



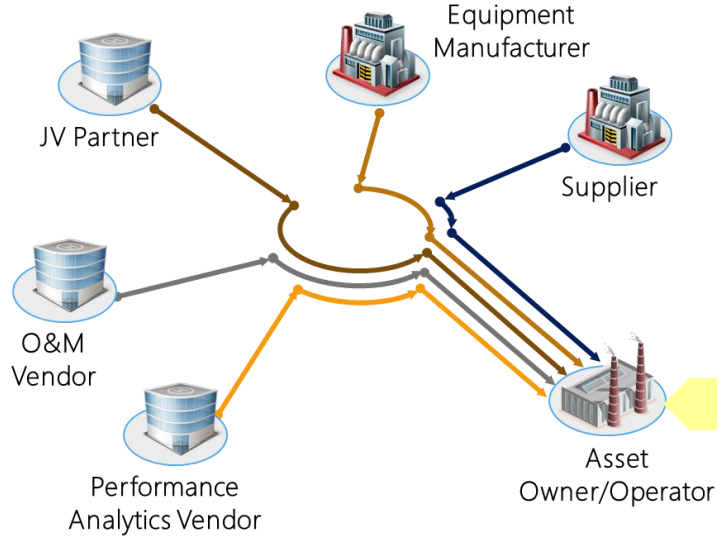
Connected Services Initiatives as a Smart Energy Enabler Integrating the PI System and Value- Added Capabilities.

**Presented by Hisashi Fukuda, ITOCHU Techno-Solutions
Enrique M.Herrera, OSIsoft**

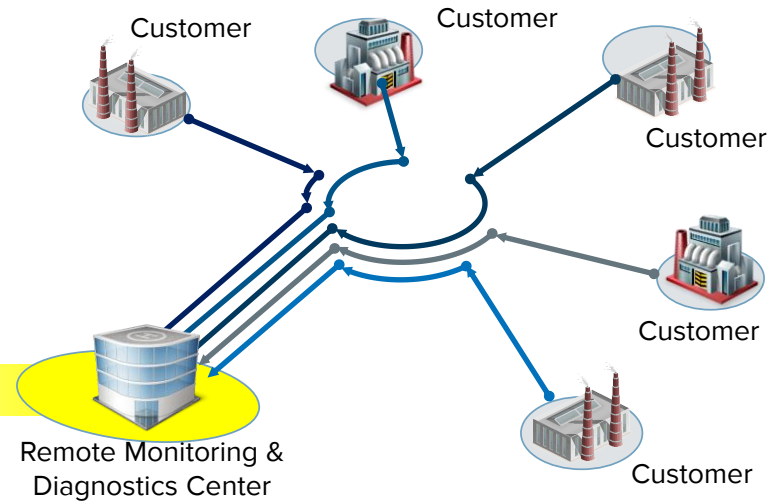
OSIsoft Connected Services

are focused on....enabling the Service Provider

Multiple stakeholders...



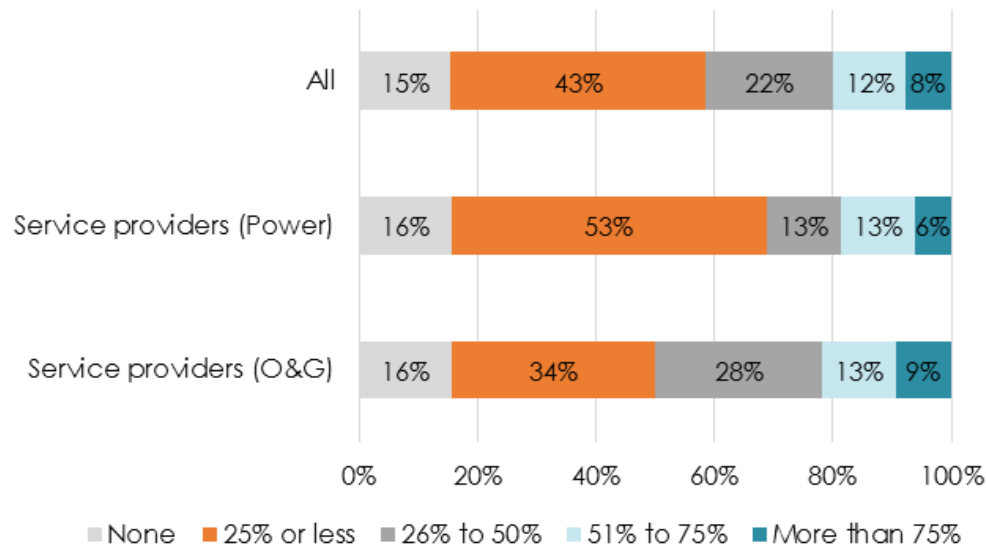
... a Service Provider perspective



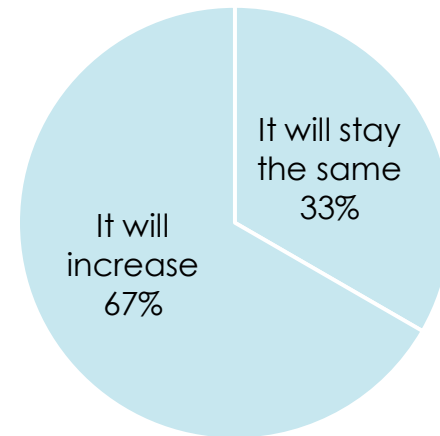
Provide a simple, secure technical and commercial framework for key service providers to obtain the data they need to drive aftermarket service excellence.

Independent 3rd Party Market Research

Percent of customers already sharing asset data with service providers (N = 65)



Importance of sharing/analyzing asset data in the next five years (N = 66)



SOURCE Zpryme: **Connected Services: Real-time Sensor Data for Enhanced Aftermarket Services 2015**

Agenda

- About ITOCHU Techno-Solutions Corp.
- Market Background
- Connected Services Value Scenario 1-2
- Applications 1-4
- KFS to expand the Connected Services
- Business Impact
- Conclusion

About Itochu Techno-Solutions Corporation

Our Strengths

50+
Years

Over 50 years of history in the IT industry

A leading company in Japan that has been advocating the shift to open systems nationwide.

70+
%

The power of engineers

Engineers constitute over 70% of the 8,000 employees worldwide.

180+
Contracts

Partnerships

Our partnership with more than 180 vendors enables **us** to offer the best-of-breed technologies.

4,000+

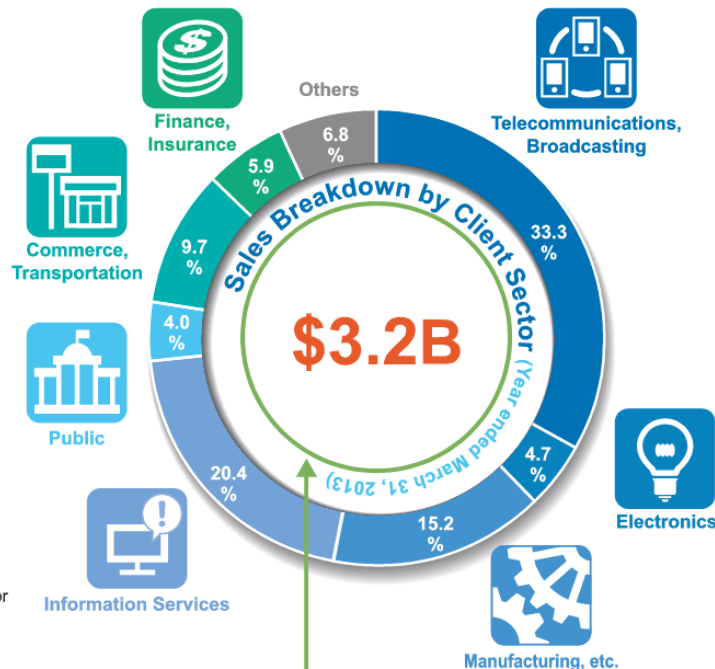
Technical excellence

Our engineers have obtained more than 4,000 certifications, including national qualifications and vendor certifications.

84,000
m²

7 data centers at 5 locations in Japan

Bringing over 25 years of uninterrupted, accident-free operation of our data centers spanning 84,000m².



3.2
Billion USD

Rich customer base:

We serve customers from a wide range of industries and have accumulated in-depth knowledge and expertise that are unique to these industries.

* 1USD = 100JPY

About Itochu Techno-Solutions Corporation

IT Lifecycle We delivers optimal services across all phases of customers' IT lifecycles.



Remote Operation Center

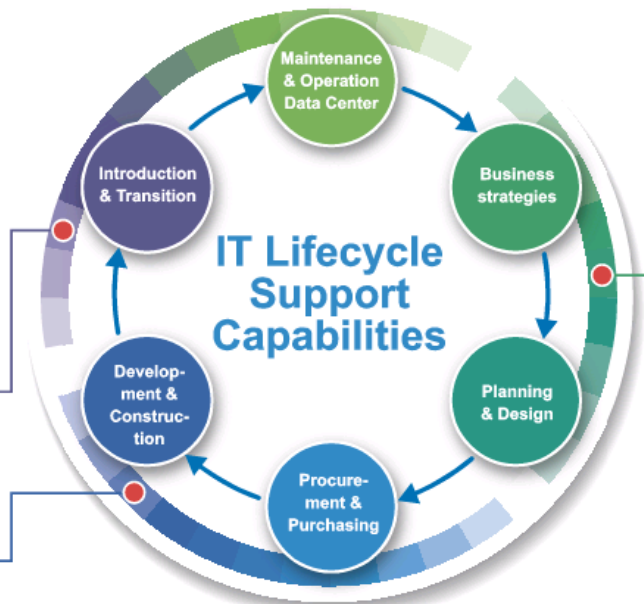
Monitors, operates, and manages IT systems using state-of-the-art technologies.

Outsourcing

- Maintenance and support
- Operational and administrative

Systems Integration

- Industry solutions
- Business solutions
- IT solutions



Big Data Processing Lab

A dedicated environment for inspection and verification of high-speed data processing technologies essential for the utilization of big data.

Consulting

- Business consulting
- IT consulting



Technical Solution Center

One of the largest and most comprehensive inspection and verification facilities in Japan.

About Science & Engineering Systems Div.

Solution of Energy and Environment



- Raise the operation rates of Nuclear energy plant
- full fledged use of environmentally friendly energy

Nuclear

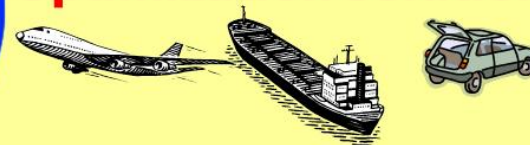
Natural Energy (Wind power, solar power)

Oil development , natural gas development

The securing of energy resource



Low-energy and Optimization solution

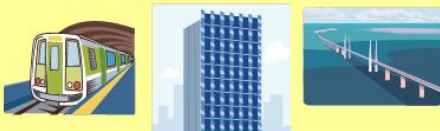


- Railway
- Automotive
- Shipbuilding, Heavy industry Aerospace

- Design for fuel efficiency
- Optimum ship course

Efficient energy use

Long life Solution



Railway

General constructor, Bridge, Life line

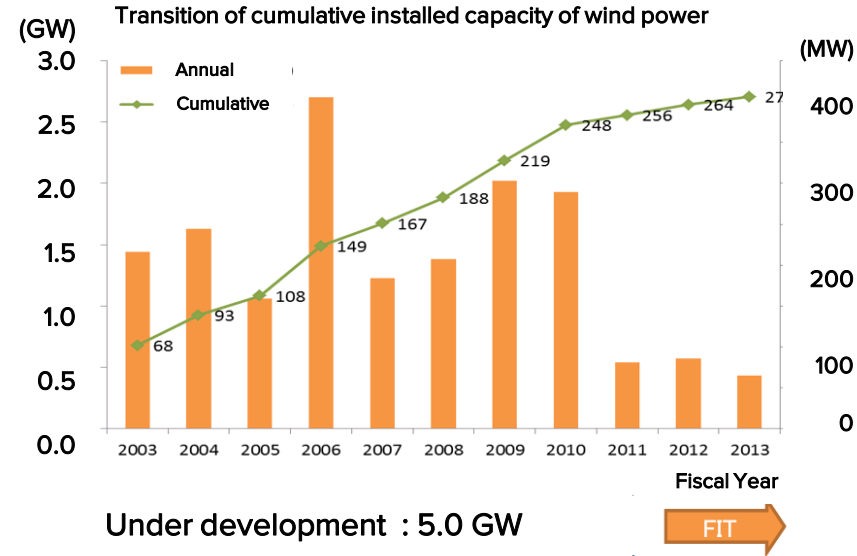
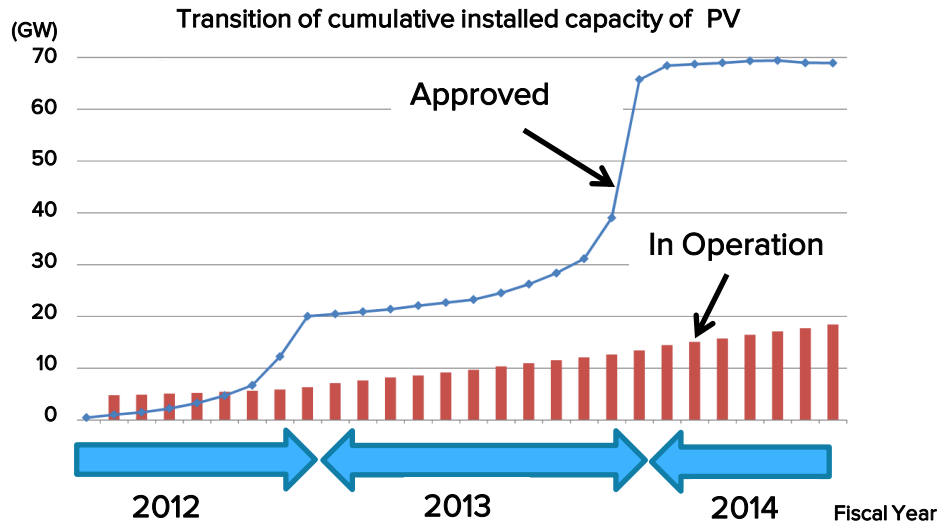
Consultant of civil engineering

Safety

Evaluate of natural disaster and aging change, Earthquake
Tsunami and flooding

Background : Renewable energy Booming

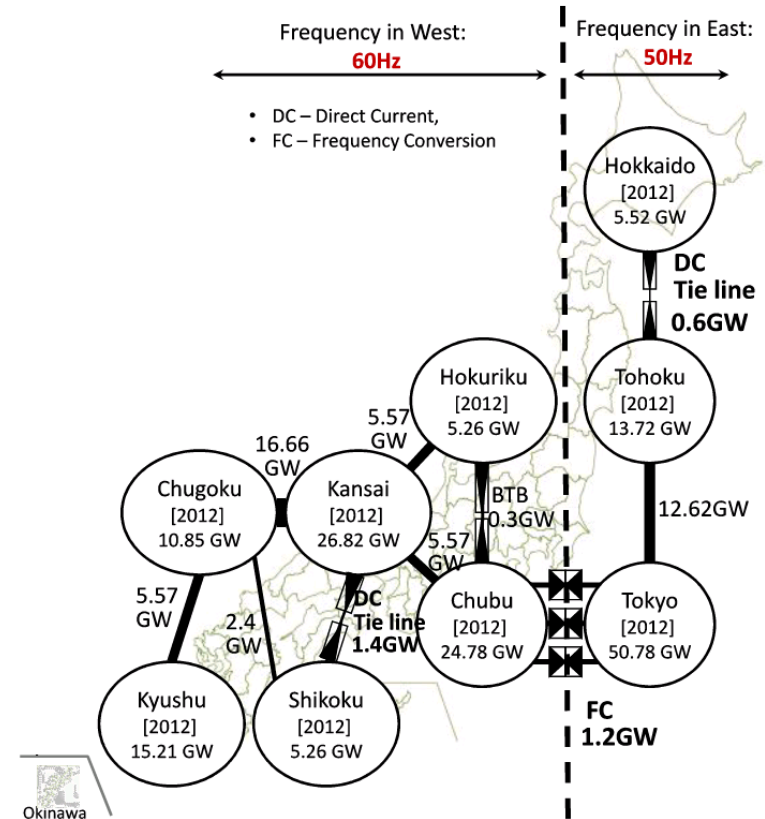
- Due to High levy
2012: PV: ¥40/kWh, Wind: ¥22/kWh
2015: PV: ¥27/kWh, Wind: ¥22/kWh



(Reference: Renewable market trend in Japanese, METI, March 2015)

Background : Japan's Electricity Market

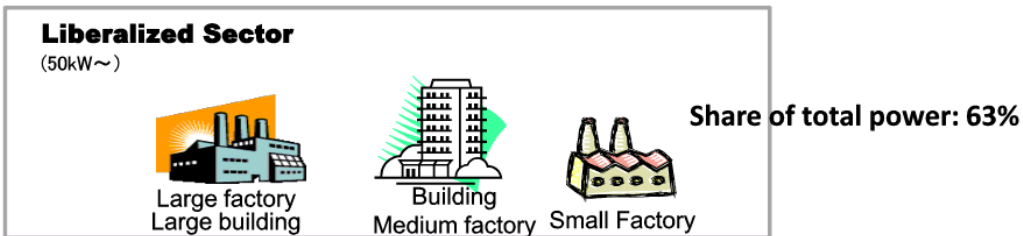
- Regional monopoly system with 10 big and vertically integrated EPCOs
- Market volume:1,094TWh/287GW(2012)
- Retail competition(2013)
 - 63% of the market
 - Share of non-EPCOs:4.2%
 - Share of EX-market :1.3%



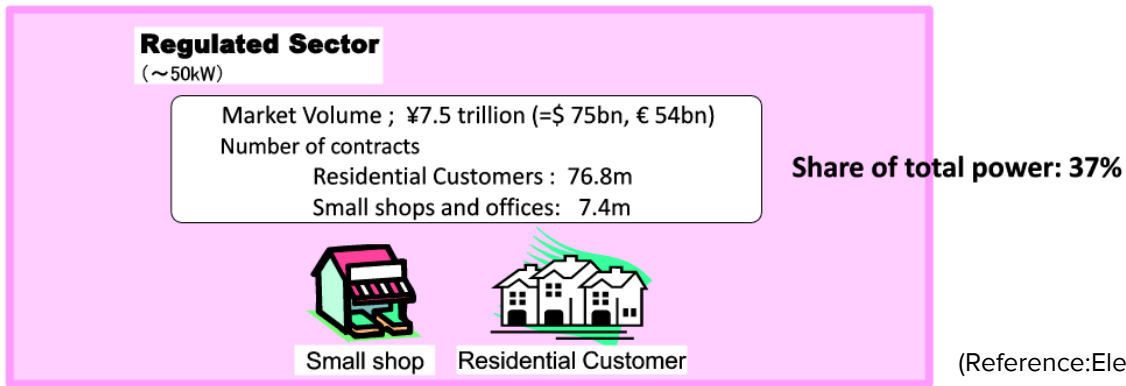
(Reference:Electricity market reform in Japan, METI, Oct 2014)

Background : Full Retail Competition

- Expand retail competition to the residential sector in 2016
- Maintain regulated tariffs to 10 big EPCOs at 2020



Current market Volume
: \$128 bn

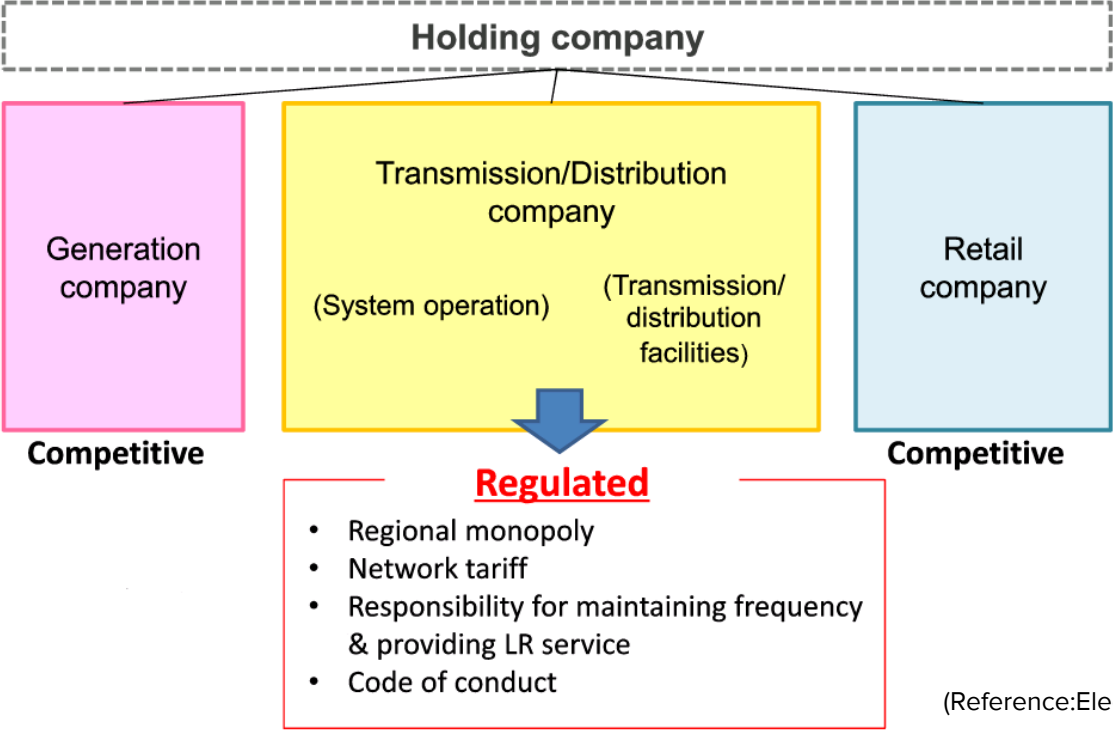


New market Volume
: \$75 bn

(Reference:Electricity market reform in Japan, METI, Oct 2014)

Background : Unbundle the T&D sector

- Unbundle the T&D sector by legal unbundling style at 2020



Both the holding style and the affiliated style are allowed.

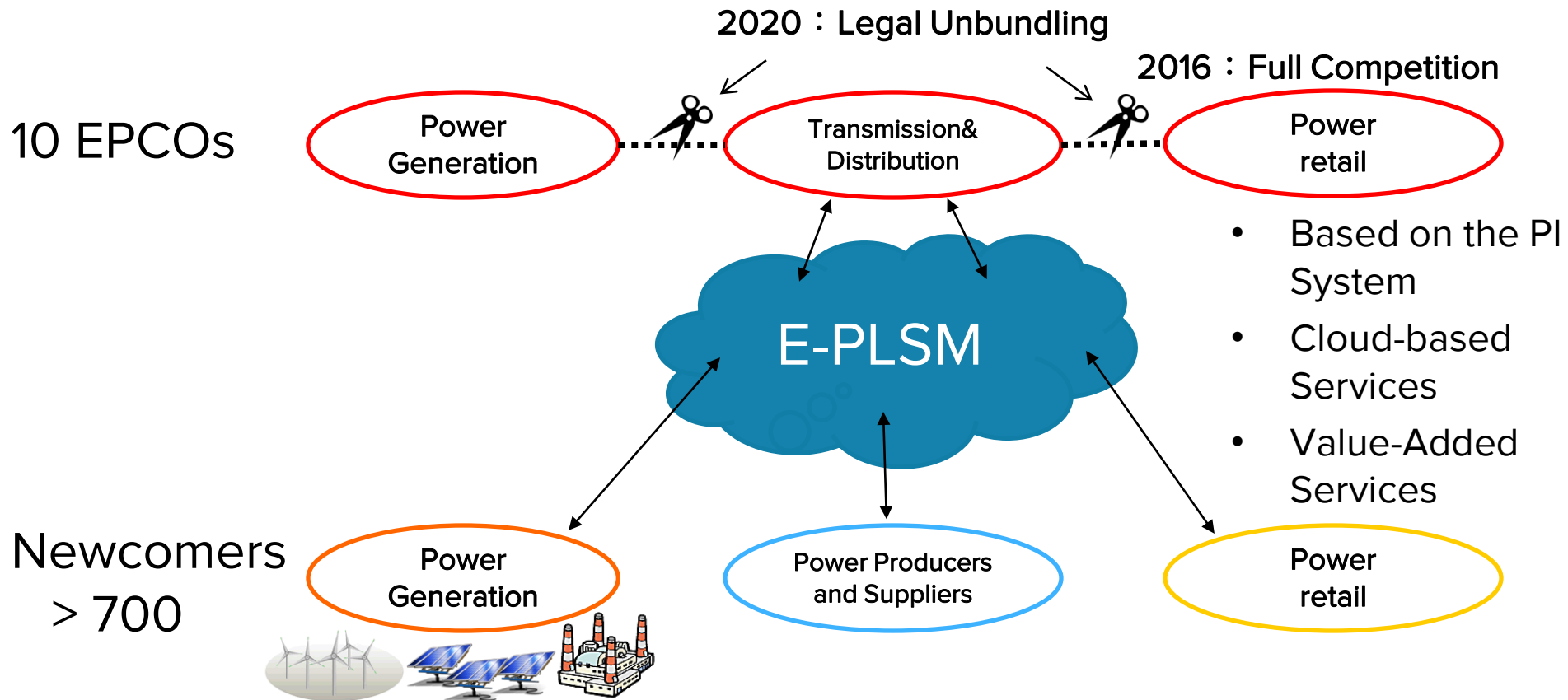
(Reference:Electricity market reform in Japan, METI, Oct 2014)

Connected Services as a Smart Energy enabler

Under the dynamic trend of deregulation and the Renewable energy booming in Japan's energy market

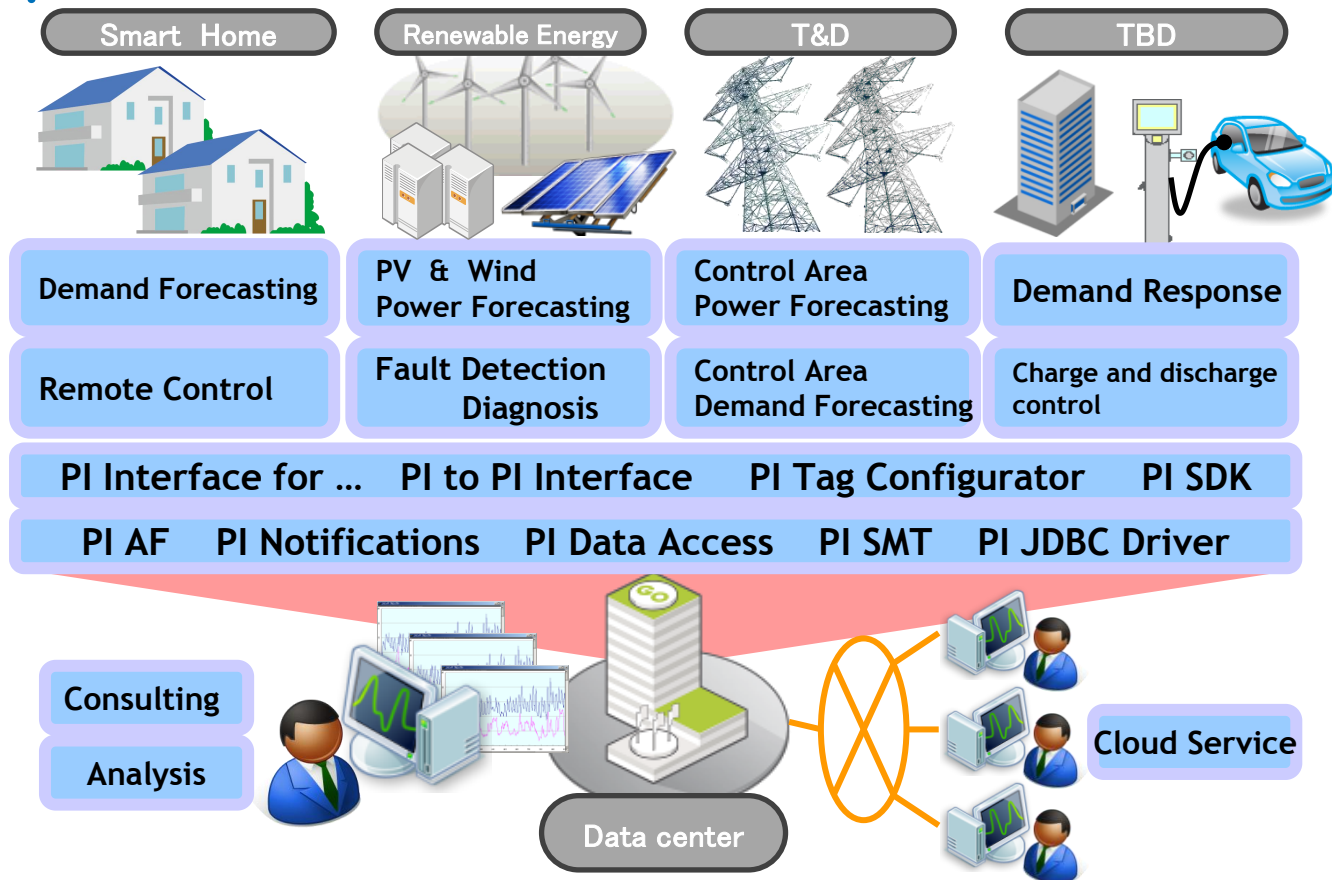
- Integrating scientific & engineering capabilities on top of the PI system for each customer
- Connecting customers regardless of the existing or the potential

Connected Services Value Scenarios 1



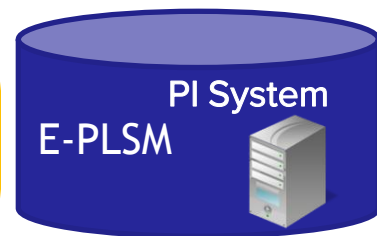
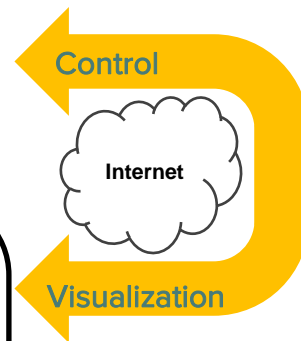
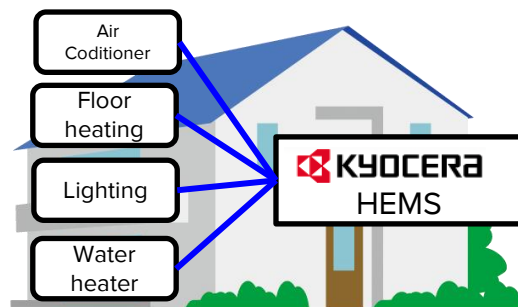
What is E-PLSM ?

- One Platform
- Multi Purpose
 - Smart Home
 - PV
 - Wind
 - T&D
 - ...
- With Specialized Applications
(Partially on-premise)



Applications 1 : For Smart Home

- Customers' Purpose
 - Energy Savings
- Value-added Services
 - Monitoring
 - Remote Control
 - PV Fault Diagnosis
 - Power/Demand Forecasting

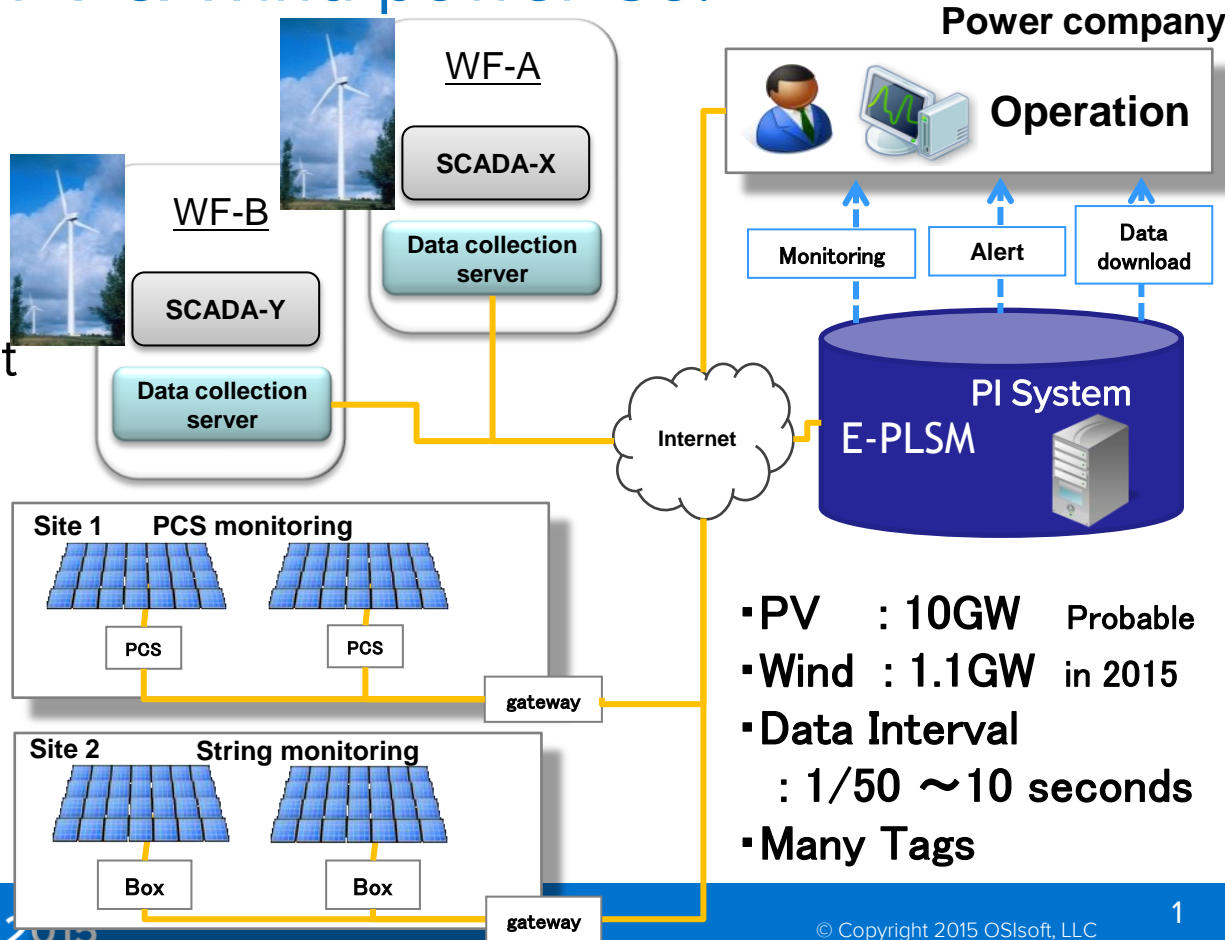


- 3,000~6,000 Homes/year
- 4 devices for now
- 8 devices soon
- Data Interval : 1 minute
- Many Tags

Applications 2 : For PV & Wind power Co.

- Customers' Purpose
 - Data Integrity
 - High Availability
 - Low Maintenance Cost

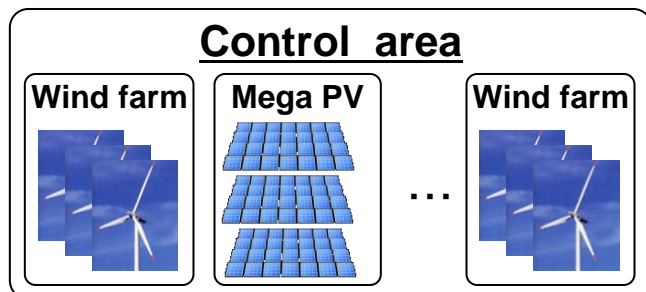
- Value-added Services
 - Monitoring
 - Power Forecasting
 - Fault Detection
 - Fault Diagnosis



Applications 3 : For T & D sector

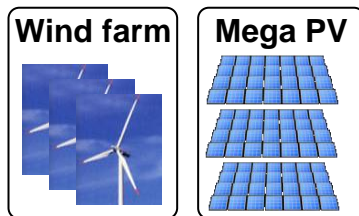
- Customers' Purpose
 - Highly Accurate Forecast
 - Optimum operation of power grid
- Value-added Services
 - Monitoring
 - Control Area & Each Power Forecasting
 - Demand Forecasting
 - Remote Control(TBD)

Control area power forecasting



Observed data
Total power output

Each power forecasting



Observed data
Meteorological and power

Japan
Meteorological
Agency

T&D Sector



Power Forecast

Demand Forecast

E-PLSM PI System

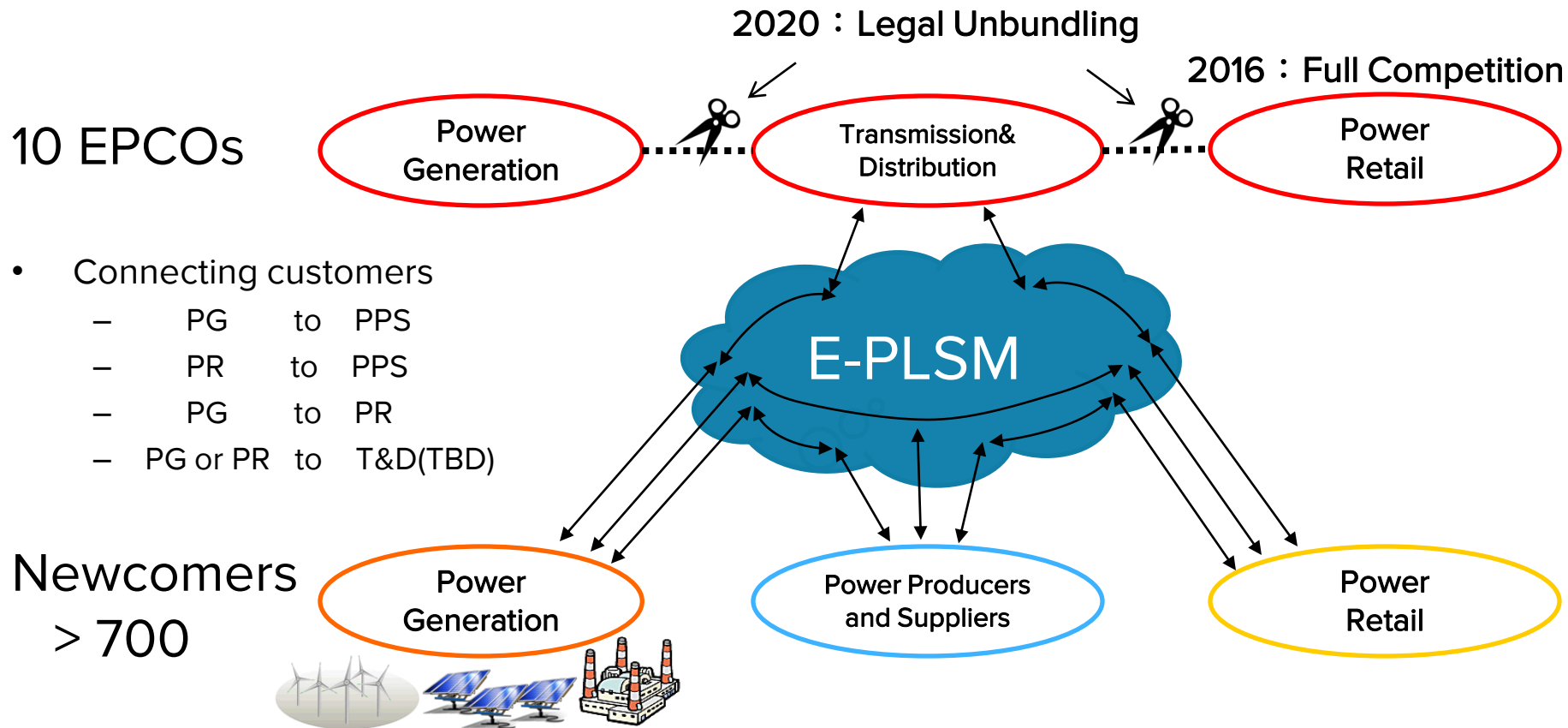
**Observed Data
Collection System**

Forecasting System

**User
Interface
System**

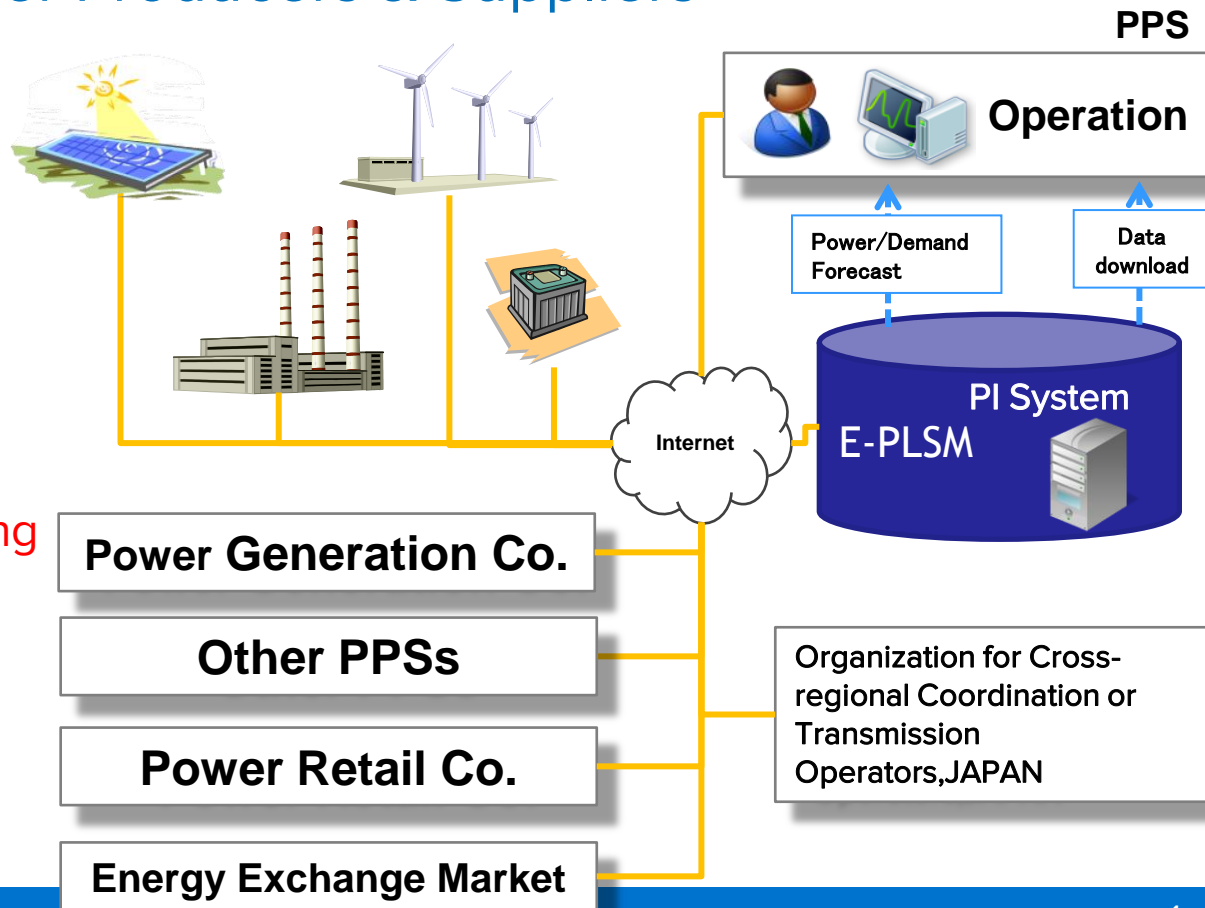
- Forecast period :1day-1week
- Temporal resolution:1min- 1hour
- Update : every 30 minute-1day

Connected Services Value Scenarios 2



Applications 4 : For Power Producers & Suppliers

- Customers' Purpose
 - Optimum Balance of Demand-Supply
 - Highly Accurate Forecast
- Value-added Services
 - Demand-Supply Balancing
 - Customer Information System
 - Power Forecasting
 - Demand Forecasting



KFS to expand the Connected Services

- Data
 - Multi sources(Various data quantity & quality)
- PI system
 - Connectivity, Scalability
 - Integrity, Visibility, etc
- Value-Added Services
 - Our Specialized Capabilities
 - Partnerships & Collaborations



Business Impact

That's one small step for a company,
giant leap for the stakeholders.

one

- Smart Home : 3,000~6,000 Homes/year
+10,000 Homes/year
Meter,FuelCell,Battery,PV,EV
- PV : 10 GW
- Wind : 1.1 GW
- T&D,PPSs : 3 companies
- Smart-something



Probable

Soon

Probable

NEDO

TBD

Conclusions

Business Challenge	Strategic Approach	PI Value
<ul style="list-style-type: none">• Adapt to Drastic change in Japan's energy market• Connect as a Enabler• Leverage our services• Transform our business model itself	<ul style="list-style-type: none">• Connected Services<ul style="list-style-type: none">✓ Specified Capabilities✓ The PI system• Add a Strategic Service• From Application Driven to Data Driven	<ul style="list-style-type: none">• Easy to Extend new markets<ul style="list-style-type: none">✓ Smart Home, PV✓ Wind, T&D, PPSs• Value creation utilizing Partnerships & Collaborations• Connectivity using "PI cloud connect", "PI to PI", etc

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THANK YOU

