุรกิจทั้งภายในประเทศและต่างประเทศ มีนโยบายที่จะส่งเสริมบรรษัทภิบาลขององค์กรอย่างต่อเนื่อง โดยมุ่งเน้นการดำเนินธุรกิจตามหลักคุณธรรม จริยธรรม มีความรับผิดชอบต่อสิ่งแวดล้อม สังคม และบรรษัทภิบาล (Environment Social and Governance : ESG) โดยการบริหารงานอย่างโปร่งใส คำนึงถึงผู้มีส่วนได้ส่วนเสีย มีศักยภาพในการแข่งขัน และสามารถสร้างผลตอบแทนได้ในระยะยาว ซึ่งจะนำไปสู่ความยั่งยืนขององค์กรแห่งความยั่งยืน

โดยคณะกรรมการบริษัทฯ ได้มีมติอนุมัติปรับปรุงจรรยาบรรณธุรกิจและแนวทางปฏิบัติ (Code of Conduct and Practices) โดยมุ่งหมายให้กรรมการ ผู้บริหาร และพนักงานทุกคนในกลุ่มบริษัทดับบลิวเอชเอ ได้มีความรู้ความเข้าใจเกี่ยวกับจรรยาบรรณธุรกิจ มีความตระหนักถึงหน้าที่และความรับผิดชอบต่อสังคม สามารถนำแนวทางปฏิบัติต่าง ๆ ที่เกี่ยวข้อง กับจรรยาบรรณธุรกิจ รวมถึงการแจ้งเบาะแสและการรับเรื่องร้องเรียน (Whistleblowing) ไปใช้ได้ อีกทั้งยังได้กำหนดให้มีกระบวนการติดตามและการจัดการให้มีการปฏิบัติตามจรรยาบรรณธุรกิจ ตลอดจนทบทวนนโยบายและแนวปฏิบัติดังกล่าวอย่างสม่ำเสมอ

ด้วยเหตุนี้ จึงกำหนดให้พนักงานกลุ่มบริษัทดับบลิวเอชเอทุกคน ต้องอบรมความรู้ประจำปีในเรื่องจรรยาบรรณธุรกิจ โดยสามารถเรียนรู้ด้วยตนเองผ่าน WHA Group – HR Sharing (SharePoint) พร้อมทั้งทำแบบประเมินทดสอบความรู้ ตามที่บริษัทกำหนด โดยคลิกปุ่ม "รับทราบนโยบายและรับการเรียนรู้" ได้ตั้งแต่วันที่ – 31 มกราคม 2565

สอบถามรายละเอียดเพิ่มเติมได้ที่ : คุณกุสุมา กาญจนะแก้ว เบอร์ติดต่อ 065-731-6750 Email : kusumak@wha-group.com  
คุณสุธิดา ตัญยสิทธิ์ เบอร์ติดต่อ 061-560-6750 Email : sutthidat@wha-group.com

- Moreover, the suppliers and contractors have been communicated WHA Group's Code of Conduct through various communication channels, including attaching it in the contracts. This is to ensure that all suppliers and contractors acknowledge and adopt the Group's Code of Conduct.

Target Groups	2021 Performance	2025 Target
Percentage of employees acknowledging and communicated of the Code of Conduct by 2025	100%	100%
Percentage of subsidiary companies/Joint venture acknowledging and communicated of the Code of Conduct by 2025	100%	100%
Percentage of suppliers/contractors acknowledging and communicated of the Code of Conduct by 2025	100%	100%





# RISK AND CRISIS MANAGEMENT

Today business is in challenging environment. The economic fluctuations, disruptive technology, demanding on better environmental management are some examples of current and emerging risks imposed on business operation. It is necessary for the business to prepare itself to stay ahead of this fast-paced world. Being aware of these challenges, WHA Group embeds the proactive and efficient risk management to enhance our ability to adapt to changes, increase agility, effectively respond to uncertainties, and ensure that our business will not be interrupted by any emergencies or crisis.

## MANAGEMENT APPROACH

### RISK MANAGEMENT ORGANIZATION

WHA Group has a commitment in effective risk management. To ensure that the all the risks are properly managed, the Board of Directors (BoD) appoints Risk Management Committee (RMC), which comprises of the CEO and members from BoD, to oversee overall risk management implementation. To ensure that all the business hubs manage risk in their entity according to the RMC's guidance, Risk Working Groups, comprising of executives and department heads from WHA Logistics, WHA Industrial Development, WHAUP business and WHA digital platform hubs, were appointed. The Risk Working Groups hold regular meetings to monitor group-wide risk profiles and identify any potential emerging risks, and reports to the entity RMC for subsequent address in Board meetings to review of economic, environmental, and social topics and their impacts, risks, and opportunities in every quarter.



## RISK MANAGEMENT FRAMEWORK

RMC developed the Risk Management Policy and Framework. The Policy is reviewed annually to ensure that all the material risks are captured, monitored, managed, and mitigated with appropriate measures. The Group implements the Policy throughout the business operations. Management and employees at all levels have responsibility on effective risk management.

In alignment with the Group's Policy, a Risk Management Framework was developed in accordance with the Committee of Sponsoring Organizations of the Treadway Commission (COSO), specifically the COSO Enterprise Risk Management (ERM). Such framework provides a guideline for risk management approach for all employees to implement consistently. The following portrays WHA Group's risk management methodology:



WHA Group has assessed internal and external risk factors on four major areas which are strategy, operational, financial and compliance risks. Material risks and their mitigation measures are regularly communicated to all staff level to build the overall

awareness of risk management within the Group, ensuring a uniform objective of supporting the Group readiness to any changes and challenges. Additional details of the identified material risks can be found in Risk Factors part of WHA Group's Annual Report 2021.



## EMERGING RISKS

WHA acknowledges the importance of emerging risks that may have an impact on business operations. The Group risks management process covers this type of risks. They are monitored, assessed, and addressed by determining mitigation plans which can help minimize adverse impacts. Among the broad range of emerging risks, the Group take the following into consideration:

### DIGITAL DISRUPTION RISK DESCRIPTION

As we are shifting towards the Digital Transformation era, accelerated by the pandemic, technological advancements have changed society's behaviors, and market conditions. Digital disruption creates uncertainty to a business, and is becoming more significant. Thus, failure to prepare and address this emerging risk may cause the business to be disrupted.

Since the traditional ways of conducting business is coming to its end of life and digitalization is shaping the market and revolutionizing the ways of working which poses market risks to many companies, including WHA Group, where digitalization plays a big part in all

aspects of its businesses and influences the products and services it offers to customers. This ranges from the product/service development, operational activities. Therefore, it is crucial that WHA Group adapt to these changes in market conditions to ensure that the Group stays competitive and does not lose its position within the market. Thus, the Group embraces digital transformation, technology, people, and culture are the key focus areas that help driving the growth, grasping new opportunities, and responding to changing market conditions and expectations.

Furthermore, the manufacturing trends in 2022 emphasize on shorter, simpler supply chains, shrinking of new product development cycles, and increase of new production technologies for low-volume manufacturing responding to consumers' demand for niche and specialty products. In addition, technology advancement, and the pandemic, shifts people daily routine to be more depending on online services. This may pose a threat to some businesses but an opportunity for some businesses such as, e-commerce and its related businesses.





## BUSINESS IMPACTS

As WHA Group houses many customers' manufacturing plants, warehouse and factories, it is essential that the Group develops and improves its products and services to respond to the changing demands and expectations from its customers including more digital innovations, and digitally enhanced offerings. Moreover, with increase in number of start-ups entering the market, illustrating the needs for more optimization services. Together with the growing demand for warehouse facilities from the growth of e-commerce business, WHA Logistics will take this opportunity to expand its customer's base by providing innovative technologies and modernized infrastructures to its customers.

With these changing trends, WHA Group must address and manage the customers' expectations and needs to adapt to the new market conditions and remain competitive. WHA Group works to ensure that both the Group and its customers stay ahead of the game and grow together. Therefore, the Group never stops developing and offering the customers smart solutions with the cutting-edge technologies.

## MITIGATION ACTIONS

To mitigate this risk WHA Group has conducted multiple digital innovations to respond and grasp the opportunities from digitization trend throughout all of its business areas.

The Group continue to work to transform all of its operating industrial estates into SMART Eco-Industrial Estate that are equipped with cutting-edge technologies infrastructure to ensure the safety, efficiency and reliability of services provided to housed customers. Moreover, in respond to the growing demands for more optimization infrastructure and services, WHA Logistics has developed warehouse services and storage for rent with automatic system, which have been fully optimized to minimized human error and increase efficiency.

Additionally, WHAUP aims to extend its capacity with new utility products as well as broaden its power portfolio with innovation energy solutions through SMART Grid.

Consider in more detail the implementation of various technologies and innovations to strengthen business operations in the topic Market Opportunities and Innovation.



## CLIMATE CHANGE RISKS

### RISK DESCRIPTION AND ITS IMPACT

In recent years, climate change is becoming more significant and has become an issue of concern for many parties. Especially with the recent UN Climate Change Conference, or COP 26 Summit, where parties from across the globe were brought together to accelerate climate actions and goals of the Paris Agreement and UN Framework Convention on Climate Change. As such, Thailand has made long-term commitments aim to reach carbon neutrality by 2050 and net zero greenhouse gas emissions by 2065. Moreover, Thailand's zero-carbon master plan include new development model, known as the "Bio-Circular-Green" (BCG) economic model as well as the supports for 'goods made from low-carbon processes, smart projects on agricultural farms and metropolitan areas, and a carbon capture storage system'.

As part of the climate actions to achieve these commitments, Thailand's government will be enforcing many changes to the public policies, as well as, laws and regulations relating to climate change, in which the mechanisms, enforcements, and actions are currently uncertain and not defined. Thus, the uncertainty poses business transition risks to WHA Group.

## BUSINESS IMPACTS

Furthermore, the inability to adapt to these changes could impact to reputation, penalties, or other liabilities. WHA Group recognizes the importance of climate change that comes with both risks and opportunities to our business. Hence, WHA Group identified Climate Change Risks as Physical Risk refers to the risks from the physical impact of climate change (e.g., cyclone, flood, and drought) and Transition Risk from change in policy, law and regulation, technology, or market shift to green energy. A conventional perception of not-so-green industry also pose reputational risks for companies without actions. To cope with such Physical and Transition Risks as a result of climate change, many industries are portraying increased interest in renewable energy.

Nevertheless, the transition period creates opportunities to WHAUP business through its solar rooftop services which benefits both the Group and our customers by reducing carbon footprint and providing carbon credit to other companies for carbon emission offsetting. WHA Group will continuously develop this solar rooftop services to be more stable energy sources, securing more benefits to our customers.



## MITIGATION ACTIONS

The Group aims to ease climate change and move toward low carbon organization with various initiatives and monitoring measures in place that contribute positively to climate change, including reduction of natural water consumption, waste to landfill and greenhouse gas emission by increasing the capacity of solar rooftop services.

WHA Group has conducted a climate change scenario analysis. The scenario analysis assesses both the physical and transition risks, as well as climate change opportunities. The analysis covers scenario for increase in global temperature for business as usual (4 degree Celsius), and for low carbon society (1.5 degree Celsius). Examples of WHA Group's climate change initiatives

include, water reclamation, solar rooftop installation, producing soil nutrient from sludge, etc. Furthermore, the Group also provides renewable solar energy as one of its core services to customers. This ensures avoided carbon emissions for customers throughout the Group's value chain.

In addition, the Group measured its scope 1 and scope 2 greenhouse gas emission. The data was verified by Thailand Greenhouse Gas Management Organization (TGO). The Group will use this data as a baseline to set our long-term, ambitious target for greenhouse gas reduction. With these efforts, WHA Group can reduce the impacts of green-house gas on the environment and on society at large.



## CRISIS MANAGEMENT AND BUSINESS CONTINUITY MANAGEMENT

As a part of our risk management, in 2021, WHA conducted sensitivity analysis and stress testing to evaluate the consequences and impact of risks events. Accordingly, risk mitigation measures were prepared. The Group's sensitivity analysis and stress testing shows that flood and drought are important risks to our business as WHA Group houses numerous

manufacturing productions. Incidents such as flooding directly translates to operational disruption to its housed customers. WHA Group's utility services is dependent on the availability of natural resources (e.g., rainfall for water services), therefore, these impacts could affect its services and customers.





Hence, WHA Group has initiated several projects to mitigate risks from drought and flood. For example, the rainwater drainage inside industrial estates which can drain the rainwater effectively during heavy rains as well as setting the working level of each rainwater pump to work automatically at the different levels. Another example is the improvement of earth dykes to prevent outside water from flooding the area, and the on-site reservoirs located nearby WHA Rayong 36, application for water allocation from Nong Pla Lai Reservoir, and water reclamation. More detailed information can be found in Climate Change chapter.

As a part of the Group's risk management system, a Business Continuity Plan (BCP) is developed to prepare for effective response during the time of emergency or crisis. It helps ensuring the smooth operation of all business hubs. The plan was reviewed and revised to cover all the events identified through risk assessment that could cause potential business disruptions, for instance: natural disasters, fire, pandemic, information security, etc.

In 2021, the effectiveness of the Group's BCP is tested within key business groups or operational processes as well as applying the test results to improve BCP to ensure accurate response in actual incidents. The BCP test of information security aspects carried out by IT Department covering Disaster Recovery and Backup Media Recovery for WHA's Data Center.

For Disaster Recovery, the testing result for critical systems of year 2021 is success. The total time used are within the estimated time. The procedures on Disaster Recovery testing are included.

- Activation & Notification is the first step after a disruption or outage that may reasonably extend beyond the RTO (Recovery Time Objective) established for a system.
- Recovery begins after the DR has been activated. The recovery phase activities are performed for Email/Office 365, EOMS (Billing System) and ERP System
- Testing & Reconstitution is the process by which recovery activities are completed and normal system operations are resumed.

In terms of Backup Media Recovery testing of each system, the latest backup media from backup storage is selected and perform execute recovery process to make sure that the backup media are able to read and restore data. The result media recovery testing of ERP System, File Sharing and MS SQL Database are success.

In addition, WHAID performed BCP test for various scenarios including Emergency Plan for Chemical spill, Road accident and Flooding Prevention Plan. The testing covered procedures in the case of emergency, as follows:

- Receiving notification report of the incidents
- Preventing the emergency incidents
- Coordinating and communicating
- Using tools and equipment
- Assessing the readiness of tools, equipment and time to respond to emergencies

According to the report, all related departments and relevant personnel can conform to instructions as stated in BCP Plan, hence the testing results are satisfied.



## HIGHLIGHT PROJECT

In 2021, WHA Group has upgraded its Unified Operation Center (UOC), the Group operation information center, to enhance capabilities in control and manage utilities services. All the water plants and solar power plants can be remotely controlled and managed from the UOC, therefore, during the time of emergencies or crisis where the movement is restricted, e.g., COVID-19 lockdown, the UOC will be a second command center, making the water plants and solar power plants well under controlled, ensuring the continuity of the business.



## SHAPING RISK CULTURE

Although risk management and governance frameworks are drivers of a positive risk culture, the underlying factors are the awareness, attitudes and behaviors of employees and executives in the organization. Therefore, WHA Group's works to enhance an effective risk culture throughout all business operations.

The Group has worked on aligning motivational systems from top-down approach. Identified risk aspects are embedded into executive's and risk owner's key performance indicators (KPIs). With risk indicators integrated as one of the performance evaluation criteria, it directly drives the promotion of risk-oriented communication and practices. An example of evaluation criteria used throughout the Group are compliance, reputation, financial performance.

To further strengthen the risk culture, WHA Group regularly organizes trainings and activities on risk management to raise awareness and build employee's competency to identify, assess, control and mitigate potential risks associated with their duties and responsibilities. Key trainings and activities are as follow:

- Executives are updated on global trends via RMC report during the Board meeting. This ensures that throughout the overall risk management process, executives, RMC as well as Risk Working Groups are well aware of risk profiles, emerging risks and risk mitigation measures. Therefore, it is presumed that 100% of the top managements are trained and informed of risk management. In addition, the company regularly update knowledge and training about risk management to new non-executive directors namely those serving in RMC.
- Aiming to enhance effective communication on risk management and control, WHA Group has adopted the Three Lines of Defence (3LOD) model since 2020. The model helps clarify essential roles and duties of relevant employees involved. It also helps create risk awareness and culture as all level employees play a part in risk management. In the

3LOD model, the first line is management control, the various risk controls and compliance oversight functions are the second line of defence, and independent assurance is the third. Each of these "lines" has a distinct role within the organization's governance framework. All relevant functions are expected be well aware and communicated on such model to ensure effective risk management within the organization.

- WHA Group conducts risk management trainings to director management and all staff level throughout all business hubs, aiming to enhance the employees' awareness and responsibility on risk management area. This will be leading to an effective risk culture. The training set in 3 online sessions to cover all management and employee of WHA Group.



- In addition, WHA Group conduct risk management workshop for Site Operation Managers and REIT (for all staff level). This is to provide understanding of risk identification, risk assessment and risk mitigation measures at their responsible areas of work and constantly raising awareness of risk management importance.

In addition, WHA Group aims to adopt digital innovations to promote effective risk culture. The Group is developing a digitalized system, equipped with an alarm, to portray all key risk statuses to effectively monitor and track the risk management implementation.



## SUPPLY CHAIN MANAGEMENT



There is an increasing pressure on sustainable supply chain from stakeholders, such as regulators, customers, and shareholders. Addressing impacts of supply chain to environment, society, and economy, e.g., pollution, working condition, and online privacy, is now a part of effective supply chain management.

Focusing on sustainability, WHA Group aware of the importance of suppliers' actions which can impact the Group's reputation and stakeholders' perception. Therefore, the Group expands its sustainability-oriented, fair, and transparent model of conducting its business operations to its suppliers by encouraging and enhancing suppliers' competency to grow together sustainably.

### MANAGEMENT APPROACH

According to WHA Group's diverse business activities, there are many suppliers that the Group interacts with

through its four business hubs. The Group places sustainable operations and adherence to regulatory requirements a priority. To ensure that suppliers actions are in line with principles the Group valued, a Supplier Code of Conduct is developed and applied across all the business hubs with the aim to set an expectation and to provide a set of principles and guidelines to the Group's existing and prospect business partners. The Supplier Code of Conduct comprises of 3 sustainability dimensions, requiring the business partners to act in compliance with the stated business ethics, fundamental human rights, occupational health and safety and environmental management. The Group's Supplier Code of Conduct can be found at WHA Group's website. In 2021, 100% of suppliers are communicated and, 47% have signed acknowledgement to the Supplier Code of Conduct. For the rest will be completed by 2022.

As WHA Group's businesses, procured construction materials are nevertheless important factors that the Group takes into account of during project development cycle. WHA Group practices sustainable sourcing for products such as raw materials, equipment and construction materials to ensure that none originates from protected areas. Additionally, WHA Group places great importance in procuring suppliers that can provide services or products that align with the Group's green building designs or initiatives. Additionally, WHA Group supports the use of energy-efficient and environmentally friendly construction materials. Contractors are also told to use materials that can be reused, which significantly reduces construction waste as much as possible. WHA

Group prioritizes environmental care as stated under the Environmental Quality, Energy Conservation and Biodiversity Policy, therefore, expects its suppliers from project construction to operation phases to abide, reduce resource consumption and manage environmental practices accordingly as stated under the Supplier Code of Conduct. To reduce the impact to the environment, the Group encourages the suppliers to apply the environmental-friendly concept or framework. It now can be observed the application of circular economy concept through using of reusable plastic formwork, and the application of some requirements of Leadership in Energy and Environmental Design (LEED) can be observed.

WHA Group's Procurement Department is responsible for overseeing overall supply chain management at a group level. The supplier screening and assessment process is in line with the Group's Procurement Procedure that is reviewed on an annual basis.



## NEW SUPPLIER SELECTION PROCESS

All potential suppliers are required to complete the Pre-Qualification (PQ) form which consists of a set of questions to assess their quality, price, capacity, management systems as well as sustainability performance and risk,. PQ form is designed to assure that the potential supplier has in place policies or management system regarding sustainability, e.g., business integrity, safety management and environmental impact management. In addition, in order

to effectively manage sustainability risks throughout the supply chain, the assessment of potential suppliers' practices on environmental, social, and governance (ESG) aspects is included in PQ form so ESG risks can be identified and managed at the first place.

The ESG criteria for supplier selection follows 3 dimensions, as demonstrated below. The following dimensions will be assessed on a 1 - 5 scale.



Moreover, the criteria for assessment also includes the assessment of the origin of the procured products to ensure that the procured products are not from restricted areas or the areas with high biodiversity risks.

In 2021, 100% of new suppliers were screened using such PQ form. This screening process helps assure that selected suppliers to the approved vendor list (AVL) will conduct business in a sustainable manner.



## SUPPLY CHAIN RISK ASSESSMENT

Apart from procurement procedure, WHA Group conducts supplier risk assessment in areas of business conduct, environmental impact, and social impact to manage the WHA Group's supply chain sustainably and help improve the supply chain impacts in the process of New Suppliers Selection and Supplier Evaluation.



### CRITICAL SUPPLIER IDENTIFICATION

WHA Group realizes that business disruptions and discontinuity of supplied products and services can cause irreparable damage to the business. To ensure the efficiency of supply chain management, WHA Group has identified critical suppliers of which the Company set up additional management measures to reduce supplier impacts and support the suppliers for business

continuity and long-term business growth. Critical suppliers are identified through ABC Analysis (spending analysis) along with additional criteria such as provision of essential or difficult to replace components.

In 2021, there were a total of 638 suppliers in the Group's supply chain, categorized into each respective business hubs as the following table.

Supply Chain Analysis	Number of Suppliers
Total supplier	638
Critical Supplier	29
critical non-tier 1 suppliers	To be identified 2022

Critical suppliers are identified through consideration of:

- Spending analysis (e.g. up to 80% of total purchasing value)
- Critical component
- Non-substitutable
- Frequency of procurement
- Type of procurement job that depends on project development.

In 2021, the total numbers of identified critical suppliers are 29 following the aforementioned criteria, representing 4.6% of WHA Group's total active supplier base, and covered up to 80.0% of WHA Group's total purchases.

### SUPPLIER RISK MANAGEMENT MEASURE

With the aim to assess all the critical and high risk suppliers on its performance associated with governance, social and environmental aspects, the suppliers will be

evaluated annually by the Procurement Department and the user through completion of the supplier's evaluation form. The form focuses on assessing quality of provided products or services, price, delivery, and cooperation. In addition to the aforementioned criteria, the supplier evaluation form also assesses the suppliers' compliance with WHA Group's environmental related policy, quality and health and safety procedures, supplier code of conduct, and etc.

The evaluation result will be communicated to each supplier/contractor. In case that the supplier or contractor does not meet the Group's requirement, the corrective action plan must get agreed. In the event that the supplier receives poor evaluation results for 2 consecutive years, it will be notified and removed from the Approved Vendor List (AVL) and a written notice will be issued.

### SUPPLIER PERFORMANCE CLASSIFICATION



#### Performance: Excellent

- Score range 80-100 %
- Action: Supplier to complete self-evaluation every two year



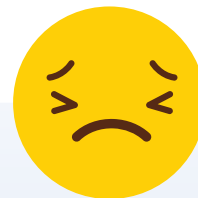
#### Performance: Good

- Score range 60-79%
- Action: Supplier to complete self-evaluation annually



#### Performance: Fair

- Score range 25-59%
- Action: Supplier to submit ESG Corrective Action Plan and complete the action within 6 months period with re-audit.



#### Performance: Poor

- Score below 25%
- Action: Supplier to submit ESG Corrective Action Plan and complete the action within agreed timeline. Business contract shall be terminated if the supplier fails the re-audit.

In addition to the evaluation form, WHA Group conducts ESG evaluation process through onsite audits, as appropriate to the circumstances, to assess the qualifications and performances associated with business ethics, environmental, health, safety and social management of the critical and high risk supplier include critical non tier 1 suppliers in accordance with

the Group's requirements and standards. WHA group determines the need for an onsite audit of all critical suppliers. The details of the criteria for determining critical suppliers are identified in the "Critical Supplier Identification" topic. In 2021, audit performance had shown in table below

Supplier	Number of onsite audit	Number of Supplier with require Corrective action plan
Critical supplier	29	no
High risk supplier	0	no
Critical non tier 1	0	no

All corrective action raised during audit, had corrective action plan in place 100%.





## SUPPLY CHAIN MANAGEMENT INITIATIVE “E-PROCUREMENT”

WHA Group leveraged innovative technology by implementing phase 1 of the E-Procurement system to assure efficiency, transparency and streamline the overall project bidding process. Prospect suppliers are able to conveniently upload quotations directly to the system, which will be approved by designated responsible personnel depending on the project contract values.

Furthermore, the system also contains a comparative database to ensure that selected suppliers are within the competitive market price. In 2021, the Group has developed phase 2 of the system as part of Digital Transformation Program Season 2 which will be incorporated with functions where users will be able to conduct PQ screening process, ESG audits and manage vendor list within the system. Moreover, the system will also enable automated bidding process where the pricing, analysis and award are conducted without manual intervention.

## “COVID-19 MEASURES”

Particularly regarding COVID-19, WHA Group has been monitoring the situation and communicating with suppliers. In present, the situation increases the likelihood of widespread, protracted outbreaks. As a result, WHA Group has taken steps and implemented measures to care for suppliers with the goal of containing and preventing the spread of COVID-19 disease.

Moreover, to address the COVID-19 crisis in WHA Group, the following steps were taken:

1. Wearing Mask
2. Social Distancing
3. Washing your hand often
4. Testing ATK before working

## SUPPLY CHAIN MANAGEMENT DURING THE CRISIS OF THE COVID-19 PANDEMIC

WHA Group concerns the impact of the crisis of COVID-19 pandemic, which may affect supplier's operations and cash flow liquidity. Agreeing the appropriate credit term to our suppliers is an important factor for sustainable business operation to our value chain. Due to various operations in all four business hubs, the credit term will be determined and received from suppliers approximately 30-45 days. In 2021, WHA Group has not been significantly impacted by this crisis and able to manage cash flow effectively. As a result, WHA group has not encountered any problems with payment to our suppliers as well as able to meet the specified credit term as stated in the policy.



## CUSTOMER RELATIONSHIP MANAGEMENT

Creating customer satisfaction in WHA Group is a critical factor in WHA's business profits, especially during periods when changes in customer behavior and preferences effect increasing of challenges in retaining key customers or finding new. Therefore, building trust

is the foundation of customer relationships management, and become a core strategy that been used to support WHA Group's long-term economic growth and strengthen stakeholders' confidence throughout the value chain.

### MANAGEMENT APPROACH

WHA Group's four business hubs are strategically operated in offering integrated solutions to the Group's customers, driven by the commitment to be "Your Ultimate Solution Partner."



WHA Group's core competency lies in the best-in-class facilities, prime logistics locations and the ability to provide an integrated one stop service solutions that fully meet the needs of its customers. The built-to-suit concept is the strategy which WHA Logistics has adopted for its customers seeking a custom warehouse, or factory that meets world-class designed infrastructures and full accommodated operations for lease. WHA Industrial Development (WHAID) is a leading developer of industrial estates and industrial parks in Thailand, providing developed lands for factories, ready built factories and warehouses for customers. With the aspiration

to provide complete services for the customers, WHA Group established WHA Utilities and Power (WHAUP) and WHA Digital Platform to provide utilities and digital services, respectively. WHAUP represents Thailand's largest private provider for industrial water production and distribution, which includes raw water, process water, and clarified water together with conventional and renewable energy. Moreover, WHA Digital Platform is a one-stop shop for digital infrastructures that offer comprehensive information technology solutions for the customers.

Altogether with the provision of the fully integrated solutions, WHAID has become Thailand's leading industrial estate developer, dominating the industrial estates' market share at a leading position. Hence, WHAID will continue to pursue its best efforts to serve its customers through service developments and improvements, which corresponds with the Group's mission to become "Your Ultimate Solution Partner". As a result, sustaining its leading position in the market.

WHA Group's business areas are strategically and comprehensively designed to suit customers' diversifying needs, therefore, customers' opinions and relationships are crucial, and managed at a group-wide level. WHA Group has in-placed a Customer Relationship Management system that serves as a standardized and centralized database platform used for housing and managing all four business hubs customers' information and requests. At the end of 2021, WHA has launched new CRM system which is part of WHA group's Digital Transformation, allowing an effective and timely responses to customer requests. The application's goal is not only to strengthen customer relationships and experiences, but also to improve customer's profile, increase WHA employee's productivity, reduce manual-working's processes and errors and enhance data accuracy and security. With this database, it allows to share the customer data across WHA group which is enable WHA's employee to focus on customer relation management and customer satisfaction.

To strengthened communication, the WHA Group ensures that it's provided channels and methods are accessible, accurate and convenient for all

customers under the four business hubs. The WHA Group distributes quarterly 'WHA Connect Newsletter' to inform customers on company news, activities, training programs and CSR activities. Furthermore, to ensure two-way communications are achieved, the Group conducts regular customer visits, phone calls, emails, appointment of a focal personnel for attaining customers' concerns or requests, provision of a grievance mechanism, etc. Feedbacks or complaints received through the provided channels are processed in accordance with the Group's Customer and Public Complaint Procedure. Upon receipt of a complaint, the Department Manager from the respective business hubs will be informed, and a competent staff will be further assigned to investigate, address and document the filed complaints. Subsequently, the complaints and progress on corrective actions are proposed to the Quality Committee during management review meeting that occurs once a year.





During the outbreak, causing restrictions on site visits from a potential customers, WHA Group has solved the problem by using technology such as teleconferencing and creating a virtual visitor system. WHA Group use MS Team, Zoom, WeChat, Line for meeting and clarifying to customers on concerning issues, discuss on land purchase and sale agreement and lease contracts. WHA Group also conduct virtual conference with overseas prospects who still could not fly to Thailand due to

some restrictions to enter our country. Online meeting involved customers from different locations at the same time. WHA Group use 360 virtual in our website to show customers or new prospects our industrial estates, to see proposed developed land, rental buildings and the proposed buildings. This innovation help WHA group on achieving business growth as well as building trust in WHA Group service and retaining existing customers.



To assess the success of customer relationship management, WHA Group conducted its annual customer satisfaction survey at WHAID and WHAUP, which covered topics including satisfaction towards the quality of services provided, tidiness of the industrial estates' common areas, quality of communicated news and quality of the trainings provided. Concerns

raised through the surveys were addressed by the Group's Customer Development Department in which its root causes were identified to prevent future reoccurrence. The survey results were communicated during management meeting, to ensure that customers' concerns were taken into account when maturing business strategies for product and service development.

Satisfaction Measurement	Unit	2017	2018	2019	2020	2021	Target 2022
Satisfied respondents*	% of satisfied respondents out of total number of respondents to the survey	90	90	87	89	90	≥90

\*Presently, the satisfied respondents covers for WHAID and WHAUP. Moving forward, WHA Group plans to combine response from customers under other business hubs, WHA Logistics and WHA Digital Platform.

Based on the customer satisfaction survey results conducted in 2021 and complaints received through the aforementioned communication channels and approaches, it was identified that the following areas can be improved to further enhance customers' experiences.

Key Area of Concerns	Mitigation Measures Implemented
Traffic management inside and outside the industrial estates	<p><b>Inside the industrial</b></p> <ul style="list-style-type: none"> <li>Install a VMS (Vehicle Management System), which is a camera that counts the number of vehicles over time in order to analyze traffic volumes and manage traffic in the industrial estate.</li> <li>Install Smart Traffic Management at high-traffic intersections, especially during rush hour, to enable the system to automatically open and close the traffic signal based on vehicle density.</li> </ul> <p><b>Outside the industrial</b></p> <ul style="list-style-type: none"> <li>Cooperate with local governments to improve roads near critical industrial estates.</li> <li>Help improve the area outside the industrial estate, which is critical for keeping traffic flowing and safe.</li> <li>Follow up on and coordinate external road construction projects that affect operators, and also inform them.</li> </ul>



## CUSTOMER RELATIONSHIP ENHANCEMENT INITIATIVES

Customer relationship is a given priority due to the subsequent impacts of the long-term economic growth of WHA Group. Therefore, the following initiatives were conducted to build and ensure excellent customer relationship management throughout WHA Group's business operations.

### WHA CUSTOMER CLUB

WHA Group established multiple customer clubs which are considered as communication channels to closely interact with customers to address their interests or concerns. Two customer clubs highlighted in 2021 include:

1. WHA Investor Club is opened for all customers that are situated in WHA Group's industrial estates. Members of the Club will receive monthly/quarterly newsletters and invitations to attend variety of training seminars. In 2021, a total of 4 online webinars were facilitated for the club members, including:
  - Innovation Advance Security System and Engineering Solution for Smart Factory
  - Enhances Reality in Production, QC and Safety with AR/VR
  - Preparation for IoT and AI Risks in New Era Manufacturing
  - IoT Technology solutions for future
2. Japanese Club is established for over 20 years which comprises of 150 Japanese representatives from factories located within the Eastern Seaboard Industrial Estate. In 2021, the Club organized monthly meetings, in which examples of meeting topics were on waste management, waste-to-energy and property tax transfer.

## HUMAN RESOURCE CLUB

In 2021, two Human Resource Clubs (HR Club) were Implemented with the objectives to assist and provide convenience for WHA's potential customers that are interested to establish factories in Thailand. Through the HR Club, WHA Group ensures that customers are supported throughout the investment process including permit application and liaise with government authorities; ensuring that vital relationships are established from the very start.

By that, Eastern Seaboard Industrial Estate Human Resource Club (ESIE HR Club) was established since 1997 and Eastern Seaboard Labor Relations Club (ESLR Club) was established since 2005. Through the Eastern Seaboard Industrial Estate Human Resource Club (ESIE HR Club), which consists of members from over 110 companies operating within WHA Group's industrial estates, the members were regularly updated on labor laws and any labor related news that are useful for completing human resource related tasks as well as received trainings facilitated by experts in the profession of human resource on a regular basis.

Eastern Seaboard Labor Relations Club (ESLR), on the other hand, is comprised of members from 140 companies operating in WHA Group's industrial estates. The ESLR Club served as a central labor related information support platform for members focusing on the labor union, regulations and coordination/advice on any arbitration or matters related to labor agreements.

Both clubs meet on a monthly basis to ensure that information communicated to the member are up-to-date.





## WHA GROUP INTERVIEWS SHOWCASING POSITIVE CUSTOMER RELATIONSHIPS

CONTINENTAL TYRES (THAILAND) CO., LTD. A BRIGHT FUTURE LIES AHEAD FOR THE GREENFIELD FACTORY AT WHA ESIE 4, EQUIPPED WITH WHAUP SOLAR ENERGY SYSTEMS



Continental's Greenfield Tyre Plant in Rayong province is one of the company's most environmentally-friendly facilities worldwide. One of the largest investors in WHA industrial estates in Thailand, Continental has brought to Thailand over 140 years of tire manufacturing know-how as well as the most advanced technologies. Continental Tyres' Greenfield Rayong plant is one of the more than 20 production units worldwide in Continental Group's 'Rubber Technologies' sector. Continental's Tire Business Area, which is present in 17 countries, employed nearly 57,000 people and generated sales of EUR 11.7 billion in 2019.

Located at the WHA Eastern Seaboard Industrial Estate 4 (WHA ESIE 4) in Pluak Daeng District, Rayong Province, the plant occupies a 470-rai plot (750,000 sqm). The Greenfield factory employs 700 people and produces passenger and light truck tires. It began operations two years ago and now produces 1.85 million tires per year, with a capacity of 4.4 million tires by 2025. In July this year, the facility will also begin to manufacture motorcycle tires, employing 100 more people as production ramps up .

As WHA ESIE 4's first occupant, Continental Tyres selected its location according to specific and strict requirements in terms of plot size, easy access, modern infrastructure, reliable electricity and water supply, as well as the availability of skilled workforce. Another important prerequisite was its proximity to its customers in Thailand and to its key markets in the Asia-Pacific region. "Since Day 1, the WHA Industrial Development team has not just been a supplier for us, but a reliable partner that has constantly supported us in terms of regulations and general advice," explains Mr. Vignesh Devasenapathy, Plant Manager.

To develop the knowledge and expertise of its employees, Continental Tyres (Thailand) has set up a 2-year vocational program called "Work Integrated Learning Program" (WiL) with Rayong Technical College, for high vocational degrees, and Chulalongkorn University, for master's degrees. In 2020, the company also organized CSR activities focusing primarily on 'Safety on roads nearby schools.

It also signed an agreement with WHA Utilities & Power (WHAUP) for 4.2 MW of total capacity. Solar roof panels have been installed on two factory buildings and the parking area, as well as a floating solar farm on a 7,000-square-meter pond. These systems started operations in February 2021. "In our industry, energy efficiency is a key element. Solar energy will represent over 20% of our power consumption and will enable us to contribute towards our sustainability initiatives and thereby also lower our production costs." concluded Mr Vignesh, who looks forward to the promising outlook of the 3-year old production facility.

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## JALON (THAILAND) CO., LTD. REACHING OUT TO THE GLOBAL MARKET FROM WHA ESIE 2



Established in March 2020, Jalon (Thailand) Co., Ltd. is the first overseas subsidiary of China-based Luoyang Jalon, which specializes in the production of molecular sieves, zeolite powder and activated alumina adsorbents. Known for their drying capabilities, these products are used across various sectors, principally industrial and medical gas, petrochemicals, oil refinery and water treatment. With an annual capacity of approximately 60,000 tons, Luoyang Jalon is the largest producer of molecular sieves in Asia. As part of its international expansion strategy, it selected Thailand to serve its growing customer base overseas, while the Chinese plant will continue to serve the domestic market.

“Thailand came up as a natural choice for our international operations, as our two countries have a long-standing business relationship and many cultural values in common,” says Mr Robert Li, Managing

Director of Jalon (Thailand) Co., Ltd. “And here in Thailand, we chose WHA Industrial Development without hesitation, due to the professionalism of its teams, the efficient support we received for documentation, permits and other requirements, plus the world-class infrastructure and services offered at WHA ESIE 2. Its location close to the Laem Chabang port is also an important advantage for importing our raw materials from China and exporting our finished products overseas.”

After purchasing 13.6 rai of land at WHA ESIE 2, the BOI-sponsored company started the construction of its new facility in November 2020. One year later, the plant is nearing completion, with an annual capacity of 12,000 tons, and the two production lines already under trial before full operations start in December 2021. “From here, our plan is to develop further the Thai market, explore new opportunities in Southeast Asia, and grow our sales in Europe and North America. The market is booming,” continues Mr Li with a confident smile.

As the newly established company studies the possibility of producing its raw materials locally within the next two years, discussions for further expansion are already underway with WHA Industrial Development’s representatives.

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## TOYOTA TSUSHO (THAILAND) CO., LTD. AND TT TECHNO PARK WORKING CLOSELY WITH CUSTOMERS TO ACCELERATE BUSINESS EFFICIENCY



Toyota Tsusho, the general trading company of Toyota Group, was first established in Thailand in January 1957 to import consumer goods, industrial machinery and vehicle wheels from Japan. Almost a half-century later in 2002, TT Techno-Park (TTTP) was created to support its customers, from the very beginning of launching their business through to operation of the business as a whole.

In addition to providing a one-stop service for the logistics, facilities, insurance, IT and other services and functions required for preparing manufacturing and production, TTTP also offers outsourced administrative and accounting services (payroll, visa and work permit acquisition, bookkeeping accounting and tax returns, commuting bus and forklift truck arrangements), all of which are essential to business operations.

“We provide such a wide range of solutions by thoroughly practicing our field-oriented policy,” explained Mr. Takayuki Tatsuta, TTTP’s general manager and branch manager of the Eastern Seaboard of Toyota Tsusho (Thailand).

“It’s an on-site, hands-on, in-touch approach. This means we contact our customers every day, listen to their problems, and concentrate on providing solutions.”

“I think this is what sets us apart from other trading companies,” he emphasized.

In 2015, Toyota Tsusho (Thailand) opened another branch office in Chonburi to help and work together with TTTP to support its customers. “We chose WHA Eastern Seaboard Industrial Estate 1 (WHA ESIE 1) as our relocation site,” said Mr. Tatsuta, “because of its large scale, reliable development plan and high-quality infrastructure, as well as its proximity to Sriracha, where there are many Japanese residents.”

While focusing on the automotive-related manufacturing industries, in terms of future business development, the company also plans to support industries such as plastics, detergents, petroleum products, semiconductors and insurance. Additionally, they are committed to improving the quality of services offered in digital transformation (DX), such as MaaS (Mobility as a Service), a new concept in mobility, and CASE (Connected, Autonomous, Shared, Electrified) in the automotive industry.

One example of a DX-related service is the improvement made in commuter bus operations. TTTP proposes to use robotic process automation (RPA), one of the DX methods, to optimize routes and vehicle types (large buses, minibuses, vans) according to the time of day. By sharing buses running on the same route to achieve 50-80% ridership, it is possible to reduce costs by 20-30%, alongside reducing CO2 emissions through fewer buses in service.



TTTP strives to provide the best solutions for their clients and Mr. Tatsuta points out that face-to-face communication is vital for business. Due to COVID-19, this was at times more challenging, but their goal remains clear: to help create business environments where customers are able to concentrate on their own business, and to contribute towards the business development of clients, whose needs are becoming more diverse.

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**HARVEST PRECISION (THAILAND) CO., LTD.  
WHA READY-BUILT FACTORIES' FLEXIBILITY  
AND READINESS FACILITATE BUSINESS  
EXPANSION**

Established in May 1999 in Johor Bahru, Malaysia, Harvest Precision Industries SDN BHD specializes in the design and manufacture of metal stamping parts and precision tool spare parts. The company supplies two principal industries: electronics (65%) and automotive (35%). Its products are widely used for digital cameras, copiers, mobile phones, and car audio and information systems.

In 2012, Harvest Precision decided to set up a production facility at WHA Saraburi Industrial Land (WHA SIL), to get closer to an existing customer. Encouraged by incentives from the Board of Investment (BOI), Harvest Precision rented a Ready Built Factory (RBF) on a 1,224 sq.m. from WHA. Just seven years later, when the Saraburi plant reached full capacity, the company opted to rent a 1,152 sq.m. RBF facility at Eastern Seaboard Industrial Estate (ESIE) in Rayong to expand its customer reach.

"Thanks to the efficient support of the WHA team and the conveniences of the RBF, it took us only six months between the moment we made the decision to set up a second manufacturing unit and the start of operations," explains Mr. Christopher Ong, the Singaporean Managing Director of Harvest Precision (Thailand) Co., Ltd.

Today, with a team of 50 employees dispatched between its facilities in Saraburi and Rayong, Harvest Precision can supply its blue-chip international customers in electronics (Canon, Epson, Kenwood, Nikon, Ricoh, Sony) and the automotive sector (Denso, Ford, Honda, Isuzu, Nissan, Toyota).

Currently in the development of Phase 1 at its Rayong location, the company foresees further expansion in

a couple of years. "WHA Industrial Estate offers the double advantage of flexibility and readiness, so we can prepare the future with serenity and confidence. Being in accessible and modern industrial estates with excellent infrastructure also helps us attract the high-skilled technicians and employees that our industry requires," adds Mr. Ong.

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## WISEWOODS CO., LTD. REAPING THE BENEFITS OF COST-EFFECTIVE SOLAR ENERGY PROVIDED BY WHAUP



Established in 2015, Wisewoods Co., Ltd. is part of a group of companies founded in 1979 by the Palarit family, specializing in the production of wood panels. Located in

Khao Yoi, Phetchaburi, the company manufactures high-quality Medium Density Fiber (MDF) boards, entirely made of rubber wood, for the furniture industry. One of the top 5 producers in Thailand, Wisewoods exports 60% of its production to the Middle East (Saudi Arabia, United Arab Emirates, Iran), 30% to Asia (China, India, South Korea and Vietnam) with the remaining 10% for the Thai market.

Since its founding, Wisewoods has based its development on sustainability and innovation. Its manufacturing plant in Phetchaburi utilizes the latest technologies that meet European specifications. For instance, to protect communities around the facility and preserve the environment, it uses a special type of glue that is eco-friendlier, despite its higher cost. It has also installed its own wastewater management system. "Implementing European standards facilitates exports to more markets overseas," relates Mr. Visarut Palarit, Wisewoods Marketing Manager.

Wisewoods' latest initiative is the use of solar energy, developed in collaboration with WHA Utilities and Power (WHAUP). "We considered several options, such as wind energy or burning sawdust for power, but we quickly saw the advantages of solar energy," explains Mr. Visarut. "With electricity representing 15% of our total operational costs, solar energy enables us to reduce our expenses by up to a significant 5%," he continues.

Through a 20-year partnership agreement, WHAUP has just completed the installation of two solar farms at Wisewoods' premises, the first one on land with a capacity of 3.76 MW; and the second one as a floating unit with 1.23 MW, taking advantage of the plant's numerous ponds and water reservoirs. Under the terms of the agreement, Wisewoods provided its land and ponds, and committed to buy the electricity generated by the solar panels from WHAUP. In return, WHAUP provided free installation and will be responsible for maintenance throughout the 20-year contract period.

Operational since February 10 this year, the solar farms' total production of 4.99 MW is enough to supply the factory during the day, while at night, the company continues to buy electricity from the Provincial Electricity Authority (PEA). "Our collaboration with WHAUP has been a win-win situation for both parties. We foresee a bright outlook for the development of more solar energy projects in our region that is blessed with abundant sunshine," concluded Mr Visarut.

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## MARKET OPPORTUNITIES AND INNOVATION MANAGEMENT



In fast-paced global economy, the businesses need to be innovative and forward-thinking to be sustainable and achieve long-term business's objectives. The understanding of global megatrends and knowing their impact to the businesses is also necessary. The global megatrends are a combination of technological innovation and changes in global society and environment leading to transformation in economies, businesses, and lifestyles. For example, pressure from climate changes leads to demanding on cleaner energy. Therefore, businesses need to understand the impacts of global megatrends and address them properly. To grasp opportunities, the businesses are required to make new investments in innovative technologies to improve operation efficiency or expand to new businesses that enhance competitive advantage.

Consequently, WHA Group is pursuing new market opportunities, and innovation investments. This business direction enables the Group to improve their business

efficiency, the completeness of its existing operations, and thus, preventing business disruptions and ensuring future business continuity. Moreover, WHA Group is constantly looking for new business opportunities and taking steps towards developing and implementing new innovations, across all four business hubs, in order to foster a smooth, efficient, and agile operation that respond to ever-changing needs and provide the best possible services to its valued customers. The Group embeds sustainability or environmental, social, and governance (ESG) features in every investment to ensure long-term value creation with the least impact possible to the society and the planet.

Ultimately, WHA Group is endeavoring to achieve continuous and long-term economic and sustainable growths through these new opportunities and investments, and likewise, also helping small entrepreneurs, to grow together with the Group.



## MANAGEMENT APPROACH

WHA Group understands the importance of impacts the megatrends have on the business, so it has prepared itself to stay ahead and be more competitive and through innovatively seeking new business opportunities. The Group sets a clear direction to seek and seize new business opportunities through analyzing regional and global trends, as well as existing and emerging risks and opportunities.

The Group sets five strategic approaches for market opportunities and innovation management and conveys them to all four business hubs. The five strategic approaches including: 1) Broadening internationally, 2) Extending product range through innovative and technology-driven solutions, 3) Establishing win-win collaborations with partnerships, 4) Maximizing synergies among WHA Group and 5) Digitalization.

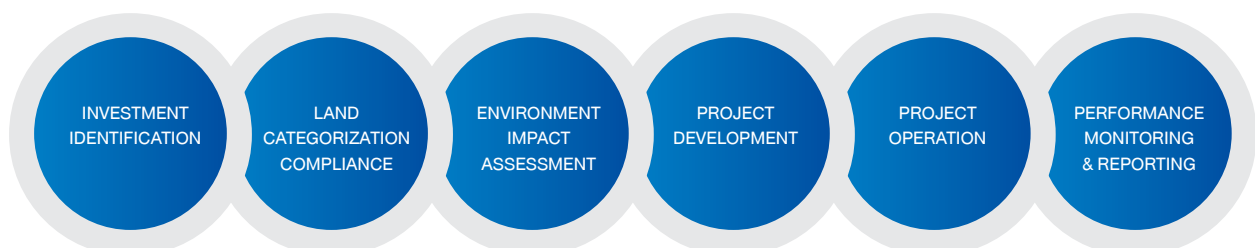
Whenever the Group finds an opportunity for improving the efficiency of the existing business through innovation

or expansion to a new business that link to or associate with the existing businesses and fit to the Group's strategy, the Business Development Department will further explore the opportunity together with the related departments. The Group has a belief that the business cannot success sustainably alone, so in each opportunity presented, the group will consider investing with high potential entrepreneurs whose strength complement the Group with the willing to achieve long-term and sustainable business together. By this way, every player in the ecosystem can grow strong together which finally will create positive impact to economy and society.

## MARKET OPPORTUNITIES AND ESG INTEGRATION

Furthermore, in seizing each opportunity and increasing market penetration, the Group considers economic benefits, integrates ESG factors into all the phases of all the projects, and complies with local and regional regulatory requirements to ensure that its investments do no significant harm to environment and society at large.

## INTEGRATION OF ESG FACTORS INTO PROJECT PORTFOLIO



Prior to any investment agreements on a specific plot of land, WHA Group takes into account of the respective land zoning categorization as well as the restrictions or advantages in terms of ESG management. The Group is permitted to develop its business projects within the designated zone characterized as industry and warehouse areas by the Town Planning Act, B.E. 2518 (1975). The Group avoids investments in lands with high biodiversity risks, environmental concerns, located close to conservation areas, or those that will potentially cause severe disruptions to the local communities. These are to ensure that the Group's business operations will not create negative impacts to environment and society that cannot be resolved by suitable mitigation measures.

The Group conducts Environmental Impact Assessment (EIA) study that covers the impacts of the industrial estate, logistic and utilities and power development projects. The assessment study does not only ensure compliance with required laws, but also assures that the developed projects are approved by relevant authorities, and that all its associated environmental and social risks are assessed with proper mitigation measures. The following environmental and social related indicators and concerns were assessed during EIA and raised by stakeholders during public participation, and appropriate precautionary and mitigation measures were defined for each project's development through to operation phases. WHA Group abides by the requirements as stipulated in the EIA reports and conducts continuous monitoring throughout project implementation to ensure sustainable operations are achieved throughout the project lifecycle.

Environmental Indicators	Social Indicators
<ul style="list-style-type: none"> <li>• Topography</li> <li>• Air Quality</li> <li>• Ambient Noise</li> <li>• Soil Quality</li> <li>• Water Quality</li> <li>• Biodiversity</li> <li>• Green Area</li> </ul>	<ul style="list-style-type: none"> <li>• Land Use Planning</li> <li>• Transportation</li> <li>• Flood and Drought Prevention</li> <li>• Waste Management</li> <li>• Socio-Economics</li> <li>• Public Health and Hygiene</li> <li>• Occupational Health and Safety</li> </ul>

The Group also takes into account of the strategic benefits of investment opportunities in the Eastern Economic Corridor (EEC) as well as the incentives and schemes (e.g. tax deductions, connectivity in trade routes, real estate ownership by foreign entities, etc.) that may attract and provide for its customers. Lastly, WHA Group believes that under these approaches, the Group will be able to transform its business services to become a resilient, and digitalized company that provide value-added services for its customers.







## MARKET OPPORTUNITIES AND INNOVATION MANAGEMENT

WHA Group gives importance to all aspects of their innovation management, ranging from formulating the strategies, defining structures that facilitate innovation, building innovative culture and environment, and including other support systems that drive innovation within the Group.

### INNOVATION STRATEGY

WHA Group focuses on enhancing its competitiveness, expanding or creating higher value of products and services in order to respond to customer needs and maintain customer base through key strategies, as follows:

1. Digital Innovation: Adopting new technology and innovation within the Group in order to improve and create higher value products and services. This is done through the development of solutions based on the concepts of incorporating business platform into the existing infrastructure, and in doing so, expanding the Group's business.
2. Digital Transformation: Using technology and information systems to increase the productivity of work processes within the Group in accordance with its management systems such as customer relationship management system, and contract/document management system.

## INNOVATION STRUCTURE AND PROCESS

The 21<sup>st</sup> Century is considered to be the era of technology and innovation. Therefore, modern companies and organizations must establish structures and processes that facilitate the creation of new innovations in order to compete, survive and grow sustainably. Therefore, WHA Group was designed to have a horizontal organizational structure so as to reduce the gap between employees and executives. This includes minimizing hierarchical controls and delegating decision-making power to employees within their scope of responsibility as much as possible. Meanwhile, WHA Group and its business units have established various ad hoc teams through combining personnel from different departments, such as from business development, operational units and finance departments, to work collaboratively to develop specific projects in addition to the routine work. This organizational structure and approaches will encourage employees to learn, practice and make decisions together as a team. In doing so, it fosters creativity and innovation across the Group and its business units.

Moreover, WHA Group shared the management structures and innovations development processes between all business units; for instance the Digital Transformation Office (DTO) which consists of project owners, technological specialist team and change agents. The DTO team will be the central unit responsible for supporting and promoting the development of projects related to technologies and innovations. The team has a direct reporting line to the Steering Committee, consisting of senior management of the Group.

Additionally, as for strategic project, WHA Group has assigned the CEO office team and corporate strategy team to develop projects that are important and related to the Group's long-term strategy. These projects are, generally, large-scale and complex in which it requires cooperation with many business partners and external entities. Thus, the CEO office and corporate strategy team will support the working teams in these projects, starting from the selection process, partner relation management until the evaluation process and the success of the projects.

Nonetheless, WHA Group is currently in the process of developing a framework for Group level risk management for projects related to new technologies and innovations. The risk management helps the Group's business units to appropriately assess and manage the related risks. WHA Group also established a Knowledge management system that allows knowledge to be better shared among the different teams within the Group.





## TOOLS AND ELEMENTS THAT SUPPORT INNOVATION WITHIN THE GROUP

WHA Group recognizes the value of all employees as an important force that drives the Group's businesses, its success, its achievement of set targets and goals, and its sustainability growth. As a results, WHA Group place a high importance on the investments in development of human resources potential, and on empowering employees to develop their abilities and skills to the fullest through provision of time, of financial support and of systems and platforms that encourages employees to continuously learn and develop themselves.

## CLIMATE AND DRIVING FACTORS FOR BECOMING AN INNOVATIVE ORGANIZATION

WHA Group seeks to develop, retain, and motivate employees with potential, capabilities and values that align with the organization. This is done through planning and selection processes and clear identification of favorable qualifications (e.g. problem solving skill, analytical and critical thinking, creativity skill and positive attitude). The Group also utilizes many effective channels that align with the target groups in order to select applicants with outstanding qualifications before negotiating a satisfactory offer and decide on the most suitable candidate. In addition to recruiting new talents, WHA Group also has a policy to support the rotation of employees within the organization between different departments. This policy aims to support and provide opportunities for employees to show their potential, as well as to find skills and expertise that will support knowledge development and nurture new generations of employees within the organization as well.

Thus, WHA Group implemented the Performance Management System (PMS) to conduct annual employee evaluations. The PMS takes into account the Key Performance Indicators (KPIs) which evaluate employees' routine performances, and the Objective Key Results (OKRs) which assess project performances. Consequently, the indicators related to innovation development are appropriately defined for each employee level. The results of such assessments will be used to consider career advancement, compensation rate and further employee incentives.

Likewise, WHA Tower, the new office building of WHA Group, has also been designed to have open-plan spaces, with meeting rooms equipped with modern technology, and common areas for collaborative activities, working as a team, and sharing of creative ideas within the Group.

## INNOVATION CULTURE

WHA Group identified innovation as part of its corporate value where the Group management team, such as the CEO and the senior management, becomes the role model in driving innovation within the organization. This is done through various engagements with employees and providing opportunity for employees to participate in expressing their opinions in a safe environment. For instance, during a meal sharing between executives, and, employees in various departments to be rotated every two weeks.



All of WHA Group executives give importance to the development of skills, knowledge, and abilities related to the work. Similarly, the executives find it is essential for employees to develop growth mindset, through coaching, open-ended questions and participation to establish trust between executives and employees and

between employees-employees. The trusts established will reduce the pressure when faces with difficulty due to differences, such as generation gap. Ultimately, this will results in cooperation between employees, as well as creativity and growth of ideas from employees, and so on.



## MARKET OPPORTUNITIES AND DIGITAL TRANSFORMATION

Moreover, in order to comply with WHA Group's strategy for digital transformation, the Group has implemented a Digital Transformation Project in 2019, which aimed to change the work processes within the organization by applying information technology to make it more efficient and effective. These include searching for new business opportunities in order to expand the business as to be able to compete and prevent risks from the current technology change (Digital disruption) that is changing rapidly all the time. The project has been implemented under 5 main strategies as follows:

### **D1 DIGITIZE & EMPOWER CORE BUSINESS**

To leverage new levels of business operations reliability and efficiency driven by intelligent analytics, automation processes, mobility & connected digital technologies.

### **D2 BUILD THE WORKFORCE OF THE FUTURE**

To prepare & transform way of working & thinking through change & culture transformation program along with strengthening digital end to end talent management & development platform.

### **D3 ENABLE THE SMART ENTERPRISE**

To build Digital Capabilities for Business Processes to Driving Organizational Efficiency and Effectiveness.

### **D4 ESTABLISH DIGITAL FOUNDATION AND PLATFORM**

To build IT foundation supporting business needs in short term and eventually driving long term business goals with open, flexible, and scalableCore IT Platform, and Governance Structure.

### **D5 LAUNCH NEW BUSINESS**

To accelerate New Business Ideation, Incubation, and Scale up through collaborative platforms with both customers & stakeholders in WHA ecosystem.



In this regard, WHA Group has presented various projects that were conceived and initiated by internal employees to improve operational efficiency and new business opportunities. In 2021, there were 8 projects that have been selected and used in the actual work process, with an investment value of more than 20 million baht, with more to come in the upcoming years.

## **MARKET OPPORTUNITIES AND INNOVATION PROJECT HIGHLIGHT**

WHA Group favors investment opportunities and innovation that generate potential tangible sustainable economic and ESG benefits for its business and stakeholders in the value chain, demonstrated by the following projects below.

## SMART LOGISTICS

The logistics business is expanding along with the growing E-commerce market in Thailand. To take advantage of such change, WHA Logistics continuously embraces new innovative technologies to provide modernized infrastructures for its potential customers.

## E-LOGISTICS STARTUP

WHA Group's Digital Innovation and Transformation strategy focused on applying new technology and innovation to further develop a full range of products and services with business partners and startups. Thus, WHA Group joins Bualuang Ventures to become the main investor in the Series B funding round of 'GIZTIX', a Thai startup that provides a digital platform for e-Logistics, with total funding of more than THB 260 million. It aims to develop a comprehensive range of transportation services and technologies for businesses throughout the country.

GIZTIX is a leading e-Logistics startup that provides a digital platform to connect operators in the transport and logistics sector with users all around the country. GIZTIX's business model covers 3 core businesses, including Full/On-demand Truck, Parcel/E-Commerce, and Transportation Management System (TMS) which address logistics pain points and also adds digital



services into its product lines including software solutions and cash on delivery/advance payment service.

This startup responds to new needs under megatrends and will create more value and quality for WHA Group's products and services. This includes the development of modern and international standard Smart Warehouse, the use of robotics and automation together with 5G technology, and the provision of Smart Logistics to support entrepreneurs to collect and use data for in-depth analysis that will benefit their business, along with AI and Machine Learning that can enhance efficiency and reduce business costs in the long term.





## SELF-STORAGE SERVICE



WHA Group aims to constantly expand its business footprint, under its long-term strategy, to create a value-added, innovative and one-stop service solution that supports customers' needs. Accordingly, WHA Group realized a great opportunity in the Self-Storage industry alongside the rising urbanization trends, and the growing sustainably in Thailand and across the region. The business has proven to be in high demand and continues to grow, as people who are living and working in smaller spaces often have trouble managing their storage space.

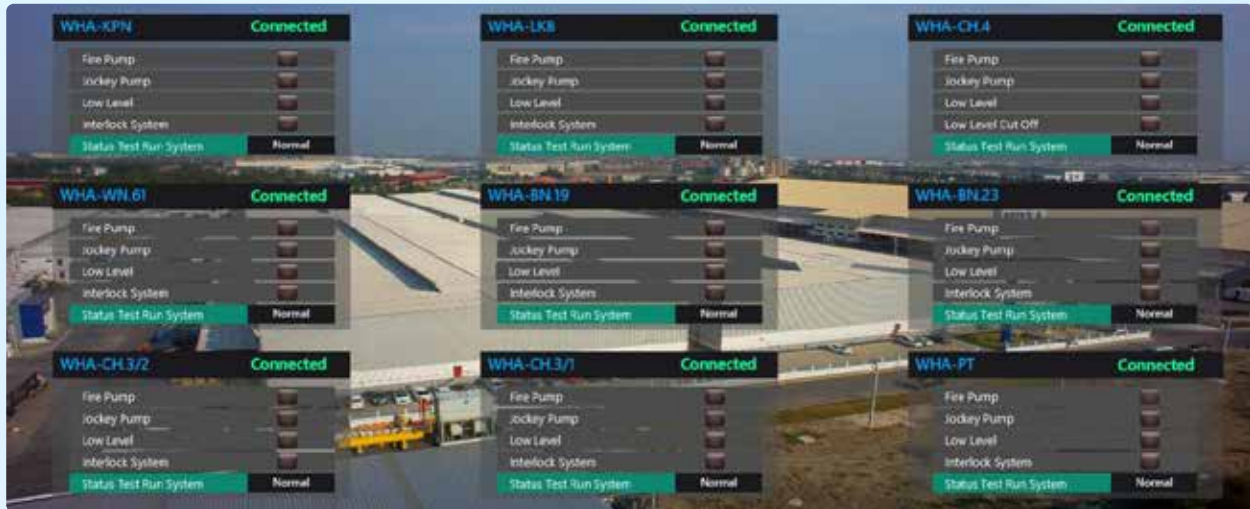
WHA Group sees great potential in the premium self-storage business, resulting in its decision to invest in Storage Asia, a top player in the business. In 2021 WHA Group acquired a 29.40% stake in Storage Asia Co., Ltd., a leading premium self-storage solution, under the brand i-Store Self Storage.

i-Store Self Storage offers a wide range of high-quality and reliable private storage solutions. Its customers are both individuals and businesses who are looking for a secure space for their valuable belongings. Customers can enjoy a customized storage size that fits their possessions, with the best self-storage service and of the highest quality. Currently, there are 2 operating branches in Bangkok; the Group plans to open more branches and expand its operations nationwide.

By expanding and diversifying into new business territories, WHA Group establishes a sustainable and steady growth. The Group leverage on our expertise and know-how in the logistics business to create enhanced self-storage services, using advanced technologies and innovation. This collaboration is to fulfill and expand the logistics business as well as create synergies to have the value-added products and provide innovative services.



## SCADA PROJECT



SCADA technology was adopted in 9 of WHA Logistics' warehouse farms, specifically to monitor and detect the working conditions of fire protection systems, including fire pump, jockey pump, and level alarms. This technological system enables WHA Logistics to better monitor performances and prevent damage to its assets.



In 2021, the SCADA system has been improved as followings

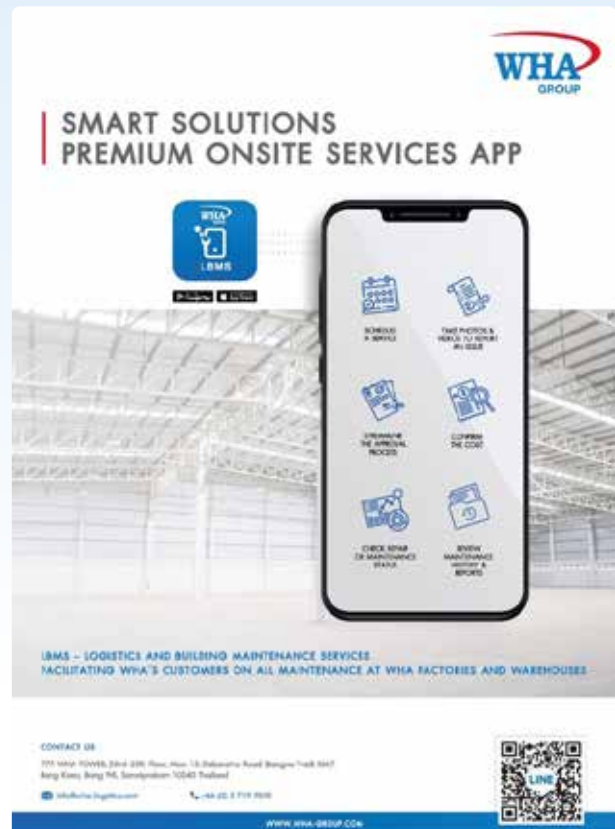
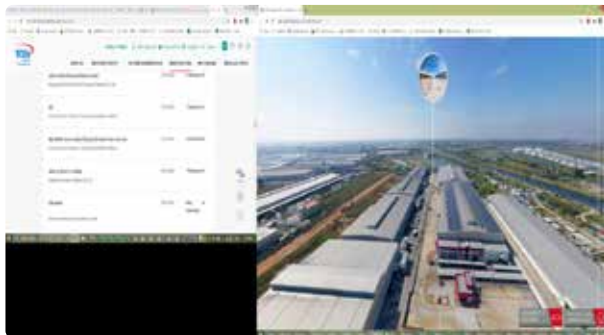
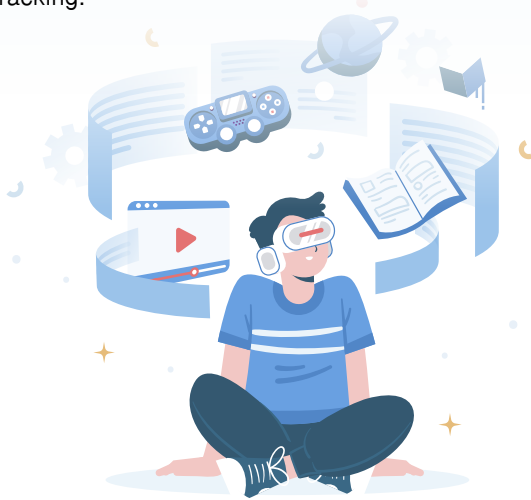
- Incorporated SCADA systems to Unified Operations Control Center which the system can be monitored at WHA Tower
- Transformed to digital commands with SCADA control
- Enabled mobility and ease of access from anywhere
- Provided future incorporation of automation, data analytics, predictive technology
- Increased data reliability and integrity





## LOGISTICS AND BUILDING MAINTENANCE SERVICES (LBMS) APPLICATION PROJECT

WHA Group has developed and piloted an application for Built-to-suit warehouse and Ready-built warehouse/factory customers to conveniently request for maintenance issues, insurance claims and quality assurance control. The application was aimed to increase prompt response to customers' requests and provide convenience and organization in terms of status tracking.



## VIRTUAL TOUR 360°

WHA Logistics utilizes an advanced technological development such as drones to capture aerial photographs and videos. Potential customers will be able to have a virtual and real-time tour of the warehouse infrastructures, remotely. This resolves inconvenience to travel to site due to travel restrictions.





## ECO-FRIENDLY WAREHOUSE DESIGN

The Group, through its logistics hub, designs warehouses according to built-to-suit concept. The warehouses are built to satisfy customer's needs with design that create least possible environmental impacts. For example, in addition to the solar rooftop, the warehouse building is designed to get enough sunlight to enable workers to perform their job with optimum temperature to save energy consumption.



## SMART ECO-INDUSTRIAL ESTATE

WHA Industrial Development (WHAID) concurrently developed and optimized numerous innovation technologies to support its aspiration to become a SMART Eco-Industrial Estate.

### UNIFIED OPERATION CENTER (UOC)

WHA Group implemented the Unified Operation Center (UOC) which projects real-time monitoring results of all relevant environmental parameters such as air quality, rainfall volume and wastewater quality, and etc. since 2019. In addition, all installed CCTVs throughout Eastern Seaboard Industrial Estate are connected to the UOC which allow all-time monitoring of valuable assets. In addition, the CCTVs installed at wastewater treatment plants' pumping stations are updated with Smart Motion Detector, enhancing security and eliminating the risk of off-standard wastewater.

Additionally, in the event that employees are unable to operate within the operating area, such as in the



case of lockdown, operators can still control and give commands (Second Command Center) through this UOC system as well.

## Unified Control Center at WHA Tower



Nonetheless, in 2021, two additional UOC systems were developed, namely 1) Predictive maintenance system; and 2) Energy Optimization. The Predictive maintenance system has been developed in order to predict the machine operational activities in advance, whether there is a chance of damage or damage to plan maintenance. Thus, this reduces the chance of machine interruption. The Energy Optimization, or use of energy efficiently, from analyzing the data that the system collects and use it to evaluate the energy efficiency plan. As a results, the UOC system covers all 10 subsystems, as follows:

1. The UOC covered 14 stations of Water Quality Monitoring Station (WQMS), which demonstrate the effluent quality against the guideline control on parameters: Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total suspended solid (TSS) before discharging to public water way.
2. The Air Quality Monitoring Station (AQMS), consisting of 6 stations, have also been completed in UOC and reported on hourly ambient air quality on parameters Total Suspended Particulate (TSP), Particulate Matter with diameter of 10 micrometers or less (PM-10) Nitrogen dioxide (NO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>).
3. The CCTV has been installed and is monitoring the industrial estate infrastructure, such as road intersection and utilities 24 hours
4. The Rainfall Monitoring Station (RMS), in the UOC, monitors the flood prevention management. There are 13 points installed and reported on current rainfall, daily rainfall and monthly accumulate rainfall.



5. The Vehicle Management System (VMS) is the smart CCTV that were installed at the main and sub entrance of Industrial estate. It is used for monitoring and tracking license plate, type and number of vehicles in-out boundary which helping for security and traffic management.
6. The Water and Wastewater Production is an additional implemented to UOC, which reported on the production and distribution volume as real time basis
7. The Chonburi Clean Energy Power Plant (CCE) is a non-hazardous industrial waste to energy (incineration). The CCTV and dashboard of CCE are linked to UOC for monitoring the production and operation of Power Plant.
8. The Smart Sensor Fire Pump (SSFP) were installed in 10 warehouses for real time detection on the working of fire protection system to provide better monitoring and response to emergency situations that would lead to damage and unexpected cost. In the case of fire pump running, the system will alarm at dashboard and send SMS via Line application.
9. The Logistics and Building Maintenance Smart Application (LBMS), is a platform for building maintenance. It starts from customers requesting fixing to the work completion. The customers can track the status of the fixing and evaluation process. All information and data of LBMS are linked to UOC, including the customer satisfaction score.
10. The Solar Rooftops, the electricity production and status of operation, are also linked to UOC.

The UOC can reduce operating costs and workload of employees whose skills could be potentially developed to perform more complex tasks to support sustainable growth of the Group. Moreover, the UOC help provide safety to communities and stakeholders surrounded in industrial estates and reduce pollution, emission, and dust produced by vehicles commuted in day-to-day operation. As a result, WHA Group maintains air quality level that complies with the requirements and standards specified in the Environmental Impact Assessment (EIA) and able to reduce approximately 75 tCO<sub>2</sub>e of direct GHG (Scope 1) per year.





## VEHICLE MANAGEMENT SYSTEM (VMS)

The Vehicle Management System (VMS) is continuously developed to enhance safety and security of vehicles that enter the Group's industrial complex. This adaptive traffic control system is equipped with a vehicle counting tool. It can recognize license plates, control traffic lights in response to the current traffic situation and reduce the use of fuel. This system saves fuel oil approximately

29,804 liter/year which leading to air pollution and greenhouse gas emission reduction. In addition, it helps reduce traffic congestion time at WHA ESIE from 10 minutes to 3 minutes and fatalities from traffic accidents also reduce from 3 cases in 2020 to 1 case in 2021. By 2022, VMS will be installed at a total of 38 main entrances to WHA Group's industrial estates.



## 5G SMART ECOSYSTEM

With the emerging digital trends and extensive number of wireless communications, the reliable, fast, stable and secure connection is the corner stone of digital transformation. WHAID foresees the potential derived value of 5G, the 5<sup>th</sup> generation technology standard, for cellular networks and its positive contributions, applications, and benefits for its valued industrial customers.

WHAID recently obtained a 5G sandbox license to perform research and development for 5G solutions in the Eastern Economic corridor (EEC). The EEC is considered an ideal location to exploit the maximum potential of 5G together with Internet of Things (IoT). To bring this effort forward, WHAID has successfully signed Memorandum of Understanding (MoU) with 4 of 5 Thailand's leading telecommunication operators

including AIS, True Corp., DTAC and CAT. This collaboration will allow 5G network and frequency planning in WHA Group's industrial estates.

Enabling the access of 5G network systems will allow WHA Group's customers to access lightning-fast data transfer, reduce latency and improve network reliability. Hence, provides convenience for remote working, a significant benefit in times where workplace flexibility is promoted. Additionally, having a reliable network, supports WHA Group's future enhancement of technological advancement systems such as artificial intelligence. Moreover, the successful implementation of 5G within the designated areas will not only advance Thailand's industrial sector but also increase the attractiveness from international investors due to the promising telecommunication system.



## INDUSTRIAL GAS SUPPLY

WHAID and Bangkok Industrial Gas Co., Ltd. (BIG) established a joint-venture company called BIG WHA Industrial Gas Company Limited (BIGWHA) since 2020. In line with WHAID strategic plan, this joint-venture was an example of establishing a win-win partnership to offer value-added products and services to WHA Group's customers. The goal of BIGWHA is to improve reliability in the supply of industrial gases such as Nitrogen, Oxygen or Argon in the industrial estates as well as reduce cost associated with supplying the gas. Providing increased reliability as well as enabling lower costs for customers will help sustainably enhance the growth of Thailand's EEC projects. The construction of the project was completed and was able to operate commercially (COD) in November 2021. Currently, the Group is in the process of planning to expand the project in the next phase.

## SCIENCE & TECH TUSPARK WHA

WHA Group's WHAID together with Tus-Holdings Co., Ltd. (TUS), a leading Chinese Science and Technology service group, have established of a joint-venture company to establish Thailand's first TusPark; it is an Innovation and Incubation Center in downtown Bangkok. The aim of this project is to incubate startups

and promote cooperation in Science and Technology between China, Thailand and other ASEAN countries. TusPark WHA Incubation Center offers more than 230 working desks to nurture over 80 startups. In additions to functional workplace and high-quality facilities, the center also provides tenants with Incubation Services which include entrepreneurship salon, venture tours, project optimizing, online training etc. Soft-landing Services will also be provided and include company registration, legal, financial, taxation advice and intellectual property services.







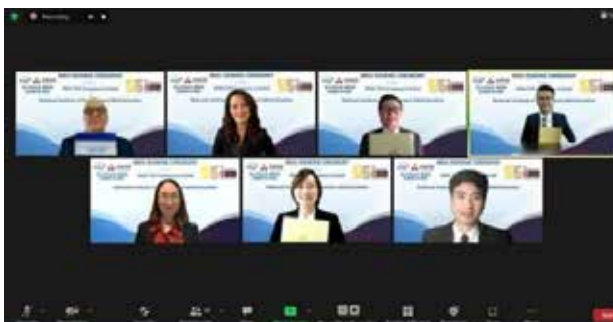
In addition, TusPark WHA's facilities, of more than 400 sq.m, can accommodate exhibitions, seminars, town hall, product launching, and business matching events. As a results, TusPark WHA Incubation Center will create an innovation ecosystem, in partnership with Chinese's government authorities, universities and research institutes as well as Thailand's leading industrial developer, to enable the development of Thai startups and to create a bridge for Thai entrepreneurs to access China's technology, talent, investors and markets – particularly China and its 1.4 billion population.

Moreover, in 2021, Tuspark WHA has signed a Memorandum of Understanding (MoU) with two academic institutes, National Institute of Development Administration (NIDA) and Chulalongkorn School of Integrated Innovation (SCLL), aiming to promote academic development from research and development collaborations, networking and knowledge exchange, and to promote cooperation among students, startups and businesses, as well as to enhance collaborations with different fields (e.g. Science and Technology).

Through the partnership with NIDA, TusPark WHA will also offer innovative working stations in its Incubation Center for NIDA students assigned to special projects or new businesses incubated by NIDA. Significantly, through the program, the students will be able to benefit

from an extensive professional network, which is vital for career advancement and business growth in the long run.

Through partnership with SCLL, Tuspark WHA seeks to create an innovation ecosystem that will promote the exchange of knowledge and information, and aims to promote joint research projects and joint development of entrepreneurial ventures. This includes New Technologies (e.g. artificial intelligence, robotics or others); Advanced Manufacturing and Industrial Practices (e.g. technologies and innovations that can transform, digitalize, and optimize manufacturing operations); Human Resources Development (e.g. studies and projects involving training and development), and various topics such as entrepreneurship, management or others. Both parties will also explore the possibility of collaborating and funding of potential innovative business ventures incubated by SCLL and/or TusPark WHA. Similarly, TusPark WHA will also offer working spaces in its Incubation Center for SCLL students assigned to special projects or business ventures incubated by SCLL. As such, the students or business ventures will be able to benefit from the various value-added incubation services, soft landing services or other acceleration programs TusPark WHA is offering to its tenants.





## SMART UTILITIES & POWER

In respond to the changes in market conditions, WHA Group has explored new market opportunities and innovations through WHA Utilities and Power (WHAUP)'s products and services. WHAUP aims to extend its capacity with new utility products as well as broaden its power portfolio with innovative energy solutions. Considering the community's quality of living and environmental impacts, WHAUP is continuously putting efforts into developing new utility services including wastewater reclamation, demineralized water, and sea water desalination.



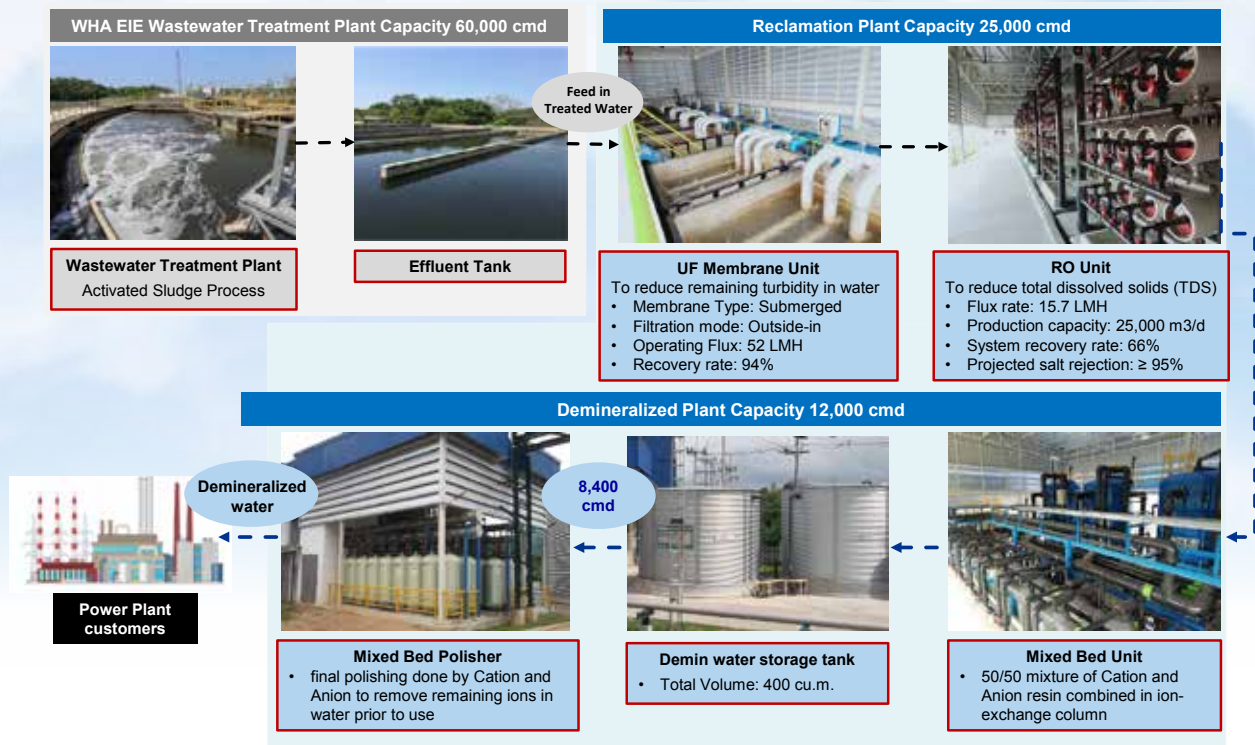
## WATER RECLAMATION

WHAUP develops water reclamation initiative as an alternative and sustainable source of water for industrials, especially in the EEC area. The project utilizes existing technologies in combination with new innovation to add value to wastewater by turning it to demineralized water and premium clarified water which have much higher value at lower cost. In 2021, revenue

generated from water reclamation project is 150 million baht, accounting for 8% of total revenue from water sold. This project also benefits to environment and society as it significantly reduces the amount of wastewater discharging, reduces withdrawal of natural water, helps secure natural resources, and mitigates dispute risk with nearby community.



## DEMINERALIZED RECLAIMED WATER PROJECT



Furthermore, WHAUP also invested in the Demineralized Reclaimed Water, a large-scale project, consisting of 2 operations, each have maximum capacity of 4.38 mm<sup>3</sup>/year. The project is developed in WHA Eastern Industrial Estate (WHA EIE) and aimed to increase treated water quality with low cost and using environmental friendly methodology. This innovative project helps the Group in reducing its dependence on major raw water distributors as well as alleviating uncertainty and impacts on both the quantity and quality of upstream water sources due to drought, pollution, contamination, etc., which are the main risk factors for utility providers. The project also

helps WHA Group's customers, which are entrepreneurs in various industries, to access to high quality water products and services at reasonable cost. In addition, the Demineralized Reclaimed Water innovation is a prototype project that can be expanded in new industrial estates of the WHA Group as well as extending and expanding the results to the community, for example, using domestic wastewater that has been treated to improve its quality to produce high-quality transformed water, etc. More detail these projects can be found in Water Management chapter.



## SMART METERING



WHAUP develops the SMART Metering initiative to enhance the traceability of utilities provided. It converts the installed analog water meters that record the volume of water supplied and usage by industrial operators throughout the industrial complex to generate digital output. This digitized data recording reduced labor expenses that initially had to collect and compile data from all meters for invoicing purposes. The initiative also enables unusual water consumption behaviors and irregularities to be detected and addressed promptly. Monitoring for potential water transmission losses and pin-pointing leakage events can also be done through this online metering system. Moreover, the operating performance as well as customer satisfaction are improved.

This online monitoring system is also adopted in recording the solar power consumption by WHAUP's customers, which provides convenience for invoicing scheme. Such data are projected at WHA Tower, therefore, employees are no longer required to travel to each customer site and manually record their energy consumption data. As a result, this initiative can save 3,000 Baht/MW from related expenses. According to the business plan, WHAUP aims to achieve producing 300 MW of solar energy in 2023. Therefore, the SMART metering will save expense by 900,000 Baht.





## SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) TECHNOLOGY AT WASTEWATER TREATMENT PLANT



Moreover, WHAUP is currently conducting studies to optimize SCADA technology at its wastewater treatment plant located within the Eastern Economic Corridor of Innovation (EECi) in Wangchan district, Rayong province. This technological system can help monitor the wastewater treatment's performances on a 24 hour

basis, thus, the Group can save cost from appointing on-site personnel. It is expected that the construction of such wastewater treatment plant along with the installation of SCADA technology will be completed in 2021.





## SMART ENERGY

Following WHA Group's enthusiasm in innovative energy solutions, WHAUP continues its ongoing cooperation under the Memorandum of Understanding (MOU) with the Provincial Electricity Authority (PEA) for joint development of smart energy and micro-grid system to reduce electricity cost and increase reliability within the industrial complex. The first project to reach approval phase in 2021 is the Peer-to-Peer Energy Trading system which enables direct buying and selling of solar power between industrial users within the Industrial Estate Complex. Moreover, WHA Group collaborates with PTT Public Company Limited and Sertis signing a Memorandum of Understanding on Smart Energy Platform. Under this MOU, Sertis jointly developed a platform to optimise electricity management using AI and Blockchain Technology to sell solar energy within WHA Group's industrial estates. This platform will allow transactions to be decentralized and processed automatically without

being controlled by any single party, making data management and transactions more secure and transparent between each of the buildings in the industrial estates. This collaboration was selected as part of the Energy Regulatory Commission Sandbox (ERC Sandbox) program run by Energy Regulatory Commission of Thailand and Provincial Electricity Authority (PEA), under the Microgrid electricity management system. The Smart Energy Platform developed between PTT, WHAUP and Sertis will help make alternative energy management more efficient and will result in better energy stability. The system, once fully implemented, will pave way for at least additional 200 MW of solar power available for use within the industrial complex, enabling industrial users to save more than 100 Million Baht per year their electricity cost and achieve over 4,300,000 tons of CO2 reduction over the project life cycle.



## SMART DIGITAL

As digital and industrial growth are indirectly intertwined, WHA Digital Platform continuously ensures that leading digital infrastructures are developed and provided for its customers. Investments were made in laying fiber optic network (FTTx), providing Data Centers with 24/7 Network Operating Center (NOC) and additional projects to improve network infrastructures. The cloud business unit including back-up, disaster recovery (DR) and data storage, has also been enhanced to support the growth of operations that are driven by data. Apart from that, WHA Digital Platform also provides other managed services and digital solutions including equipment rental, IT outsourcing, Video Management Service, telephony with IP-PBX technology and call center, email, website, firewall, security and storage, backup system, colocation, and access control system.

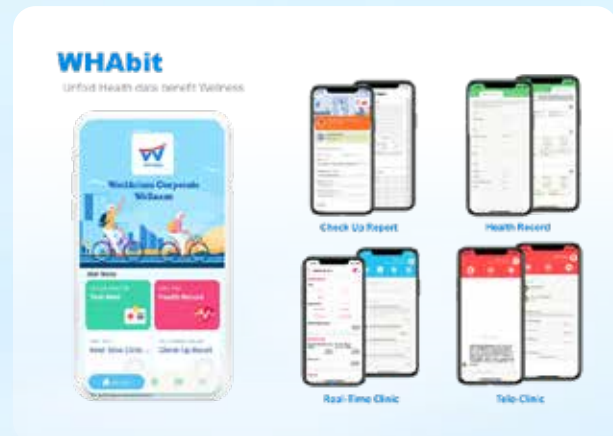




## SMART HEALTHCARE

WHA Group sees the business opportunities within the health and medical services. The Group developed and designed its products and services to fit with the new ways of living in the digital era. This is achieved by utilizing the use of advanced technology in communication systems and incorporating with the use of data for diagnostic health analysis. Through the WHAbit Platform, users (i.e. patients) can consult with doctors with telemedicine without having to travel to the hospital. With this, the doctors can prescribe users with medications at home. Significantly, the WHAbit Platform can also help to identify people with health problems, alerting them to receive a response from the system in real time. This increases the convenience of service users in receiving medical services and reduces at risk during the spread of the COVID-19 virus as well.

In 2021, WHA Group has started to implement the platform for employees within the Group by focusing



on the development of its occupational health and safety, and improving good health of employees through WHA Happy Workplace project, starting from collecting employees' health data from annual health check-up to providing Smart clinic services within the Group's offices. The Smart clinics acted as a measurement point, and as a connection point to medical services via WHAbit Application

## WHA Happy Workplace

Employees are the most valuable assets



## DATA SECURITY



Accelerated by COVID-19, the digitalization of global economy is rapidly growth. Businesses need to be agile, adaptive, and positively transforming. Using of digital infrastructure and data is necessary to collaborate, develop innovative business models, navigate disruption, and transition to a new normal, sustainable, and purpose-driven world. However, assuring the stability of the systems and securing data at all times is challenging. Technical failure, human error, cyberattack may cost the companies' reputation. Managing these risks is necessary to ensure business continuity. WHA Group strives to stay competitive through digital transformation, leading to significant investments and heavy reliance

on information technologies and systems. As a result, the potential risks related to cybersecurity, and information security breaches are increasing. Internal and customers' assets and information could be lost or misused leading to severe impacts on the company. The potential impacts range from losing customers' trusts to financial disruptions and in some cases, could lead to non-compliance, lawsuits or business disruptions. WHA Group is aware that data security lies at the core of running all of its business hubs successfully as it gives the Group's customers and employees the confidence that their data are being collected, processed and transferred securely.

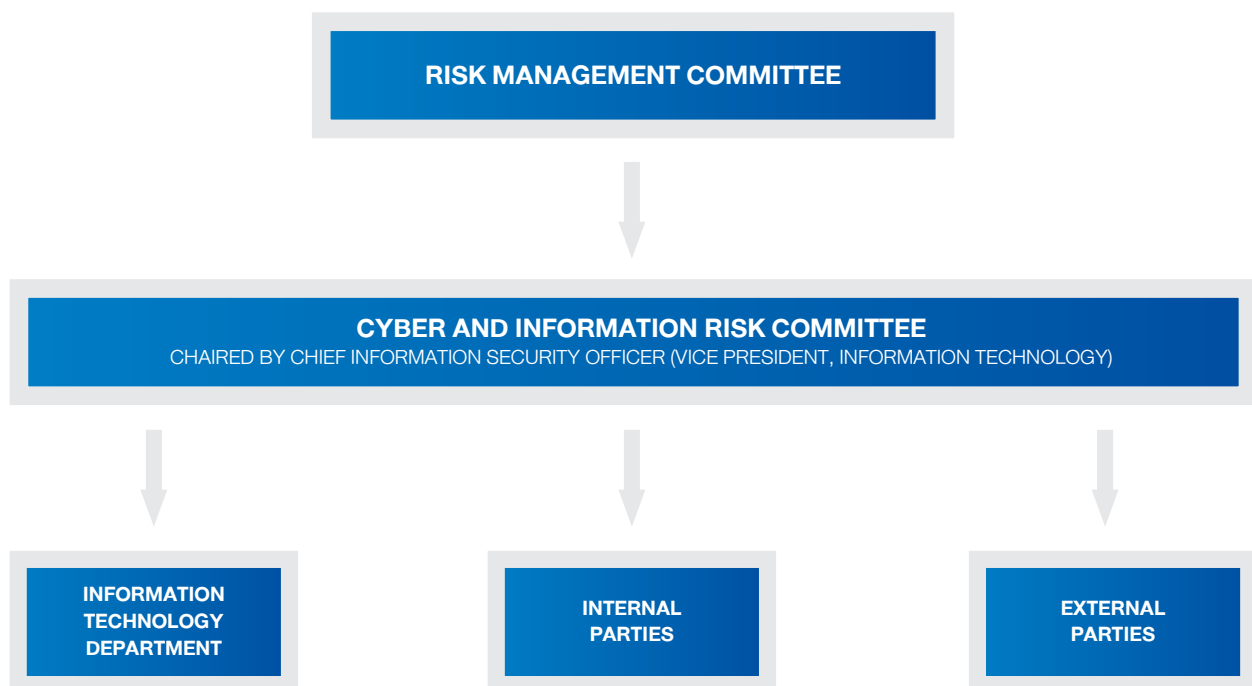




## MANAGEMENT APPROACH

WHA Group is committed to comply with the Personal Data Protection Act (PDPA) B.E. 2562 (2019) and Cybersecurity Act B.E. 2562 (2019) as they are fundamental to ensure effective protection of customer and internal data. In 2021, the Group revised its

Information Security Policy and renamed to Cybersecurity and Information Security Management Policy to ensure the Group's effective digital transformation. WHA Group has a policy on IT Security and Cyber Security as a guideline to control related operations.





An Information Technology Department (ITD) was appointed to undertake holistic review of information technology security throughout all the business hubs, including installation and maintenance of the information technology system. Additionally, the ITD is also required to summarize all the reported information security incidents, including the types and details of the issues faced (e.g., place of occurrence, consequences imposed, immediate response conducted), root causes and mitigation measures implemented. The ITD reports directly to the Cyber and Information Risk Committee that is made up of department heads, and responsible for approving policies and provide directions, perform key decisions related to data security and cyber security issues. This Committee is chaired by the Chief Information Security Officer (CISO) who is a Vice President of Information Technology. The Cyber and Information Risk Committee subsequently reports to the corporate Risk Management Committee (RMC) quarterly to ensure that risks related to information technology are fully captured. The RMC, consisting of a member who has a background in information technology and cybersecurity, reviews the information security risks through quarterly meetings, then reports to the Board of Directors.

The Group believes that digital transformation will help create business resiliency and drive the growth of the business. Therefore, the Group has adapted to digital transformation through digital innovation and digital transformation. Initiatives have been set and started to implement to transform its core business or its backbone. Digital transformation also helps to ensure effective data security systems which support the goal to achieve 100% data breach prevention by 2025.

In 2021, the Group builds digital foundation and strengthens security to delivering efficient digital and IT operations and services. The risks related to data security of each business hub are assessed, categorized, and rated. The risks that are rated as medium to low are mitigated by the following actions:

## IMPROVING IT GOVERNANCE AND ENSURING THE IMPLEMENTATION

- Introducing the revised Cyber Security and Information Security management Policy and other related policies and procedures, such as, IT Service Request Procedure, IT Change Management Procedure, and IT Incident Management Procedure establish a best practice controls and standards policy and procedure to govern IT processes in order to align IT people and organization to optimize IT operation performances through effective IT governance
- Communicate and train all the Group employees to ensure that the policies and procedures introduced are effectively implemented. The Group has planned and conducted mandatory training sessions to all the employees. Each mandatory training session has a test to evaluate the employees' understanding and it is set as the employees' KPI to pass the test in the mandatory training. In case that employees do not pass the test, they must reattend the training until they pass. Mandatory training sessions include
  - Cybersecurity awareness training: Account and Password Management policy is included in this session. There are 435 employees attend this class and all of them passed the exam.
  - Data/Information Protection Policy Training: The policy will be developed and train to all employees in 2022.
  - Corporate Document Management System (CDMS): The system will be go live on 1/Feb/2022 and start roll-out tall departments including document management process and system training.
  - For new joiners, they must attend the induction session which includes the training on policies and procedures related to cybersecurity, physical security, email security, password security, mobile devices, wireless network and security, and etc.

## ENHANCE SECURITY SOLUTION



In order to prevent a risk of data loss, WHA has implemented as below:

- (1) Cybersecurity and Information Security Management Policy
- (2) Account and Password Management Policy
- (3) Computer and Network Usage Management Policy
- (4) Cybersecurity Awareness Training
- (5) Enhance Microsoft Security Solution
- (6) Disable USB Mass Storage with enable procedure if need
- (7) Implementing Corporate Document Management System (CDMS)
- (8) Developing Data/Information Protection Policy

### CORPORATE DOCUMENT MANAGEMENT SYSTEM (CDMS)

To efficiently manage the corporate document, Information Classification is revised and incorporate in Cybersecurity and Information Security Management Policy. Information classification is redefined to 5 categories, ranging from public to personal. Defining category of document helps manage and secure the

Group information as appropriate information handling for each classification.

### BLOCK USB STORAGE AND EXTERNAL HARD DISK

In order to prevent WHA computers and network from virus and malware transmitted through USB devices, to minimize risk of intended or unintended data leakage, the Group do not allow the use of unauthorized USB storage devices. The Group disabled the USB port of all staff's computers for mass storage purpose on 23/Sep/2021.

### MOBILE DEVICES MANAGEMENT

The Group have deployed Mobile Device Management (MDM) with Microsoft EMS (Enterprise Mobile Security) to manage mobile devices in our organization, either on-premises or cloud-based in order to control how our organization's devices are used, including mobile phones, tablets, and laptops. We can also configure specific policies to control applications. It helps make sure our organization's data stays protected and can isolate organization data from personal data.

## ASSURE SECURITY OF THE SYSTEM

To assure security of the system, penetration and vulnerability tests will be conducted in 2022 to ensure that we can protect our data, reduce cyber risk, satisfy stakeholder requirements, and preserve the organization's image and reputation.

In 2021, the Group's subsidiary, WHA Infonite Company Limited is certified for ISO/IEC 27001: 2013. For the Group, it now prepares for ISO/IEC 27001: 2013 certification with a plan to get certified by the first quarter of 2023.

## INFORMATION SECURITY RESPONSE MECHANISM

The security and confidentiality of information are also governed by the Group's Code of Conduct and Practices. Any suspicions, grievances or breach cases on potential violations to such principles can be reported and investigated following the established whistle-blowing process as stated in the Codes of Business Conduct chapter. Additionally, the Group has conducted a breach assessment and implemented an Cybersecurity and Information Security Management Policy. The Policy enforces to all employees, states the procedures and responsible personnel for management and reporting of information security events in respondent to a reported breach case.





## ENSURING CUSTOMER'S DATA SECURITY

As the Group provides information technology solutions through WHA Digital Platform, protection of the customer's data is prioritized equally as security of its own internal data. By that, WHA Group continues to improve and keep its technological services up to date.

## WORLD CLASS STANDARD DATA CENTERS



WHA Digital Platform is operated through its subsidiary - WHA Infonite Company Limited, a subsidiary company of the Group, which provides variety of digital solutions for customers. One of the services provided is the Data Center which is a dedicated space for customers to rent or lease out storage space to house their computer systems and associated components. WHA Group currently established three data centers that are fully equipped with high-speed communications and linkages as well as a high-security operating system, an experienced consultant service in accordance with the information security management system ISO/IEC 27001: 2013. With these advanced features, the data centers are popular amongst customers as their main database or disaster recovery site. To ensure of the security of customers' data, the data centers' infrastructures are constructed and operated in accordance with the "Best Practices" in conformance to world-class standard, the Tier III Compliances Uptime Institute. Among the four established data centers, one of them received the Tier IV Gold Certificate, while the other three received the Tier III Gold Certificates. In addition to the infrastructure advancements, all of the data centers are equipped with an emergency electricity backup generator to prevent down time. Moreover, all data centers are ensured

24-hours ambience monitoring including controlled temperature and humidity, allowing server to function efficiently together with longer machine life expectancy.

Nevertheless, to improve the security system, CCTV cameras were installed at all entry and exit points within the facilities together with 24 hours' onsite security staffs to prevent trespassing activities, thus safeguarding the customers' valuable and confidential data. Fire alarms have also been put in-placed throughout the facilities. Physical access to all the data centers are strictly monitored through cardholder data environment (e.g. badges, locks and keys). Physical and logical control measures have also been imposed to network access, restricting public access and bypassing those explicitly authorized. Lastly, 24-hours Business Continuity Plan (BCP) is provided on-site in order to assist customers to manage their IT systems contentedly.

In addition, the Company was certified with PCI-DSS "Payment Card Industry Data Security Standard" standard for customers' financial transactions. This achievement enabled WHA Group to build trust with financial and banking customers about security in storing their financial information.

## CLOUD SERVICES SECURITY

On top of the data centers, WHA Group also offers cloud services to customers. WHA Group cloud services have flexible options enabling the customers to choose between public and private, multi-cloud and hybrid cloud services. The Group provides computer resources, both hardware and software, and computer networks supported with FTTx infrastructures which allow customers to access fast speed, high security, and low latency connections. The cloud services are supported by experienced professionals with certification from world class agencies such as Dell Certification, Hitachi Data System Certification, VM Ware Certification, and OpenStack Certification to provide advice and control the computer network system.

To ensure the ability to deal with any data security related risks, the Group offers a range of pro-active approach that customers can choose to secure their data such as firewall, Anti-Virus, information back-up system, security system, access control systems, etc. With these data security approach, the customers can ensure business continuity as data security risks are minimized.



## PERFORMANCE

WHA Group commits to continuously improve its data security management and systems in order to continuously ensure that 100% data breach prevention in terms of data leaks, thefts or losses of both inbound and outbound data are achieved.

Performance	2019	2020	2021
Total Number of Complaints Received from Outside Parties and Substantiated by the Organization	0	0	0
Total Number of Complaints from Regulatory Bodies	0	0	0
Total Number of Identified Leaks, Thefts, or Losses of Customer Data	0	0	0

# **SOCIAL DIMENSION**





## HUMAN RESOURCE MANAGEMENT

Human resource has always been one of the most critical elements driving every organization's success. To ensure a sustainable growth, strategy to acquire and retain skilled and capable talents need to be well planned, especially during the past few years which the pandemic has catalyzed the speed of change to an unprecedented level. Companies have seen more opportunities arising to drive progress in sustainable development during this volatile situation. Through interactions and engagement with workforces, companies are starting to integrate the vision of "Future of Work" to their workforce strategy, to be inclusive, and to develop and motivate them in both their personal and professional aspects, as well as preparing them for future challenges they may encounter.

Consequently, being aware of this rapid change and the impact of the "Future of Work", WHA Group is forced to rethink about their People Strategy resulting in the revamp of its human resource principles and practices. WHA Group realizes the impact of shifting in workforce demographics, generation gap, difference in value perception, and the importance of diversity in our workforces; thus, we take into account these aspects to ensure our capability to capture any opportunities arising for sustainable development, as well as to mitigate all risks which might affect our workforces capacity and capability to retain the competitive edge for our Group.

Accordingly, WHA Group continuously put tremendous efforts through the Group's effective talent attraction and retention processes, and their advanced and holistic



approach towards a more comprehensive human capital development. During the pandemic, the management has emphasized more on the workforces' health and wellness, both physical and mental. The Group has provided at least two doses of COVID-19 vaccine to all employees, including their family members, as well as hosting "Health & Wellness" sessions with physicians from top hospitals to provide information, knowledge, and consultation for all WHA employees. Moreover, the Group has always updated and taken into consideration the labor practices that are fair, ethical, respectful towards human rights and ultimately, having the employees' best interest at heart.

## WHA GROUP '5-YEAR' DIRECTIONS FOR HUMAN RESOURCE MANAGEMENT

WHA Group sets out a 5-year strategic direction for human resource management, starting from 2022 to 2026, aiming to be one of the best employers in Thailand and the region. The strategy is implemented to re-vitalize and revamp the existing human resource management systems, including talent attraction and retention, human capital development and managing labor practices. The overview of the goals for each year are as follows:





## WHA CORPORATE VALUES

Established in 2017, WHA Group's Corporate Values plays a vital role in promoting and fostering digital transformation and innovation within the organization. The WHA's Core Values were implemented throughout the four business hubs. The corporate values instill and foster employees' mindset to act and perform their roles with inclusivity and harmony in the most effective ways. Advanced, Champion, Resourceful, Partnership and Integrity are the five elements of the corporate value,

which are delicately designed to support the development of employees' leaderships and competencies. In 2022, the Group is planning to revamp the core values to align with the corporate branding and instill digital elements into the corporate DNA (WHA DNA). This process will play an important role in capacitating WHA Group to improve business through its digital transformation aspiration as well as in driving WHA's strategic direction to turn ourselves into tech company by 2024.



**ADVANCED**



**CHAMPION**



**RESOURCEFUL**



**PARTNERSHIP**



**INTEGRITY**



## HUMAN RIGHTS

Human Rights are inherent rights in which every human-being are entitled to. Nonetheless, there have been a rising number of human rights violations across the world. Whether it is the violations of human rights-related laws, international standards or commitments, or human rights circumstances in which leads to human rights abuse. Salient human rights issues in which business operations are paying close attention to includes unfair labor practices and unsafe working environment, insufficient occupational health and safety management, excessive environmental pollution and degradation of ecosystem, restrictive on freedom of association and rights to collective bargaining, forced re-settlement and improper land acquisition, and the use of illegal forms of labors from unsystematic recruitment processes (i.e. child labor, forced labor, human trafficking). Especially with the on-going pandemic, the employees' and communities' rights to health as well as fair working conditions are highly subjected to being violated due to the risks of spread of COVID-19 virus.

The interconnections between business and human rights is increasingly drawing attention from various actors and stakeholders, within the public and private sectors, and growing their expectations for companies to conduct their businesses with respect to human rights. This emphasis on human rights became a key driver for businesses to proactively act upon the human rights risks and mitigate human rights impacts, negative reputations, complaints from human rights' defenders and protests by right holders.

As an operator of multiple business services, WHA Group believes that to become a truly sustainable business, it is essential that the Group enhance the human rights practices in their own operations as well as promoting WHA Group's human rights principles and commitments to all relevant stakeholders, rights holders, and vulnerable groups across the value chain.



## MANAGEMENT APPROACH

WHA Group conducted Human Rights Due Diligence (HRDD) to assess human rights risks and impacts throughout the value chain. WHA Group's HRDD process is in accordance with international guidelines such as Universal Declaration of Human Rights (UDHR), United Nation Guiding Principles on Business and Human

Rights (UNGP), United Nation Global Compact (UNGC) and the International Labor Organization's Declaration on Fundamental Principles and Rights at work. WHA Group has an annual systematic review of the HRDD and conduct the Human Rights Assessment every year.

### WHA GROUP'S HUMAN RIGHTS DUE DILIGENCE PROCESS





## 1. POLICY COMMITMENTS

As part of the HRDD, WHA Group has established the Group's Human Rights Policy which adhere to international human rights standards, local as well as international laws and regulations. The scope of the Human Rights Policy explicitly covers all relevant stakeholders and affected rights holders, including all employees in our operations, and extends to all suppliers, contractors and business partners, and in

new business relations (i.e. mergers, acquisitions, joint ventures). Moreover, WHA Groups extends these human rights commitments to their customers, communities, and vulnerable groups (i.e. women, children, migrant workers, third-party contracted labor, local communities, people with disability, elderly, and LGBTQI+ communities). Furthermore, the Policy was communicated to all employees at every business hubs by a group-level Human Resource Department.

## HUMAN RIGHTS POLICY









## 2. ASSESS POTENTIAL AND ACTUAL HUMAN RIGHTS RISKS AND IMPACTS

Additionally, the Human Rights Risk Assessment (HRRA) was also conducted in all of WHA Group's own operations as part of its respective Environmental Impact Assessment (EIA) study.

The HRRA covered 100% of WHA Group's operational sites which are categorized by business hubs and its associated activities (ranging from construction to operation phases) in WHA Group's value chain, as follows:

Business Hubs	Upstream	Operations	Downstream
<b>Logistics Hub</b> 	<ul style="list-style-type: none"> <li>Land acquisition</li> <li>Property development</li> </ul>	<ul style="list-style-type: none"> <li>Warehouse leasing and sale</li> <li>Asset management</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance</li> <li>Customer service</li> </ul>
<b>Industrial Development Hub</b> 		<ul style="list-style-type: none"> <li>Industrial plot sale</li> <li>Asset service management</li> </ul>	
<b>Utilities &amp; Power Hub</b> 	<ul style="list-style-type: none"> <li>Raw Water Procurement</li> <li>Fuel and solar panel procurement</li> </ul>	<ul style="list-style-type: none"> <li>Water production</li> <li>Wastewater treatment</li> <li>Power production</li> <li>Solar rooftop installation</li> </ul>	
<b>Digital Platform Hub</b> 	<ul style="list-style-type: none"> <li>IT product and service procurement</li> </ul>	<ul style="list-style-type: none"> <li>Data Center service and solution management</li> <li>Network service management</li> <li>Managed services and solutions management</li> </ul>	

## HUMAN RIGHTS CONSIDERATION

WHA Group has identified and assess potential and actual human rights issues (including risks and impacts) as part of the due diligence process. The human rights issues covered are as follows:



### EMPLOYEE RIGHTS

- Illegal forms of labor (i.e. Forced labor, Child labor, Human trafficking)
- Freedom of Association
- Right to Collective Bargaining
- Equal Remuneration
- Segregation and Discrimination
- All forms of Harassment, including sexual and non-sexual harassment (e.g. verbal threats)
- Foreign Human Capital, and Migrant Workers
- Health and Safety of Employee (and COVID-19 risks)
- Work Environment and Workers' Quality of Life
- Working Hours



### COMMUNITY RIGHTS

- Resettlement
- Socio-economic impacts
- Environmental impacts
- Livelihood and Standard of Living
- Community Health and Safety
- Foreign human capital



### CUSTOMER RIGHTS

- Data Privacy
- Health and Safety of Customer
- Waste, Hazardous waste and contagious waste management

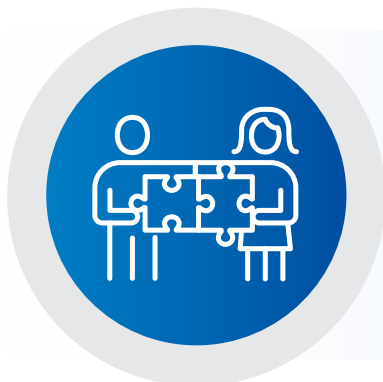


### SUPPLIER RIGHTS & BUSINESS PARTNERS

- Health and Safety in the Supply Chain
- Fair Hiring Condition for Suppliers
- Working Condition and Environment for Contractors and Suppliers
- Joint venture partnership's unsafety or unhealthy working conditions

## VULNERABLE GROUPS

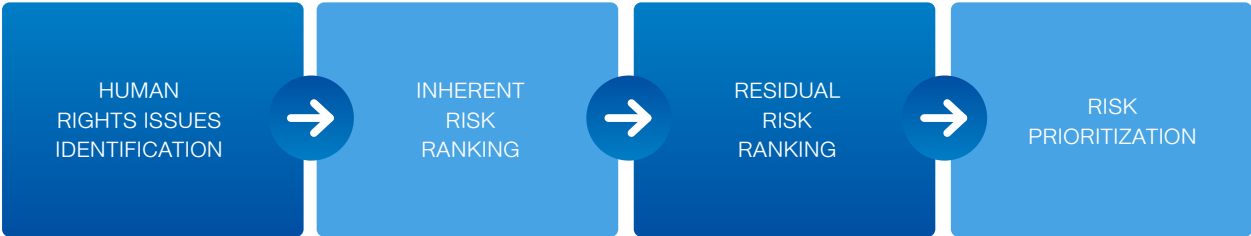
The vulnerable groups covered by the risk assessment includes:



- Own employees
- Women
- Children
- Indigenous People
- Migrant workers
- Third-party contracted labor
- Local communities
- People with disabilities
- Elderly
- LGBTQI+ communities

Moreover, WHA Group has also covered the human rights risks identification for its new business relations (i.e. mergers, acquisitions, and joint ventures) where human rights criteria have been incorporated into the M&A Check-list.

HUMAN RIGHTS ASSESSMENT METHODOLOGY



HUMAN RIGHTS CRITERIA

The HRRA was conducted using WHA Group’s Human Rights Risk Assessment Criteria to determine the significance of each human rights issues. The human rights criteria covered the likelihood and impacts of each human rights issues.

WHA GROUP’S HUMAN RIGHTS PERFORMANCE

100%  
of WHA Group’s



OPERATIONAL SITES AND ASSOCIATED ACTIVITIES WERE ASSESSED ON THEIR HUMAN RIGHTS RISKS AND IMPACTS.

100%  
of WHA Group’s

OPERATIONAL SITES AND ASSOCIATED ACTIVITIES WHICH HAVE BEEN IDENTIFIED WITH HIGH HUMAN RIGHTS RISKS, HAVE MITIGATION MEASURES AND/OR REMEDIATION ACTIONS IMPLEMENTED.

AFTER THE ASSESSMENT,

100%  
of WHA Group’s

OPERATIONAL SITES AND ASSOCIATED ACTIVITIES WERE IDENTIFIED WITH HIGH HUMAN RIGHTS RISKS (SALIENT ISSUES), AS FOLLOWS:

- HEALTH AND SAFETY OF COMMUNITIES, CUSTOMERS AND EMPLOYEES
- HEALTH AND SAFETY IN THE SUPPLY CHAIN
- LIVELIHOOD AND STANDARD OF LIVING FOR COMMUNITIES



### 3. INTEGRATE FINDINGS AND POTENTIAL IMPACTS INTO HUMAN RIGHTS POLICY

Once the risks and potential impacts have been identified, the findings are then used to guide the revision of the Human Rights Policy to ensure that WHA Group's Human Rights Policy and commitments is in line with the current global trends, international standards and comply with the most present laws and regulations.

The results and findings are also integrate into WHA Group's management systems and approaches, procedures and work processes, and are also use to guide business direction and strategy in the future.

### 4. IDENTIFY AND IMPLEMENT MITIGATION MEASURES FOR HUMAN RIGHTS IMPACTS;

Based on the nature of WHA Group's activities as providers of logistics and industrial developments, it was identified through assessments that human rights related risks are less severe in comparison to other business sectors. This is because WHA Group complies with the governmental land zoning laws, follows the EIA requirements, and involves low numbers of foreign labors.

Nevertheless, WHA Group has implemented various mitigation measures as well as tracking and monitoring processes for the human rights issues identified.

Human Rights Issue	Affected Rights Holders and Vulnerable Groups	Tracking and monitoring, mitigation measures, and remediation actions
Health and Safety		
<p>Accidents occurring in customers' operations within the Industrial Estates and/or in WHA's operational areas (i.e. offices, water treatment plant)</p> <p>For example: gas pipe explosion, chemical leakage, and fire hazard</p>	<p>Community, Customer, Employee</p>	<ul style="list-style-type: none"> <li>Conducted a risk assessment to identify safety risks that may occur due to business activities, and, implement proper measures to eliminate or minimize those risks. The assessment is conducted on an annual basis, and when there are changes to the business activities and operations.</li> <li>Installed the Emergency Control Center (ECC) in 9 of WHA Group's industrial estates. The control centers are used to assess and prevent emergency incidents. ECC systems are managed by OHS specialists that can immediately respond to the incidents that have occurred in real-time.</li> <li>Implemented emergency plan and conduct the emergency drill, annually.</li> <li>Have communication channels that can be easily accessed by all stakeholders, regarding health and safety issues</li> <li>Gathered Safety Data Sheet (SDS) on hazardous chemical uses within the industrial estates in order to prevent any further risks from occurring</li> </ul>



Health and Safety in the Supply Chain		
<p>Accidents from construction activities which could lead to work-related injuries or loss of life</p> <p>For example: falling off height, cuts from sharp objects, burn wounds</p>	Contractors and Suppliers	<ul style="list-style-type: none"> <li>• Developed safety manual for contractors which they must strictly followed</li> <li>• Assessed safety risks and develop safety procedures for each work tasks/types</li> <li>• Implemented an approval process for all suppliers and contractors before entering work premises</li> <li>• Continuously assess and monitor the safety systems within the industrial estates.</li> </ul>
Livelihood and Standard of Living		
<p>Water management, competition for water with local communities and wastewater releases into natural sources</p>	Community	<ul style="list-style-type: none"> <li>• Committed to managing water efficiently and effectively.</li> <li>• Set target to reduce water uses from natural sources through Recycled water/Reclamation water system</li> <li>• Strictly followed waste management requirements and procedures for industrial estates</li> <li>• Controlled and monitored water management parameters in accordance with EIA requirements</li> <li>• Developed and continuously improve the efficiency and effectiveness of WHA Group's water production and water treatment systems</li> </ul>





## 5. TRACKING AND MONITORING OF HUMAN RIGHTS PERFORMANCE

Human rights performances can be tracked and monitored through WHA Group's corporate KPIs. Moreover, Human Rights criteria have also been incorporated as part of the Group's KPIs for all levels of employment.

Furthermore, the Group has in place a whistle-blowing channel in which stakeholders could conveniently access to report any potential human rights violation acts, or those against the Human Rights Policy. The grievance mechanism is as detailed under the Codes of Business Conduct chapter.

## 6. REMEDIATE ADVERSE IMPACTS

WHA Group recognizes that its business activities and operations may cause human rights violations to its stakeholders/rights holders and vulnerable groups. Thus, the Group is committed to preventing and mitigating the potential human rights risks associated with these activities, across the value chain.

In the case of human rights violations, WHA Group has implemented various measures to ensure proper remediation actions to restore affected groups that have been harmed by the business's activities to the situation they would have been in had the impact not occurred.

This includes grievance mechanism and complaint channels through telephone, email, and website, as well as, directly informing relevant staffs and employees. WHA Group will assess the causes and address the issues through an anonymous process. Additionally,

after the assessment, WHA Group will ensure that effective remedy, and compensation have been provided, as well as insurance coverage to those that were harmed.

Moreover, WHA Group verifies its human rights results, and review the assessment and due diligence process every year. This is to ensure that its human rights practices are the most effective and updated. Finally, In 2021, there are no human rights violations, therefore, there are no remediation actions.

## HUMAN RIGHTS AWARENESS

To ensure alignment with WHA Group's human rights principles and commitments, the Group continuously raise awareness and build understanding of human rights to all its employees. The Human Rights Policy is communicated as part of the induction program for all new employees since 2020. This is facilitated by the group-level Human Resource Department. Moreover, in 2021, 100% of 78 new joiners across all of WHA Group's business hubs have surpassed the orientation programs. In conclusion 60% of WHA employees were trained and 180 total hours were devoted to training human right policies and procedure

Additionally, the Human Resource Department provided public relations on the importance of the following topics: nationality, religion, language, age and gender. The developed materials are attached with the Human Rights Policy, through the internal SharePoint platform to raise existing employees' awareness on human rights issues and serve as a refresher to revisit the Policy.



## LABOR PRACTICE INDICATORS



As the employment landscape is changing drastically in the recent years, new laws, regulations and requirements arise. Unemployment rate and violations of labor practices is intensifying across the globe. These factors put tremendous pressure on businesses to reform their labor practices to prevent potential violations and negative impacts to their employees and media presence. WHA Group is aware of the concern, thus, puts utmost efforts to manage its labor practices effectively and appropriately.

### MANAGEMENT APPROACH

WHA Group aims to improve employees' prosperity, promote diverse work environment, and ensure fair and equal treatment of employees, in line with the proper local labor practices and international standards. The Group ensures that its employee management practices also adhere to the national labor laws and regulations.

As addressed in the Employee Regulation Manual, the Group placed great importance on improving its organization labor practices. Thus, WHA Group prioritizes and enhance its actions and measures towards anti-discrimination throughout its operations and promote diversity in its workforce at both management and staff levels. WHA Group has appointed a Nomination Remuneration and Compensation Committee (NRC) which is comprised of members from the Board of Directors. The NRC is responsible to perform duties to nominate qualified persons, with no limitations or discrimination regarding the gender, age, color, race, ethnicity, nationality and cultural background to serve as directors and top executives. The NRC is also responsible for proposing principles and guidelines to clearly, fairly and appropriately fix remuneration that is consistent with the labor market conditions. The NRC conducts bi-annual meetings and subsequently reports to the Board of Directors.

Diversity of Director to Executives Level by Age (Persons)	2019	2020	2021
< 30 Years old	0	0	0
30-50 Years old	17	25	23
> 50 Years old	13	13	16

WHA Group promotes diversity in the workforce by supporting and facilitating an inclusive environment that creates a workplace where differences are valued. The Group provides equal opportunities for all employees, regardless of their gender, race, religion, age, and other status, across all business hubs, ranging from recruitment to career advancement. In order to optimize the workforce, it is importance that WHA Group considers

employees from diversified cultures and backgrounds, with different skill sets, experiences and unique perspectives to enhance workforce diversity. Diversity within the workforce allows the Group to broaden the knowledge and enhance creativity within the companies and extending the benefits to the wider society. Thus, WHA Group is monitoring various indicators to ensure the diversity of its workforce.



**TABLE 1 WORKFORCE BREAKDOWN: GENDER**

Diversity Indicator	Percentage	Targets (in 2023)
Share of women in total workforce (as % of total workforce)	36.45%	40%
Share of women in all management positions, including junior, middle and top management (as % of total management positions)	50%	60%
Share of women in junior management positions, i.e. first level of management (as % of total junior management positions)	52.50%	55%
Share of women in top management positions, i.e. maximum two levels away from the CEO or comparable positions (as % of total top management positions)	38.46%	45%
Share of women in management positions in revenue-generating functions (e.g. sales) as % of all such managers (i.e. excluding support functions such as HR, IT, Legal, etc.)	58.97%	65%
Share of women in STEM-related positions (as % of total STEM positions)	15.71%	20%

**TABLE 2 WORKFORCE BREAKDOWN: NATIONALITY**

Categories	Share in total workforce (as % of total workforce)	Share in all management positions, including junior, middle and senior management (as % of total management workforce)
<b>Thai</b>	99.18%	98.33%
<b>Others</b>	0.82%	1.67%







**TABLE 3 WORKFORCE BREAKDOWN: OTHER MINORITIES**

Diversity Indicator	% of FTEs	Coverage
<b>People with disability</b>	0%	>75% of FTEs
<b>Age Group:</b>		>75% of FTEs
<30 years old	0%	
30-50 years old	0%	
>50 years old	0%	

Furthermore, the Group adopted a fair and non-discriminatory recruitment process to ensure equal opportunities for all candidates. Fair compensation is provided and reviewed based on personal performances and achievements. Furthermore, the Group has engaged with external institutions to assess the employees' payments to assure that it remains competitive in the labor market.

Embedded in the Human Rights Policy, WHA Group illustrated its commitments to prohibiting all forms of harassment, including sexual and non-sexual harassment. Moreover, the policy also stated the commitments for zero tolerance for discrimination. Nonetheless, as part of the Group's commitments to non-discrimination and anti-harassment, WHA Group has also organized training for all employees

on discrimination and harassment in the workplace. However, if the Group's received reporting's on incidents related to discriminatory behavior and harassment, a defined escalation process as well as proper procedures including corrective and disciplinary actions will be taken. These procedures are outlined in WHA Group Code of Conduct policy.

WHA Group ensures fair lay off through an established transparent process. Moreover, employees are able to express opinions and propose suggestions on labor practices to the established Employee Committee or other provided channels acquainted with an established grievance mechanism process (refer to details on whistleblowing in Codes of Business Conduct chapter). In 2021, WHA Group received zero case reports regarding violations to labor laws and regulations.

## TALENT ATTRACTION AND RETENTION

In this highly competitive and fast-paced environment, companies are finding it more challenging to attract top talents while retaining existing employees. The challenges are intensifying, especially amidst the post-pandemic economy. New strategies and tactics for human resource management must be devised for employers to remain competitive and attractive for both existing and future talents, aligned processes for talent attraction and retention are crucial to the growth of new business opportunities and shifting business directions.

The current pandemic is accelerating the disruption of how we work and it will shape up the new normal for 'Future of Work.' Noticeable changes include increasing in remote working, flexible working hours, online meetings and work collaborations, as well as

virtual hiring. Remote working, or the 'work from home' practice, brings to light the importance in obtaining employees with skill and knowledge suitable and adaptable to these societal changes (e.g. technological-specific skills and digital literacy).

Furthermore, with the shifts towards digital transformation, new jobs have been created, which require new capabilities that are currently not available in the companies. Within the existing jobs, a change in mindset, job focus and approaches are needed to perform certain tasks more effectively in this competitive environment. Nonetheless, certain jobs may be eliminated and obsolete; these jobs are being replaced by new technologies, new alternatives, or are simply not needed anymore.





Moreover, COVID-19 had resulted in business' high lay-off rates and hiring freeze. The impacts have also led many people to re-allocate across the globe, or enforced circumstances that may disrupt their normal routines and/or prevent them from working. Therefore, these circumstances caused companies to lose their high-skilled and talented employees.

As a result, WHA Group puts great importance to attract new and retain existing talents. Fundamentally, human resource is one of the critical drivers in gearing the company towards achieving sustainable business successes.

## MANAGEMENT APPROACH

WHA Group's talent attraction and retention management, across four business hubs, is under the responsibility of the group-level Human Resource Department. WHA Group realizes that low employee turnover rate helps to maintain the company's productivity and competitiveness, and that recruiting is a costly endeavor that is also time consuming. To save itself from such hassle, WHA Group has initiated to reduce the total turnover rate at 12.61%, voluntary turnover rate at 7.39%, and turnover rate of talent at 1.54%.

The Group recognizes that in order to achieve sustainable business success, its current human resource strategy and corporate values are no longer sufficient. Therefore, WHA Group has revamped its human resource strategy, and incorporating Strategic workforce planning (SWP) and People Analytics (PA) as part of its human resource management system. SWP is a long-term planning process, providing up to 3-5 years of future forecasts. It allows WHA Group to align their workforce to the business needs and expected outcomes. SWP focuses on identifying the workforce implications, current, transition and future of business strategic objectives, including scenario planning.

## STRATEGIC WORKFORCE PLANNING (SWP)

WHA Group's strategic workforce planning process aim to build WHA Group future. Agile workforce planning will shape WHA Group employee experience in significant ways. It also helps companies form teams that work well together for long-term results and enhances talent management capabilities.



As part of the SWP, WHA Group utilizes People Analytics to estimate the future workforce that the Group will need along with studying external landscape. People Analytics (PA) is determined as methods, tools or applications that integrate the use of advanced analytics and large, complex data sets into human resource management system. PA allowed companies to identify current risks and opportunities, provide better understanding of organizational networks and information flows leading to an informed decision-making process in talent management. WHA Group collects data through the Human Resource Information System (HRIS) in order to track current human capital and headcounts with the manpower planning and adjust implementation plans. The data collected, such as human capital vacancies, and human capital return on investment (HCROI) are used to analyze progress and success, and to monitor human capital with business performance. Therefore, WHA Group continuously implements these applications into all aspects of its human resource strategy. This includes, recruiting and hiring, measuring employee performance, identifying workforce skill gaps, and identifying flight risks to improve retention. Ultimately, this will help companies improve their business performance and sustainable growth.

People Analytics (PA) has been used to collect data for improving human resources performance i.e. identify, attract, develop and retain our talent. As a results, WHA Group was able to transform HR business interaction and build employee relationship.

## RECRUITING & HIRING

Recognizing the importance of attracting new talents, the Group has strengthened the awareness and

attractiveness of WHA Group among targeted graduates and professionals through a clearly defined and effective Employer Value Proposition (EVP), that align with their corporate values. The objective of this process is to fulfill manpower planning in order to meet the plan and business objectives that have been set. To start, WHA Group is seeking talent insights from both internal and external inputs. This is to ensure that the talent attraction process matches with the external perceptions as well as the internal reality of the organization. The Group aims to bring EVP to life through creative assets and communications.

Moreover, WHA Group has also implemented WHA's recruitment rebranding program which aims to attract and find the best candidates. WHA Group aims to enhance their employment branding in targeted workforce markets by developing a strategic partnership with targeted academic institutions and professional groups. This is done through two engagement processes:

### 1. Academic Partnership

WHA Group engages with young talents through internship program, on-site visits, coaching & action-learning hackathons program, projects-based learning, etc.

### 2. Professional Community Outreach

WHA Group reaches out to professional/business associations and communities to increase exposure of the Group through knowledge sharing, keynotes speech, and social activities to connect with experienced professional.



Furthermore, WHA Group is re-designing an end-to-end talent acquisition process that are customized to fit with the business needs and respond to the behaviors of new generation talents. This includes on-going social network activities, digitalized approaches to support new ways of workforce sourcing. The Group is developing a more comprehensive sourcing database to enable a more efficient candidate management and also implementing recruiting technology on cloud-based and on mobile device, incorporated into WHA Group's new HRIS. In order to track, monitor and analyze the success from these processes, the Group collect data on new hire ratio, filling time, and termination ratio, as well as assess the % of recruitment achievement with plan to accelerate key strategic position and enhance support to the business needs and growth. Nonetheless, through these processes, the Group will continuously improve these processes to ensure that it is keeping up with the changing markets, trends and future of work.

### MEASURING EMPLOYEE PERFORMANCE

WHA Group measures employee performance through its annual performance review, in accordance with the Group's Performance Management System (PMS). The review provides an analysis of the employees' performance against KPIs, as well as the ratio of talent (i.e. top performers). The objectives for this process are to support and strengthen talent pool within the Group, to improve employee engagement across the hubs, and to close the relationship gap between supervisor and staff. In 2021, 100% of all employees have completed the performance review. Additionally, WHA Group is implementing a coaching system, for all employees in manager roles, to develop coaching skills, and reinforce coaching at work as part of leader role to ensure team performance and productivity. As part of the system, WHA Group is also promoting regular performance dialogue between manager and employees. In term

of tracking, monitoring and analyzing success, WHA Group continues to monitor quality of performance management and give feedback to staff.

Moreover, WHA Group is developing a Multiple-track Career System, which is a job grading system that is harmonized across the Group. The system is designed to be applicable to various job family model across WHA Group, to promote upskill/reskill organization-wide. As part of the system, the Group will be able to see the career progression and rotation opportunities for all employees.

### IDENTIFYING CURRENT WORKFORCE SKILLS GAPS

As part of the SWP, WHA Group also identifies gaps in the current workforce, such as lack of technical skills, or specific knowledge, to ensure that the Group's operational activities and achievement of business goals can continue smoothly towards WHA Group strategic direction. The process includes WHA Group Development program. It is a short-term approach, in order to identify which positions are needed and can be open for the next recruitment or which skills/positions are needed in specific years. This is to ensure that critical skills and knowledge's for both existing and future business activities are timely developed and secured for the whole organization. The information collected as part of the process includes ratio on training completion per departments, training completion alignment with plans, ratio of training hours per headcounts. Similarly, these information are collected through HRIS system and are used to evaluate, upskill and reskill employee skill gaps. By collecting and analyzing these data, WHA Group will also be able to develop employee capabilities and build their career plan within the organization, as well as, to build talent pipeline to succession across all business hubs.

## IDENTIFYING FLIGHT RISKS TO IMPROVE RETENTION

Certain employees may not be satisfied with their current compensation, career prospects, or working environment, which leads to searching for new opportunities elsewhere. Through the HRIS system, WHA Group collects information from employees, such as attribution rate and regrettable lost to analyze employee engagement within the Group. Moreover, to retain its talent pool, WHA Group must identify disengaged or dissatisfied employees. Thus, the Group conducts annual employee engagement survey in order to locate and understand the factors that contribute to employees' turnover intentions.

Employee engagement is a process that promotes employees' satisfaction, maintain efficiency, and ensures all employees feel valued and involved in their everyday work. Employees across four business hubs that have been employed for over six months are subjected to participate in this survey. In 2020, the survey was conducted by an external third-party company, NIDA, through the Employee Engagement on Meter (EMO Meter) methodology, while in 2021 the company has collaborated with Kincentric, a global employee engagement consultant, to conduct the survey for the journey to become one of the best employers in Thailand and region. This is to ensure the transparency of the methodology, unbiased data collection and analysis, as well as the benchmarking opportunity with other best employers.

The survey assessed employees' satisfaction on eight categories including:



In 2021, the Group of companies developed a roadmap with the goal of continuously improving itself until it achieved national certification as one of the best employers in the country. As a result, the Group decided to modify the tool used to conduct employee engagement surveys. For the first year, Kincentric Thailand used the Employee Engagement Survey as a tool.

The tool addresses issues involving and affecting employee engagement with the organization. These issues have been proven and developed over the last 20

years to be good for long-term employee engagement with the company. Additionally, using such tools will enable the Group of companies to compare its performance to that of its counterparts both nationally and globally in order to implement best practices for human resource development to maintain a sustainable level of employee engagement within the company group.



Employee Engagement Survey results from the Kincentric Thailand tool for 2021 indicated a score of 68 percent, which is an acceptable level for those attending this program for the first time during its first year. The evaluations in the surveys represent a complete difference from those recorded last years. As a result, this year's survey results cannot be directly compared to previous surveys. However, WHA Group has benefited by identifying opportunities and gaps in the operations of a wide range of positions, and perhaps most significantly, the group has received the highest volume of comments and ideas from employees. Additionally, an employee engagement survey was conducted, and

each employee's voice will be critical in determining the Group's long-term development strategy.

The engagement survey results were communicated to the Executives and the respective business hubs' management levels, and results were also shared to all employees via the internal SharePoint platform. In 2021, 93% of the total eligible workforce had completed the survey, and received a favorable score rating of 68%.

To get a more accurate engagement result, WHA Group aims to survey 100% of full time employees by 2022.



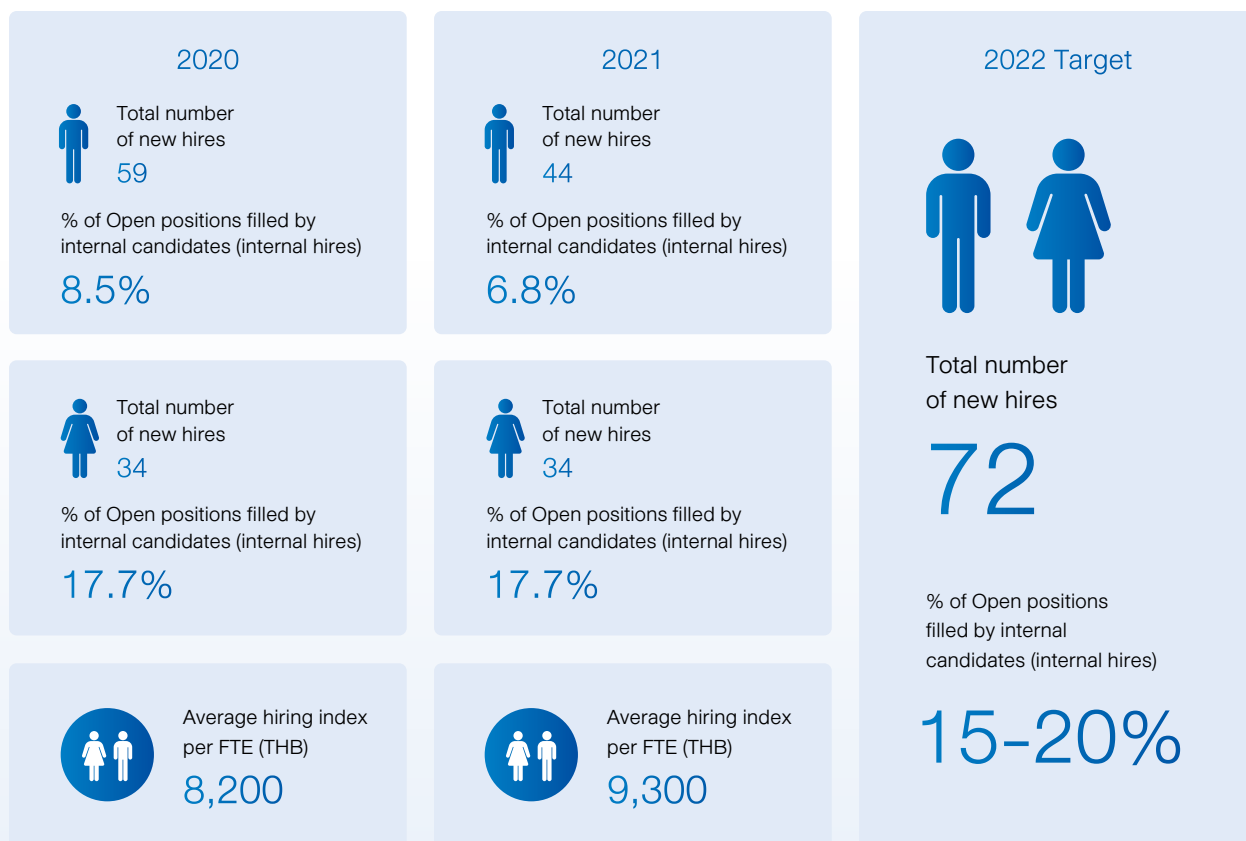
**2022 Target**  
 More than **80%\***  
 % of Total Employees Coverage **100%**

**Remarks:**

\* Assessment score methods and criteria have changed in 2021. The 2021 target also makes reference to the scoring process and criteria used in the previous year's assessment. The goals for 2022 have been revised to reflect the new assessment system and scoring criteria.

As a results, all employees' insights from the performance review, as well as the engagement survey, were gathered and analyzed to promote career advancement or formulate meaningful development programs,

job-rotation programs, and pre-retirement plans as well as to fill internal job opportunities. In 2021, 11.54% of open positions are filled by internal candidates (internal hires).



To further enhance employee engagement and satisfaction to the company, the Group provided the following initiatives, including:

- 

**WHA GROUP TOWN HALL**

**2021**

**9 Feb 2021**

**2 - 4 p.m.**

**Date**

**9 Feb 2021**

**Time**

**2 - 4 p.m.**

**Locations**

**Board of Directors**

**Executives & Managements**

**Town Hall @ Race, with a show**

**Staff**

**AGENDA**



**Elin Jørgensen**  
Investment Manager



**Elin David**  
Richard Nordlie



**Elin Høyen**  
Rudolf Eide



**Elin Kristine**  
Ongstad



**Elin Høyen**  
Rudolf Eide



**Elin David**  
Richard Nordlie



**Elin Høyen**  
Rudolf Eide



**Elin Kristine**  
Ongstad

- ## WORK-LIFE SOLUTIONS



## Digital Innovation of WHA Tower



Security and Contactless  
Access Control System



Thermo Scan



Vehicle License  
Plate Recognition



Face Recognition  
Turnstile



 Add Friends



For more details, please visit

[www.wha-group.com](http://www.wha-group.com)

Tel. 02-719-9555



Moreover, WHA Tower has advanced technologies, incorporating with safety and flexibility, as well as innovation technologies that is operated by digital system that is highly known for its effective safety management. The technologies within the building include a face scanner for when entering or exiting, a body temperature monitoring system to ensure good public health, parking lots of up to 500 spaces, as well as, innovative technologies that is environmentally friendly and a light rail project that is expected to be completed in 2023.

Nonetheless, the transition to a new headquarter is also a process to group together all the business units into one location. This is to increase work performance, reduce transportation, and minimize communication limitations between the business units.



## WELFARE AND BENEFITS

WHA Group's aspiration, to be attract and retain its talent pools, drives the Group to enhance their welfare and benefits, which are provided appropriately to employees and exceeds the regulation requirements where possible. All employees were informed of their rights to receive the welfare and benefits at the beginning of their employment. All WHA Group's full time employees are entitled to a standard WHA Group benefit package which consists of life and accident insurance, health

insurance covered to staffs' family members, annual health check, safety uniform, provident fund and financial assistant fund. A communication channel for employees to propose benefits improvements was set up through the Welfare Committee and Human Resource Department.

Moreover, WHA Group is working on creating a positive atmosphere with boosted employee morale. As the group values the well-being of the employees, WHA Group arranged employee well-being activities and programs. As part of the new human resource strategy, WHA Group articulates its "employee well-being" by focusing on occupational health and safety as the new priority. This includes establishing the WHA Care, and Voice of Employee Program In 2021, WHA Group organized a WHappy Friday activities, Fit and Firm balance, Stretching fit for fun, Stress Management program which aimed to promote employees' wellbeing through staff activities. Altogether, there were a total of 60% participants to the event.



Lastly, WHA Group also provides and extra incentives in 2021, with paid to our volunteer who dedicate and drive the Change agent program . This program applies to those who are our talented. This program is also associated with WHA Group's sustainability performance target to Digital Transformation.

## MANAGEMENT PERFORMANCE

### Employee Turnover Rate



Total employee  
turnover rate  
**12.61%**

Total turnover  
rate by gender



64.00%



36.00%

Total turnover rate for  
management level

Top level  
management  
**9.09%**

Middle  
management  
**22.73%**

Junior/low level  
management  
**68.18%**

Total turnover rate by race/ethnicity/nationality/  
country of origin/cultural background

Thai  
**98.67%**

Vietnamese  
**1.33%**

Others  
**0%**



Voluntary employee  
turnover rate  
**7.39%**

Voluntary turnover  
rate by gender



56.82%



43.18%

#### Remark:

The performance data covered 100% of all FTEs globally



# HUMAN CAPITAL DEVELOPMENT

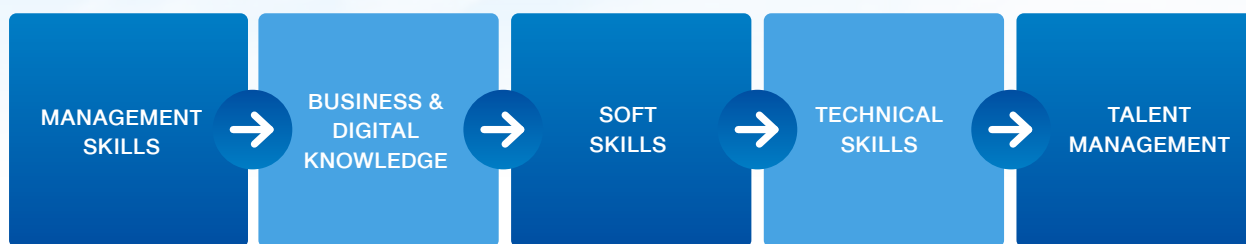
'Future of Work' has become the key driver that is shaping needs for change of the current workforce and its management for most organizations. Together with other global trends such as technological advancement, innovation, demographic shifts and society development, it is essential for companies to rethink about its human capital development which is crucial to the business success and sustainable growth.

To address these changes, WHA Group is re-assessing its current workforce and human capital development, from identifying skill gaps, investing in trainings, upskilling and reskilling, to ensure that necessary skill sets are aligned with the Group's business visions and strategy. WHA Group truly believes in the philosophy that people is the most valuable asset to the company, and recognize that they play a critical role in the organization's sustainable growth. Thus, the Group prioritizes human capital development to support its employees to reach their full potential and career aspirations.

## MANAGEMENT APPROACH

Human Resource Department is the key function to plan, execute, and manage all HR relating issues for the whole Group. WHA Group realizes that investing in employee learning and development not only serves as a motivation for employees to develop themselves, but also enables the organization to ensure the continuity and growth of our business with uninterrupted supply of highly skilled workforces. Therefore, the Group provides comprehensive development program to support personal and career advancement, which in turn leads to greater job satisfaction and motivation.

The learning and development program focuses on five key growth areas including 1) Management skills development, 2) Business and digital knowledge development, 3) Soft skills development, 4) Technical skills development, and 5) Talent management.



To foster the employees' knowledge and capabilities, WHA Group also analyzes human capital return on investment (HCROI) to serve as an indicator to reflect appropriate levels of employee investment. In 2021, the Group's HCROI rate is at 12 times, thus, achieving its 2021 target. The Group has also initiated a target for maintaining the HCROI rate at 14 times by 2025. Moreover, WHA Group has dedicated 1.7 million Baht to people development in 2021, which was accounted as 2,767 Baht per FTE.



TABLE 1: HUMAN CAPITAL RETURN ON INVESTMENT (HCROI)

	FY 2019	FY 2020	FY 2021	Target FY2021	Target FY 2025
<b>HCROI</b> (Times)	12	10	12	11	14

WHA Group has revamped its human resource strategy to accelerate people transformation through enhancing capabilities, upskills & reskills, and promote creative work environment, to support continuous self-development as well as driving business results. In 2022, WHA Group has a plan to revisit the organization capability requirements for both current and future skill sets ; this is in line with WHA's strategic plan and each business hub's requirements, as follows:

Business Hubs	BU's Specific Skill Sets
WHA Group	International expansion across the Group
WHA Industrial Development (WHAID)	Specialized Estates for WHAID
WHA Logistics	Value added products and Smart Warehouse features
WHA Utilities and Power (WHAUP)	Value added products for WHAUP
WHA Digital Platform	Digital-enabled solutions for WHA Group

Moreover, WHA Group is focusing on the upskilling the Digital Competency, ranging from fundamental skills for all employees to more savvy skills; e.g., data analytic, programming, or more sophisticated digital skills for specific functions and levels. This Digital upskill roadmap will be carried out across WHA Group from 2022 onwards.

As part of the WHappy Programs, various sessions were conducted on different topics that are important to employee development and align with the Group's change strategy. We have grouped all activities to 4 key categories including;

## EMPLOYEE DEVELOPMENT PROGRAMS

### WHAPPY PROGRAM

In 2021, WHA Group has launched WHappy program which is the combination of WHA + Happy. This program is a series of change management activities and communication to promote positivity and can-do attitude among WHA community. The program includes various activities to enhance employees' knowledge, capabilities, mindset, including health and well-being.







## เป็นอย่างไรกันบ้าง?

หลังจากที่พวกเราได้เดินทางบนเส้นทาง WHA Digital Transformation มาตั้งแต่ต้นปี

ทีมงาน WHAppy จึงอยากขอเชิญเพื่อนๆ ชาว WHA มาคือมองฟัง sharing session เกี่ยวกับ **การบริหารเอกสารภายในองค์กรในยุคดิจิทัล** เพื่อช่วยให้เราสามารถเข้าใจ และร่วมกันเตรียมความพร้อมสู่การบริหารจัดการเอกสารในยุคดิจิทัล โดยคุณผู้ชม ณัฐฐพงศ์ จากแผนกไอที

### Digital Transformation Sharing Session

เพราะเราอยากให้เพื่อนๆ ได้มาร่วมกิจกรรมนี้ WHAppy จึงได้จัดกิจกรรมครั้งนี้ ออกเป็น 2 รอบ เพื่ออำนวยความสะดวกให้กับเพื่อนๆ

**รอบที่ 1** วันพฤหัสบดีที่ 16 ธันวาคม 2564 เวลา 13.30 - 14.30 น.

**รอบที่ 2** วันศุกร์ที่ 17 ธันวาคม 2564 เวลา 13.30 - 14.30 น.

ใครสะดวกช่วงไหน กดเลือกได้เลย อยากให้เข้ามาฟังกันเยอะๆ นะคะ

3. WHAppy Cast - a series of podcast to be broadcasted internally to enhance staffs' awareness and knowledge on global new trends and ongoing digital transformation journey, e.g., Cybersecurity, How to become paperless organization, Data-driven organization, etc.

WHA GROUP

## CONNECTING

WHA GROUP NEW YEAR PARTY 2022  
LOG-IN OUR NEXT HAPPINESS

22 DEC 2021

TIME: 18.00 น. เป็นต้นไป  
DRESS CODE: RED INNOVATIONS  
LOCATION: โรงแรม WHA TOWER  
BOWEN ARENA Bangkok  
(Bukhlo ESE Plaza 1)  
- Streaming MS Teams

WHA GROUP

## WHAppy to CHANGE

ขอเชิญชาว WHA  
ร่วมงานเปิดตัว WHAppy

เพื่อนทั้งทีมาร่วมส่งกำลังใจในงาน WHAppy to change

Wed 7 April 9.00 - 11.30 น.

ห้อง Townhall ชั้น 24 WHA Tower  
WHA- Live Streaming ผ่าน MS Teams

กำหนดการ

09.00 - 09.30 น.	1. พิธีเปิด โดย คุณ วราภรณ์
09.30 - 10.00 น.	2. พิธีมอบรางวัลให้กับทีมที่ชนะเลิศในการแข่งขัน
10.00 - 10.30 น.	3. พิธีมอบรางวัลให้กับทีมที่ชนะเลิศในการแข่งขัน
10.30 - 11.00 น.	4. พิธีมอบรางวัลให้กับทีมที่ชนะเลิศในการแข่งขัน
11.00 - 11.30 น.	5. พิธีมอบรางวัลให้กับทีมที่ชนะเลิศในการแข่งขัน

มาร่วมกันสร้างการเปลี่ยนแปลงสู่องค์กรที่ดีกว่าเดิม

@Work

ภาพโดย: ทีมงาน WHA Group

4. WHAppy Festival - a series of activities aligning with key festive seasons for the whole year to create bonding and unity among WHA staffs, e.g., Songkran Festival, Annual Merit Making Day, WHA Group New Year Party, etc.





As a result, in total of 20 activities had been hosted in the year 2021, after the kick-off of WHAppy program in March. All activities had been adjusted to accommodate and comply with the social-distancing and work from home policy, which have been quite challenging for the team. However, the results from each activity had been beyond the expectation. In total, average satisfaction rate for all activities are at 4.35 out of 5 scale, and more than 60% of all employees participated 100% in all activities. Most importantly, working team has received abundant of feedbacks and suggestions from staffs to further plan for a more employee-focused activities in the year 2022.

## MANAGEMENT SKILLS DEVELOPMENT

In 2021, WHA Group has organized various training programs for employees to gain and improve their management skills. The programs include:

- Human Resource was virtually conducted “Effective mid-year performance review” and “Coaching for Result” course for WHA people managers over 6 hours in which 161 participants from a target of 186 participants that attended the 5 sessions. The program objective is to equip Line managers with techniques and guidelines for giving feedback and applying continuous effective performance review to drive the team towards expected business results.
- WHA Group organized executive briefing session topic “Exponential people development for Sustainable Growth” for executive and department head 41 participants. This session focused on the new leadership challenges, the new leadership capabilities and the new way of leadership & people development, was facilitated by Khun Porntip Iyimapun, CEO and Founder of PacRim Group.
- WHA Group collaborated with “AMCHAM Academy” to initiate Leadership Program in which two participants at management level (Vice President) were nominated to attend. During the training program, all participants shared their business views and in return, the participants’ leadership insights were enhanced. This program focused on personal, career and leadership development and exposing the cohort to exclusive group seminars with executives from leading organizations in Thailand and the United States.

## BUSINESS AND DIGITAL KNOWLEDGE DEVELOPMENT

The following training programs were organized with the aim to build employees' understandings and knowledge on business and digital aspects.

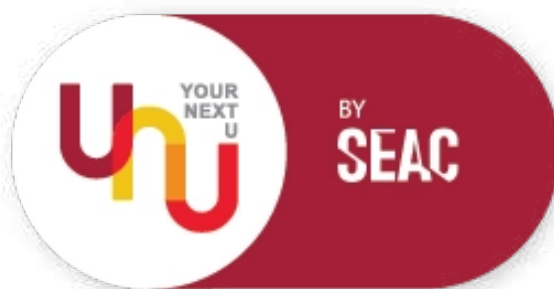
- WHA Group collaborated with "RISE Accel Company Limited" to initiate Innovation Journey workshops for top management 24 participants. This workshop was facilitated over two sessions by khun Apisith Thanopajai (Aj.Kla) and khun Narudee Krithanin, in which each session was conducted over 6 hour. The program objective is to identify WHA strategic direction "How to be tech firm in 2024". In addition, there are also "WHA Innovation Journey Forum: Enhancing Innovation Power from You" was offered to WHA Group's employees all level over 3 hours in which 370 participants. This forum focused on the key characteristics of innovative organization and innovative People and transforming to the innovative corporate from Leadership to Innovation culture & Innovative mind-set of people.
- "Business agility for leading change" and "HEM for beyond leading change" are the training course with the objective to apply the principles of agile development to the entire organization's culture and behavioural characteristics an agile organization. The training course offered a helpful guide to each step of transformation process for Change Agent 26 participants and DTO Team 15 participants over 15 hours duration.

## SOFT SKILLS DEVELOPMENT

The following training program were initiated or organized with the objective to develop and enhance the employees' soft skills.

- In 2021, WHA Group has provided a digital transformation program to upskill and reskill digital mind-set and digital literacy for employees at all levels across the four business hubs.

### YOUR NEXT YOU



Starting in 2020, in response to COVID-19 pandemic, WHA Group adjusted its human resource development training to suit the situation through online learning virtual course. The training program is named 'Your Next You' which is organized by the SEAC Institute. The training aims to enhance employees' knowledge, capabilities and innovative mindset including design thinking, creative thinking blocker, growth mindset, outward mindset, New me Newland, The four houses of DISC and Self Leadership, etc. In 2021, there were 43 employees that attended this training program. The program lasted for 3 months in which participants were required to attend the online virtual course for no less than 35.5 hours in total.



## BEYOND TRAINING

WHA Group has provided online learning platform for employee at all levels across the four business hubs. The training program is organized by Beyond Training Plus. The training aims to lay foundation, build readiness for digital transformation and agile way of working such as Reshaping the future of work, Digital Mindset, Data driven organization, Agile Leadership, Changing for growth and New way of work thru changes beyond agile, Innovation in organization, etc. there were 501 from 585 employees that attended this training program. The program lasted for 5 months in which participants were required to attend the online course for no less than 20 course in total.

## TECHNICAL AND FUNCTIONAL SKILLS

In 2021, WHA Group organized the following competencies and development training programs for employees to improve their functional and technical skills and knowledge they need, such as compulsory occupational safety and health trainings.





**WHAPPY** หลักสูตร **Computer 101 : Tools & Application**

D2.6 : Upskill IT & Digital Literacy

WHA GROUP

ขอเรียนเชิญเข้าอบรมวิธีการใช้งานอีเมลผ่านโปรแกรม Microsoft Outlook

จะช่วยให้คุณสามารถจัดระเบียบอีเมล บันทึกรายชื่อผู้ติดต่อ บริหารจัดการเวลาจดบันทึก และนัดหมายต่างๆ ได้อย่างมีประสิทธิภาพ สะดวกต่อการใช้งาน ไม่ซับซ้อน เรียบร้อยกับเครื่องช่วยส่วนบุคคลและธุรกิจได้ตลอดเวลา

- การติดตั้งแอปบนมือถือ และการใช้งานบน Web Browser
- การใช้งาน Calendar การแชร์ปฏิทิน
- การนัดประชุม และการจัดตารางนัดหมาย
- การสร้าง Rules
- การค้นหา E-mail
- การตรวจสอบและแก้ปัญหาของไฟล์แนบ

ถึงจะ Work From Home แต่งานก็ไม่สะดุด

7 กันยายน 14.00-18.00

13 กันยายน 14.00-18.00

23 กันยายน 14.00-18.00

5 ตุลาคม 14.00-18.00

14 ตุลาคม 14.00-18.00

20 ตุลาคม 14.00-18.00

5 ตุลาคม 2 ชั่วโมง

Microsoft Teams Meeting

คลิกเลย

นายธนกร รัตน (คุณโอโอ) Sharma

- Safety training programs covering the following topics were provided as per required by the regulations including occupational, health, safety and environment in workplace, working at height, confined space, overhead crane, electrical safety, fire drills, hazardous chemicals, etc. Such training programs were provided for WHAUP and WHAIDs' relevant employees at various levels from managers to operation staffs. Altogether, the total training hours for safety programs are 603 hours, with a sum of 72 participants across all sessions.

WHA Group has also organized the Computer 101 programs. The program included 6 sessions relating to computer skills which are the use of Mitel, Microsoft Teams, Onedrive & VPN, Microsoft Outlook, Computer, Printer, Network, and MRBS. The program conducted training total of 8 hours with 648 participants, across all sessions. Participant's knowledge on the topics improved from average of 58% to 84% after the training sessions.



## TALENT MANAGEMENT

### INDIVIDUAL PERFORMANCE APPRAISAL

WHA group uses individual employee evaluation activities to determine skill and competency development in line with the organization's growth strategy. WHA Group has implemented various tools and measures to assess employees' individual's performance across all business hubs. The Group has adopted 3 types of individual performance appraisal for use in identifying the individual performance-related compensation

Type of performance appraisal	% of all employees (coverage)
Management by objectives: systematic use of agreed measurable targets by line superior	100%
Multidimensional performance appraisal (e.g. 360 degree feedback)	Applicable with talent pool
Formal comparative ranking of employees within one employee category	100%

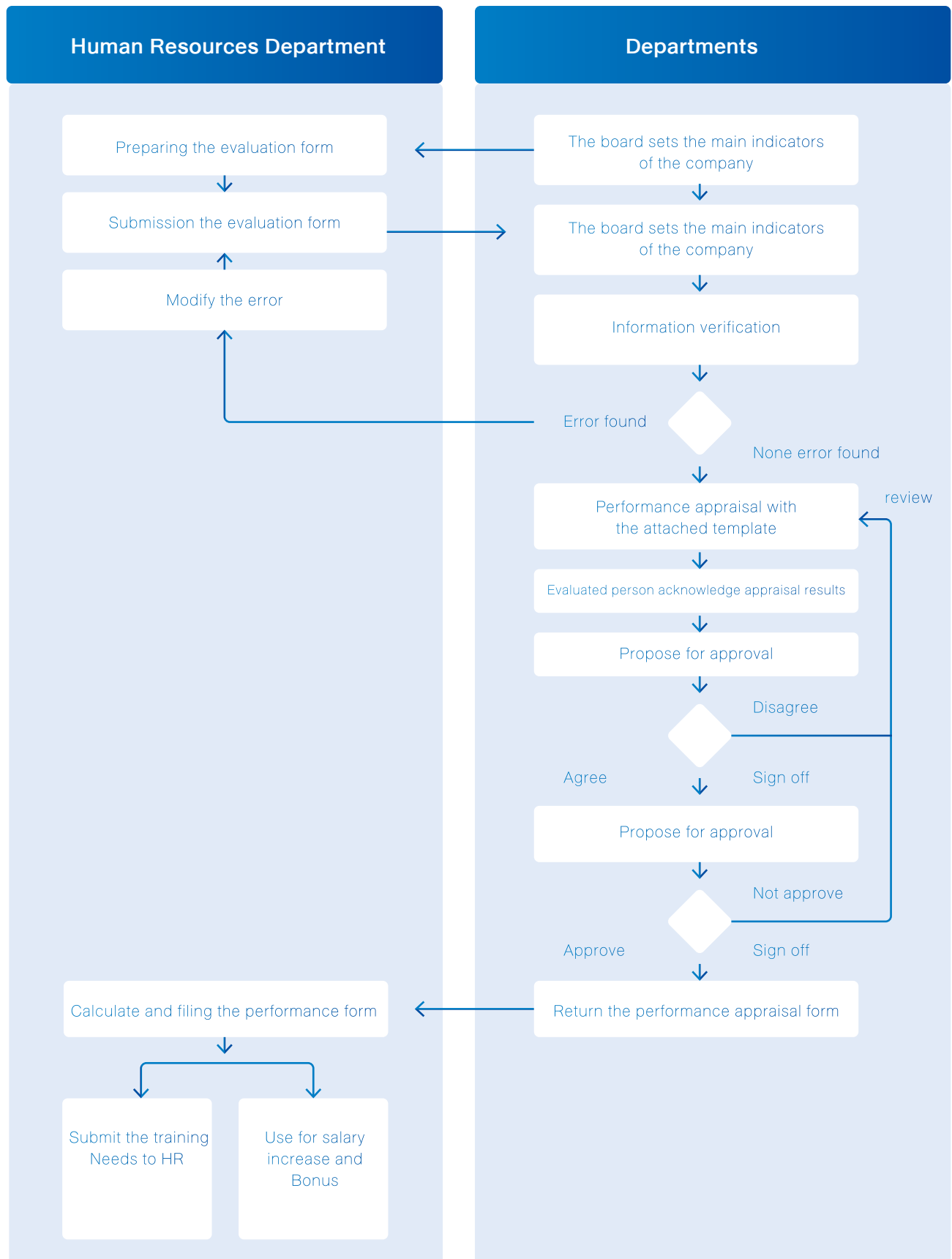


## PERFORMANCE MANAGEMENT

Moreover, WHA Group's implemented performance management to in order to guide all employees, for all employment level. As part of measuring employees' performance, the Group has implemented corporate KPIs, Functional KPIs and Competency measurement

comprising of core competencies and leadership competencies. Furthermore, WHA Group also set targets and weighting for four perspectives measured, including: financial, partnership, process and organization development.

## PROCESS OF THE PERFORMANCE EVALUATION.





## INDIVIDUAL DEVELOPMENT PLAN

Additionally, WHA Group prepared short and long-term individual development plans (IDP) for each employee to cater for their career advancement and growth. The IDP helps to identify and outline the employees' knowledge, skills, and abilities as well as to improve their performances and sharpen their professional competencies.

## INNOVATION LEADERSHIP PROGRAM

In 2021, WHA Group, as part of the WHApy Talk Program, organized the WHA Innovation Journey Forum. There were 361 participants in total from all business

units. The objective of the session was to communicate the strategic direction of turning WHA Group to Tech company within 2024, and to preempt all staffs to participate in this journey. The program promoted the participants' necessary skills and capabilities to lead the organization through changes and disruptions. During the program, the potential leaders were engaged in enriching innovation project experiences which promoted start-up minds and customer-oriented mindsets. This helped to encourage an innovative workplace and enhanced innovative culture. After the session, employees were asked to complete the satisfaction survey. The satisfaction score was 4.46 out of 5.



## MANAGEMENT PERFORMANCE

In 2021, performance in terms of average hours of training per year per employee are as portrayed in the following table.

Breakdown Category	Number of Average Training Hours/Year (hours)	Average hours per FTE of training and development (hours)	Average amount spent per FTE on training and development (Baht)
<b>Gender</b>			
Male	27.00	27.00	2,326
Female	32.12	32.12	3,528
<b>Age groups</b>			
<30 years old	23.75	23.75	1,402
30-50 years old	31.35	31.35	2,723
>50 years old	41.63	41.63	4,942
<b>Management level</b>			
Junior/low level management	25.73	25.73	13,350
Middle level management	35.63	35.63	5,033
Senior/Top level management	33.88	33.88	967
<b>Race, Ethnicity, Nationality, Country of origin, cultural background</b>			
Thailand	28.88	28.88	2,775
<b>Type of training</b>			
In house-training	26.75	26.75	2,132
Public training	2.14	2.14	635



# OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety management is a fundamental issue for organizations to minimize opportunities and prevent risks to the lives and properties of stakeholders involved in the organization. Because of the nature of WHA Group's business operations, one of the fundamental core components in how WHA Group conducts its business is safety. However, there are occupational health and safety (OHS) risks that could harm its employees, customers, and communities, such as workplace chemical exposure or spill incidents, accidents or incidents involving road safety, construction, and maintenance activities. As a result, WHA Group is committed to instilling a safety culture throughout the organization. The Group has taken proactive steps to ensure the safety and well-being of all employees and stakeholders in the industrial complex. This includes implementing preventive measures, organizing safety training, and cultivating an internal

safety culture to increase employees' confidence and morale in working with WHA Group. The purpose is to prevent and minimize workplace accidents, injuries, and illnesses.

## MANAGEMENT APPROACH

To ensure that safety is effectively managed, WHA Group strictly adheres to the Occupational Safety, Health, and Environment Act, B.E. 2554 (2011) and all related rules and regulations, as well as international safety standards. A Safety Committee was formed, comprised of management and employees from all business hubs, to review workplace health and safety on a regular basis. In addition, the Group established a Safety Department, led by the Chief Operating Officer, to oversee OHS matters across four business hubs and ensure that the group-wide zero incident goal for its employees and contractors is met.







WHA Group has implemented an OHS Management System to identify and address various OHS risks and issues across its four business hubs. The management system's scope includes employees, contractors, customers, visitors as well as surrounding communities. The Safety Department then conducts a risk assessment to identify potential hazards associated with operational activities and implement control measures to eliminate hazards and minimize risks. The key risks identified and mitigation measures implemented in 2021 are detailed in the sections below. Simultaneously, the risk assessment served as the foundation for the work-related procedures, which were then integrated and implemented into day-to-day operations.

Nevertheless, there was 1 recorded work-related injury case involving a contractor performing work for WHAUP. The contractor experienced a cut when during construction process. The incident was of a moderate severity, but it was not serious or fatal in any way. The injured contractor received immediate medical attention. In 2021, there were not reported cases of spill incidents.

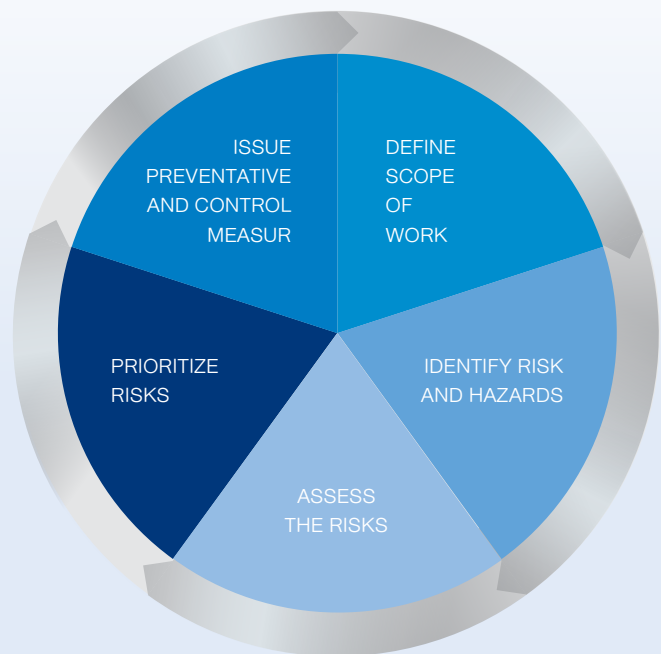
Similarly, WHA Group commits to improving the OHS system on a regular and continuous basis in order to prevent any previous incidents from reoccurring and to achieve its zero incident (target zero).

#### WORK HAZARD IDENTIFICATION AND RISK ASSESSMENT

To thoroughly manage health and safety, WHA Group conducts health and safety assessments throughout its business operations, covering all activities in WHA Group's premises that can be performed by either employees or contractors and identifying the hazards associated with the tasks in order to find appropriate preventative and control measures. WHA Group ensures that all risk and hazard assessments are conducted in a systematic manner and meet the Occupational Health and Safety standard by ensuring that all safety officers responsible for risk assessment hold an Occupational Health and Safety certificate. The health and safety risk assessment is reviewed on an annual basis or whenever there is a change in the operations.

- **RISK ASSESSMENT PROCESS**

As part of ISO 45001 standard, WHA Group's risk assessment process identified activities with significant hazards of which the Safety Department has applied control measures to minimize the risk and mitigate the impact. In 2021, result of the risk assessment shows that exposure to chemicals at water treatment plant, potential accident in construction work, and road safety (transportation and logistics activities) are the Group's primary activities that have high health and safety risks. WHA Group has mitigation plans and actions to manage such risks as follows.



## ENHANCING OCCUPATIONAL HEALTH AND SAFETY

In 2021, WHA Group focused on enhancing its OHS system and approach through the “SMART Safety” concept, which addressed three key areas, including:



The idea of SMART safety is to promote a safety culture as well as to effectively manage safety precautions across the Group's industrial estates and their surrounding areas.

## EMERGENCY MANAGEMENT

In case of an emergency, employees can report all work-related incidents through an event submission form, a complaint form, or directly to their supervisors in an emergency. Following that, these cases will be investigated in accordance with the Group's emergency call process. Employees are strongly encouraged to follow the protocol in the event of an incident and, in extreme cases, to be responsible for removing themselves from the situation. Similarly, all incidents will be thoroughly reviewed by the Safety and Security Departments to protect employees from retaliation and to prevent future accidents from occurring.

Another key safety risk identified by the WHA Group's risk assessment process is the potential accident caused by construction work. Contractors or WHA Group employees may encounter injuries or fatalities while performing construction activities as a result of accidents such as falling from heights, amputation of limbs, burns, and so on. As a result, WHA Group developed and implemented the following mitigation strategy:

- Developed a contractor handbook in which contractors are required to follow safety standards;
- Performed a job safety analysis and developed safety procedures;
- Implemented a work permit system; and
- Surveyed orderliness within the industrial estates.

## FIRE AND EVACUATION

WHA Group established an Emergency Control Center (ECC) at 10 of the Group's industrial estates to monitor



and suppress emergency situations. The ECC is managed by occupational health and safety experts and is equipped with fire control systems that are ready to go at any time. In 2021, the ECC stopped one emergency case at a factory in the Group's industrial estate. Furthermore, the ECC assisted the local authorities in suppressing 5 emergency cases in the surrounding communities outside of the industrial complex premises.

Nonetheless, WHA Group organizes annual emergency drills. The drill covered advanced level firefighting training. The evaluation of drill performance, which assessed employees' readiness for all processes, including Personal Protective Equipment (PPE), responding, and reporting processes and time, received a perfect score.







## SPILL INCIDENT

Chemical exposure at a water treatment plant was identified as one of WHA Group's safety risks during the risk assessment process. Employees at the water treatment plant may be exposed to chlorine and sodium hydroxide, according to the group. As a result, the following risk-mitigation measures were identified and implemented:

- All employees are provided with appropriate personal protective equipment (PPE);
- Installation of a chlorine detector;
- Annual workplace monitoring; and
- Annual medical health surveillance for employees.

WHA Group hosted an emergency response drill for a chemical spillage incident at WHA Eastern Seaboard Industrial Estate (WHA ESIE) on Jul 17 2021, involving by personnel from The Industrial Estate Authority of Thailand (IEAT) representatives, the Department of Disaster Prevention and Mitigation, the Department of Labor Protection and Welfare, local authority offices, local communities, local hospitals, customers, the Group's employees, and others. The drill covered emergency response mechanisms such as emergency reporting, first aid, PPE selection, order and control, and so on.



In 2021, a customer's chemical transportation truck fell into the waterways, resulting in a spillage incident at WHARIL. So WHA Safety and Security team has managed in accordance with the established measures and procedures. During the incident, no WHA Group employees were injured. Nonetheless, WHA Group is constantly developing and improving its road safety precautions as preventive measures following the incident in order to respond to similar cases in the future in a resilient and effective manner.



## COVID-19

With the ongoing spread of the pandemic virus, COVID-19 has been identified as a potential threat that could impact the health of WHA Group employees, contractors, or those exposed to such risks in 2021. As a result, good OHS practices are especially important during pandemics. Because of the rapid spread of the COVID-19 virus, employees and workers within WHA Group estates and workplaces are at a high risk of infection. Similarly, it is critical for the WHA Group to take appropriate actions and precautions in response to the virus's risk. WHA Group has established a COVID-19 Procedure that prescribes precautionary practices in accordance with the Ministry of Public Health's regulatory requirements. This includes regular alcohol sanitization of facilities, body temperature checks, and the recording of personal data upon entry to workplaces, among other things. Furthermore, all employees were kept up to date on any COVID-19-related news via internal SharePoint and emails.







In 2021, WHA Group also implemented the Bubble and Seal measure in accordance with the government's goal of protecting industrial plant workers and surrounding communities from COVID-19 infections.

## ROAD SAFETY

The roads on the premises of industrial estates are used by a variety of stakeholders, which may cause traffic congestion or accidents. As a result, another key safety risk identified during the risk assessment process is road safety. When traveling within the industrial estates, the Group's employees, customers, and commuters may encounter potential road accidents. As a result, the Group implemented the following risk-mitigation measures:

- The installation of speed bumps on its main roads, as well as barrier concrete and a new turnaround lane for incoming vehicles from local roads, in order to alleviate traffic congestion.
- Constant inspection, monitoring, and improvement of road conditions;
- Development of traffic control systems

WHA Group takes road safety very seriously, constantly improving infrastructure and developing technologies to improve road safety to the best of its ability. To address road safety and traffic congestion within the industrial complex, the Group implemented a vehicle management system, which was installed at entrances as stated in the Innovation Management chapter. With this system in place, the WHA Group was able to obtain accurate vehicle counts, license plate numbers, classify car colors, car types, including vehicles that violate traffic rules such as wrong lanes, in order to manage traffic congestion and deal with hit-and-run incidents. At ESIE, approximately 137,754 cars entered the premises per day, for a total of 49,185,040 cars per year in 2021. Furthermore, WHA Group integrated digital transformation to further analyze adaptive traffic control systems that monitor the level of congestion



and automatically change traffic lights to allow traffic flow. For instance, WHA ESIE was able to reduce traffic congestion time from 10-15 minutes to 3-5 minutes by using these technologies, and fatalities from traffic accidents were reduced from 2 cases in 2020 to 1 case in 2021, which came from health problems (heart attack) while driving.

Similarly, WHA Group researched the use of drone technology for road and traffic monitoring during peak hours and start using this type of drone in 2021. Drones will aid in the investigation of any road accidents. It can also be used to detect potential risks, which can then be analyzed to identify and implement preventive measures to reduce future accidents. Drones will enable a faster and more effective emergency response in the event of an accident. Reducing the number of accidents will, in turn, reduce traffic on the roads.

In 2021, there were 34 road accidents involving commuters at the Group's industrial estates. The accidents resulted in 22 injured people and 1 fatality, none of whom worked for WHA Group. However, the Group is committed to lowering these figures and will continue to implement road and other safety

measures, as well as new innovations, to reduce accident rates.

### THE ADAPTIVE TRAFFIC

The Adaptive Traffic project, is implemented in 2021, which is a new technology that will assist in the efficient management of traffic. It is using a real-time traffic light control system that collects data from surveillance cameras and calculates the amount of time required to control the traffic lights. Furthermore, this system helps to reduce traffic congestion, traffic accidents, and saving time, while also lowering the energy consumption and carbon footprint. The process is expected to be completed in the second quarter of 2022.

Furthermore, The Group has assessed the risk points for car accidents that are likely to occur frequently and has made plans to improve them. To reduce the number of car accidents at the Group's operations as much as possible, the WHA Avenue E16 junction was repaired in the Eastern Seaboard Industrial Estate (WHA ESIE) industrial estate in 2021, where three accidents occurred in 2020. Following the revision, the installation of the speed hump and concrete barrier means that no such accidents will occur in 2021.

BEFORE



AFTER



## PROTECTING ESTATE PROPERTY

As stated in the Innovation Management chapter, WHA Group adopted digital advancements in 2021, such as upgrading the 57 installed CCTVs at the ESIE and WHAESIE rental building to have motion detection function and control cable alarms. The motion detection sensors can detect and alert whenever trespassers are detected using this technology, thereby protecting the facility's assets. As a result, the system enabled more automated and effective risk and operation monitoring, reducing the need for employees to conduct constant on-site monitoring and examinations. As a result, WHA Group was able to reduce nine employees and transfer them to more complex jobs, as well as reduce traffic accidents and incidents as a result of monitoring activities.

## SAFETY CULTURE

WHA Group provides employees with training programs that are required by regulations in order to foster a thorough understanding and awareness of OHS practices. On an annual basis, the Group provides and ensures that all employees receive appropriate health surveillance programs.

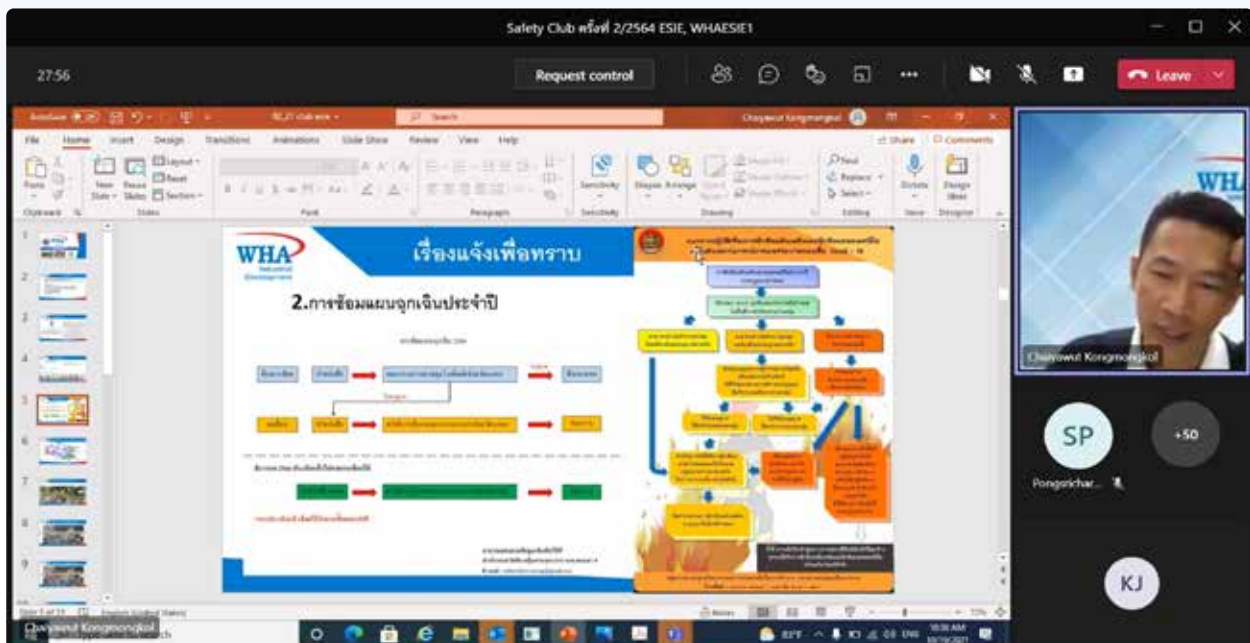
Furthermore, access to medical services for employees is ensured through the provision of health and safety insurance. Nonetheless, WHA Group welcomes and encourages its employees to make suggestions to their supervisors, Human Resource Department, Safety Department, and OHS Specialist about how to improve working conditions.

Notably, WHA Group extends its safety concerns to the Group's contractors. It is critical that these stakeholders strictly adhere to the Group's safety standards to the best of their abilities. As a result, prior to beginning work, the contractors will receive training in three areas: environmental policy, relevant regulations, and safety standards. Those who successfully complete the training course will be issued a contractor card that will expire one year from the date of issuance. In 2021, a similar training course was held for 165 new contractors and 936 contractors with expired contractor cards. Contractors who perform short-term work must also complete training and obtain a one-time work permit.



In addition to safety training programs, WHA Group established the Safety Club to collaboratively improve safety measures among stakeholders. The Club is made up of WHAID and WHAUP employees, contractors, and customers. The goal of this Safety Club is for participants to share their thoughts and opinions on safety practices. Due to the pandemic, WHA Group held online meetings with customers, the most recent of which was held in

October 2021. There were 41 customers in attendance at this meeting, and the topics of discussion included traffic management, road safety, drug addiction/abuse control, first aid, cardiopulmonary resuscitation, and the benefits of community enterprise. Furthermore, In order to prepare for any incidents that may occur, the Group held a drill for employees both in the office and in the field.





## EMPLOYEE WELLBEING

Guarantee “Employee Wellbeing” as a new priority, with a focus on occupational health and safety. WHA Group values employee health because employees’ health and safety are the keys that drive the company. As a result, The Group has taken action to encourage health and safety in order to prevent employee illnesses. Moreover, the Group supported the promotion of employee well-being by the following program:

- Creating a well-being program that aligns with employees’ needs in terms of health, wealth, and career
- Workplace improvement projects
- WHA Care; Voice of Employee program

WHA Group has also encouraged employee recreation activities by supporting employee clubs such as fitness clubs, boxing clubs, yoga clubs, football clubs, and badminton clubs, among others, in order to promote employee health and well-being.

In addition, WHA Group created an online communication activity called “WHAPPY program” by using Microsoft Team to provide knowledge to all employees on various topics such as health and wellness knowledge, exercise activity. In 2021, the Group organized online health-related activities such as “Stress management and burnout syndrome,” “Stretching fit for fun,” and “Life balancing to fit and firm,” etc.



## COMMUNITY DEVELOPMENT AND SOCIAL INTEGRATION

As the world moves toward a more sustainable economy, many businesses are becoming more conscious of the impact their operations have on the communities in which they operate. The main issue is conflict between businesses and local communities, which is not only divisive but also costly. Failure to recognize the risk of social conflict can cost a lot of money and cause investments to be delayed for years. Therefore, WHA ensures that every local community in our operation, as well as all stakeholders, believes that WHA is focused on its business slogan, “Your ultimate solution partner,” which emphasizes leaving no one behind and growing together, and also supporting community development projects. Even during a pandemic, the WHA does not abandon any communities, but instead assists and builds trust. One of the key reasons for WHA Group’s business success has been its ability to harmonize with and gain acceptance from local communities over the course of its 34-year existence. As a result, WHA Group recognizes its responsibility to give back to society and contribute to the development of its surrounding communities on an ongoing basis.

### MANAGEMENT APPROACH

Community perceptions, as well as all social and environmental impacts on the communities, are identified and assessed as part of the Environmental Impact Assessment (EIA) study conducted for WHA Industrial Development (WHAID) and WHA Utilities and Power (WHAUP) businesses, in total 100 % of operations, with appropriate mitigation measures in place. To obtain the communities’ opinions, various social engagement approaches and communication channels were established, including phone calls, emails, engagement activities, surveys, appointing local community representatives, and a whistleblowing platform (see details of the response mechanism under the Code of Business Conduct chapter). All feedback and concerns are reviewed by an established Corporate Social Responsibility Committee, which meets monthly to develop appropriate community development initiatives and report to the Board of Directors.



EDUCATION



WELL-BEING



ENVIRONMENTAL  
DEVELOPMENT

WHA Group established a group-wide strategy to positively impact its neighbors and society through long-term programs centered on three pillars: education, well-being, and environmental development, in order to support and address the needs and concerns of the community. In 2021, WHA Group collaborated on a number of corporate social responsibility initiatives with communities within a 50 km radius of the industrial estates. The Group contributed 22.48 million Baht to corporate social responsibility (CSR), as shown in the table below. A total of 36,410 employee working hours were contributed to the CSR initiatives' implementation. Such community development projects benefited a total of 126,386 people from 156 different communities. WHA Group has set a goal of reaching more than 97 percent of the communities in the surrounding area as part of its Community Engagement Level. In 2021, the company

met this goal by working with 156 out of 159 villages in Rayong, Chonburi, and Saraburi. Its community engagement goal for 2021 will be at 98%



### Types of Philanthropic Activities

#### 1. Charitable Donations

Amount (Million Baht)	Percentage (%)
6.54	29.10%

### Types of Philanthropic Activities

#### 2. Community Investments

Amount (Million Baht)	Percentage (%)
7.30	32.46%

### Types of Philanthropic Activities

#### 3. Commercial Initiatives

Amount (Million Baht)	Percentage (%)
8.64	38.44%

## Total

#### Charitable Donations

Amount (Million Baht)	Percentage (%)
22.48	100%

WHA Group aims to assess companies' awareness of the total costs associated with corporate citizenship programs, including indirect costs such as employee volunteering and management overheads (i.e. the costs associated with having a community affairs function in place).



#### Type of Contribution

Cash contributions

Total amount (in local currency)

22.48 Million Baht

#### Type of Contribution

Time: employee volunteering during paid working hours

Total amount (in local currency)

4.52 Million Baht

#### Type of Contribution

In-kind giving: product or services donations, projects/partnerships or similar

Total amount (in local currency)

43.50 Million Baht

#### Type of Contribution

Management overheads

Total amount (in local currency)

5.63 Million Baht

## CORPORATE SOCIAL RESPONSIBILITY (CSR) STRATEGY

To ensure that the initiatives and processes implemented by WHA Group are effective and produce the most positive outcomes and benefits to the communities, the Group has conducted local stakeholder engagement review to measure the success of each stakeholder engagement activities. Hence, it is crucial for WHA Group to assess and measures the performance of these social activities organized, as the lesson learned from these activities will be incorporated into the Group's business processes and guide the improvement of the Group's CSR strategy. The stakeholder engagement review will be conducted on an annual basis.

Thus, WHA Group has adopted two KPIs to measure the performances:

- **Community Satisfaction Survey** (Units: as operation unit/%), conducted at the end of the engagement projects and activities.
- **Social License to Operate** (i.e. number of Warehouse business license, Industrial Estate Business License), that the Group has obtained and renewed.

- **Complaints Channels** (i.e. complaints received through whistleblowing channels and other communication channels) from local stakeholders e.g. communities, authorities, media, associations and NGOs

The lessons learned and knowledge gained, both positive and negative matters, through these performance indicators are used to guide WHA Group's business processes and operations, communicated across all WHA Group's business hubs. This is done through dedicated interactive intranet site, standardized debriefing process, development of training modules, internal conference where local plant managers meet and share best practices, and road shows to local operating units to share best practices from other operating units.

## EDUCATION DEVELOPMENT PROJECTS

In 2021, WHA Group carried out the following CSR projects which focused on educational development for community members at all ages.



### ART CAMP FOR STUDENTS

Since WHA is concerned about the impact of industrial estates on the community, it has established Corporate Social Responsibility programs to support schools that are located near its industrial estates by developing a love of art for school-age children. Moreover,



environmental conservation, history, and local cultural teachings were also incorporated into the curriculum through Art Camp activities to develop the children's creativity, freedom of expression, and communication skills.



In 2020, The program was attended by The program was attended by 560 students from 20 upper elementary schools and 30 students from 15 junior high schools in total. According to the survey results, the satisfaction rate for the two organized Art Camps was 88.2 percent and 92.4 percent, respectively. The majority of students felt that the program improved their fundamental art skills and that the knowledge gained could be applied in their daily lives. The programs were successful in promoting and improving education for Thai students, which is essential for the development of communities and the country as a whole.





Due to the pandemic crisis, the project was postponed until 2022. On the other hand, WHA Group continued to change things for the better in the lives of these students in 2021 by supporting and donating educational utilities including school bags, books, pencil, and crayon to over 20,400 students in 66 schools around WHA Industrial Estates.



## SCHOLARSHIPS

Children are the future workforce and the nation's drivers. WHA Group recognizes that some students, despite being exceptionally talented and skilled, may be unable to pursue their education to the fullest extent possible due to financial constraints. As a result, the Group regards educational support as an important scheme for community development. WHA Group aspires to provide youth with opportunities to develop their

skills and potentially improve their quality of life. As a result, WHA Group continues to provide educational support through scholarship funds for students to attend vocational training. Finally, from the beginning, nurture capable youth. In 2021, WHA Group has currently awarded 26 scholarships totaling 0.7 MB. These scholarship programs will benefit 26 students.





The Eastern Economic Community (EEC), which includes the strategically important provinces of Rayong, Chonburi, and Chachoengsao, continues to attract more private investment. The government is currently developing major projects, such as motorways and double-track railway systems, as well as the expansion of U Tapao airport and seaport facilities, with infrastructure as one of the pillars of development.

The need for well-trained, skilled workers is a current challenge that must be addressed. The Dual Vocational Training (DVT) initiative was created by the Office of Vocational Education as a result of collaboration between the educational sector and private companies, allowing students to receive on-the-job training in addition to theoretical education.

## GRANTS FOR THE SMART AND SKILLED

Graduates of vocational colleges and universities are in high demand in the present. However, many promising students are unable to complete their courses due to financial constraints. In light of this, the WHA Group has been supporting the DVT Program for the past 10 years, in collaboration with Ban Khai Technical College in Rayong, by awarding grants to bright, disadvantaged undergraduates. Furthermore, WHA Group assists them in locating on-the-job training opportunities among customers in its industrial estates. The only educational institution qualified for the DVT Program is Bankhai Technical College in Rayong.

As a result of the grants, there were over 350 students participating in this program and over 70% of the DVT students were hired by WHA Group or WHA's customers.



## SETTING A GOOD EXAMPLE IN THE COMMUNITY

DVT participants are chosen collaboratively by the Ban khai Technical college and WHA Group based on their abilities and motivation to learn, and could be potential interns for all of WHA's customers.

Bankhai Technical College in Rayong is the only educational establishment qualified for the DVE Program. Its Director, Mr. Prateep Chulalert expressed his gratitude to WHA for supporting the program year after year. "This is beneficial

for the students, the companies, the EEC, and of course, members of the local communities. Training and orienting the students right in the workplace can bring them more job opportunities. The companies are able to teach and strengthen specific skills that they need, and in many cases, offer full employment upon graduation. Students who complete the DVE Program become role models for the younger students, because they see that there are high-paying jobs out there for them."



For all parties involved with the DVT program is a win-win situation. WHA Group is proud to support this excellent initiative that assists in the provision of qualified, skilled workers, particularly for sectors such as next-generation automobiles, smart electronics, agriculture and biotechnology, robotics, and other S-curve industries that the EEC welcomes under the Thailand 4.0 scheme.





## TEACHER FELLOWSHIP PROGRAM

Our society is currently dealing with issues related to a lack of qualified teachers. As a result, the WHA Group supported the schools within the Group's industrial premises in Rayong and Chonburi provinces by providing a total of 1,260,000 Baht funds for teachers from 7 different schools in the area.



Evaluation of outcomes that provide funds to teachers. There are about 1,400 students from 7 schools in each year that were trained by WHA 's Teacher.



## TEACHER ENGLISH PROGRAM

Due to COVID-19, physical courses cannot be organized, WHA Group has provided opportunities for 4 teachers from 4 different schools to learn English online course 40,000 Baht



List of School in English Camp - Virtual Class by VOXY

List of School in English Camp - Virtual Class by VOXY				
Schools		Education Level	Teacher Course	Area
1.	Ban Klongkrum School	Primary	English	ESIE
2.	Chumchon Numtarn School	Primary + Secondary	English	WHA ESIE 1
3.	Ban Kaohin School	Primary	English	WHA CIE 1
4.	Ban Hoobbon School	Primary + Secondary	English	WHA CIE 2





## WHA GROUP SCHOOL CONTRIBUTION PROGRAM

For the 24th year, WHA Group, in collaboration with over 70 companies in WHA industrial estates, assisted students from low-income families in using education as a stepping stone to improve their quality of life and also their health and safety. Through practical donations, WHA Group's Annual School Contribution Program continues to have a positive impact on the surrounding communities and society. WHA Group executives appoint the representative to visited 50 schools and 15 child development centers in the vicinity of the Group's industrial estates for 5 days with social distancing policy during COVID-19 pandemic situation in July to deliver much-needed supplies and sports equipment for the mental, physical, social, and academic development of 20,400 children through the WHA Group School Contribution Program. Each child received backpack, notebooks, pencils, crayons, and other basic tools include Alcohol Gel for creative and educational learning both

inside and outside of the classroom. However, WHA Group is following COVID-19 preventing practices, including social and physical distancing as well as temperature monitoring. Due to the pandemic, representatives from the Group, led by Ms. Siyaphas Chantachairoj, Director of Corporate Marketing, distributed alcohol gel to all schools to ensure that teachers and students prevent and protect themselves from the spread of COVID-19.

"For over two decades, we have successfully encouraged our employees, management, and customers from various industrial estates to participate in this worthwhile program." This confirms our belief that by working together, we can effect change through education. We'd like to thank all of our sponsors for their generous support over the years". -Mr. David Nardone, WHA Industrial Development PLC's Group Executive, Industrial and International.





## WHA GROUP UNIVERSITY CONTRIBUTION PROGRAM

WHA Group recently made a contribution of 100,000 baht to Chulalongkorn University during the Piyamaharajanusorn Event held annually to celebrate Chulalongkorn Day. On behalf of the company, Mr. Varanon Laosuwan (left), Director of Utilities Customer Development, WHA Utilities and Power Plc., handed over the donation to Ms. Atcharin Pattanaphanchai, President of the Chulalongkorn University Alumni Association under the King's Patronage and President of the organizing committee, to help deserving students facing financial difficulties, purchase computers for online learning and subsidize the school lunch program.



## COMMUNITY DEVELOPMENT PROJECTS

WHA Group completed the following projects in 2021 to improve the livelihoods of the communities.



### SPONSOR FOR HEALTHCARE BY PROMOTING DIGITAL HEALTH TECHNOLOGY.

WHA Group supported Thai startup that is developing an Artificial Intelligence (AI) system that helps doctors analyze X-ray images to help diagnose diseases. WHA gives back to society in many ways to make a positive change. Providing healthcare through sustainable initiatives and the latest technology will ensure a healthy community which is a driver for progress and growth



### COOPERATION WITH CUSTOMERS

WHA Saraburi Industrial Land (WHA SIL) and WHA Rayong Industrial Land (WHA RIL), together with their housed customers, have established a Community Relationship Committee. Members of the Committee cooperatively collect funds to conduct social development programs to enhance the surrounding communities' livelihoods. There are currently 64 members in WHA SIL's Community Relationship Committee with a shared budget of 30,000 Baht/member/year from the participating factories, and 23 members in WHA RIL's Committee with a shared budget of 30,000 Baht/member/year. In 2021, a total of 2,610,000 baht of funds were collected and allocated towards scholarship, religious & youth activities and "We Care Nong Kae Project", and WHA RIL CSR Committee.



## PAN GAN PROJECT

WHA Group launched PAN GAN in 2020, an online marketplace to promote and sell homemade products and homegrown specialties made by local people who live in the vicinity of nine of the Group's industrial estates in Chonburi and Rayong provinces.



There is a promotion channel through social media such as Facebook, and a website, [pangan.wha-industrialestate.com/en/home](http://pangan.wha-industrialestate.com/en/home), that aims to connect sellers and buyers by providing a showcase of products ranging from handmade crafts and traditional

medicines to local food items and homemade delicacies. To reach a global audience and provide opportunities to increase sales and support communities.



Micro-entrepreneurs, food producers, small cottage industry owners, and housewives were among those who welcomed the program and were invited to participate in order to promote and sell their products to a larger market. The CSR initiative of WHA Group promotes job creation and local economic development. This opportunity represents a new source of revenue or side income for many households, allowing them to improve their lives and secure a better future for their children. Furthermore, it is a means of preserving the community's heritage and passing on the art of handicrafts and specialty food products from various hometowns. It emphasizes the creation of value based on local traditions, the availability

of agricultural products and natural materials, and the transmission of skills from one generation to the next. In 2021, WHA Group promoted and sold local products as new year gifts via the PAN GAN online market place to people who associated with WHA Group.

As a result of PAN GAN market, WHA supported to buy products from Pan Gan for New Year Basket almost 1.0 Million Baht, and almost 5MB is the financial value of the whole purchase and selling via PAN GAN market to the community. There are 12 products and 12 communities participating in this program.

### WHA PAN GAN Community Shop





## MOBILE MEDICAL

A key health approach used to improve access to health care services in remote areas was the Mobile Medical Unit. As a result, WHA Group recognizes the direct relationship between good health and community livelihood and, as a result, has organized annual mobile medical units to reach out to neighboring

community members within the Group's industrial estate premises in Rayong and Chonburi provinces. In 2021, WHA Group had provided many things such as Flu vaccination over 320 doses, COVID-19 vaccination, survival kits, medical equipment, and field hospitals were distributed to community members to help them live healthier lives.



1. WHA Group had provided the vaccination centre for preventing COVID-19 as follow:

- 5,615 of vaccine doses were offered to Eastern Seaboard Industrial Estate (Rayong)
- 2,285 of vaccine doses were offered to WHA Rayong Industrial Land
- 1808 of vaccine doses were offered to WHA Saraburi Industrial Land (WHA SIL)



2. WHA Group had provided X-Ray mobile system as follow:

- 1,440,000 Baht of X-Ray mobile system offered to Pluak Daeng Hospital



3. WHA Group had provided survival kits include water and food as follow:

- 120 of survival kits were offered to Samut Thai Village
- 210 of survival kits were offered to Tasit and Jompoljaopraya communities.



4. WHA Group had provided medical equipment as follow:





Disposable medical gloves, Face shield, Medical Mask to Pluak Daeng Hospital for the use of medical and health care personnel to reduce the risk of contamination



5. WHA Group had provided PPE kits as follow:

- 1,000 of PPE kits offered to Ramathibodi Hospital



6. WHA Group had provided field hospitals as follow:

- 3 places in total;
  - Samut Prakarn Ruamjai 5 at the WHA Mega Logistics Center Chonlarn Pichit project 10,000 sq.m. warehouse for 1,300 patient beds



- CP - WHA - CHG Field Hospital” at WHA Mega Logistics Center (Chonlaharnpichit KM.4) : 600 beds



- WHA SIL : 400 patient beds





7. WHA Group had provided 10 Million Baht funds for Ramathibodi Foundation and Siriraj Foundation



8. WHA Group sponsored 2 “The “Pinto” robots - CU- RoboCovid” (100,000 Baht) to be used at hospitals nationwide, will assist doctors and nurses in their task to detect and treat COVID-19 cases, while reducing the risk of infection.

In addition, at WHA tower had a donation drop point to drop food, medical equipment, and medical suppliers forward to Samut Prakarn Hospital 5.





## SURMOUNTING CHALLENGES OF COVID-19 PANDEMIC

COVID-19 has shaken the world in unprecedented ways, and the consequences are still difficult to assess. In Thailand, the physical and psychological health of countless individuals, families, and communities was severely impacted, while the virus claimed many victims. The pandemic had an impact on many businesses as well as the lives of the most vulnerable members of society. Since its inception, WHA Group has been concerned with the well-being of not only the communities surrounding its industrial estates, but also of the greatest number of people possible. During these trying times, the company launched the following initiatives to adapt to the situation and assist those in need.



- **Tackling the COVID-19 Crisis Together**

Despite the anxiety and uncertainty caused by the COVID-19 pandemic, WHA Group did not relent in its efforts to improve the lives of its neighbours. WHA Group donated a brand new vehicle to the local police department in order to ensure a safe working and living environment for all. Furthermore, to help protect the brave medical front-liners serving COVID-19 patients at Ban Khai Hospital, the Group donated a much-needed negative pressure cabinet designed to prevent the spread of germs and viruses; it is critical for reducing the risk of infection among patients and medical staff. Food packs were distributed to vulnerable families who had limited access to food or faced economic hardship as a result of the pandemic. A blood donation event was organized in collaboration with the Thai Red Cross Rayong Chapter and Rayong Hospital to ensure that the blood supply is always adequate and ready for those in need.



The Group representatives delivered care packages containing first aid kits, adult diapers, soaps, and basic medicines to senior citizens and those with limited or impaired mobility in the Aor Bor Tor Nong Sua Chang community. WHA Group employees also took part in a clean-up activity in the Ban Khai district, strengthening ties with local residents through environmental awareness.



### • Supporting Local Front Liners and First Responders

The Group presented Ramathibodi Hospital with 1,000 Personal Protective Equipment (PPE) suits, which will be distributed to hospitals throughout the country. Furthermore, over 5,000 KN-95 masks were distributed to various provincial health administrations and hospitals across the country to ensure that medical staff members are adequately protected from infection. A significant amount of money was also donated to front-line personnel who performed their duties bravely and selflessly.



### • Helping the Community Observe Health and Safety Protocols

WHA Group teams were also hard at work distributing KN-95 masks and hand sanitizers to Rayong's Pluakdaeng Hospital, the Pattaya Administrative Office, and other public institutions in the Eastern Economic Corridor. They also went to Rayong's Maenamkoo district to assist in the production of masks for monks and villagers.



The Group has been distributing hand sanitizers to 66 local schools, as well as hospitals, healthcare centers, and provincial administrative offices, since the outbreak began. In addition to this donation, Group executives and staff visited schools and child development centers to promote personal hygiene and health awareness through interactive games in order to keep students safe as schools reopened.



Food donations, consisting of nutritious food packs and freshly cooked meals, were also arranged for the province of Saraburi through a giving back program called We Care for Nong Kae to alleviate the impact of COVID-19 on vulnerable residents of nearby communities.



#### • WHA E-Job Market

WHA Group organized the “WHA E-Job Market” Project in 2021 in collaboration with public companies and industrial operators within the Group’s premises in Rayong and Chonburi provinces. It is an online platform that will match its customers’ recruitment needs with job seekers’ qualifications. The E-Job Market program is easily accessible via the company’s website as part of WHA Group’s CSR initiatives. WHA’s website is also linked to the Vocational Education Commission’s website, where vocational and/or technical graduates from all over the country can go to look for job openings. Furthermore, WHA Group provided the simplest way to find a job by using a QR code.





The project's goal is to increase hiring in the surrounding communities during the COVID-19 pandemic by providing jobs within the industrial premises, and sending this database to WHA Group's customer for consideration. There were 360 job positions/roles available, and 1,036 community members applied through this project.

AS a result of the E-Job market, WHA Group gained the benefits from created value added for WHA's customer. To be the Customers' supporter in the tough time during the pandemic. The COVID-19

impacted a number of industries and affected many of their employees. However, there are some companies that are looking forward to filling vacancies, specifically in their production line. Through the WHA E-Job Market, WHA Group provide a platform to create a win-win situation for all, by matching WHA customers' HR needs with job seekers' expectations, increase their job channels and chances of attracting new and skilled talents. In addition, all process were done on-line. There were paperless. This program can help WHA's customers to reduce number of paper for the job applications and recruitment process.



## ENVIRONMENT DEVELOPMENT PROJECTS

WHA Group conducted the following initiatives to raise awareness, improve understanding, and highlight the importance of the environment in order to instill a sense of responsibility among community members to care for the community's valuable natural resources.



### CLEAN WATER FOR PLANET

Established in 2016, the Clean Water for Planet project is comprised of three key activities as detailed below.



#### 1) TRAINING COURSES FOR STUDENTS AND KNOWLEDGE-SHARING WITH LOCAL ORGANIZATIONS.

In collaboration with Chulalongkorn University, WHA Group provides engineering students with training courses on water conservation and wastewater management. The WHA Group offers internship programs for university students each year in order for them to gain newfound knowledge from the Group's expertise and specialization in wastewater and water management services. The internship program had 4 students participating in 2021.

## 2) WHA CLEAN WATER FOR PLANET LEARNING CENTRE

The learning center is a water management consultant center for various organizations or agencies, student communities, and interested individuals. The learning center showcases WHA's innovative water management, logistics and supply chain developments, industrial development, utilities, and power development expertise that can run a business with the community while also preserving the environment and reinforcing the circular economy concept. In 2021, 2 visiting groups visited and observed WHA Group's expertise in wastewater treatment at the constructed wetland project.



## 3) PROVIDE CLEAN WATER FOR LOCAL COMMUNITIES.

One of the program's most notable accomplishments was the delivery of a constructed wetland system, considered a natural technology that is eco-friendly, cost-effective, and easy to maintain, to the Pluak Dang Sub-District Office in Rayong province. The overall water treatment process in the wetland system can be found in the Water Management chapter.

Wetland Water Systems could reduce organic compounds by 80%, treat waste water with a capacity of 146,000 cubic meters per year, and benefit 4,000 people, 220 apartments, 125 houses, and 30 local markets in the Pluak Daeng community. As a result, this process may reduce the company's risk of receiving complaints about water pollution.

WHA Group signed a Memorandum of Understanding (MOU) with Banchang Municipality for Wastewater Reclamation Project in 2021. WHA Group plays a key role in promoting, supporting, sharing knowledge with system operators, and serving as a design consultation system. The MoU agreement is part of WHA Group's Clean Water for Planet CSR initiative, and Ban Chang municipality's plan to embrace a "Smart City" concept. Realizing the need for an enhanced water system management, both parties aim to maximize the use of reclaimed water from Ban Chang communities by industrial operators in neighboring WHA industrial estates.





Moving forward, the WHA Group has built a similar sustainable wastewater treatment system in Nong-kla municipality, Chantaburi province. The system can treat up to 800 cubic meters of wastewater per day. The WHA Group sees this project as having two benefits: it gives the Nong Kla communities access to clean water, and it allows the WHA Group to reserve such a water supply as a backup in the event of a drought.



In 2021, special for WHA Eastern Industrial Estate (Map Ta Phut) (WHA EIE) received Eco Industrial Town Awards in the Eco-Excellence category during the recent ECO Innovation Forum 2021 co-organized by Industrial Estate Authority of Thailand, Department of industrial works, Federation of Thai Industries and Water and Environment Institute for Sustainability.

In addition, five of WHA Industrial Estates received Eco Industrial Town Awards in the Eco- Champion category

1. WHA Eastern Seaboard Industrial Estate 1 (WHA ESIE 1)
2. WHA Eastern Seaboard Industrial Estate 2 (WHA ESIE 2)
3. WHA Chonburi Industrial Estate 1 (WHA CIE 1)
4. WHA Chonburi Industrial Estate 2 (WHA CIE 2)
5. Eastern Seaboard Industrial Estate (ESIE)

All 6 of WHA Industrial Estates were recognized for their outstanding commitment in operating a conscious business that drives sustainability, in line with the smart and sustainable industrial town concept.



## WATER HYACINTH PROJECT

WHA Eastern Seaboard Industrial Estate (WHA ESIE) continually implemented for surrounding community in the Baan Kai District, Rayong province, in 2021, to generate job and additional income flows toward the local communities of its operations through employment. On a monthly basis, the community

can take unwanted water hyacinths from WHA ESIE's wastewater polishing pond for free and use them to make and sell laptop bags and hampers. This enabled the community to generate income, save money on the purchase of such water hyacinths, which can save cost around 150 Baht per basket, from total cost is 300 Baht

per basket, and have a reliable source of raw material on a monthly basis. Every year, WHA purchase 300 baskets that made from the water hyacinth from the local community, and contained with the local Product from Pan Gan Project as a new year gift. As a result, this project generated 1 million Baht in revenue for the community, an additional income of approximately 10,000 Baht/month/person



Additionally, in 2021, WHA Group assisted this business in increasing the value of the water hyacinth through collaboration with PTTGC. WHA Group has come up with a new fabric idea that uses water hyacinth from a built wetland in WHA Group's industrial estates, recycled plastic bottles (PET) from GC's YOUTURN platform, and cotton.



As a result of this project, WHA Group has been able to create jobs and generate over 36,000 baht in revenue for the community through the scraping of water hyacinths into fibers. Prior to processing and spinning, the fibers from water hyacinth, fibers from plastic bottles (PET), and cotton fibers are combined to create the fabric. In addition, it builds a library of knowledge for the community that can be used to make more money in the future.





WHA Group earns revenue in this area by selling such fibers to manufacturers for further processing into products. which generated a total revenue of approximately 40,000 baht.



The collaboration between GC and WHA utilized this new fabric to create the laptop case and hampers. WHA Group then created 200 laptop bags and 300 hampers from new innovation fabric as upcycling new year gifts in 2021 for WHA Group's most valued customers, who expressed their satisfaction with the gifts received.







## GREEN EFFORTS PROJECT

WHA Group worked with community volunteers to plant 300 samples of indigenous trees such as afzelia xylocarpa, lamduan, and mahogany in a tropical forest in the Kaokansong sub district, Sriracha Chonburi, and 100 of Wild Himalayan Cherry at Ban Kao Hin Shool, Bo Win sub district. Students from Chonburi's Ban Khao Hin School were also invited to learn about the importance of trees in the ecosystem and the effects of climate change on daily life. Aside from providing shade, healthy trees also provide oxygen and reduce carbon in the air, as well as food and shelter for wildlife and the maintenance of favorable water and soil conditions.



In addition, teaching children about recycling and living an environmentally friendly lifestyle. WHA Group employees delivered color-coded trash bins to the Ban Phan Sadet Nok School in Sri Racha, Chonburi province, and explained the concept of sorting and recycling to the students in order to keep the planet clean. The young students engaged in lively discussions about how to sort waste materials and listened to suggestions and tips about waste reduction and reuse. Sharing the value of doing good for nature and the environment can begin at a young age.

## WATER MANAGEMENT FOR COMMUNITY

The Community Water Management Program's objectives are as follows:

1. To be a waste water treatment plant for the Nong Khla community that is both technologically and environmentally advanced.
2. To treat Nong Khla Community waste water before discharging it into natural water resources.
3. To serve as a recreation area for the Nong Khla community.
4. The waste water treatment plant's capacity is 800 cubic meters per day.





WHA-UP has provided financial support in Construction of the wastewater treatment system for communities in Nong Khla Subdistrict Municipality, and shared knowledge in waste water management, constructed wet land, and etc. Nong Khla Subdistrict Municipality provided the vacant land in area of Nong Khanun for the project of 11 rai.

18 February 2021 - WHA Utilities and Power Plc (WHAUP) and the municipality of Ban Chang in Rayong province recently signed a Memorandum of Understanding (MoU) to collaborate and share knowledge in the field of wastewater management in general, and specifically in the use of recycled wastewater, also known as reclaimed wastewater.

This MoU agreement, which is valid for two years, is part of the WHA Group's Clean Water for Planet CSR initiative and the Ban Chang municipality's efforts to embrace the "Smart City" concept. Recognizing the importance of improved water system management, both parties intend to maximize industrial operators' use of reclaimed water from Ban Chang communities in neighboring WHA industrial estates.

Mr. Suchin Pulhirun, Mayor of Ban Chang Municipality, declared: 'We are very pleased to sign this MoU with WHA Utilities & Power, as our city seeks to become a model for sustainable development in water management. We believe this will be a "win-win" project that will benefit both parties and promote long-term environmental solutions for our community.'

Dr. Niphon Bundechnan, CEO of WHA Utilities and Power Plc., commented: "With this MoU, we are looking forward to share our experience in wastewater management to Ban Chang Municipality, a socially-active district in the Eastern Economic Corridor. The treated wastewater will be converted into high-quality water that can be used by industrial customers in WHA Group's industrial estates. It will help us secure raw water resources in the EEC and contribute to solve the drought problems in the long term."

Ms. Jareeporn Jarukornsakul, Chairman and Group CEO of WHA Group Pcl, added: “This MoU will support the development of the EEC. Together with Ban Chang Municipality, as well as other municipalities and partners, we aim to set the standards for sustainable and environment-friendly techniques and practices in water management and treatment,” she explained.

“This is also a great opportunity to spread information to community members, from households to factories, on the importance of water conservation. This ‘municipal wastewater to industrial user’ concept is a good practice for sustainable development and create the utmost collaboration between local and industry”



WHAUP offers value-added water products, such as wastewater reclamation and demineralized water, to industrial customers both in WHA industrial estates and non-WHA industrial estates, as well as other industrial land developers and municipalities. In 2020, the company invested THB 300 million (nearly USD 10 million) in two reclaimed water projects in WHA Eastern Industrial Estate (Map Ta Phut) and Eastern Seaboard Industrial Estate (Rayong).





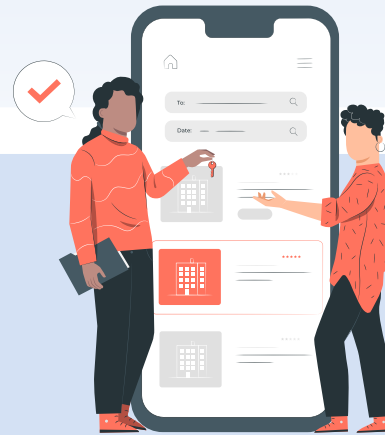
## MANAGEMENT APPROACH

WHA places importance on being a part of society, so WHA's take social factors into consideration when designing or operating a business. Social integration criteria were developed and applied when constructing new building or during reconstruction. This include integrating

social integration criteria in the due diligence checklist, social integration criteria that are part of the planning stage and guide the development phase, as

well as an advisory committee of handicapped people or cooperate with handicapped people's associations.

As a result, WHA Group has implemented a variety of social integration initiatives and criteria in order to widen its contribution to society. Building social integration is a material topic that is important in the Real Estate industry. In 2021, WHA Group completed the projects listed below to benefit the community by providing good opportunities for low-income or disadvantaged individuals.



## LOW RENTAL FEE FOR COMMUNITY



WHA Group supported and enhanced the value and opportunities for the local community by offering an available space to be the rental area for a low fee of around 250-500 baht/rai/Year to be used as a community cultivated area. The low rental area can generate community jobs while also ensuring an



efficient area free of prairie fire, waste, and trespass. WHA Group is primarily concerned with assisting the social and environmental communities. The process is WHA supported the local people to plant the Cassava or pineapple on the vacant land of WHA with low rental fee in many areas.

In 2021, WHA supported and offered available space to rent for agricultural as following:

## 1. WHA CIE1

Total area

143.91 Rai

63.04 Rai : 250 Baht/rai/year

80.87 Rai : 500 Baht/rai/year

## 2. WHA ESIE 4

640.6 Rai : 500 Baht/rai/year

## 3. WHA RY36

424.96 Rai : 500 Baht/rai/year

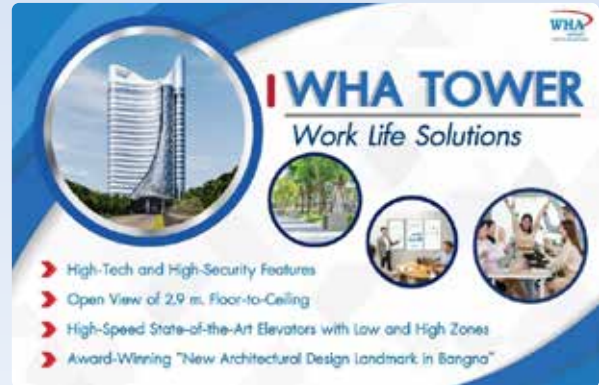






## WHA OFFICE SOLUTIONS

The WHA Tower was designed to be environmentally friendly and became the group's new headquarters in 2021. The Tower was designed with a flexible working environment conducive to the generation of new ideas and results, in accordance with the "Work-Life Solution" principle. The buildings are only a 3-minute walk from a bus stop as well as provide shuttle-bus to transportation hub at Mega Bangna, and they encourage WHA Group employees to provide sustainable transportation services such as carpooling. Similarly, carpooling can provide numerous social benefits, such as reduced energy consumption, lower greenhouse gas (GHG) emissions, and congestion reduction for the local community, helping to create a good environment and supporting and encouraging the community's health and well-being. Furthermore, WHA Office



Solutions offers prime rental options that encourage collaboration and vibrancy in the workplace, and WHA Group organizes evacuation plans and training for tenants to be responsible and minimize risk in the community. The training process involves 11 tenants.







New Premium Office in Bangna - Trad KM. 7

## SURROUNDING AMENITIES

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02 719 9555



**52,000 sq.m.**  
of Flexible Office Space,  
and Common Open Spaces



**25-storey Tower**  
New Architectural Design  
Landmark in Bangna





## WHA INDUSTRIAL ESTATE

Collaboration with WHA Group, SAIC Motor-CP Co., Ltd., and MG Sales (Thailand) Co., Ltd., Thailand's MG car manufacturers and distributors. They signed an agreement to install five "MG Super Charge" electric vehicle charging stations in WHA industrial estates in the Eastern Area (EEC) and Saraburi Province. There are electric vehicles in operation for monitoring and sending documents. The process of electric vehicles in operation five stations. Every year, the WHA Group conducts a fire and evacuation drill in which all relevant stakeholders are required to participate (i.e., all employees, customers, and community

representatives). As a result, the surrounding communities can be assured that WHA Group's operations will have no negative consequences for them. As a result, this program can benefit both internal WHA Group employees and the community as a whole. In addition to community evacuation, the Emergency Control Center (ECC) stepped in to assist in one emergency situation at a factory in the Group's industrial estate in 2020. Furthermore, the ECC helped local authorities in the suppression of emergency situations in the communities surrounding the industrial complex's premises.





# ENVIRONMENT DIMENSION





## ENVIRONMENTAL IMPACT MANAGEMENT

WHA Group's policy and focus has always been to ensure that the Group's business operations, surrounding communities, and the environment coexist harmoniously and sustainably. Hence, WHA Group is committed to provide world-class solutions and ensure its customers of the highest quality and unyielding responsibility for environment preservation, through actions that promote energy conservation, the use of renewable energy and biodiversity management. In support of this, WHA Group recognizes the critical importance of environmental management and resource conservation. As a result, WHA Group has sought to operate in a sustainable manner, focusing on a practical environmental management system. This includes the active management and monitoring of key environmental parameters such as biodiversity, wastewater quality, waste disposal, emissions, and resource conservation. These are the key parameters based on the nature of the WHA Group's operations in relation to customers, suppliers, and surrounding communities, as well as the Group's ability to influence its business operations.



Environmental Quality, Energy Conservation and Biodiversity Policy

The WHA Group's efforts to drive sustainable operations are governed by the Board of Directors' approval of the Group's Environmental Quality, Energy Conservation, and Biodiversity Policy. The Policy outlines the WHA Group's commitment to preventing and mitigating environmental impacts while continuing to improve quality, ensure regulatory compliance, and align practices with international standards such as the International Organization for Standardization (ISO) 14001 Environmental Management System and the ISO-9001 Quality Management System. As a result, a framework for ensuring a consistent environmental management approach across all WHA Group business hubs is provided.

Moreover, WHA has developed a corporate environmental requirement, guidelines, and management program to manage its investments. This includes the following:

- Due diligence at the pre-purchase/acquisition/ investment stage initial environmental audit of each new investment
- Property/building development with environmental requirements and resource efficiency.
- Maintenance programs with a focus on environmental performance and resource efficiency.
- Guidelines, training, and newsletters to ensure that property managers and tenants are up-to-date on emerging best practices and regulatory developments.



## ENVIRONMENTAL STANDARD AND PERFORMANCE ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

WHA Industrial Development (WHAID) and WHA Utilities and Power (WHAUP) have been certified in accordance with international standards, most notably the International Organization for Standardization (ISO) 14001: Environmental Management System, as a highlight of the Group's operational practices in environmental management.

In addition, the company has implemented an annual environmental management system through internal audits in order to monitor system implementation on a regular basis. External audits and certifications were also carried out in accordance with applicable international standards like ISO 14001.

## ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

All of WHA Group's required projects have undergone the Environmental Impact Assessment (EIA) Study in accordance with the requirements and conditions outlined in the Promotion and Conservation of National Environmental Quality Act, B.E. 2535 (1992). The EIA study considers the environmental and social impacts within a 5-kilometer radius of the project site to ensure that these impacts are monitored, mitigated, and controlled appropriately. Prior to proceeding with project construction, commencement, and operation phases, the EIA must be approved by the Office of Natural Resources and Environmental Policy and Planning (ONEP).

Following that, WHA Group ensures that all environmental schemes specified in the EIA requirements are followed. The project's performance against EIA requirements and standards is monitored and reported to the Industrial Estate Authority of Thailand (IEAT), Natural Resource and Environmental Policy and Planning, and local provincial offices on a bi-annual basis, covering the months of January to June and July to December, respectively. In 2021, no monitoring parameters were found to be in violation of environmental laws or EIA requirements. In addition, WHA Group oversees the overall environmental management schemes of its

customers located within the industrial complex to ensure best practices and compliance with regulated requirements. If not, the WHA Group will work with the IEAT to take appropriate next steps. Additional environmental practices with customers in accordance with EIA requirements are detailed in the following chapters.



**TARGET**  
100% EIA COMPLIANCE

## UNIFIED CONTROL CENTER (UOC)

The Unified Control Center (UOC) system is implemented to centralize, consolidate, and project results from the three monitoring systems offered at the Group's projects and operation sites. The regulatory agencies' requirement to publicize real-time results to the public by reporting data from various WHA Group operations, including water reclamation and solar systems, in order to analyze, develop, and improve the capacity to manage, control, and plan the WHA Group's utility services, as well as WHA Group's desire to be transparent with its environmental monitoring results, were the primary motivators for developing the UOC system.



### 1. Environmental Monitoring and Control Center (EMCC) focuses on five monitoring components as follows.

- A real-time Water Quality Monitoring Station (WQMS) monitors the quality of treated wastewater before it is discharged to natural sources. Organic substances, chemical oxygen demand (COD) levels, and bio-chemical oxygen demand (BOD) levels are among the monitoring parameters. In the event of a non-compliance, an alert will be sent to the appropriate operators, who will take immediate corrective action to pump and retreat until compliance is achieved.

- An Air Quality Monitoring Station (AQMS) continuously monitors Total Suspended Particulates (TSP), Particulate Matter (PM-10), Sulfur dioxide (SO<sub>2</sub>), and Nitrogen dioxide (NO<sub>2</sub>). In addition, meteorological data such as wind speed and wind direction are monitored.
- The EMCC discloses the results of environmental monitoring of industrial estates in accordance with EIA requirements. Indicators include the quality of ambient volatile organic compounds, noise pollution, and surface water quality, etc.
- The EMCC serves as a channel for factory operators located within industrial estates to submit environmental reports in accordance with their respective EIA requirements. Air emission quality via stack, EIA compliance, risk analysis, and boiler/steam generator inspection reports are examples of submission reports. This system allows the IEAT to effectively review submitted reports while also reducing paper consumption.
- Complaints received through available channels are recorded and tracked by this EMCC system until the complaint handling process is completed. Complaints are entered into the system and forwarded to the appropriate personnel so that they can carry out the necessary response actions.



## 2. Closed Circuit TV (CCTV) and Vehicle Management System (VMS) Center

At the UOC, data from all CCTV installed at critical points around the industrial estates' common areas is projected. This enables the emergency response team to easily identify and take immediate action, if necessary. The VMS is also used at the main entrance of the industrial estates to collect all traffic-related information, such as license plate numbers and times of vehicle entry and exit, for better traffic management and safety.

## 3. Water and Wastewater Treatment Plant Control Center

This Center forecasts and monitors the performance of the equipment used at water and wastewater treatment plants. This ensures that both the water and wastewater quality meet the threshold before being supplied to end users or discharged into public waterways.





## ENVIRONMENTAL COMPLAINT HANDLING PROCESS

As part of the continuous improvement process of the environmental management system, WHA Group has established and communicated available channels for stakeholders to submit any environmental-related complaints and concerns. The compliant handling process follows the ISO14001:2015 guidelines in which root causes are identified and appropriate preventive and mitigation measures are implemented to prevent future reoccurrences. Channels that are available include :



In 2021, WHA Group received a total of 6 complaint cases from factories in industrial estates regarding odor and dust concerns caused by other factories. WHA Group then followed the compliant handling process and was able to resolve the cases as a result.

## ENVIRONMENTAL SCHEMES AS PER GOVERNMENT POLICY ECO-INDUSTRIAL TOWN DEVELOPMENT

Eco-Industrial Town is an IEAT initiative that promotes and directs the economic development and environmental sustainability of industrial estates. The IEAT has defined five dimensions of standard criteria for granting an Eco-Industrial Town award : physical, economic, social, environmental, and management, which evaluates the industrial estate's performance on organizational governance, human rights, labor practices, environment,

community involvement, and development. The Eco-Industrial Town Development Award is divided into three levels : Eco-Champion, Eco-Excellence, and Eco-World Class.

By 2021, 5 WHA Group's industrial estates will have earned the Eco-Industrial Town award at the Eco-Champion level . This includes Eastern Seaboard Industrial Estate (Rayong) (ESIE), WHA Chonburi Industrial Estate 1 (WHA CIE 1), WHA Eastern Seaboard Industrial Estate 1 (WHA ESIE 1) and WHA Chonburi Industrial Estate 2 (WHA CIE 2) . Furthermore, WHA Eastern Industrial Estate (WHA EIE) raised its profile from that of an Eco-Champion Industrial Estate to that of an Eco-Excellence Industrial Estate. These industrial estates were recognized for their exceptional commitments to operating a conscious yet sustainable industrial estate in accordance with the SMART and Eco-Industrial Town concepts.

## ENVIRONMENTAL GOVERNANCE AUDIT

The Environmental Governance Audit (White Flag Green Star) is a program started by the IEAT to recognize factories that perform well enough in terms of environmental and social performance. To use this program, factories will host open-house events for auditors to evaluate their manufacturing processes, pollution management procedures, and social engagement programs. WHA Group, along with government officials, communities, and field experts, served as one of the auditors to evaluate the factories in the Group's industrial estates. In 2021, a total of 5 factories across the Group's industrial estates were certified with the "White Flag, Green Star" certification (two at WHA ESIE 1, two at WHA CIE 1, and one at WHA CIE 2).

## BIODIVERSITY

Policymakers and investors are now taking notice of biodiversity loss and adapting a playbook they developed for measuring and managing the risk. It is no longer a matter of caring about nature, but fear of facing extinction which could have devastating human, economic, and environmental consequences. Global regulators have begun to develop more stringent biodiversity protection strategies in response. As a leading industrial developer that houses factories on extensive areas of land across Thailand, WHA Group fully understands the potential impacts posed on the environment and biodiversity. As a result, it is the responsibility of WHA Groups to protect the environment and to minimize potential impacts on biodiversity in the local areas such as avoiding penetration into protected areas and national parks, using certified wood to decrease deforestation and etc.



### TARGET FOR BIODIVERSITY

WHA Group is committed to minimize its impacts on biodiversity. To ensure that our business activities have net positive impact or at least no net loss of biodiversity and no deforestation, the Group has applied mitigation hierarchy to manage risks and impacts to biodiversity. WHA Group avoid of creating negative impact through proper site selection and design. The Group prohibit the operations in World Heritage sites or IUCN Category I-IV protected areas. However, if Group operations are located near such the areas, measures for mitigation will be implemented to avoid negative impacts, minimize remaining impacts through controls measure, restore the damage caused by our activities, and offset by compensating for any residual negative impacts.

## SCOPE OF COMMITMENT

WHA Group conducts business with an understanding of the value of biodiversity, as well as a proactive business strategy to manage natural loss and reduce environmental impact. WHA Group encourages and expects our business partners, such as contractors and tier-1 suppliers, to commit to maintaining and preserving deforestation and biodiversity in their operations.

## BIODIVERSITY POLICY

WHA Group commits to taking unwavering responsibility for environmental preservation through biodiversity management actions. WHA Group conducts its operations in accordance with the Environmental

Impact Assessment (EIA) report and develops action plans to protect and restore ecosystem services that may be harmed by the company's operations, as well as to prevent the extinction of endangered species.

According to action plans, WHA demonstrated that no project posed a high biodiversity risk because biodiversity risks are assessed when new projects are initiated. Furthermore, the Group focuses on selecting materials from sustainable sources by using certified wood and raising awareness among all stakeholders of the group about the impact that business operations can have on biodiversity and deforestation.





## MANAGEMENT APPROACH

The Environmental Quality, Energy Conservation, and Biodiversity Policy encapsulates the WHA Group's vision for biodiversity protection. The policy strengthens the WHA Group's commitment and establishes a framework for the conservation of biodiversity in the ecosystems, landscapes, and species of the territories in which all of its business hubs operate. Furthermore, an Environmental Impact Assessment (EIA) study was conducted for all WHA Group industrial estates to assess specific biodiversity risks from project construction to operation phases. The project-specific biodiversity risks are assessed as part of the EIA study. For projects that are located in high-risk biodiversity areas, its activities and related impacts must be surveyed as well as have mitigation measures deployed to mitigate biodiversity loss and negative impacts to the surrounding ecosystem. In the case that WHA Group is unable to avoid deforestation, the Group will ensure that the areas loss due to deforestation is compensated by reforestation in a different location. Nonetheless, in line with our Biodiversity Commitments, the reforestation area should be equivalent to, or larger than, the deforested land to offset any losses (i.e. no net loss) and as well as creating net positive impact (NPI).

To ensure biodiversity preservation, the Group has established a risk monitoring process after risk assessment from Group's activities and provided training program or circulate knowledge through "WHA Connect Newsletter" in order to communicate environment and biodiversity to all stakeholders.

WHA Group participates in a tripartite committee to communicate with stakeholders to recognize the significance of the ecosystem in each WHA Group's Industrial Estate. The tripartite committees are appointed in accordance with the quality of life measures (society and economy) outlined in the EIA report. The tripartite committee is comprised of representatives from the Group, representatives from the public sector, and representatives from government agencies who work together to ensure that the WHA Group's operations do not have a negative impact on the community, society, or the environment. WHA Group also supports and promotes the quality of life in the surrounding community and the environment. This is consistent with the foundation of determination to run the company for long-term growth. The Tripartite Committee will meet at least twice a year, depending on the measures jointly established in each industrial estate to jointly monitor performance. This meeting also serves as a channel for listening, consulting and resolving complaints from various stakeholder groups in order to improve and develop even further. The meeting's outcomes will be reported in an EIA report to the Office of Natural Resources and Environmental Policy and Planning. The issue of biodiversity is one of the issues that the tripartite committee is constantly monitoring to prevent any impact from the Group's operations.





## BIODIVERSITY PROTECTION MEASURES

Following the EIA process, it was highlighted that four out of ten total WHA industrial estates (Total 1,327 hectares) were identified to have biodiversity concerns due to their close proximity to protected areas. These three industrial estates are WHA Chonburi Industrial Estate 2 (WHA CIE 2) which has an area of 101 hectares and WHA Eastern Seaboard Industrial Estate 2 (WHA ESIE 2), which has an area of 566 hectares and is located near Khao Khiao-Khao Chompu Wildlife Sanctuary in Chonburi province, WHA Eastern Seaboard Industrial Estate (WHA ESIE 3), which has an area of 351 hectares and is located near Klong yai canal and WHA Eastern Seaboard Industrial Estate 4 (WHA ESIE 4), which has an area of 309 hectares and is located near Nong Pla Lai canal. Biodiversity within the canal is of concern as it is a discharging point of treated wastewater from WHA ESIE 4.

WHA Group ensures that the precautionary actions and mitigation measures outlined in the respective industrial estate's EIA report are carried out.

At WHA ESIE 2, the Group is required to monitor the species count and abundance of wildlife within the industrial complex and surrounding areas every two years. Furthermore, WHA ESIE 2 will monitor ambient air quality and provide support for research conducted by local forest conservation organizations or educational institutions on the effects of industrial operations on the ecosystem.

WHA Group clearly defines the area scope of operation at WHA ESIE 3 and conducts activities only within the WHA ESIE 3 area, avoiding disturbance to the surrounding forest. Furthermore, promote the planting of trees that have the potential to reduce pollution from WHA ESIE 3 activities, such as the Burma Padauk and the Mast Tree, etc. Employees of the WHA are not permitted to cut down trees, hunt, or engage in illegal activities that harm habitats and wildlife.

For WHA ESIE 4, it is necessary to monitor nearby aquatic ecology within the canal into which the industrial estate discharges its treated wastewater. A baseline study of each biodiversity parameter (phytoplankton, zooplankton, aquatic animals, aquatic plants, and benthos) was conducted to allow for comparison with monitoring results. On a biannual basis, such monitoring is carried out at the upstream and downstream of the wastewater discharging point. Based on 2020 monitoring results, the diversity index remains at a moderate level, confirming that the operation of WHA ESIE 4 had no significant impact on biodiversity. All EIA-required monitoring results are reported to local authorities as well as the Industrial Estate EIA Committee. Furthermore, biodiversity risks at WHA ESIE 2 and WHA CIE 2 are re-assessed every two years, as required by the EIA, to investigate changes and additional impacts caused by industrial developments on forest resources and wildlife.





## WATER MANAGEMENT

Water is a vital resource that plays a part in all aspects of life, ranging from our health and well-being, society development, economic growth, and the ecosystem. Hence, it is an essential resource in order for our society to progress sustainably. Currently, with the expansion of industrial operations and climate change intensification, which could ultimately results in the degradation of the natural environment. Subsequently, shifts in precipitation patterns could occur, thus, resulting in low water levels in reservoirs. Thus, water resource has been identified as a critical issue in terms of water deficit (drought), water excess (flood), and water quality and accessibility. As a result, utility service providers could be faced with challenges to ensure safe and sufficient water supply for its business operations. Alternatively, societal and environmental pressures over the recent years have

also led to a forward movement for industries to reduce generated wastewater and ensure acceptable quality prior to discharging to natural waterways.

As a provider of industrial water supply and provision of wastewater treatment facilities, water is inevitably a critical shared resource for WHA Group's business operation. Industrial operators located within the Group's industrial estates utilize such provided industrial water and wastewater treatment services, and at the same time, water sources are also shared with the local communities. WHA Group, therefore, recognizes that optimizing treated wastewater along with other efficient water consumption and impact prevention practices are a circular, more sustainable approach to responsibly conserve and manage water resources for its value chain.





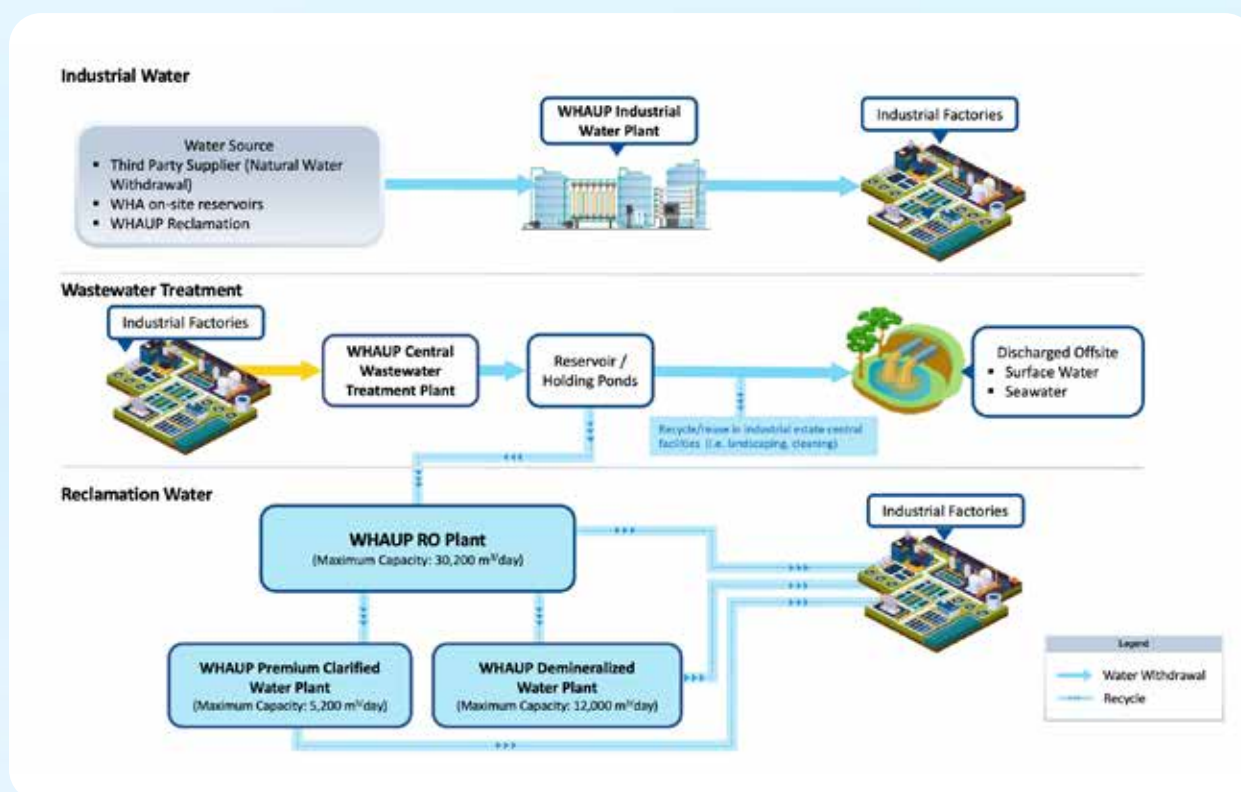
## MANAGEMENT APPROACH

Water management across WHA Group's four business hubs are governed by the Environmental Quality, Energy Conservation and Biodiversity Policy that was endorsed by the managements. The Policy provides guidelines to ensure effective water balance without posing negative impacts to the nature. Water management at WHA Industrial Development (WHAID) and WHA Utilities and Power (WHAUP) are overseen by the established Industrial Estate Operator (IEO) Department under WHAID and Utilities Operation department under WHAUP, both works collaboratively for the water management and environmental mitigation functions.

The overall process of water management of WHA Group include industrial water supply management, wastewater treatment system and reclamation water management. This is to ensure effectiveness of water resource management, reduce risk related to water, as well as comply with relevant regulations.

In order to achieve the water management programs, WHA Group is using technology in finding new source of water to reduce impact to community (R&D technology that reduces surface water dependency). In 2021, the technology applied in water management includes not only to enhance the existing implemented technologies such as the wastewater reclamation into the value added product in order to introduce the new utilities to those manufacturers who may need the variety of utilities, but also to start the new frontier in developing the new projects to transform water services and management from mostly physical to digital systems. The projects include real time monitoring and control via reliable SCADA system, UOC (Unified Operational Control) where management can monitor and command all operation unit functions through the UOC from WHA Tower and the Smart Utilities Solution by changing the device such as meter, pump, flow meter into smart device starting at WHA EIE in 2021.





## WASTEWATER TREATMENT

For the wastewater treatment service, WHAUP monitors the wastewater quality against the standards on a regular basis. Sampling of wastewater generated from customers prior to treatment via the central wastewater treatment facility are conducted on a monthly basis for parameters including: heavy metals, conductivity, pH, total dissolved solid (TDS) and dissolved oxygen (DO). The parameters are monitored against the standards as prescribed under the respective EIA report. This enables the detection and prevention of potential impacts to the treatment efficiency of the central wastewater treatment facilities. In the event that the sampled wastewater generated from the customers exceed the permitted threshold, the Group will pursue with the following measures:

1. Issuance of an official warning letter to inform and authorize for the operators to re-treat its wastewater;
2. If the issue is not remediated, receiving valve at the central wastewater treatment facility will be closed;
3. Stop supplying industrial water; and

4. Contact Industrial Estate Authority of Thailand (IEAT) to take further actions (e.g. operation termination until remediation).

WHAUP offers wastewater treatment technologies at each industrial estate that is most suitable for the customers' industrial activities including activated sludge system, aerated lagoon system and the hybrid rotation biological contactor system (Hybrid-RBC). The Hybrid-RBC system is a combination of the rotation biological contractor and activated sludge system, which is capable to treat wastewater with higher organic loading rates. Once treated at the central wastewater treatment facility, the wastewater quality are inspected against the standards prescribed by the Ministry of Natural Resources and Environment, Ministry of Industry, Industrial Estate Authority of Thailand and the respective EIA study prior to discharge. The monitored parameters include heavy metals, pH, temperature, biological oxygen demand, chemical oxygen demand, grease and oil, suspended solid and total dissolved solid (TDS). In 2021, all monitoring parameters complied with the prescribed standards.

In 2022, WHA Group has a plan to continue implementing the smart operation technology 'WHAUP Intelligence Platform' in order to move toward the digital transformation and accurate as-built drawing in digital format in wastewater management system. This includes GIS Hydraulic Model, smart meter, OCR, AMR, Pressure Transmitter and Data Integration. Total budget for this project is 10 million THB/year.

In 2021, the first phase has been started implementation at WHA EIE and will complete the whole system in 2022. WHAUP will expand the solution to WHA ESIE (Rayong) and WHA ESIE1. The aims of this project are to reduce water loss, improve meter accuracy, prompt detection & response of water leakage, improve energy usage, better load distribution, and better pressure control as well as gain customer consumption behaviour in order to propose better experienced solution.

## INDUSTRIAL WATER SUPPLY

For industrial water service, WHA Group recognizes the importance of water availability for its business, and that

it is a shared resource amongst industrial operators, local communities and the environment.

## WATER RECLAMATION PROCESS

To build customers' confidence and take part in the water reduction scheme, WHA Group established a long-term target to double the reclamation capacity from 30,200 m<sup>3</sup> per day in 2020 to 60,400\* m<sup>3</sup> per day by 2025; likewise, the target is not limited to only project within WHA Industrial Estate territory, but to other projects across the Group. This, in turns, will reduce the volume of raw water withdrawal from natural sources. WHAUP develops water reclamation initiative as an alternative and sustainable source of water for industrials, especially in the EEC area. The project utilizes existing technologies in combination with new innovation to add value to wastewater by turning it to demineralized water and premium clarified water which have much higher value at lower cost. In 2021, revenue generated from water reclamation project is 150 million baht, accounting for 8% of total revenue from water sold.





WHA Group also applies the 3R (Reduce, Re-use, Recycle) and the circular economy principles to recycle treated wastewater for cleaning and landscaping purposes within the Group's industrial estates. Through such reclamation systems, the Group was able to reduce and minimize 11 Mm3 of total water withdrawal and water discharge. In 2020, the actual water saving is approximately 32% higher than in 2019. By this reclamation program, the Group could save cost on raw water sourcing by 81.1 million Baht annually.

Nonetheless, WHA Group commits to continue investing on development for water reclamation process which significantly decrease the Group's dependence on natural water sources. In 2021, WHA Group uses 6,924,065 m<sup>3</sup>, in comparison to 3,269,895 m<sup>3</sup> in 2020, demonstrating an increase of 3,654,170 m<sup>3</sup> in total water use from reclamation process from previous year. Moreover, WHA Group also set a target to reduce water use from natural resources by increasing the use of water from reclamation process to 7,272,000 m<sup>3</sup> in 2022.

Furthermore, ESIE also invested to connect HDPE pipe from the main reuse water pipe to its flushing system to reuse water for flushing in toilet. Altogether, reusing of treated wastewater

has reduced a total volume of water withdrawal from natural sources by 1.89 Mm3 in 2021. With the reclamation system and water reuse practices, the Group was able to recycle 6.92 Mm3 of water, thus reduced water consumption by 9% of the total water withdrawal. Therefore, this project also benefits to environment and society as it significantly reduces the amount of wastewater discharging, reduces withdrawal of natural water, helps secure natural resources, and mitigates dispute risk with nearby community.

### DEMINERALIZED RECLAIMED WATER: THE REAL SUSTAINABLE RESOURCE FOR FUTURE DEVELOPMENT

WHAUP invested in Demineralized Water Project, a large-scale project, consisting of 2 operations, each have maximum capacity of 4.38 mm3/year, covering 3% of total industrial water capacity. The project is developed in WHA Eastern Industrial Estate (WHA EIE) and aimed to increase treated water quality with low cost and using environmental friendly methodology. The Group has developed the Demineralized Reclaimed Water Project as an alternative water source for sustainable industrial development in the country. This is considered to extend the existing technology and create innovations to increase product value, from wastewater by turning it into demineralized industrial water



The implementation of the aforementioned project has received positive results for the industrial development in many dimensions, such as

1. Significantly reduce the amount of wastewater entering the environment.
2. Reduce government investment budget in the development of water storage and delivery.
3. Reduce conflicts between the community and industry on the allocation of water resources.
4. The industry uses high quality water at a competitive cost.
5. Industrial operators in WHA Group's estates receive comprehensive utility services, with a wide variety of products

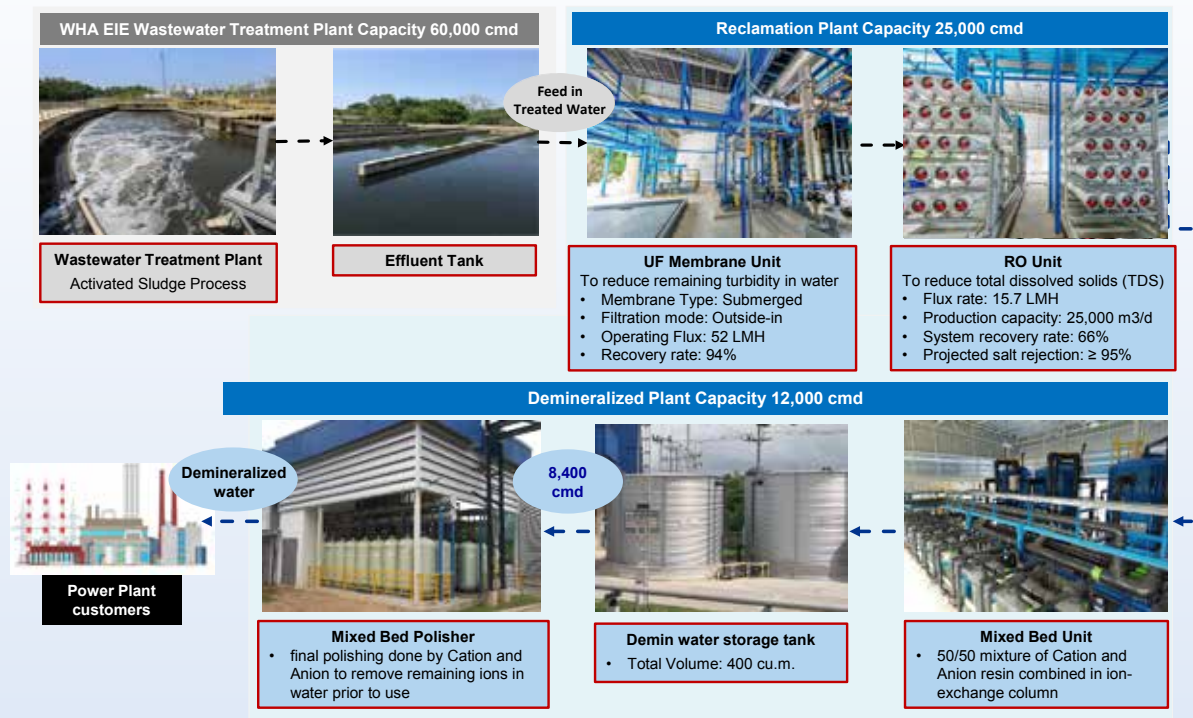


Moreover, the project also helps the Group in reducing its dependence on major raw water distributors as well as alleviating uncertainty and impacts on both the quantity and quality of upstream water sources due to drought, pollution, contamination, etc., which are the main risk factors for utility providers. This is because if the water source is not able to supply sufficient production to meet

the demand for a certain period of time, it will have a significant impact on the business continuity and the customers' operations within the industrial estates. The project also helps WHA Group's customers, which are entrepreneurs in various industries, to access to high quality water products and services at reasonable cost. In addition, the Demineralized Reclaimed Water innovation is a prototype project that can be expanded in new industrial estates of the WHA Group as well as extending and expanding the results to the community, for example, using domestic wastewater that has been treated to improve its quality to produce high-quality transformed water, etc. Through such demineralized water systems, the Group was able to reduce and minimize 2.5 Mm<sup>3</sup> of total water withdrawal and water discharge in 2021. By this reclamation program, the Group could save cost on raw water sourcing by 29 million Baht annually.



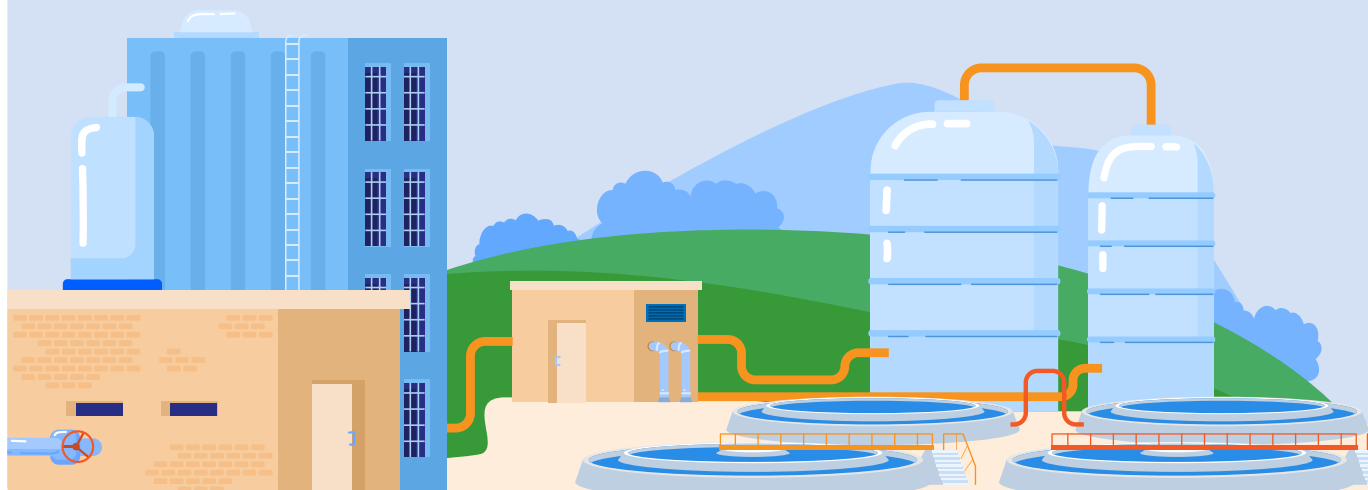
The Return of Investment (ROI) for the Demineralized Reclaimed Water Project is 9%.



In 2021, WHAUP received an Outstanding Innovative Company Awards from the SET Awards 2021 for its innovation on Demineralized Reclaimed Water, an alternative water resource for sustainable development. This award demonstrated WHAUP's commitment to innovation as a driving force towards sustainability. By implementing this project, WHA can reduce water withdrawal by 2 Mm3 in 2020 and 2.5 Mm3 in 2021.

"The Outstanding Innovative Company Awards is a prestigious distinction that reflects WHAUP's DNA and shows its commitment and determination to initiate quality innovative works that can bring positive changes to society. WHAUP is considered a model organization that helps lift the standards and bring sustainable growth to the country's economy and society in the long run."

Dr. Niphon Bundechanan, Chief Executive Officer of WHA Utilities and Power Public Company Limited or WHAUP







## SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) TECHNOLOGY AT WASTEWATER TREATMENT PLANT

WHAUP is currently conducting studies to optimize SCADA technology at its wastewater treatment plant located within the Eastern Economic Corridor of Innovation (EECI) in Wangchan district, Rayong province. This technological system can help monitor the wastewater treatment's performances on a 24 hour basis, thus, the Group can save cost from appointing on-site personnel.





## WASTE MANAGEMENT

With the increasing scarcity of natural resources, resource conservation and efficiency and circular value chain has become increasingly vital. Society has consumed natural resources more than it could be regenerated. Together with the rise of new regulations and agendas, as well as more recognition of business benefits of circular economy principles; businesses are putting tremendous effects into transitioning its waste management approaches to incorporate these circular business model and promote sustainable consumption.

Moreover, improper waste management and unsustainable treatment of municipal and/or industrial solid waste only amplifies the burden on the environment as well as to the general public health. Correspondingly, WHA Group is putting continuous efforts in order to reduce waste generation from its own operations and ensure proper waste management practices are implemented across its business operations.

### MANAGEMENT APPROACH

Due to the diversity of WHA Group's business hubs, there are various types of waste generation from construction and operational activities as a whole. The primary contributors toward the Group's absolute waste footprint are non-hazardous waste associated with domestic wastes from all four business hubs and sludge generated from water and wastewater treatment facilities under WHA Utilities and Power (WHAUP)

services, and hazardous industrial waste. Moreover, WHA Group acknowledges that there is a significant amount of waste generated during the construction of its infrastructures. Thereby, the Group ensures that the selection of suppliers for its construction materials take into account the environmental and social impacts.

WHA aware that improper of waste disposal may lead to impact to the environment e.g. air pollution, soil and groundwater contamination, etc., therefore, WHA Groups' efforts toward waste management across four business hubs and new project development are governed by the Environmental Quality, Energy Conservation and Biodiversity Policy, respective Waste Management Procedures and the Environmental Impact Assessment (EIA) study. A Waste Management Committee was established to oversee and ensure proper waste management practices in adherence to the regulatory requirements. The Committee is responsible for monitoring and categorizing different types of waste generated from our operations and instigate effective waste management schemes. The Group sets the target for zero waste to landfill or incineration without energy recovery by 2025.

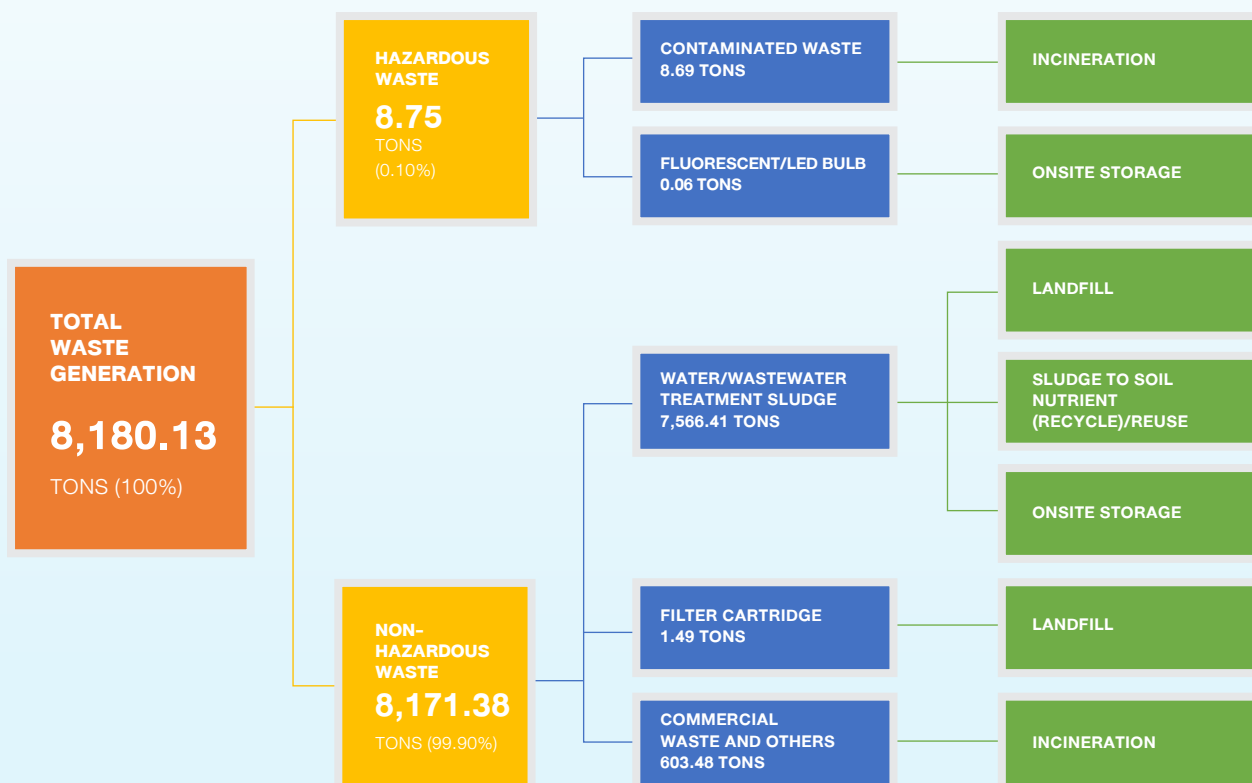
The waste generated from WHA and customers are disposed by the licensed waste vendors, all waste disposal information is tracked and monitored by manifest.

## WASTE MANAGEMENT INITIATIVES

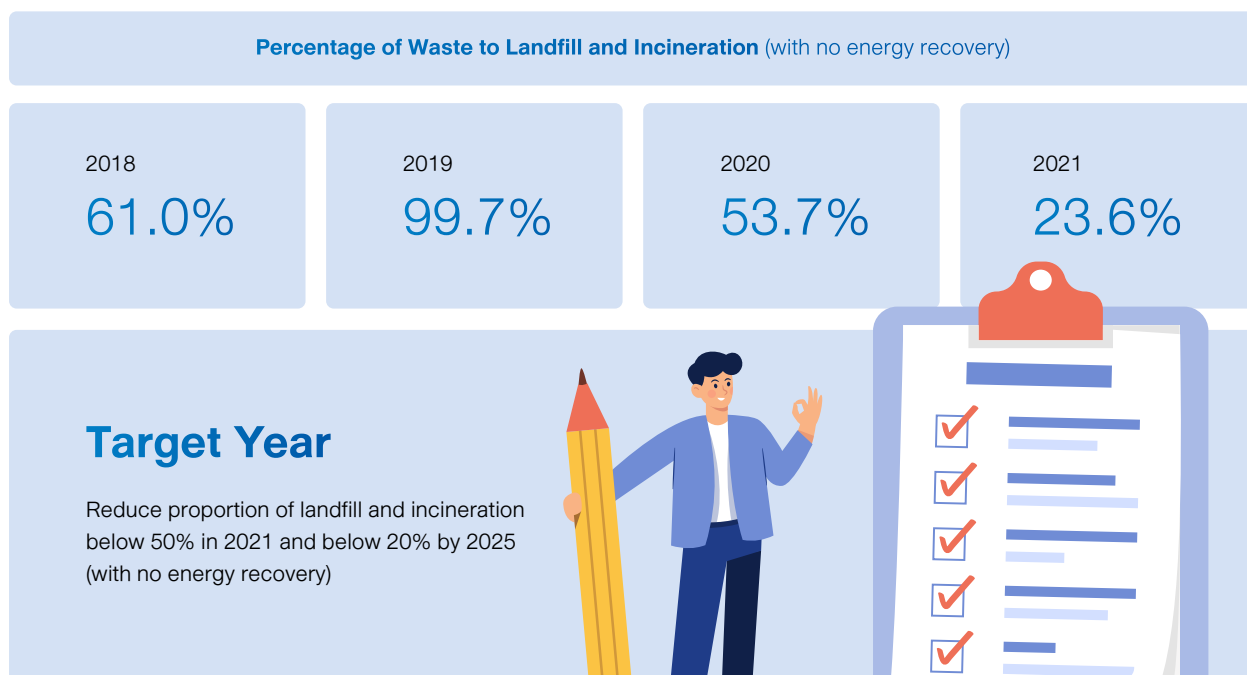
In 2021, WHA Group has managed to reduce the proportion of solid waste disposed by landfill or incineration (without energy recovery) methods using 3R approach (i.e. Reduce, Re-use, Recycle) to total amount of waste generation from 59.5% in 2020 to 23.6% in 2021, respectively. The reduction was achieved through a combination of initiatives and efforts, such as conducting research and development on reuse and recycling processes along with investment in technological advancements to provide alternate solutions to landfilling or incineration. Other initiatives include providing useful resources, and engaging with customers and communities in order to raise awareness and promote sustainability in waste management processes and systems. Waste management projects, focusing on reduce, reuse and recycle to contribute to the Group's zero landfill and incineration (without energy recovery) ambition are as highlighted in the following subsections.

In regarding to Project Development, waste management plan are considered and approved for new development projects as part of the EIA study. This is to ensure waste generated are well managed throughout the project life cycle. The plan will also be communicated to the customers in the industrial estates, and WHA will monitor the effectiveness of implementation through the reporting submitted by customers.

In 2021, 6 contractors of the Project Development e.g. WHAESIE3 and WHA Rayong36, are trained on waste management practices Based on the 3R approach, the segregation of construction waste is implemented for further reused, recycled and proper disposal. most of waste during the construction phase are construction waste that is reused as material for land leveling. Other waste, which is generated by contractors, is managed by contractor themselves.



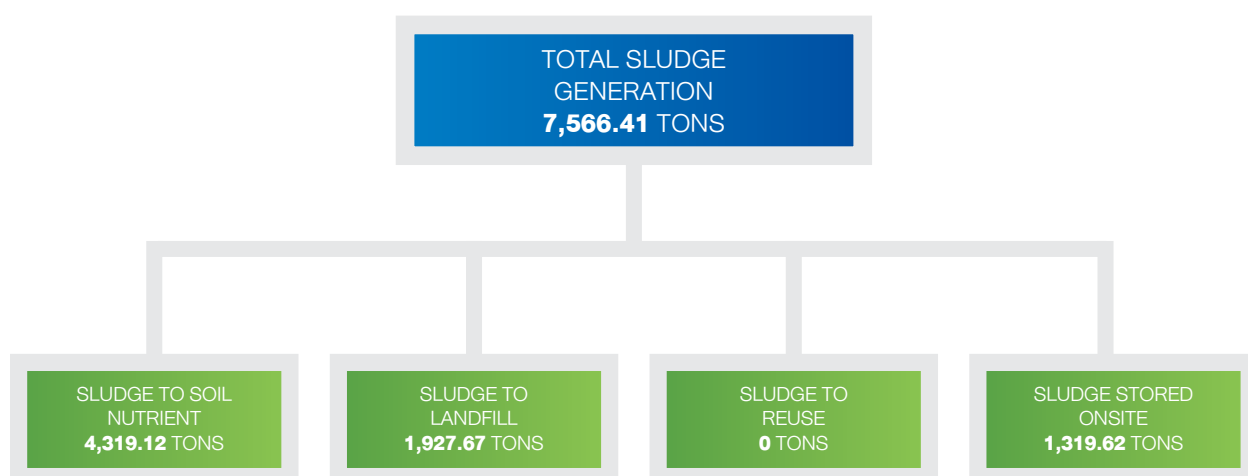




## SLUDGE TO SOIL NUTRIENT

To reduce waste disposal through landfill or incineration methods, WHA Group identified an opportunity to divert sludge generated from WHAUP's water and wastewater treatment plants to produce soil nutrient. Such material is used for soil conditioning purposes throughout the industrial complex. Through aerobic composting, quality of the soil nutrient is analyzed to ensure that there are no

contaminants of heavy metals or high levels of organic compounds or pathogens. Starting in 2020, up to 23.94 tons of sludge were converted to soil nutrient instead of being disposed via landfill/incineration methods. In 2021, WHA Group performs the producing soil nutrient 4,319.12 tons of sludge against the target 1000 tons of sludge.





## WASTE TO ENERGY

Broadly, the waste-to-energy concept utilizes all resources including the residues of everyday operations and converts the otherwise waste, into a valued resource ready for the next cycle of use. In alignment with Alternative Energy Development Plan 2015-2036 (AEDP 2015) which proposes a target of using 30% renewable or green energy of the total energy consumption by 2036; WHA Group views that converting waste to electricity is the prevailing method to tackle the significant waste problems and support concerns on energy demands. As a result, WHA Group along with other two shareholders, invested in a waste-to-energy power plant known as Chonburi Clean Energy (CCE).

CCE is the first industrial waste to energy facility in Southeast Asia to meet European emission standards. CCE was awarded by the Commission of Energy, Ministry of Industry to be constructed as the first industrial waste-to-energy power plant in the Eastern Economic Corridor (EEC). CCE falls in line with the concept of circular economy and sets a good example for sustainable non-hazardous industrial waste management. It has the capacity to generate electricity by converting non-hazardous waste to energy at 400 tons per day, or approximately 100,000 tons per year, enabling a maximum output of 8.63 MW of electricity energy per year.

CCE contribution in 2021:



**CCE**  
has incinerated  
102,000 ton waste

**CCE**  
has generated  
53,000 MWh to the PEA

**CCE**  
has saved around  
33,000t CO2

**Sustainable electricity**  
for around  
30,000 homes





Since 2020, WHA Group has signed a contract agreement with its waste management service provider, Waste Management Siam, to send waste acquired from industrial factories to CCE annually for energy recovery. As a result, a total of 1,896 tons of waste was diverted from landfill/incineration disposal methods since 2020. This generated a total of 1,646 MWh.

## PAPERLESS TRANSFORMATION

As part of the Group's digital transformation aspiration, use of technological appliances are encouraged and promoted. Communication, information, and meetings are all made through online platforms, ultimately reducing the Group's consumption of paper. Along with the Group's "E-Paperless" project that was implemented to all business hubs as well.

WHA Group provides employees with tablet appliances to create a paperless culture. Meeting slides, reports, inspection forms and minutes are therefore readily accessible and retrieved. Currently, the initiative helped

avoid 196,363 document paper from being printed, and saved an equivalent to 726,543 Baht of printing expenses. Subsequently, by 2022, WHA Group aims to reduce up to 25% of paper usage.

Accelerated by the effects of the global pandemic COVID-19, adoption of digital technologies has quickly been taken up. For businesses worldwide, including WHA Group, the use of digital technologies has helped reduce face-to-face interactions and safeguard the well-being of employees.

## HAZARDOUS CHEMICAL CONTAINMENT REDUCTION

WHA Group is dedicated to reduce the total volume of hazardous waste generated from its operation. Therefore, starting in 2020, WHAUP procured most of the chemical substances for its water and wastewater treatment facilities via loading tankers. Poly Aluminium Chloride (PAC) 20% concentration and liquid chlorine are still procured within chemical containers, but an agreement was made for the suppliers' responsibilities to reuse or dispose the empty containers. By procuring via loading tankers, it helped to reduce WHA Group's disposal efforts of empty chemical storage containers to landfill by 2 ton/year.

## SORT N' SAVE PROJECT

Initiated from WHA Innovation Leadership Program in 2019, WHA Group has continued to support this project in 2021. The objective of the Sort N' Save Project is to increase environmental awareness amongst WHA Group employees as well as explore plausible innovative business platforms in alignment with the circular economy principles. Behavioral oriented campaigns were launched to increase the awareness and adjust employees' practices on recycling and waste minimization. Communication of these campaigns were

made through accessible portals such as default desktop screens, Line-application, email signatures and WHA Group's monthly newsletter.

## REDUCE DEPENDENCY ON PLASTICS

Served together with comfort and convenience, single-use plastics without proper management are the manmade predators in the ecosystem, imposing potential irreversible, global impacts on vital climate processes and biodiversity levels. To combat this, WHA Group are taking steps to reduce the consumption and disposal of single use plastics. Since 2020, WHA Group stopped serving plastic bottled drinking water to its guests and visitors, enabling to reduce single-use plastics of more than 68,940 plastic bottles. Collectively, through all of WHA Group's efforts mentioned, the Group was able to reduce up to 0.7 tons of total plastic waste generated as a result of less plastic consumption.





## ENHANCE CUSTOMERS' AWARENESS ON INDUSTRIAL WASTE MANAGEMENT

As an industrial estate developer, WHA Group does not have the authority to control waste management practices that are conducted by the industrial operators within the industrial complex. Nonetheless, the Waste Management Committee is responsible to oversee and ensure that proper waste management in accordance with regulations are carried out by the industrial operators. The Committee takes proactive steps to conduct audits at the operating factories or selected waste disposers, and conducts other waste management schemes as inquired by the managements. Furthermore, a 3R waste campaign called 'Green Industry' was implemented across the Group's industrial estates to promote the 3R (reduce, reuse, recycle) and circular economy principles for industrial factories. In 2021, there were a total of 65 factories participating in the campaign.

In 2021, WHA also communicate the waste management system through the meeting with customers in ESIE, WHAESIE1, WHAESIE2, WHACIE1, WHACIE2, WHAESIE4, WHARIL, WHASIL and WHAEIE via the

safety club meeting in 2021, 5 meeting were held. The topics of communication include waste reduction, methodology of waste to recycle, waste transportation and using of manifest according by laws, as well as implementation of CCE project (turning waste to energy). This is to enhance awareness and corporation on waste management practices in the industrial estates.

## GREEN EFFORTS

Educating and empowering posterity to make responsible and environmentally-friendly decisions are WHA Groups' efforts to contribute to a sustainable future. In 2021, WHA Group taught students in schools nearby WHA Industrial estate, such as Ban Pan Sadet Nok school in Chonburi, about waste minimization, segregation and recycling. Students who participated in the program had interesting discussions on the methodology of waste separation, and listened to the recommendations and tips made concerning waste reduction and reuse. Having the opportunity to work with young audiences allowed WHA Group to be a good role model and shared good practices.



### WASTE MANAGEMENT COLLABORATION PROJECT: HAMPER AND LAPTOP CASE

WHA incorporates with PTT Global Chemical (GC) to collect used PET bottles from school under ThinkCycle Bank Project and collect water hyacinth from wastewater treatment system; polishing pond of ESIE, WHA ESIE1 and WHA ESIE2 forming to yarn and produce hampers and laptop cases. In 2021, the project collected 8,850 used PET bottles and approximately 4.0 tons of water hyacinth to produce 300 hampers and 200 laptop cases. The products are sold at 600 THB each. From this project, WHA

is responsible for the processing of water hyacinth dippers into dry scraped fibres for using as raw materials to produce yarns containing fiber from plastic bottles, fiber from water hyacinth and cotton to produce fabrics that contain ingredients from such raw materials. WHA can reduce the cost of water hyacinth management by generating such an income with the community to sell the dried water hyacinth fibers for approximately 40,000 baht. Moreover, the rest of the water hyacinth in the WHA 's pond, WHA can use it to produce soil fertilizer using in the Group's industrial estates.





## AIR EMISSION



While the recent COVID-19 and lock-down have proven to reduce air emission, in Thailand and globally, air pollutants remain one of the major threat for human and our ecosystem. Exposure to air pollutants, such as particulate matter (PM 10 and PM 2.5), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>) and carbon

monoxide (CO), is a recurring problem in Thailand; it may lead to tremendous economic and health problems for the years to come. By improving air quality, not only will it delivers massive health benefits to the society but also strengthen the climate actions and mitigations, and making ways towards sustainable development.



WHA Group recognizes the broader effects of air emission which stemmed from the activities within the industrial complex. It can cause immense impacts to the environment, ecosystem, communities and the society. WHA Group acknowledge that these impacts can be felt globally as well as locally by the surrounding communities, and especially worse for the vulnerable communities. Emissions from project construction, operating industrial plants, and transportation from both internal and external stakeholders are all common sources of emissions that have an impact on ambient air quality. Therefore, it is a core value of the WHA Group, as stated in the Environmental Quality, Energy Conservation, and Biodiversity Policies, that industrial estates, communities, and nature coexist in a harmonious and sustainable manner.

## MANAGEMENT APPROACH

WHA Group's policy adheres to the respective Environmental Impact Assessment (EIA) requirements and standards for air emission management from project development to project operation. Additionally, WHA Group enforces an internal threshold where its operational activities and industrial factories, located within the industrial estate, should altogether generate 20% less than the permitted threshold of pollutant emission intensity rate per unit area.

To ensure that air emission is considered at the forefront of service agreements through to customers' operations, WHA Group monitored levels of air emission such as TSP, NO<sub>x</sub>, SO<sub>2</sub>, discharged from

stacks of each factory located in Industrial estate and developed the screening criteria to select only potential industrial clusters that generate low air emissions to reside within the Group's industrial estates. The Group also has air emission control measures for factories resided within the Group's industrial estates. If any factories pollute excess level of air emission, the Group will notify such factories as well as inform the Industrial Estate Authority (IEAT) to request for corrective actions that align with the specified standard. However, if air emission level is still out of specified range, the Group and the IEAT will suspend operation of those factories further. In the past, the Group has never experienced any exceeded level of air emission to the extent that such factories have to suspend their operations.

Nevertheless, the Group monitors the presence of total suspended particulate (TSP), Particulate Matter with diameter of 10 micrometers or less (PM-10), Particulate Matter with diameter of 2.5 micrometers or less PM-2.5, nitrogen dioxide (NO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>) in the industrial complex's ambient air following the methodology and frequency as prescribed by the respective EIA study. The monitoring stations are distributed within the Group's industrial estates and across communal areas within a 5 km radius of the premises. Monitoring results are collected on a real-time basis and displayed at the Environmental Monitoring and Control Center (EMCC). The monitoring results are submitted to the Industrial Estate Authority of Thailand (IEAT) and Office of





Natural Resources and Environmental Policy and Planning (ONEP). as part of the EIA Monitoring Report on a bi-annual basis. In 2021, WHA Group's commitment to EIA compliance was achieved as all ambient air quality parameters were in line with the EIA standards.

Furthermore, the Group conducted sampling and testing of particulate matter sized generally 2.5 micrometers or smaller (PM 2.5) within all of its industrial complex. High levels of PM 2.5 could potentially impact the health, especially of the people in surrounding communities with heart and respiratory diseases. Thus, monitoring of this parameter helps to ensure the safety of operators in the industrial estate as well as the local surrounding communities. Samples are monitored against the Notification of the National Environment Board, No. 36, B.E. 2553 (2010) standard. In 2021, the PM 2.5 monitoring results were all within the regulatory threshold. WHA Group is constantly taking proactive measures against PM 2.5, including seriously restricting burning activities within the industrial complex. As for construction and operation of WHA Group's industrial development projects, mitigation measures such as none of burning, water sprays during construction were enforced to reduce the level of PM 2.5 and total dust Emissions.

The Group also requests and records all air emission data from industrial operators in the Group's industrial estates. This ensures that environmental controls implemented by the factories are efficient and emissions are in compliance with the Department of Industrial Work and EIA standards. WHA Group will undertake proactive measures, such as issue warnings if any factories, operating within its industrial estates, were found to emit air pollutions regulatory threshold.





## AIR EMISSION INITIATIVES

In 2021, WHA Group conducted various traffic management initiatives in order to control the level of air emissions from internal and external stakeholders transporting within the industrial complex, such as dust and carbon monoxide that could potentially affect local communities and the environment.



## ADAPTIVE TRAFFIC CONTROL

Since 2020, WHA Group has installed an Adaptive Traffic Control System that uses CCTV to monitor

the traffics and calculate the number of vehicles in the industrial complex. This is done in order to appropriately control the traffic lights in response to the current traffic situation. In the event where traffic is light, the duration of the red lights will be lowered, thus, reducing the time in waiting for red light signals. Consequently, vehicle engines are still running during this waiting period, so reducing the duration will contribute to reducing the use of energy fuel, reduce air pollution and greenhouse gas emission. By using this system, approximately 573 Liter/week or 29,804 Liter/year of fuel oil can be saved.



## DRONE TECHNOLOGY

Similarly, WHA Group is currently studying the use of drone technology in the road and traffic monitoring process during rush hours in 2021. The drones will

help monitor any accidents occurring on the roads. It can also be used to detect any potential risks that can then be analyzed and used to identify and implement

preventive actions to limit any future accidents. In the case of accidents, the drones will allow for a faster and more effective emergency response and action.

Indirectly, by limiting numbers of accidents will also reduce the traffics on the roads. By detecting potential risks of accidents, less fuel will be used by ambulances with less accidents occurring. Altogether, this will help reduce air pollution.



### CONTROL CABLE ALARM SYSTEM

Implementing Control Cable Alarm system, as stated in the Innovation Management chapter, is one of the initiatives that could help reduce air pollution. Installation of CCTVs with motion detecting function at the wastewater pumping stations can eliminate the

need for employees to conduct on-site monitoring that required fuel usage for travelling processes. Before the system was introduced, there were two cars conducting such on-site monitoring for every 2 hours within 24 hours' period. With this automated and effective monitoring system, such travelling requirements were eliminated, thus, reduced air pollutions from fuel combustion. In 2021, WHA additionally installed 60-point Control Cable Alarm system around the ready built factories in ESIE and WHA ESIE1. As a result, WHA Group is able to control air quality within industrial estates and surrounding areas to meet the requirements and standards specified in the Environmental Impact Assessment (EIA), and also able to reduce approximately 23.9 tCO<sub>2</sub>e of direct GHG (Scope 1) per year after the system was introduced.



### VEHICLE MANAGEMENT SYSTEM

Traffic congestion outside industrial estate during rush hour cause air pollution. WHA Group has

invested heavily on smart ecosystems and technologies including the permanent tracking for vehicles and visitors, and drones for traffic management for managing and decreasing traffic congestion as well as pollution. Vehicle Management system is one major system can count number, type and license plate of vehicles, which enter and exit through the industrial estate gates. This system is not benefit only security but also data analysis for traffic improvement. In 2021, ESIE use data from VMS system (see picture1) to implement the traffic improvement project in ESIE (see picture2 and 3) and can reduce the traffic congestion about 30%, from 3,000 vehicles/hour to 2,000 vehicles/hour.



Picture 1: VMS System for traffic control



Picture 2: Expansions traffic lane in E-6 Road by expanding road 2 lanes to 4 lanes, thus Increasing traffic flow.



Picture 3: And improve traffic lanes E-10 crossroads for the car out of the settlement more

#### BEFORE IMPROVEMENT



#### AFTER IMPROVEMENT



As a results, the air emission, including NO<sub>x</sub>, SO<sub>x</sub>, Total Suspended Particulate (TSP), and Particulate matter<sub>10</sub> (PM<sub>10</sub>) has decreased significantly and result a better air quality over community.





## CLIMATE CHANGE

In the recent decades, the effects of climate change can be felt more severely across the world, and Thailand is no exception. Last year, Thailand experienced the worst drought in the last four decades. Additionally, Bangkok, in particular, is extremely vulnerable to the rising sea levels. Rising waters have flooded Bangkok's riverside districts, forecasting that the entire city may be underwater by 2050. With this climate urgency, many countries around the world came together as part of the 2021 United Nation Climate Change Conference (COP26) to accelerate action towards the climate goals of the Paris Agreement and the UN Framework Convention on Climate Change to maintain the global temperature increase at below 1.5°C. During the conference, Thailand has committed to reaching net zero emissions target by 2065.

As WHA Group's business activities relies heavily on the availability of natural resources (e.g. rainfall for water services and solar for renewable solar energy), the impacts from climate change could affect its services and customers. Furthermore, WHA Group housed

various manufacturing productions; the climate-related incidents, for instance, flooding will directly translates to operational disruption to its customers. Thus, as part of the commitments and global movement to combat climate change, WHA Group places climate change at very high importance.

As a result, the WHA Group is closely monitoring COP26 and plan to implement government policies aimed at reducing climate change and Green House Gas emissions in order to meet COP26's pledged target. WHA Group recognizes the negative effects of climate change, including floods and drought, and, as a result, assesses and proposes mitigation measures for any risks posed by climate change to the Group's value chain and the community it serves. As a leading industrial estate developer, WHA will focus on promoting renewable energy sources such as solar energy in order to reduce greenhouse gas emissions and also protect the environment in the future.



## MANAGEMENT APPROACH

Recognizing the urgency to address the issues of climate change and accelerate its climate-related actions, WHA Group has integrated the TCFD framework in the climate-related risk management, from the ways in which the Group identifies, manages, tracks and responds to the financial implications of climate-related risks and opportunities. Thus, in this Sustainability Report, WHA Group is disclosing its climate-related financial risks and opportunities in line with TCFD recommendations, for the first year. Nonetheless, this is initial step for WHA Group; annually, the Group will update this disclosure to ensure it remains transparent and aligns with stakeholders' expectations, and that the Group's climate performance are effective and continuously improving.

## GOVERNANCE

WHA Group's Board of Directors assigned the Risk Management Committee to set up working team

in managing the Group's climate-related risks and opportunities. The working team comprises of the Company executives to jointly discuss and regularly evaluate the risk in the organization both internal and external risk factors including strategic risks, business operation risks, financial risks, compliance risks and emerging risks. The emerging risks identified as climate change risks and digital transformation.

The risks working team monitors risks, with support from various divisions and report the results to Risk Management Committee for acknowledgement. Risk Management Committee will, subsequently, evaluate the effectiveness of risk management and report it to the Board of Directors at least four times a year to closely monitor and ensure that the Company maintain the risk level to be within risk appetite (acceptable risk level) and achieve the defined objectives and goals of the Company.

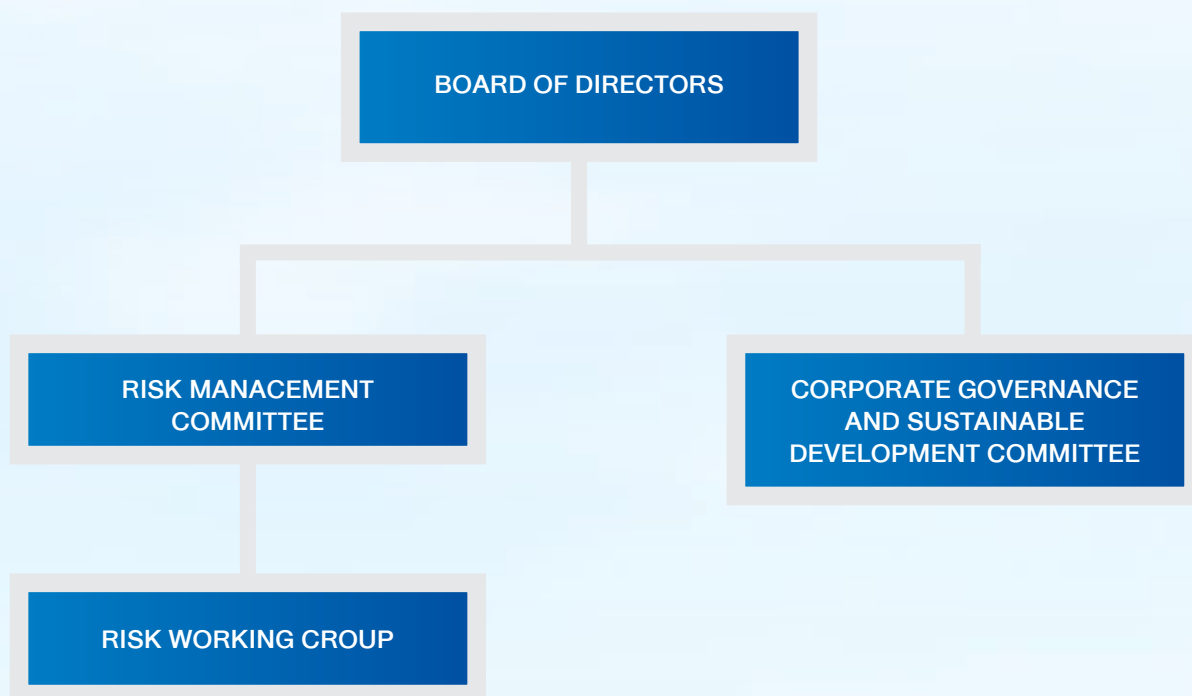


TABLE 1: CLIMATE CHANGE GOVERNANCE AND RESPONSIBILITIES

Role	Responsibilities
Board of Directors (BOD)	The BoD provides visions, missions, directions, and operational strategies with an efficient performance monitoring as well as evaluation system in place, which is independent from the management, to review the operation of Executives.
The Corporate Governance and Sustainable Development Committee	The Corporate Governance Committee is responsible for developing strategies associated with climate change, which is a part of the Group's agenda on planning and performance related to sustainable development.
Chief Executive Officer (CEO)	The CEO is responsible to manage the Company according to the established and agreed policies, plans and budget under the authority granted by the Board of Directors. In regards to Climate Change, CEO has the responsibility of strategic movement to manage climate related risk and opportunities, and ensure sufficient resources are allocated for mitigating climate related risk.
Risk Management Working Team, Sustainable Development Working Team, in collaborations with divisions and business units	The RMC and business units working team are tasked to define comprehensive key risk management policies and practices, which include climate-related risks. They assess and review risks, taking into account both internal and external factors which may affect the achievement of the Company's goals in order to ensure that appropriate measures that in line with the business are taken place to tackle climate change.





Moreover, in order to demonstrate accountability and responsibility for climate change, WHA Group has implemented a climate-related incentives, for the management and employee, ensure that This ensures that climate-related ambitions and goals are embedded throughout the company and that management is held accountable for the achievement of these goals.

## STRATEGY AND RISK MANAGEMENT PROCESS

Without effective management against climate change impacts, more frequent and severe weather (i.e. droughts and flooding) can be introduced. Climate change impacts are, therefore, at the forefront of WHA Group's consideration when developing industrial estates and supporting utility services. The Group takes into account of the geographical settings of each industrial estates, beyond the regulatory zoning requirements, to ensure that potential climate change impacts can be managed at the selected locations. Precautionary actions were effectively laid out and implemented throughout the project life cycle in order to safeguard the industrial complex from climate change impacts (e.g. sufficient water reservoir, increasing Water Reclamation capacity which minimize the Group's reliance on natural resources, monitoring schemes, etc.).

WHA Group is aware of the potential operational risks resulting in potential business disruption or asset damage imposed by climate change upon WHA Group's Sites and its customers. Therefore, climate change related risk assessment was conducted as part of the Enterprise Risk Management. The objectives of conducting such risk assessment are to:

- Identify significant risks based on hazards, vulnerability and exposure;
- Understand the impacts of climate change on business operation;
- Evaluate the effectiveness of existing mitigation measures; and
- Address future challenges imposed by climate change.

Therefore, WHA Group has identified a timeframe climate-related physical and transition risks, as well opportunities. The timeframe, Short term (1-3 years), Medium term (3-10) years, and Long-term >10 years, are also demonstrated below.



## CLIMATE-RELATED PHYSICAL AND TRANSITION RISKS

The tables below illustrated the climate-related financial risks that WHA Group has identified.

Physical Risks	Financial Impacts
<p>Acute: The increased in severity of extreme weather events, relating to flooding. Currently, there is low risk of flooding in WHA Group's industrial estates.</p> <p>Timeframe: more than 5 years</p>	<ul style="list-style-type: none"> <li>Project development and construction may be delayed or interrupted. This may increase project development costs and may affect the reputation and trust from customers for not being able to deliver the building to the customer as scheduled.</li> <li>Customers' businesses within industrial estates interrupted due to flooding in operations can affects customers' trust towards WHA Group and their reputation</li> <li>Increase in capital cost due to the increase in cost of flood prevention management</li> </ul>
<p>Acute: The increased in severity of extreme weather events, relating to droughts. Currently, there is low risk of droughts in WHA Group's industrial estates.</p> <p>Timeframe: more than 5 years</p>	<ul style="list-style-type: none"> <li>Insufficient water supply to meet the needs of customers in the industrial estate affects the reputation and customers' trust</li> <li>Increase in capital cost due to the increase in cost of procuring water sources</li> </ul>
<p>Acute: The increased in severity of extreme weather events, relating to storms and lighting</p> <p>Timeframe: between 1 - 5 years</p>	<ul style="list-style-type: none"> <li>Storms and lighting may results in damage to the assets of WHA Group which may affects the Group's performances, such as maintenance costs, increase in cost of insurance premiums</li> </ul>
<p>Chronic: Fluctuations and changes in precipitation patterns and extreme variability in weather patterns, e.g. rising mean temperatures. Currently, there are no risks found.</p> <p>Timeframe: more than 5 years</p>	<ul style="list-style-type: none"> <li>Increase in average temperature may result in the air within the warehouse not circulating. Thus, tenants may demand that the building be renovated or that additional equipment be installed in order for the warehouse to be able to transfer heat better, affecting the operating/maintenance cost of WHA Group</li> <li>Building material (metal sheet roof) may deteriorate faster. This results in financial impacts such as higher maintenance costs.</li> <li>Higher capital cost on project construction</li> </ul>

Transition Risks	Financial Impacts
<p>Policy and Legal: Legal and regulation changes relating to GHG reduction, such as enforcing the use of construction materials with no GHG emission. WHA Group predicted that by 2030, the Thai government should enforce the Greenhouse Gas Reduction Law, which will likely be applied to heavy industry first.</p> <p>Timeframe: more than 5 years</p>	<ul style="list-style-type: none"> <li>• Changes in laws and regulations on GHG emission may results in higher cost of construction materials</li> <li>• However, the business and financial impact is expected to be at a low level, as the laws are not enforced in 2025, and the current actions and approaches can manage the risks appropriately.</li> </ul>
<p>Technology: Changes in direction and development of current renewable energy technology may leads to new demands and expectations from customers. This is expected to have a low impact as the existing technology can be used to meet the renewable energy needs of customers immediately.</p> <p>Timeframe: between 1 - 5 years</p>	<ul style="list-style-type: none"> <li>• With the changes in direction and development of renewable energy technology, WHA Group sees business and financial opportunity by bringing more renewable energy into its business to increase competitiveness and respond to needs of customers who see the importance integrating and utilizing renewable energy in their businesses.</li> <li>• Significantly, the installation of solar panels to generate electricity for use in buildings and warehouses.</li> </ul>
<p>Market: Due to rapid technological advancements, customers in some industries are able to improve and develop their production processes to utilize more machines or robots to increase efficiency and reduce costs. There may also be more demand for environmental friendly building (in both construction process and GHG emission)</p> <p>Timeframe: between 1 - 5 years</p>	<ul style="list-style-type: none"> <li>• Due to the rapid changes in technological advancements, customers may need less space to build factories.</li> <li>• Additionally, customers may need to relocate the production base of the factory to nearby countries resulting from the investment promotion policy of that country. Therefore, these changes can impact income from sales of WHA Group's lands.</li> <li>• There may also be increase in demand from customers for energy efficient building, energy standard certification etc. These requirements could become a priority for customers, which may leads to loss in competitiveness and business performance if WHA Group is not able to meets these demands</li> </ul>
<p>Reputation: WHA Group's stakeholders may pay more attention and demand that the Group take actions to reduce GHG emissions</p> <p>Timeframe: between 1 - 5 years</p>	<ul style="list-style-type: none"> <li>• If WHA Group doesn't meet the expectations and demands from its stakeholders (e.g. customers, investors, communities), its reputation can be jeopardize which could lead to long-term financial impacts, if these stakeholders lose trusts and supports in WHA Group.</li> </ul>



## CLIMATE-RELATED PHYSICAL AND TRANSITION OPPORTUNITIES

The table below demonstrated the climate-related financial opportunities for WHA Group.

Opportunities	Description/Business Impacts
Resource Efficiency & Energy Source: Increasing the proportion of energy production from renewable energy.	<p>This includes installing Solar rooftop which leads to saving of electricity costs and reducing GHG emissions, hence, providing financial opportunities to WHA Group.</p> <p>Thus, WHA Group formulates circular economy strategic plan to determine the scope of application of the circular economy in the Group's operations, as well as to raise awareness among personnel in all sectors about the limited resources available through various activities to promote knowledge. The Group also formulates climate management plans and strategies which focuses on increasing energy efficiency and investing in energy-saving technologies such as alternative and renewable energy projects, as well as follow up on operating results to reduce greenhouse gas emissions to meet the set goals</p> <p>Timeframe: more than 5 years</p>
Markets: The increase in demand for renewable energy and the use of environmentally friendly building and energy-efficient building can present opportunity for WHA Group and its businesses to grow	<p>With WHA Group's comprehensive services, that offer solutions according to the needs of customers, both in terms of buildings requirements (e.g. international standards) and taking into account the environmental impacts.</p> <p>Moreover, the Group offers solar rooftop installation service that can meet the needs of renewable energy for customers who may require them.</p> <p>Timeframe: between 1 - 5 years</p>

Moreover, WHA Group has integrated the climate-related risks and opportunities into their business strategy and operations in order to enhance resilience and drive continuous improvements.

## RISK MANAGEMENT ANALYSIS SCENARIO

WHA Group conducted a Climate change scenario analysis which has the scenario analysis covered two scenarios, which are climate change physical and transition risks and impacts, and financial opportunities at business as usual (4 degree Celsius) and at low

carbon economy (1.5 degree Celsius). The analysis took into account the emerging regulation requirements such as GHG emission reduction that may be enforced in 2030.

Remarks: Please see details of the Climate change scenario analysis in appendix.

## WHA GROUP'S RISK MANAGEMENT PROCESS



If climate change impacts are not effectively managed, more frequent and severe weather (e.g., droughts and flooding) can be expected. Climate change impacts are indeed prioritized by WHA Group when developing industrial estates and supporting utility services. Beyond the regulatory zoning requirements, the Group considers the geographical settings of each industrial estate

to ensure that potential climate change impacts can be managed at the selected locations. Precautionary measures were effectively laid out and implemented throughout the project life cycle to protect the industrial complex from the effects of climate change (e.g. sufficient water reservoirs, monitoring schemes, etc.)

WHA Group is aware of the potential operational risks that climate change may impose on WHA Group's industrial estates and customers, resulting in potential business disruption or asset damage. As a result, a climate change risk assessment was carried out as part of the Enterprise Risk Management. The goals of such risk assessments are to:

- Identify significant risks based on hazards, vulnerability, and exposure;
- Understand the effects of climate change on business operations;
- Evaluate the effectiveness of existing mitigation measures; and
- Address future challenges posed by climate change.

According to the assessment results, climate change was identified as a threat to the industrial complex as a result of Thailand's overall significant low water levels and drought periods experienced at the industrial estates during the first quarter of 2020. As a result of the risk assessment, the following mitigation measures were identified, which the Company has meticulously implemented at the relevant industrial estates to manage climate change impacts.

## CLIMATE STRATEGY

### CLIMATE ADAPTATION

WHA Group developed risk management process in order to respond and address to the physical risks of climate change which may impacts and disrupt the Group's operations, and throughout the value chain (e.g. customers in the industrial estates, and surrounding communities).

WHA Group have not experienced any risks or impacts relating to flooding in its industrial estates due to its effective site selection process which undergo an analysis to ensure that the areas have no history of flooding. Moreover, WHA Group has implemented many measures to mitigate risks. Moreover, despite the recent drought events, with effective measures, WHA Group were able to manage the risks and thus, climate physical risks have pose low threat to the Group, in 2021. Nonetheless, the Group continues to actively adapt to climate change and implement actions to address the climate physical risks for the future.





## HIGHLIGHT PROJECTS:

Projects	Risks & Mitigation Measures
Physical Climate Risk Adaptation Plan	<p><b>Managing Flood Risk</b></p> <ul style="list-style-type: none"> <li>• Routine monitoring of water storage level at Eastern Seaboard and Northern reservoirs. The Group also dig wells/dredging to drain water in case of flooding</li> <li>• Routine inspection and maintenance for dykes and water pumps to ensure effective conditions.</li> <li>• Installation of ultrasonic equipment at WHA Saraburi Industrial Land (WHA SIL) to monitor water levels in the retention pond and raw water reservoir.</li> <li>• Installation of ultrasonic equipment and SCADA system to closely monitor water levels and manage raw water supply at both the raw water retention pond and reservoir at WHA Eastern Seaboard Industrial Estate (WHA ESIE) and WHA ESIE 1.</li> <li>• Project development area selection in areas with low flood risk or no reports of flooding in the past. Majority of WHA Group's projects are located in the Bangna-Trad area, or EEC, through which there is a low risk of disaster.</li> <li>• Implement a plan/manual in case of emergency</li> <li>• Assess the changing environment and surrounding in each projects' locations.</li> </ul>
	<p><b>Managing Drought Risk</b></p> <ul style="list-style-type: none"> <li>• Routine monitoring of water storage level at Eastern Seaboard and Northern reservoirs.</li> <li>• Increase the efficiency of natural water use through the implementation of the Natural Water SCADA project</li> <li>• Monitor and assess the usage of natural water sources and report to related parties at least once a month.</li> <li>• Maintain the embankment to prevent erosion of the soil embankment around the water supply system</li> <li>• Prepare arterisan well</li> <li>• Construction of additional ponds and water reservoir to ensure that capacity of water storage is sufficient for self-supply. <ul style="list-style-type: none"> <li>• Increased construction of water storage at WHA SIL by 383,600 m3 or equivalent for which can support water uses and water efficiency for customers, throughout the year.</li> <li>• Construction of floating pump with capacity to divert 250,000 m3 of water from dead storage.</li> <li>• Renovate underground deep well at WHA Rayong Industrial Land resulting in an increase of water for self-supply by 1,121 m3/day or approximately 10% of the water demand.</li> </ul> </li> <li>• WHA Group uses Water Reclamation which minimize the Group's reliance on natural resources, by reducing water withdrawal and water discharge. This project allows the Group to save costs on raw water sourcing. Additionally, this project also help the Group to avoid competition with local communities for these resources, hence maintaining its license to operate.</li> </ul>
	<p><b>Managing Storms and Lighting Risk</b></p> <ul style="list-style-type: none"> <li>• WHA Group's has a high standard of building construction which can support and withstand extreme events.</li> <li>• Closely monitor climate change situations through news channels and alert customers when there may be risks to ensure that the customers are prepared.</li> </ul>

Projects	Risks & Mitigation Measures
Increase in global temperature	<p>Managing Risks from Increase in Air Temperature</p> <ul style="list-style-type: none"> <li>Use innovation in materials during construction of warehouses to reduce the temperature in the facilities as well as improve the structural design and air vents within the warehouse for better ventilation</li> </ul>
Transition Climate Risk Adaptation Plan	<p>Managing Policy &amp; Legal Risk</p> <ul style="list-style-type: none"> <li>Track relevant legal changes and establish guidelines for effective mitigation actions</li> <li>Plan to increase energy production from renewable energy to reduce greenhouse gas emissions and environmental impact as well as control greenhouse gas emissions</li> <li>Focus on the use of construction materials that reduce greenhouse gas emissions, including the use of high-performance construction materials to reduce the generation of waste, and try to reuse construction materials through processes of recycling and re-use.</li> </ul>
	<p>Managing Technology Risk</p> <ul style="list-style-type: none"> <li>Expand to alternative energy services for customers. With the readiness from the design process of the building that can install solar panels on the roof immediately. The aforementioned solar panel installation service is provided by WHAUP, an expert who can offer a full range of services to customers.</li> <li>Study various technologies in the reabsorption and storage of carbon dioxide to reduce the impact of climate change in the future</li> </ul>
	<p>Managing Market Risk</p> <ul style="list-style-type: none"> <li>Continue to adopt cutting-edge technologies to complement the concept of SMART ECO Industrial Estates, which supports and ensure smoothness of the production of factories, logistics and other businesses processes</li> <li>Design and construct buildings that are environmentally friendly, and adhere to international standards</li> <li>Provide alternative energy services, especially solar energy, fully integrated in the Group's warehouse building that can enable customers to reduce energy costs including reducing the environmental impact of customers as well</li> </ul>
	<p>Managing Reputation Risk</p> <ul style="list-style-type: none"> <li>Planning and implementing strategy towards becoming Net Zero while also supports customer and partners in utilizing and transitioning to renewable energy.</li> <li>WHA Group hopes to work together with its customers and partners to reduce climate change challenges throughout its business value chain</li> </ul>

## METRICS AND TARGETS

### CLIMATE-RELATE METRICS

#### GHG EMISSION DATA

Performance	Unit	2018	2019	2020	2021
Direct (Scope 1) GHG emissions	Metric tons CO2e	667	693	645	1,146
Energy indirect (scope 2) GHG emissions		14,696	19,419	18,670	18,104
GHG emissions (Scope 1 and Scope 2)		15,363	20,112	19,315	19,250
GHG emissions intensity (Scope 1 and Scope 2)	Tons CO2e/ THB	0.0000015	0.0000015	0.0000021	0.0000016
Coverage	%	100	100	100	100

#### CLIMATE-RELATED TARGETS

1. GHG emission reduction targets (e.g. scope 1, scope 2, scope 3)





WHA Group has committed to long-term target to provide solar power and has signed solar power purchase agreement of 300 MW corresponding to 171,000 tons CO<sub>2</sub>e GHG emission (Scope 2) reduction per year by 2023.

**TARGET YEAR**  
**2023**

**GHG EMISSION**

Offset from Grid Electricity  
Consumption (tCO<sub>2</sub>e) per year

**171,000**

(assuming full year operation of signed capacity)

**OTHER CLIMATE-RELATED TARGETS**

• **WATER MANAGEMENT TARGETS**

WHA Group targets to double its reclaimed industrial water for industrial use from 30,200 cubic meter/day in 2020, to 60,400 cubic meter/day by 2025.

**TARGET YEAR**

**TARGET YEAR**  
**2025**

**2020**

Reclaimed Industrial Water for  
Industrial Uses (cubic meter/day)

**30,200**

Reclaimed Industrial Water for  
Industrial Uses (cubic meter/day)

**60,400**

- **ENERGY & RENEWABLE ENERGY TARGETS**

WHA Group targets to reduce grid electricity consumption within its own operation by 3% within 2022 against 2019 baseline.

- **WASTE MANAGEMENT TARGETS**

WHA Group targets to optimize proportion of waste to landfill or incineration without energy recovery by 2025.

## **CLIMATE-RELATED MANAGEMENT INCENTIVES**

WHA Group has integrated climate change into its climate related management incentives, with operational KPIs. For instance, additional MW of renewable generating capacity is part of KPI of WHA Utilities and Power, accounting around 10% of KPI of this hub. In addition, operational performance is also embedded into financial KPI of this hub. Hub KPI is an important proportion of KPI of each management, with different weight to each management depending on roles and responsibilities.

The group is dedicated to involve in solving the problems caused by the climate changes. According to the continuous implementations of the plans to improve the solar power generation and distribution from the solar rooftops of the group, the greenhouse gas emission could be reduced for over 26,378 tons of carbon dioxide equivalent in the last year. By comparing it to the greenhouse gas emission of 19,250 tons of carbon dioxide equivalent from the activities of the group in the same period, it could be considered that the group achieved the carbon neutrality by 2021. However, the company is still dedicated to minimizing environmental effects and involving in solving the problems from the climate changes in order to achieve the net zero. WHA Group is working on a long-term plan to achieve Net Zero Emissions target, which will be announced a detailed plan and a clear timeline further.





## ENERGY MANAGEMENT



As the world is transitioning towards 'Net Zero' and 'Low Carbon Society', the market forces and conditions, government's plans and regulations, businesses' opportunities and the society's demands, are, together, driving this green transition and accelerating the adoption of low carbon solutions and business-smart solutions. Equally important, the increasing in resource scarcity has plays a large part in influencing the private and public sectors to develop and optimize energy efficient SMART solutions. Governments around the world including Thailand, have rolled out supporting policies regarding the production and consumption of renewable energies. In parallel, private sectors are also applying technological advancements to create platforms for green energy usage as well as ensuring energy security.

Indefinitely, clean energy is better for the planet and humanity in comparison to energy derived from fossil fuels. Clean energy provides benefits in avoiding greenhouse gas emissions, delivering cleaner air and reducing dependency on scarce natural resources. Therefore, WHA Group places importance to effectively and responsibly manage energy usage within its operations to reduce potential adverse impacts on the environment and all stakeholders involved. As 'Your Ultimate Solution Partner', WHA Group also offers utility service for customers to offset their carbon footprint through renewable energy portfolio. Utilizing renewable energy allows customers to efficiently use energy, reduce dependency on the grid and also mitigate impacts on the wider environment.



## MANAGEMENT APPROACH

WHA Group realizes the importance of energy management, therefore, established an Energy Conservation Policy to outline the needs for energy conservation programs within its operations. The Policy is applied to employees and buildings or infrastructures complying with the Building Control Act, B.E. 2540 (1997) and Promotion and Conservation of National Environmental Quality Act, No. 2, B.E. 2550 (2007) across all four business hubs. Energy management is overseen by the Energy Committee, which is comprised of representatives from four business hubs to accurately encapsulate the diverse but supporting nature of WHA Group's business operations.

## ENERGY CONSERVATION IN OWN OPERATION

As an industrial estate developer, WHA Group does not have the authority to control industrial operators in the industrial complex to reduce their energy consumption. Hence, WHA Group targets to reduce grid electricity consumption within its own operation by 3% within 2022 against 2019 baseline. To support the Group's energy reduction goal, the following energy conservation projects were carried out in 2021.

### SOLAR ROOFTOP

WHA Group prioritizes the installation of solar panels within the Group's own operations to increase the use of renewable energy consumption. In 2021, renewable energy generated from the installed solar rooftop panels at the water treatment facility at WHA Eastern Industrial Estate (WHA EIE) were able to reduce conventional electricity by 315,857 kWh per year, thus offset 177 tCO<sub>2</sub>e of GHG Scope 2 emission. Additionally, the solar carparks at WHA ESIE at Plaza 1 and Plaza 2 and at WHA ESIE 4 carpark also generated and substituted grid electricity usage by 352,015 kWh, thus prevented 197 tCO<sub>2</sub>e of indirect emissions with its produced solar energy.



To further increase the Group's renewable energy generation capability, WHA Utilities and Power (WHAUP) has developed a pilot project to install solar rooftop panels coupled with battery energy storage system (BESS) at the water plant in Eastern Seaboard Industrial Estate (ESIE). The solar rooftop system was completed and commenced operation in November 2021. The system's solar installed capacity is 813.2 kW with BESS capacity of 550 kWh. This project will help WHAUP reduce around 1,150 MWh of electricity off-take from the grid each year, which is equivalent to saving on electricity expenses of around 4 million Baht per year. In parallel, WHA Group will be able to reduce greenhouse gas (GHG) scope 2 emissions by 15,000 tCO<sub>2</sub>e due to grid electricity substitution throughout the project's lifetime.

#### REPLACE STREET CONVENTIONAL LAMP BULBS WITH LED LIGHTING



#### USE SMART SOLAR POWER FOR FLASHING LIGHT SYSTEM



### ENERGY SAVING IN INDUSTRIAL COMPLEX

To increase equipment efficiency and support the achievement of the energy reduction target, WHA Group has replaced a total of 8,182 LED installed throughout the Group's logistics properties and industrial estates till now. Furthermore, improvements to equipment appliances such as resizing of UF Feed

Pump fan size, adjustment of equipment operating time, regular monitoring and maintenance of appliances and SMART solar powered street lighting systems were continued to be conducted in 2021 to enhance and contribute to the energy reduction efforts. Collectively, WHA Group was able to reduce a total 32,253 kWh of grid electricity, thus reduced GHG emission by 18.77 tCO<sub>2</sub>e.

### ENERGY SAVING IN OFFICE BUILDINGS

Apart from energy saving schemes conducted at the industrial estates, all business hubs also acknowledge and actively support the directional movement to reduce energy consumption. "Let's Save the World Together" program was initiated to encourage all employees to make slight modifications to current practices to save energy, such as turning off electrical appliances, use stairs instead of elevators, etc. This propagates the positive behavior changes towards energy consumption reduction.







## ENERGY SAVING AT DATA CENTER

WHA Group's Data Center through the operation of WHA Infonite Company Limited, adopted containment options (i.e. hot-air and cold-air containment) to deliver promising energy-efficient measures for data centers. These containment strategies allow the supplied temperature to be set high, thereby saving energy and increasing cooling capacity, while still operating safely. The system is energy efficient as it can save up to 21% of annual cooling system energy cost, corresponding to a 15% reduction in annualized power usage effectiveness (PUE). Additionally, apart from the facility design upgrades, progress from the solar panels installed on the Data Center rooftop illustrated that 270,673 kWh of solar energy was used corresponding to a 17% replacement of the grid electricity in 2021.

## RENEWABLE ENERGY CONSUMPTION AND ON-SITE ENERGY GENERATION

Altogether, operational energy used in buildings in WHA Group's investment portfolio and projects derived from renewable sources (wind, water, solar, biogas) are demonstrated below:

Indicator	2018	2019	2020	2021
Of electricity from renewable sources (wind, water, solar, biogas) used in buildings in portfolio (kWh)	0	623,105	555,990	863,029





## RAISING AWARENESS ON ENERGY CONSERVATION

In 2021, WHA Group has organized a workshop session on energy conservation awareness and saving technic for employees at the Eastern Seaboard Industrial Estate (ESIE). The session was led by Dr Weera Sriyikul, a specialized lecturer on energy from Energy Quality Services Co., Ltd. The workshop was held online and with 56 participants. The session consisted of pre-test and post-test to verify the knowledge before and after the session, as well as a certification for completion of the session. Altogether, 87.5% of the participants passed the post-test and received a certification.

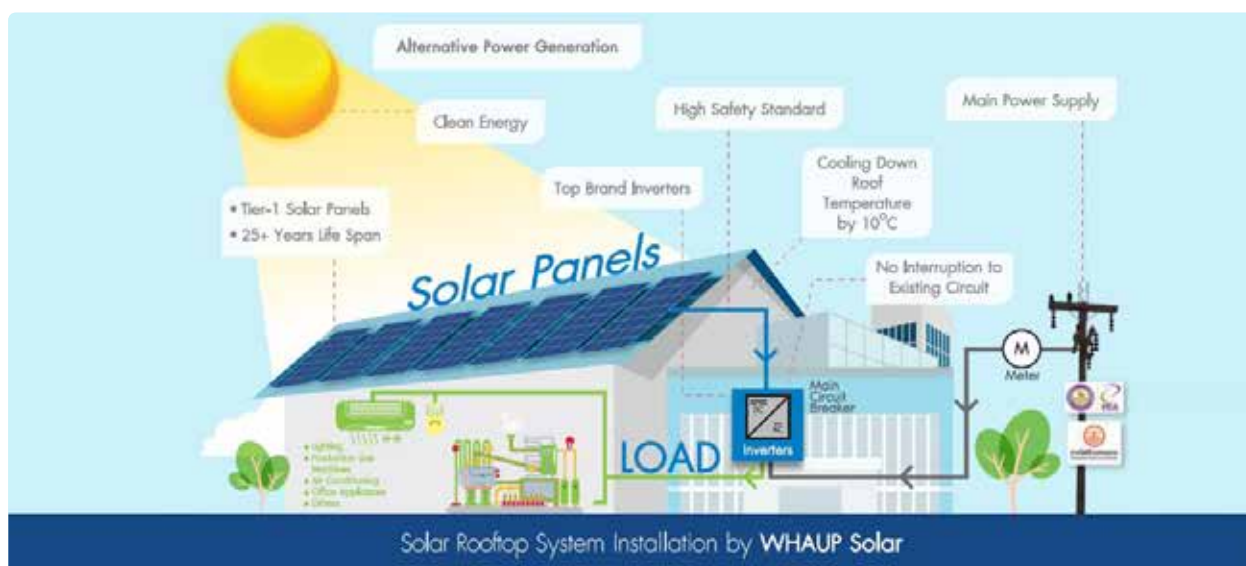
## ENERGY EFFICIENCY PROGRAM

WHA Group has converted wastewater pumps from the holding pond to the reservoir in order to produce water for industrial use in WHA Eastern Seaboard Industrial Estate (WHA ESIE). This is done by converting 1 water pump from the original pump motor of 30 KW to a pump engine of 15 KW. This results in an energy savings of 32.69 percent (0.17 kWh/m<sup>3</sup> or 0.00017 MWh) from 2019 to 2021.



## INTEGRATED SOLAR SYSTEM SOLUTIONS FOR CUSTOMERS

Due to the increasing interests from industrial operators looking to transition to green energy for lower costs and to protect the environment, installing solar rooftops have matured into the preferred solution. WHA Group's reputation for high engineering and safety standards along with expertise in solar roof has fundamentally embedded the trust of customers to shift towards renewable energy use through WHAUP's service.



WHAUP offers an all-in solar rooftop service package for customers including design, permitting, installation, and long-term operation and maintenance at no upfront cost to customers. With zero investment and zero maintenance costs, WHAUP's solar rooftop package helps businesses be a part of the green energy cycle under a long-term power-purchase agreement. This solar rooftop is cost-effective and has less impact on the environment.



The Group is aware of the environmental impacts that may be imposed by stakeholders within the value chain, therefore, is committed to a long-term target to a signed power purchase agreement and provide altogether 300 MW of solar power system for potential customers by 2023. By the end of 2021, WHAUP installed solar rooftop system capacity for customers has reached 92 MW which surpassed the annual target set. Collectively, achievement of this target will substitute grid electrical consumption with solar energy, which offsets around 64,400 tCO<sub>2</sub>e per year of GHG scope 2 emission to the environment.

Energy Saving	Performance	Target		
	2021	2021	2022	2023
Contracted Capacity (End of Year) (MW) <sup>1</sup>	92	90	150	300
GHG Emission Offset from Grid Electricity Consumption (tCO <sub>2</sub> e) per year (assuming full year operation basis) <sup>2</sup>	64,400	63,000	105,000	210,000

**Note:** <sup>1/</sup> Included MW under both operation and development stage; as of end 2021, operational 57 MW and 35 MW under development.

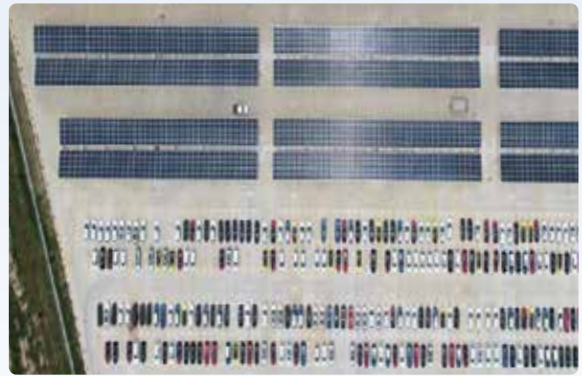
<sup>2/</sup> Expected level of GHG offset on per year basis. Actual level can be varied with multiple operating parameters and standard used to calculate kg CO<sub>2</sub>e/kwh of the grid.

Capacity of operating solar projects selling to industrial customers increased from 40 MW to 57 MW in 2021. Energy supplied to customers total 52,800 MWh in 2021, accounted for 26,378 Ton CO<sub>2</sub>eq avoided emissions.

### THAILAND'S LARGEST SOLAR CARPARK

Starting in 2020, WHAUP officially delivered the solar carpark at SAIC Motor Company - CP Co., Ltd. (SAIC MOTOR-CP) with solar installed capacity of 4.8 MW. By end of 2021, the second phase of the project was completed. Total installed capacity of both phases

together is 6.2 MW, covering a total solar rooftop area of 40,000 m<sup>2</sup>. It will generate around 7,750 MWh of clean energy per year, making it the largest solar carpark project to date in Thailand. The solar roof carpark ultimately supports the customer to save energy cost and fulfill their environmental commitments.



### SOLAR PV ECO SYSTEM AT THE CONTINENTAL TYRES FACTORY IN RAYONG



Solar Car Park



Solar Rooftop



Floating Solar System



The solar PV ECO system is for the tires manufacturing facility of Continental, located in WHA Eastern Seaboard Industrial Estate 4, comprising a floating solar system on the factory's water pond, a solar rooftop system on its factory buildings as well as a solar car park. Solar rooftops, representing a combined space of 27,400 square meters, have been installed on two factory buildings, with a power generating capacity of 482 and 2,275 KW respectively. Solar carparks, covering a total of 8,400 square meters, will generate 958 KW while a floating solar system, on a 7,000 square meter pond, will produce 475 KW. The complete 42,800 square meters installation will generate 4.2 MW of electrical power throughout the entire 15-year service agreement.



# PERFORMANCE SUMMARY

## ECONOMIC PERFORMANCE

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
201-1	<b>Direct economic value generated</b>					
	Revenue	Million Baht	11,622	13,386	9,407	11,964
	<b>Economic value distributed</b>					
	Annual dividend payment	Million Baht	1,299	2,398	1,348	1,348
	Operating cost		5,356	7,262	4,282	6,306
	Employee expenses		884	870	855	961
	Tax		371	301	293	679
	Social investment		30	26	41	7
	Economic value retained		3,683	2,529	2,588	2,663
205-2	<b>Communication and training on anti-corruption policy to governance body members</b>					
	WHA Industrial Development	%	90	100	100	100
	WHA Utilities and Power		90	100	100	100
	WHA Logistics		100	100	100	100
	WHA Digital Platform		90	100	100	100
	<b>Communication and training on anti-corruption policy to employees</b>					
	WHA Industrial Development	%	100	100	100	100
	WHA Utilities and Power		100	100	100	100
	WHA Logistics		100	100	100	100
	WHA Digital Platform		100	100	100	100
205-3	<b>Confirmed incidents of corruption</b>					
	Total number of confirmed incidents of corruption	Case	0	1	0	0
	Number of employees who dismissed due to corruption	Person	0	1	0	0
	Total number of confirmed incidents when contracts with business partners were terminated or not renewed due to violations related to corruption	Case	0	0	0	0
	Public legal cases regarding corruption	Case	0	1	0	0
	<b>Anti-competitive practice</b>					
	Total amount of fines and settlements	Baht	0	0	0	0
	Total amount of fines and settlements	% of revenues	0	0	0	0
	<b>Corruption and Bribery Cases</b>					
	Total number of confirmed incidents of corruption	Case	0	0	0	0
	Employees who were dismissed due to corruption	Person	0	0	0	0
	Business partners who were terminated or not renewed due to corruption	Number	0	0	0	0
	Public legal cases regarding corruption (public investigations, prosecution or close cases)	Case	0	0	0	0
	<b>Violations of Business Ethics</b>					
	Violations received from grievance mechanisms specified by the company	Case	0	0	0	0
	Violations that are in the process of being resolved	Case	0	0	0	0
	Violations that have been resolved	Case	0	0	0	0

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
205-3	<b>Written Acknowledge (%)</b>					
	<b>Employees</b>					100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Contractors/ Suppliers/ Service Providers</b>					
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Subsidiaries</b>	%				100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Joint Ventures (including stakes above 10%)</b>					100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Training Provided</b>					
	<b>Employees</b>	%				100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Contractors/ Suppliers/ Service Providers</b>					
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Subsidiaries</b>					100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
	<b>Joint Ventures (including stakes above 10%)</b>					100
	WHA Industrial Development					100
	WHA Utilities & Power					100
	WHA Logistics					100
	WHA Digital Platform					100
418-1	<b>Customer privacy</b>					
	Total number of substantiated complaints received concerning breaches of customer privacy from outside parties and substantiated by the organization	case	0	0	0	0
	Total number of substantiated complaints received concerning breaches of customer privacy from regulatory bodies		0	0	0	0
	Total number of identified leaks, thefts, or losses of customer data		0	0	0	0



## SUPPLY CHAIN MANAGEMENT

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
308-1	<b>Supplier Environmental Assessment</b>					
	New suppliers	Number	0	0	1	1
	WHA Industrial Development		0	0	0	1
	WHA Utilities and Power		0	0	1	0
	WHA Logistics		0	0	0	0
	WHA Digital Platform		0	0	0	0
	<b>New suppliers that were screened using environmental criteria</b>					
	New suppliers that were screened using environmental criteria	Number	0	0	1	2
		Percentage	NA	NA	100	200
	WHA Industrial Development		0	0	0	1
	WHA Utilities and Power		0	0	0	0
	WHA Logistics		0	0	1	0
	WHA Digital Platform		0	0	0	1
308-2	<b>Negative environmental impacts in the supply chain and actions taken</b>					
	Number of suppliers assessed for environmental impacts	Number	0	0	9	29
	WHA Industrial Development		0	0	0	9
	WHA Utilities and Power		0	0	9	16
	WHA Logistics		0	0	0	1
	WHA Digital Platform		0	0	0	3
414-1	<b>New suppliers that were screened using social criteria</b>					
	New suppliers that were screened using social criteria	Number	0	0	1	2
		Percentage	NA	NA	100	100
	WHA Industrial Development	Number	0	0	0	1
	WHA Utilities and Power		0	0	0	0
	WHA Logistics		0	0	1	0
	WHA Digital Platform		0	0	0	1
414-2	<b>Negative social impacts in the supply chain and actions taken</b>					
	Number of suppliers assessed for social impacts	Number	0	0	9	29
	WHA Industrial Development		0	0		9
	WHA Utilities and Power		0	0	9	16
	WHA Logistics		0	0		1
	WHA Digital Platform		0	0		3
	<b>Total tier 1 supplier</b>					
	<b>Absolute number of suppliers</b>	Number			745	638
	WHA Industrial Development					224
	WHA Utilities and Power					215
	WHA Logistics					138
	WHA Digital Platform					61
	<b>Share of total procurement spent</b>	%			100	100
	WHA Industrial Development					35.11
	WHA Utilities and Power					33.70
	WHA Logistics					21.63
	WHA Digital Platform					9.56
	<b>Critical tier 1 suppliers</b>					
	<b>Absolute number of suppliers</b>	Number			35	29
	WHA Industrial Development					9
	WHA Utilities and Power					16
	WHA Logistics					1
	WHA Digital Platform					3

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021	
414-2	Share of total procurement spent	%			5	100	
	WHA Industrial Development					31.03	
	WHA Utilities and Power					55.17	
	WHA Logistics					3.45	
	WHA Digital Platform					10.34	
	Critical non-tier 1 suppliers						
	Absolute number of suppliers	Number			0	0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Supply chain risk exposure						
	Tier 1 suppliers	Number					
	Number of tier 1 suppliers assessed (for sustainability risks) in the last 3 years					0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Percentage of suppliers in that category assessed in the last 3 years (based on total number of suppliers in that category provided in “Critical Supplier Identification” question).	%				0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Number of suppliers classified as high-risk	%				0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Percentage of total suppliers in that category classified as high-risk (based on total number of suppliers in that category provided in “Awareness” question).					0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Critical non-tier 1 suppliers						
	Number of critical non-tier 1 suppliers assessed (for sustainability risks) in the last 3 years	Number				0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	
	Percentage of suppliers in that category assessed in the last 3 years (based on total number of suppliers in that category provided in “Critical Supplier Identification” question).	%				0	
	WHA Industrial Development					0	
	WHA Utilities and Power					0	
	WHA Logistics					0	
	WHA Digital Platform					0	

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
414-2	Number of suppliers classified as high-risk	%				0
	WHA Industrial Development					0
	WHA Utilities and Power					0
	WHA Logistics					0
	WHA Digital Platform					0
	Percentage of total suppliers in that category classified as high-risk (based on total number of suppliers in that category provided in “Awareness” question).	%				0
	WHA Industrial Development					0
	WHA Utilities and Power					0
	WHA Logistics					0
	WHA Digital Platform					0
	Supplier Risk Management Measures					
	Critical suppliers (tier 1 and non-tier 1)	%				
	Percentage of critical suppliers assessed (ongoing sustainability monitoring) annually				72	100
	WHA Industrial Development					31.03
	WHA Utilities and Power					55.17
	WHA Logistics					3.45
	WHA Digital Platform					10.34
	Percentage assessed at least once every 3 years	%				100
	WHA Industrial Development					31.03
	WHA Utilities and Power					55.17
	WHA Logistics					3.45
	WHA Digital Platform					10.34
	Total (should not exceed 100%)				72	100
	WHA Industrial Development					31.03
	WHA Utilities and Power					55.17
	WHA Logistics					3.45
	WHA Digital Platform					10.34
	Suppliers with high sustainability risk (If you have not identified any suppliers with high sustainability risks, please ensure to input“0”)					
	Percentage of suppliers with high sustainability risk assessed (ongoing sustainability monitoring) annually	%				0
	WHA Utilities and Power					0
	WHA Logistics					0
	WHA Digital Platform					0
	Percentage assessed at least once every 3 years	%				0
	WHA Industrial Development					0
	WHA Utilities and Power					0
	WHA Logistics					0
	WHA Digital Platform					0
	Total (should not exceed 100%)	%				0
	WHA Industrial Development					0
	WHA Utilities and Power					0
	WHA Logistics					0
	WHA Digital Platform					0
	Suppliers who were monitored for compliance with the Supplier Code of Conduct	Number				29
		Percentage				4.55
	WHA Industrial Development	Number				9
	WHA Utilities and Power					16
	WHA Logistics					1
	WHA Digital Platform					3



## Customer Relationship Management

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
	<b>Satisfaction Measurement</b>					
	<b>Satisfied Respondents</b>	% of satisfied respondents out of total number of respondents to survey	90	97	89	90
	WHA Industrial Development					
	WHA Utilitises and Power					
	WHA Logistics					
	WHA Digital Platform					
	<b>Data coverage: % of customers/consumers surveyed (both respondents and non-respondents) out of total number of customers/consumers, % of revenues, etc..</b>	%	75.64	61.11	73.75	87.21
	WHA Industrial Development					100
	WHA Utilities and Power					48.83
	WHA Logistics					100
	WHA Digital Platform					100

## Customer Privacy

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
418-1	<b>Substantiated complaints concerning breaches of customer privacy and losses of customer data</b>					
	<b>Total number of substantiated complaints received concerning breaches of customer privacy</b>		0	0	0	0
	<b>Complaints received from outside parties and substantiated by the organization</b>	Incident	0	0	0	0
	WHA Industrial Development		0	0	0	0
	WHA Utilities and Power		0	0	0	0
	WHA Logistics		0	0	0	0
	WHA Digital Platform		0	0	0	0
	<b>Complaints from regulatory bodies</b>	Incident	0	0	0	0
	WHA Industrial Development		0	0	0	0
	WHA Utilities and Power		0	0	0	0
	WHA Logistics		0	0	0	0
	WHA Digital Platform		0	0	0	0
	<b>Total number of identified leaks, thefts, of losses of customer data</b>	Incident	0	0	0	0
	WHA Industrial Development		0	0	0	0
	WHA Utilities and Power		0	0	0	0
	WHA Logistics		0	0	0	0
	WHA Digital Platform		0	0	0	0

## SOCIAL PERFORMANCE

### EMPLOYMENT

GRI STANDARD	PERFORMANCE	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
102-8	Total number of employees	Persons	552		571		613		615	
	Number of employees by business units									
	WHA Industrial Development	Persons	193	103	199	108	207	114	199	111
	WHA Utilities and Power		83	18	92	18	106	23	121	31
	WHA Logistics		54	66	58	68	59	76	57	81
	WHA Digital Platform		29	6	23	5	23	5	13	2
	Employee by gender									
	Total number of employees by gender	Persons	359	193	372	199	395	218	390	225
	Permanent employees by business units									
	WHA Industrial Development	Persons	193	103	199	108	207	114	199	111
	WHA Utilities and Power		83	18	92	18	106	23	121	31
	WHA Logistics		54	66	58	68	59	76	57	81
	WHA Digital Platform		29	6	23	5	14	2	13	2
	Total temporary employees		12	3	11	3	9	3	3	1
			15		14		12		4	
	Temporary employees by business units									
	WHA Industrial Development	Persons	0	0	0	0	0	0	0	0
	WHA Utilities and Power		0	0	0	0	0	0	0	0
	WHA Logistics		1	0	1	0	0	0	1	0
	WHA Digital Platform		11	3	10	3	9	3	2	1
	Total temporary employees		12	3	11	3	9	3	3	1
			15		14		12		4	
401-1	New Employee									
	Total new employee	Persons	37	27	46	24	59	34	44	34
			64		70		93		78	
	New hire rate	%	11.92		12.57		15.17		12.77	
	New employee by business units									
	WHA Industrial Development	Persons	5	14	16	14	23	12	10	12
		%	2.59	13.59	8.04	12.96	11.11	10.53	5.03	10.81
	WHA Utilities and Power	Persons	17	4	19	1	25	9	24	7
		%	20.48	22.22	20.65	5.56	23.58	39.13	19.83	22.58
	WHA Logistics	Persons	6	8	10	9	7	12	7	14
		%	11.32	15.09	17.54	13.24	11.86	15.79	12.50	17.28
	WHA Digital Platform	Persons	9	1	1	0	4	1	3	1
		%	50.00	33.33	7.69	0.00	28.57	50.00	27.27	100.00
	New employee by age									
	Below 30 years old	Persons	14	9	23	15	29	14	21	17
		%	2.61	1.68	4.13	2.69	4.83	2.33	3.44	2.78
	30-50 years old	Persons	22	18	23	9	30	20	23	16
		%	4.10	3.35	4.13	1.62	4.99	3.33	3.76	2.62
	Over 50 years old	Persons	1	0	0	0	0	0		1
		%	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.16
	Turnover rate									
	Total employee turnover	Persons	22	17	28	16	22	10	25	19
		39		44		32		44		
Turnover rate	%	7.26		7.90		5.32		7.20		

GRI STANDARD	PERFORMANCE	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
401-1	Employee turnover by business unit									
	WHA Industrial Development	Persons	7	9	8	10	8	4	8	12
		%	1.30	1.68	1.44	1.80	1.33	0.67	1.31	1.96
	WHA Utilities and Power	Persons	3	1	11	1	8	3	4	1
		%	0.56	0.19	1.97	0.18	1.33	0.50	0.65	0.16
	WHA Logistics	Persons	7	6	6	4	4	2	10	5
		%	1.30	1.12	1.08	0.72	0.67	0.33	1.64	0.82
	WHA Digital Platform	Persons	5	1	3	1	2	1	3	1
		%	0.93	0.19	0.54	0.18	0.33	0.17	0.49	0.16
	Employee turnover by age									
	Below 30 years old	Persons	4	0	8	6	4	2	4	8
		%	0.74	0.00	1.44	1.08	0.67	0.33	0.65	1.31
	30-50 years old	Persons	16	17	20	10	16	8	20	11
		%	2.98	3.17	3.59	1.80	2.66	1.33	3.27	1.80
	Over 50 years old	Persons	2	0	0	0	2	0	1	0
		%	0.37	0.00	0.00	0.00	0.33	0.00	0.16	0.00
	Turnover by management level									
	WHA Industrial Development	Persons	0	1	1	0	0	0	0	2
		%								
	WHA Utilities and Power	Persons	0	0	0	0	1	0	0	0
		%								
	WHA Logistics	Persons	0	0	3	0	0	0	2	0
		%								
	WHA Digital Platform	Persons	1	0	0	0	0	0	0	0
		%								
	Percentage of open positions filled by internal candidates (internal hires)									
	WHA Industrial Development	Persons	1	1	0	0	0	0	0	1
		%	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.16
	WHA Utilities and Power	Persons	1	1	1	0	1	0	0	3
		%	0.19	0.19	0.18	0.00	0.17	0.00	0.00	0.49
	WHA Logistics	Persons	0	0	0	1	1	1	1	1
		%	0.00	0.00	0.00	0.18	0.17	0.17	0.16	0.16
	WHA Digital Platform	Persons	0	0	0	0	0	0	0	0
		%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Employee training									
	Total number of training hours provided to employees	Hours	8,348.85	2,030.40	9,724.50	5,929.00	3,987.00	1,872.500	10,450.07	7,195.91
	Total number of training hours provided to employees by business units									
	WHA Industrial Development	Hours	5,576.75	959.50	5,230.00	2,686.00	935.000	864.00	5,526.91	4,079.22
	WHA Utilities and Power		1,474.10	121.90	1,346.50	408.00	2,187.00	276.00	3,144.93	725.86
	WHA Logistics		1,013.00	874.00	2,632.00	2,755.00	832.00	729.50	1,599.97	2,359.87
	WHA Digital Platform		285.00	75.00	516.00	80.00	33.00	3.00	178.26	30.96
	Average training hours by gender		24.06	10.69	26.94	30.25	10.3	8.75	27	32.12
	Average training hours by business units									
	WHA Industrial Development	Hours	28.90	9.32	26.28	24.87	4.35	7.00	27.77	36.75
	WHA Utilities and Power		17.76	6.77	14.64	22.67	20.63	12.00	25.99	23.41
	WHA Logistics		19.11	13.24	46.18	40.51	16.00	11.22	28.57	29.13
	WHA Digital Platform		15.83	25.00	39.69	40.00	2.36	1.50	16.21	30.96



GRI STANDARD	PERFORMANCE	Unit	2018		2019		2020		2021		
			Male	Female	Male	Female	Male	Female	Male	Female	
	Average hours of training by employee category										
	Total number of executives	Persons	34		30		43		39		
	WHA Industrial Development		15		14		20		17		
	WHA Utilities and Power		7		7		8		7		
	WHA Logistics		10		8		14		14		
	WHA Digital Platform		2		1		1		1		
	Total number of training hours provided to executives		Hour	470		280		306		149	
	WHA Industrial Development	0		0		0		45			
	WHA Utilities and Power	470		280		360		28			
	WHA Logistics	0		0		0		76			
	WHA Digital Platform	0		0		0		0			
	Average hours of training for executives	Hour		13.82		9.33		7.12		3.82	
	WHA Industrial Development		0		0		0		2.65		
	WHA Utilities and Power		67.14		40		38.25		4		
	WHA Logistics		0		0		0		5.43		
	WHA Digital Platform		0		0		0		0		
	Total number of middle management		Persons	129		139		140		152	
	WHA Industrial Development	74		80		77		77			
	WHA Utilities and Power	14		17		19		28			
	WHA Logistics	36		40		43		45			
	WHA Digital Platform	5		2		1		2			
	Total number of training hours provided to middle management	Hour		140		58		62		3424.5	
	WHA Industrial Development		0		0		0		1465		
	WHA Utilities and Power		140		58		62		668.5		
	WHA Logistics		0		0		0		1219.5		
	WHA Digital Platform		0		0		0		71.5		
	Average hours of training for middle management		Hour	1.09		0.42		0.44		22.53	
	WHA Industrial Development	0		0		0		19.03			
	WHA Utilities and Power	10.00		3.41		3.26		23.88			
	WHA Logistics	0		0		0		27.10			
	WHA Digital Platform	0		0		0		35.75			
	Total number of staff	Person		389		402		430		424	
	WHA Industrial Development		207		213		224		216		
	WHA Utilities and Power		80		86		102		117		
	WHA Logistics		74		78		78		79		
	WHA Digital Platform		28		25		26		12		
	Total number of training hours provided to staffs		Hour	1063		1258		5812.5		5876.5	
	WHA Industrial Development	0		0		1752		2470			
	WHA Utilities and Power	1063		1258		2463		1672.5			
	WHA Logistics	0		0		1561.5		1626.5			
	WHA Digital Platform	0		0		36		107.5			
	Average hours of training for staffs	Hour		2.73		3.13		13.52		13.86	
	WHA Industrial Development		0		0		7.82		11.44		
	WHA Utilities and Power		13.29		14.63		24.15		14.29		
	WHA Logistics		0		0		20.02		20.59		
	WHA Digital Platform		0		0		1.38		8.96		

GRI STANDARD	PERFORMANCE	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
404-3	Percentage of employees receiving regular performance and career development reviews									
	Total number of employees	Person	359	193	372	199	395	218	390	225
	WHA Utilities and Power		193	103	199	108	207	114	199	111
	WHA Logistics		83	18	92	18	106	23	121	31
	WHA Digital Platform		54	66	58	68	59	76	57	81
	Total number of employees receiving regular performance and career development reviews by gender	Person	359	193	372	199	395	218	390	225
	WHA Utilities & Power		193	103	199	108	207	114	199	111
	WHA Logistics		83	18	92	18	106	23	121	31
	WHA Digital Platform		54	66	58	68	59	76	57	81
	Performance review									
	Percentage of employee received performance review	%	100.00		100.00		100.00		100	
	Total number of executives who received regular performance and career development reviews	Person	32		30		43		39	
	- WHA Industrial Development		15		14		20		17	
	- WHA Utilities & Power		7		7		8		7	
	- WHA Logistics		8		8		14		14	
	- WHA Digital Platform		2		1		1		1	
	Percentage of executive receiving regular performance and career development reviews by employee category	%	100.00		100.00		100.00		100.00	
	Total number of middle management who received regular performance and career development reviews	Person	129		139		140		152	
	- WHA Industrial Development		74		80		77		77	
	- WHA Utilities & Power		14		17		19		28	
	- WHA Logistics		36		40		43		45	
	- WHA Digital Platform		5		2		1		2	
	Percentage of middle management who received regular performance and career development reviews	%	100		100		100		100	
	- WHA Industrial Development		100		100		100		100	
	- WHA Utilities & Power		100		100		100		100	
	- WHA Logistics		100		100		100		100	
	- WHA Digital Platform		100		100		100		100	
	- WHA Industrial Development		100		100		100		100	
	Total number of staffs who received regular performance and career development reviews	Person	391		402		430		424	
	- WHA Industrial Development		207		213		224		216	
	- WHA Utilities & Power		80		86		102		117	
	- WHA Logistics		76		78		78		79	
	- WHA Digital Platform		28		25		26		12	
	Percentage of staffs who received regular performance and career development reviews	%	100		100		100		100	
	- WHA Industrial Development		100		100		100		100	
	- WHA Utilities & Power		100		100		100		100	
	- WHA Logistics		100		100		100		100	
	- WHA Digital Platform		100		100		100		100	
405-1	Diversity of Director to executives level by age									
	Below 30 years old	Persons	0		0		0		0	
	30-50 years old		20		17		25		25	
	Over 50 years old		14		13		13		13	

## LABOR PRACTICE INDICATORS

GRI Standard	Performance	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
405-1	<b>Total number of governance bodies members</b>	Persons	359	193	372	199	395	218	390	225
	WHA Industrial Development	Persons	193	103	199	108	207	114	199	111
	WHA Utilities and Power		83	18	92	18	106	23	121	31
	WHA Logistics		54	66	58	68	59	76	57	81
	WHA Digital Platform		29	6	23	5	23	5	13	2
	Diversity of governance bodies by gender	%	0.65	0.35	0.65	0.35	0.64	0.36	0.63	0.37
	- WHA Industrial Development		1	1	1	1	1	1	1	1
	- WHA Utilities and Power		1	1	1	1	1	1	1	1
	- WHA Logistics		1	1	1	1	1	1	1	1
	- WHA Digital Platform		1	1	1	1	1	1	1	1
	Diversity of governance bodies by age group	%	0.3		0.25		0.38		0.37	
	<30		0		0		0		0	
	30-50		0.06		0.05		0.06		0.06	
	>50		0.04		0.03		0.05		0.04	
	<b>Total workforce by Age group</b>									
	Below 30 years old	Person	69	37	65	28	75	35	78	42
		% FTEs	0	0	0	0	0	0	0	0
	30-50	Person	247	136	243	136	263	148	258	154
		% FTEs	0	0	0	0	0	0	0	0
	>50	Person	43	20	64	35	57	35	54	28
		% FTEs	0	0	0	0	0	0	0	0
	<b>Share of women in total workforce</b>									
	Share of women in total workforce	Person					395	218	390	225
	- WHA Industrial Development						207	114	199	111
	- WHA Utilities and Power						106	23	121	31
	- WHA Logistics						59	76	57	81
	- WHA Digital Platform						23	5	13	2
	Share of women in total workforce	% of total force					-	0.36	-	0.36
	- WHA Industrial Development						-	0.18	-	0.20
	- WHA Utilities and Power						-	0.56	-	0.59
	- WHA Logistics						-	0.18	-	0.13
	<b>Target (Target year)</b>									
	Share of women in all management positions, including junior, middle and top management	Person					-	88	-	90
	- WHA Industrial Development						42	39	40	35
	- WHA Utilities and Power						17	7	22	9
	- WHA Logistics						29	42	25	46
	- WHA Digital Platform						4	0	3	0
	Share of women in all management positions, including junior, middle and top management	% of total management positions					-	50	-	50
	- WHA Industrial Development						-	0.48	-	0.47
	- WHA Utilities and Power						-	0.29	-	0.29
	- WHA Logistics						-	0.59	-	0.65
	- WHA Digital Platform						-	-	-	-



GRI Standard	Performance	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
405-1	Share of women in junior management positions, i.e. first level of management	Person					-	21	-	21
	-WHA Industrial Development						7	7	7	7
	-WHA Utilities and Power						5	1	7	1
	-WHA Logistics						3	13	4	13
	-WHA Digital Platform						2	0	1	0
	Share of women in junior management positions, i.e. first level of management	% of total junior management positions					-	0.49	-	0.46
	-WHA Industrial Development						-	0.50	-	0.50
	-WHA Utilities and Power						-	0.17	-	0.13
	-WHA Logistics						-	0.81	-	0.76
	-WHA Digital Platform						-	-	-	-
	Share of women in top management positions, i.e. maximum two levels away from the CEO or comparable positions	Person					-	17	-	15
	-WHA Industrial Development						10	10	10	7
	-WHA Utilities and Power						6	1	6	1
	-WHA Logistics						9	6	7	7
	-WHA Digital Platform						1	0	1	0
	Share of women in top management positions, i.e. maximum two levels away from the CEO or comparable positions	As % of total top management positions					-	0.35	-	0.35
	-WHA Industrial Development						-	0.50	-	0.41
	-WHA Utilities and Power						-	0.14	-	0.14
	-WHA Logistics						-	0.40	-	0.50
	-WHA Digital Platform						-	-	-	-
	Share of women in management positions in revenue-generating functions (e.g. sales)	Person					-	25	-	23
	-WHA Industrial Development						1	17	1	14
	-WHA Utilities and Power						5	3	9	4
	-WHA Logistics						7	5	6	5
	-WHA Digital Platform						0	0	0	0
	Share of women in management positions in revenue-generating functions (e.g. sales)	% of all such managers (i.e. excluding support functions such as HR, IT, Legal, etc))					-	0.58	-	0.57
	-WHA Industrial Development						-	0.94	-	0.93
	-WHA Utilities and Power						-	0.38	-	0.31
	-WHA Logistics						-	0.42	-	0.45
	-WHA Digital Platform						-	-	-	-
	Share of women in STEM-related positions	Person					-	10	-	11
	-WHA Industrial Development						39	10	38	10
	-WHA Utilities and Power						0	0	0	0
	-WHA Logistics						9	0	10	1
	-WHA Digital Platform						14	0	11	0

GRI Standard	Performance	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
405-1	Share of women in STEM-related positions	% of total STEM positions					-	0.20	-	0.23
	-WHA Industrial Development						-	0.20	-	0.21
	-WHA Utilities and Power						-	-	-	-
	-WHA Logistics						-	-	-	0.09
	-WHA Digital Platform						-	-	-	-
	Breakdown based on Nationality: Thailand									
	Share in total workforce	Person					384	215	383	221
	- WHA Industrial Development						205	114	195	108
	- WHA Utilities and Power						105	23	120	31
	- WHA Logistics						60	76	57	81
	- WHA Digital Platform						14	2	11	1
	Share in total workforce	% of total workforce					0.90	0.85	0.95	0.87
	- WHA Industrial Development						0.99	1.00	0.98	0.97
	- WHA Utilities and Power						0.99	1.00	0.99	1.00
	- WHA Logistics						1.02	1.00	1.00	1.00
	- WHA Digital Platform						0.61	0.40	0.85	0.50
	Share in all management positions, including junior, middle and senior management	Person					89	88	87	90
	- WHA Industrial Development						40	39	38	35
	- WHA Utilities and Power						16	7	21	9
	- WHA Logistics						29	42	25	46
	- WHA Digital Platform						4	0	3	0
	Share in all management positions, including junior, middle and senior management						0.25	0.3	0.26	0.29
	- WHA Industrial Development						0.19	0.34	0.19	0.32
	- WHA Utilities and Power						0.15	0.30	0.17	0.29
	- WHA Logistics						0.49	0.55	0.44	0.57
	- WHA Digital Platform						0.17	0.00	0.23	0.00
	Breakdown based on Nationality: Others									
	Share in total workforce	Person					3	1	4	1
	- WHA Industrial Development						2	1	3	1
	- WHA Utilities and Power						1	0	1	0
	- WHA Logistics						0	0	0	0
	- WHA Digital Platform						0	0	0	0
	Share in total workforce	% of total workforce					18	39	16.83	35
	- WHA Industrial Development						20.00	39.00	12.67	35.00
	- WHA Utilities and Power						16.00	0	21.00	0
	- WHA Logistics						0	0	0	0
	- WHA Digital Platform						0	0	0	0
	Share in all management positions, including junior, middle and senior management	Person					3	0	3	0
	- WHA Industrial Development						2	0	2	0
	- WHA Utilities and Power						1	0	1	0
	- WHA Logistics						0	0	0	0
	- WHA Digital Platform						0	0	0	0

GRI Standard	Performance	Unit	2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female
	Share in all management positions, including junior, middle and senior management	As % of total management workforce					2	0	3	0
	- WHA Industrial Development					0.00	0	0.00	0	
	- WHA Utilities and Power					2.00	0	3.00	0	
	- WHA Logistics					0	0	0	0	
	- WHA Digital Platform					0	0	0	0	
405-2	Ratio of basic salary and remuneration of women to men									
	Average pay for executives	Baht			512,000.00	339,200.00	467,300.00	316,000.00	495,500.00	352,000.00
	Average pay for middle management	Baht			115,500.00	140,000.00	115,100.00	134,500.00	119,400.00	143,000.00
	Average pay for staffs	Baht			35,900.00	42,500.00	36,300.00	42,500.00	44,500.00	46,500.00
	Equal pay analysis									
	Executive level (base salary only)	Baht			413,300.00	272,500.00	405,000.00	270,000.00	440,000.00	320,000.00
	Management level (base salary only)	Baht			93,200.00	108,000.00	98,900.00	97,000.00	94,500.00	100,800.00
	Non-Management level (base salary only)	Baht			24,200.00	35,700.00	24,900.00	35,500.00	37,500.00	38,800.00



## COMMUNITY ENGAGEMENT

GRI Standard	Performance	Unit	2018	2019	2020	2021
413-1	<b>Industrial estates with community engagement</b>					
	<b>Total number of industrial estate</b>	Operation unit	32	35	35	34
	- Industrial estates involved with local community engagement	Operation unit	30	33	33	33
		%	100	100	100	100
	- Industrial estates involved with social impact assessment	Operation unit	10	10	10	10
		%	100	100	100	100
	- Industrial estates with environmental impact assessments and ongoing monitoring	Operation unit	10	10	10	10
		%	100	100	100	100
	- Industrial estates involved with public disclosure of results of environmental and social impact assessments	Operation unit	10	10	10	10
		%	100	100	100	100
	- Industrial estates involved with local community development programs based on local communities' needs	Operation unit	10	10	10	10
		%	100	100	100	100
	- Industrial estates involved with broad based local community consultation committees and processes that include vulnerable groups	Operation unit	9	9	10	10
		%	90	90	100	100
	- Industrial estates involved with works councils, occupational health and safety committees	Operation unit	10	11	11	10
		%	31.25	31.43	31.43	28.57
	<b>-Revenue</b>		10054.0	13386.0	0	0
	- WHA Industrial Development					
	- WHA Utilities & Power		3,569.86	3755.7	3738.37	
	- WHA Logistics					
	- WHA Digital Platform					
	- Economic value distributed					
	- Operating cost		1088.31	1127.08	0	0
	- WHA Industrial Development					
	- WHA Utilities & Power		1088.31	1127.08		
	- WHA Logistics					
	- WHA Digital Platform					
	<b>-Employee wages and benefits</b>		91.63	106.37		0
	- WHA Industrial Development	Million Baht				
	- WHA Utilities & Power		91.63	106.37		
	- WHA Logistics					
	- WHA Digital Platform					
	- Payments to providers of capital		778.01	1162.8		0
	- Payments to government by country		65.01	62.63		0
	- Community investment		1.07	0.3		0
	- Economic value retained		8029.97	10926.82	0	0
	- WHA Industrial Development		0	0	0	0
	- WHA Utilities & Power		1731.67	1279.19	0	0
	- WHA Logistics		0	0	0	0
	- WHA Digital Platform		0	0	0	0
	<b>Type of Philanthropic Activities</b>					
	Total type of philanthropic activities	% of total cost (A+B+C) must equal to 100	0	100	100	100
	A) Charitable Donations		0	25.15%	26.51%	29.10%
	- WHA Industrial Development			7.55%	7.69%	8.73%
	- WHA Utilities & Power	% of total costs		17.61%	18.82%	20.37%
	- WHA Logistics			0.00%	0.00%	0.00%
	- WHA Digital Platform			0.00%	0.00%	0.00%

GRI Standard	Performance	Unit	2018	2019	2020	2021
	B) Community investment	% of total costs	0	25.56%	18.64%	32.46%
	- WHA Industrial Development			3.49%	5.41%	7.86%
	- WHA Utilities & Power			8.13%	13.24%	18.33%
	- WHA Logistics			13.94%	0.00%	6.27%
	- WHA Digital Platform			0.00%	0.00%	0.00%
	C) Community initiatives	% of total costs	0	49.28%	54.85%	38.44%
	- WHA Industrial Development			14.79%	8.76%	11.53%
	- WHA Utilities & Power			34.50%	21.44%	26.91%
	- WHA Logistics			0.00%	24.66%	0.00%
	- WHA Digital Platform			0.00%	0.00%	0.00%
	<b>Philanthropic Contributions</b>	Baht				
	Total amount of Cash contributions			53.05	42.59	22.48
	- WHA Industrial Development			15.65	9.31	6.32
	- WHA Utilities & Power			36.4	22.78	14.75
	- WHA Logistics			1	10.5	1.41
	- WHA Digital Platform					
	Total amount of Time: employee volunteering during paid working hours	Baht		5,219,357	5,513,978	4,517,921
	- WHA Industrial Development			2,755,898	2,864,822	1,016,989
	- WHA Utilities & Power			1,181,091	1,227,781	2,372,974
	- WHA Logistics			1,276,549	1,415,462	1,120,865
	- WHA Digital Platform			5,836	5,913	7,094
	Total amount of In-kind giving: product or services donations, projects/partnerships or similar	Baht		5,000,000	588,975.00	43,497,315.00
	- WHA Industrial Development			2,000,000.00	588,975.00	588,975.00
	- WHA Utilities & Power			2,000,000.00		
	- WHA Logistics			1,000,000.00		42,908,340.00
	- WHA Digital Platform					
	Total amount of Management overheads	Baht		5,463,688	5,194,328	5,632,153
	- WHA Industrial Development			4,414,994	4,040,634	3,914,123
	- WHA Utilities & Power			661,738	818,910	1,108,809
	- WHA Logistics			356,244	302,535	609,221
	- WHA Digital Platform			30,713	32,248	-

## OCCUPATIONAL HEALTH AND SAFETY

GRI Standard	Performance	Unit	2018	2019	2020	2021
403-9	<b>The number of hours worked</b>					
	<b>Employee</b>	Hour	1,077,504	1,110,024	562,845	1726988
	WHA Industrial Development		577,792	596,808		1188194
	WHA Utilities & Power		197,152	213,840	333,189	320746
	WHA Logistics		234,240	244,944	229,656	185768
	WHA Digital Platform		68,320	54,432		32280
	<b>Contractor</b>		866,784	1,195,996	386,174	1045239
	WHA Industrial Development		460,824	571,236		74750
	WHA Utilities & Power		397,200	616,000	386,174	391993
	WHA Logistics		-	-	-	578496
	WHA Digital Platform		8,760	8,760		0
	<b>Lost time injury frequency rate (LTIFR) – Employee</b>					
	Employee	Case per 1,000,000 hours worked	0	0	0.90	0
	WHA Industrial Development		0.00	0.00	0.00	0
	WHA Utilities and Power		0.00	4.68	0.00	0.579042819
	WHA Logistics		0.00	0.00	0.00	0.579042819
	WHA Digital Platform		0.00	0.00	0.00	0
	<b>Lost time injury frequency rate (LTIFR) – Contractor</b>					
	WHA Industrial Development	Case per 1,000,000 hours worked	0.00	0.00	0.00	0.00
	WHA Utilities and Power		0.00	0.00	0.93	0.00
	WHA Logistics		0.00	0.00	0.00	0.00
	WHA Digital Platform		0.00	0.00	0.00	0.00
	<b>Number of high consequence work related injuries</b>					
	Employee	Case/ 1,000,000 hours worked	0.00	0.00	0.00	0.00
	WHA Industrial Development		0.00	0.00	0.00	0.00
	WHA Utilities and Power		0.00	0.00	0.00	0.00
	WHA Logistics		0.00	0.00	0.00	0.00
	WHA Digital Platform		0.00	0.00	0.00	0.00
	Contractor		0.00	0.00	0.00	0.00
	WHA Industrial Development		0.00	0.00	0.00	0.00
	WHA Utilities and Power		0.00	0.00	0.00	0.00
	WHA Logistics		0.00	0.00	0.00	0.00
	WHA Digital Platform		0.00	0.00	0.00	0.00
	<b>Number of recordable work related injuries</b>					
	Employee	Case	0	1	0	0
	WHA Industrial Development		0	0		0
	WHA Utilities and Power		0	1	0	1
	WHA Logistics		0	0	0	1
	WHA Digital Platform		0	0	0	0
	Contractor		0	0	0	1
	WHA Industrial Development		0	0	0	0
	WHA Utilities and Power		0	0	0	1
	WHA Logistics		0	0	0	0
	WHA Digital Platform		0	0	0	0
	<b>Fatalities</b>					
	Employee	Persons	0.00	0.00	0.00	0
	Contractor		0.00	0.00	0.00	0



## ENVIRONMENT PERFORMANCE

### MATERIALS

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
301-1	Total renewable materials used					
	Total renewable materials used	m3	33,542,602.00	15,989,684.20	21,180,879.88	39,131,671.77
301-2	Recycled input materials used					
	Total input materials used to manufacture the organization's primary products and services	m3	66,262,741.00	64,943,944.00	67,343,639.00	69,233,393.00
	Total recycled input materials used to manufacture the organization's primary products and services	m3	1,841,427.00	3,239,548.00	4,477,502.00	4,583,126.50
	Percentage of recycled input materials used to manufacture the organization's primary products and services	%	2.78	4.99	6.65	6.62

## WASTE

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
306-3	Waste composition					
	Total waste		4,605.16	5,492.90	9234.94	8180.13
	- Hazardous waste	Tons	7.17	6.93	8.31	8.75
	- Non-hazardous waste		4,597.99	5,485.97	9,226.63	8,171.38
306-4	Hazardous waste diverted from disposal by recovery option					
	Total		-	-	-	0
	- Preparation for reuse	Tons	-	-	-	0
	- Recycling		0	0	0	0.06
	- On-site storage		-	-	-	7.02
	Non-hazardous waste diverted from disposal by recovery option					
	Total		-	-	-	-
	- Preparation for reuse	Tons	-	-	-	0
	- Recycling		0.00	0.00	0.00	4,319.12
	- On-site storage		-	-	-	1,319.62
306-5	Hazardous waste directed to disposal by disposal operation					
	Total		1.49	2.28	1.40	1.67
	- Incineration (with energy recovery)	Tons	-	-	-	-
	- Incineration (without energy recovery)		0.00	0.00	0.83	1.67
	- Landfilling		1.29	1.64	1.00	0
	- Other disposal operations		0.00	1.00	0.00	-
	- WHA Utilities & Power		0.20	0.64	0.40	1.67
	Non-hazardous waste directed to disposal by disposal operation					
	Total		3,252.51	4,597.99	5,011.85	2532.64
	- Incineration (with energy recovery)	Tons	-	-	-	-
	- Incineration (without energy recovery)		-	-	-	-
	- Landfilling		3,023.51	2,923.93	4,998.85	2532.64
	WHA Industrial Development		466.00	544.00	588.00	603.48
	WHA Utilities & Power		2,558.00	2,380.00	4,411.00	1,929.16
	- Other disposal operations		229.00	1,674.00	13.00	0
	Total weight of waste directed to disposal	Tons	3,254.00	4,600.27	5,013.25	2354.31

## ENERGY

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
302-1	Energy consumption from non-renewable sources					
	Diesel / Petrol/gasoline	KWh	31,639.00	44,164.00	32,967.00	4,034,794.44
	Grid electricity consumption	KWh	20,413,719.00	25,354,447.00	27,022,964.00	46,569,512
	Energy consumption from renewable source					
	Solar power	KWh	N/A	623,105	555,990	863,029
	Percentage of electricity from renewable sources (wind, water, solar, biogas) used in buildings in portfolio	%	N/A	2.45	2.05	1.85

## GHG EMISSION

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
305-1	Scope 1 emissions by business unit	ton CO2e	667.17	693.18	644.93	1,146
	WHA Industrial Development	ton CO2e	581.49	573.58	555.66	639
	WHA Utilities and Power		85.68	119.60	89.27	274
	WHA Logistics		N/A	N/A	N/A	228
	WHA Digital Platform		N/A	N/A	N/A	5
305-2	Scope 2 emissions by business unit		14,696.30	19,418.87	18,670.51	18,104
	WHA Industrial Development	ton CO2e	2,368.64	2,376.38	2,295.75	3,041
	WHA Utilities and Power		11,882.83	14,758.82	15,730.07	13,458
	WHA Logistics		188.32	262.67	260.34	956
	WHA Digital Platform		256.51	2,021.00	384.35	649

## WATER AND EFFLUENTS

GRI STANDARD	PERFORMANCE	UNIT	2018	2019	2020	2021
303-3	Water withdrawal by source					
	Total water withdrawal	MI	66,262.74	64,943.94	67,343.64	131,611.59
	- Surface water		7,397.59	7,369.52	3,811.91	119,465.57
	- Third party water		58,865.15	57,574.43	63,531.73	11,650.88
303-4	Water discharge by destination					
	Total water discharge	MI	32,720.14	48,954.26	46,162.76	58,538.05
	- Surface water		30,872.90	47,185.82	44,292.55	44,918.63
	- Seawater		1,847.24	1,768.44	1,870.21	13,619.42
	Water discharge by category					
	Freshwater (≤ 1,000 mg/L Total Dissolved Solids)	MI	30,872.90	47,185.82	44,292.55	24711.40
	Other water (> 1,000 mg/L Total Dissolved Solids)		1,847.24	1,768.44	1,870.21	33826.65

## EFFLUENTS QUALITY

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
306-1	Water discharge by quality and location*						
	WHA CIE1						
	pH	-	5.5 - 9.0	7.40	7.30	7.20	7.42
	Temperature	°C	≤ 40.00	30.80	32.50	32.40	30.17
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	12.00	13.00	11.00	8.50
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	42.00	44.00	44.00	37.64
	Grease and Oil	mg/L	≤ 5.00	< 3.00	< 3.00	<3.00	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	17.00	16.00	12.00	7.43
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	832.00	864.00	965.00	1,139.00
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	7.70	4.50	5.20	6.88
	Mercury (Hg)	mg/L	≤ 0.005	0.0001	0.0002	0.0002	ND
	Selenium (Se)	mg/L	≤ 0.02	Na	Na	Na	-
	Cadmium (Cd)	mg/L	≤ 0.03	0	0.007	<0.0001	<0.001
	Lead (Pb)	mg/L	≤ 0.20	0.003	0.003	0.001	0.007
	Arsenic (As)	mg/L	≤ 0.25	0.003	0.003	0.003	0.003
	Chromium (Cr)	mg/L	≤ 0.25	<0.01	<0.01	<0.01	ND
	Barium (Ba)	mg/L	≤ 1.00	Na	Na	Na	-
	Nickel (Ni)	mg/L	≤ 1.00	0.07	0.05	0.1	0.05
	Copper (Cu)	mg/L	≤ 2.00	0.17	0.21	0.31	0.22
	Zinc (Zn)	mg/L	≤ 5.00	0.26	0.22	0.21	0.26
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	NA	NA	NA	-
	-	mg/L	≤ 0.20	NA	NA	NA	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	NA	NA	NA	-
	WHA CIE 2						
	pH	-	5.5 - 9.0	8.50	8.40	8.30	8.32
	Temperature	°C	≤ 40.00	29.60	30.60	29.7	28.58
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	6.00	3.00	5	3.83
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	26.00	27.00	51.00	33.25
	Grease and Oil	mg/L	≤ 5.00	< 3.00	< 3.00	<3.00	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	13.0	11.00	12.00	13.83
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	1,787.00	1,764.00	2160.00	1,603.00
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	2.00	2.30	2.30	1.90
	Mercury (Hg)	mg/L	≤ 0.005	<0.0001	<0.0001	0.0003	ND
	Selenium (Se)	mg/L	≤ 0.02	NA	NA	NA	-
	Cadmium (Cd)	mg/L	≤ 0.03	0.0004	<0.0001	<0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	0.001	<0.0002	<0.0002	<0.0002
	Arsenic (As)	mg/L	≤ 0.25	0.01	0.009	0.01	0.008
	Chromium (Cr)	mg/L	≤ 0.25	<0.01	<0.01	<0.01	ND
	Barium (Ba)	mg/L	≤ 1.00	NA	NA	NA	-
	Nickel (Ni)	mg/L	≤ 1.00	0.01	0.02	0.02	0.006
	Copper (Cu)	mg/L	≤ 2.00	0.002	0.003	0.00	0.022
	Zinc (Zn)	mg/L	≤ 5.00	0.03	0.13	0.16	0.04
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	NA	NA	NA	-
	Cyanide as HCN	mg/L	≤ 0.20	NA	NA	NA	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	NA	NA	NA	-



GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	ESIE Phase 1						
	pH	-	5.5 - 9.0	8.27	8.04	7.69	7.8
	Temperature	°C	≤ 40.00	29.9	29.6	29.80	29
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	5.00	6.00	3.00	4.30
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	38.00	49.00	44.00	31.67
	Grease and Oil	mg/L	≤ 5.00	< 3.00	< 3.00	<3.00	<3.0
	Suspended Solid (SS)	mg/L	≤ 50.00	20.00	12.00	10.00	10.00
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	886.00	685.00	890.00	736
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	2.30	2.20	2.70	8.9
	Mercury (Hg)	mg/L	≤ 0.005	0.0002	0.0004	0.0003	ND
	Selenium (Se)	mg/L	≤ 0.02	0.0004	0.0004	0.0004	<0.0001
	Cadmium (Cd)	mg/L	≤ 0.03	0.0001	0.0001	0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	0.0004	0.0004	0.0003	<0.0002
	Arsenic (As)	mg/L	≤ 0.25	0.004	0.004	0.005	0.0020
	Trivalent Chromium (Cr+3)	mg/L	≤ 0.75	<0.01	<0.01	<0.01	<0.01
	Hexavalent Chromium (Cr+6)	mg/L	≤ 0.25	<0.01	<0.01	<0.01	0.042
	Barium (Ba)	mg/L	≤ 1.00	0.19	0.27	0.11	0.06
	Nickel (Ni)	mg/L	≤ 1.00	0.03	0.02	0.07	0.0005
	Copper (Cu)	mg/L	≤ 2.00	0.004	0.006	0.003	0.11
	Zinc (Zn)	mg/L	≤ 5.00	0.18	0.17	0.12	<0.5
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	<0.50	<0.50	<0.50	<0.005
	Cyanide as HCN	mg/L	≤ 0.20	<0.005	<0.005	<0.005	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	Na	Na	Na	
	ESIE Phase 2B						
	pH	-	5.5 - 9.0	7.70	7.80	7.60	8.2
	Temperature	°C	≤ 40.00	29.80	29.90	30.10	29.29
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	7.00	7.00	5.00	4.7
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	32.00	35.00	45.00	41.45
	Grease and Oil	mg/L	≤ 5.00	< 3.00	< 3.00	<3.00	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	16.00	12.00	9.00	15.45
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	889.00	841.00	905.00	593.5
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	2.40	2.30	2.50	1.36
	Mercury (Hg)	mg/L	≤ 0.005	0.0001	0.0001	0.0001	ND
	Selenium (Se)	mg/L	≤ 0.02	ND	0.0001	0.0001	-
	Cadmium (Cd)	mg/L	≤ 0.03	0.0001	0.0001	0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	0.0003	0.0002	0.0002	0.0003
	Arsenic (As)	mg/L	≤ 0.25	0.002	0.002	0.002	0.0025
	Trivalent Chromium (Cr+3)	mg/L	≤ 0.75	<0.01	<0.01	<0.01	<0.01
	Hexavalent Chromium (Cr+6)	mg/L	≤ 0.25	<0.01	<0.01	<0.01	-
	Barium (Ba)	mg/L	≤ 1.00	0.03	0.03	0.03	-
	Nickel (Ni)	mg/L	≤ 1.00	0.012	0.009	0.009	0.035
	Copper (Cu)	mg/L	≤ 2.00	0.001	0.001	0.001	0.0019
	Zinc (Zn)	mg/L	≤ 5.00	0.03	0.08	0.05	0.033
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	<0.05	<0.05	<0.50	-
	Cyanide as HCN	mg/L	≤ 0.20	<0.005	<0.005	<0.005	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	Na	Na	Na	-

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	WHA ESIE 1 Phase 1						
	pH	-	5.5 - 9.0	7.82	7.60	7.70	8.0
	Temperature	°C	≤ 40.00	30.04	29.85	30.00	30.7
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	10.00	11.00	10.16	6.4
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	30.33	40.75	50.26	51.25
	Grease and Oil	mg/L	≤ 5.00	4.00	3.00	3.00	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	16.58	10.90	17.16	7.5
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	619.00	572.00	626.00	1391
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	9.10	6.80	7.80	2.8
	Mercury (Hg)	mg/L	≤ 0.005	0.0001	0.00065	0.0001	ND
	Selenium (Se)	mg/L	≤ 0.02	0.0005	0.00075	0.0003	0.0003
	Cadmium (Cd)	mg/L	≤ 0.03	0.0001	0.0001	0.0001	<0.0001
	Lead (Pb)	mg/L	≤ 0.20	0.00047	0.0046	0.0003	0.0003
	Arsenic (As)	mg/L	≤ 0.25	0.0083	0.0083	0.0055	0.005
	Chromium (Cr)	mg/L	≤ 0.25	0.01	0.01	0.01	<0.01
	Barium (Ba)	mg/L	≤ 1.00	0.024	0.065	0.035	<0.01
	Nickel (Ni)	mg/L	≤ 1.00	0.05	0.074	0.07	0.14
	Copper (Cu)	mg/L	≤ 2.00	0.0012	0.0011	0.0007	0.09
	Zinc (Zn)	mg/L	≤ 5.00	0.03	0.04	0.04	0.002
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	0.50	0.50	0.50	0.14
	Cyanide as HCN	mg/L	≤ 0.20	0.005	0.005	0.005	<0.5
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	Na	Na	Na	<0.005
	WHA ESIE 1 Phase 3						
	pH	-	5.5 - 9.0	7.8	7.7	7.5	8.7
	Temperature	°C	≤ 40.00	29.55	29.4	29.36	-
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	7.40	8.4	8.1	2.1
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	36.08	39.25	49.17	28.8
	Grease and Oil	mg/L	≤ 5.00	5	3	3	3
	Suspended Solid (SS)	mg/L	≤ 50.00	14.27	10.83	8.7	-
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	303	282	319	291
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	4.25	5.12	9.7	-
	Mercury (Hg)	mg/L	≤ 0.005	0.0001	0.0004	0.0001	ND
	Selenium (Se)	mg/L	≤ 0.02	0.0002	0.0001	0.0003	<0.0001
	Cadmium (Cd)	mg/L	≤ 0.03	0.0001	0.0001	0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	0.0005	0.0002	0.0002	0.0002
	Arsenic (As)	mg/L	≤ 0.25	0.009	0.0053	0.0059	0.002
	Chromium (Cr)	mg/L	≤ 0.25	0.01	0.01	0.01	ND
	Barium (Ba)	mg/L	≤ 1.00	0.045	0.046	0.06	0.01
	Nickel (Ni)	mg/L	≤ 1.00	0.0025	0.001	0.002	0.0011
	Copper (Cu)	mg/L	≤ 2.00	0.00006	0.0005	0.0007	0.0007
	Zinc (Zn)	mg/L	≤ 5.00	0.011	0.019	0.02	0.01
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	0.5	0.5	0.7	-
	Cyanide as HCN	mg/L	≤ 0.20	0.005	0.005	0.005	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	N/A	N/A	N/A	-

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	<b>WHA ESIE 2</b>						
	pH	-	5.5 – 9.0	8.69	7.70	8.75	8.2
	Temperature	°C	≤ 40.00	27.4	29.00	31.00	29.29
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	11.00	8.00	5.00	4.7
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	64.00	31.00	52.00	41.45
	Grease and Oil	mg/L	≤ 5.00	<3	<3	<3	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	56.00	15.00	17.00	15.45
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	261.00	470.00	668.00	593.5
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	3.1	1.9	3	1.36
	Mercury (Hg)	mg/L	≤ 0.005	<0.0001	<0.0001	0.002	ND
	Selenium (Se)	mg/L	≤ 0.02	N/A	N/A	N/A	-
	Cadmium (Cd)	mg/L	≤ 0.03	Not detected	Not detected	Not detected	ND
	Lead (Pb)	mg/L	≤ 0.20	0.0006	0.0004	0.0002	0.0003
	Arsenic (As)	mg/L	≤ 0.25	0.004	0.003	0.004	0.0025
	Chromium (Cr)	mg/L	≤ 0.25	<0.01	<0.01	<0.01	<0.01
	Barium (Ba)	mg/L	≤ 1.00	-	-	-	-
	Nickel (Ni)	mg/L	≤ 1.00	0.002	0.008	0.02	0.035
	Copper (Cu)	mg/L	≤ 2.00	0.002	0.001	0.001	0.0019
	Zinc (Zn)	mg/L	≤ 5.00	0.04	0.02	0.02	0.033
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	N/A	N/A	N/A	-
	Cyanide as HCN	mg/L	≤ 0.20	N/A	N/A	N/A	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	N/A	N/A	N/A	-
	<b>WHA ESIE 4</b>						
	pH	-	5.5 – 9.0	NA	N/A	7.4-8.9	8.0
	Temperature	°C	≤ 40.00	NA	N/A	26.8-32.3	30.8
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	NA	N/A	4-13	4.8
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	NA	N/A	19-64	34.1
	Grease and Oil	mg/L	≤ 5.00	NA	N/A	<3	<3
	Suspended Solid (SS)	mg/L	≤ 50.00	NA	N/A	6-50	17.5
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	NA	N/A	152-260	295
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	NA	N/A	1.4-5.7	1.7
	Mercury (Hg)	mg/L	≤ 0.005	NA	N/A	ND, <0.0001	ND
	Selenium (Se)	mg/L	≤ 0.02	NA	N/A	ND, <0.0001	0.0006
	Cadmium (Cd)	mg/L	≤ 0.03	NA	N/A	ND, <0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	NA	N/A	<0.0002	0.0005
	Arsenic (As)	mg/L	≤ 0.25	NA	N/A	0.000.8-0.002	0.0010
	Trivalent Chromium (Cr+3)	mg/L	≤ 0.75	NA	N/A	<0.01	<0.01
	Hexavalent Chromium (Cr+6)	mg/L	≤ 0.25	NA	N/A	ND, <0.01	ND
	Barium (Ba)	mg/L	≤ 1.00	NA	N/A	0.02-0.04	0.05
	Nickel (Ni)	mg/L	≤ 1.00	NA	N/A	0.0006-0.001	0.002
	Copper (Cu)	mg/L	≤ 2.00	NA	N/A	0.001-0.006	0.0059
	Zinc (Zn)	mg/L	≤ 5.00	NA	N/A	0.01-0.13	0.03
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	NA	N/A	<0.05	<0.5
	Cyanide as HCN	mg/L	≤ 0.20	NA	N/A	<0.005	<0.005
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	NA	N/A	N/A	-



GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	<b>WHA EIE</b>						
	pH	-	5.5 - 9.0	8.00	8.00	8.00	8.45
	Temperature	°C	≤ 40.00	34.00	33.00	34.00	34.60
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	3.00	6.00	2.00	4.00
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	33.00	45.00	49.00	42.58
	Grease and Oil	mg/L	≤ 5.00	3.00	3.00	3.00	<3.0
	Suspended Solid (SS)	mg/L	≤ 50.00	17.00	26.00	22.00	11.16
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	1833.00	2065.00	2405.00	2,417.00
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	3.00	3.00	3.00	2.27
	Mercury (Hg)	mg/L	≤ 0.005	0.00	0.00	0.00	<0.0001
	Selenium (Se)	mg/L	≤ 0.02	0.00	0.00	0.00	0.0008
	Cadmium (Cd)	mg/L	≤ 0.03	0.00	0.00	0.00	0.0020
	Lead (Pb)	mg/L	≤ 0.20	0.00	0.00	0.00	0.0006
	Arsenic (As)	mg/L	≤ 0.25	0.00	0.00	0.00	0.006
	Chromium (Cr)	mg/L	≤ 0.25	N/A	N/A	N/A	ND
	Barium (Ba)	mg/L	≤ 1.00	0.00	0.00	0.00	0.17
	Nickel (Ni)	mg/L	≤ 1.00	0.00	0.00	0.00	0.023
	Copper (Cu)	mg/L	≤ 2.00	0.00	0.00	0.00	0.004
	Zinc (Zn)	mg/L	≤ 5.00	0.00	0.00	0.00	0.36
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	1.00	1.00	1.00	<0.5
	Cyanide as HCN	mg/L	≤ 0.20	0.00	0.00	0.00	0.016
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	N/A	N/A	Na	Not analyzed
	<b>WHA RIL</b>						
	pH	-	5.5 - 9.0	8.00	7.00	7.00	7.00
	Temperature	°C	≤ 40.00	32.00	30.00	31.00	29.50
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	9.00	12.00	8.00	7.83
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	33.00	36.00	49.00	37.16
	Grease and Oil	mg/L	≤ 5.00	3.00	3.00	3.00	<3.0
	Suspended Solid (SS)	mg/L	≤ 50.00	9.00	11.00	10.00	10.83
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	1466.00	1193.00	1083.00	1,224.00
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	11.00	10.00	11.00	9.10
	Mercury (Hg)	mg/L	≤ 0.005	0.00	0.00	ND	<0.0001
	Selenium (Se)	mg/L	≤ 0.02	N/A	N/A	N/A	0.0004
	Cadmium (Cd)	mg/L	≤ 0.03	N/A	N/A	N/A	<0.0001
	Lead (Pb)	mg/L	≤ 0.20	N/A	N/A	N/A	0.0010
	Arsenic (As)	mg/L	≤ 0.25	N/A	N/A	N/A	0.0065
	Chromium (Cr)	mg/L	≤ 0.25	N/A	N/A	N/A	<0.01
	Barium (Ba)	mg/L	≤ 1.00	N/A	N/A	N/A	0.0650
	Nickel (Ni)	mg/L	≤ 1.00	0.00	0.00	0.00	0.013
	Copper (Cu)	mg/L	≤ 2.00	N/A	N/A	N/A	0.003
	Zinc (Zn)	mg/L	≤ 5.00	0.00	0.00	0.00	0.15
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	1.00	1.00	1.00	<0.5
	Cyanide as HCN	mg/L	≤ 0.20	N/A	N/A	N/A	0.0060
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	N/A	N/A	N/A	Not analyzed

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	WHA SIL						
	pH	-	5.5 - 9.0	8.00	8.00	8.00	7.5
	Temperature	°C	≤ 40.00	31.00	30.00	31.00	34.6
	Biochemical Oxygen Demand (BOD)	mg/L	≤ 20.00	6.00	4.00	3.00	3
	Chemical Oxygen Demand (COD)	mg/L	≤ 120.00	54.00	45.00	41.00	35
	Grease and Oil	mg/L	≤ 5.00	4.00	4.00	3.00	3
	Suspended Solid (SS)	mg/L	≤ 50.00	19.00	13.00	11.00	10.6
	Total Dissolved Solid (TDS)	mg/L	≤ 3,000.00	1128.00	1084.00	1073.00	1263
	Total Kjeldahl Nitrogen (TKN)	mg/L	≤ 100.00	2.00	3.00	3.00	1.94
	Mercury (Hg)	mg/L	≤ 0.005	ND	ND	ND	<0.0001
	Selenium (Se)	mg/L	≤ 0.02	N/A	N/A	N/A	N/A
	Cadmium (Cd)	mg/L	≤ 0.03	<0.0001	ND	<0.0001	ND
	Lead (Pb)	mg/L	≤ 0.20	0.00	0.00	0.00	0.0014
	Arsenic (As)	mg/L	≤ 0.25	N/A	N/A	N/A	N/A
	Chromium (Cr)	mg/L	≤ 0.25	N/A	N/A	N/A	N/A
	Barium (Ba)	mg/L	≤ 1.00	N/A	N/A	N/A	N/A
	Nickel (Ni)	mg/L	≤ 1.00	0.00	0.00	0.00	0.009
	Copper (Cu)	mg/L	≤ 2.00	0.00	0.00	0.00	0.004
	Zinc (Zn)	mg/L	≤ 5.00	0.00	0.00	0.00	0.06
	Sulfide as H <sub>2</sub> S	mg/L	≤ 1.00	<0.5	<0.5	<0.5	<0.5
	Cyanide as HCN	mg/L	≤ 0.20	N/A	N/A	N/A	-
	Chloride as Cl <sub>2</sub>	mg/L	≤ 1.00	N/A	N/A	N/A	-

**Remark:** NA = Not applicable; Na = Not analyzed; ND = Not detected

## AIR EMISSION

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
305-7	<b>Ambient air quality monitoring by industrial estate operation*</b>						
	<b>WHA ESIE</b>						
	<b>Location 1: Chompon Chao Phraya Temple</b>						
	NOx	ppm	≤ 0.17	0.004-0.009	0.002-0.008	0.007-0.016	**0.004-0.011
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0035-0.0044	0.0123-0.0138	0.0100-0.0120	**0.0185-0.0204
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.026-0.061	0.024-0.069	0.028-0.053	**0.065-0.080
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	**0.004-0.011
	<b>Location 2: Klong Gram Temple</b>						
	NOx	ppm	≤ 0.17	0.007-0.016	0.009-0.025	0.007-0.019	**0.006-0.008
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0029-0.0039	0.0258-0.0269	0.0097-0.0106	**0.0217-0.0253
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.029-0.113	0.025-0.102	0.026-0.074	**0.051-0.092
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 3: Ras Asadaram Temple</b>						
	NOx	ppm	≤ 0.17	0.006-0.010	0.002-0.003	0.007-0.019	**0.006-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0035-0.0043	0.0094-0.0357	0.0035-0.0040	**0.0124-0.0146
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.039-0.083	0.039-0.074	0.026-0.123	**0.114-0.236
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 4: Ban Wang Ta Pin</b>						
	NOx	ppm	≤ 0.17	0.006-0.011	0.004-0.048	0.007-0.019	**0.003-0.007
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0043-0.0059	0.0093-0.0097	0.0047-0.0053	**0.0088-0.0096
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.049-0.119	0.038-0.118	0.040-0.129	**0.059-0.282
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 5: Ban Map Lang School</b>						
	NOx	ppm	≤ 0.17	0.010-0.023	0.006-0.011	0.007-0.019	**0.007-0.012
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0033-0.0043	0.0039-0.0042	0.0092-0.0103	**0.0060-0.0067
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.026-0.072	0.030-0.095	0.015-0.051	**0.065-0.077
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 6: Sri Sattanaram Monk Center</b>						
	NOx	ppm	≤ 0.17	0.008-0.016	0.003-0.015	0.003-0.016	**0.005-0.011
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0029-0.0040	0.0039-0.0042	0.0050-0.0354	**0.0045-0.0060
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.017-0.035	0.015-0.031	0.018-0.030	**0.056-0.078
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>WHA ESIE1</b>						
	<b>Location 1: Eastern Sugar Company Community School</b>						
	NOx	ppm	≤ 0.17	0.007-0.018	0.015-0.028	0.004-0.016	**0.001-0.030
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0067-0.0087	0.012-0.016	0.0035-0.004	**0.0045-0.0060
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.053-0.097	0.059-0.107	0.023-0.049	**0.030-0.231
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.019-0.040	0.054-0.086	0.014-0.021	**0.011-0.120
	<b>Location 2: Surasak School</b>						
	NOx	ppm	≤ 0.17	0.011-0.021	0.067-0.086	0.008-0.014	**0.004-0.065
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0061-0.0065	0.024-0.026	0.0003-0.004	**0.0003-0.0052
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.066-0.1640	0.090-0.149	0.038-0.068	**0.021-0.251
	Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.013-0.066	0.042-0.097	0.018-0.028	**0.010-0.093
	<b>Location 3: Weather Station</b>						
	NOx	ppm	≤ 0.17	0.004-0.009	0.015-0.028	0.031-0.038	**0.011-0.018
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.004-0.010	0.012-0.016	0.002-0.012	**0.002-0.013
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.031-0.058	0.059-0.107	0.021-0.030	**0.020-0.087
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.031-0.054	0.054-0.086	0.013-0.018	**0.018-0.042



GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
<b>Location 4: Klong Gram Temple</b>							
	NOx	ppm	≤ 0.17	0.014-0.022	0.010-0.026	0.011-0.019	**0.002-0.015
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.003-0.005	0.004-0.005	0.004-0.006	**0.005-0.023
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.046-0.112	0.044-0.209	0.018-0.062	**0.024-0.082
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.017-0.040	0.030-0.120	0.017-0.029	**0.010-0.044
<b>Location 5: Ban Tai Sun</b>							
	NOx	ppm	≤ 0.17	0.009-0.023	0.008-0.035	0.008-0.012	**0.009-0.033
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.006-0.010	0.010-0.012	0.002-0.003	**0.0047-0.012
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.035-0.071	0.034-0.041	0.019-0.039	**0.019-0.052
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.013-0.030	0.027-0.036	0.014-0.020	**0.013-0.044
<b>Location 6: Khao Kan Song Temple</b>							
	NOx	ppm	≤ 0.17	0.007-0.013	0.019-0.043	0.005-0.013	**0.003-0.023
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.006-0.0077	0.037-0.052	0.004-0.0097	**0.007-0.021
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.048-0.092	0.074-0.088	0.034-0.082	**0.023-0.097
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.036-0.059	0.029-0.050	0.019-0.050	**0.017-0.050
<b>Location 7: Ta Kien Ku Temple</b>							
	NOx	ppm	≤ 0.17	0.006-0.015	0.007-0.024	0.004-0.010	**0.002-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.004-0.012	0.017-0.023	0.001-0.003	**0.0003-0.006
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.047-0.063	0.044-0.069	0.019-0.037	**0.018-0.062
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.028-0.049	0.029-0.053	0.016-0.029	**0.010-0.043
<b>Location 8: Ban Som</b>							
	NOx	ppm	≤ 0.17	0.005-0.010	0.006-0.016	0.003-0.010	**0.002-0.020
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0042-0.0044	0.0053-0.007	0.0019-0.0042	**0.0004-0.007
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.064-0.090	0.041-0.120	0.023-0.035	**0.014-0.102
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.028-0.044	0.020-0.048	0.015-0.025	**0.005-0.038
<b>WHA ESIE 2</b>							
<b>Location 1: Ban Map Lam Bid School</b>							
	NOx	ppm	≤ 0.17	0.008-0.016	0.003-0.010	0.016-0.039	**<0.001-0.015
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.007-0.013	0.0031-0.0045	0.0084-0.0089	**0.003-0.008
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.038-0.074	0.031-0.098	0.046-0.115	**0.024-0.039
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.019-0.050	0.019-0.058	0.034-0.053	**0.015-0.023
<b>Location 2: Industrial estate area</b>							
	NOx	ppm	≤ 0.17	0.007-0.021	0.003-0.012	0.010-0.018	**0.004-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.005-0.006	0.0055	0.0060-0.0079	**0.002-0.003
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.046-0.081	0.025-0.128	0.049-0.071	**0.017-0.030
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.029-0.065	0.012-0.043	0.016-0.030	**0.010-0.018
<b>Location 3: Ban Map Lam Bid Moo. 7</b>							
	NOx	ppm	≤ 0.17	0.006-0.012	0.003-0.012	0.004-0.012	**0.003-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.003-0.012	0.0010-0.0204	0.0037-0.0047	**0.008-0.009
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.037-0.075	0.032-0.074	0.038-0.062	**0.025-0.039
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.020-0.044	0.018-0.047	0.024-0.031	**0.014-0.024
<b>Location 4: Khao Kan Song Moo. 3</b>							
	NOx	ppm	≤ 0.17	0.001-0.002	0.002-0.004	0.010-0.028	**0.002-0.009
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.010-0.025	0.0309-0.0398	0.0042-0.0060	**0.005-0.011
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.024-0.073	0.025-0.072	0.050-0.087	**0.033-0.093
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.021-0.051	0.023-0.047	0.022-0.036	**0.029-0.048

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	<b>Location 5: Chong Lom Temple</b>						
	NOx	ppm	≤ 0.17	0.006-0.012	0.0220-0.004	0.002-0.008	**0.003-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.002-0.010	0.001-0.002	0.0029-0.0037	**0.008-0.012
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.023-0.055	0.022-0.066	0.039-0.080	**0.018-0.047
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.016-0.042	0.010-0.038	0.016-0.026	**0.008-0.013
	<b>Location 6: Ban Map Kla Moo. 4</b>						
	NOx	ppm	≤ 0.17	0.005-0.016	0.013-0.028	0.007-0.014	**0.007-0.009
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.003-0.008	0.0283-0.0526	0.0031-0.0092	**0.006-0.015
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.064-0.108	0.041-0.173	0.079-0.175	**0.031-0.077
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.031-0.055	0.024-0.076	0.034-0.076	**0.014-0.029
	<b>WHA ESIE 3</b>						
	<b>Location 1: Ban Ta Jam School</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.031-0.163	0.080-0.218	***0.210-0.790
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.025-0.070	0.034-0.053	***0.071-0.175
	<b>Location 2: Ta Jam Sub-District Hospital</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.035-0.063	0.065-0.087	***0.039-0.061
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.031-0.046	0.028-0.051	***0.021-0.046
	<b>Location 3: Huay Mara Sub-District Hospital</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.031-0.061	0.031-0.055	***0.043-0.129
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.029-0.046	0.023-0.037	***0.021-0.052
	<b>Location 4: Ban Meun Jit Sub-District Hospital</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.032-0.109	0.033-0.076	***0.043-0.056
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.029-0.076	0.025-0.032	***0.020-0.030
	<b>Location 5: Raweng School</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.023-0.077	0.050-0.076	***0.037-0.093
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.018-0.043	0.027-0.040	***0.020-0.041
	<b>Location 6: Chaloemraj Temple</b>						
	NOx	ppm	≤ 0.17	-	-	-	-
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	-	-	-
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	-	0.029-0.063	0.027-0.101	***0.028-0.050
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	0.021-0.041	0.020-0.033	***0.013-0.024

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	<b>WHA ESIE 4</b>						
	<b>Location 1: Ban Nikom Sans Ton Eng-main road</b>						
	NOx	ppm	≤ 0.17	-	0.006-0.014	0.004-0.030	**0.003-0.009
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	0.0051-0.0054	0.0083-0.0089	**0.0113-0.0162
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.023-0.049	0.037-0.075	0.079-0.123	**0.022-0.036
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.021-0.036	0.020-0.038	0.038-0.066	**0.028-0.042
	<b>Location 2: Ban Nong Mapring</b>						
	NOx	ppm	≤ 0.17	-	0.0030-0.0080	0.004-0.021	**0.005-0.010
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	0.0013-0.0017	0.0056-0.0060	**0.0034-0.0063
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.024-0.059	0.034-0.070	0.064-0.096	**0.020-0.029
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.014-0.036	0.021-0.044	0.025-0.039	**0.028-0.038
	<b>Location 3: Mae Nam Ku Temple</b>						
	NOx	ppm	≤ 0.17	-	0.0020-0.0100	0.004-0.022	**0.005-0.016
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	0.0014-0.0031	0.0005-0.0013	**0.0031-0.0042
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.021-0.061	0.054-0.088	0.073-0.117	**0.020-0.032
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.016-0.030	0.024-0.041	0.011-0.043	**0.028-0.040
	<b>Location 4: Ban Mae Nam Ku</b>						
	NOx	ppm	≤ 0.17	-	0.0120-0.0230	0.013-0.024	**0.008-0.016
	SOx	mg/m <sup>3</sup>	≤ 0.30	-	0.0101-0.0104	0.0100-0.0114	**0.0068-0.0168
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.032-0.082	0.042-0.072	0.074-0.115	**0.025-0.037
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.018-0.039	0.027-0.049	0.034-0.061	**0.043-0.077
	<b>WHA CIE1</b>						
	<b>Location 1: Resident and commercial area within the industrial estate</b>						
	NOx	ppm	≤ 0.17	0.002-0.071	0.009-0.062	0.010-0.034	**<0.001-0.028
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0033-0.0045	0.0076-0.0079	0.0029-0.0183	**0.0026-0.0079
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.107-0.123	0.086-0.102	0.110-0.146	**0.183-0.257
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 2: Bo Win School</b>						
	NOx	ppm	≤ 0.17	0.002-0.011	<0.001-0.017	<0.001-0.010	**<0.001-0.033
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0046-0.0065	0.0048-0.0058	0.0017-0.0027	**0.0055-0.0086
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.083-0.091	0.043-0.084	0.028-0.031	**0.132-0.161
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>Location 3: Pan Saded Nok Temple</b>						
	NOx	ppm	≤ 0.17	0.003-0.028	<0.001-0.013	0.033-0.010	**0.0060-0.0580
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0034-0.0046	0.0046-0.0089	0.0079-0.0088	**0.0037-0.0081
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.058-0.073	0.026-0.043	0.016-0.031	**0.157-0.167
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	-	-	-	
	<b>WHA CIE2</b>						
	<b>Location 1: Hoobbon Sub-District Hospital</b>						
	NOx	ppm	≤ 0.17	<0.001-0.022	<0.001-0.003	<0.001-0.003	**<0.001-0.032
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0015-0.0069	0.034-0.0404	0.0053-0.0054	**0.0026-0.0037
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.032-0.092	0.021-0.046	0.032-0.069	**0.044-0.064
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.022-0.059	0.015-0.031	0.018-0.033	**0.031-0.057



GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
<b>Location 2: Khao Hin Lad Temple</b>							
	NOx	ppm	≤ 0.17	0.005-0.046	<0.001-0.001	<0.001-0.018	**<0.001-0.007
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0036-0.0047	0.0078-0.0082	0.0154-0.0236	**0.0037-0.0217
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.057-0.097	0.017-0.031	0.024-0.061	**0.041-0.082
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.022-0.063	0.010-0.020	0.015-0.031	**0.030-0.057
<b>Location 3: Khao Kan Song Moo.3 Community</b>							
	NOx	ppm	≤ 0.17	<0.001-0.058	<0.001-0.010	0.004-0.030	**<0.001-0.008
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0111-0.0159	0.0035-0.0115	0.0010-0.0017	**0.0003-0.0058
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.069-0.107	0.020-0.043	0.024-0.060	**0.080-0.135
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.025-0.072	0.015-0.034	0.019-0.035	**0.045-0.069
<b>Location 4: Siri Anusorn Community</b>							
	NOx	ppm	≤ 0.17	<0.001-0.023	0.001-0.006	0.001-0.027	**<0.001-0.035
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0035-0.0054	0.0123-0.0204	0.0192-0.0196	**0.0173-0.0212
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.055-0.120	0.023-0.037	0.027-0.059	**0.048-0.096
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.027-0.063	0.008-0.031	0.014-0.032	**0.028-0.048
<b>WHA EIE</b>							
<b>Location 1: WHA EIE office</b>							
	NOx	ppm	≤ 0.17	0.001-0.038	<0.001-0.025	0.001-0.024	<0.001-0.018
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0059-0.0102	0.0032-0.0053	0.0034-0.0228	0.0004-0.0014
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.018-0.082	0.015-0.077	0.018-0.055	0.016-0.029
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.039-0.142	0.034-0.161	0.020-0.115	0.020-0.047
<b>Location 2: Nong Fab Temple</b>							
	NOx	ppm	≤ 0.17	0.001-0.034	<0.001-0.022	<0.001-0.025	**<0.001-0.033
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0081-0.0245	0.0278-0.0289	0.0037-0.0436	**0.0046-0.0059
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.029-0.075	0.014-0.066	0.027-0.055	**0.023-0.042
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.040-0.131	0.030-0.127	0.047-0.096	**0.038-0.065
<b>Location 3: Map Chalud Temple</b>							
	NOx	ppm	≤ 0.17	<0.001-0.060	<0.001-0.016	<0.001-0.016	**<0.001-0.017
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.0072-0.0339	0.0024-0.0190	0.0198-0.0278	**0.0014-0.0026
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.021-0.093	0.023-0.081	0.023-0.055	**0.02-0.072
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.038-0.180	0.055-0.145	0.045-0.118	**0.035-0.101
<b>WHA RIL</b>							
<b>Location 1: WHA RIL office</b>							
	NOx	ppm	≤ 0.17	<0.001-0.033	<0.001-0.024	0.001-0.025	**<0.001-0.041
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001-0.007	0.001-0.019	<0.001-0.041	**0.002-0.006
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.015-0.049	0.008-0.044	0.015-0.032	**0.013-0.039
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.025-0.098	0.018-0.058	0.021-0.053	**0.023-0.061
<b>Location 2: Ban Sam Yak Community</b>							
	NOx	ppm	≤ 0.17	<0.001-0.024	<0.001-0.024	<0.001-0.030	**<0.001-0.026
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.002-0.007	0.002-0.016	<0.001-0.002	**<0.001-0.009
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.011-0.072	0.008-0.035	0.007-0.029	**0.018-0.048
	Total Suspended Particulate matter <sub>10</sub> (PM <sub>10</sub> )	mg/m <sup>3</sup>	< 0.12	0.025-0.084	0.023-0.057	0.017-0.049	**0.030-0.066

GRI Standard	Performance	Unit	Standard	2018	2019	2020	2021
	Location 3: Nong La Lok Community						
	NOx	ppm	≤ 0.17	<0.001-0.022	<0.001-0.032	0.001-0.029	**<0.001-0.008
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001-0.014	0.001-0.038	<0.001-0.006	**0.003-0.008
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.015-0.045	0.009-0.030	0.013-0.027	**0.015-0.031
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.030-0.068	0.016-0.049	0.022-0.042	**0.031-0.054
	Location 4: Ban Klong Nam Yen Community						
	NOx	ppm	≤ 0.17	<0.001-0.025	<0.001-0.023	<0.001-0.026	**<0.001-0.032
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001-0.011	<0.001-0.006	<0.001-0.006	**0.001-0.008
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.017-0.053	0.010-0.030	0.015-0.033	**0.014-0.088
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.042-0.126	0.020-0.042	0.025-0.049	**0.031-0.125
	WHA SIL						
	Location 1: WHA SIL office						
	NOx	ppm	≤ 0.17	<0.001-0.008	0.002-0.019	<0.001-0.062	**<0.001-0.020
	SOx	mg/m <sup>3</sup>	≤ 0.30	0.002-0.004	0.001-0.004	0.002-0.007	**0.002-0.003
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.015-0.038	0.019-0.066	0.031-0.087	**0.016-0.021
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.051-0.111	0.059-0.117	0.069-0.121	**0.030-0.038
	Location 2: Nong Pla Mo School						
	NOx	ppm	≤ 0.17	0.001-0.007	0.001-0.048	<0.001-0.051	**0.002-0.018
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001-0.002	0.001-0.003	<0.001-0.002	**0.002-0.005
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.021-0.033	0.041-0.099	0.040-0.104	**0.026-0.053
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.050-0.088	0.084-0.264	0.079-0.204	**0.058-0.141
	Location 3: Bua Loi Klang School						
	NOx	ppm	≤ 0.17	<0.001-0.009	0.001-0.035	0.001-0.032	**0.003-0.017
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001-0.002	0.002-0.006	0.001-0.002	**0.001-0.005
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.017-0.030	0.025-0.043	0.045-0.079	**0.014-0.023
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.048-0.066	0.045-0.077	0.073-0.132	**0.043-0.063
	Location 4: Ban Mai Tung Din Khor School						
	NOx	ppm	≤ 0.17	<0.001-0.009	0.001-0.016	<0.001-0.048	**0.001-0.017
	SOx	mg/m <sup>3</sup>	≤ 0.30	<0.001	0.001-0.003	0.001-0.003	**0.002-0.005
	Total Suspended Particulate (TSP)	mg/m <sup>3</sup>	≤ 0.33	0.016-0.048	0.042-0.059	0.036-0.080	**0.017-0.026
	Total Suspended Particulate matter10 (PM10)	mg/m <sup>3</sup>	< 0.12	0.036-0.088	0.053-0.100	0.066-0.146	**0.034-0.060

**Note:** \*\* is the data from WHAID  
\*\*\* is the data from WHA UP

## BIODIVERSITY

GRI Standard	Performance	Unit	2018	2019	2020	2021
304-1	Number of operations in relation to protected area	Operations		2.00	2.00	2.00
	Number of operations in relation to high biodiversity value area			2.00	2.00	2.00
	Number of operations assessed for biodiversity value			2.00	2.00	3.00
	Number of operations required biodiversity management plan			2.00	2.00	3.00
	Number of operations implemented biodiversity management plan			2.00	2.00	3.00
	<b>Total number of sites for operational activities that have conducted biodiversity impact assessments in past 5 years</b>	Number		4.00	4.00	4.00
	Area	Hectares		2.00	2.00	2.00
	<b>Of the sites assessed in the past five years, how many sites are in close proximity to critical biodiversity, and what is the total area of these sites?</b>					
	Area	Hectares		2.00	2.00	2.00

## ENVIRONMENTAL COMPLIANCE

GRI Standard	Performance	Unit	2018	2019	2020	2021
307-1	Non-compliance with environmental laws and regulations					
	<b>Total number of violations of legal obligations/ regulations</b>	<b>Cases</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	- Significant fines	Baht	0	0	0	0
	- Non-monetary sanctions	Cases	0	0	0	0
	- Case brought through dispute resolution mechanisms	Cases	0	0	0	0



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# CLIMATE CHANGE SCENARIO ANALYSIS

		Scenario 1							
		4C Scenario							
		BAU							
		Short Term (1-5 years)			Medium Term (>5 years)			Long Term	
Risk Type	Specific Risk	WHALG	WHAID	WHAUP	WHALG	WHAID	WHAUP	WHALG	WHAUP
PHYSICAL RISKS									
Acute	Flooding				●	●	●	●	●
	Drought					●	●		●
	Storm and lighting	●					●		
Chronic	Increase mean temperature				●	●	●	●	●
TRANSITION RISKS									
Policy and Legal					●	●	●	●	●
Technology - New improvements or innovations		●	●	●					
Market - shift in supply and demand		●	●				●		
Reputation - Change in customer and community perception		●	●				●		
OPPORTUNITIES									
Market - shift in supply and demand		●	●		●	●	●	●	●
Resource Efficiency & Energy Source			●			●			●
Technology - New improvements or innovations				●					

● Low    ● Medium    ● High



[illegible]



## LRQA INDEPENDENT ASSURANCE STATEMENT

### Relating to WHA Corporation Public Company Limited's GHG assertion for the calendar year 2021

This Assurance Statement has been prepared for WHA Corporation Public Company Limited in accordance with our contract but is intended for the readers of this Report.

#### Terms of engagement

LRQA (Thailand) Limited was commissioned by WHA Corporation Public Company Limited (WHA) to provide independent assurance on its GHG assertion 2021 against the AccountAbility's AA1000AS v3 assurance criteria to a moderate level of assurance for the GRI specific standard disclosures listed below and materiality level of the professional judgement of the verifier is applied, where the scope was a Type 2 engagement.

Our assurance engagement covered WHA's financial control in Thailand only and specifically the following requirements:

- Evaluating the reliability of data and information for only the selected environmental indicators listed below:
  - GRI 305-1: Direct GHG emissions (Scope 1)<sup>1, 2</sup>
  - GRI 305-2: Energy indirect GHG emissions (Scope 2)

Our assurance engagement excluded the data and information of WHA's financial control and activities outside Thailand, as well as suppliers, contractors and any third parties mentioned in the report.

LRQA's responsibility is only to WHA. LRQA disclaims any liability or responsibility to others as explained in the end footnote. WHAs' responsibility is for collecting, aggregating, analysing and presenting all the data and information within the Assertion and for maintaining effective internal controls over the systems from which the Assertion is derived. Ultimately, the Assertion has been approved by, and remains the responsibility of WHA.

#### LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that WHA has not, in all material respects:

- Met the requirements above
- Disclosed reliable performance data and information as no errors or omissions were detected

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

**Note:** The extent of evidence-gathering for a moderate level of assurance engagement is less than for a moderate level of assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a moderate assurance engagement been performed.

## LRQA's approach

LRQA's assurance engagements are carried out assurance using AA1000AS v3. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Auditing WHA's data management systems to confirm that there were no significant errors, material mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions, and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.
- Sampling of evidence during remote verification from facilities level, only the selected indicators to confirm its reliability.

## Observations

Further observations and findings, made during the assurance engagement, is:

- Reliability: Data management systems are properly defined for the selected environmental indicators. However, should consider interim verification to further improve the reliability and timeliness of its disclosed data and information

## LRQA's Standards, competence and independence

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification is the only works undertaken by LRQA for WHA Corporation Public Company Limited and WHA Utilities and Power Public Company Limited and as such does not compromise our independence or impartiality.

Dated: 21 March 2022

Opart Charuratana  
LRQA Lead Verifier

On behalf of LRQA (Thailand) Limited  
22nd Floor, Sirinrat Building, 3388/78 Rama IV Road  
Klongton, Klongtoey, Bangkok 10110 Thailand  
LRQA reference: BGK406131A

**Table 1. Summary of WHA Corporation Public Company Limited, GHG Assertion 2021**

Scope of CO2 emissions	CY 2021 01 Jan - 31 Dec 2021
GRI 305-1: Direct GHG emissions (Scope 1). Biogenic emissions.	1,146 41
GRI 305-2: Energy indirect GHG emissions (Scope 2).	18,104
<b>Notes:</b> <ul style="list-style-type: none"><li>• Data is presented in tonnes of Co<sup>2</sup> equivalent.</li><li>• CY2021 is an organization selected base year.</li></ul>	



## FEEDBACK FORM : 2021 SUSTAINABILITY REPORT

### READER PROFILE

#### GENDER

<input type="checkbox"/> Female	<input type="checkbox"/> Male
<input type="checkbox"/> Not Specified	

#### AGE

<input type="checkbox"/> Below 25 years old	<input type="checkbox"/> 25 – 40
<input type="checkbox"/> 41 – 60	<input type="checkbox"/> More Than 60

### RELATIONSHIP WITH WHA GROUP (PLEASE SELECT 1 ANSWER)

<input type="checkbox"/> Shareholder/Investor	<input type="checkbox"/> Customer	<input type="checkbox"/> Employee	<input type="checkbox"/> Supplier and Creditor
<input type="checkbox"/> Competitor	<input type="checkbox"/> Government / Regulator	<input type="checkbox"/> Community	

### WHY DO YOU PREFER READING THIS SUSTIANABILITY REPORT?

<input type="checkbox"/> For support investment decision	<input type="checkbox"/> For understanding more about WHA's business
<input type="checkbox"/> Research and educational purposes	<input type="checkbox"/> Other (Please specify) <input type="text"/>

### YOUR SATISFACTION WITH THE PRESENTATION FORMAT OF "SUSTAINABLE REPORT"

Content easy to understand	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied
Content cover your interested topics	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied
Reliable information	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied
The design of this report	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied
Readability	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied
Overall satisfaction with the Report	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Dissatisfied

### AFTER READING THIS ANNUAL REPORT, ARE YOU CONFIDENT THAT WHA POTENTIALLY ACHIEVES THE SUSTAINABLE GROWTH?

<input type="checkbox"/> Yes,	<input type="text" value="because"/>
<input type="checkbox"/> No,	<input type="text" value="because"/>
<input type="checkbox"/> No idea,	<input type="text" value="because"/>

### IN YOUR OPINION, WHICH IS THE MOST SIGNIFICANT ASPECT TOWARD WHA SUSTAINABLE GROWTH?

<input type="checkbox"/> Economy	<input type="text" value="(Please specify)"/>
<input type="checkbox"/> Environment	<input type="text" value="(Please specify)"/>
<input type="checkbox"/> Society	<input type="text" value="(Please specify)"/>

### SUGGESTIONS

PLEASE SPECIFY OTHER SUGGESTIONS FOR DEVELOPMENT AND IMPROVEMENT OF SUSTAINABILITY REPORT OF THE FOLLOWING YEAR

**Thank you for your information and valuable opinion which advantages us for improvement of next issue of the report.**

Questionnaire can be sent by postal mail or email to:  
Sustainability Development Working Team : WHA CORPORATION PUBLIC COMPANY LIMITED  
77 WHA TOWER, 23<sup>rd</sup>-25<sup>th</sup> Floor, Moo 13, Debaratna Road (Bangna-Trad) KM.7,  
Bang Kaeo, Bang Phli, Samutprakarn 10540 Thailand  
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