

DIGITALIZATION : A KEY ENABLER OF ENERGY TRANSITION

Digitalize Indonesia 2019 PII-EKONID-Siemens
31 Oktober 2019

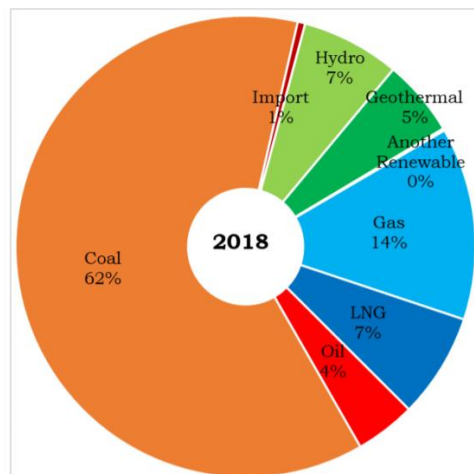


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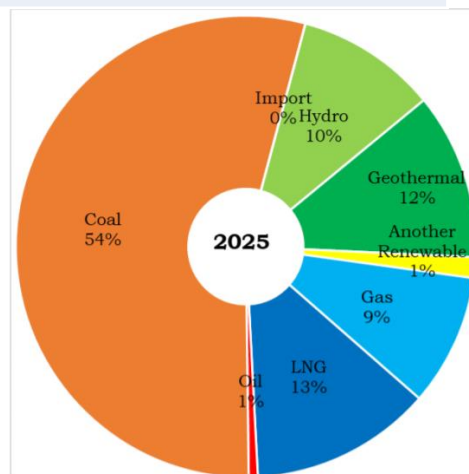
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(*Smart Grid Indonesia Initiative*)

Indonesia at the Cross Road of Energy Transition

Fuel Mix Projection



RE portion in 2018 : 12,4%



RE portion in 2025 : 23,0%

PLN

“Push” Policy

PP No.79/2014
National Energy Policy
(KEN)

UU No.16/2016
Ratification of COP 21

“Pull” Factor

Solar PV price
reach “tipping point”

Battery price keep
decreasing

Rapid development of
EV

Ministry of Industry :
Making Indonesia 4.0

Restraining Factor

35.000 MW Fast Track
Project dominated by
CFSP

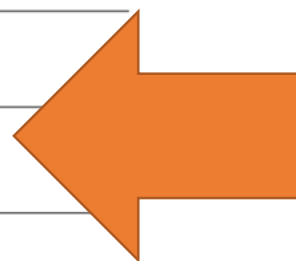
Weak electricity demand

PLN uncertainty

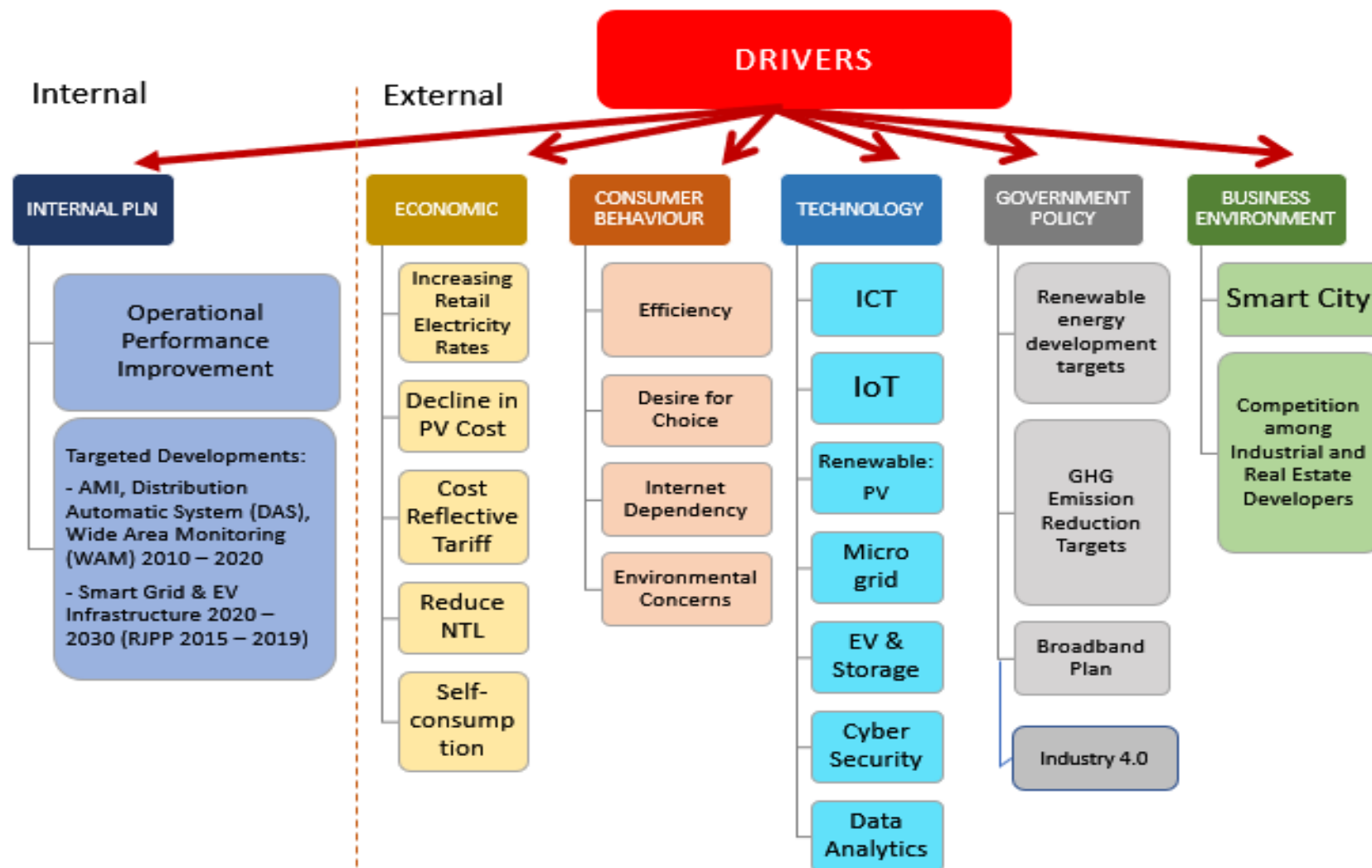
The relation between renewable penetration and digitalization

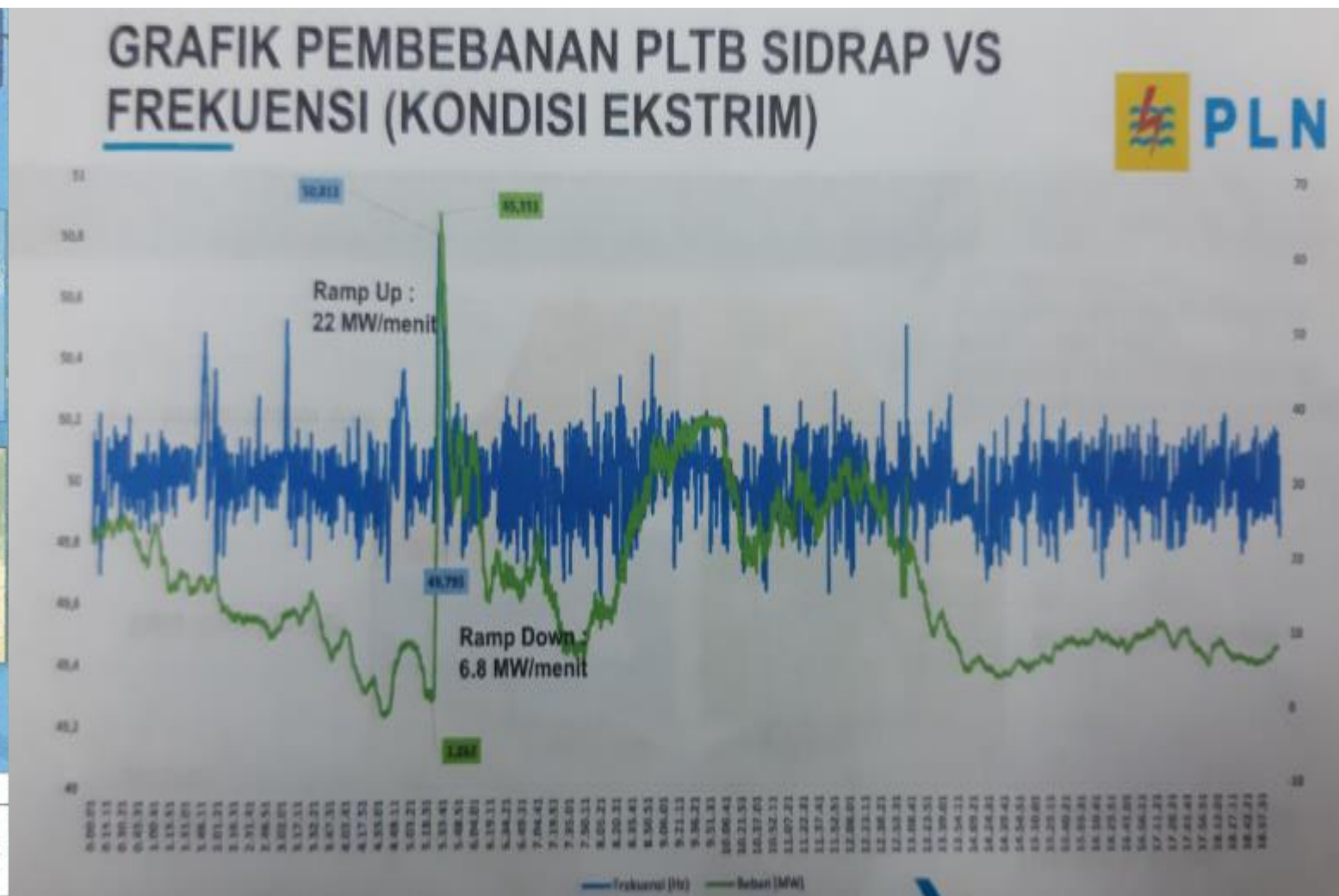
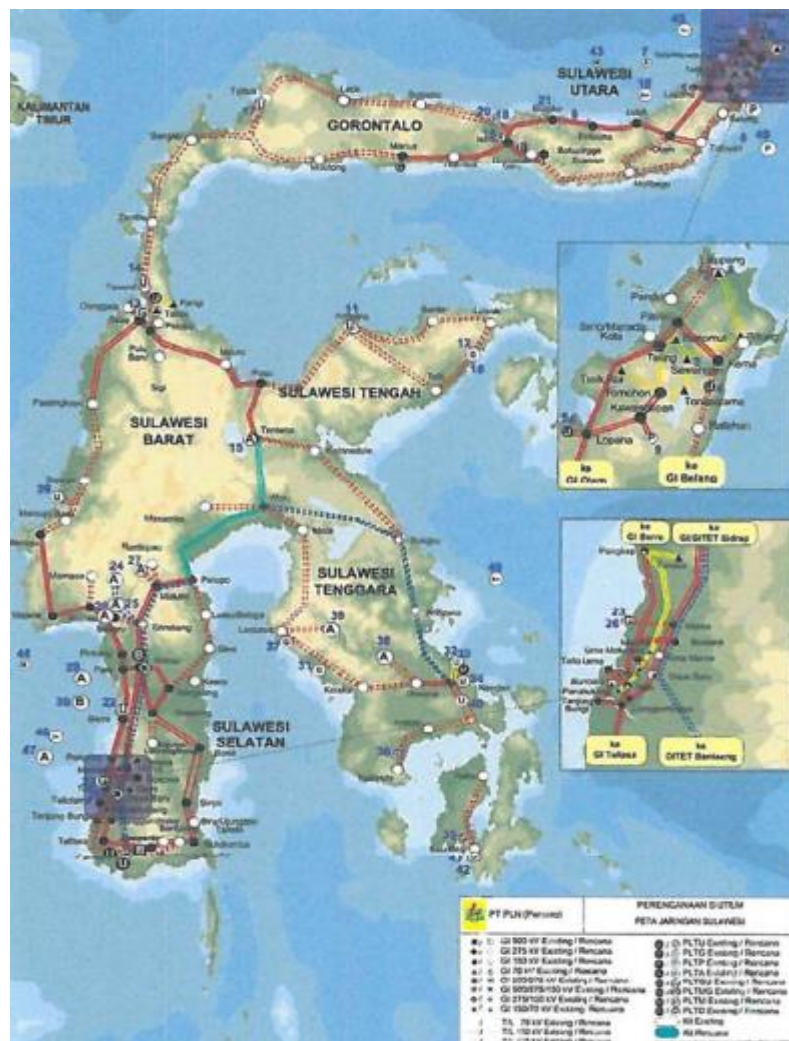
Requirement to Increase Renewable Energy Penetration

- 1 Load Frequency Control (LFC)
- 2 Automatic Generation Control (AGC)
- 3 Weather Monitoring System
- 4 Flexible (Fast Response) Generation
- 5 Pumped Storage/Battery Storage
- 6 Technical Minimum Loading (TML) for base load unit
- 7 Low Voltage Ride Through, Load Frequency Ride Through, "Half" Frequency Control

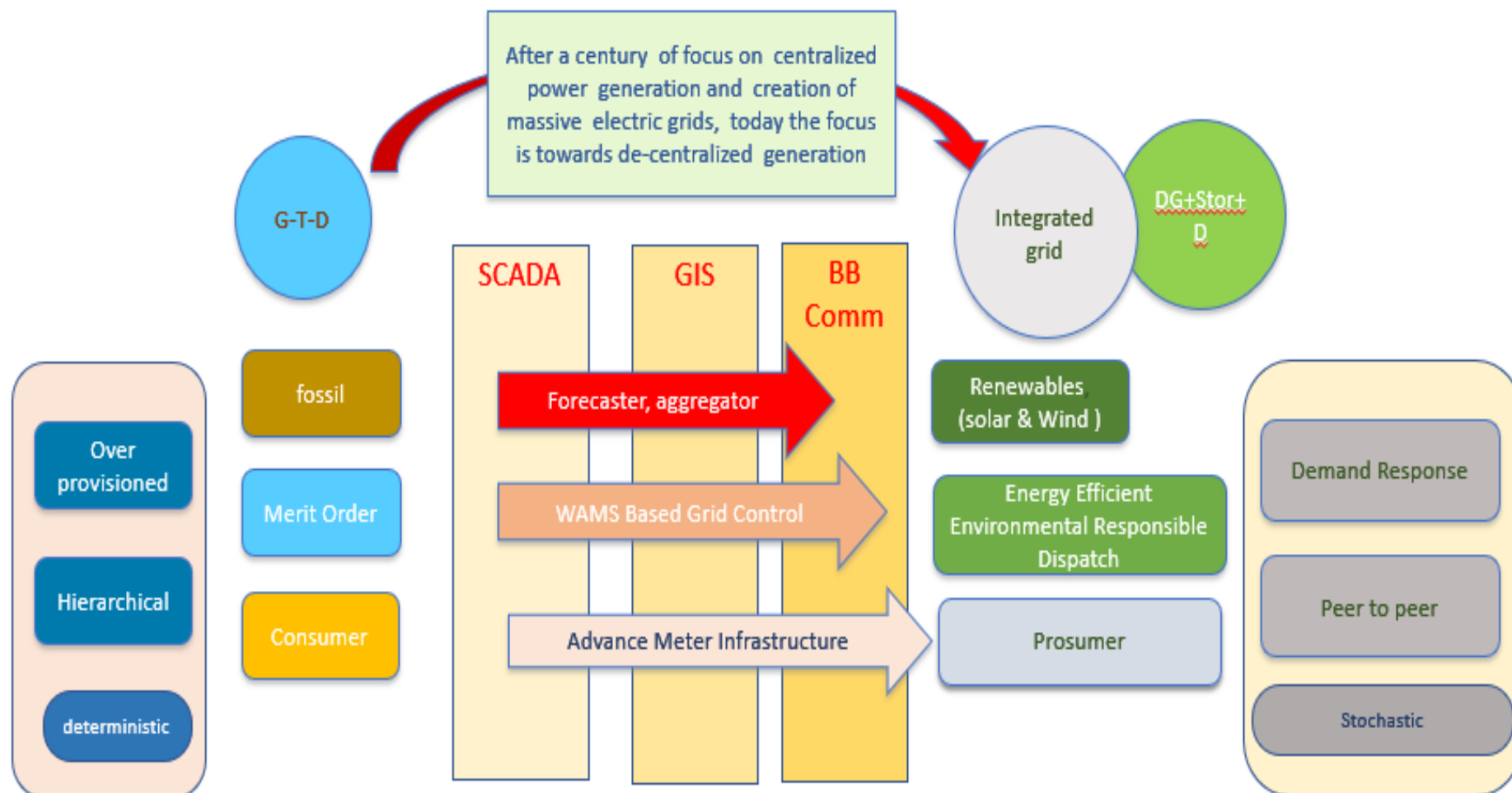


Potential Drivers for Indonesia Smart Grid Development



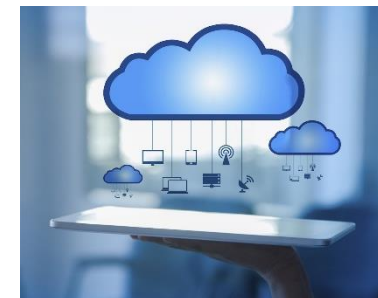


The Changing Landscape And Paradigm Shift



9 Techno drivers

1. Industrial Internet
2. Cloud Computing
3. Big Data & Analytics
4. Advanced Robotics
5. Industrial Automation Integration
6. Virtual & Augmented Reality
7. Simulation
8. Additive Manufacturing
9. Cybersecurity



AMI & Communication



Always Online

- Real time Monitoring & Control
 - Network Parameters
 - Customer Consumption

Remote Connect & Disconnect

- Early Realization of Dues
- Recovery Cost Saving

Cry Out Alarms

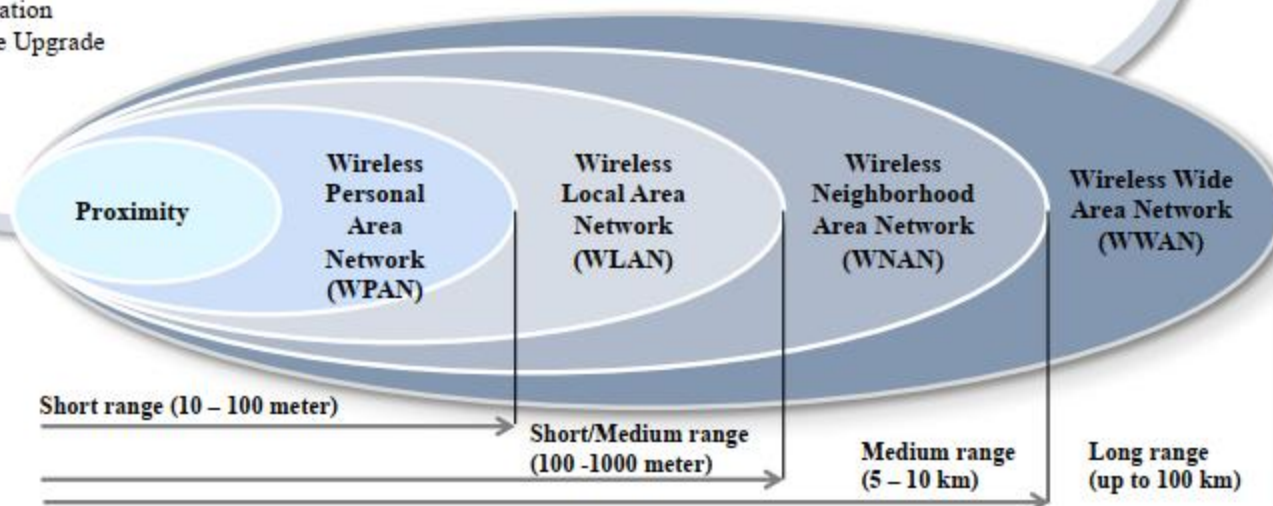
- Theft Prevention
- Loss Reduction

Remote Management

- Remote Configuration
- Remote Firmware Upgrade

- Standard Based
- Wi-Sun Alliance
- ZigBee Alliance
- LoRa Alliance
- IPSO (Internet Protocol for Smart Objects) Alliance
- Proprietary

AMI AND COMMUNICATION

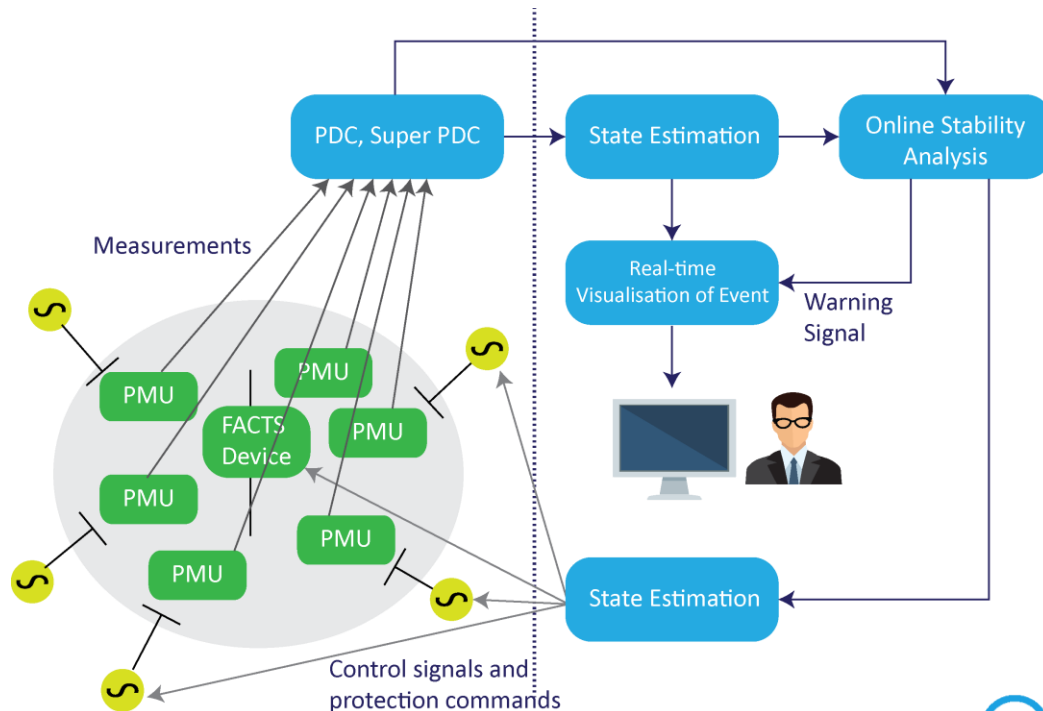


Prepaid
Meter
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customers

AMR
30K
customers

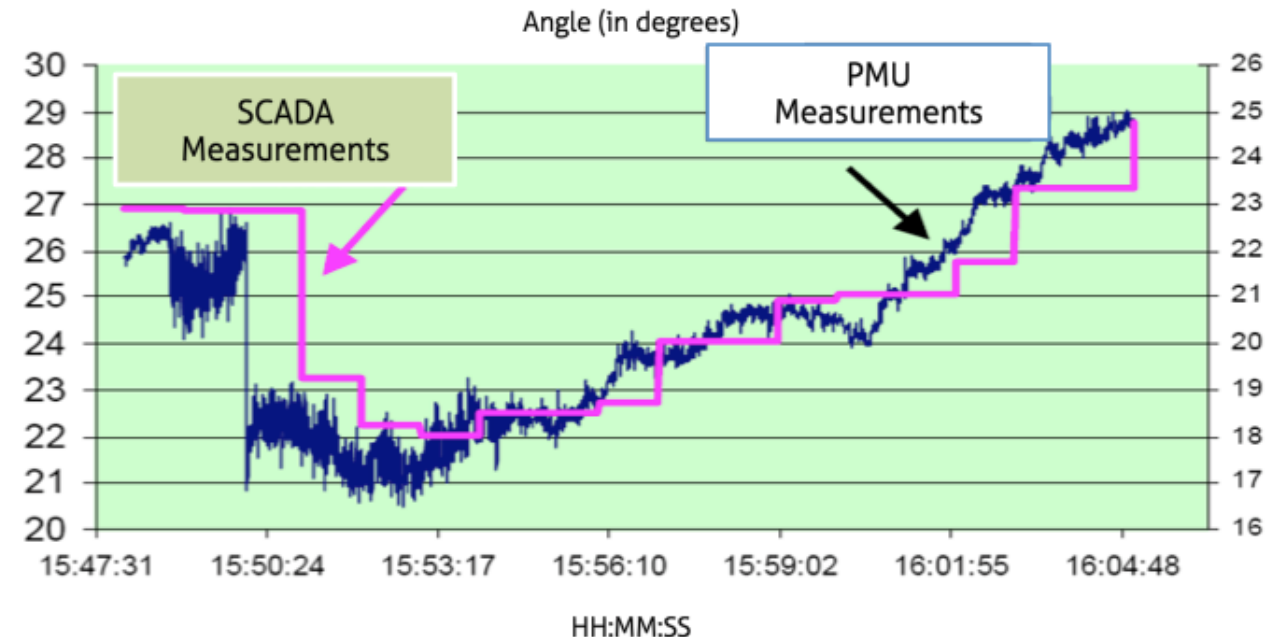
WAMPACS – Wide area Monitoring and Control System

SIMPLIFIED REPRESENTATION OF WAMPAC

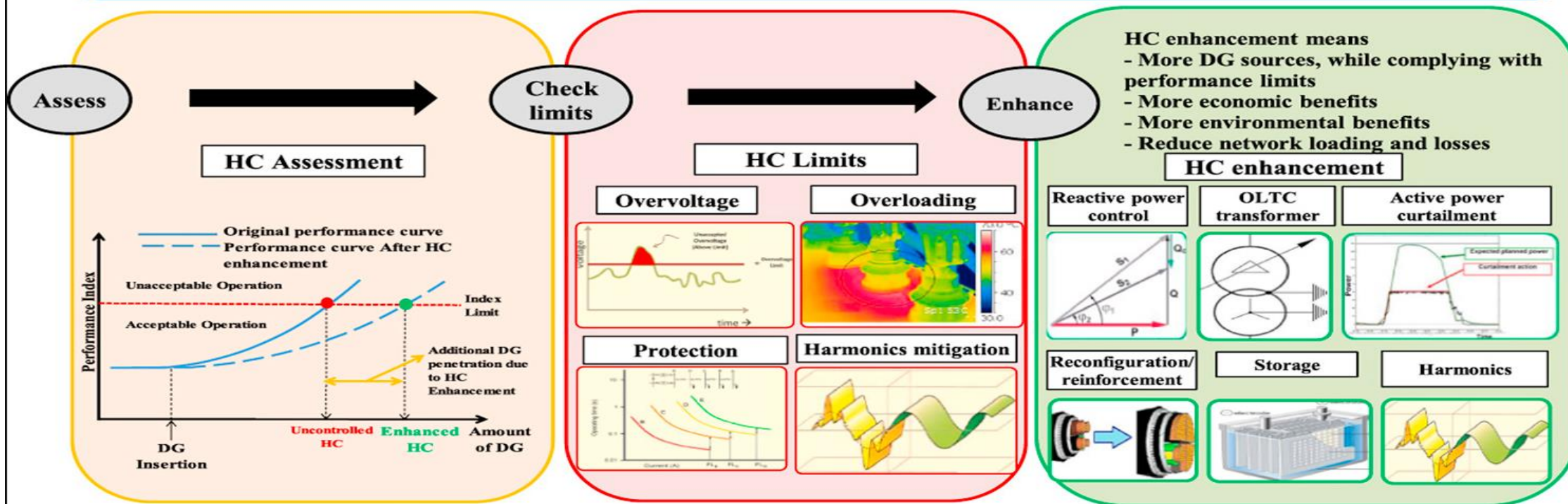


PMU resolution is much higher than SCADA

Higher Resolution (typically 25 samples/second compared to 4 to 10 seconds/sample of SCADA)



- Distributed generation plays an important role in energy systems across the world.
- This paper presents a comprehensive overview of hosting capacity in power systems.
- Hosting capacity developments, limitations, and enhancement techniques are discussed.
- Practical experiences of system operators and real case studies are presented.
- Success in integrating more distributed generation hinges on accurate hosting capacity assessment.





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