GPSC

Sustainable & Innovation Customer Programs 2024

Content

To support the global shift across various economic sectors toward sustainable development and energy transition, GPSC recognizes key trends such as renewable energy, circular economy adoption, low-carbon technologies, and digital transformation as essential directions for its future products and services. In response, GPSC is actively adopting and developing new business models to ensure its offerings align with the evolving needs of the market, customers, and stakeholder.

Accordingly, GPSC now offers products and services that facilitate Thailand's energy transition, focusing on renewable energy, circular economy solutions, digital technologies, and sustainable transportation-related innovations.

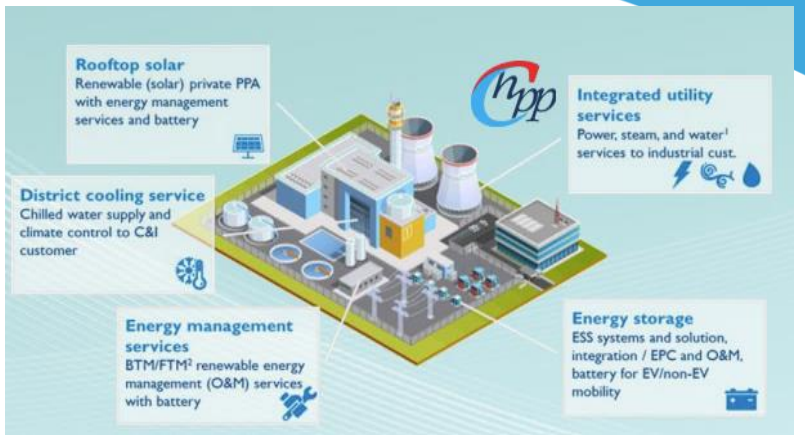
Helping customers generate energy and/or retrieve water using sustainable technologies

Sustainable technologies (1/5)

Sustainable technologies – Energy

Combine Heat and Power Producing Co., Ltd (CHPP), a subsidiary of GPSC, primarily operates under a B2C business model, offering a range of products and services such as solar power installation, both centralized and decentralized district cooling systems, energy management solutions, and energy storage systems.

Solar power installation is one of the GPSC's services **encourage customers to generate their own energy using sustainable technologies**. This technology encompasses solar farm, rooftop solar, and floating solar that are enabling users to produce electricity directly from sunlight, reducing reliance on centralized power grids. By installing solar panels on rooftops, open land, households, businesses, basin, and industrial facilities can generate their own clean energy on-site. This decentralization not only lowers electricity bills but also enhances energy security and resilience, especially during grid outages.



Ref: https://www.chpp.co.th/en/highlight-project

Sustainable technologies (2/5)

Sustainable technologies – Energy

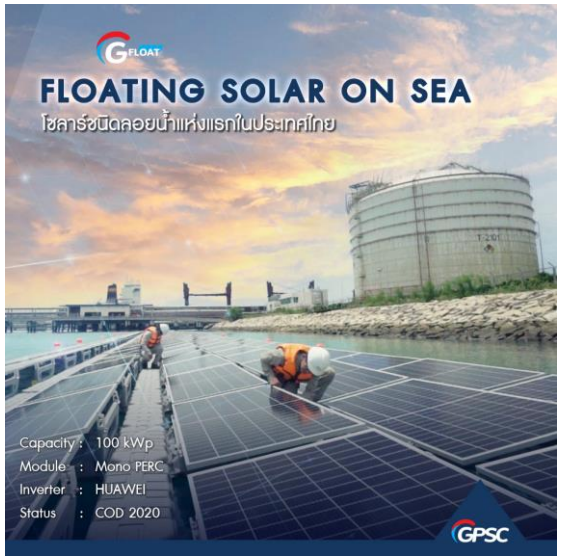
GPSC has tasked its subsidiary, CHPP, with collaborating with Suranaree University of Technology (SUT) to develop and implement a 6-MW Solar Rooftop–Floating Solar Project. This initiative integrates advanced smart energy technologies—including Battery Energy Storage Systems (BESS), blockchain, and artificial intelligence (AI)—to enhance the efficiency of power generation and distribution. The project **encourages customer to generate their own energy using sustainable technologies** and will be connected to the Provincial Electricity Authority's grid to ensure a stable and reliable supply of renewable energy.

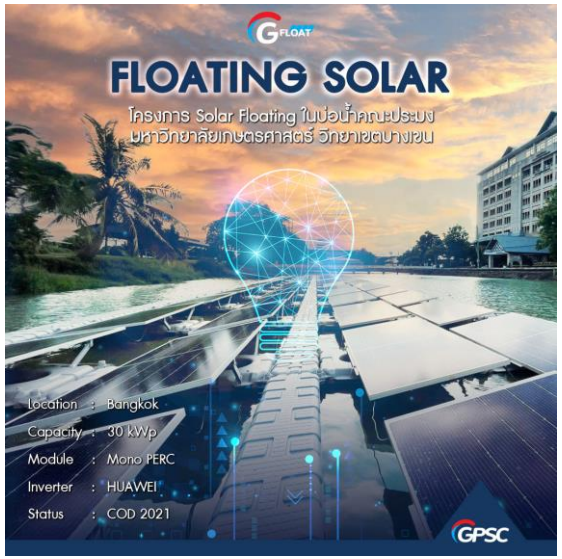
An estimated budget of 150 million baht has been allocated for the project, which is expected to generate over 510 million baht in energy cost savings over its 25-year lifespan. Additionally, the project will function as a smart energy learning hub for the northeastern region and serve as a model for a Smart Microgrid Energy City

Ref:
https://investor.gpscgroup.com/news.html/integrate/1/id/799692#:~:text=GPSC%20has%20assigned%20its%20subsidiary,the%20form%20of%20Private%20Power
https://www.chpp.co.th/th/highlight-project/renewable-energy/82/sut-smart-university
https://www.thunkhaotoday.com : "GPSC ผนึกกำลัง ม เทคโนโลยีสุรนารี รุกโครงการติดตั้งโซลาร์ลอยน้ำ

Sustainable technologies (3/5)

Sustainable technologies – Energy





GPSC, in collaboration with PTT Group, has promoted the use of **sustainable technologies by encouraging customers in generating their own energy**. This includes the installation of a 100-kW floating solar system at sea within the marine area of PTT Tank Terminal Company Limited in Rayong, as well as the development of a floating solar project in a water pond at the Faculty of Fisheries, Kasetsart University, Bang Khen Campus.

Additionally, GPSC partnered with PTTGC Logistic Solutions on a solar rooftop project designed for time-shift applications, which integrates battery energy storage technology.

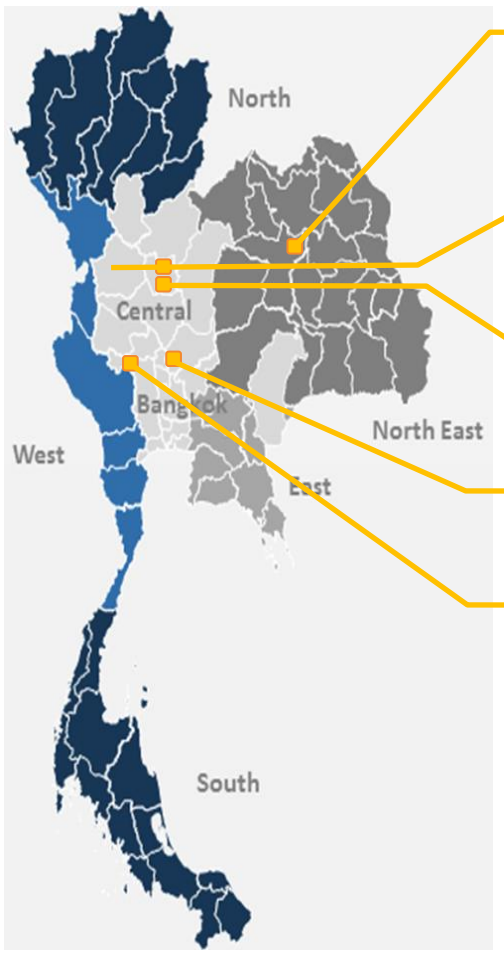
Ref:
https://www.facebook.com/gpscthofficial/posts/244061971055861
https://www.gpscgroup.com/en/sustainability/economic/evolving-business-model

Sustainable technologies (4/5)

Sustainable technologies – Energy

#	Company	Capacity (kWp)	Location
1	Confidential Example of the previous and future projects on GPSC Group's PV service	867	Nong Khae
2		999	Amata City
3		428	Phuket
4		637	Chonburi
5		1000	Mat Ta Phut
6		500	Rayong
7		19	Rayong
8		1925	Samut Prakarn
9		500	Pluak Daeng
10		2960	Mat Ta Phut
11		170	Rayong
12		998	Mat Ta Phut

GPSC Group has actively advanced its photovoltaic (PV) service portfolio through a series of strategic projects aimed at enhancing clean energy adoption for customer. Previous projects include the installation of rooftop solar systems for industrial and commercial clients, **supporting customers generate energy using sustainable technologies**. These projects not only demonstrate GPSC's technical expertise but also reflect its role in promoting decentralized energy generation. Looking ahead, GPSC Group plans to expand its PV service offerings through larger-scale solar farm developments in the market, integrated solar-plus-storage solutions, and tailored PV systems for smart industrial estates.



Kranuan, Khon Kaen
PPsolar1 Capacity 1.2 MW
PPsolar2 Capacity 1.2 MW
PPsolar3 Capacity 1.2 MW

Saklek, Phichit
NPS1 Capacity 6 MW
WXA2 Capacity 6 MW

Taphan Hin, Phichit
WXA1 Capacity 6 MW
WXA3 Capacity 6 MW

Ban Mi, Lop Buri
NPS3 Capacity 6 MW

Dan Chang, Suphan Buri
NPS2 Capacity 6 MW

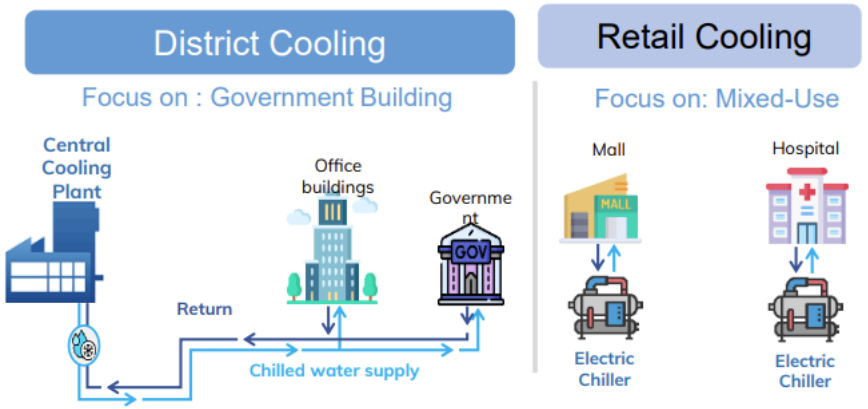
Total Installed Capacity
39.5 MWDC

Projects operated by global renewable power company limited (GRP) (Subsidiary of GPSC Group)

Sustainable technologies (5/5)

Sustainable technologies – Water

In addition, GPSC provides the service that **promotes customer for self-generating water through district cooling systems**. The service provides self-generating water by capturing condensate from chilled surfaces and reusing it for non-potable purposes like irrigation or cooling towers. They can also treat and reuse blowdown water from cooling towers and integrate atmospheric water generators (AWGs) to extract water from air using existing chilled infrastructure. In trigeneration systems, steam condensation can provide additional clean water. Centralized operation enables efficient water reuse across multiple buildings, enhancing overall water sustainability.



Ref: https://www.chpp.co.th/en/home

Ref: https://gpsc.listedcompany.com/misc/presentation/20250226-gpsc-oppday-4q2024.pdf

Engaging with customers to implement circular economy solutions

Circular Economy Solution

GPSC has adopted the circular economy principle into its products and services through three key approaches:

- Research and development of **Energy Recovery** using solar panels and batteries to produce RDFs as an alternative energy source.
- Research and development of **Battery Recycling** to extend the life cycle of end-of-life batteries.
- Operation of an **Energy Recovery Unit** utilizing petroleum pitch as a source of energy.

These initiatives are part of GPSC's business pipeline and are planned for market implementation in alignment with the **Circular Economy Solution**.

GPSC has partnered with INSEE Ecocycle, a company with expertise in transforming industrial waste into renewable fuels and signed a memorandum of understanding (MOU) to initiate a refuse-derived fuel (RDF) power plant development project and a solar panel and battery recycling facility project in order to ***put solar panels and batteries into the recycling process and produce RDFs****, in line with circular economy principles. The first phase of the program, lasting three years from 2022 to 2024, focuses primarily on the feasibility of the two projects, which will then lead to the development of a joint investment scheme in the future.*

INSEE

Nuovo Plus recognizes the significance of various battery management practices, including post-use management, as well as alternative business applications such as battery rental services and recycling. ***This enhances the business capability through circular economy principle and encourages customers to return the end-of-life battery for its secondary life cycle****.*

NUOVO

GPSC provides the energy recovery unit (ERU) service to Thaioil Co., Ltd in producing the energy from petroleum pitch. ***This encourages customer in conducting circular economy approach through energy recovery aspect that minimizes waste and maximizes resource utilization****. By recovering energy from waste streams, the ERU contributes to a closed-loop system where resources are continuously reused and recycled, aligning with the goals of a circular economy.*

Thaioil

Ref: https://24-m.com/

Ref: https://www.gpscgroup.com/en/business/project/37/energy-recovery-unit-co-ltd

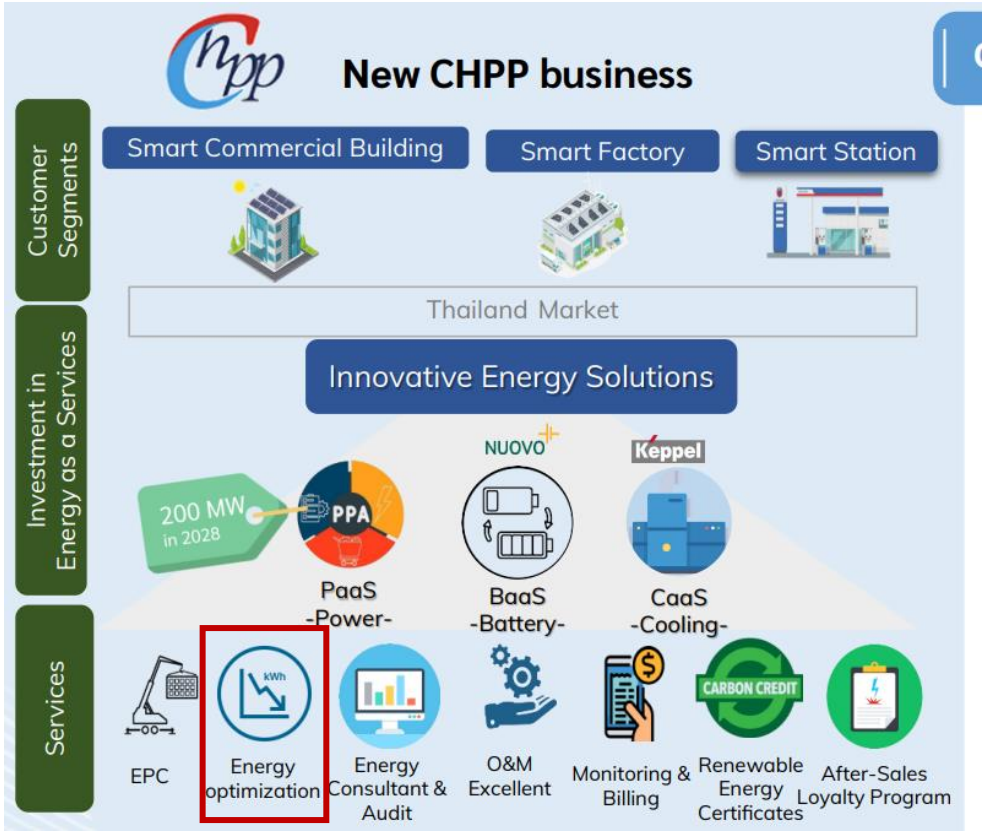
GPSC

Encouraging customers to reduce energy or water consumption through demand management programs

Demand Management Programs (1/3)

GPSC X CHPP X Demand Management Service

GPSC, through its subsidiary CHPP (Combine Heat and Power Producing Co., Ltd.), provides integrated **demand management program/ services** for both energy and water to its customers. This service enables customers to optimize their consumption patterns by monitoring, analyzing, and controlling real-time usage, which helps reduce operational costs and improve efficiency. By leveraging advanced technologies and data-driven tools, the demand management system supports peak load reduction, enhances system reliability, and aligns consumption with off-peak periods or renewable energy availability. Additionally, it contributes to resource conservation and supports customers in achieving their sustainability targets. This service reflects GPSC's commitment to delivering smart utility solutions tailored to the evolving needs of businesses, while promoting more sustainable and resilient infrastructure.



Ref: https://gpsc.listedcompany.com/misc/presentation/20250226-gpsc-oppday-4q2024.pdf

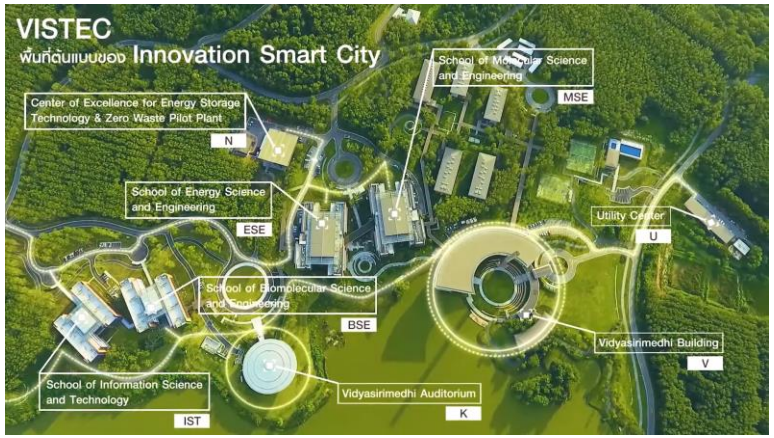
Demand Management Programs (2/3)

GPSC X CHPP X Demand Management Service – Example of Demand Management Program

GPSC develops electricity innovations and intelligent **energy management systems** to create a prototype smart energy community in VISTEC, the prototype innovation smart city. The project comprises three types of innovation:

1. Stable electricity generation from renewable sources;
2. Energy storage to increase the adoption of renewable energy; and
3. Artificial intelligence (AI) for energy management within the VISTEC Smart Energy community.

AI-assisted forecast for electricity generation, storage, and distribution enables us to better cope with each building's fluctuating demand throughout the day. This AI also predicts each building's electricity surplus and stores it in the energy storage system or to be used when there is no electricity from solar energy.
If each building consumes less electricity than anticipated during the day, the surplus will be sold to other buildings through a smart contract that relies on blockchain technology. This peer-2-peer (P2P) trading eliminates an intermediary and promotes a balance between energy use and storage.
Data is shown in real-time, allowing VISTEC to manage its green energy efficiently.

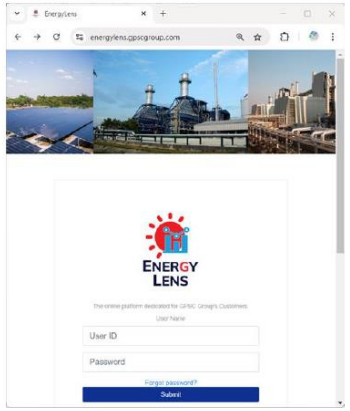


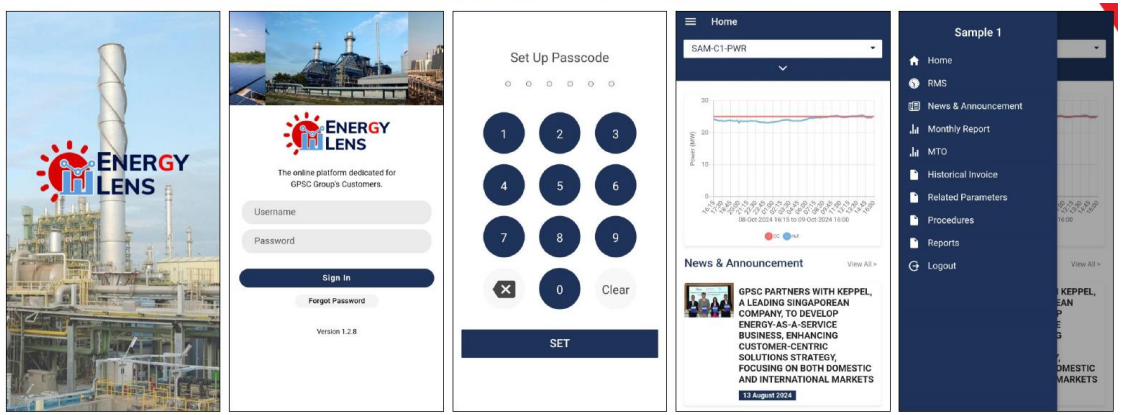
Demand Management Programs (3/3)

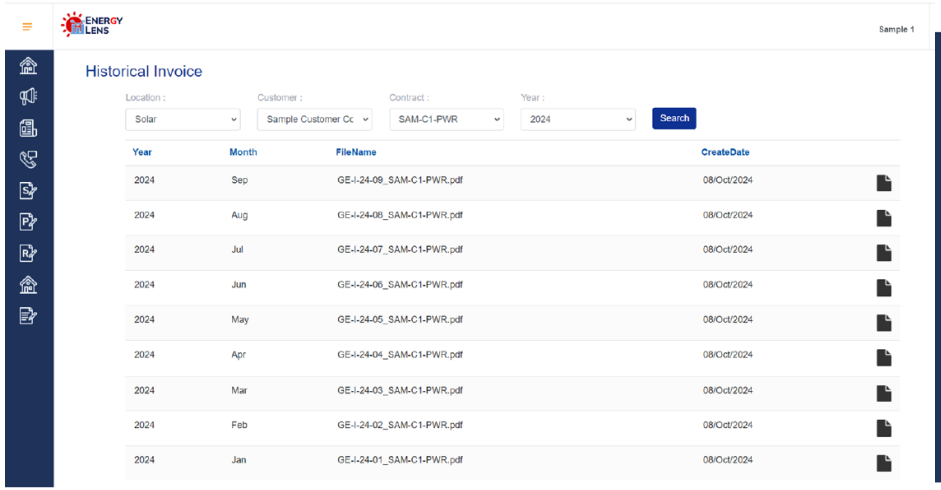
EnergyLens

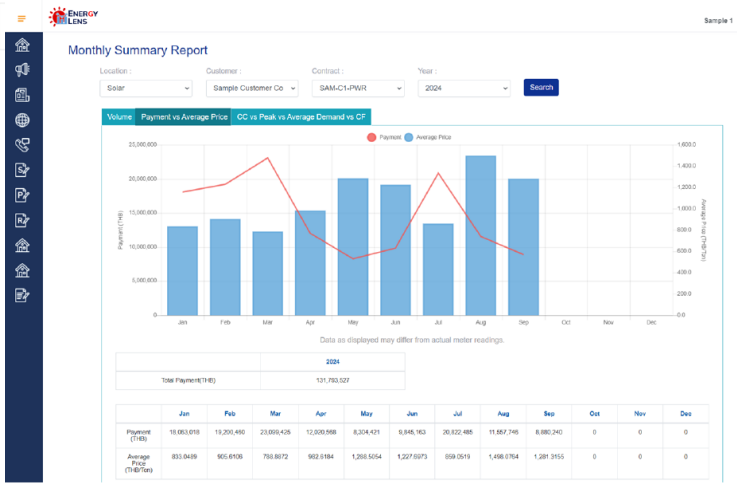
EnergyLens is the online monitoring software provided for all GPSC customers to remotely monitor their power and steam consumption as well as to access and check a wide array of information related to the supply of power and steam to your plants i.e. historical invoices, report, communication channels guidance, minimum take obligation (MTO), news and announcement. **This platform enhances the capability of Demand Management Programs for customer**.

EnergyLens is designed to be accessed by mobile phone and tablet (Android and iOS) and through web platform via any web browsers.









Supporting the implementation of community-based energy/water trading or sharing platforms

Community-based Energy Trading/Sharing Platforms

GPSC, in collaboration with PTT, is advancing intelligent energy management systems through cutting-edge technologies at Vidyasirimedhi Institute of Science and Technology (VISTEC), a prototype **smart energy community**. This collaboration focuses on integrating renewable energy sources –such as Solar Rooftop and Floating Solar – with Battery Energy Storage Systems (BESS), and applying artificial intelligence (AI) to optimize energy production, storage, and distribution. The initiative explores the use of blockchain for decentralized, **real-time Peer-to-Peer (P2P) energy trading** via smart contracts, eliminating the need for intermediaries. A prime example of these innovations in action is the Energy Solutions University project at Suranaree University of Technology (SUT), which features a 6-MW solar installation and acts as a model for smart microgrid cities. With approximately 150 million baht invested, the project is expected to save over 510 million baht in energy costs over 25 years. In addition to being integrated with the Provincial Electricity Authority's grid for stable renewable power, the project supports the development of **community-based energy and water trading platforms** and serves as a regional learning hub for smart energy systems in northeastern Thailand.

Developing sustainable transportation options for customer use

Sustainable Transportation (1/2)

GPSC has developed and introduced a battery product designed to meet the growing demands of Thailand's dynamic electric vehicle (EV) market. This initiative reflects the company's commitment to supporting the national agenda on reducing GHG emissions, particularly in the transportation sector. By providing reliable and efficient battery solutions, this product is accelerating the adoption of EVs across the country. The battery technology not only enhances vehicle performance and energy efficiency but also contributes to lowering the environmental impact throughout the operational phase of the vehicles. This effort is aligned with broader goals of transitioning toward a low-carbon economy and promoting **sustainable transportation**, helping Thailand move closer to achieving its climate and energy targets.

Ref: https://www.nuovoplus.com/

Ref: https://www.nvgotion.co.th/

Sustainable Transportation (2/2)

As of 2025, GPSC continues to advance its battery business with a focus on accelerating production capacity to meet the rising demand for clean energy solutions. The company is progressing toward its target of reaching 1 gigawatt-hour (GWh) of battery production capacity, with further expansion to 10 GWh projected within the next several years, supported by a capital expenditure plan totaling 30 billion baht. The initial focus remains on producing batteries for electric vehicles to support the growth of **sustainable transportation**, followed by the development of stationary batteries for renewable energy storage.

To drive this expansion, GPSC is implementing its S3 (S-Curve & Battery) Strategy, designed to capture opportunities arising from the global energy transition. Central to this strategy is the advancement of battery technology – an essential enabler for decentralized power systems and the broader dynamic energy value chain – positioning GPSC to maintain competitiveness and achieve sustainable long-term growth.

Ref: gpsc-new-business-opportunities-en.pdf

Thank You