



SGtech

School of Renewable Energy and Smart Grid Technology
Naresuan University

Update Smart Grid Situation and trends in Thailand

5th ASEAN SMART GRID CONGRESS (ASGC 5)

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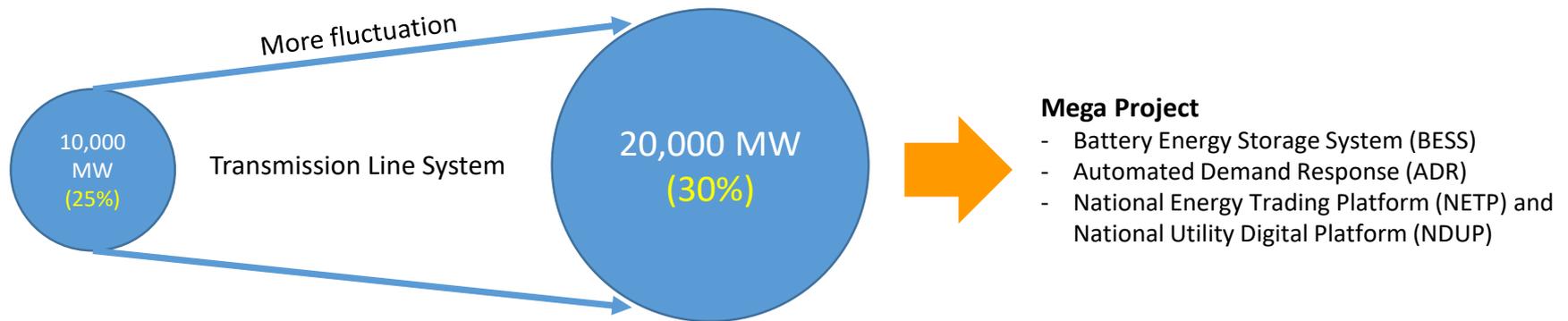
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Power Development Plan (PDP 2018)*

- Peak power and RE capacity about 30,000 MW and 10,000 MW respectively*
- Forecasting peak power 54,000 MW with increasing the RE capacity up to 20,000 MW (30%) in 2037

RE capacity target in 2037



Pain point: Need to use the BESS applications for maintaining of power quality in transmission system

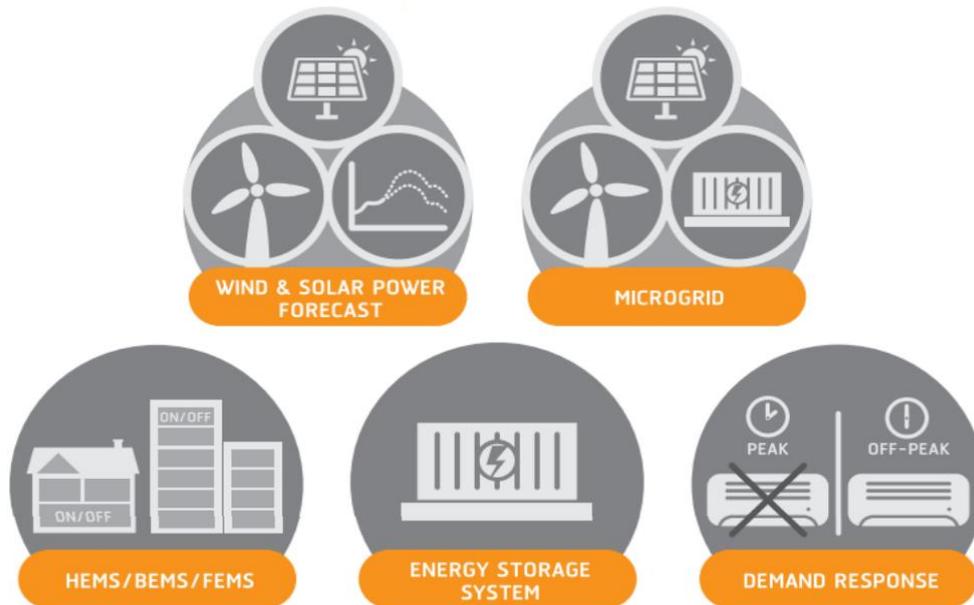
* update in April 2019 (PDP 2018 - 2037)





Smart Grid Development Plan (PDP 2015)*

- Focusing of Smart Grid technology area with budget about 6,600 Million USD
- 5 components SG technology areas based for Thailand



Five components of Smart Grid development plan

SG development plan 5 components:

1. Energy Management System: EMS
2. Pricing & Incentive Design for Demand Response
3. Microgrid System
4. Energy Storage System
5. National RE Forecast Model

* Roadmap SG development plan 2015 - 2037





Electricity Generating Authority of Thailand (EGAT) Planning project (middle part of Thailand)

- Too much of renewable energy installation in this areas such as **Lopburi province** about 300 MW and **Chaiyaphum province** about 200 MW
- Using **BESS about 16 MW** in Chaiyaphum and **21 MW** in Lopburi province
- Both of area using BESS for integration of renewable energy: RE Smoothing, Frequency Regulation and Peak Shifting



Renewable energy installation in the middle part of Thailand

Substation	Renewable Energy Plan in 2020		Total (MW)
	Wind (MW)	Solar (MW)	
Chaiyaphum	140.7	77.5	218.2
Lopburi	207.0	94.2	301.2

- 2018 : Design and Planning Phase
- 2019 : Constructions Phase
- Estimation cost : 65 Million USD





Provincial Electricity Authority (PEA) Planning project (Samui Island: Surat Thani province)

- Increasing of demand every day with power limitations of transmission systems
- Using **BESS about 25 MW** for peak clipping (3 hr) and demand reduction (10 hr)



การไฟฟ้าส่วนภูมิภาค
PROVINCIAL ELECTRICITY AUTHORITY



Samui Island in the southern part of Thailand





Metropolitan Electricity Authority (MEA) Planning project (Bangkok: Pathumwan Substation)



การไฟฟ้านครหลวง
Metropolitan Electricity Authority

- Increasing the peak demand in this area because Chulalongkorn University is planning to set up the Smart City Project (increasing of demand consumption: 2 MW)
- Using **BESS 1.2 MWh** for load leveling and spinning reserve

CHULA SMART CITY PROJECT



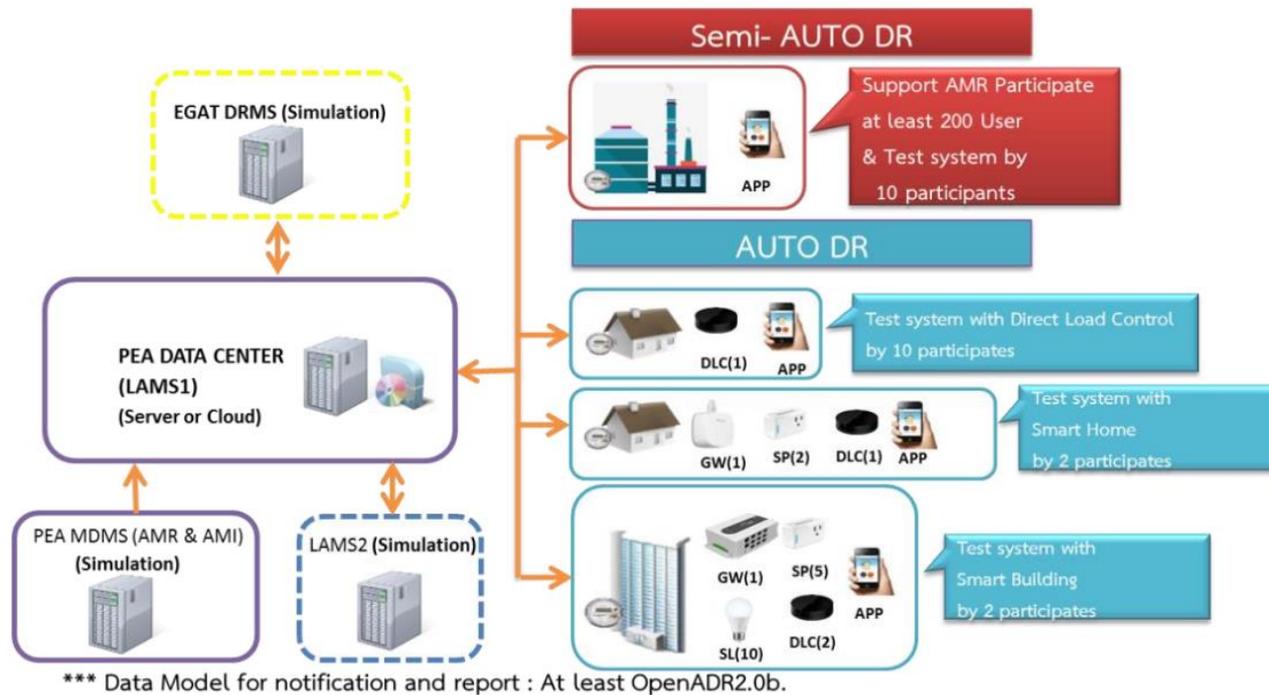


Automated Demand Response (Pattaya: Chonburi province)

- Using Direct Load Control (DLC) function for smart home and smart building
- Cooperate with EGAT (DRMS) for testing system in the PEA customer area



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PROVINCIAL ELECTRICITY AUTHORITY



ADR architectural design concept

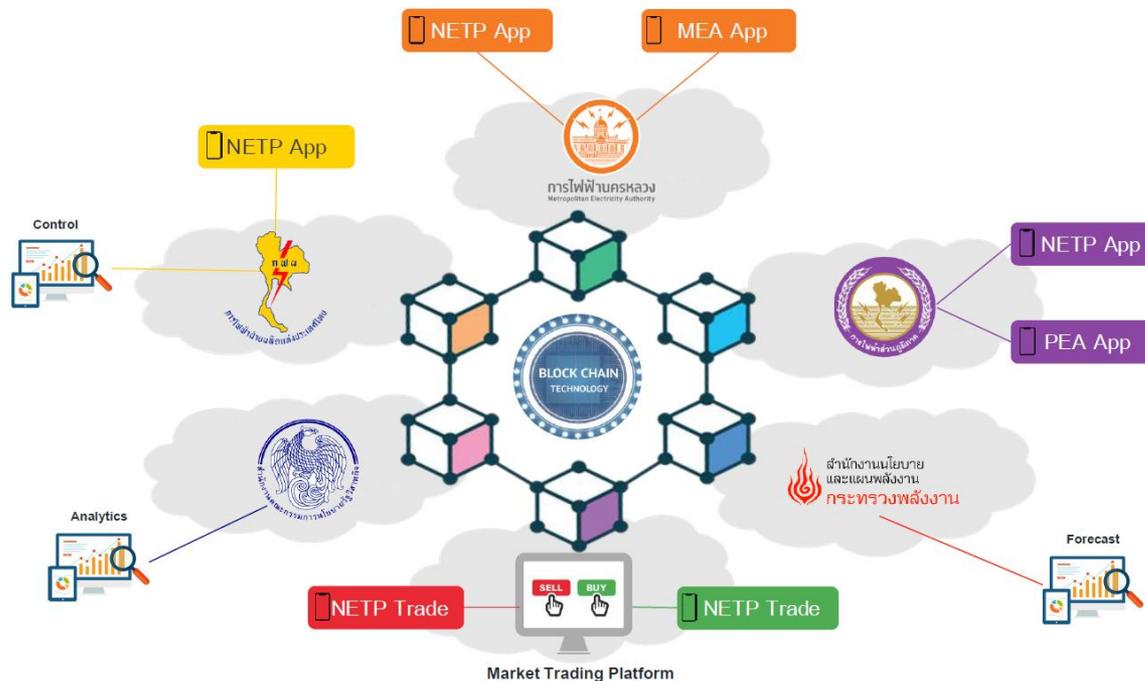




National Energy Trading Platform (NETP)

lead to

National Utility Digital Platform (NDUP)



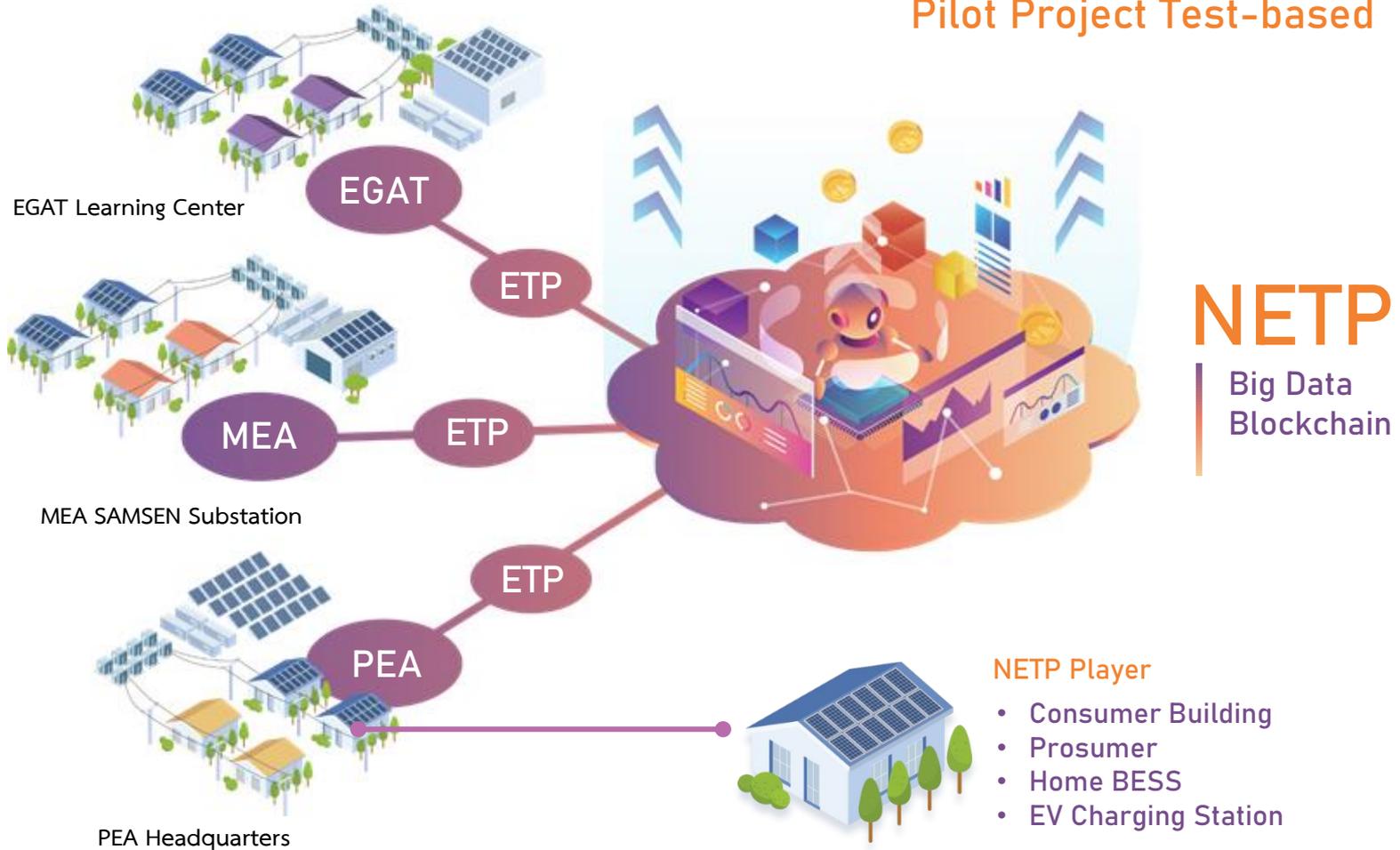
NETP Concept:

The prosumer can buy and sell excess energy directly between buildings by using blockchain technology





Pilot Project Test-based



NETP

Big Data
Blockchain

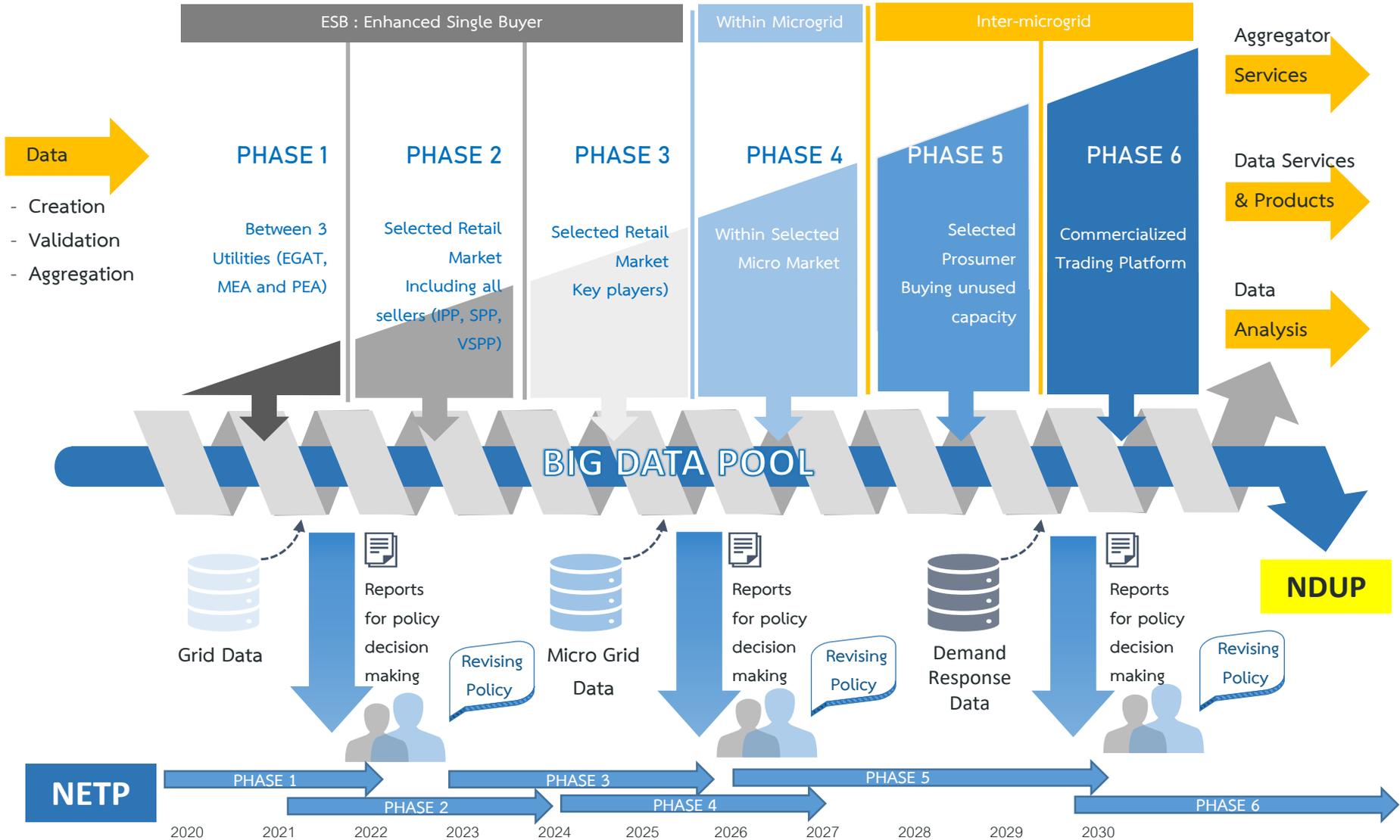
NETP Player

- Consumer Building
- Prosumer
- Home BESS
- EV Charging Station





NETP & NDUP Roadmap





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