

UBS ESG Corporate Day 2021

October 27, 2021



1. Overview of GPSC

2. GPSC Strategy & Sustainability

3. Sustainability Initiatives



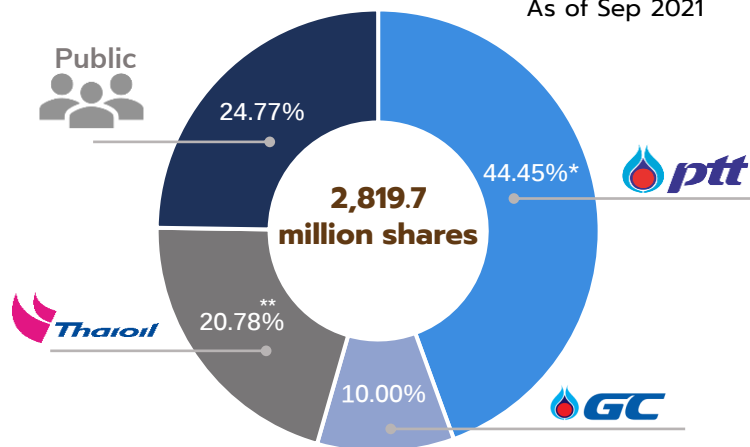


The power and smart energy flagship of PTT Group

*"GPSC, The global leading innovative and sustainable power company, the core business is to **generate and supply electricity and utilities** to customers and also **developing new S-Curve business** to create value to stakeholders."*

GPSC's shareholding structure

As of Sep 2021



**TOP is under the process of regulatory work to divest not exceeding 10.8% of GPSC.

* PTT stake includes 1.91% hold via SMH, a wholly-owned indirect subsidiary of PTT.

COMPANY INFORMATION (as of Sep 17, 2021)

Business Type | Energy & Utilities listed on SET

Paid-up Capital | THB 28,197 million

Market Cap. | THB 218,529 million

CREDIT RATINGS

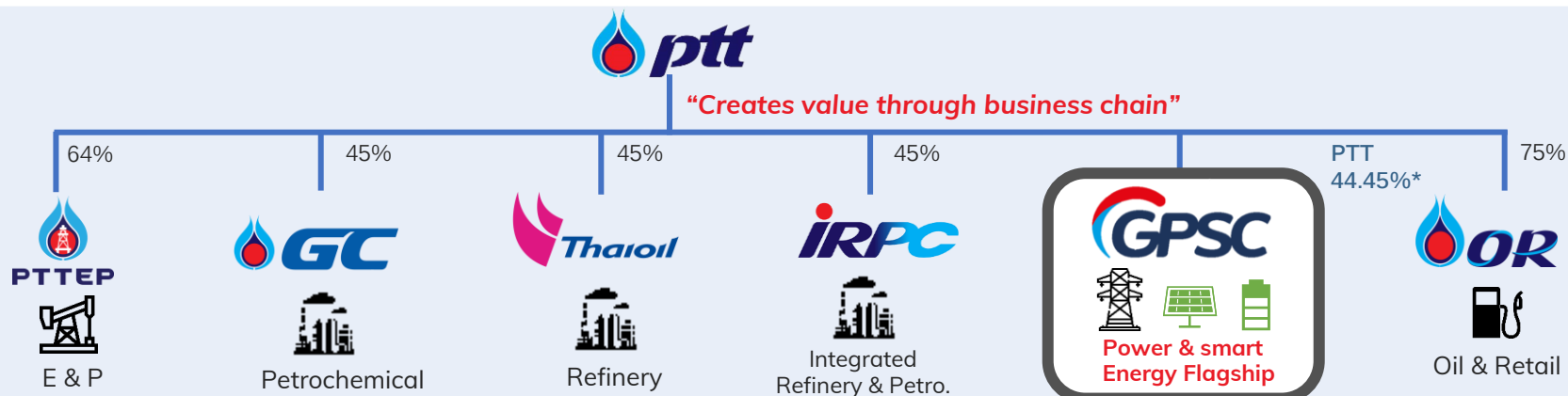
AA+



A+(tha)

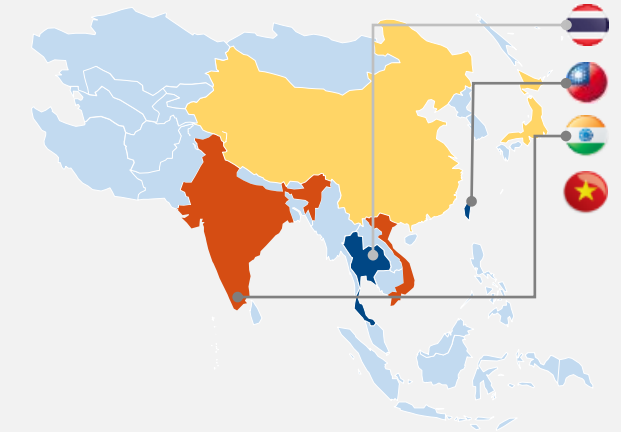
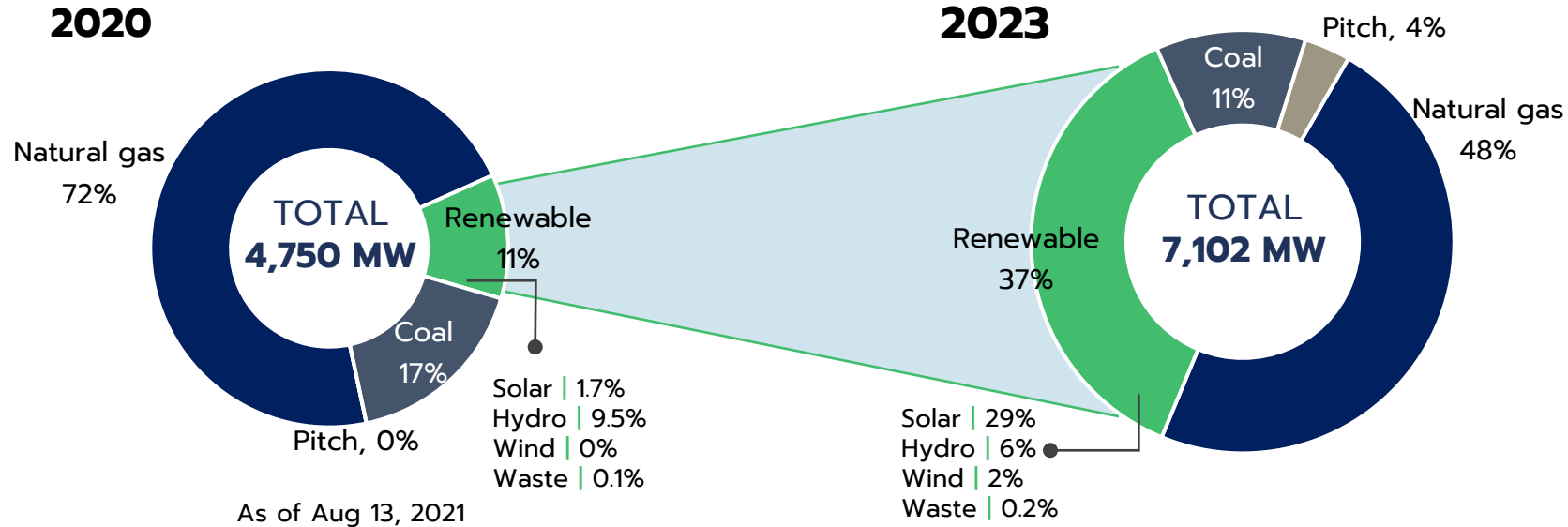
FitchRatings

PTT Group's Business



* PTT stake includes 1.91% hold via SMH

Total committed equity capacity by Fuel Type



New investment in Jul-2021



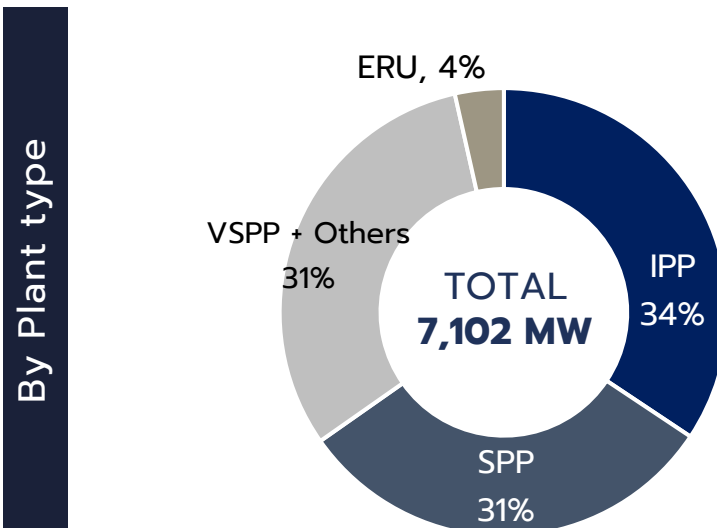
Solar Power Platform in India

- 41.6% of shares
- 1,897 MW_{equity}

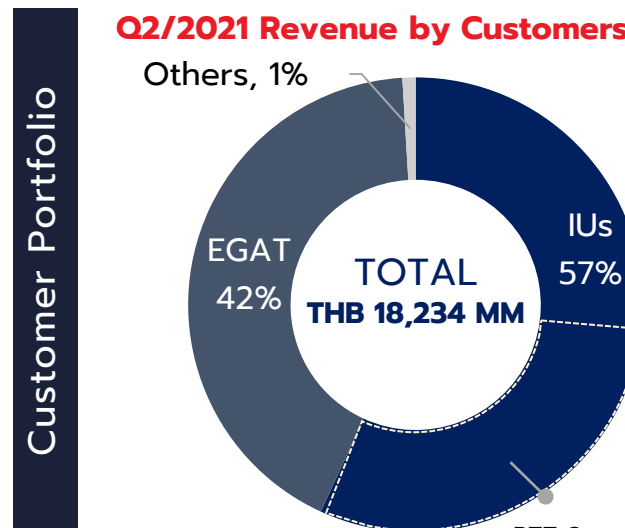


Offshore wind in Taiwan

- 25% of shares
- 149 MW_{equity}



Q2/2021 Revenue by Customers | THB MM, %



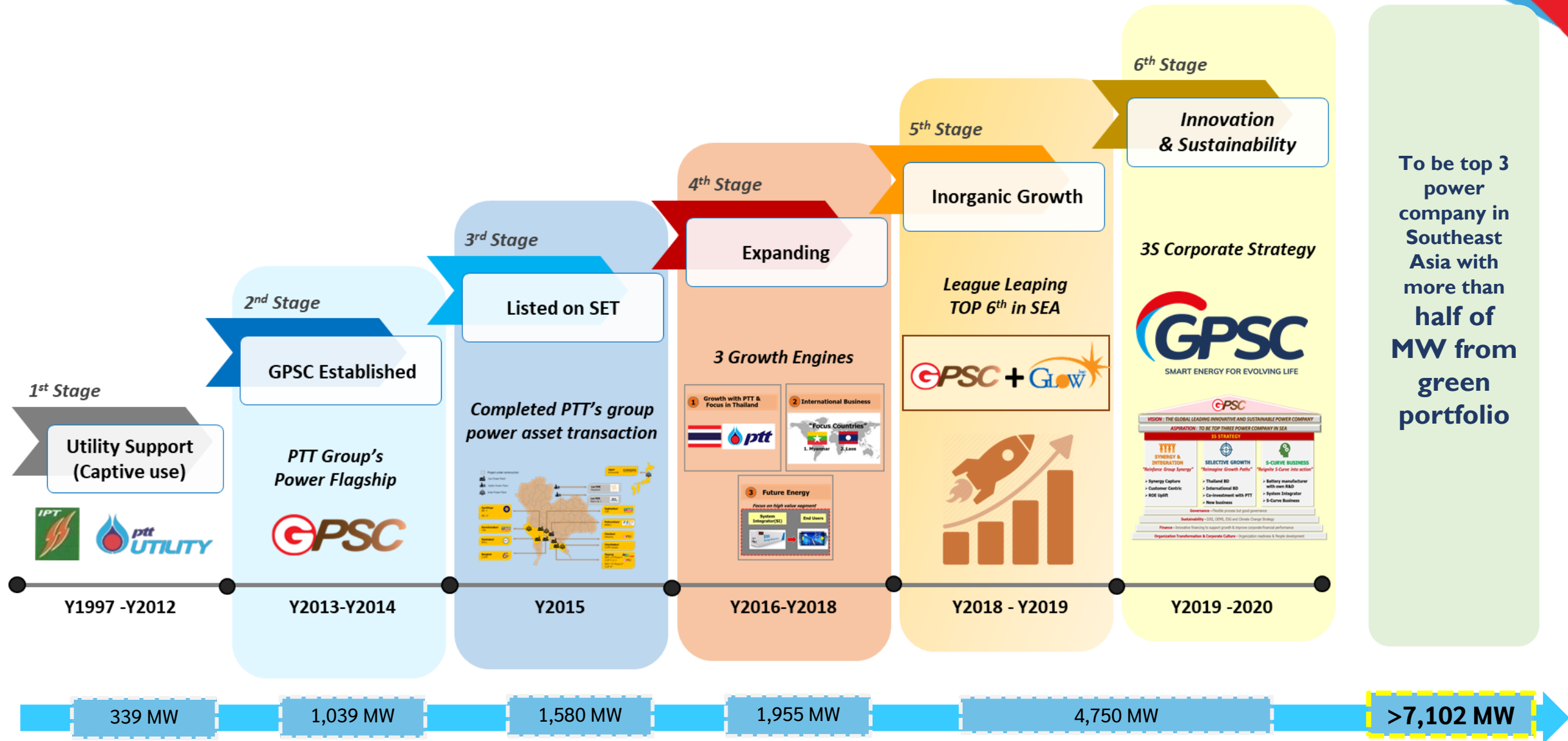
PTT Group | 30% of Total Revenue

LT OFF-TAKE CONTRACTS

- ✓ Guaranteed market and source of revenue
- ✓ Guarantee a minimum level of profit in regard to their investment
- ✓ Price adjustment formula, varying with fuel price

Note: Total equity capacity includes Solar Power Platform (Avaada) 1,897 MW and Offshore wind farm (CFXD) 149 MW.

GPSC | GPSC's 1st Decade Journey

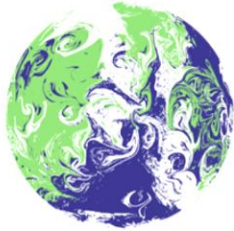


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**UN CLIMATE
CHANGE
CONFERENCE
UK 2021**

IN PARTNERSHIP WITH ITALY

Powering life with Future energy and Beyond

GPSC plays all in PTT's new Future Energy Vision

1 Future Energy

GPSC
Champion



Renewable



Energy
Storage &
system related

GPSC
Champion

GPSC
Key role
(EV battery,
Quick charger)



EV Value
Chain



Hydrogen

GPSC
Key role
(Generation,
Application)

Beyond

2 Life Science



Pharmaceutical



Medical device



High Value
Business



Mobility &
Lifestyle



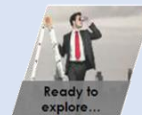
Logistics &
Infrastructure



AI, Robotics
digitalization

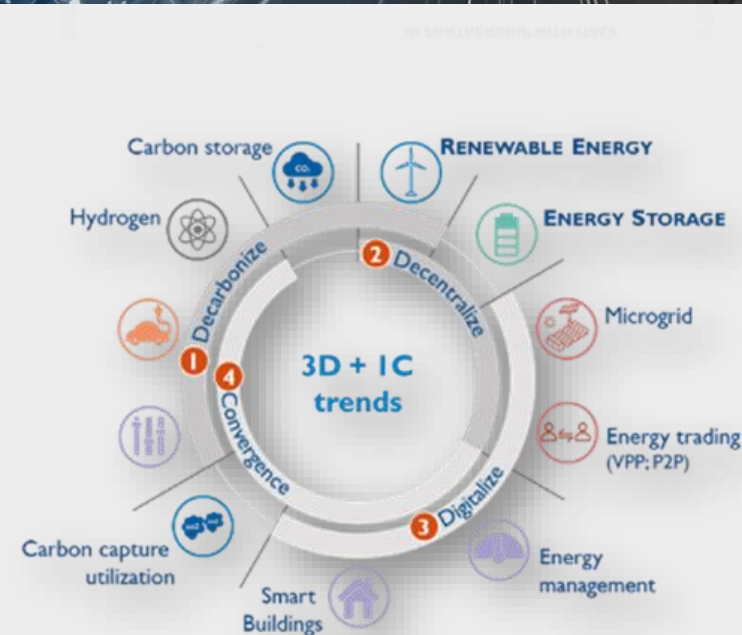


Nutrition

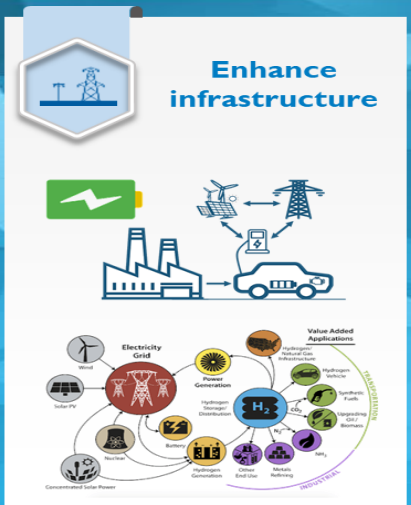


Ready to
explore...

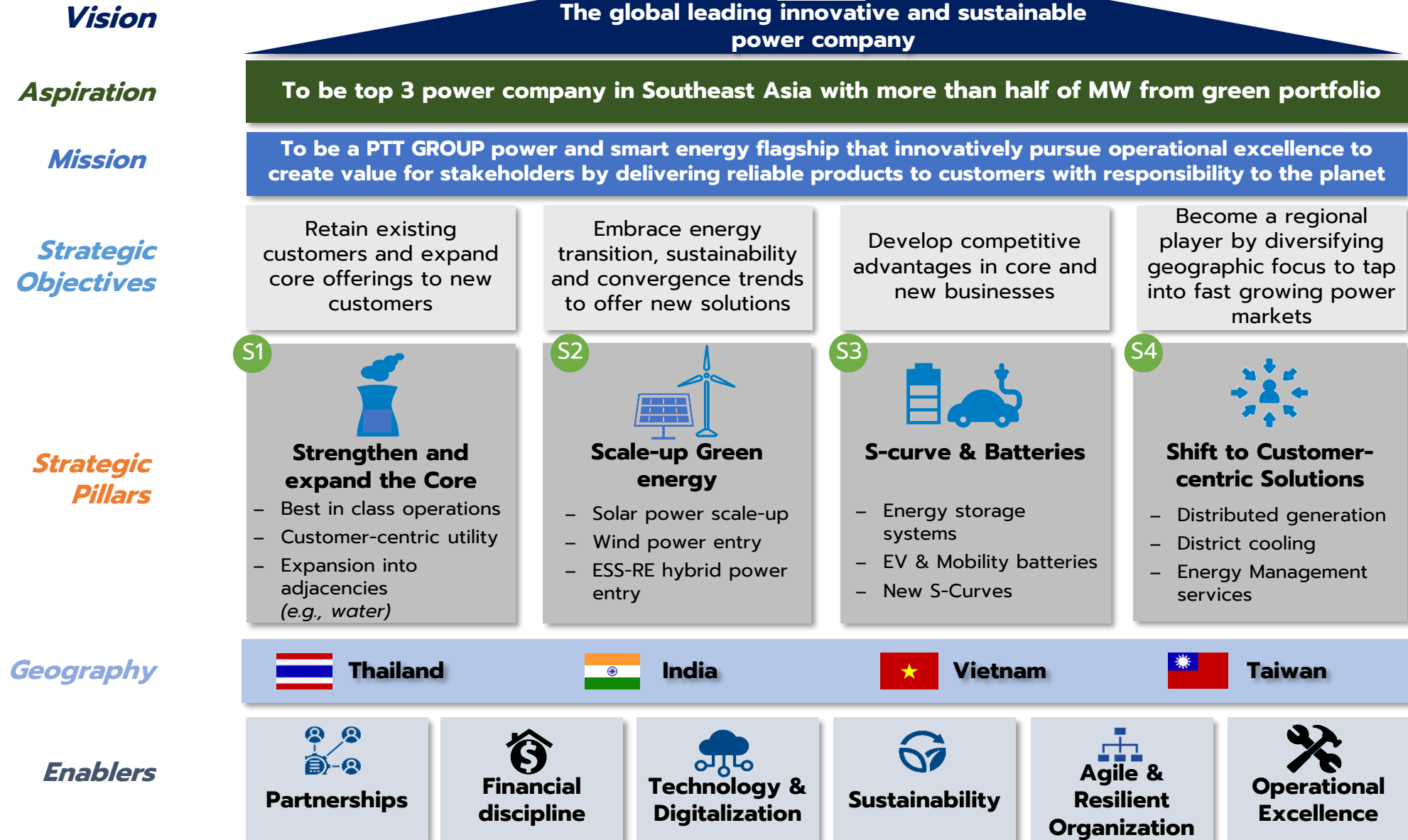
TTS#3 Discussion



**Net zero
strategy
framework**

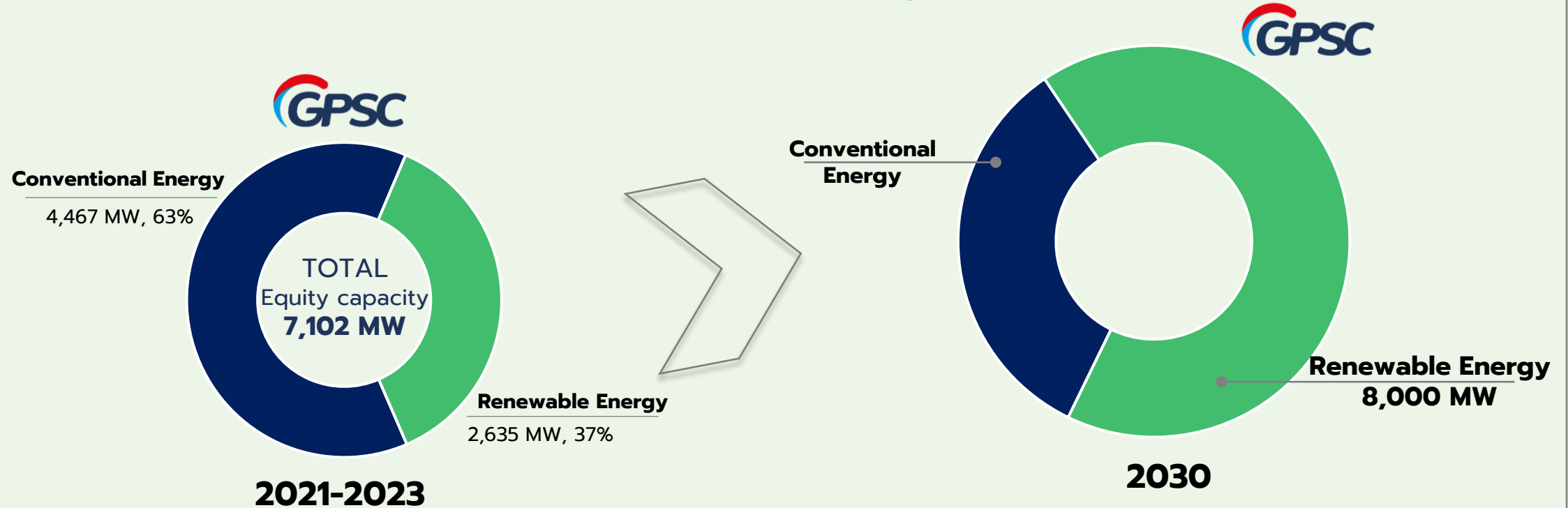


Corporate Strategy 2021 | Strategy House (2021-2030)



Long-term target to align with PTT group strategy in 2030

GPSC Aspiration: "To be top 3 power company in SEA
with more than half of MW from green portfolio"



Moving towards Low Carbon Utilities by Reducing Carbon Equivalent Intensity 35% by 2030

PTT group target in 2030

- Renewable Energy | 12,000 MW
- Conventional Energy | 8,000 MW



Moving towards **Low Carbon Utilities** by Reducing Carbon Equivalent Intensity **35%** by 2030

The route to net zero for utilities

INTERNAL



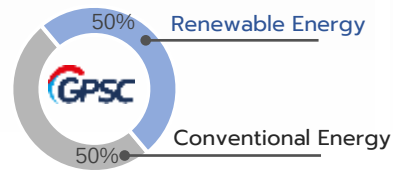
Reduce fossil fuel usage

- Adopt best practice operational excellence
- Retrofit non-renewable power plants, etc.



Grow renewables

- Execute the growth strategy as planned by
- Develop solar and wind power plants
 - Integrate distributed solar and Switch to microgrid, etc.



Enhance infrastructure

- ESS with renewable energy generation support and EMS
- Implement digital transformation
- Study and adopt CCUS, etc.



EXTERNAL



Trading / Offsets

- Study carbon credits, emissions trading schemes, shadow carbon pricing, etc.



“Move towards Sustainability” Another step on the road to sustainability at the global level

KEY ACHIEVEMENT

GPSC is now listed in
Sustainability Yearbook 2021
of S&P Global

Participated in the Corporate Sustainability Assessment (CSA)
in 2020 with top 15 percentile



Carbon Disclosure Project

Carbon management services to a level that is
managed well. (Management level: B)



The Stock Exchange of Thailand

Listed in the Thailand Sustainability Investment (THSI)



Thailand Greenhouse Gas Management Organization

Low Carbon and Sustainability Award 2020



The Asset Triple A Country Awards 2020 - Southeast Asia

Best Green Bond award (the 5 billion Baht green debentures)



AMBITION

To be listed in DJSI by 2022



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SMART ENERGY MANAGEMENT

VISTEC
VIDYASIRI MEDH
INSTITUTE OF SCIENCE AND TECHNOLOGY

SMART ENERGY MANAGEMENT

- ✓ 1.39 MW renewable energy (solar roof + floating)
- ✓ 1.2 MWh ESS, Renewable optimization and Zero-import building
- ✓ Blockchain P2P energy trading, EV chargers and Artificial Intelligence



EECI
ELECTRICITY ENERGY CERTIFICATE
INSTITUTE OF INNOVATION

@Wangchan Valley Smart Natural Innovation Platform



SMART Energy Management

- ✓ Clean Energy Generation
- ✓ Flexibility Distributed Generation
- ✓ Cost Efficient No Clean Energy Shedding

PTT TANK

First offshore floating solar farm 100 kW installed capacity for seaside of PTT Tank



- ✓ **PTT Tank**: Cut the electricity cost and reduce carbon dioxide emission
- ✓ **GC** developed special plastic "InnoPlus HD8200B"
- ✓ **CHPP** designed and installed the floating solar system

Goal 7
Affordable and
Clean Energy



Goal 11
Sustainable Cities
and Communities





The Coffee Journey to Sustainable Community-Based Tourism, Boklua, Nan

- Installation of a greenhouse solar dryer or Parabolic Dome for the community in Amphoe Boklua, Nan
- Ban Huai Khab development guidelines:** tourism and coffee routes



- Ban Sawa School development guidelines:** tourism and community products



LIGHT FOR BETTER LIFE Small-scale Solar PV in remote areas

Solar Rooftop to Schools in Rayong



- GPSC delivered Solar Rooftop System (25.9 kW) in Wangchan Valley in Rayong
- Lower emission of green house gas 93.5-187 tons of carbon/year

- GPSC and Thailoil delivered Solar Rooftop System (53.46 kW) to Koh Sichang Hospital to improve energy security of the hospital



Solar Rooftop to Hospital in Mae Hong Son



- GPSC and TOP delivered Solar Rooftop System (40.5 kW) to Thanyarak Hospital in Mae Hong Son

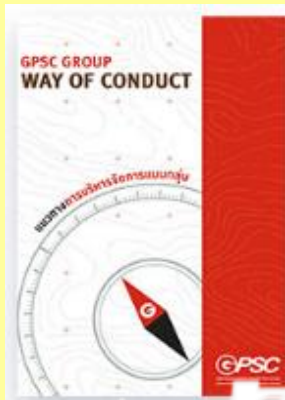


Sourcing Sustainable Materials

- Sustainable Procurement and Supplier Management



- GPSC Group sustainable way in operations



Operating Low Carbon Utilities

Operation

- Efficiency Improvement
- Green energy scale-up
- Greenhouse gas reduction initiatives
- Battery cell manufacturing



Zero Waste Village Project



Green Product

Products

- Low carbon products
- Renewable energy
- Smart grids
- Stationary/ Mobility battery ESS
- EPC Contractor for Solar Rooftop, Solar Floating installation and Energy Management such as "Solar Orchestra"





GPSC YOUNG SOCIAL INNOVATOR

GPSC Young Social Innovator Season 4
เวทีแข่งขันชิงรางวัลพระราชมานสมเด็จพระกนิษฐาธิราชเจ้า
กรมสมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
นอรางวัลมูลค่ารวมกว่า 1 ล้านบาท

ประเภทผลงาน

- 1 Product**
ผลิตภัณฑ์
นวัตกรรมใหม่
ที่ใช้งานได้จริง
และมีความ
เหมาะสมกับ
ความต้องการ
ของชุมชน
- 2 Innovation**
สิ่งประดิษฐ์
นวัตกรรมใหม่
ที่ใช้งานได้จริง
และมีความ
เหมาะสมกับ
ความต้องการ
ของชุมชน
- 3 Process & Service**
กระบวนการ & บริการ
ที่ใช้งานได้จริง
และมีความ
เหมาะสมกับ
ความต้องการ
ของชุมชน

รางวัลชนะเลิศ "พลังงาน ทรัพยากรธรรมชาติและสิ่งแวดล้อม"
(Sustainable Energy, Natural resource and Environment)

GPSC
กรมส่งเสริมการค้าระหว่างประเทศ
กระทรวงพาณิชย์

GPSC Young Social Innovator 064-927-8836

สมัครเลย!!
วันที่ 31 สิงหาคม 2564

WeDesign 2021

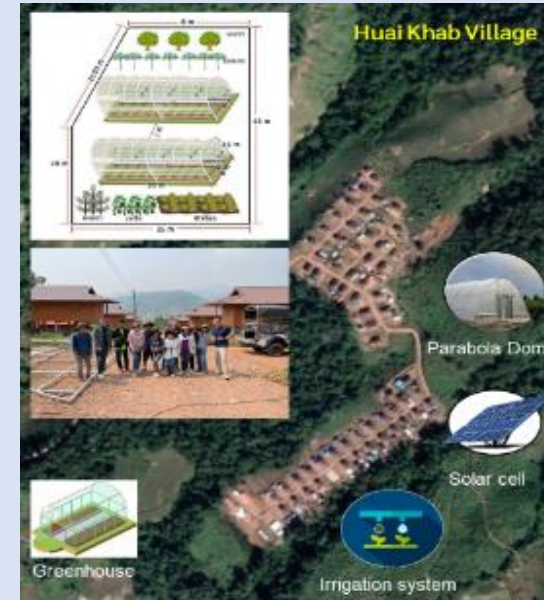
GPSC
กลับมาอีกครั้ง
กับโครงการ WeDesign 2564
สำหรับผู้ที่มี CSR DNA อย่างน้อย 10 คน
ส่งโครงการที่เป็นนวัตกรรมพลังงานเพื่อชุมชน
ชิงเงินรางวัลสูงสุด 2 ล้านบาท
ศึกษารายละเอียดโครงการและดาวน์โหลดใบสมัครได้ที่ [click](#)
ก่อนวันที่ 31 กรกฎาคม 2564 นี้

WeDesign Project 2021
comes back again!
Those with CSR DNA, hurriedly group together at least 10
and submit your smart energy initiatives for community
to win **Bt200,000** from now until **31 July 2021**
Project details and application form are available here [click](#)

ACT SPIRIT
That energy can change together

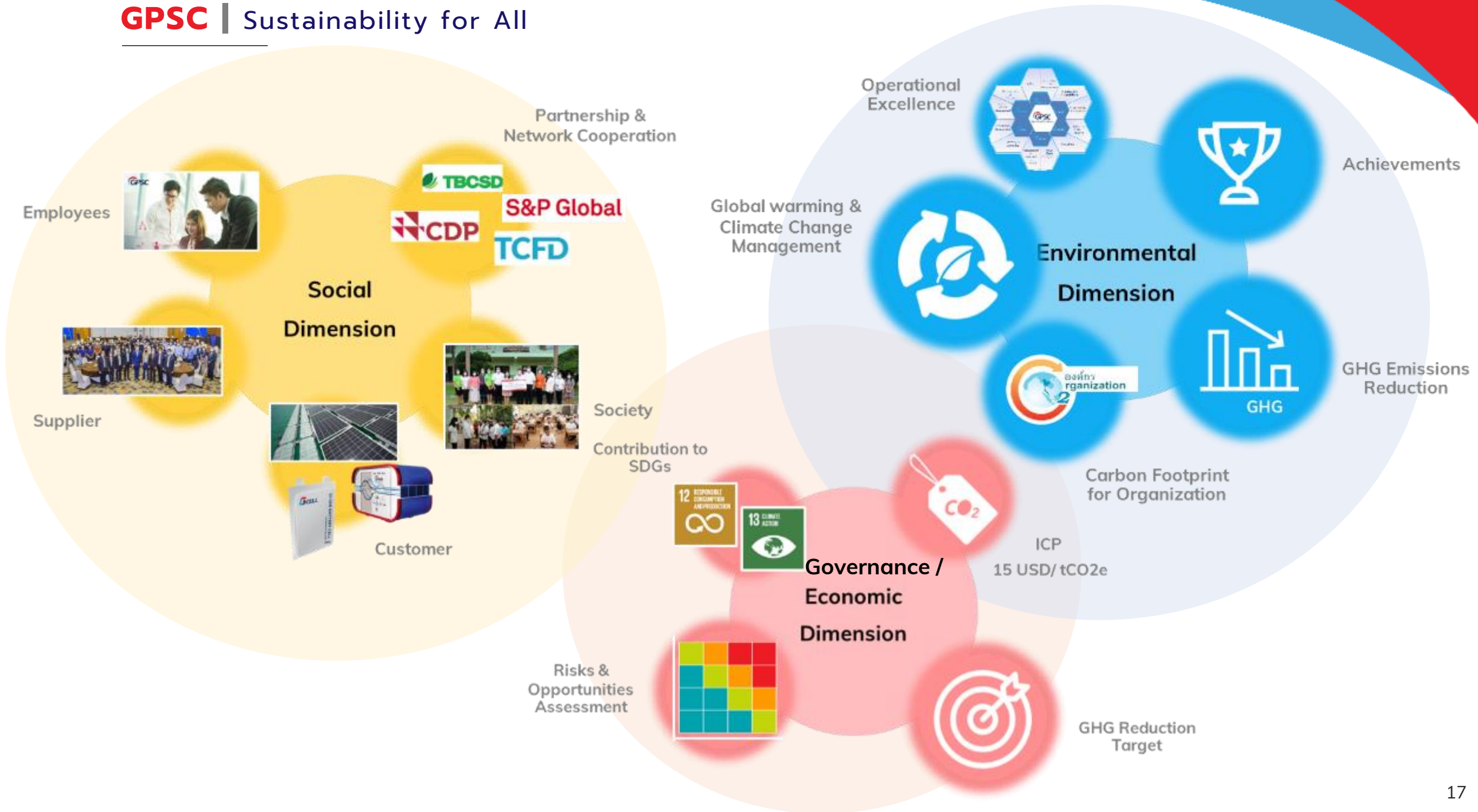
YSM-NEWS No. 001/64
กรมส่งเสริมการค้าระหว่างประเทศ (YSM) 05 กรกฎาคม 2564

PTT Group SMART Farming by GPSC (Restart Thailand)



- Basic training in agriculture and technology
- Smart farming technology installation and business plan creation





Q&A SESSION



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Achariya Sanrattana +662 140 1818

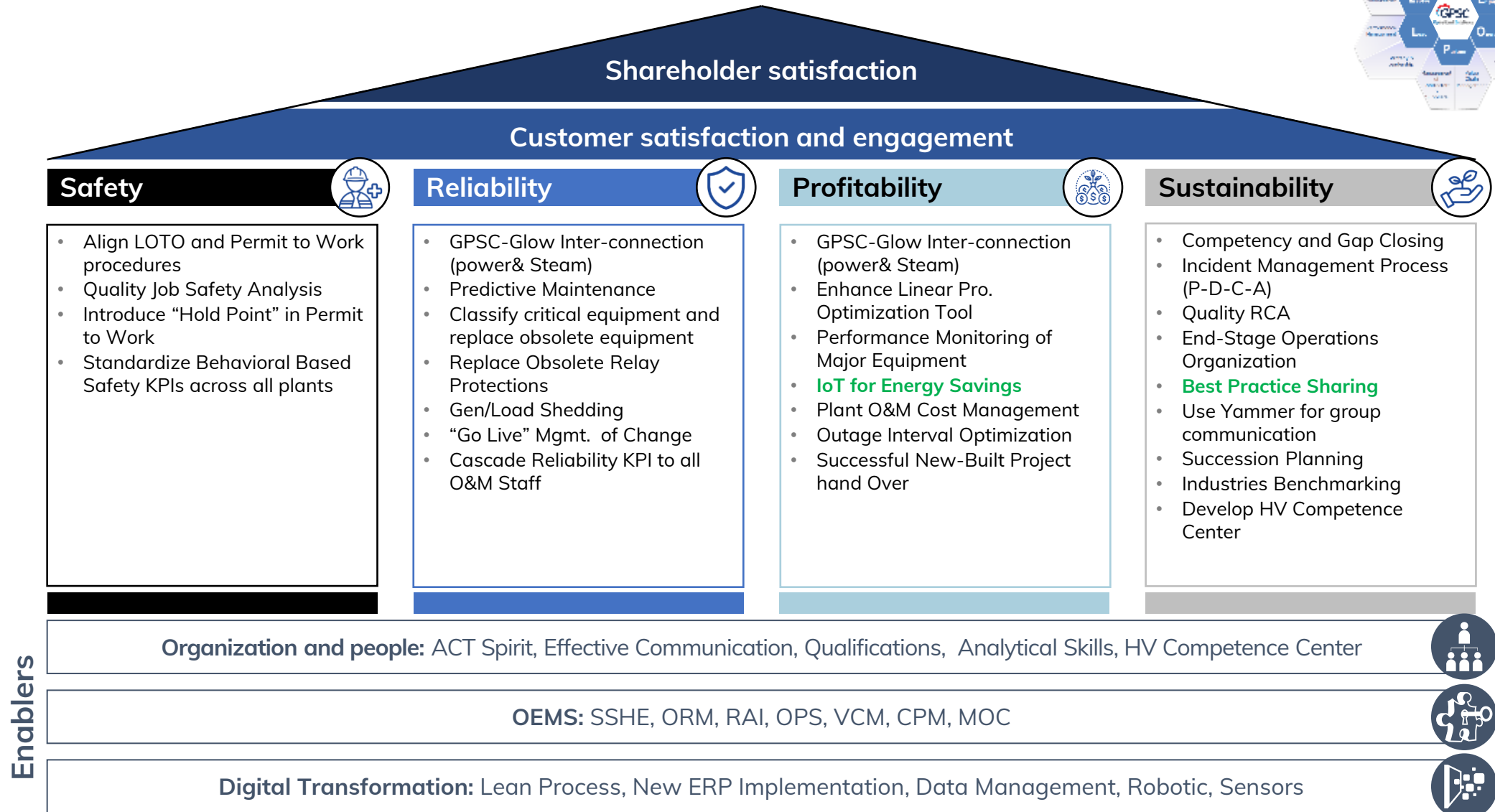
ir@gpscgroup.com

www.gpscgroup.com

Appendix

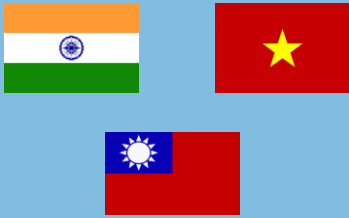


To drive “Operational Excellence” across all assets of GPSC

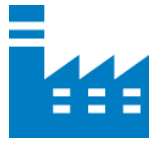


More focusing on platform growth

*Priority
2nd home market*



**Establish local
base**



**Build and
maintain local
relationships**



**Separate
organization
structure**



**Build on ground
capabilities**

**Solar power scale-up**

- Become a developer and operator of solar IPP assets in Thailand and target markets
- Selectively participate in EPC for solar floating assets in Thailand

Wind power scale-up

- Achieve scale by becoming developer and operator of wind assets in target markets

ESS-RE hybrid power entry

- Become a developer and operator of RE hybrid plants to increase power system efficiency and ensure a greater balance in energy supply

GPSC will take lead in new S-Curve ventures pertaining to
Renewables, Batteries and Digital power businesses



- Scale-up and Spin-out battery operations
- Build ESS and non-EV mobility battery business with current technology
- Enter EV battery business with additional partners

- Seek opportunistic investments and strategic partnerships with startups
- Devise business and commercial offering for Virtual Power Plant (VPP), P2P
- Propose trials with C&I clients e.g., MTP area

S3

Key Drivers to make Thailand & ASEAN EV happen

Government Incentive

EV Makers

PTT Group Collaboration & Value Chain Development



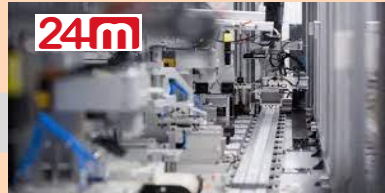
EV Platform



EV Autonomous Pilot



Battery & Components



Battery Cell Technology



Giga-scale Capability



Local R&D



Infrastructure



Smart Station



EV Quick Charge



Charging Solution

Service



Digital Platform



G-CELL Core Values



Safer

Greener

Reliable



Semi-Solid Battery Unique Design

Shorter
ProcessRemove **40%**
Inactive Material**No** binder
Needed**Low Risk**
of Contamination

Application and Manufacture Development for Semi-Solid Energy Storage Unit (30 MWh p.a.)

Energy Storage



E-Mobility



Target applications

Commercial & Industrial

- Charging station
- Industrial Estate

Micro-Grid

- Remote Area

Residential (RESS) and others

- Property Development
- ESS Mobility and others

E-Mobility

- Battery for EVs
- Battery swapping



Lead Acid Replacement



EV-Bus



ESS x EV Charger

Battery Swapping
& Car ChargingBattery Pack
for EVEnergy
Platform



SMART ENERGY MANAGEMENT

- ✓ 139 MW renewable energy (solar roof + floating)
- ✓ 1.2 MWh ESS, Renewable optimization and Zero-import building
- ✓ Blockchain P2P energy trading, EV chargers and Artificial Intelligence



6 MW Smart Energy Project at Suranaree University To create a low carbon university

174 MW
Solar Rooftop

4.312 MW
Floating Solar

100-200 kWh
Lithium-ion BESS

**AI &
Smart Energy
Platform**

- ✓ High efficiency BESS with management of solar power generation
- ✓ Blockchain-based smart grid and AI
- ✓ Cutting-edge innovation and smart energy platform



@Wangchan Valley Smart Natural Innovation Platform



SMART Energy Management



Clean Energy Generation



Flexibility Distributed Generation



Cost Efficient No Clean Energy Shedding



ESS FOR GC's INNOVATION CENTER (Launched: Feb 2020)



- ✓ Increase gas engine efficiency
- ✓ Peak shift with ESS
- ✓ 250kW/1.5MWh
- ✓ Emergency backup power



First offshore floating solar farm 100 kW installed capacity for seaside of PTT Tank



- ✓ **PTT Tank** : Cut the electricity cost and reduce carbon dioxide emission
- ✓ **GC** developed special plastic "InnoPlus HD8200B"
- ✓ **CHPP** designed and installed the floating solar system

Shift to customer-centric solutions



Distributed generation

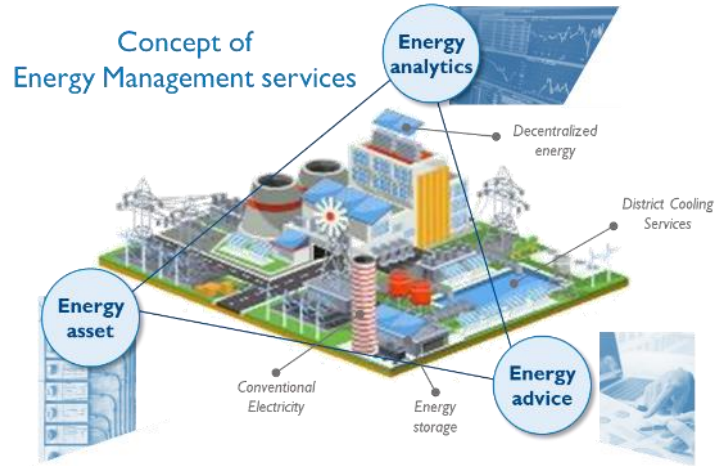
- Provide captive renewable power through **distributed generation** solutions (rooftop solar, microgrids, etc.) to C&I customers
- Offer full range of installation and O&M incl. monitoring services
- **Bundle with BTM ESS** to enhance reliability and maximize RE power consumption

District cooling

- Provide **turnkey district cooling** development, operations and maintenance solutions
- Offer diverse selections of cooling systems suitable for different customers

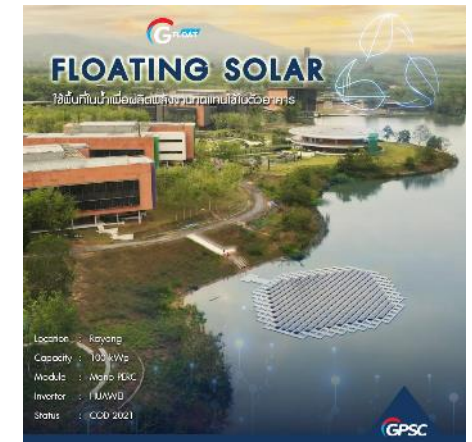
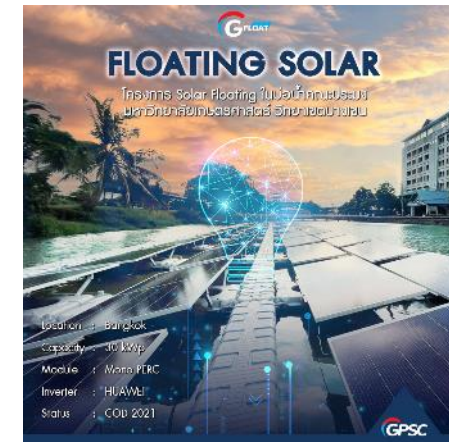
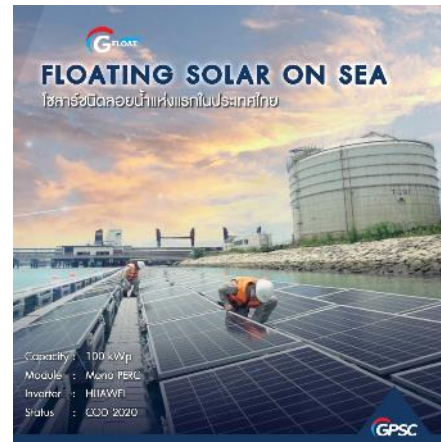
Energy Management services

- Provide **all-round energy support**, incl. energy audits & digital tools
 - e.g., Energy audits, real-time energy monitoring, remote mgmt. of C&H, energy efficiency equipment supply etc.
- Bundle EMS with distributed generation & district cooling offerings










GPSC emphasizes the customer-centric solutions through CHPP's decentralized energy services

- Distributed generation
- District cooling
- Energy Management services
 - Energy Asset
 - Energy Advice
 - Energy Analytics





GPSC has embraced 7 main goals of the UN's Sustainable Development Goals as guidelines for the company's sustainable development management and for the benefit of all stakeholders.

	SDGs	Key Issues
	Affordable and Clean Energy <i>Ensure access to affordable, reliable, sustainable and modern energy for all</i>	<ul style="list-style-type: none"> • Electricity Access • Electricity availability and reliability • Renewable energy • Energy efficiency
	Decent Work and Economic Growth <i>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</i>	<ul style="list-style-type: none"> • Housing and basic services • Green and public spaces • Sustainable urbanization
	Industry, Innovation, and Infrastructure <i>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</i>	<ul style="list-style-type: none"> • Infrastructure investments • Environmental investments • Research and development
	Sustainable Cities and Communities <i>Make cities and human settlements inclusive, safe, resilient and sustainable</i>	<ul style="list-style-type: none"> • Housing and basic services • Green and public spaces • Sustainable urbanization
	Responsible Consumption and Production <i>Ensure sustainable consumption and production patterns</i>	<ul style="list-style-type: none"> • Energy efficiency • Water efficiency • Air quality • Waste • Water quality
	Climate Action <i>Take urgent action to combat climate change and its impacts</i>	<ul style="list-style-type: none"> • Energy efficiency • Environmental investments • GHG emissions • Risks and opportunities due to climate change
	Peace and Justice Strong Institutions <i>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</i>	<ul style="list-style-type: none"> • Corruption and bribery in all forms • Transparent institutions

Sustainability & Climate Change Strategy



GPSC | Sustainability Achievements



01
Institutional Investor
Corporate Awards 2020:
Best Strategic Corporate
Social Responsibility
By Alpha South East Asia

02
Low Emission Support
Scheme: LESS
By Thailand Greenhouse Gas
Management Organization
(Public Organization)

03
ECO FACTORY
By The Federation of Thai
Industries water and
environment institute for
sustainability

04
Thailand Voluntary Emission
Reduction Program:
By Thailand Greenhouse Gas
Management Organization
(Public Organization)

05
Asia's Best CSR
By Corporate Governance
Asia

06
B Score for Company
Disclosing on Climate
Change
By Carbon Disclosure Project

07
Asia's Best CSR
By Corporate Governance
Asia

08
Sustainability Disclosure
Award
By Thaipat Institute

09
Thailand Sustainability
Investment (THSI)
By The Stock Exchange of
Thailand

10
ESG100
By Thaipat Institute

11
ASEAN Renewable Energy
Projects Award 2020
By ASEAN Energy Center

12
Sustainability Yearbook
Member 2021
By S&P Global



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