



## **B.Grimm Power**

SET AWARDS 2022

*Sustainability Excellence*

*2<sup>nd</sup> September 2022*

# Presenters



**Mr. Harald Link**

President



**Mr. Nopadej Karnasuta**

Senior Executive Vice President  
– Investment, Innovation and  
Sustainability



**Dr. Florian Nagel**

First Senior Vice President  
- Head of Corporate Strategy



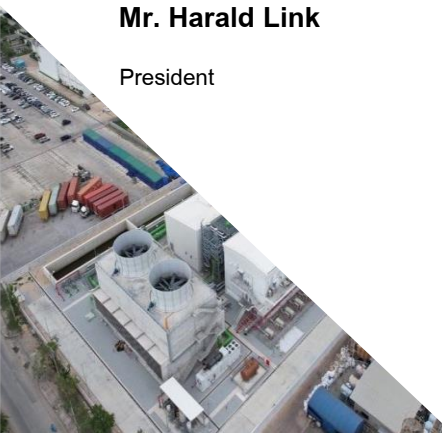
**Mrs. Solaya Na Songkhla**

First Senior Vice President  
- Head of Investor Relations  
and Corporate Sustainability



**Ms. Varaporn Osatanon**

Assistant Vice President  
- Corporate Sustainability



# Agenda



Competitive Advantages



Climate Strategy



Driving Positive Changes





# Our Competitive Advantages





# B.Grimm: **More than 144 Years** of **Doing Business with Compassion**

*"Doing Business with Compassion for the Development of Civilization in Harmony with Nature"*

**Values: Positivity, Pioneering Spirit, Professionalism, and Partnership**

- **Longest established** infrastructure, industrial, and healthcare group in Thailand **since 1878**
- **Concessionaire and contractor of the largest infrastructure system in Thailand and Southeast Asia** of the 1890s: Rangsit irrigation canals
- **Introducing leading engineering technologies into Thailand since the 1880s** until today with Krupp, Siemens, Carl Zeiss, Merck, Voith and United Technologies



Opened Siam Dispensary

1878



Built Rangsit canal together with Snidvongse family

1890



Installed the first telephone line between Germany and Thailand

1931



Supplied turnkey systems and services with Siemens for BTS sky train

1994



Awarded 1<sup>st</sup> Small Power Producer (SPP) contract for Amata B.Grimm Power 1

1996



Consortium leader for Airport Rail Link

2010



B.Grimm Power reached 3,379 MW installed capacity

Aug 2022



# Empowering the World Compassionately



## EMPOWER

- Build human capabilities
- Power industries, businesses and communities



## THE WORLD

- Find trusted partners and great opportunities in attractive countries
- Grow our footprint all over the world

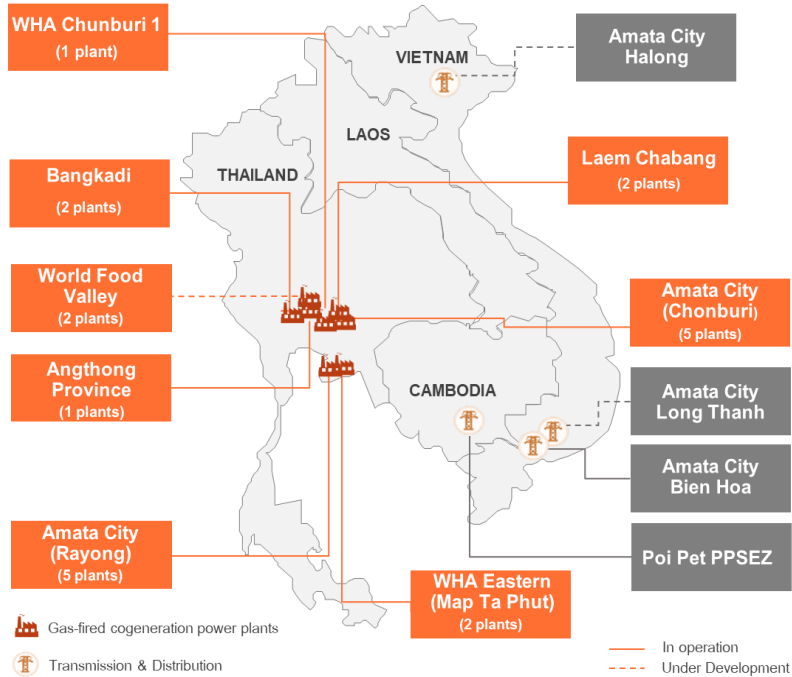


## COMPASSIONATELY

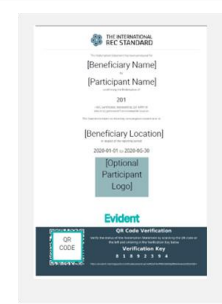
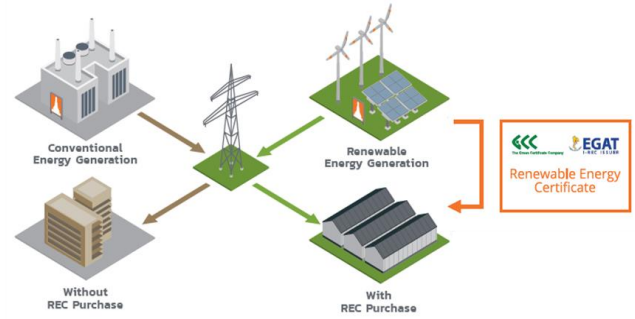
- Cultivate a culture of mindfulness and compassion among everyone at B.Grimm

That means **empowering great people and partners** to be a force for good in the **societies and the environment** where we operate.

# Pioneer in providing clean energy to the industrial sector



**>20 Industrial power plants** in portfolio  
 The region's longest private transmission & Distribution



*“Facilitating and procuring REC certificates from various renewable sources in Thailand and Vietnam”*

Pioneer in providing **REC** to industrial users in Thailand and Vietnam

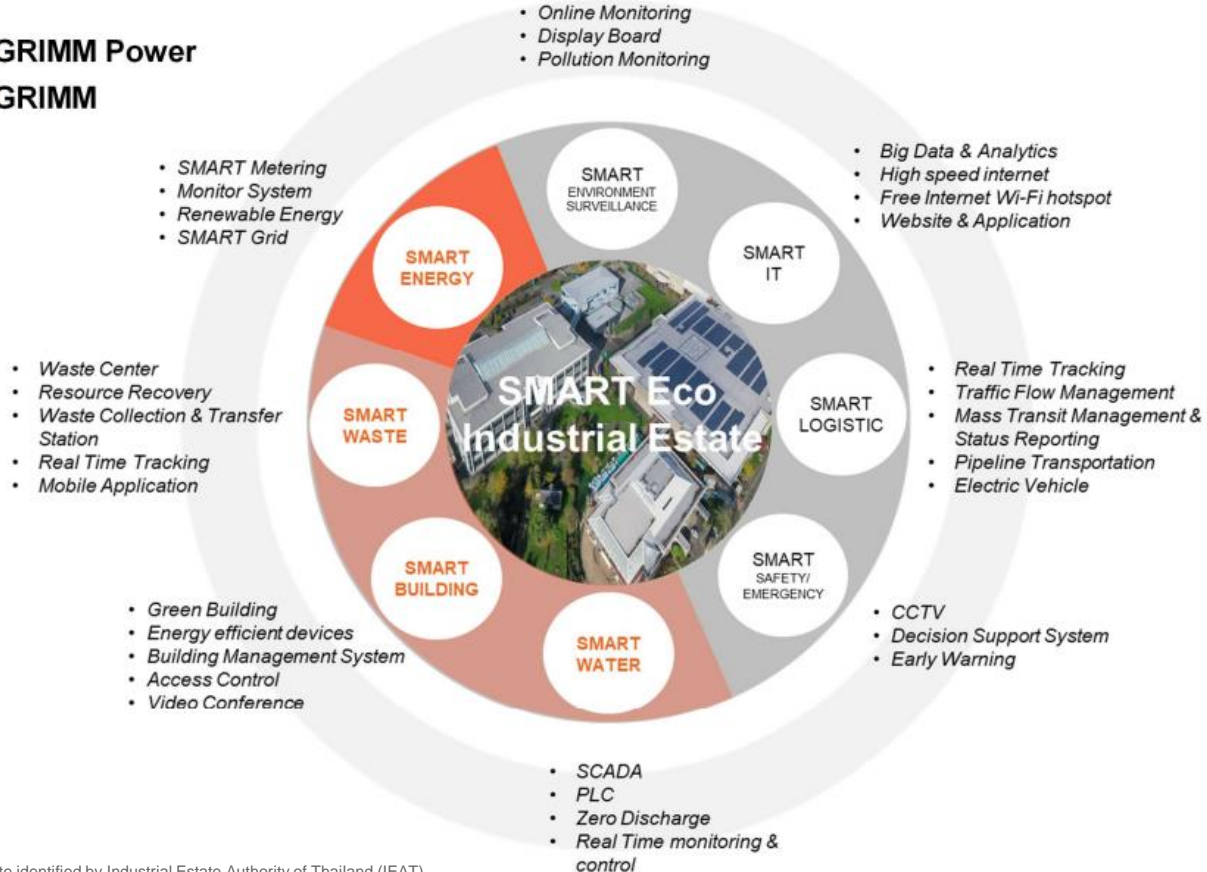




# SMART Eco Industrial Estate

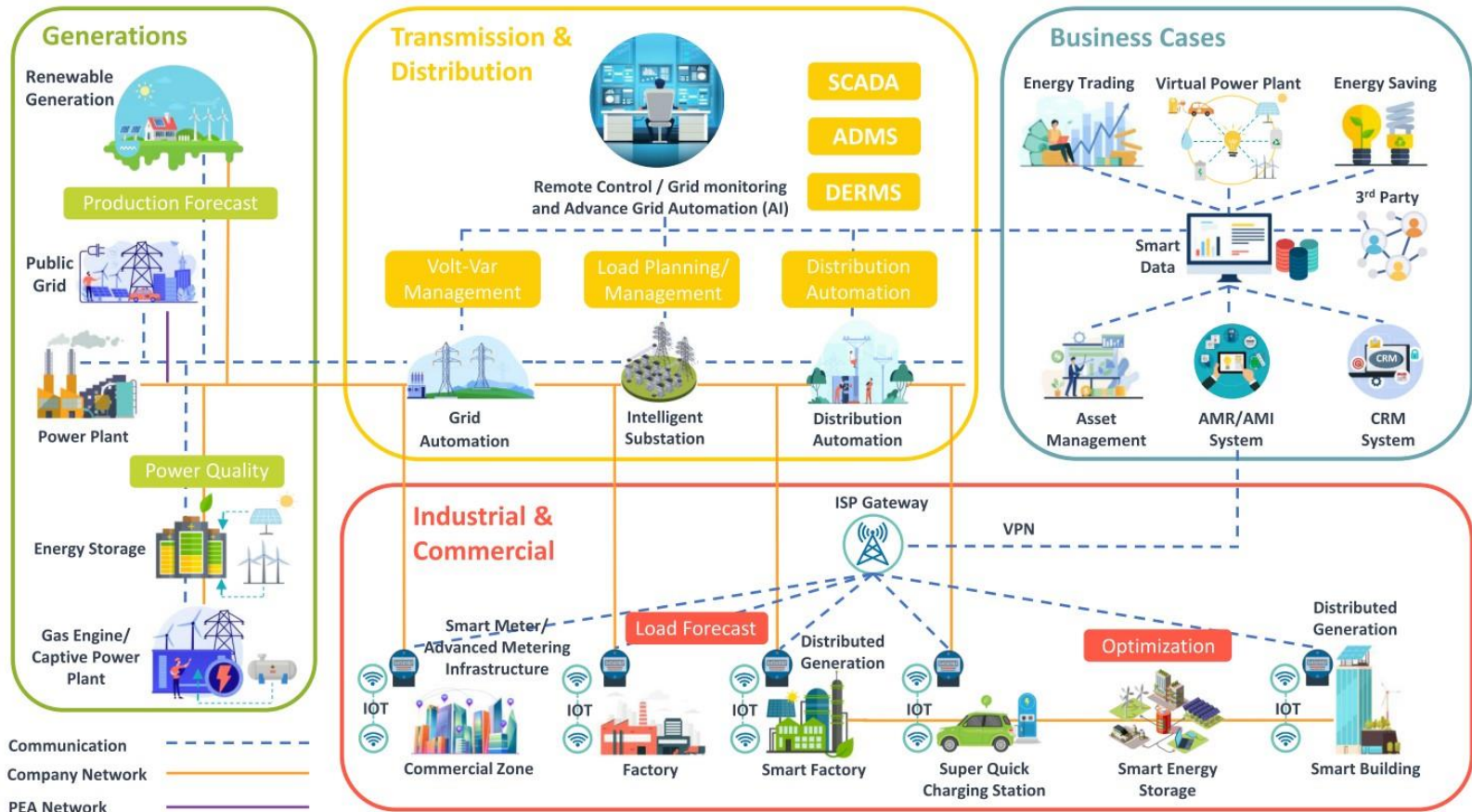
● **B.GRIMM Power**

● **B.GRIMM**



# Utilities Solution: Electricity and Transmission & Distribution

Ensuring high reliability and digital platform readiness

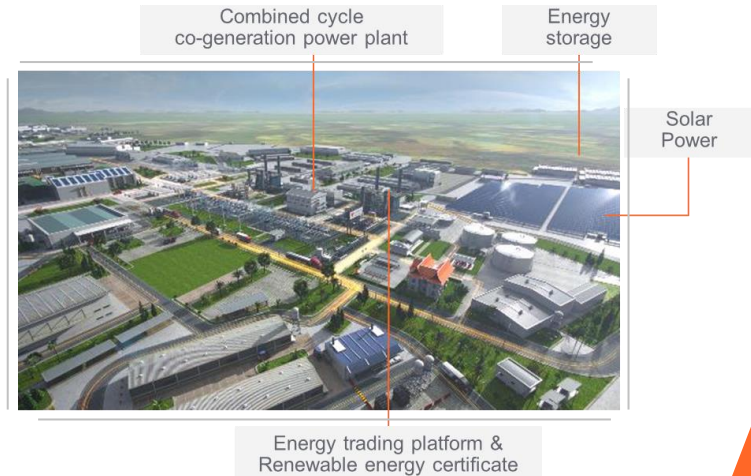
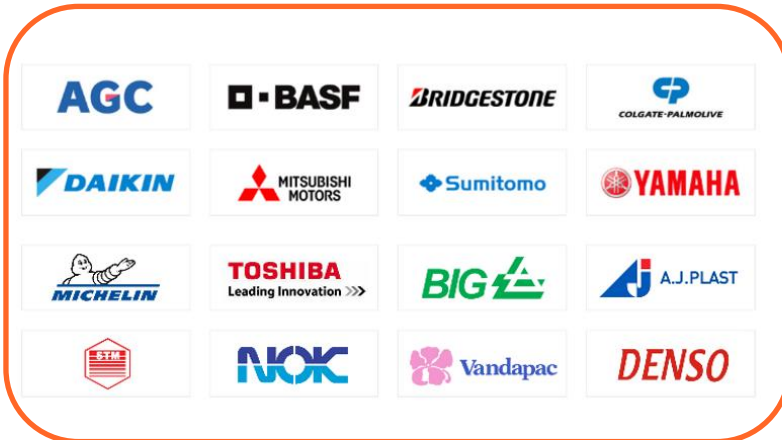


# B.Grimm Power Competitive Advantages



## Industrial Customer Base and Data

- Over 20 years of experience in corporate PPA's by collaboration with our industrial customers
- Customer intelligence best positions us to future-proof our products and services by implementing innovative energy solutions at scale



# B.Grimm Power Competitive Advantages



## Know-how

- First-in-class proprietary know how in the development, implementation, and operation of high-efficiency gas-fired as well as renewable generation assets
- Highly flexible operation of thermal power plants is the prime enabler for large-scale renewable energy penetration

### Efficiency improvement

#### 1 Gas-Turbine Upgrades (2019-2024)

- ⚙️ ↓ Maintenance period
- 🔥 ↓ Gas consumption by 1%
- ⚡ ↑ 7 MW / plant available for IU

#### 2 SPP Replacement

- ⚙️ New Technology
- 🔥 Gas consumption by ~15%
- ⚡ MW increase
- 💧 Wastewater treatment capacity to reduce freshwater consumption



*The collaboration to be the world pioneer in technology for power industry by developing digital tools called “Digital Performance Twin”*



# Key Challenges and Strategies

## Challenges

### High and Volatile Fuel Cost

- Fuel makes up the major share of our cost and can only partially be transferred to our industrial customers
- LNG spot prices >THB700, Pool prices >THB400/MMBTU
- Margin of Industrial customer business is under pressure
- FT Increase partially restores margin but makes Thailand less attractive, which may be creating challenges in the future



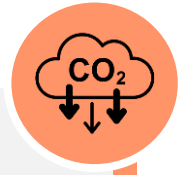
## Strategy

### Stabilise Margin and Electricity Prices

- Long-term LNG supply agreements using shipper license
- Co-firing locally produced hydrogen and syngas using excess renewable energy
- Hedging our cashflows through merchant tail of renewable assets in liberalized markets, where electricity and gas prices are strongly correlated

### Decarbonizing our Generation Portfolio

- Maintaining a stable and reliable grid with large renewable penetration is a big technical challenge
- Intermittency of renewable energy calls for over-capacity or costly large-scale energy storage, both driving prices
- Subsidies or compensation payments are not available, leaving the technical and financial burden on us



### Use Gas-fired Assets as Transition Enablers

- Future-proof our gas assets to transition from steady-state operation to back-up capacity operation
- Using operational data from our extensive customer base, enhance our operation capabilities of gas assets with procedures for efficient balancing of renewables at low cost
- Develop capabilities in co-firing of alternative fuels

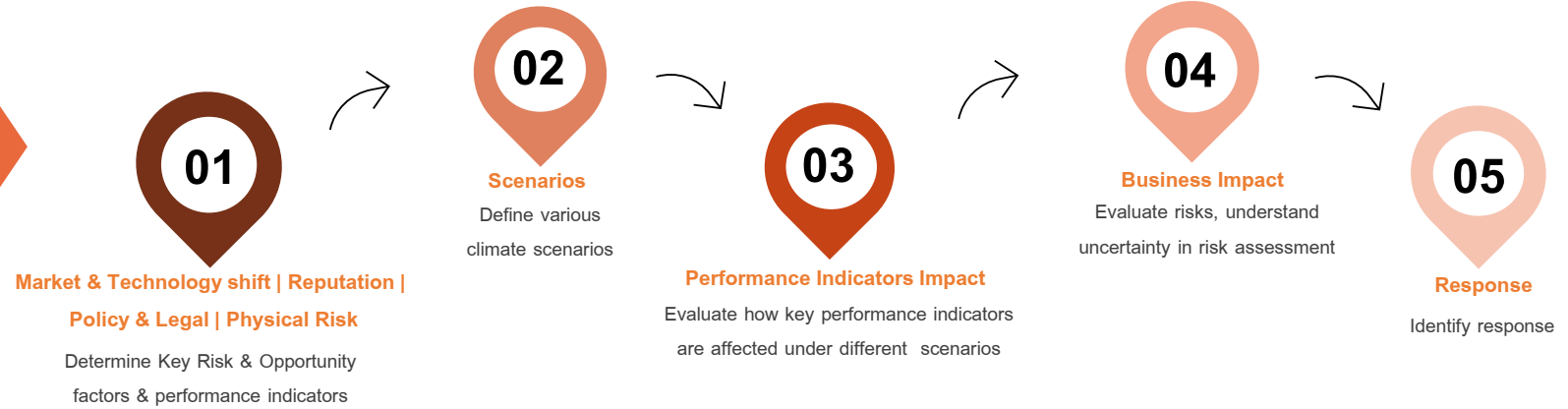


# Climate Strategy



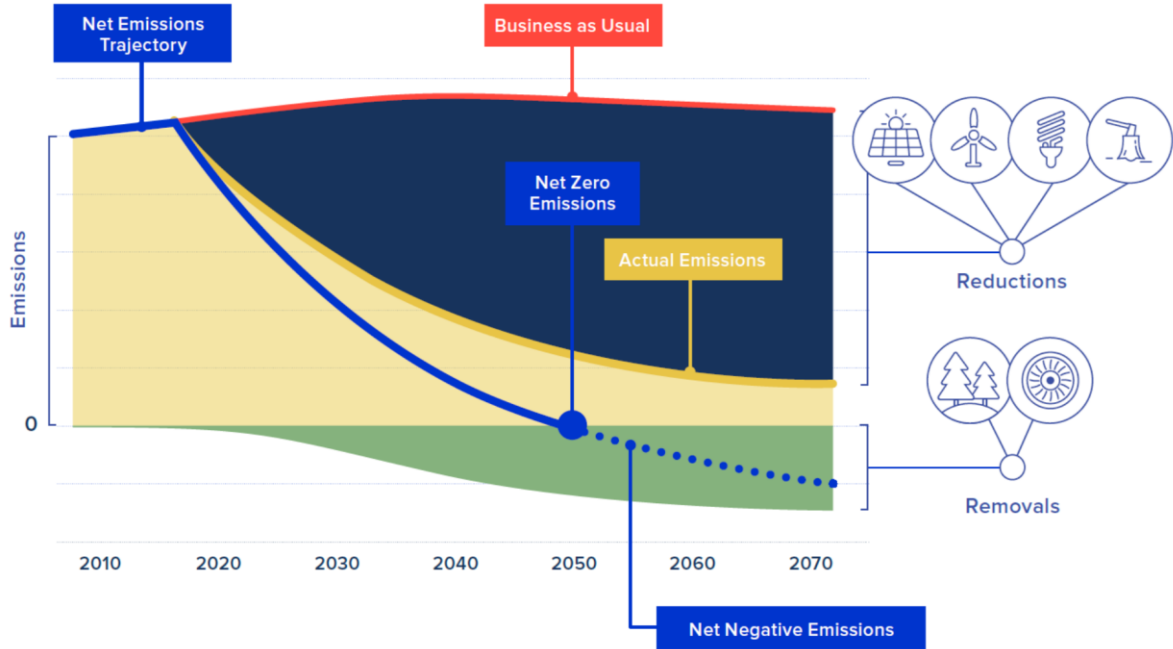
# Climate-Related Risk & Opportunities Assessment

Impacts from Climate Change

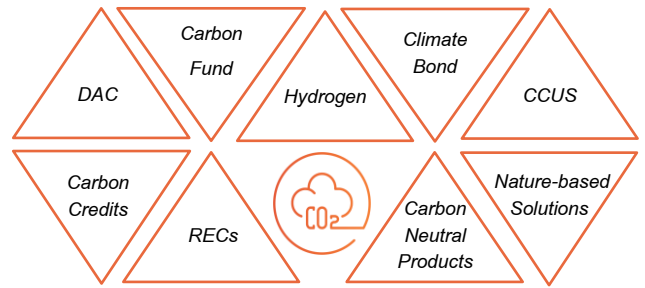


Physical risks	<b>Acute</b> <i>Medium-Long term time horizon</i> P1 Flooding P2 Typhoons	<b>Chronic</b> <i>Medium-Long term time horizon</i> P3 Rising Sea Levels P4 Extreme Heat P5 <b>Water Stress</b>	Opportunities	<b>Resource Efficiency</b> <i>All time horizon</i> O1 Increased Energy Efficiency	<b>Energy Source</b> <i>Medium-Long term time horizon</i> O2 Shift towards decentralized energy generation O3 <b>Revenue from selling Energy Attribute Certificates</b>
	<b>Policy and Legal</b> <i>Medium-Long term time horizon</i> T1 <b>Carbon Cost (tax/allowance)</b> T2 Enhanced emissions reporting obligation	<b>Technology</b> <i>Medium-Long term time horizon</i> T3 Costs to transition to lower emissions technology		<b>Products and Services</b> <i>Medium-Long term time horizon</i> O4 Expand Business to low emission products	<b>Markets</b> <i>Medium-Long term time horizon</i> O5 Access to new markets
	<b>Market</b> <i>Medium-Long term time horizon</i> T4 Increased costs of raw materials (Natural gas/LNG) T5 Changing customer behavior towards net-zero	<b>Reputation</b> <i>All time horizon</i> T6 Changes in reputation amongst investors and stakeholders			
Transitional risks					

# Opportunities from translating net-zero target into an action plan



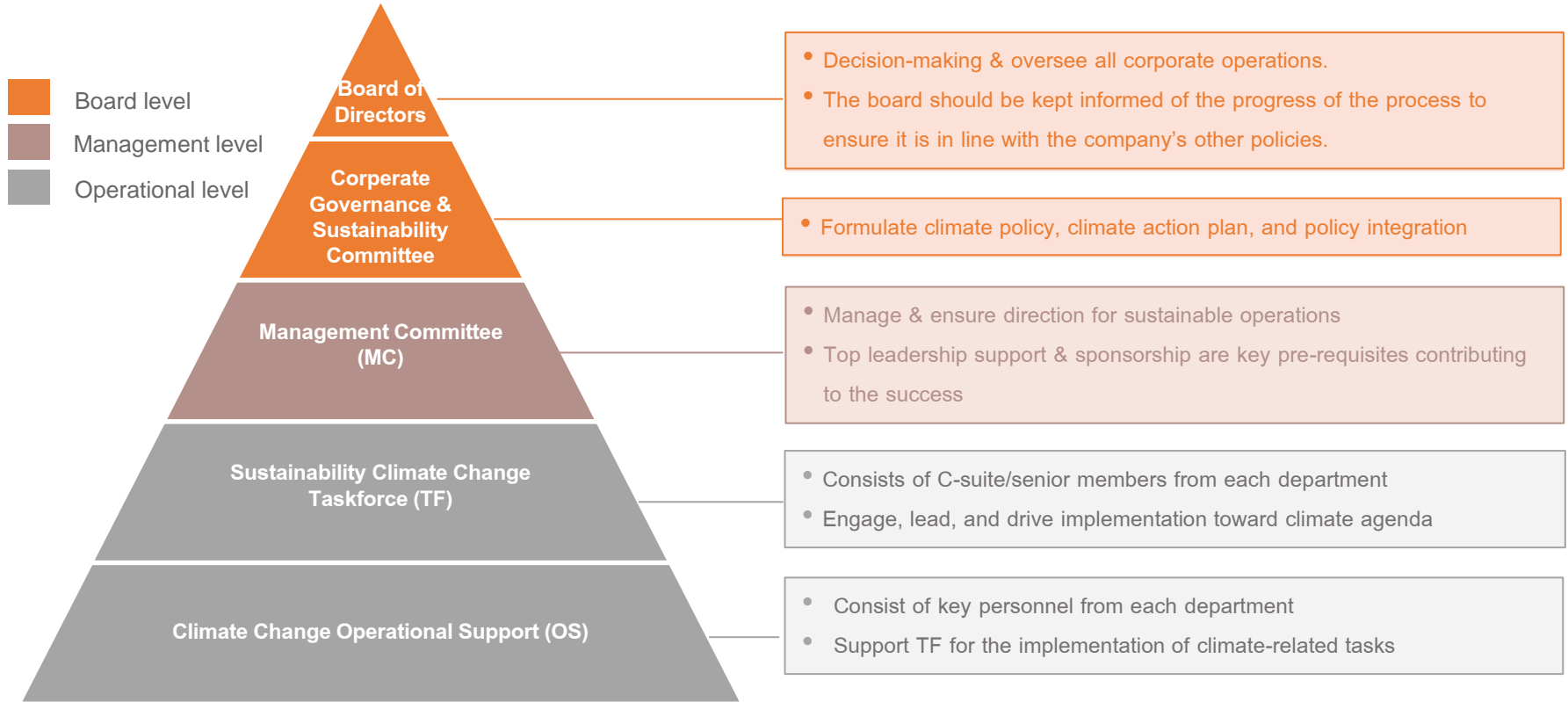
*Opportunities arise to work clients & stakeholders by focusing on value chain emission management.*





# Progress and Actions

## Climate Governance Structure



# Climate Strategy Framework

## “Net-Zero Emissions by 2050”



### Climate Governance & Commitment

Integrate climate vision to the **core strategic value**, driving sustainable business growth

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Establish **Climate Governance Structure** and strengthen our operational practices

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Raise staff awareness and knowledge related to climate through **workshops and training**

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Disclose and report carbon practices & performance aligning with the **international standards**



### Climate Risk & Opportunity Management

Integrate **climate-related risks & opportunities** into business strategy

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Use **Internal Carbon Pricing** to make CAPEX decisions

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**Assess & monitor** corporate-level climate-related risks, opportunities and climate actions

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**Carry out adaptive capacity action** to reduce risks from natural phenomenon

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#### Monitor decarbonisation opportunities

- green hydrogen blending
- carbon capture and storage
- other carbon removal options



### Low Carbon & Adaptive Capacity Investment

Increase investment in **renewables**, aim to **secure 1 GW** of capacity during 2021-2025

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Investment in:

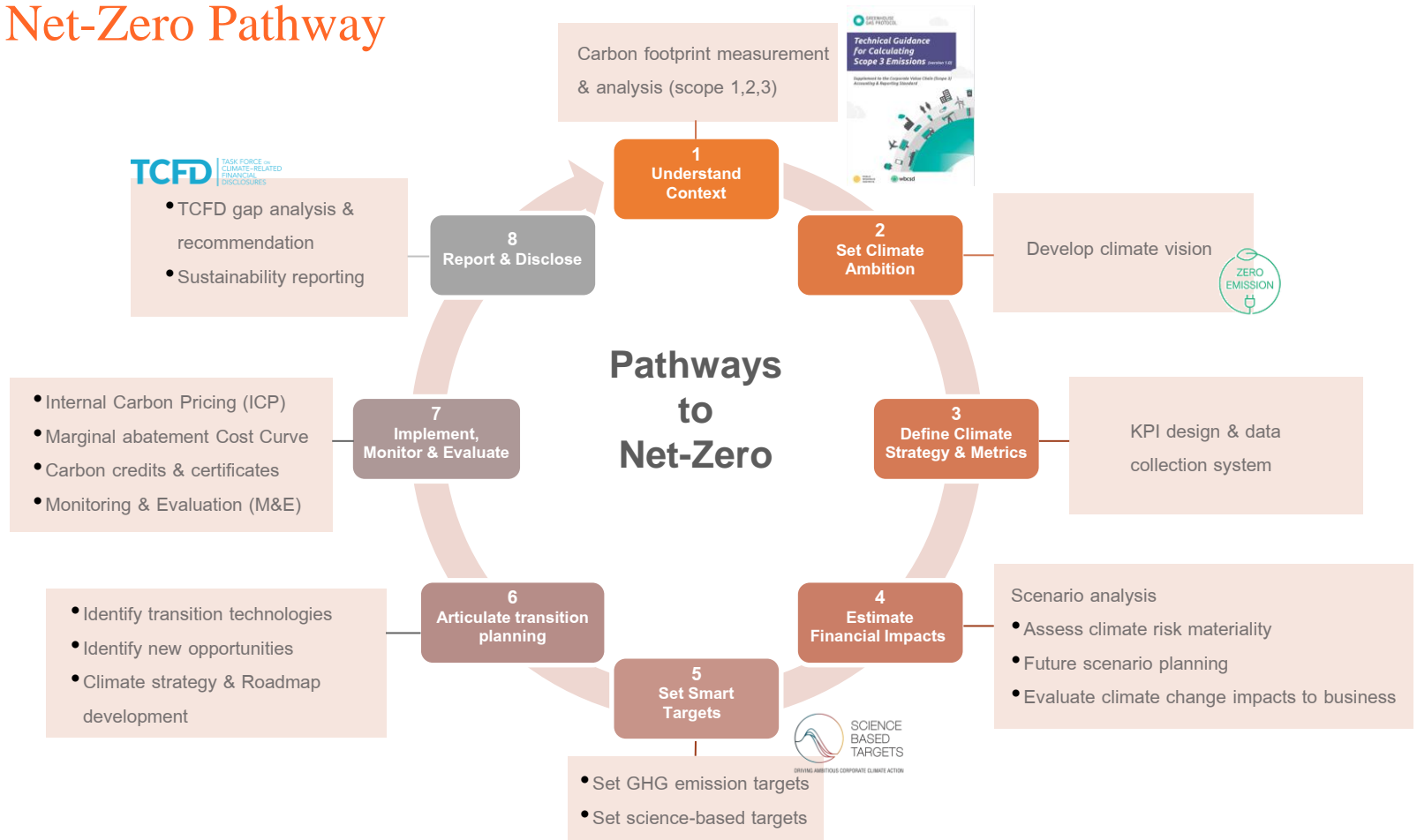
- operational efficiency,
  - resource consumption reduction,
  - limiting emissions throughout supply chain
- 

Raise the **Sustainable funds** i.e.

- green/climate bonds
  - sustainability-linked loans
- 

Create a verified GHG inventory covering scope 1, 2 and 3 to **identify emissions reduction potentials**

# Action Cycle toward the Net-Zero Pathway



# Progress and Actions

## B.Grimm Climate Journey



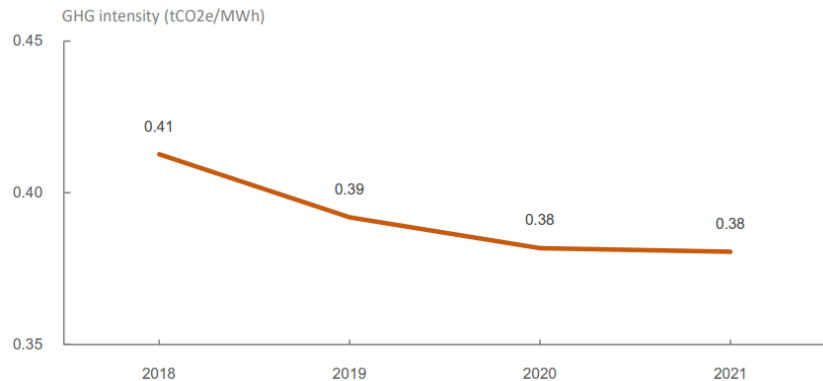
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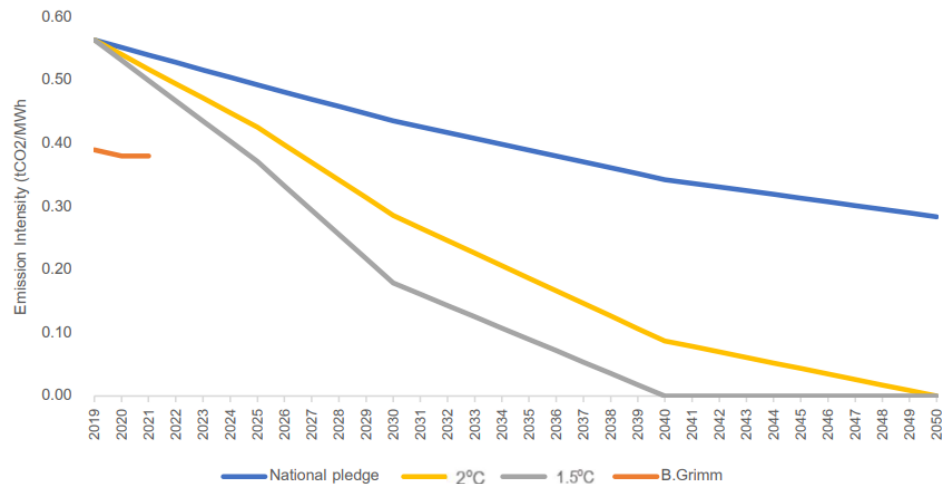


# B.Grimm's GHG intensity has reduced by 6.8% from 2018

B.Grimm's GHG intensity



Non-OECD countries power sector carbon intensity benchmark



*Our intention for emission intensity is to perform better than the benchmark of IEA for non-OECD countries.*

# Driving Positive Changes



# B.Grimm Power Sustainability Framework

- Cover economic, environment, and social dimensions, underpinned by corporate governance, directly contribute to **the 7 strategic** United Nations Sustainable Development Goals (UNSDGs)
- Aim to address B.Grimm Power's key materiality issues and **promote long-term growth and deliver positive values to all stakeholders** in the value chain.

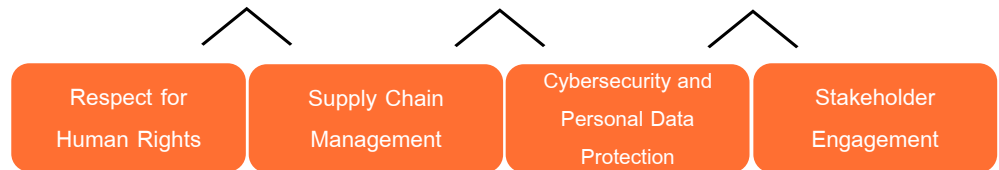
“  
EMPOWERING THE WORLD COMPASSIONATELY  
”



## B.Grimm Power Sustainability Strategy



## Solid Sustainability Foundation under Good Corporate Governance



# Economic Dimension

## Management Approach and Performances

Material

### Operational Excellence

- Ensure regular monitoring, analysing, and reporting indicators to deliver operational improvement beyond legal limits on project-based and overall performance
- Embedded innovation and technologies into operation e.g. Digital Twins, Machine Health Monitoring and Diagnostics
- Regular on the job trainings & case studies sharing across power plants



#### Business & Social/Environmental Benefit

- Revenue rose by **5.8% YoY**
- Gas consumption reduction by **1% YoY**
- Increasing **7 MW / plant** available for IU

Inputs

### Customer Relationship Management

- 24/7 customer service at each power plants
- Leveraging results from annual customer satisfaction survey to fulfill customer needs
- Help customer efficiently manage their usage via Customer web service portal
- Regular trainings for sales & customer service teams

#### Business & Social/Environmental Benefit

- **95%** customers satisfied (vs 92% in 2021)



### Digital Transformation

- Digital Transformation towards Sustainability Program
- Ensure staff readiness through Innovation Execution Program, Digital Mindset Program
- Pilot project for Energy Trading Program



#### Business & Social/Environmental Benefit

- **76 digital transformation projects** in 2021
- New Business **opportunities**
- **Transforming** company culture

Outcomes



# Economic Dimension

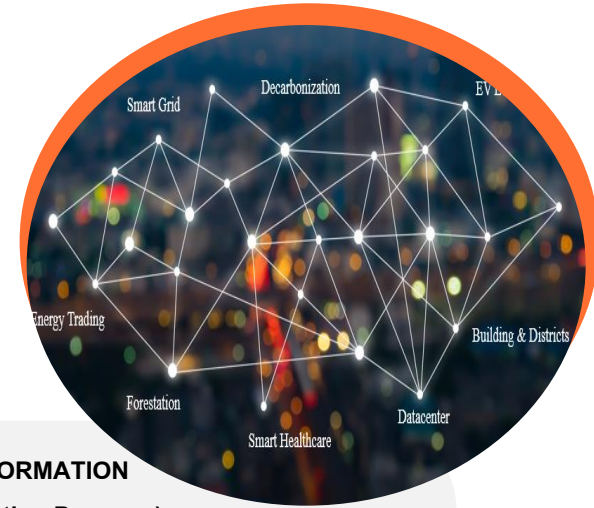
## Activity Highlights

### AI Machine Health Monitoring and Diagnostics

Cooperation with Rayong Engineering and Maintenance Co., Ltd. under REPCO NEX, Industrial Solutions in the SCG Chemical group



- ↑ Predictive Analytic and real time detection to early detect anomalies
- ↑ Prevent operating disruption (reduce severe risks/damage)






### DIGITAL TRANSFORMATION (Innovation Execution Program)

Partnered with GIC: Global Innovation Catalyst and Stanford Online, to enhance innovation management and execution, and for our staff to become transformation leaders

- ↑ Transform company into an innovation-focused organization
- ↑ Opportunity of business growth and new initiatives
- ↑ Build an innovative and entrepreneurship mindset

# Social Dimension

## Management Approach and Performances

Material	<h3>Our People</h3>	<h3>Occupational Health &amp; Safety (OHS)</h3>	<h3>Community &amp; Social Development</h3>
Inputs	<ul style="list-style-type: none"> <li>6-Dimensional <b>Strategic Workforce Planning</b></li> <li><b>Identify core competency, new skills required in Employee development programs</b> through online (B.Grimm Academy) &amp; offline channels, cooperated with educational institutes e.g. UTCC, Harbour Space, Standford online</li> <li><b>Employee well-being</b> e.g. hybrid-workplace policy, Mindful Compassion</li> </ul>	<ul style="list-style-type: none"> <li><b>Promote culture of safety, aiming for zero accident in both employees and contractors</b></li> <li>Set OHS policy, strategy and governance in place and verified OHS management system (ISO 45001)</li> <li>OHS risk and hazard assessments and a business continuity plan &amp; an emergency response plan</li> <li>OHS training</li> </ul>	<ul style="list-style-type: none"> <li><b>Enhance youth education and skilled workforce particularly in STEMs</b> through Dual Vocational Education Program, The Little Scientists' House Program</li> <li><b>Sustainable Cultivation Centre</b> at Hydro Powerplants in Laos</li> <li><b>Promote art, sport, and culture</b> through scholarships and sponsorship e.g. RBSO, the Princess Mother's Charity Fund Foundation, Thai polo club)</li> </ul>
Outcomes	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li><b>77% employee satisfaction</b> (vs 65% in 2019)</li> <li>Narrow skill gaps to support future growth by upskill/reskill</li> </ul> 	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li><b>Zero fatalities</b> for both employee and contractors</li> <li><b>Zero Lost-Time Injury Frequency Rate (LTIFR)</b> for contractors in 2021</li> </ul> 	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li>Gain social license to operate and improve relations with local communities</li> <li>Support students, create job opportunities, build awareness and knowledge</li> </ul> 

# Social Dimension Activity Highlights

*“Doing Business with Compassion for the Development of Civilisation in Harmony with Nature”*

## DUAL VOCATIONAL EDUCATION PROGRAMS



- **118 students** joining the programs to be equipped with practical skills in electrical engineering during 2011 to 2021
- Increase potential talent pool for B.Grimm selection

## SUSTAINABLE CULTIVATIVE CENTRE at our Hydro Power Plants in Laos



- **49 individuals** from nearby communities participated in the centre's organic farming and environmental stewardship activities
- **Reduced electric consumption by 2,373 kW** or 1,933,588 kip/year by switching to solar pumps

**THB238mn**

Community & Social  
Engagement Investment



## THE LITTLE SCIENTISTS' HOUSE OF THAILAND



- **232 schools** joining the program under B.Grimm network (of total 29,120 schools for the whole program)
- Multiply the number of workers in **scientific and engineering fields** for future national development

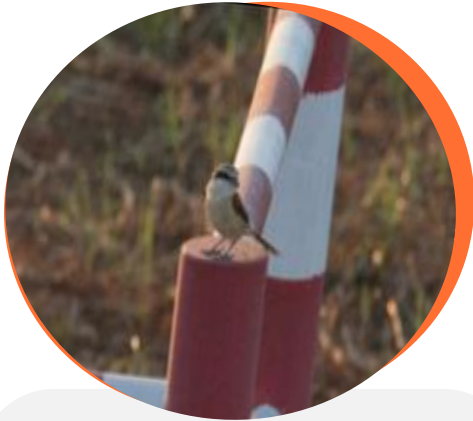
# Environment

## Management Approach and Performances

Material	Climate Strategy	Environmental and Resource Management	Biodiversity and Forest Conservation
Inputs	<ul style="list-style-type: none"> <li>Net-zero carbon emissions by 2050 commitment</li> <li>Task Force on Climate-Related Financial Disclosures (TCFD) supporter</li> <li>Set up climate-related framework &amp; establishing Internal Carbon Pricing: ICP</li> </ul> 	<ul style="list-style-type: none"> <li><b>100%</b> of Combined Cycle Co-generation power plants certified by ISO14001 standard</li> <li><b>Promote initiatives to reduce and/or optimise resources</b> e.g. Power wing project, Circular Economy and 3Rs concept e.g. reduce chemical</li> </ul>	<ul style="list-style-type: none"> <li><b>Net Positive Impact on biodiversity &amp; No Net Deforestation commitments</b></li> <li>Restore biodiversity impact at operating sites by performed Biodiversity Risk Assessment at all operating sites</li> <li>Create positive biodiversity impact &amp; compensate deforestation through partnership</li> </ul>
Outcomes	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li>Set up climate governance and taskforce</li> <li>Linked management compensation with climate related performance</li> <li>GHG intensity (GHG emission tCO<sub>2</sub>e/MWh) decreased <b>by 6.8%</b> from 2018 to 2021</li> </ul>	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li><b>-5.7%</b> YoY net water consumption (<b>82%</b> of which were treated wastewater)</li> <li><b>-22%</b> YoY total waste generated, (<b>87%</b> of which were Reuse / Recycle / Sold)</li> </ul> 	<p><b>Business &amp; Social/Environmental Benefit</b></p> <ul style="list-style-type: none"> <li>Improve tiger population, food &amp; habitats of tiger prey, recovery of banteng &amp; bird species on IUCN Red list</li> <li>Set up Biodiversity Action Plan (BAP) where relevant</li> </ul>

# Environment Dimension

## Activity Highlights



### RESTORE ECOSYSTEM

- **Performed avian biodiversity monitoring** & restored at 3 solar powered sites, located in Lat Krabang, Nong Chok and Sai Noi.
- Improved species of birds near by the sites **from 2 in 2018 to 8 in 2021** on IUCN Red List

### WATER CONSUMPTION OPTIMISATION CAMPAIGNS

**Reduced water consumption of 77,244 m<sup>3</sup>/year from initiatives at powerplants** i.e.

- Increasing water cycles at cooling towers by 3-4 times (reuse wastewater)
- Add a cover to a cooling basin to avoid water overflow
- Reuse wastewater from sludge thickener
- Reuse water discharged from Reverse Osmosis (RO) system



### POWER WING

- **570 solar panels, built as a shade covering car park areas** of 1,211sqm<sup>2</sup> at B.Grimm Power Headquarter
- **Generate 129,713 kWh electricity** and save Bt408k/year



# Environment Dimension

## Activity Highlights

*Achieve positive impact on biodiversity collaborating with communities & stakeholders*

### SAVE THE TIGERS PROJECT

- **Tiger & prey monitoring:** 17 tigers (+2 YoY) and Recovery of Banteng
- **Increase tiger prey:** 32 sambars released, 2 grasslands, 6 artificial saltlicks installed
- **Smart patrol & awareness raising:** 231 students & 200 individuals from local communities participated in activities and campaigns.











### FORESTATION

- **No deforestation at 43 of 45 operating sites**
- **328,090 trees planted** both in Thailand and overseas to compensate forest loss through collaboration with partners e.g. The Mrigadayavan Palace Botanic Garden, Economic Forest, Drone Afforestation, Industrial Estate Greenification

More details on [Biodiversity Highlights](#)

# Sustainability Recognitions

	<p><b>S&amp;P Global Sustainability Yearbook and Industry Mover</b> by S&amp;P Global</p>		<p><b>MSCI ESG Rating: A</b></p>
 <p>FTSE4Good</p>	<p><b>FTSE4GOOD Emerging Index</b> <b>FTSE4GOOD ASEAN 5 Index</b></p>		<p><b>Thailand Sustainability Investment</b> by SET <b>4 consecutive years (2018-2021)</b></p>
	<p><b>ESG 100 company</b> by Thaipat Institute <b>4 consecutive years (2018-2021)</b></p>		<p><b>Thai CAC certified</b> by Thailand's Private Sector Collective Action <b>2 consecutive terms</b></p>
	<p><b>CGR Score: EXCELLENT</b> by Thai Institute of Directors Association <b>2 consecutive years (2020-2021)</b></p>		<p>2020 The first green loan certified by <b>Climate Bond Initiative in CLMVT</b></p>





**B.GRIMM**

**SINCE 1878**

# Appendix





## Who we are

# B.Grimm Power today

We are a top-tier energy utility, providing reliable and affordable energy, from natural gas and renewable energy, to single-buyer markets and industrial customers in our region.

# 3,379

Mega Watt

**Installed  
Capacity**

# 75.2

% of the operating capacity

**Natural Gas  
Powered**

# 29.4

Billion Thai Baht

**1H'2022  
Revenue**

# 74.0

% of 1H'2022 revenue

**State-Owned  
Off-taker**

# We will focus on **7 strategic initiatives** to (em)power our future

## Market Opportunities



Increasing electricity demand in Asia Pacific (B2G)

1



Needs for lower cost of electricity and resources

2



Needs for reliable power in industrial estate

3



Needs for end-to-end total solution for buildings

4



Needs for power transmission in other countries

5



Energy trading

6



Implement wide ranging digital technologies

7

## 7 Strategic Initiatives

Significantly expand our **gas and renewable generating capacity** in the region (B2G)

Become a significant player in the **LNG business and clean fuel supply**

Grow our B2B solution offerings to **industrial** customers

Supply **commercial building complexes with reliable utilities**

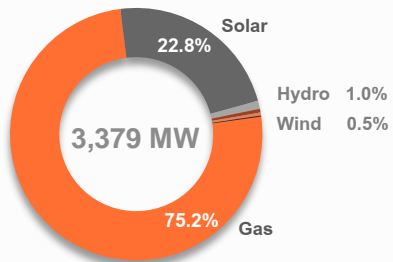
Become a significant player in **private transmission & distribution**

Maximize reliability and viability in **energy trading**

Champion global best practices in **digital transformation**

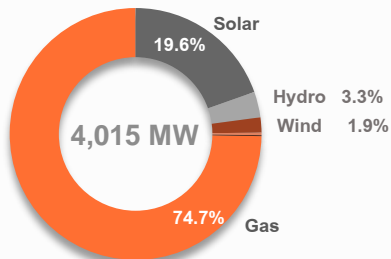
# Generation overview and growth target of 7,200 MW in 2025

## Capacity Breakdown by Fuel Type



**Q2'2022** (operating)

Conventional 76%  
Renewable 24%

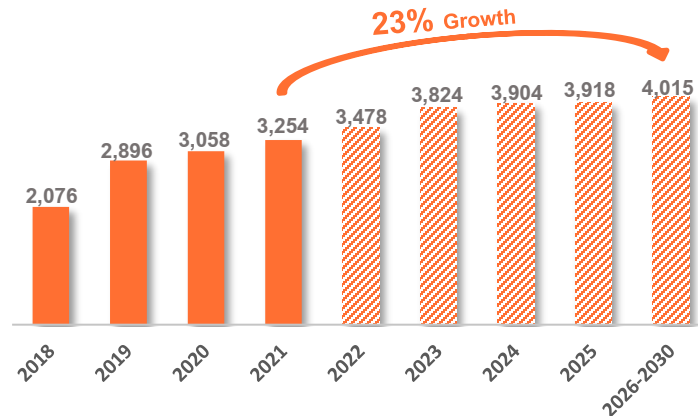


**2026-2030** (existing PPA)

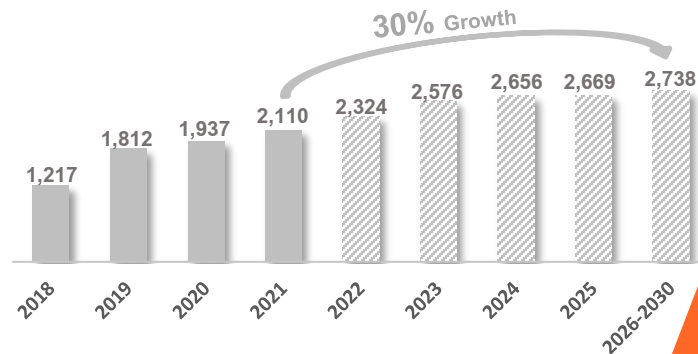
Conventional 75%  
Renewable 25%

- Gas 2,920 MW
- Solar 769 MW
- Hydro 133 MW
- Hybrid 98 MW
- Wind 78 MW
- iWTE 5 MW
- Backup 13 MW\*

## Installed Capacity of Existing PPA (MW)



## Equity Capacity of Existing PPA (MW)



## Other Business

### Transmission & Distribution



Bien Hoa (Vietnam)

(with 13 MW back up for power trading)



Poi Pet PPSEZ (Cambodia)

### Solar Rooftop\*\*



Solar rooftop for industrial users and commercial buildings with up to 100 MW opportunity

### Renewable Energy Certificate (REC)

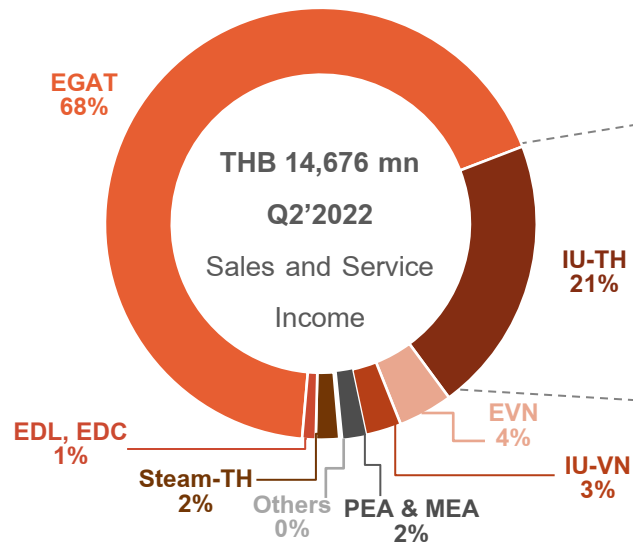


Facilitating and procuring REC certificates from various renewable sources in Thailand and Vietnam

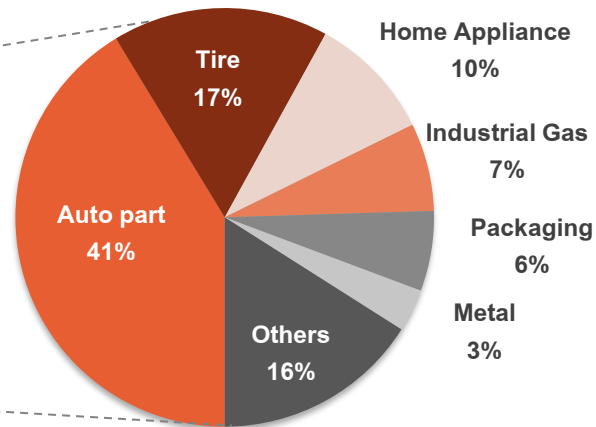
\*For power trading, \*\*Solar rooftop is not included in total installed capacity

# Revenue breakdown

## Q2'2022 REVENUE BREAKDOWN BY CUSTOMER



## Q2'2022 IU VOLUME BREAKDOWN BY SECTOR



### IU Volume

