2016/11/17

TEPCO, FUKUSHIMA, and 4 “D” challenges

Shin-ichiro KENGAKU
Managing Executive Officer
Tokyo Electric Power Company Holdings, Inc.

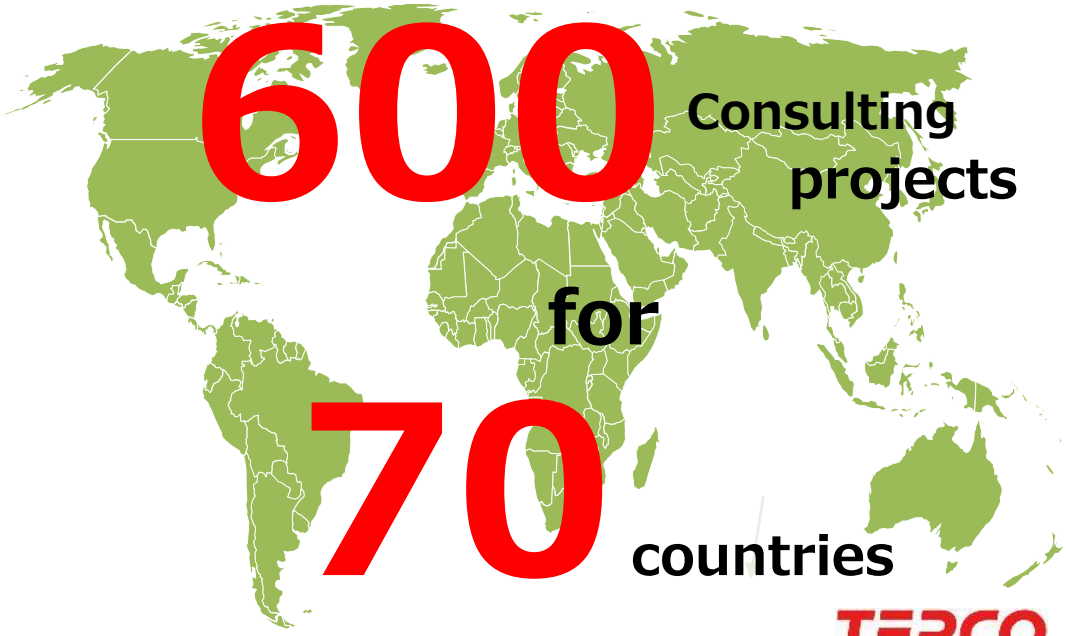
TEPCO: Who we are?

- 29mil; costumers in the Tokyo metropolitan area
- Fukushima nuclear accident and nationalized
- World highest reliability
- Technical expertise to all over the world

Outage:

4 min p.a.

(2014,SAIDI)



The latest project in Europe

- “Efficiency Center” at the University of Belgrade
- Energy management system in Serbia

UNIVERSITY OF BELGRADE

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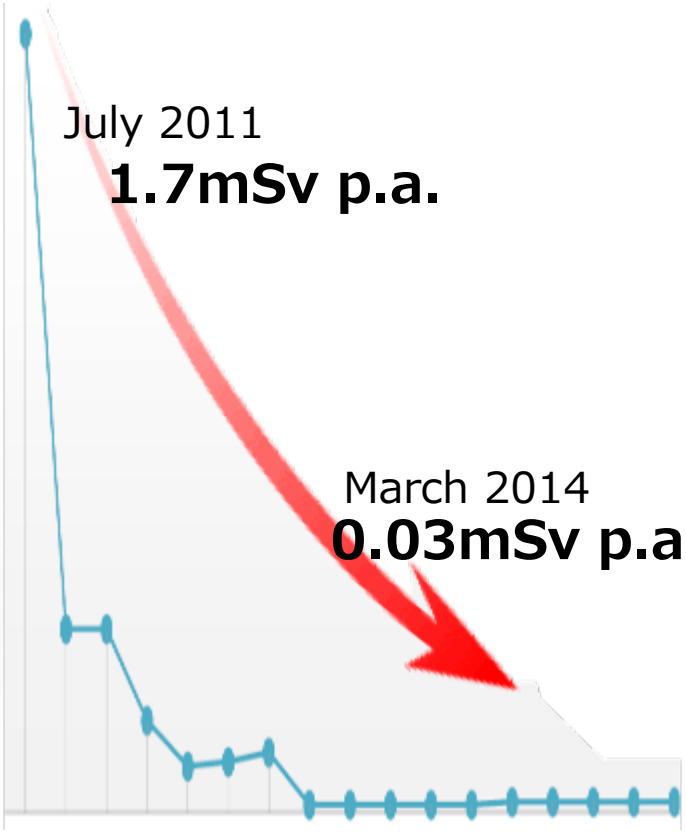
Progress in Fukushima Daiichi decommissioning

- Reactors are stably cooled
- Prepared for spent fuel & debris removal

Improvement of workers' environment and communications

- **6000** workers/day
  - 90% full-face mask-free & tyvek-free
- Annual radioactive dose; less than a one way flight between New York and London
- More than **20,000** visitors



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Innovation for Fukushima Decommissioning

- Cooperation with manufacturers and academia
- Will be adopted in various fields

IRID TOSHIBA 同志社 ACSL

MITSUBISHI ELECTRIC HITACHI GE NAGOYA UNIVERSITY iRobot

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Main Topic: Four big “D” challenges facing us

- Not only TEPCO or Japan has to respond to these changes

Demography

Deregulation

Digitalization

De-carbonization

TEPCO

Demography

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Power Demand

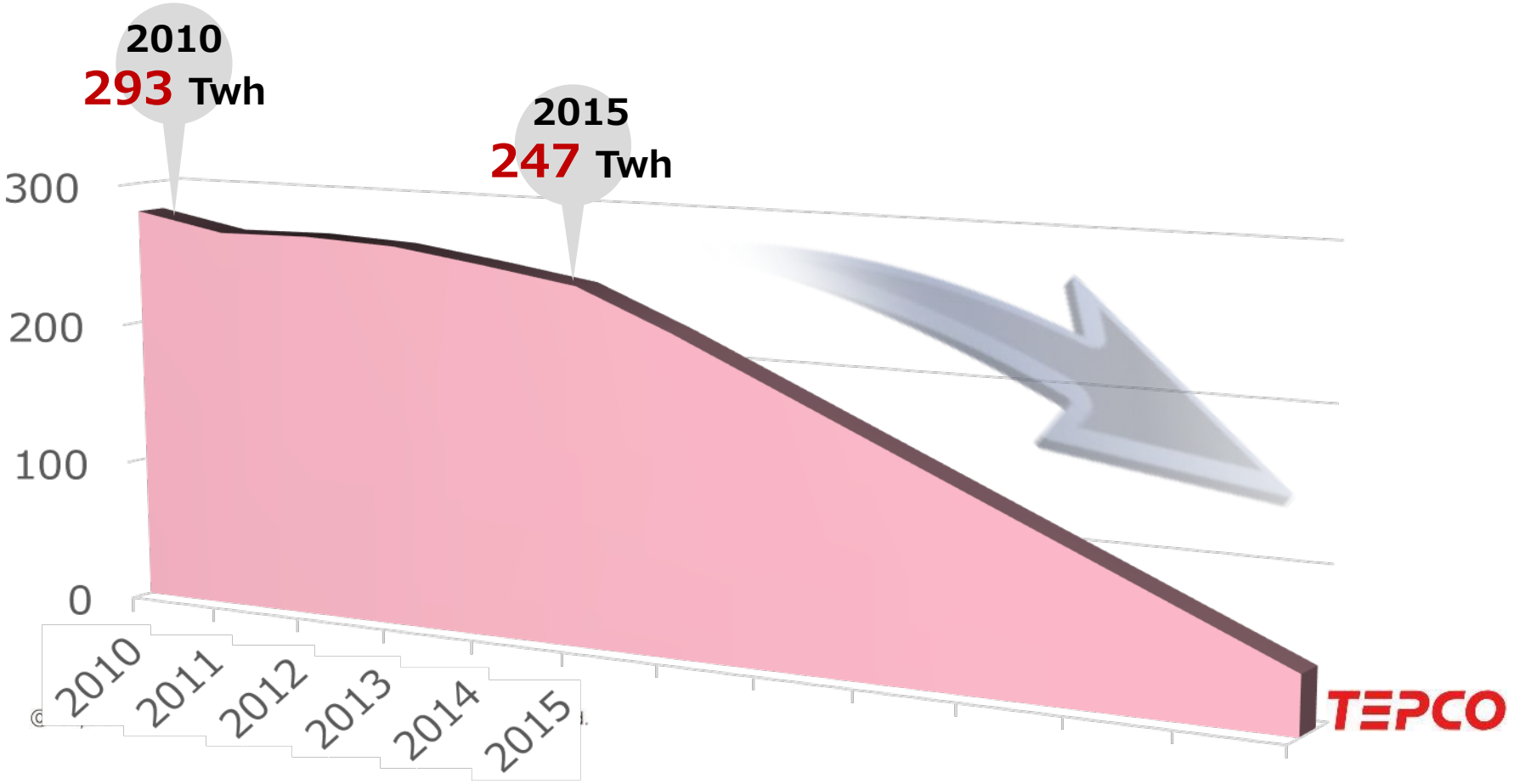
- Electricity sales continue to decline due to;

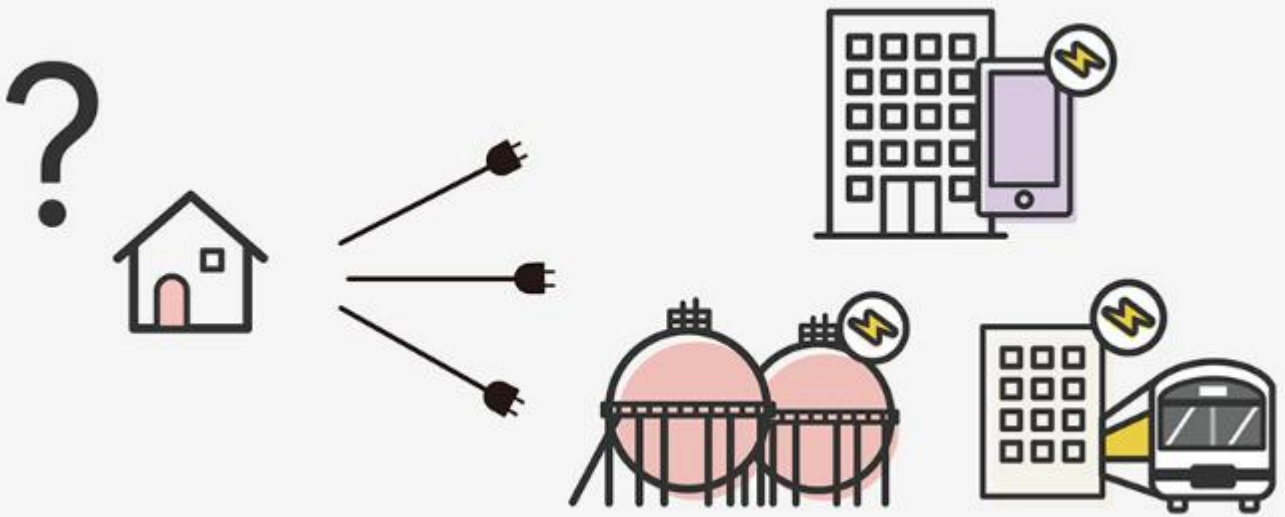
Population decline

Production transfer

Energy conservation

Competition





Deregulation

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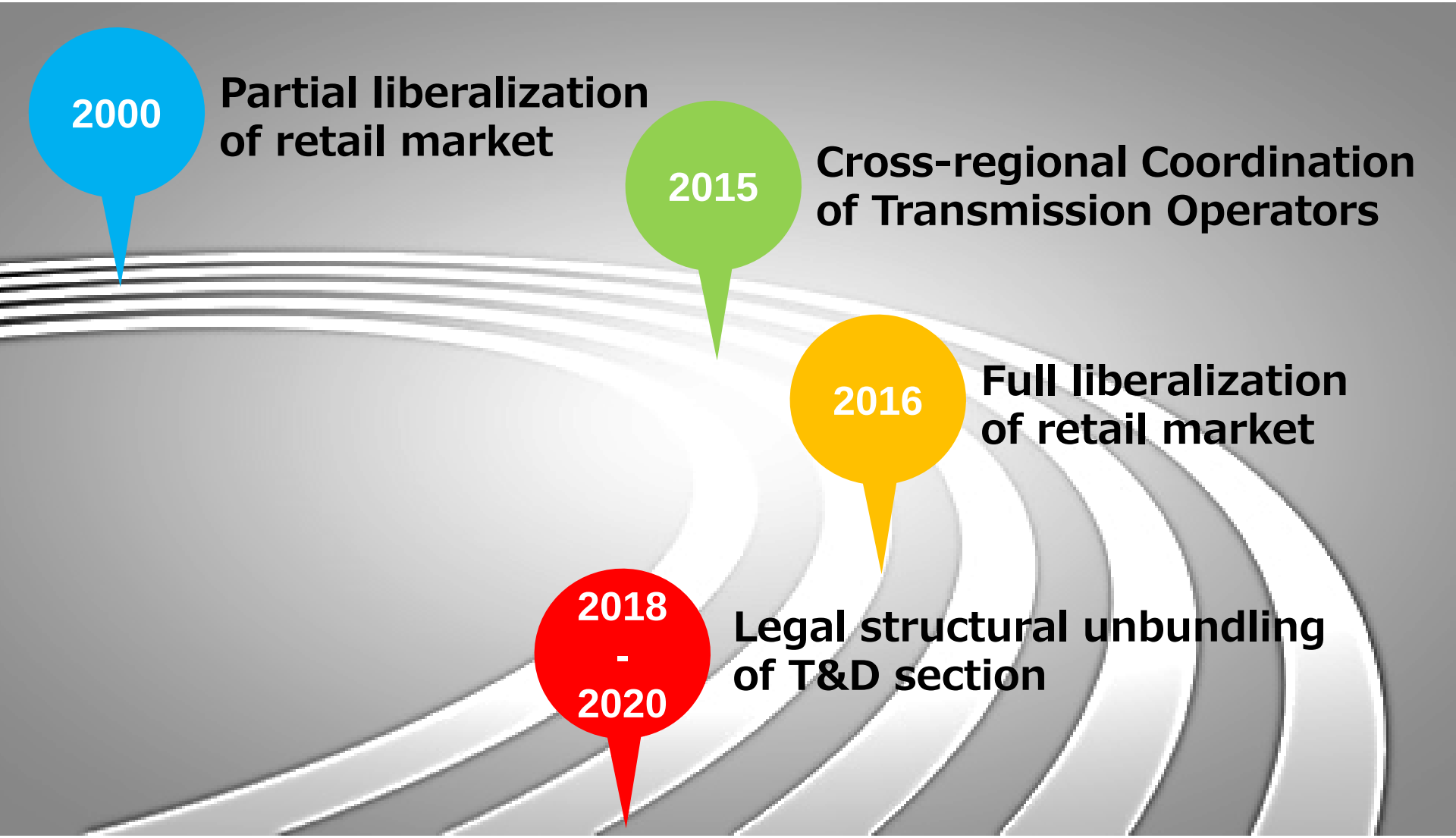
Electricity System Reform in Japan



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Alliances for retaining customers

- Provide new services in addition to electricity supply

SONY

Communication services

+

TEPCO

Electricity services

TOKAI GAS NICIGAS ニチガス

+

TEPCO

TEPCO Holdings

- TEPCO shifted to a holding company system in April 2016

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Tokyo Electric Power Company Holdings

Support Functions + Nuclear, Renewable, R&D

Fuel & Thermal Power Generation	Transmission & Distribution	Retail
TEPCO Fuel & Power + CHUBU Electric Power → JERA	TEPCO Power Grid	TEPCO Energy Partner

JERA

Energy for a New Era

TEPCO's global expansion now under JERA

- JERA aims for one of the world's largest IPPs

Experience

9 IPPs in **6** Countries

Target

2016 **6** GW ➡ 2030 **20** GW

Thailand

Indonesia

UAE

Vietnam

Philippines

Taiwan

Development of renewables in the world

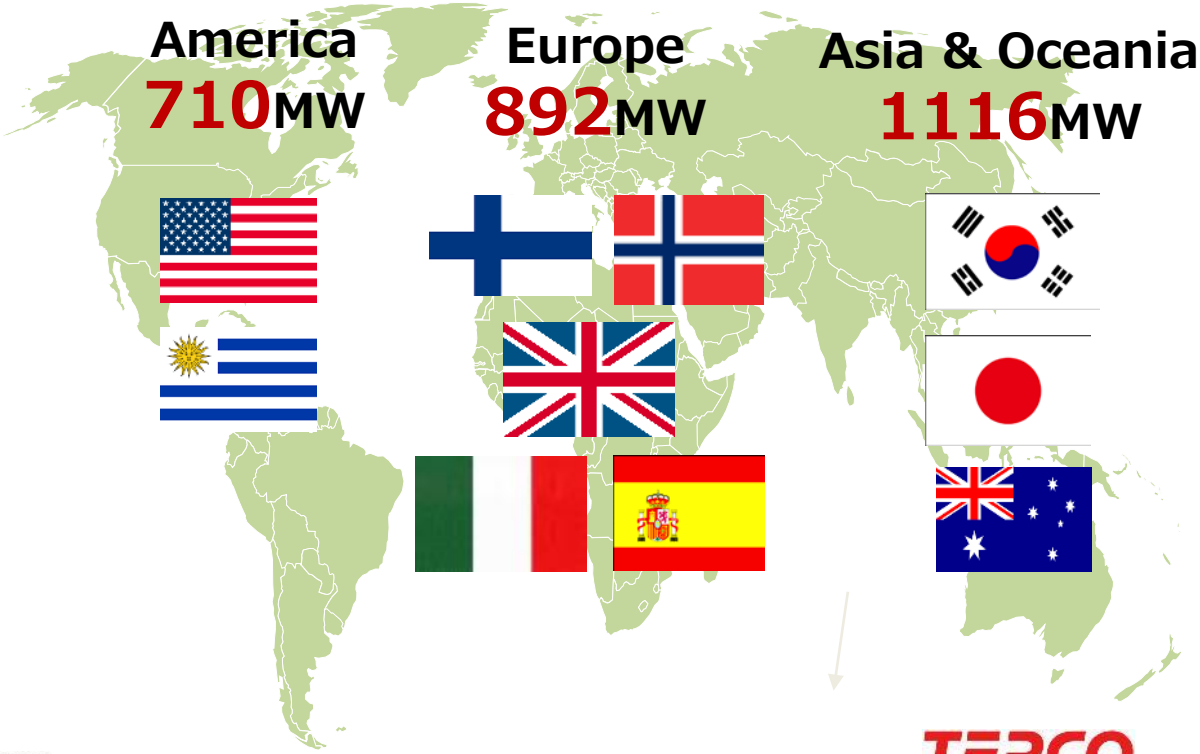
- TEPCO develops renewables globally through ”Eurus Energy”

Eurus Energy

2720 MW in **10** countries

WIND 2434 MW

SOLAR 285 MW



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Digitalization

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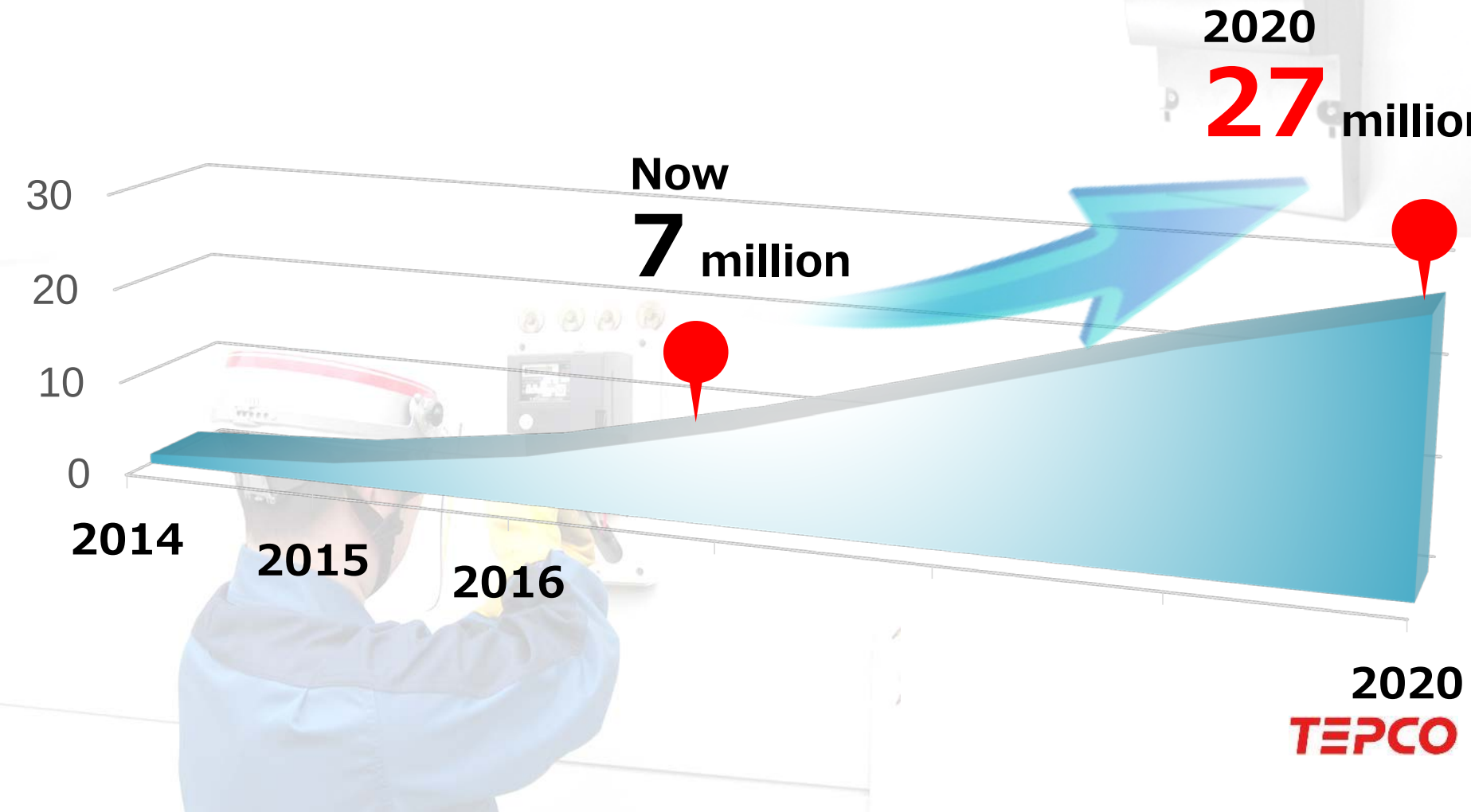
Smart meters

- 27 million smart meters by 2020
- Have accumulated know-how, experience and lessons-learned
- Considering some new customer services



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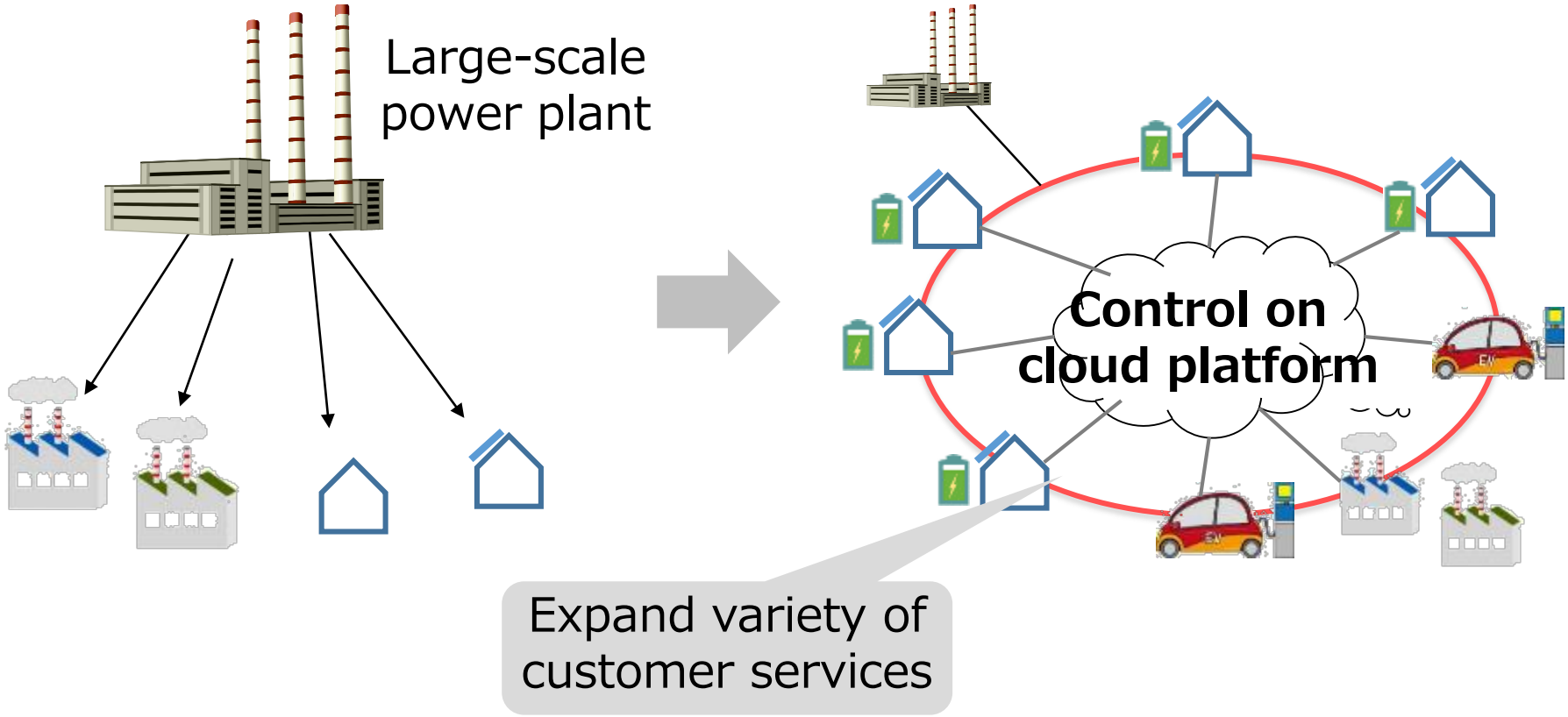
Power Sharing like UBER!

- Ventures can provide cloud services for power sharing
- Game Changer?: Utilities should take in, not be taken in by, this development



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De-carbonization

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Reduction targets by 2030

- Does Japanese target compare well with the other countries?

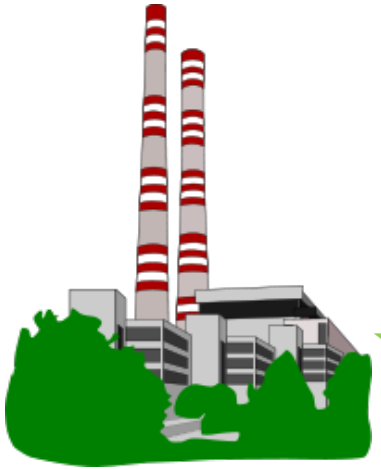
2013 ▲26% 2030

1990 ▲40% 2030

2005 ▲26-28% 2025

per unit GDP
2005 ▲60-65% 2030

From Power Generation



35% DOWN per kWh

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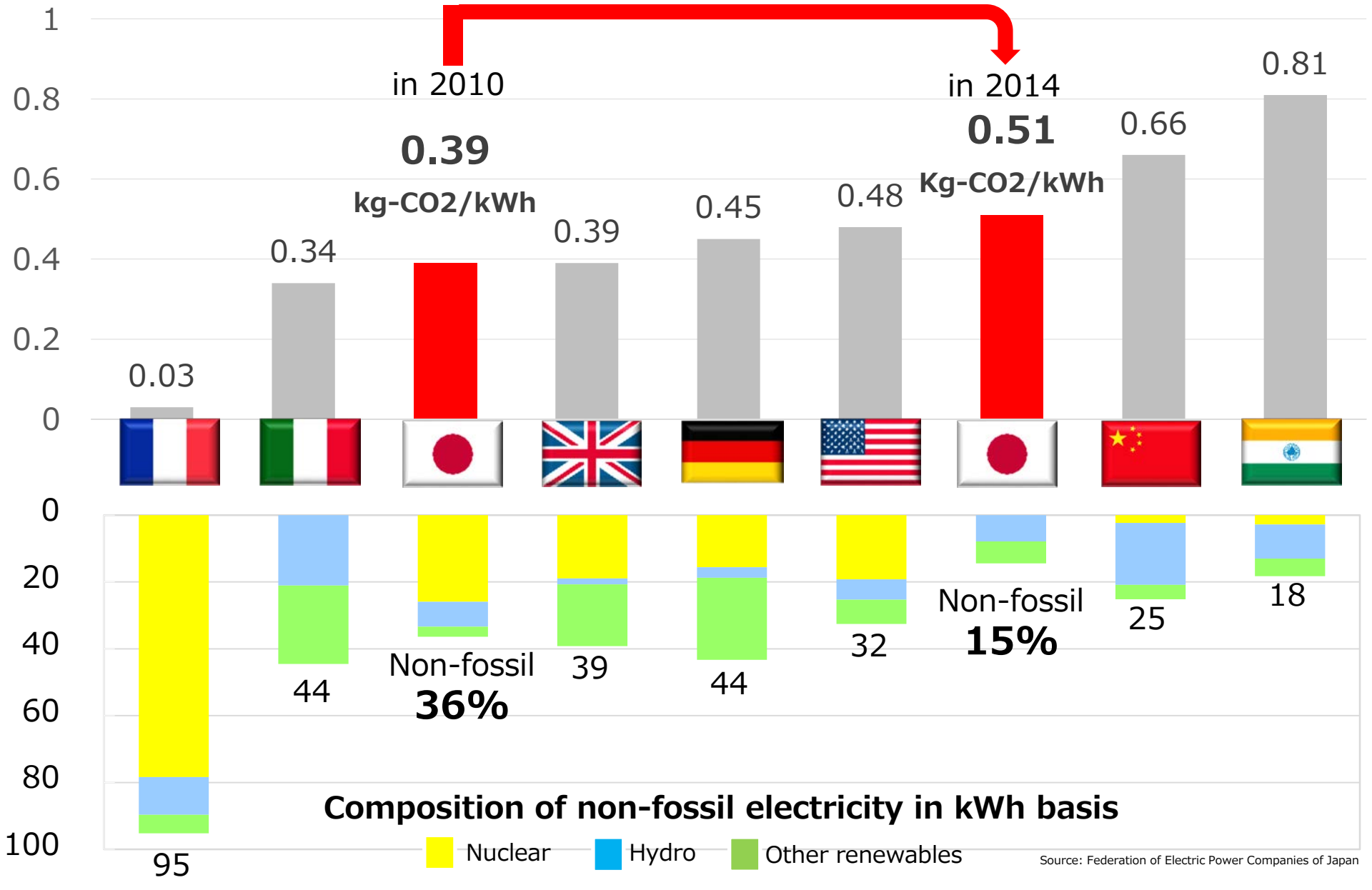
CO2 Intensity

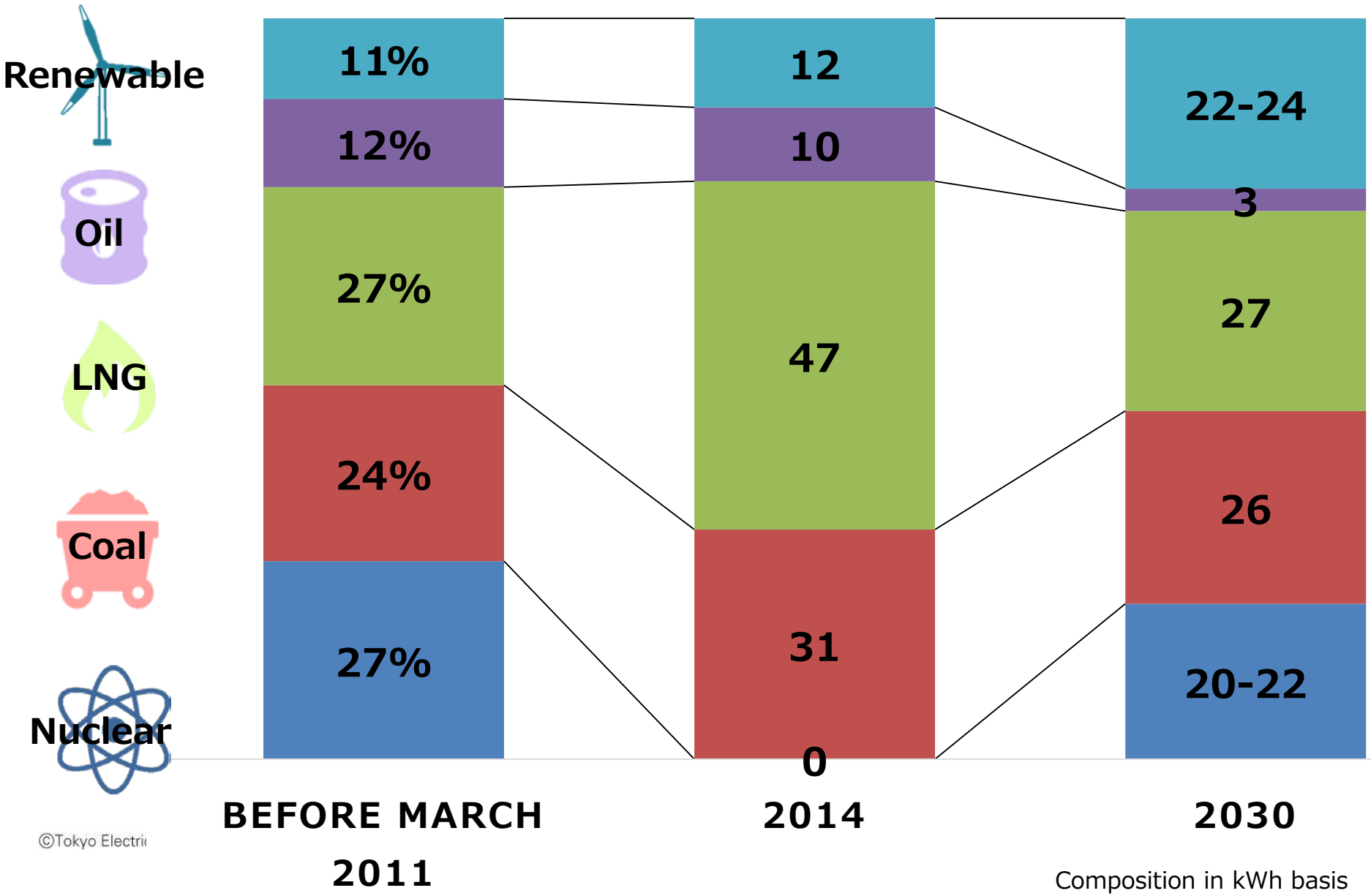
- Japan has become higher after the accident



Source: Federation of Electric Power Companies of Japan

Energy Mix for 2030

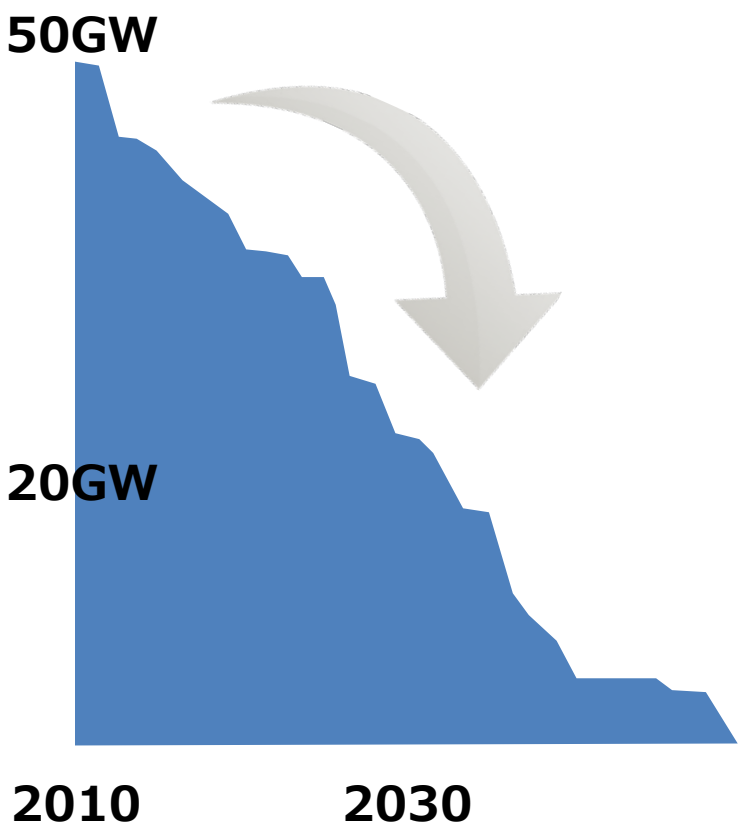
- Japan continues to use nuclear as base-load



Composition in kWh basis

How to increase nuclear ?

- In 2030, installed capacity of nuclear might be 50% of that in 2010



Extend life span
from 40 to 60 years

Improve operation rate
from 70 to 90%

Build new nuclear stations

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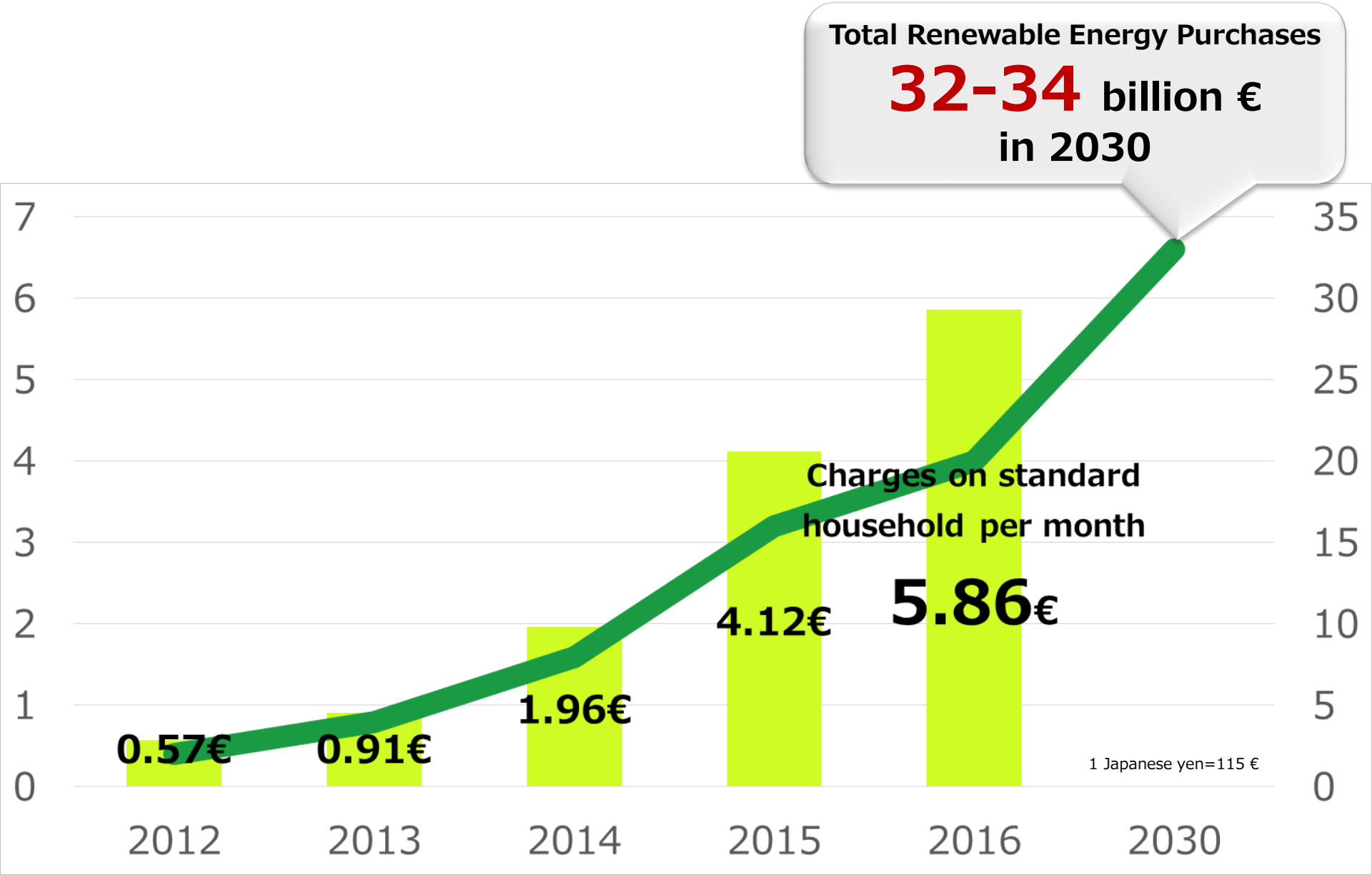
Problem of FIT

- Burden on consumers is increasing by FIT same as Germany



Risk or Opportunity?

- Overcome the challenges with new ideas and advanced technologies

Demography

Deregulation

Digitalization

De-carbonization

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The Energy for Every Challenge