



The International Renewable Energy Asia Conference (REA 2017)

Session II : PV, Wind and Smart Grid (Meeting Room: MR212)

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Smart Grid Pilot Project in Mae Hong Son Province

By

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Power for Thai Happiness

SMART GRID MASTER PLAN AND EGAT ROADMAP



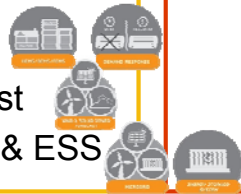
Smart Grid Master Plan Timeline

Preparation 2015-2016

- Assigned Utilities/ Committee for Driving of Smart Grid (SG)
- Decided Platform for SG Development
- SG Human Resource Development, R&D

Short term 2017 - 2021

- SG Pilot Project (Study, Test and Research)
- Policies for SG Implementation in 3 Domains
 - DR & EMS
 - RE Forecast
 - Micro Grid & ESS



Middle term 2022-2031

- Infrastructure Development
- Policies, Rules and Regulations for SG
- Support the Investment on SG Infrastructure

Long term 2032-2036

- Support utilities for Investment on SG with High Technologies
- Incentives for SG Customers with High Technologies Installation
- Support utilities for SG R&D



EGAT's Role

- Take part in sub-committees to drive and decide platform for SG (e.g., interoperability sub-committee in 2015-2016)
- Funding provided for universities on SG research
- Funding for Universities on SG Research

A

Mae Hong Son Pilot Project



RE Forecasting
DR/EMS/DRCC
Energy Storage System

B

Invest in

- ICT Integration
- SPP/VSP Data Communication System
- Substation Automation (SA)
- SCADA/EMS
- WAMS/WAPC

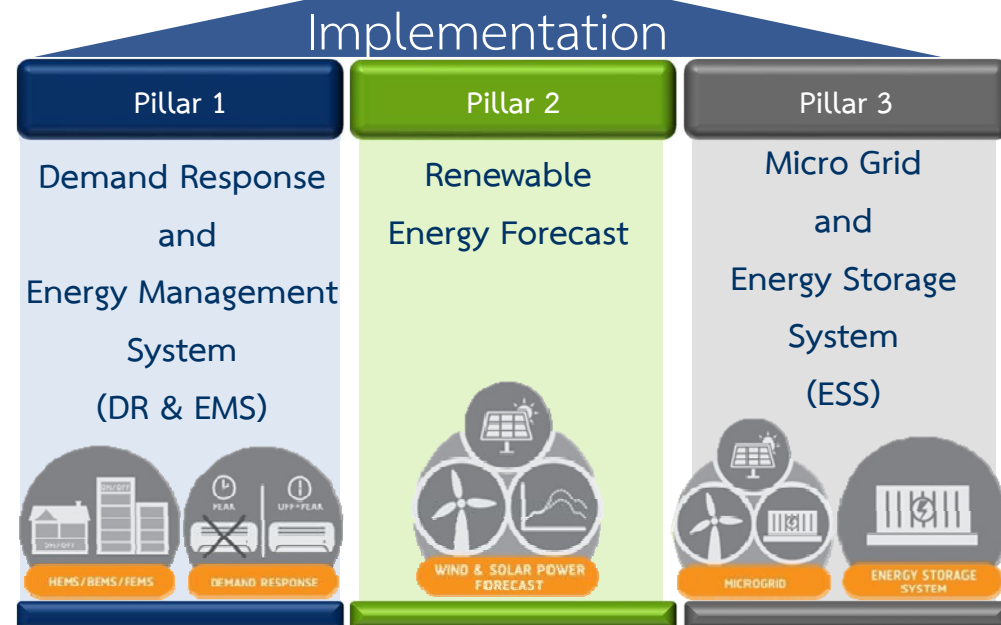
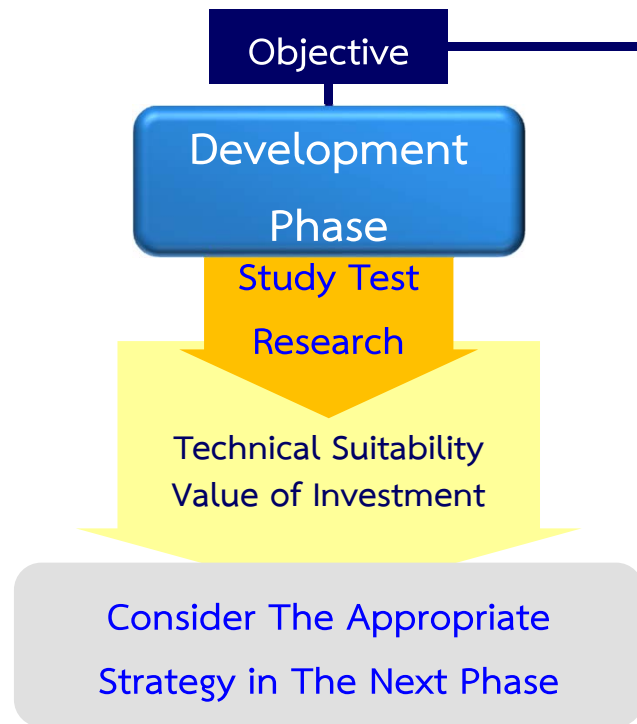
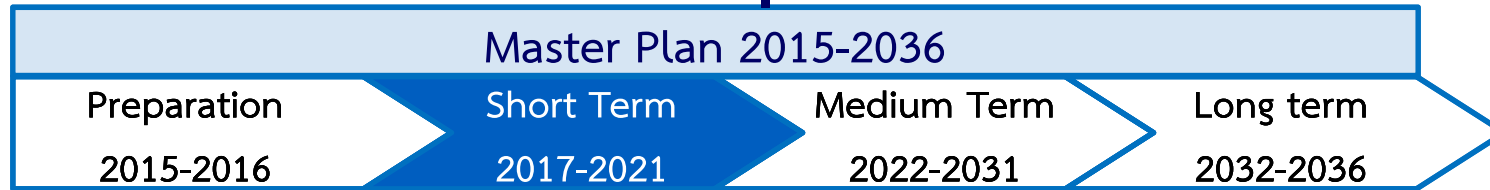
B

Invest in

- EHV/FACTS
- Intelligent Charging/ V2G
- DR/DSM
- RE Forecast

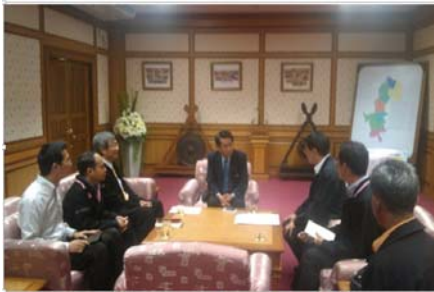
THAILAND SMART GRID DEVELOPMENT MASTER PLAN

Thailand Smart Grid Development Master Plan 2015-2036



MAE HONG SON SMART GRID PILOT PROJECT BACKGROUND

*Discussions with the Assist Governor.
On January 17, 2556*



2556

Conceptual study



*4 sectors Conference (government, business, people and electricity authority).
On October 21, 2556*

*A joint meeting between Mae Hong Son, Executive EGAT present the EPPO, EGAT, PEA and CU on March 4, 2557.
On February 3, 2558*



2557

Feasibility Study



Executive EPPO, EGAT, CU, provincial energy. Explore the area On March 5, 2557.



2558

Approval of budget



*Executive EGAT present the progress of the project.
On February 3, 2558*

*Governor present the progress of the project.
On January 6, 2560*



2559 - 2562

Project Development

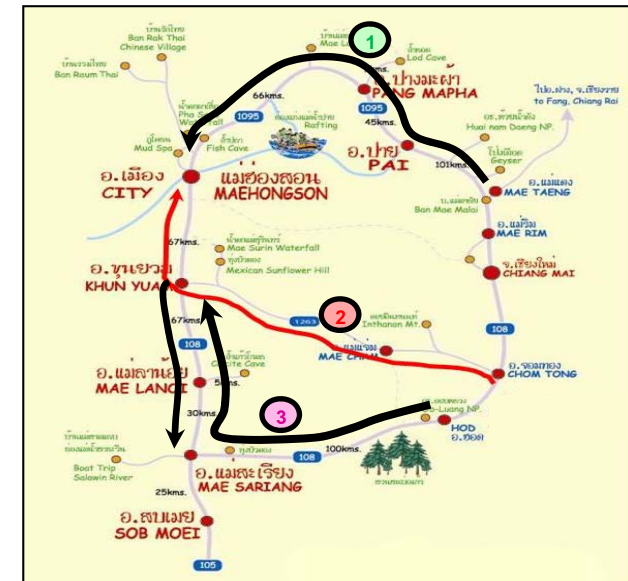


*Meeting of Heads of Government
On June 29, 2559*

MAE HONG SON SMART GRID PILOT PROJECT BACKGROUND (2)

Background

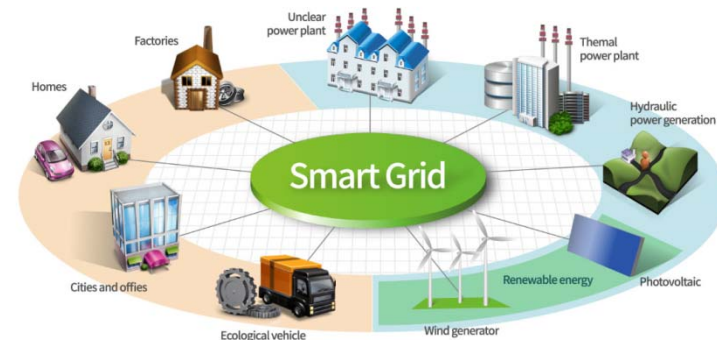
- Power Failures due to Long Distance Line from Chiang Mai Province through mountainous area with wildfire (dry season) and mudslides (rainy season)
- Restricted Area for Transmission Line (National Park, Watershed Area Class 1A)



MAE HONG SON SMART GRID PILOT PROJECT BACKGROUND (3)

Existing Generation

- Mae Sa Nga Dam Hydro Power Plant (2x2.5MW+2x2.65MW), DEDE
- Pha Bong Dam Hydro Power Plant (0.85MW),DEDE
- Pha Bong Solar Farm (0.5 MW), EGAT



Smart Grid Technologies
with Various Applications
can be applied

MAE HONG SON SMART GRID PILOT PROJECT CONCEPT

Concept

Transmission

+ Operation and Automatic Control

- Electricity from RE (more than 80%)

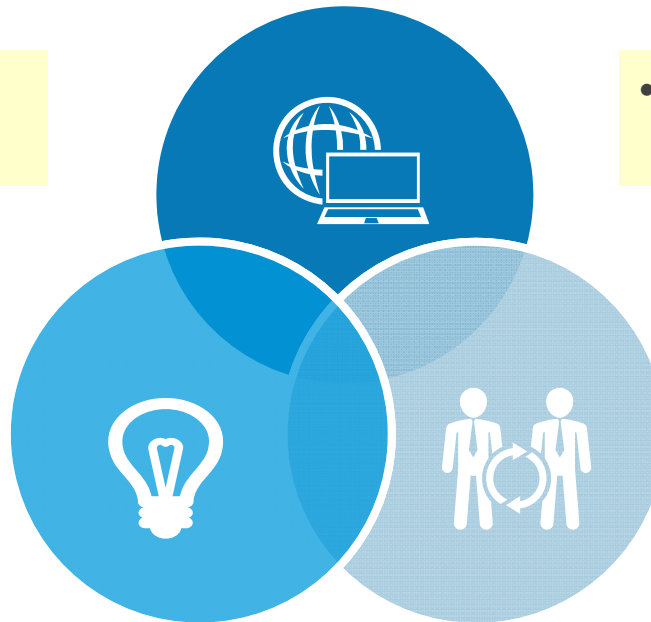
- Increasing Power Reliability and Quality

Generation

- + Renewable energy
- + CO2 Emission Reduction
- + Sustainable Generation
- Fluctuations

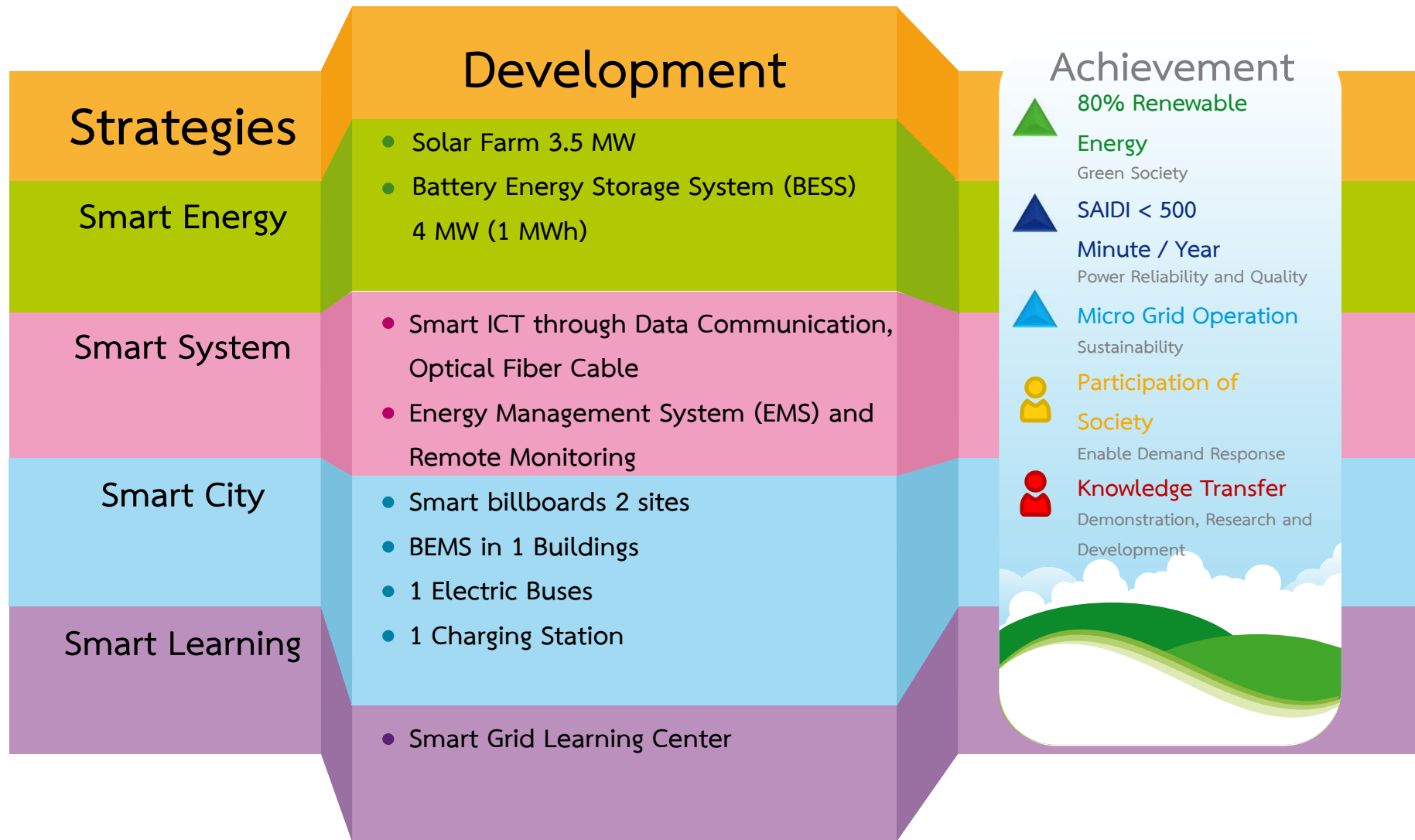
Demand

- + Participation in the electrical power management



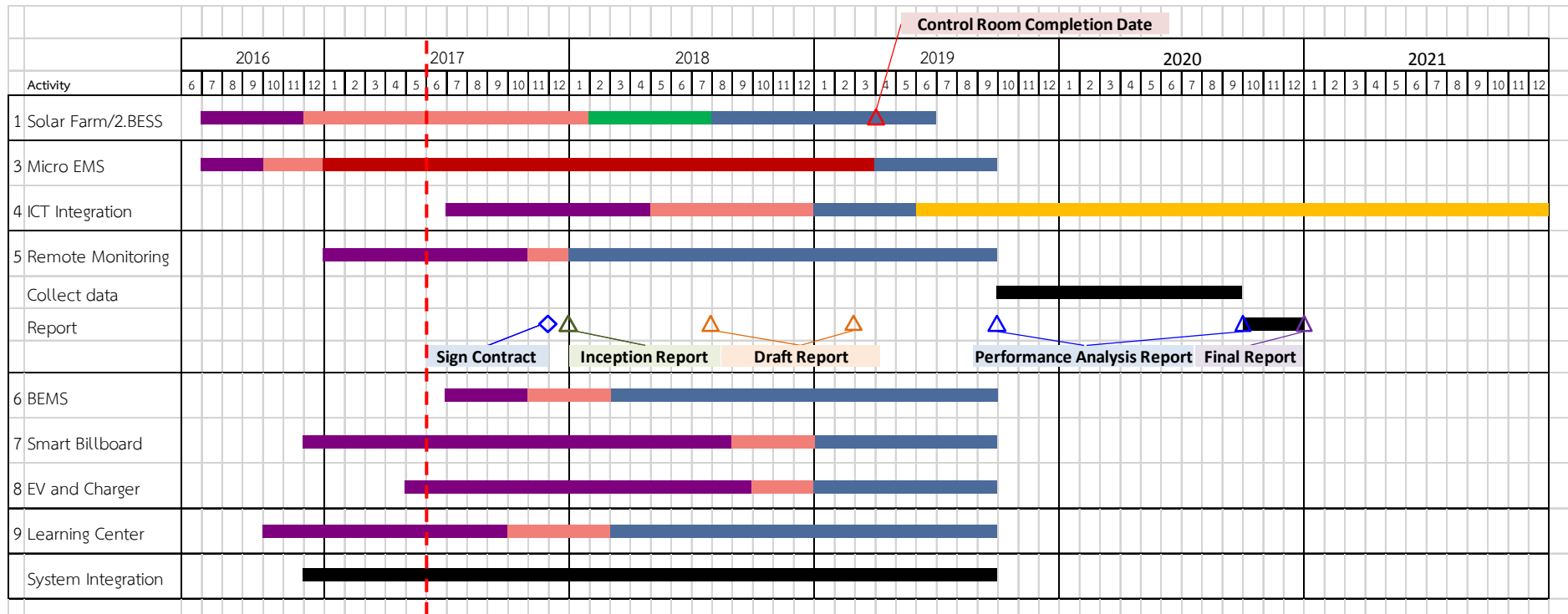
SMART GRID

MAE HONG SON PILOT PROJECT STRATEGIES



IMPLEMENTATION PLAN FOR MAE HONG SON SMART GRID PILOT PROJECT

Smart Grid Pilot Project Progress



NOW

- Prepare Bidding Document
- procurement
- Licensing process
- Construction and Installation
- Development
- Performance Analysis
- lease Communication

MAE HONG SON PILOT PROJECT BENEFITS

BENEFITS

Renewable Energy Power Plant

- Solar Power Plant

- 3 MW solar farm
- Solar Rooftop Installation in cooperation with the local and communities

- Dam (Hydro Power Plant)

- Automatic Order Operation from μ EMS in cooperating with DEDE to install RTU.

Smart Billboard

- A large outdoor board in real-time for communicating with consumers and travelers showing the amount of electricity consumption from green power. Which relying on the distribution line from Mae Taeng district, Chiang Mai Province.

Smart Street Light (future)

BEMS (Demand Response) (future)

- Raise Awareness for people in Mae Hong Son
- Support EPPO policy for DR operation

Smart Learning Center



- Being an effective leader for Smart Learning Center among ASEAN countries.
- Become a significant knowledge landscape for Mae Hong Son's visitors.

Micro Energy Management

System (μ EMS) provides automatic control

- BESS (Applications)

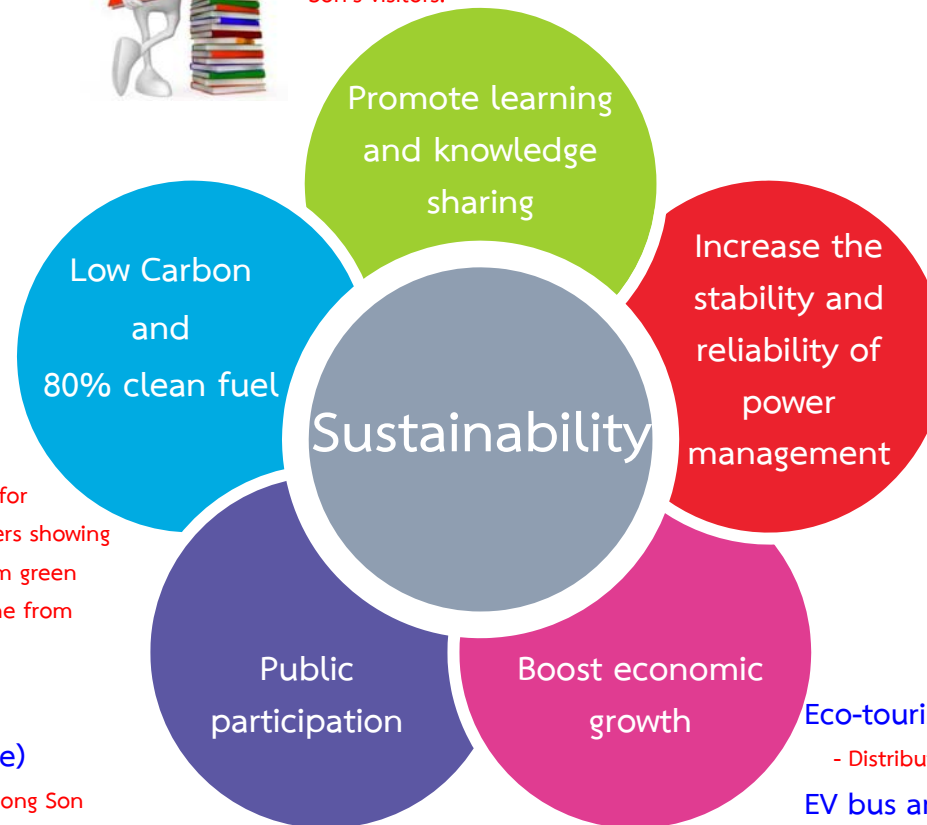
Effective Testing on the 4 modes and being as the applicable prototype for deployment in central/ northeast part with large source of wind power and solar energy.

- Islanding Mode
- Frequency Regulation
- Renewable Firming
- Peak Shifting

- Diesel Power Plant

- Automatic operation when the battery run out of power.

Cooperation with the Mae Hong Son's PEA and DEDE through the working group of Mae Hong Son's smart grid pilot project with the director of EPPO as chairman.



Eco-tourism

- Distribution of income to community through tourism.

EV bus and charging stations

- Collecting the data of EV charging
- Calculating the energy efficiency of the charger