

# Smart Grid Standardization Implementation in Japan

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May 16<sup>th</sup>, 2012

## Outline for today

1. Importance of International Standardization
2. The role of standardization in Smart Grid
3. After the Great East Japan Earthquake
4. Japan's Roadmap

## Importance of Standardization

The global changes regarding technical regulations, standards and conformity assessment

WTO/TBT (1995) ; With regard to the operation of technical regulations, standards and conformity assessment procedures, **member economies are required to use international standards and guidelines** as a basis of them.

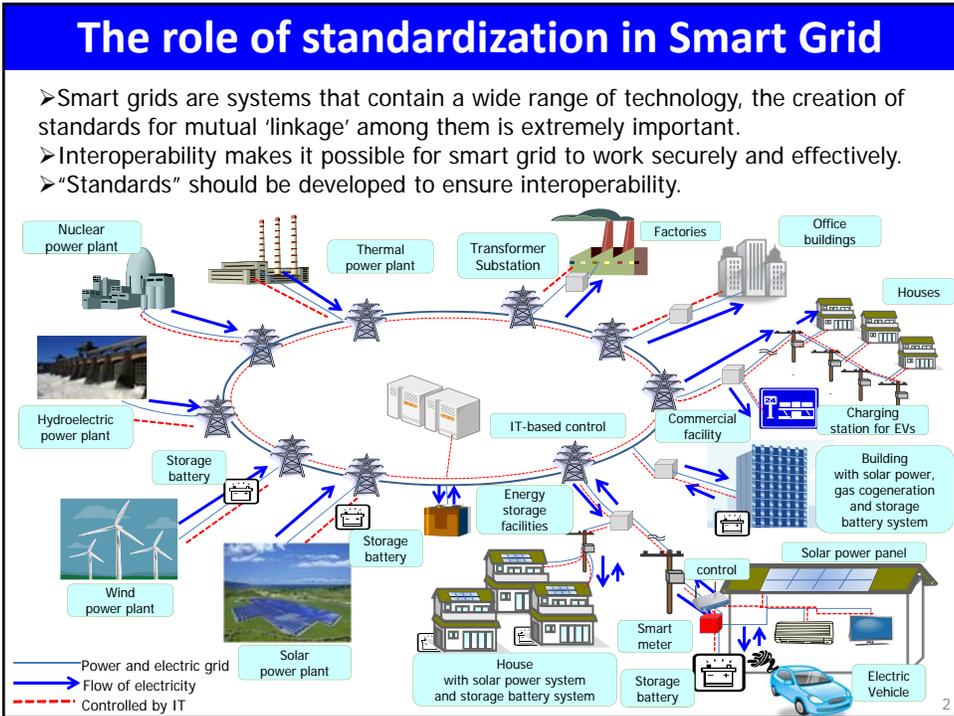
WTO/TBT Agreement took effect (1995)  
China became a WTO member (2001)

WTO members must use International Standards as basis of their technical regulation. Western developed economies such as EU and US have paid more attention to emergent market such as China and are making International Standardizing activities stronger from the view point of ensuring international competitiveness of their industry.

Japan's Positive International standardization activities

↔

Harmonization of J I S and International standards



## After the Great East Japan Earthquake

➤ In the wake of the Tohoku disaster, the lack of capacity in the system made it urgent for users to reduce electricity consumption and for peak usage also to be cut. At the same time, it pointed to the issue of how to ensure adequate supplies of energy during disasters.

➤ Systems that enable energy in the form of electricity, heat, and transportation to be used efficiently comprise the systems of "Smart Communities."

(1) When significant amounts of renewable energy are introduced into a system, this poses the challenge of how to ensure stable voltages, frequencies and other such issues of electricity quality.

◆ Example of variations in the output of solar energy

(2) In the wake of the Tohoku disaster, the issue became how to conserve electricity and to reduce peak loads.

(3) Companies launch products whose sales point is safety.

**V2H**  
Supplies power to homes from the lithium ion battery on a Nissan Leaf

Capacity	Price
1kWh	¥870,000
2.5kWh	¥1,890,000

Yamada Denki Co., Ltd. (Edison Power)

**Smart grid**

Smart meters

HEMS

Storage batteries

EV

Efficient use of electricity through IT and storage batteries

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Cogeneration

Fuel cells

Car sharing

Efficient use of energy, whether electricity, heat or transportation

## After the Great East Japan Earthquake

### Summary of the Feed-in Tariff Scheme for Renewable Energy

➤ Electric utilities will be obliged to purchase electricity generated from renewable energy sources such as solar PV and wind power on a fixed-period contract at a fixed price.

➤ Costs of purchased electricity generated from renewable energy shall be transferred to electricity customers all over Japan in the form of a nationwide equal surcharge. They shall pay the surcharge for renewable energy proportional to electricity usage.

➤ It will start on July 1<sup>st</sup>, 2012.

Those engaged in the power generation business using renewable energy sources

- Solar PV
- Small and medium scale hydraulic power
- Wind power
- Biomass
- Geothermal power

Those who generate power at home

Sale of electricity from renewable energy sources

➔

**Electric utility**

➔ Electricity supply

➔

**Electricity customers**

Collection of surcharge together with the electricity charge

➔

Cost bearing adjustment organization  
(Organization to collect and distribute the surcharge)

Submission of collected surcharge

➔

Procurement price calculation committee  
(appointment of five committee members requires consent by the Diet)

Approval of facilities

➔

Government

Decision of surcharge unit price per kWh

➔

Cost bearing adjustment organization

Deliver of purchase cost

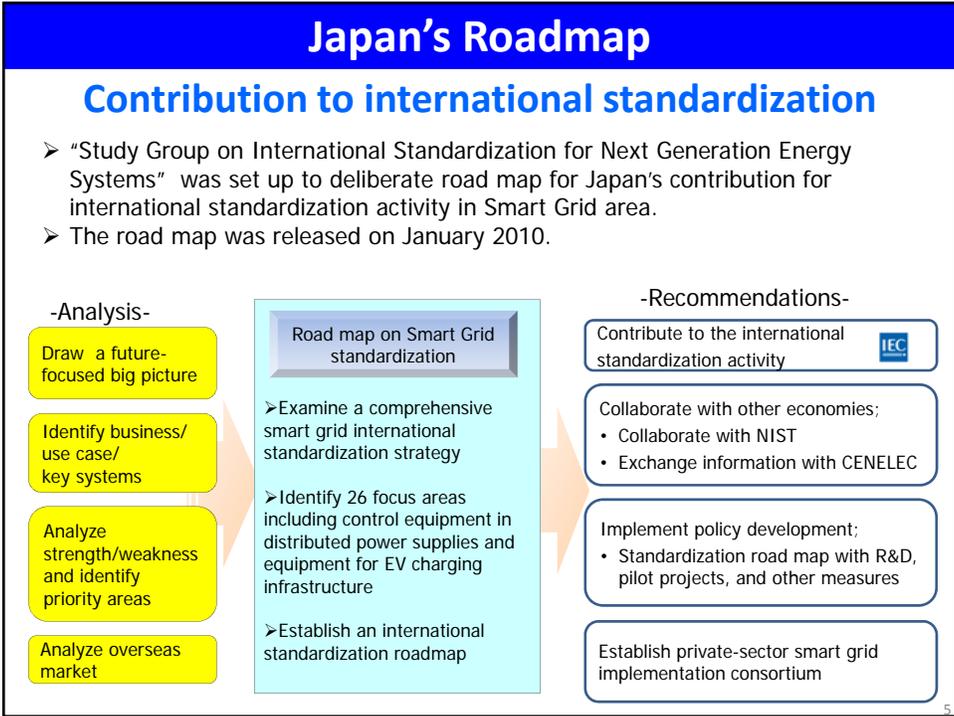
➔

Electric utility

Purchase of electricity at a fixed price for a government specified period

➔

Those engaged in the power generation business using renewable energy sources



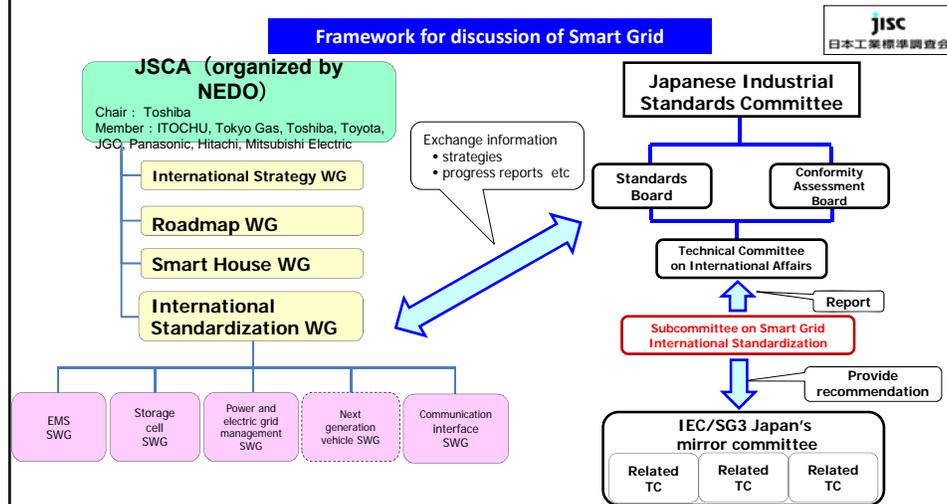
## Japan's Roadmap

### 26 Focus Areas Identified by the Study Group

1. Wide-Area Situational Awareness (WASA) in transmission systems	14. Fixed energy storage systems
2. Optimized controls for system storage cells	15. Storage cell modules
3. Optimized controls for distribution storage cells	16. Methods of assessing the salvage value of EV storage cells
4. Optimized controls for building/community energy storage	17. Quick EV charger-vehicle communications
5. High-efficiency power conditioners for storage cells	18. Quick EV charger connectors
6. Distribution automation systems	19. Quick EV charger unit design
7. Power conditioners for distributed power supplies	20. Safety testing of lithium-ion batteries for vehicles
8. Power electronic devices for distribution	21. Vehicle-to-regular EV charger infrastructure communications
9. Demand response networks	22. Infrastructure control of regular EV chargers
10. HEMS	23. Wide-area meter access communications
11. BEMS	24. Local meter access communications
12. FEMS	25. Gas metering for AMI systems
13. CEMS	26. Authentication method between meter communicators and higher-level systems

## Japan's Roadmap

- Established "Subcommittee on Smart Grid International Standardization" under JISC in early 2012
- To enhance the Japanese activities
- Contributing international standardization



## Conclusion

- Problem we are facing -Energy supply shortage
- Challenges we have to implement
  - How to avoid rolling blackout?
- The purpose to make use of standards
  - to reduce cost
  - less trade restrictive
  - interoperability
  - interchangeability
- How to use of standards to solve energy problem?