

# **Asia Super Grid (ASG) And Electricity Market Reform in Japan**

Oct 30<sup>th</sup>, 2017

**Shigeki (Sean) Miwa**

GM, CEO Project Office, SoftBank Group Corp.  
Representative Director & CEO, SB Energy Corp.

# March 11<sup>th</sup>, 2011

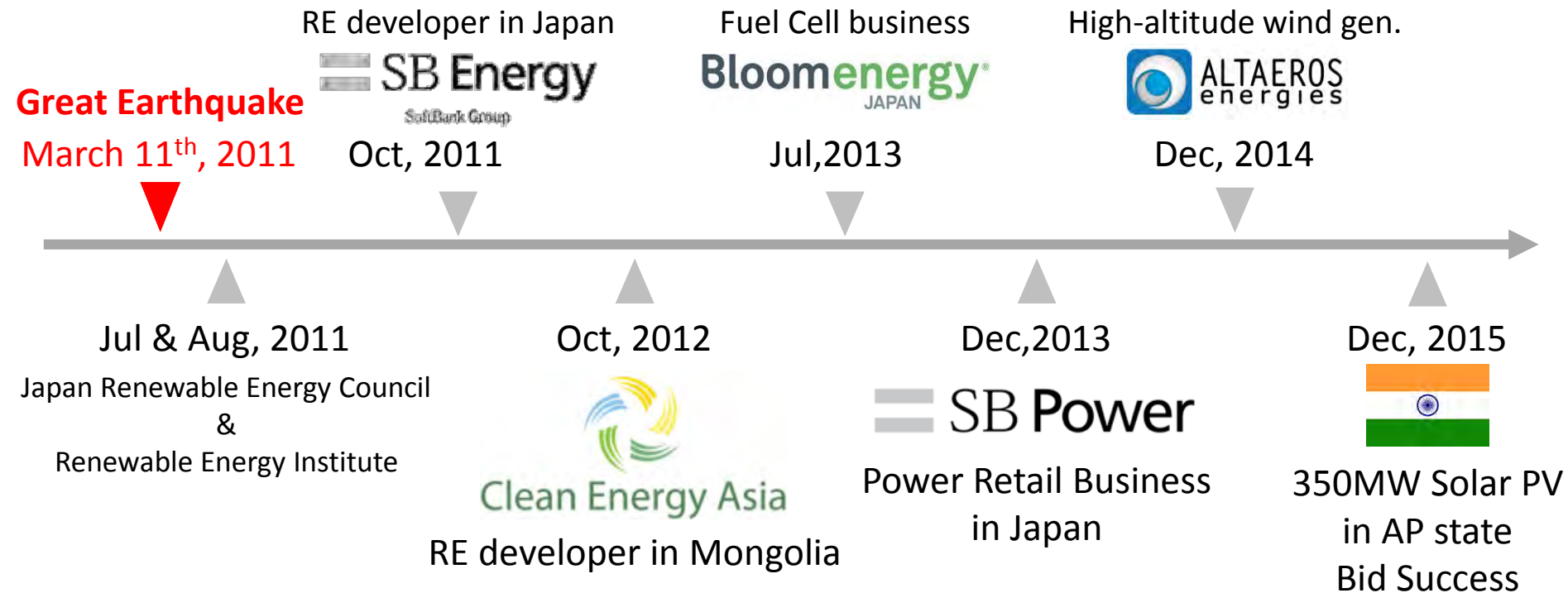


**Earthquake + Tsunami**

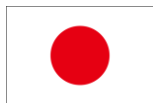


**Fukushima Accident**

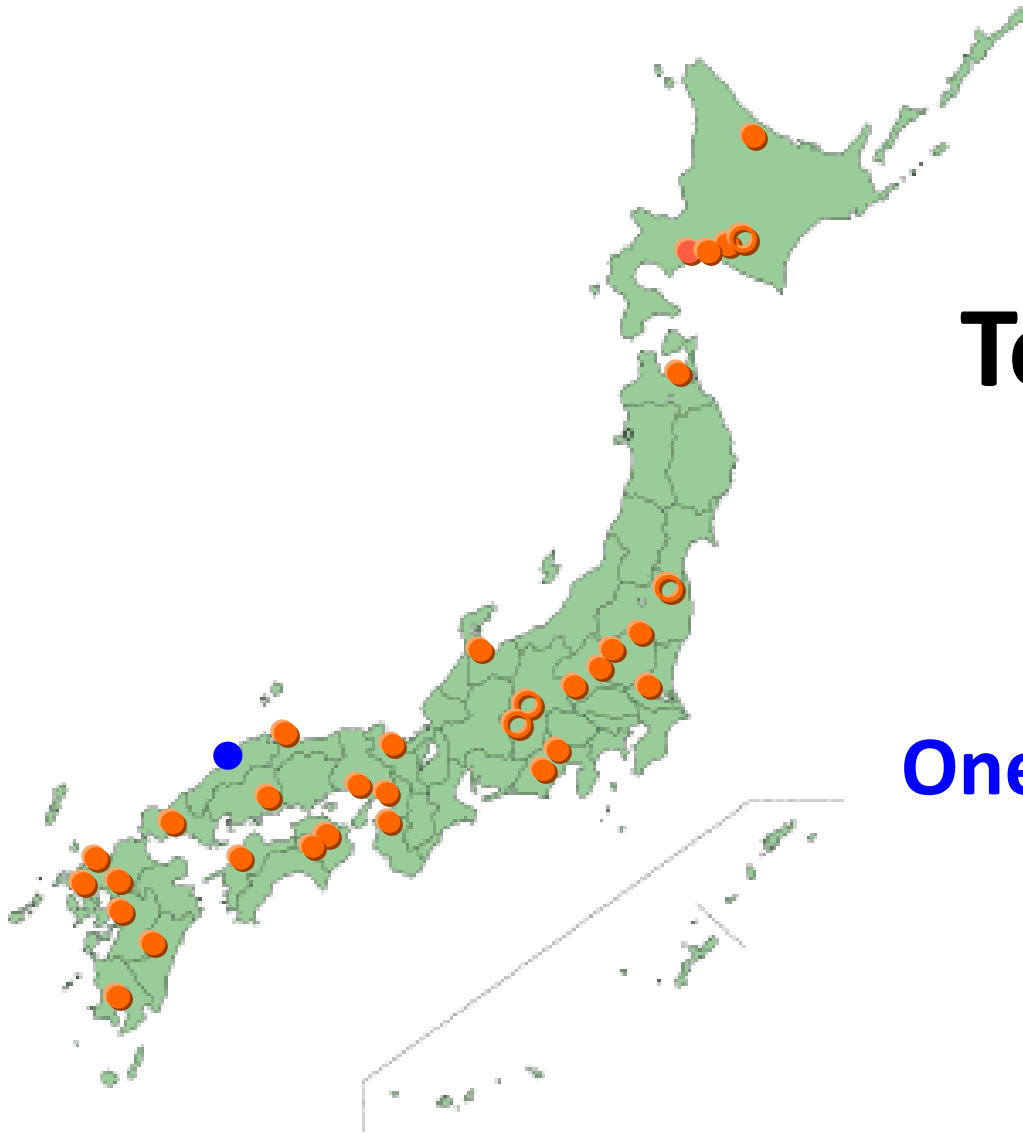
# SoftBank's Clean Energy Projects



**Established RE business base  
in Japan, India and Mongolia**



# SB Energy (Japan)



Total **546**MW

(38 sites)

As of Oct 30<sup>th</sup>, 2017

**One of top RE developers  
in Japan**

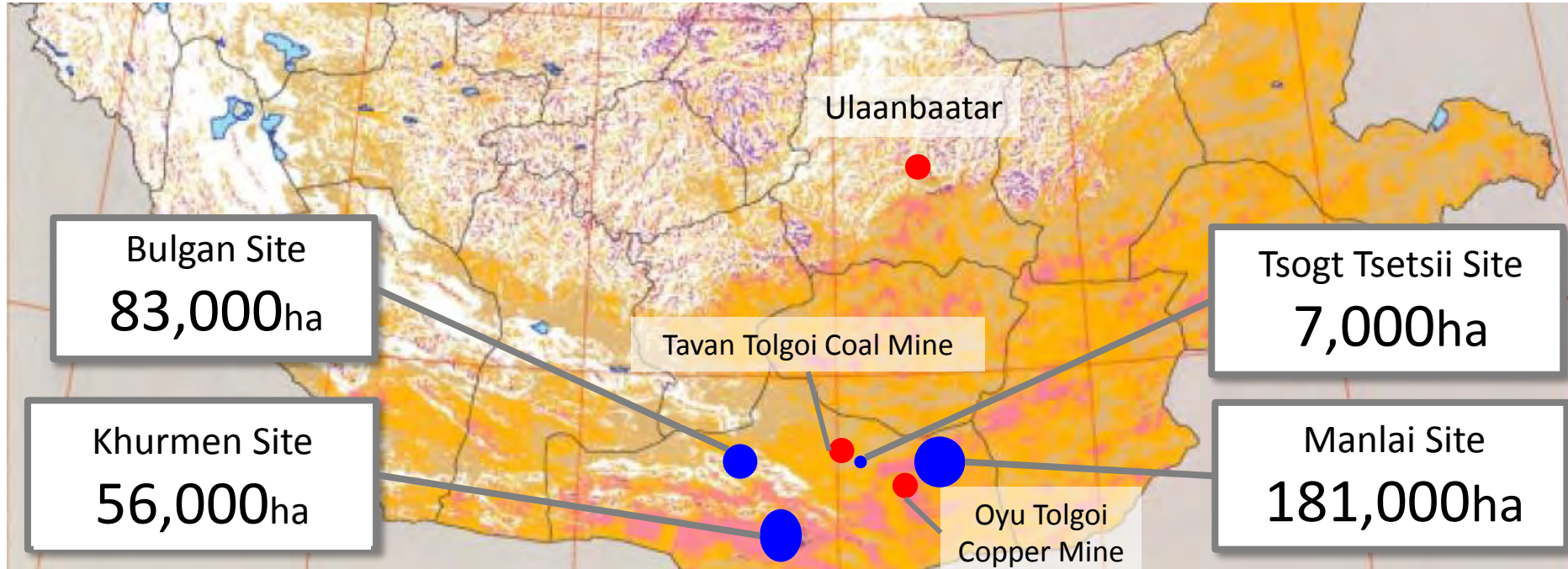
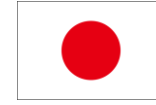
● : Solar

● : Wind

# Gobi Green Energy (Mongolia)



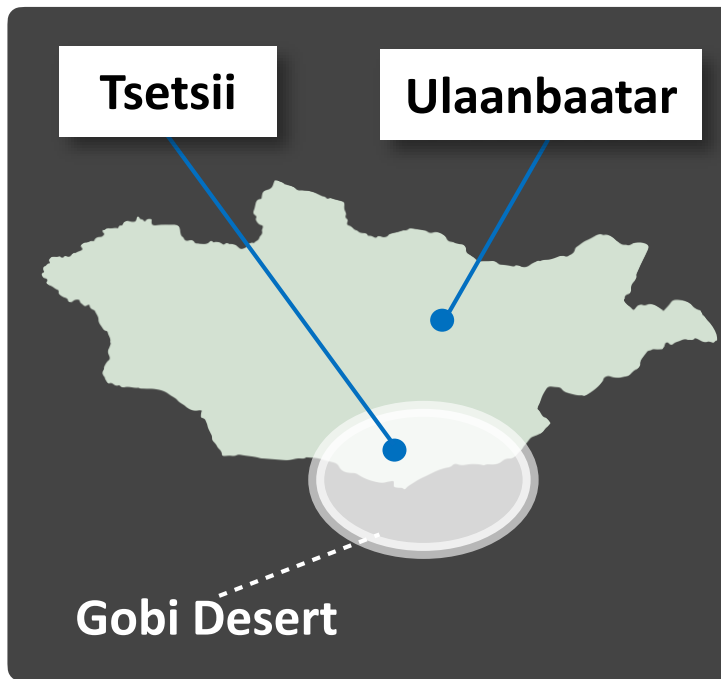
(Newcom:51%, SoftBank: 49%)



## Land secured for development in the Gobi Desert

Total **326,000ha** (3,260km<sup>2</sup>)  
(**13GW+** wind potential)





## Wind Farm Development

- **50MW completed**  
(COD: 6<sup>th</sup> Oct. 2017)
- **2GW project going on**



# Trilateral MOU for RE Development in Mongolia

(signed on July 18<sup>th</sup>, 2016 @Ulaanbaatar)



## Joint Development of RE in Mongolia

# Solar PV project (India)

## Our Project



1. **350MW** (COD is 29<sup>th</sup> Mar. 2017)



- The world's **7<sup>th</sup>** largest solar power plant
- Tariff is **7.1** cent/kWh (INR 4.63)

2. **400MW**

- Under preparation to start construction
- Tariff is **3.8** cent/kWh (300MW, INR 2.45)  
and **4.0** cent/kWh (100MW, INR 2.63)

**Solar PV cost is already lower than  
new coal-fired power plant in India**



# Solar tender in Middle East

Place	Abu Dhabi	Kingdom of Saudi Arabia
Size	1177 <sub>MW</sub>	300 <sub>MW</sub>
Bid Opening	Sep. 2016	Oct. 2017
PPA Tarrif	Marubeni Corp. + Jinko Solar: <b>2.42</b> cent/kWh (~2.92 cent/kWh)	Masdar: <b>1.78</b> cent/kWh Acwa Power: 2.34 cent/kWh Marubeni Corp.: 2.66 cent/kWh, etc.
PPA Period	25 years	25 years

**Now renewable energy is an economic choice,  
starting to redefine all the industries**

# Bloom Energy Japan (Fuel Cell)

(SoftBank:50%, Bloom Energy:50%)

## New System of Distributed Power Generation



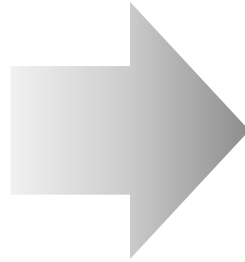
*Will lead to...*

- ✓ **CO2 Reduction**
- ✓ **Disaster Resilience**

**Provide clean, reliable and affordable energy to Japan**

# Our Vision

**Fossil Fuels**



**Renewables**



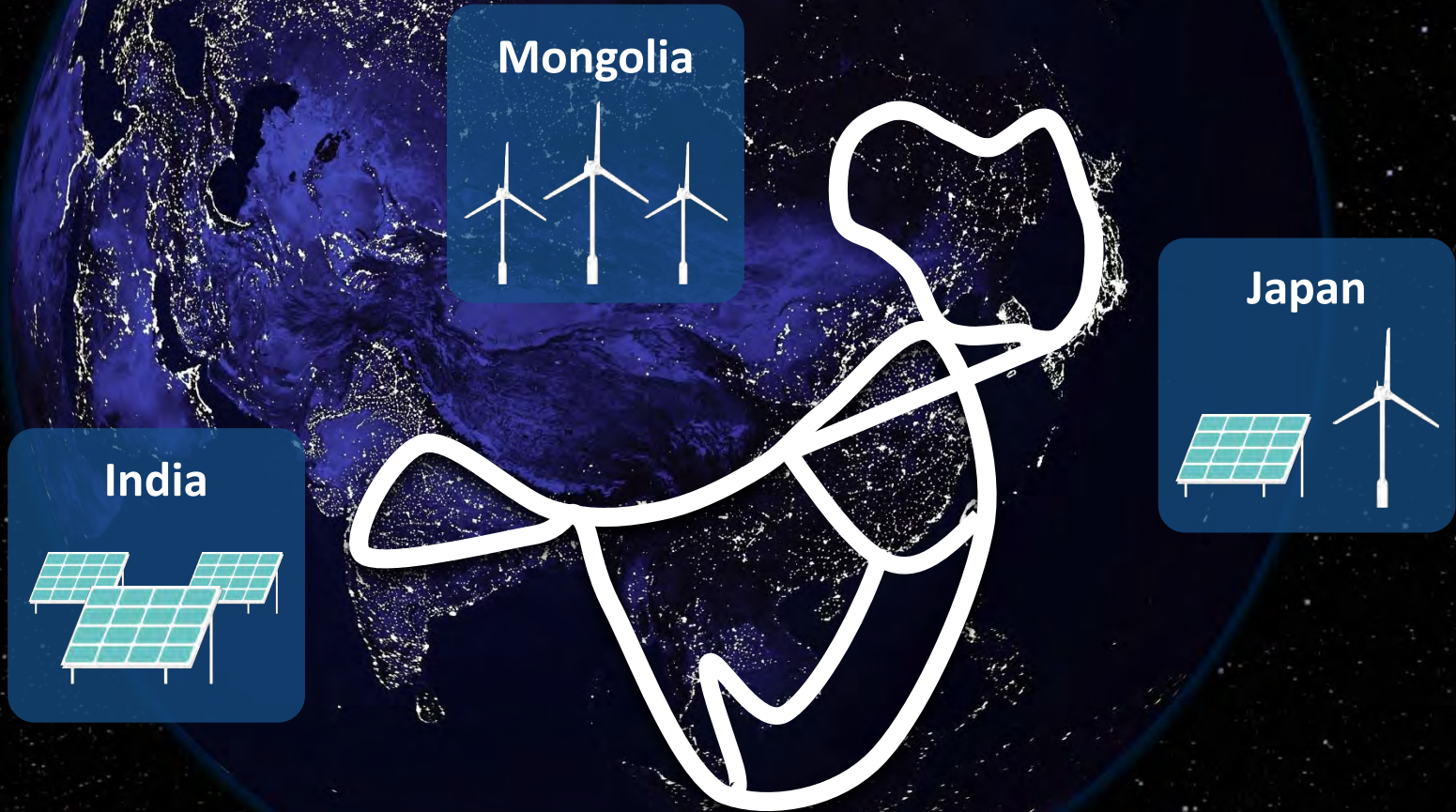
**Promote transition to Greener World  
further across the globe**

# **Asia Super Grid (ASG)**



# Asia Super Grid Concept

(announced in September 2011)





# 4-Party MOU to study feasibility of ASG (signed on March 30<sup>th</sup>, 2016)



国家电网  
STATE GRID



**Masayoshi Son**  
Chairman & CEO  
SBG



**Shu Yinbiao**  
Chairman  
SGCC

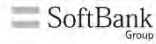


**Cho Hwan-Eik**  
President & CEO  
KEPCO

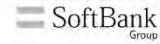


**Roman Berdnikov**  
First Deputy General  
Director  
ROSSETI

# Project Status



## Russia-Japan Route



## Mongolia-China-Korea-Japan Route

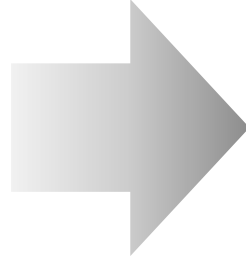


**Pre F/S completed**  
(Common concept)

**2GW transmission capacity & maximize RE**

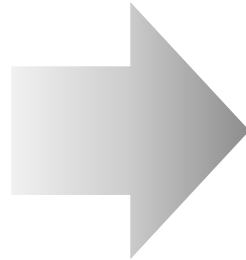
# 3 Key Factors

**Technology**



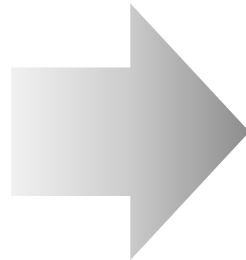
**Feasible**

**Economics**



**Makes sense**

**Politics, Law  
& Regulations**



**Big challenge**

# Government Stance toward ASG

## - China, Korea, Russia and Mongolia-



**Xi Jinping**  
President



- One Belt One Road Initiative
- GEI Promotion  
\*Global Energy Interconnection  
(2015.Sep., United Nations)



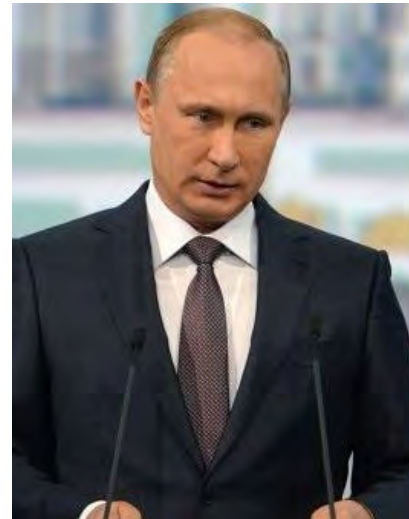
**Moon Jae-in**  
President



- Request each country leaders to cooperate with ASG  
(2017.Sep Eastern Economic Forum)
- Speech about significance of ASG  
(2017.Sep., United Nations)



**Vladimir Vladimirovich Putin**  
President



- Energy Bridge  
(2016.Sep., Eastern Economic Forum)  
(2017.Sep., Eastern Economic Forum)
- Russia-Japan Intergovernmental WG has been set up



**Jargaltulgyn Erdenebat**  
Prime Minister



- Let RE main export item
- Plan to construct high voltage transmission line to China

# Top leaders expressed support

# Government Stance toward R-J route of ASG



- Japan -



**Mr. Hiroshige Seko**

(Minister of Economy, Trade and Industry /  
Minister for Economic Cooperation with Russia)

**Agreed to study the feasibility of  
the grid interconnection project  
without having a preset conclusion**



**Russia-Japan Intergovernmental WG  
has been set up**

**Slow but steady progress**

**Need intergovernmental discussions also for MCKJ Project**

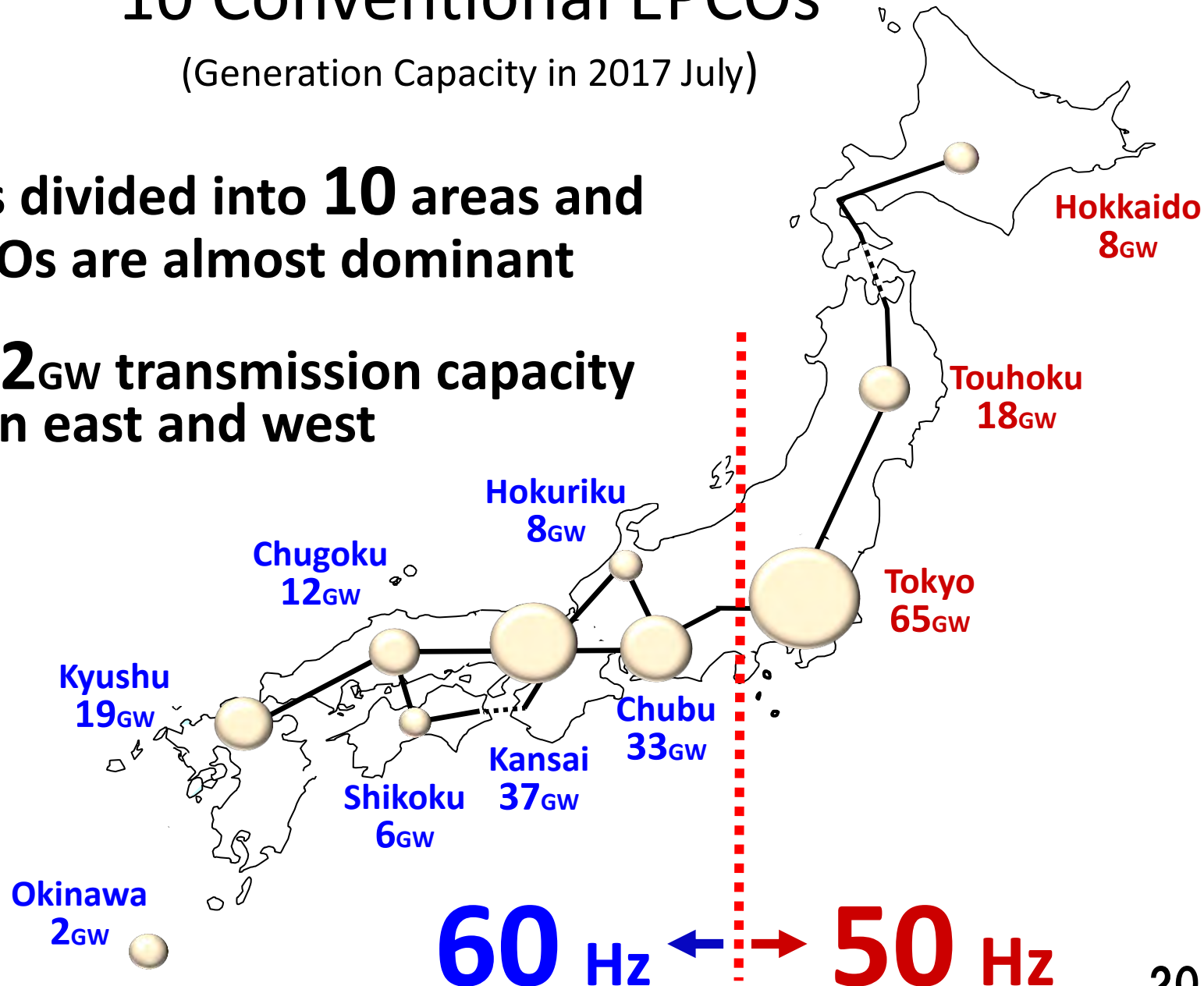


# **Why Japan takes time?**

# 10 Conventional EPCOs

(Generation Capacity in 2017 July)

- Japan is divided into **10** areas and **10** EPCOs are almost dominant
- Only **1.2GW** transmission capacity between east and west



# Electricity Market Reform

METI defined 3 Processes:

**1<sup>st</sup> step, 2015 Apr. :**

**Establishment of OCCTO\***

\*the Organization for Cross-regional Coordination of Transmission Operators

**2<sup>nd</sup> step, 2016 Apr. :**

**Full liberalization of retail sales**

..... (Now) .....

**3<sup>rd</sup> step, 2020 Apr. :**

**Unbundle the transmission & distribution sector**

# 1<sup>st</sup> Step: OCCTO

**Independent organization to maintain stable and efficient electricity supply with fairness and neutrality**

(Main function)

- Aggregate and analyze the EPCO's supply-demand plans and grid plans
- Order to change EPCO's plans such as tie lines construction
- Order EPCOs to reinforce generations and power interchanges under a tight supply-demand situation

## 2<sup>st</sup> Step: liberalization of retail sales

UHV<sub>(2000kW~)</sub>



Industrial Use  
(Large scale)

liberalized in  
(March 2000)

HV<sub>(50kW~2000kW)</sub>



Business Use  
(Medium scale)

liberalized in  
(April 2004)

LV<sub>(~50kW)</sub>



Household  
Convenience store

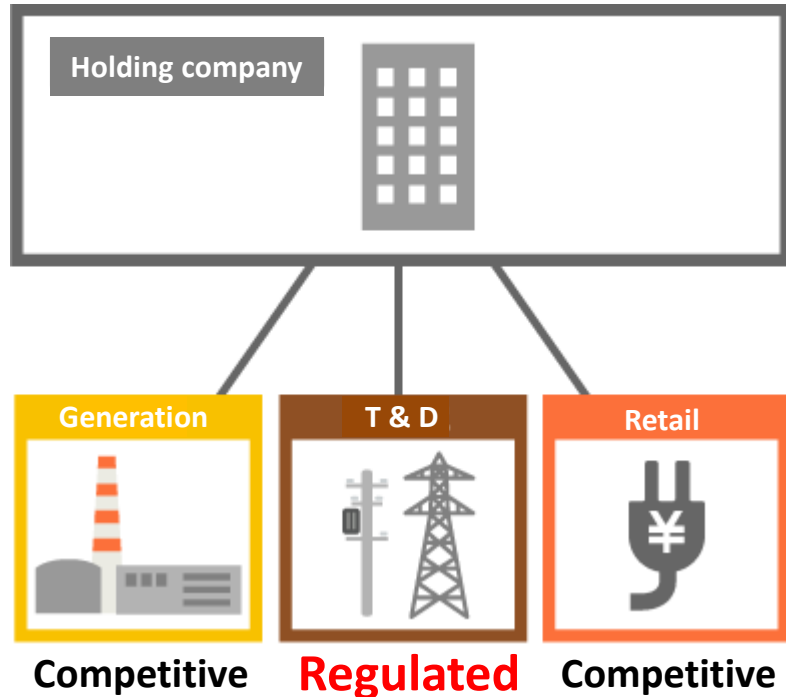
liberalized in  
**(April 2016)**

## Fully liberalization of retail sales completed

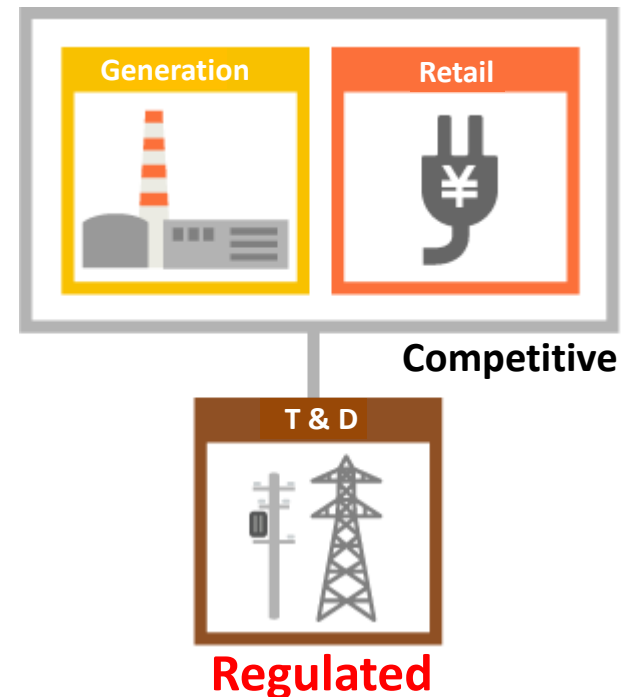


# 3<sup>rd</sup> Step: Unbundle the T&D sector

## 1. Holding company style



## 2. Only T&D subsidiary style




EPCOs have to transform to 1 or 2 by 2020 Apr..

**Equal access to the grid will be realized**

# Why Japan takes time?

- Electric market reform is in progress to implement efficient T&D operation and it supports renewable energy expansion in Japan.
- Need independent and unified T&D company / organization to realize equal access to the grid.

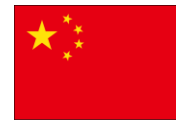
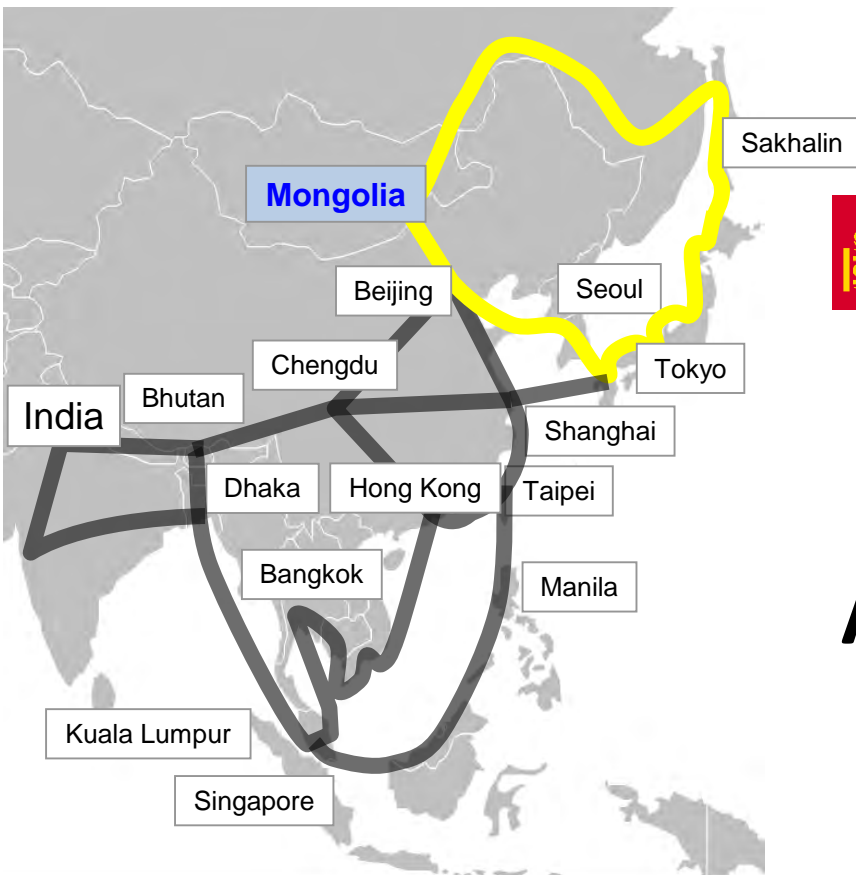


**We need to discuss not only multi-national grid interconnection (ASG) but also national electric market reform in parallel**



**Promotion of ASG is synonymous with  
electricity market reform in Japan**

# Our Target



## “Golden Ring”

**Aim to gain clear progress  
by Tokyo Olympics  
(2GW, 2020)**

**We are ready to execute the project  
once G-to-G agreement / rule-making is in place**





# Internet of Things

(nerve system)



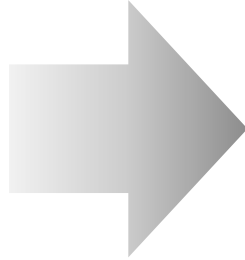
# Grid of Things

(blood system)



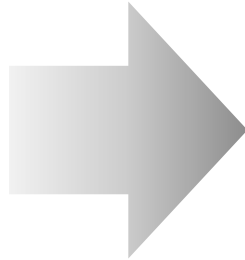
# Problems revealed by 3.11 Earthquake

**Electricity  
Supply**



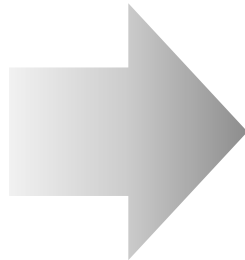
**Lack of transmission  
capacity beyond regions**

**Electricity  
Price**



**High price and little  
competition market**

**Electricity  
Choice**



**Can not choose**

(Not liberalized for household and small shop)  
(Many Japanese thought no more nukes)

# Electricity Market Reform Goals

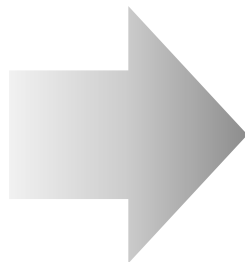
METI defined 3 goals:

1. Secure the stable supply of electricity
2. Suppress electricity rates to the maximum extent possible
3. Expand electricity choices for consumers and business opportunities

**Create new comprehensive energy market,  
by removing barriers in vertically integrated market**

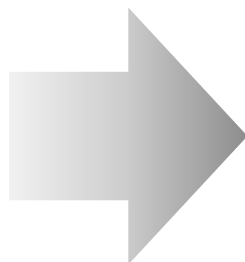
# Profits of ASG & Electricity Market Reform

**Electricity  
Supply**



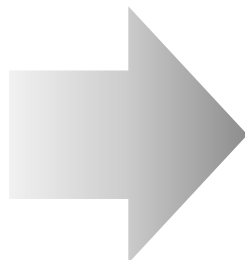
**Stable supply across Asia**

**Electricity  
Price**



**Low price and int'l  
competition market**

**Electricity  
Choice**



**Can choose RE energy**

(Maximize utilization of RE across Asia)