Energy Market Reform and Digitalization of Electric Power Companies

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Underlying Trends behind the Energy Business Reform

- Deregulation
- Decentralization
- De-Carbonization
- Digitalization
Strengthening the Energy Value Chain

- **Generation**
- **T&D**
- **Distributed Generation**
- **Customer**

**Optimization of Asset and Operation by Doubling Productivity**

- Investment in Low Carbon Assets
- Consolidation of Upstream and Generation
- Overseas Business

**Integrated Grid Platform**

- Energy Efficiency, Energy Management O&M and Finance
- Innovative Services Combined with IoT Platform

**Flexibility for Balancing and Optimization**
Towards a Digital Utility

- Market and Regulation
  - Wholesale Market
  - Capacity Mechanism
  - Transmission and Distribution Code, Tariff

- Cyber Space
  - IoT (Integration of IT and OT)
  - Smart Grid
  - Behavior Analysis
  - Diagnosis, Asset Management, Optimization

- Hardware and Devices
  - Decommission
  - Renewable Energy
  - Robotics
  - Material Technology
  - HVDC
  - Energy Storage
  - Smart House
  - EV
  - Distributed Generation

- Generation
  - (Climate Change Policy)
  - Pricing
  - DR

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Inter-regional Capacity and Flexibility Provision for Renewable Power Integration

Variable Speed Pumped Hydro

Interregional Ancillary Service and Capacity Mechanism Needed
Smart Home Platform with HD-PLC Technology

Power Line

Service Providers
- Home Security
- Delivery
- Energy
- Appliance Retailer
- Energy Management
- Others

GW + HD PLC

WiSUN

BLE

DECT

WiFi

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Marketplace based on IoT (high frequency transaction)

- Energy (MWh)
- Capacity (MW)
- CO2 Credit
- Flexibility
- Other benefit

Power Producer

Customer

- Storage
- EV
- Distributed generation

Other players

System Operator

Grid Owner

Energy Service Provider

Gas, Water, Transportation, ...

Electricity

Operation, Maintenance, Finance, ...
Integrated Grid Service Provider

Verification of the Power Network System, which maximize output of Renewable Energy

- Renewable Energy
- Distribution Network
- Communication Network
- Control Center
- Supply-Demand Control
- Prediction
- Control/Suppress
- Compensation
- Generator & Battery
- Energy Storage
- Supply Capacity
- Adjusting Capacity for Frequency Control
- Output
- Fluctuation
- Ramp