



ESIG Down Under 2020

Recent TEPCO projects exploring the role of customer engagement in Japan

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5D's bring Energy Transformation

Utility 1.0 : Vertically Integrated Utility



Deregulation -> Democratization

Utility 2.0 : Unbundling Network Business



Decarbonization

Decentralization

Digitalization

Depopulation

Utility 3.0 : Integration with Other Platformers



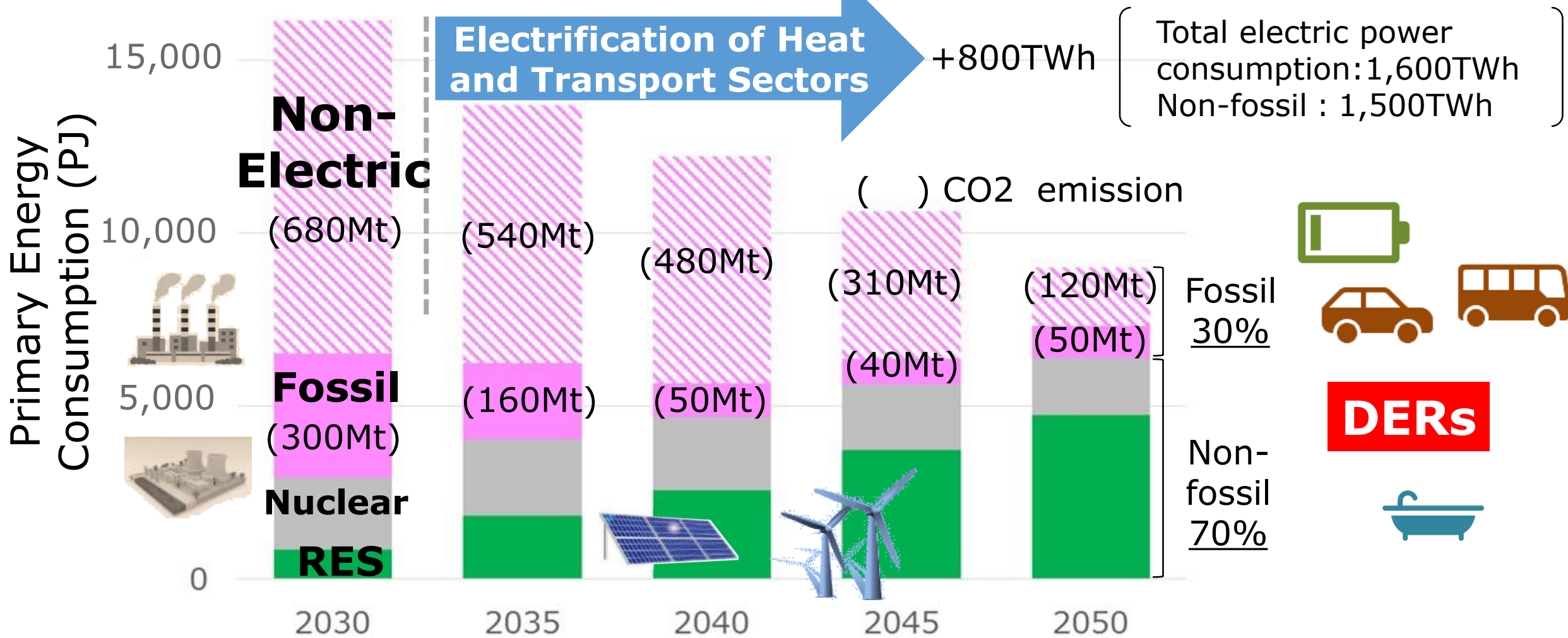
Energy Transformation in Japan

Sector Coupling

Electrification of Heat and Transport Sectors

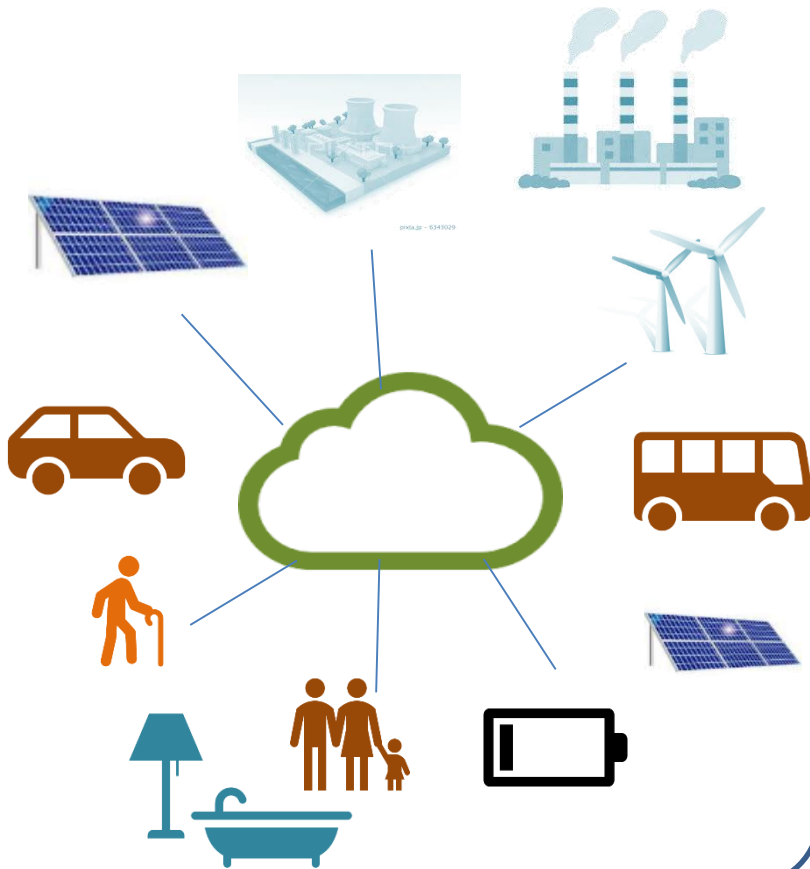
+800TWh

Total electric power consumption: 1,600TWh
Non-fossil : 1,500TWh



Future Role of Power Grid for Cyber-Physical Society

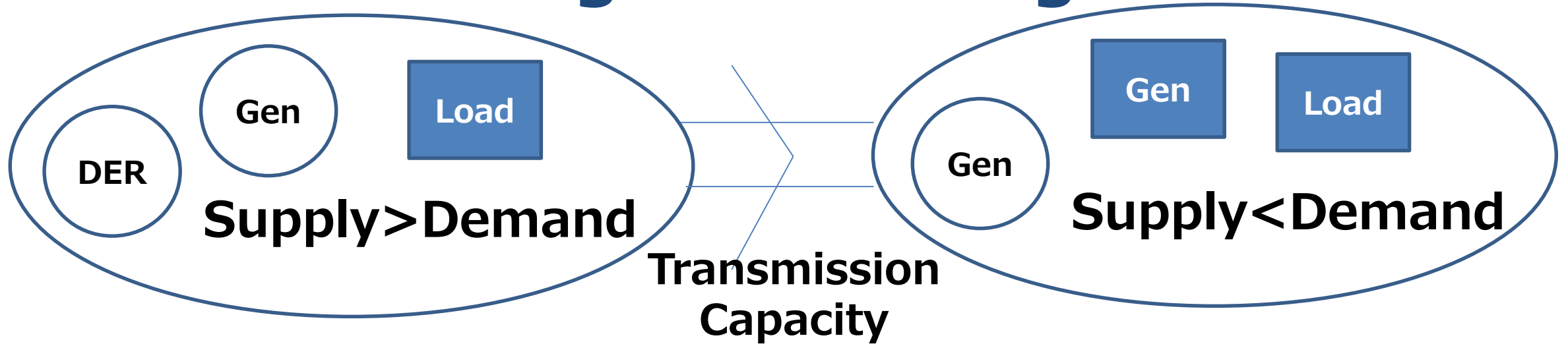
Utility 3.0



Infrastructure for Cyber-Physical Society with Grid Edge Devices (DER, mobility, heat and others) which are

- **connected**
- **autonomous**
- **shared**
- **electric**

Congestion management with DERs for maximum usage of existing Tx Grid



Security
Constrained
Transmission
Capacity

Monitoring of
Network

Real-time
Congestion
Management

Emergency
Control

- Increase capacity by emergency controls

- Dynamic Rating

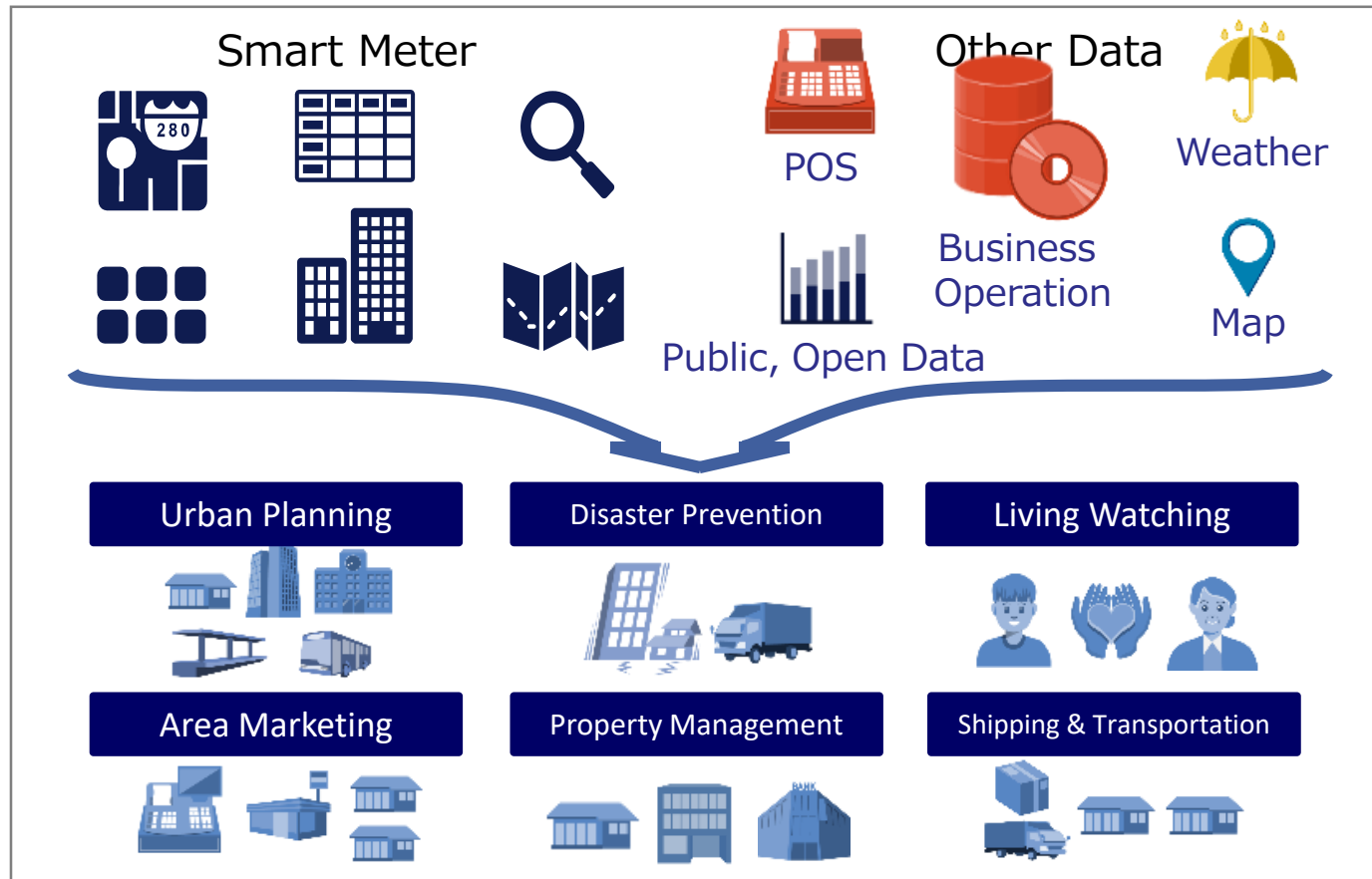
- **Control of Generation and Demand**

- Emergency control of NW/Gen/Load



Grid Data Bank Lab.

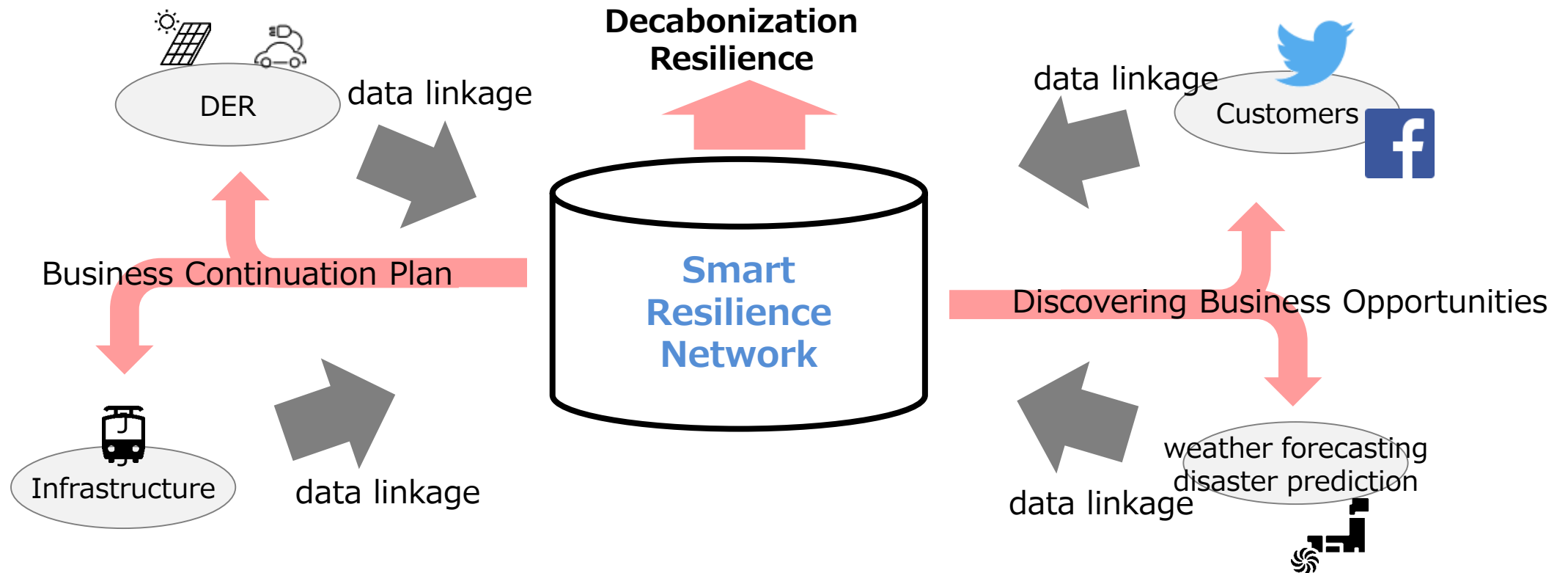
- Solve social issues and create new values based on cross analysis with data from different industries.



Founded by TEPCO PG, Chubu Electric Power, Kansai Electric Power, NTT Data
Members: 120 organizations (as of June 20)

Smart Resilience Network

- “Smart Resilience Network” was established with experts and Kansai Electric Power T&D to serve as a foundation for social co-creation by linking various social data and distributed resources and collaborating across business and industry boundaries.



Conclusions

- 1. Megatrends of 5D's will accelerate electrification in heating, transportation and IoT activities.**
- 2. Energy management is important for realizing a supply-demand transitions and maximizing synergies with supply and demand technologies.**
- 3. TEPCO Power Grid will continue to develop the platform for future energy management and collaboration to engage customers with partners.**

