Japan’s Current Nuclear Energy Policy

Agency for Natural Resources and Energy, METI

Sep, 2015

METI
Ministry of Economy, Trade and Industry

Table of Contents

1. Nuclear Energy Policy in New Strategic Energy Plan of Japan
2. Efforts toward Restoration and Reconstruction of Fukushima
3. Existing Light Water Reactors
4. Reconstruction of Safety Culture
5. Promotion of Strategic Development of Technologies and Human Resources
6. Establishment of Appropriate Business Environment under the More Competitive Market
7. Contribution to Peaceful Use of Nuclear Power and Nuclear Non-proliferation in the World

1. Nuclear Energy Policy in the New Strategic Energy Plan of Japan

＜Description in **the Strategic Energy Plan** of Japan＞

Decided by the Cabinet in April, 2014

Introduction

We will do our utmost to achieve the reconstruction and recovery of Fukushima while reflecting on the pains felt by the people affected by the accident at TEPCO's Fukushima nuclear accident. Needless to say, that is the starting point for rebuilding Japan's energy policy.

1. Issues related to the energy supply-demand structure in Japan

① Concerns over the safety of nuclear power generation and deteriorated public confidence in the government and operators

② Outflow of national wealth and increase in dependency on the Middle East, price of electricity and greenhouse gas emission in Japan due to higher dependency on fossil fuels

③ North America's move toward independency of its energy supply by the shale-gas revolution and widening gap of regional energy prices in the world

2. Basic policy regarding measures concerning energy supply and demand

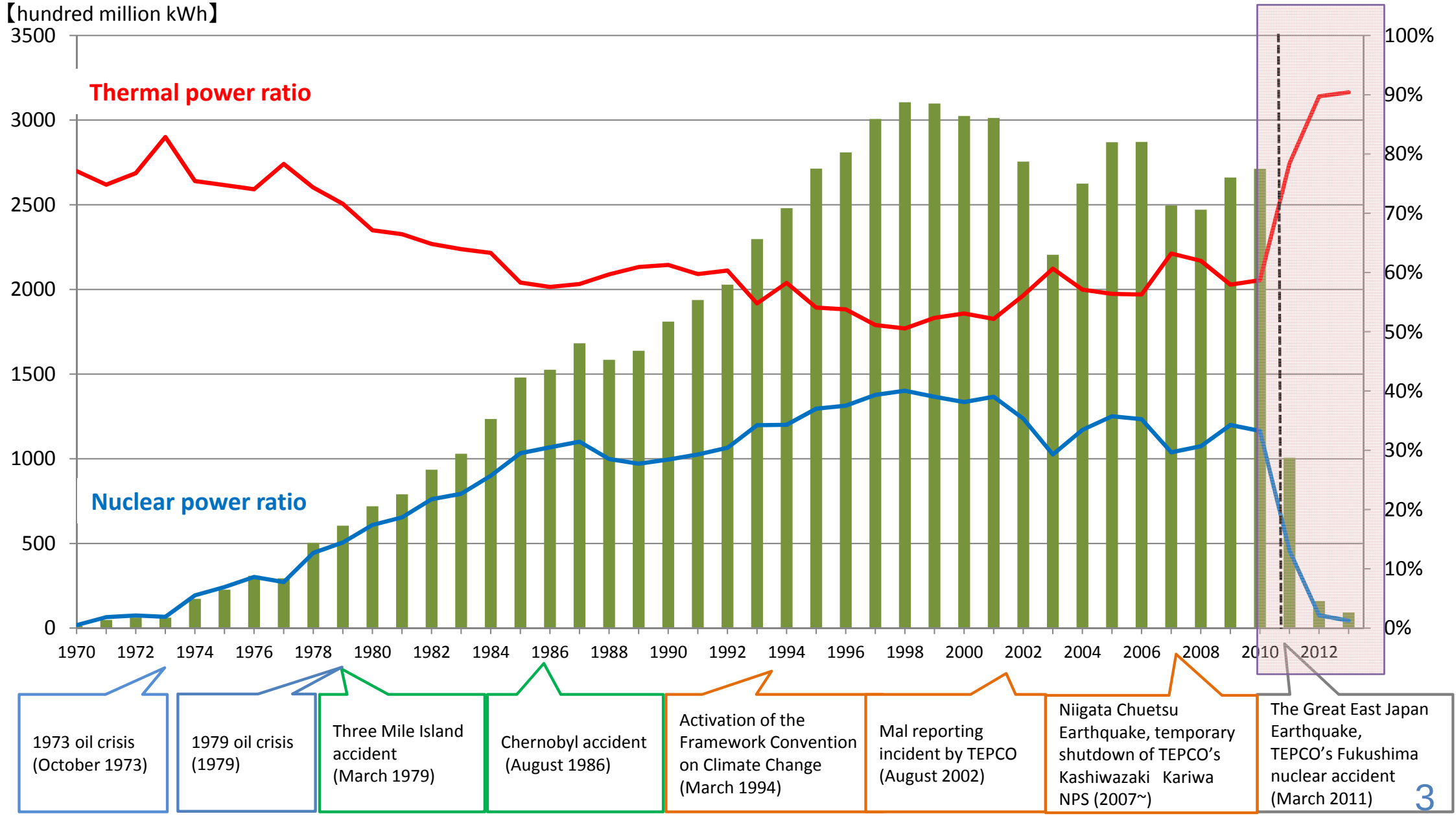
① To pursue "Energy Security", "Economic Efficiency" and "Environment" on the premise of "Safety" as the basic viewpoint, in consideration of "global viewpoint" and "economic growth"

② "Multilayered" supply structure where the strength of each energy source is to be maximized by appropriately offsetting each other's weakness

③ More "flexible and efficient" energy supply-demand structure where various options are to be prepared by various suppliers

(Ref.) Change of Nuclear Power Generation Output in Japan

After the Great East Japan Earthquake and TEPCO's Fukushima Daiichi Nuclear accident in 2011, all nuclear power plants (NPPs) are in a state of temporary shutdown.



(Ref.) Adverse Effects due to Shutdown of NPPs after the Disaster

Energy Security

1 . Increase in dependency on fossil fuels from overseas

- Fuel for 88% of total power generation is imported from overseas. 【FY2013】
  Before the Earthquake, it was 61% in FY 2010.

※ dependency on the Middle East : Crude oil (83%), Natural gas (30%)

- Ratio of renewable energy : About 2.2% of total power generation (where Hydro power generation is not included) 【FY2013】

Nation's Life and Economy

2 . Increase in fuel cost (due to increase in thermal power generation)

About 3.4 trillion yen (National burden is about 30 thousand yen/person.) 【estimation in FY2014】

3 . Increase in price of electricity

An average of about 25% increase from the level before the disaster
(monthly price of standard family : TEPCO about 6,300yen ⇒ about 7,900yen
KEPCO about 6,400yen ⇒ about 8,000yen)

(Expenditures for the Feed-in-Tariff system of renewables is about 650 billion yen/year which corresponds to 2,700yen/year for standard family) 【FY2014】

Climate Change

4 . Increase in greenhouse gas emissions 【as of FY2013】

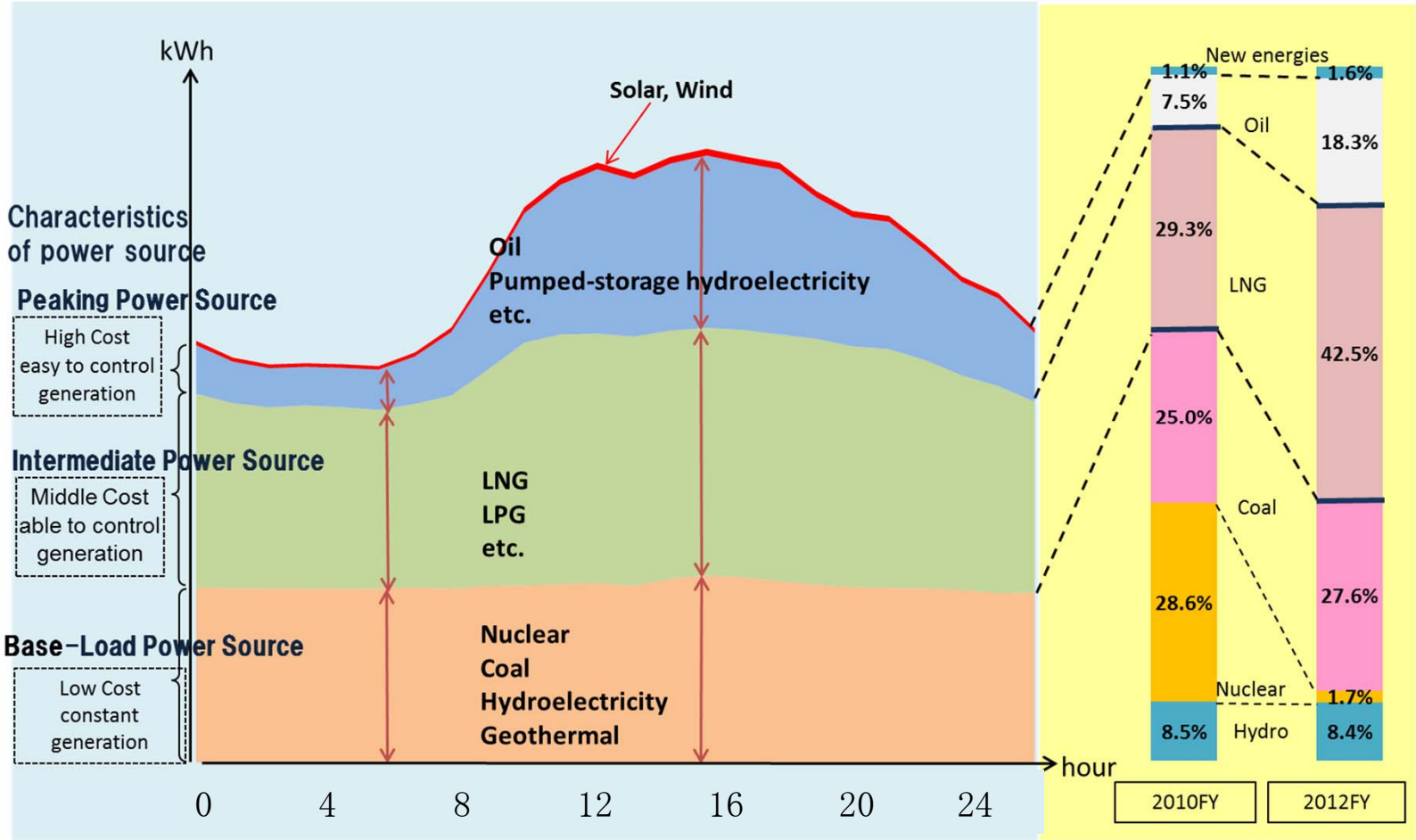
The amount of CO_2 emissions from general electricity utilities increased by about 110 million tons in FY2013 compared to FY2010. (about 9% of the total Japan's CO_2 emission)

(Ref.) Constitution of Electric Power Supply Corresponding to Demand

＜Description in the Strategic Energy Plan of Japan＞

Nuclear power is an important base-load power source as a low carbon and quasi-domestic energy source, contributing to stability of energy supply-demand structure, on the major premise of ensuring of its safety, because of the perspectives;

i. superiority in stability of energy supply and efficiency,
ii. low and stable operational cost and
iii. free from GHG emissions during operation.



(Ref.) Energy Best Mix - Target Level on the Premise of Considering the Energy Best Mix

- A METI's advisory-committee on energy best mix set up 3 goals corresponding to 3"E" on the premise to secure safety, in order to compile an outlook of 2030 demand & supply structure of energy in Japan.

【Source】Extraction (preliminary translation) from documents in the 8th Long-term Energy Supply & Demand Outlook Subcommittee, Advisory Committee for Natural Resources & Energy, METI

Secure Safety

Premise

Self-Sufficiency Rate

Only 6% at present

【Goal for Energy security】

Approx. 25%, exceeding the level before 3.11（≒approx. 20%）

Electricity Cost

Significant rise in electricity price since 3.11
- approx. 30% up for industry
- approx. 20% up for household

Surcharge for FIT ; 1.3 trillion yen in FY2014

【Goal for Economic efficiency】

Lower the cost less than present level

Greenhouse Gas Emission

Worst record of CO_2 emission* in FY2013, due to NPPs shut-down replaced by additional thermal power generation

*Originated from energy supply

【Goal for Environment】

Internationally comparable target of Greenhouse gas reduction

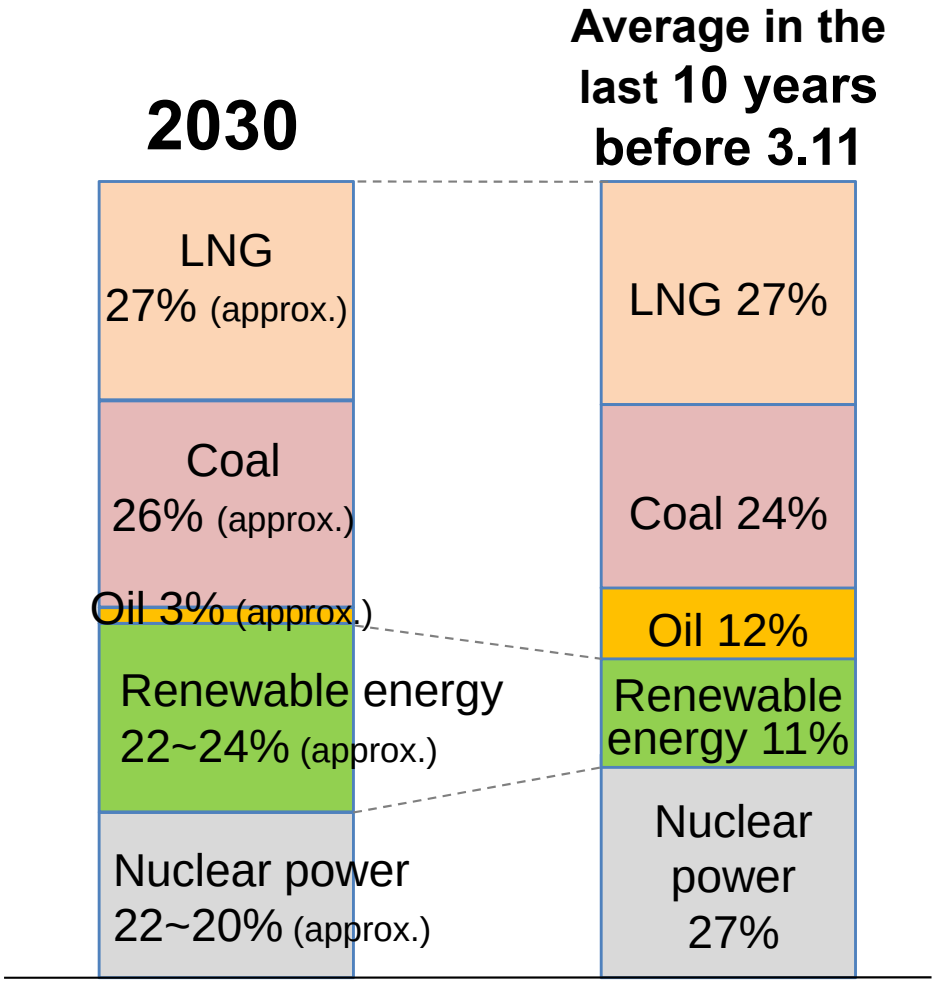
(Ref.) Energy Best Mix – Outlook of Composition of Electric Power Sources

Composition of electricity sources and electricity generation (billion kWh)

	2030	
Oil	31.5	3%
Coal	281.0	26%
LNG	284.5	27%
Nuclear power	216.8～231.7	22～20%
Renewable energy	236.6～251.5	22～24%
Total	1065.0	100%

	2030	
Solar	74.9	7.0%
Wind	18.2	1.7%
Geothermal	10.2～11.3	1.0～1.1%
Hydropower	93.9～98.1	8.8～9.2%
Biomass	39.4～49.0	3.7～4.6%

※All the numbers are approximately



【Source】 extracted (preliminary translation) from documents released in the 11th Long-term Energy Supply and Demand Outlook Subcommittee, Advisory Committee for Natural Resources and Energy, METI

2. Efforts toward Restoration and Reconstruction of Fukushima

＜ Description in the Strategic Energy Plan of Japan ＞

- ○Efforts towards restoration and reconstruction of Fukushima is a starting point to rebuild Japanese energy policies.
- ○GOJ's playing more proactive roles in the decommissioning of Fukushima Daiichi NPPs and the countermeasures for the contaminated water issue (CWI).
- ○GOJ's playing more proactive roles in proceeding compensation, decontamination and operations of intermediate storage facilities.
- ○ Conducting necessary studies for the establishment of R&D center for decommissioning and of industrial cluster for the fabrication/maintenance around the Fukushima Daiichi site.

(Ref.) Assistance of Fukushima evacuees from both aspects of quick return and quick launch of new life

【Number of evacuees from Fukushima】
About 157 thousand ➔ About 119thousand
（December 2012） （Jan 2015）

【Number of evacuees from the evacuation zone】
About 110 thousand ➔ About 73 thousand
（December 2012） （Jan 2015）

1. Measures for lifting of evacuation orders and return

①Measures for safety and removing anxieties
（Reduction of radiation exposure/health consultation）
② Additional compensation for return
③Improving environment for return by using Subsidy for Accelerating Fukushima Reconstruction
④Decontamination in collaboration with the reconstruction and policy measures after the decontamination work

Materialization of lifting of evacuation orders through dialogues with host municipalities and local residents

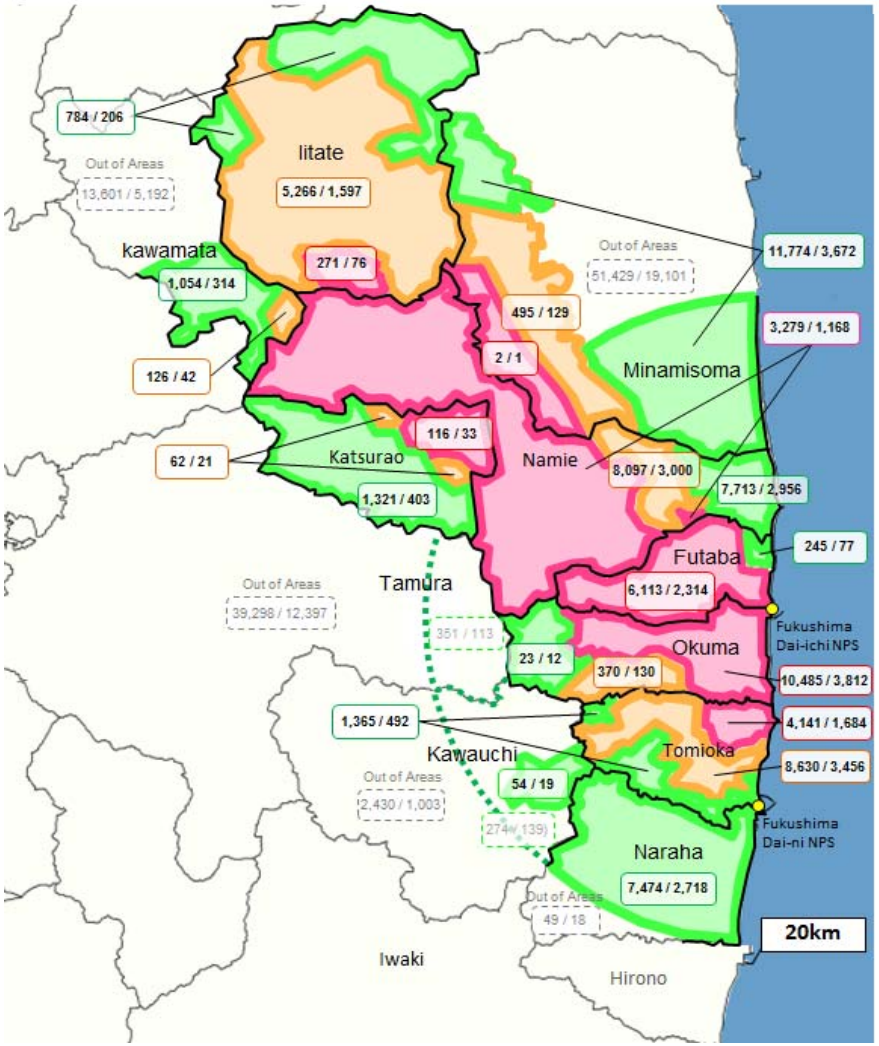
2. Expansion of assistance for launching new life

①Additional compensation necessary for new life
②Developing reconstruction centers in or out of the evacuation zone
③Considering how to implement regional construction and decontamination work in light of future perspectives of decontamination business, etc.

Materialization of mid and long term vision in a wide area through dialogues with host municipalities and residents

Evacuation order areas of Fukushima Dai-ichi Nuclear Power Plant (as of October 2014)v

Area1 : Areas to which evacuation orders are ready to be lifted(annual cumulative dose ; ～20mSv/y)
Area2 : Areas in which the residents are not permitted to live(annual cumulative dose ; 20mSv/y～50mSv/y)
Area3 : Areas where it is expected that the residents have difficulties in returning for a long time (annual cumulative dose ; 50mSv/y～)



(Ref.) Main point of revision of the Mid-and-Long-Term Roadmap

1. Give priority to Risk Reduction

Focus on Speed → Focus on Risk Reduction

Give priority sequence to actions in order to certainly reduce risks in a long-term, not only to focus on speed

- Contaminated water management, Fuel removal from SFP → Deal with as soon as possible
- Fuel debris removal → Deal with safely, surely and carefully with adequate preparation
- Solid radioactive wastes, Secondary waste generated from contaminated water treatment → Deal with in a long-term

2. Clarifying Milestones

→ Clarifying Milestones in a few years, taking stakeholder's opinions into account

3. Strengthen confidential relationship with the local stakeholders by maximizing disclosure, etc.

Establishment of Fukushima Council for stakeholder communication (February, 2014) → Further enhanced communication

(International Forum on Strategy for the Decommissioning of F1, etc.)

4. Further reduction in workers' exposure dose, Enhancement of Organization for Industrial Safety and Health Management

5. Reinforcement of Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF), as the Control Tower of technical strategy for decommissioning

Foundation of NDF (August, 2014) → Total management of R&D, Association with wisdom from all over the world

(Ref.) Clarification of Milestones

■ Clarify the short-term targets (green) for higher priority measures, while keeping the general framework (blue)

Overall	Completion of decommissioning		30 – 40 years
Contaminated water management	Completion of treatment of stagnant water in buildings	Minimizing the amount of increase of contaminated water and water inside the building, except cooling water	**2020**
Removing	Additional effective dose rate at the site boundary < 1 mSv/y	Achieving the risk reduction goal of exposure dose	FY2015
	Start of preparation to determine long-term management of ALPS-treated water		First half of FY2016
Isolating	Control inflow of groundwater into the buildings < 100 m3/day	Huge decrease in the amount of contaminated water increase	FY2016
Preventing leakage	Storage of all the water generated by treatment of highly contaminated water in welded-joint tanks	Huge reduction in risk of leakage from tanks	early FY2016
Stagnant water treatment	Reduction of radioactive materials in stagnant water in the buildings by half	Reduction in risk of leakage from buildings	FY2018

NEW

Retrieval of spent fuel	Decision on methods for the treatment and storage of spent fuel		**around 2020**
	Start of spent fuel retrieval at Unit-1	Second half of FY2017 ⇨	FY2020
	Start of spent fuel retrieval at Unit-2	First half of FY2020 ⇨	FY2020
	Start of spent fuel retrieval at Unit-3	First half of FY2015 ⇨	FY2017

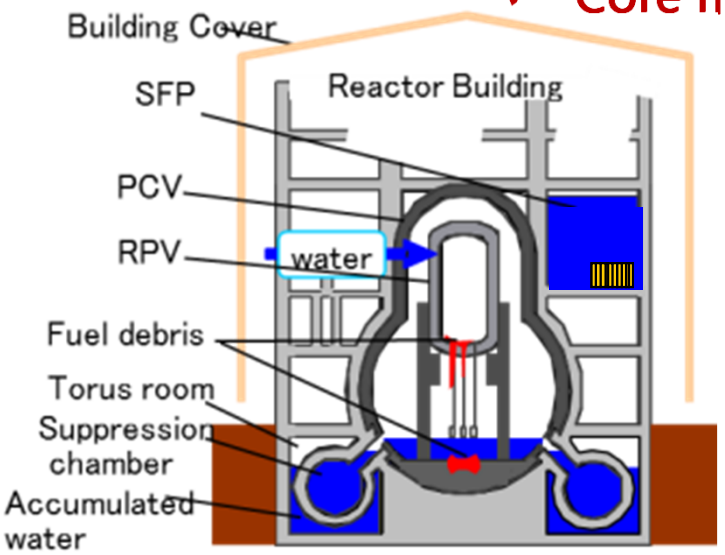
※The changes in milestones for SF removal are mainly due to "Measures for Safety and Securing more", including measures for preventing dust dispersion or reduction of workers' exposure dose, etc. Best efforts to avoid delay due to "troubles" or "delay in decision" should be made hereafter.

Retrieval of fuel debris	Policy on fuel debris retrieval from each Unit	around 2 years from now
	Decision on the method for fuel debris retrieval from the 1st implementing Unit	First half of FY2018
	Start of fuel debris retrieval from the 1st implementing Unit	2021
Radioactive waste	Establishment of basic concept of processing/disposal for solid radioactive wastes	FY2017

(Ref.) Current Status of Each Unit at Fukushima Daiichi NPPs

Unit 1

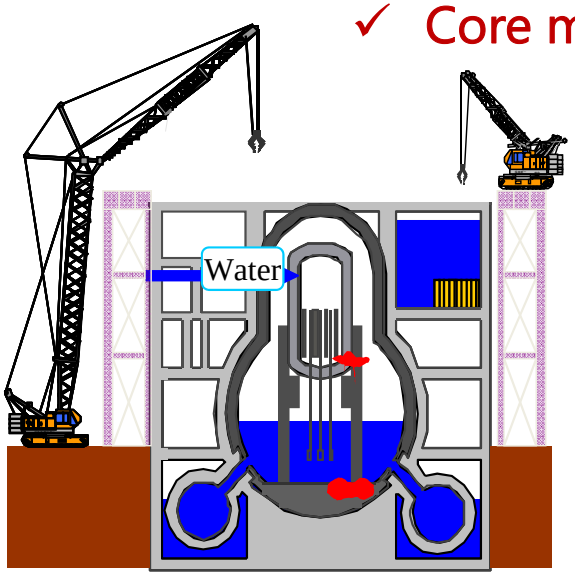
✓ Hydrogen explosion
✓ Core melt



- The building cover was installed to prevent dispersion of radioactive materials.
- Now the cover is being dismantled in preparation for the fuel removal operation.

Unit 3

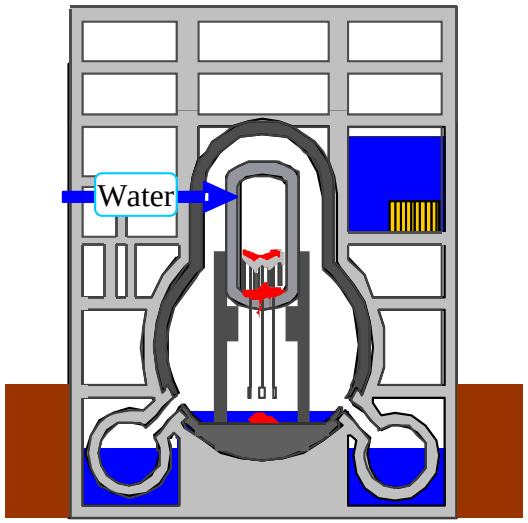
✓ Hydrogen explosion
✓ Core melt



- Currently, toward the fuel removal from SPF, removal of rubbles is underway.
- On August 2, 2015, removal of huge rubble, weighs close to 20 tons, lying in the spent fuel pool was completed.

Unit 2

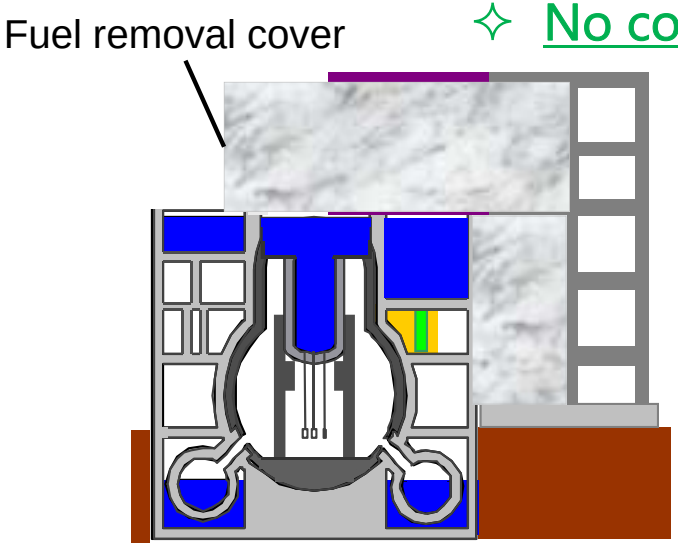
✧ No hydrogen explosion
✓ Core melt



※ According to the TEPCO's latest analysis result, more fuel debris might be melted and dropped off the reactor core than had been anticipated.

Unit 4

✓ Hydrogen explosion
✧ No core melt



- On December 22, 2014, all (**1533**) fuel removal from Unit 4 SPF was completed.

– Comprehensive Countermeasures

Three measure policy

1. Removing the contamination source

① Clean up contaminated water using multi-nuclide removal equipment, etc.

② Pump-up contaminated water from trench

2. Isolating groundwater from contamination sources

③ Groundwater bypassing system

④ Pump-up from sub-drain around the reactor building

⑤ Land-side frozen soil impermeable walls

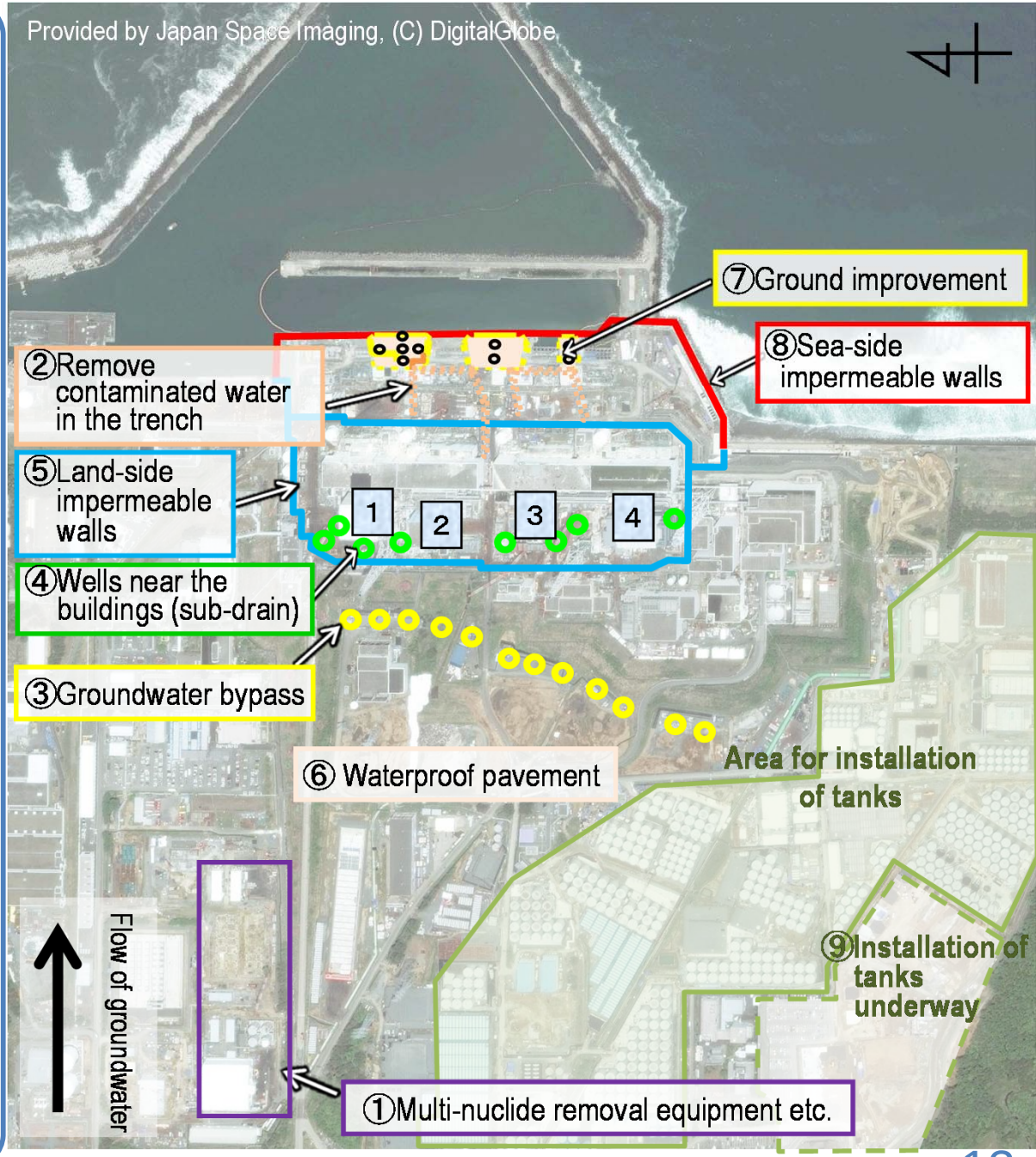
⑥ Waterproof pavement wide area facing

3. Preventing leakage of contaminated water

⑦ Ground solidification by sodium silicate

⑧ Sea-side impermeable walls

⑨ Construction of welding type tanks including replacement from flange (bolt) type



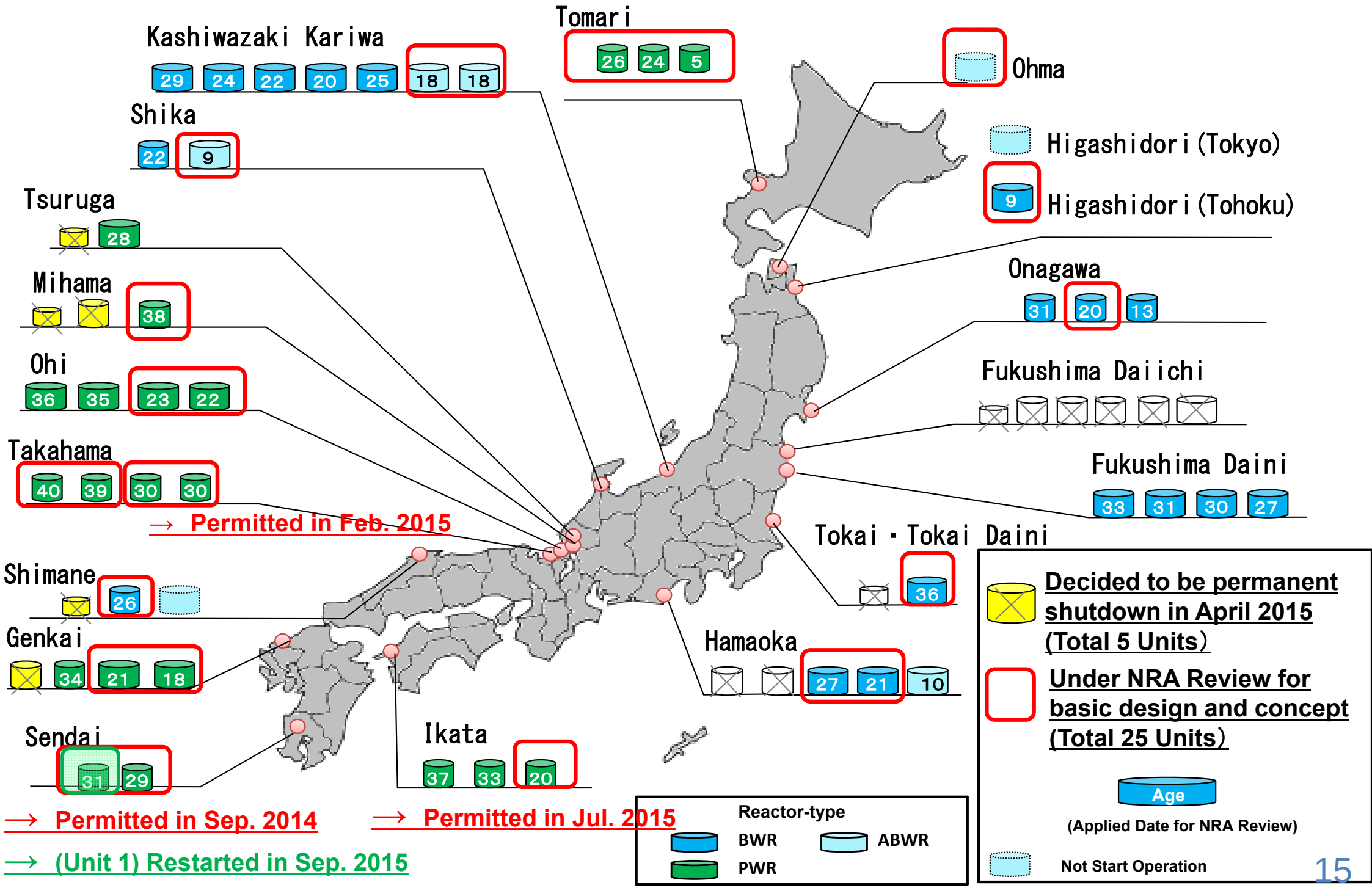
3. Existing Light Water Reactors

＜Description in the Strategic Energy Plan of Japan＞

○On the premise that safety comes before everything else and that every possible effort is made to resolve the people's concerns, judgment as to whether nuclear power plants meet the new regulatory requirements will be left to the Nuclear Regulation Authority (NRA)

○In case that the NRA confirms the conformity of nuclear power plants with the new regulatory requirements ,which are of the most stringent level in the world, GOJ will follow NRA's judgment and will proceed with the restart of the nuclear power plants.

(Ref.) Nuclear Power Plants in Japan (As of Sep 10, 2015)



(Ref.) Outline of processes for restart of NPPs

Safety Reviews and Inspections process of NRA

Application by operators

Review of basic design and concept (for permission of reactor installment license change)

Review of detailed design (for approval of construction works plan)

Inspection before reactor start-up

Reactor start-up

Inspection after reactor start-up

Completion of assessment and inspections

Assessment of Operation management systems, etc. (for approval of operational safety programs

Permitted reactors

Date	Reactor	Applicant
Sep. 10 2014	Sendai NPS, Unit 1 and 2	Kyusyu Electric Power
Feb. 12 2015	Takahama NPS, Unit 3 and 4	Kansai Electric Power
Jul. 15 2015	Ikata NPS, Unit 3	Shikoku Electric Power

Approved reactors

Date	Reactor	Applicant	Date	Date	Date
Mar. 18 2015	Sendai NPS, Unit 1	Kyusyu Electric Power	May 27 2015	Aug 11 2015	Sep 10 2015
May 22 2015	Sendai NPS, Unit 2			—	—

Local acceptance process

* No legal requirements

Local acceptance process

Disaster prevention and evacuation plan

*Not a legal prerequisites for restart

Preparation and enhancement of the disaster prevention and evacuation plan

**Based on "the Basic Act on Disaster Control Measures" and "the Act on Special Measures concerning Nuclear Emergency Preparedness"

(Ref.) Efforts towards restart of Sendai NPPs

1. NRA's Safety Review

Sendai NPP

- Kyushu Electric Power submitted its application to make changes to the reactor installment license of Sendai NPS Unit 1 and 2 in July 2013.
- **NRA compiled a draft evaluation report on 16th July 2014** which admits that Sendai NPPs satisfies new regulatory requirements.
- After the public comment process (until 15th August) and reviewing of the submitted opinions, **NRA granted a permission(changes to the reactor installment license) on 10th September 2014 for the basic design and safety features of Sendai NPPs**. After that, **NRA approved the detailed design and construction of Sendai NPS Unit 1 and 2 on 18th March 2015 and 22th May 2015, respectively**. And then, **NRA approved the operation management systems of Sendai NPS Unit 1 and 2 on 27th May 2015.**
- **Sendai NPS Unit 1 was restarted on 10th September 2015,** and Unit 2 can be restarted after completing pre-service inspection of operational safety programs.

18,600 page document was reviewed & 62 review meetings were held for 110 hours

2. Disaster prevention and evacuation plan

- A regional disaster prevention plan (including evacuation plan) against nuclear disaster should be formulated by local authorities based on the Basic Act on Disaster Control Measures.
- Although formulation of regional disaster prevention plan is not a legal requirement for restart, the plan is important to ensure safety of local residents. The government supports local authorities to make a sufficient plan.

3. Local Consent of the restart of Sendai NPPs

- Both the governor of Kagoshima prefecture and Mayor of Satsumasendai City, hosting Sendai NPPs, approved the restart of the NPPs, which means the local consent process was completed for those two reactors.

4. Reconstruction of Safety Culture

＜Description in the Strategic Energy Plan of Japan＞

- ○Nuclear industry as well as GOJ must shed the so-called “safety myth”, and pursue the world’s highest level of safety for operations through continuous and voluntary safety improvement.
- ○The industrial circles, including nuclear operators, need to set up business schemes to persistently pursue safety and make efforts to foster safety culture that places top priority on the safety of nuclear facilities.
- ○Each nuclear power operator, with a firm resolve that it will never let another nuclear accident to happen, should establish an appropriate risk management system and implement objective and quantitative risk assessments such as probabilistic risk assessment (PRA).

(Ref.) Lessons from TEPCO's Fukushima Nuclear Accident

One of the lessons from the TEPCO's Fukushima nuclear accident is that preparation for unexpected situations was not sufficient.

＜Government＞

①Independency of the regulatory body was not sufficient and there was a "regulatory capture".

②Measures to prevent or deal with severe accidents were not subject to regulation.

③The government had publicly reiterated that nuclear facilities were safe. That led to a loss of opportunities for improvement of regulation.

＜Nuclear operators＞

①They had publicly reiterated that nuclear facilities were safe because they complied with regulatory requirements.

②An unanimous decision-making process among operators on regulatory issues has discouraged them from voluntary safety improvements.

③A study by TEPCO employees warning of a possible inundation of 15.7m was not taken seriously by its executives.

＜Nuclear vendors＞

- Considerations for their clients, operators, had prevented them from proposing additional safety installations.

＜Countermeasures＞

- Nuclear Regulation Authority (NRA) independent of the other governmental bodies was established.
- NRA's new regulation covers measures to prevent or deal with severe accidents.
- "Conformity to new regulatory requirements does not mean absolute safety."
  (Dr. Tanaka, the Chairman of NRA)

＜Challenges＞

①No common understanding of residual risk with local communities and residents.

②Dependence of operators on venders and an utility association on safety issues.

③Lack of proper incentives for voluntary improvement of nuclear safety in the current regulatory scheme.

(Ref.) Challenges of Nuclear Operators

- Proper risk management should take root in each utility based on a firm commitment by top executives to nuclear risk information
- Proper communication on residual risk with various stakeholders such as local residents near NPP's or general citizens should be established
- Thorough site-specific risk assessments should be implemented
- On-site operators who have experiences in owner's engineering during construction, and are familiar with detail designs of NPP's and able to take appropriate actions in case of unexpected accidents should be properly trained.

(Ref.) Proposals for Voluntary and Continuous Improvement of Nuclear Safety

A METI's Advisory Committee published the proposals on what the industry's initiative to voluntarily improve safety should look like were on 30th of May 2014.

Proposals for Voluntary and Continuous Improvement of Nuclear Safety (May 30, 2014)

（1）Implementation of risk management under an appropriate risk governance framework

（2）Activities required to be implemented based on lessons learned from the accident at TEPCO's Fukushima Daiichi NPS as the starting point

①Implementation of exhaustive and comprehensive risk assessments including low-frequency events

②Reduction of residual risk through strengthening "defense in depth"

③Identifying the accident sequences and cliff edges at each plant, focusing on external events such as earthquakes and tsunamis, which are particular to Japan's geographical conditions, and improving resilience including response to, and recovery from unexpected incidents that are not properly addressed by the existing ordinary system

④Reorganization of research for improving the safety of light-water reactors that are commercially operated in Japan and reinforcement of research coordination among organizations at home and abroad

（3）Attitudes especially required to steadily proceed with these activities and have them take root

①Creation of an organizational culture with a critical mind and power of imagination concerning residual risks

②Swiftly introducing state-of-the-art information and opinions from both home and abroad, and making Japan's efforts known overseas

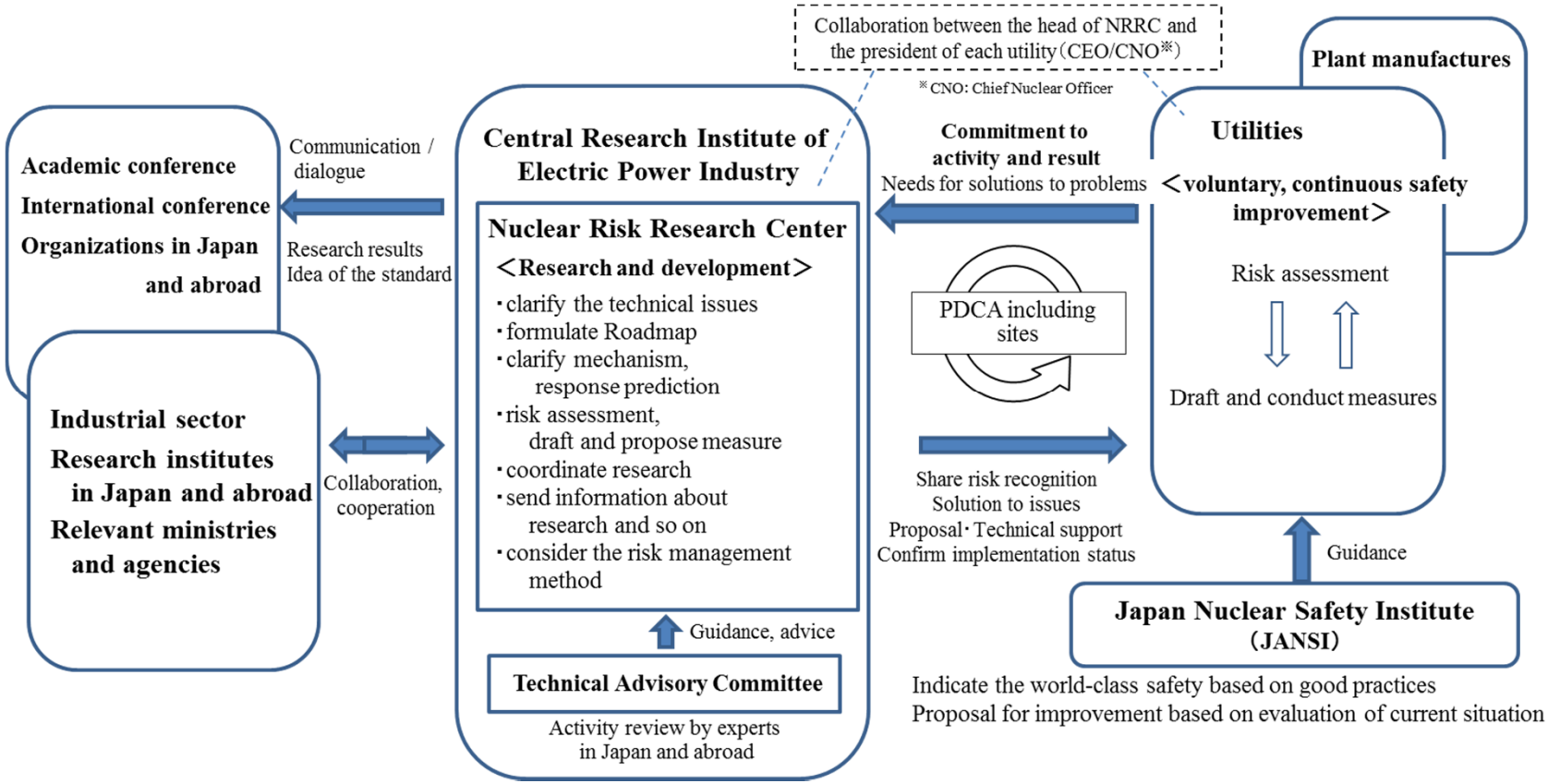
③Involvement of external stakeholders

④ Improving human and intelligence bases across industry

⑤ Sharing roadmaps to be constructed by each industrial actor based on the WG's proposals and pursuing for the overall optimization through constantly monitoring actions based on the roadmaps and continuously revising the roadmaps

(Ref.) Establishment of the Nuclear Risk Research Center (NRRC)

- ○Established within the Central Research Institute of Electric Power Industry (CRIEPI) on October 1, 2014.
- ○Utilizing PRA, this center is to perform R&D of safety-enhancing technologies which is beyond merely fulfilling regulatory requirements and to examine and propose effective problem-solving measures at individual plant, etc.
- ○The authorities of nuclear safety with strong leadership experience were invited to serve as the NRRC's executives.
  - Head: Dr. George Apostolakis (A former member of the U.S. NRC)
  - Executive Advisor : Dr. Richard A. Meserve (A former Chairman of the U.S. NRC)



(Ref.) Proposals on Further Improvement of Voluntary Efforts to Safety Enhancements

○A METI's Advisory Committee overhauled how the efforts toward voluntary improvement of nuclear safety have been conducted by each actor (utility, vendor, scientist, government) based on the proposals in 2014, and published the proposals on further improvement of voluntary efforts toward safety enhancements on the 27 of May 2015.

Proposals for further Improvements of Voluntary Efforts for Improvement of Nuclear Safety (May 27, 2015)

＜Examples of good practices＞

1. Shikoku Electric Power Co. has participated in the NRRC's research project on seismic level 2 PRA using the Ikata NPS unit 3 as a model plant of the research.
2. Kansai Electric Power Co. has worked on the development of human resources who are deeply familiar with its plant design and installation in the case of accident.
3. Tokyo Electric Power Co. has established a council headed by the nuclear division's manager in charge of a risk management and the council has been directly reporting to a executive committee on risk management chaired by the president as necessary.

＜Major proposals on further improvement of voluntary efforts＞

1. It is necessary for the electric utilities to utilize PRA for daily risk management including operation and maintenance of nuclear plants.
2. It is necessary for the electric utilities to implement appropriate risk communication with various stakeholders presuming the possibility of a severe accident.
3. It is desirable for the nuclear industry to voluntarily set a safety goal in light of accidents at sites with multiple units such as the TEPCO's Fukushima Daiichi NPS.

5. Promotion of Strategic Development of Technologies and Human Resources

＜Description in the Strategic Energy Plan of Japan＞

1. Maintaining and developing high-level nuclear technologies and human resources is imperative for smoothly decommissioning aged nuclear power plants, which are expected to increase in the future, as well as TEPCO's Fukushima Daiichi Nuclear Power Plants.

2. Because enhancing the nuclear safety in surrounding countries ensures the safety of Japan, maintaining and developing high-level nuclear technologies and human resources which enable Japan contribute to their safety enhancement is essential.

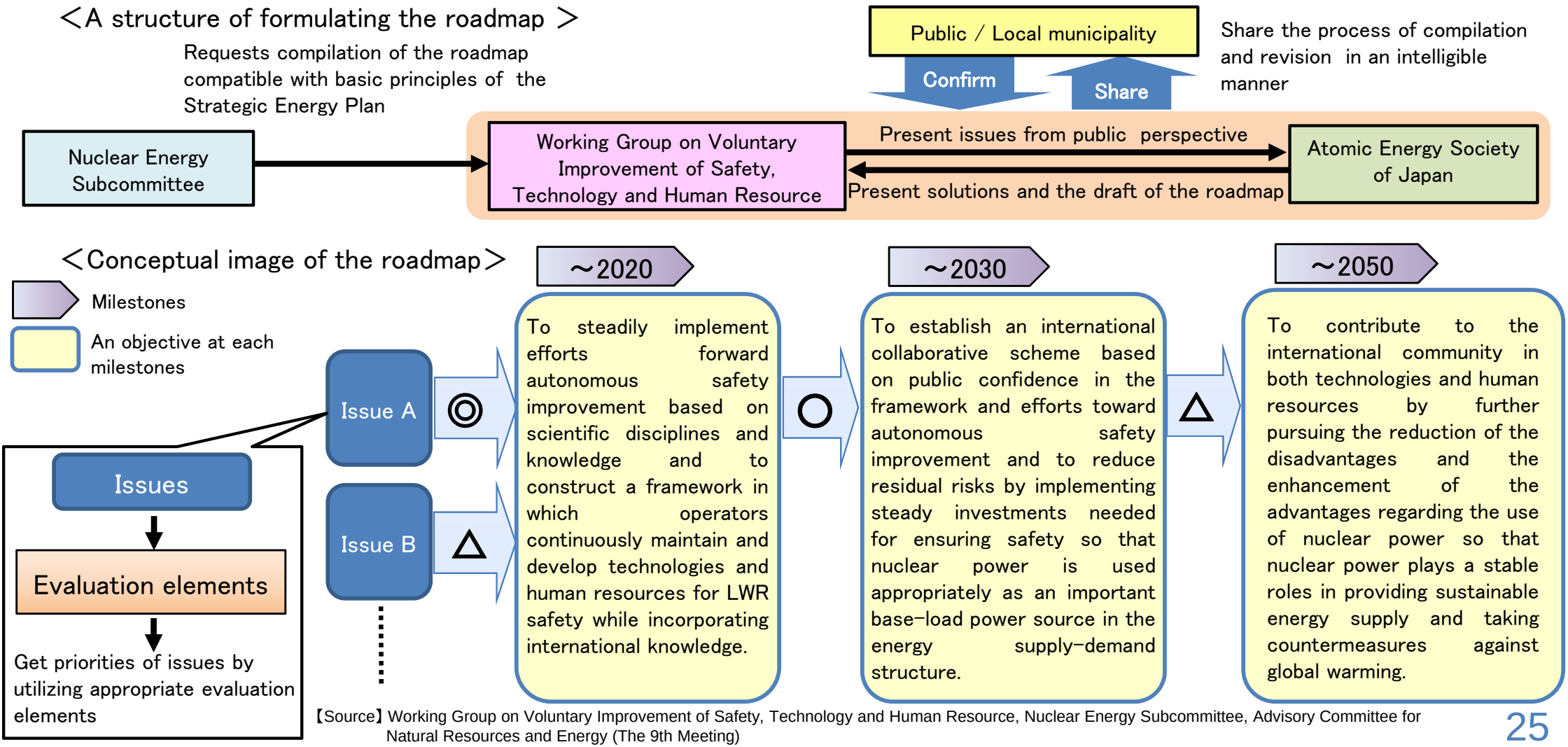
3. GOJ promotes the development of technologies that contribute to safety improvement of LWRs including countermeasures against severe accidents and enhance their reliability and efficiency in order to reduce risks in case of an accident.

4. Under international cooperation, GOJ also facilitates R&D of nuclear technologies that serves the safety improvement of nuclear use, such as high-temperature gas-cooled reactors which are expected to be utilized in various industries including hydrogen production and which has an inherent safety.

(Ref.) Basic Policy for Formulation of Light Water Reactor Safety Technology and Human Resource Roadmap

○The draft of the "Light Water Reactor Safety Technology and Human Resource Roadmap" was compiled on 27th of May 2015 through the interaction between a METI's advisory committee and the Atomic Energy Society of Japan.

○This roadmap will be reviewed at least once a year.



【Source】Working Group on Voluntary Improvement of Safety, Technology and Human Resource, Nuclear Energy Subcommittee, Advisory Committee for Natural Resources and Energy (The 9th Meeting)

6. Establishment of Appropriate Business Environment under the More Competitive Market

＜Description in the Strategic Energy Plan of Japan＞

○Nuclear operators are also required to

1) maintain high-level nuclear technologies and human resources,
2) smoothly go through decommissioning work, which will increase in the future
3) quickly take the best safety measures in response to regulations reinforced after the TEPCO's Fukushima nuclear accident and
4) contribute to global warming countermeasures and stable electricity supply utilizing base-load power sources.

○Therefore, GOJ will explore an appropriate business environment in which nuclear power operators can meet the above challenges even under the more competitive environment promoted by the electricity system reform, learning lessons from the overseas examples.

(Ref.) Roadmap for Electricity Market Reform in Japan

Bills

1st Reform: passed in Extraordinary Diet in 2013

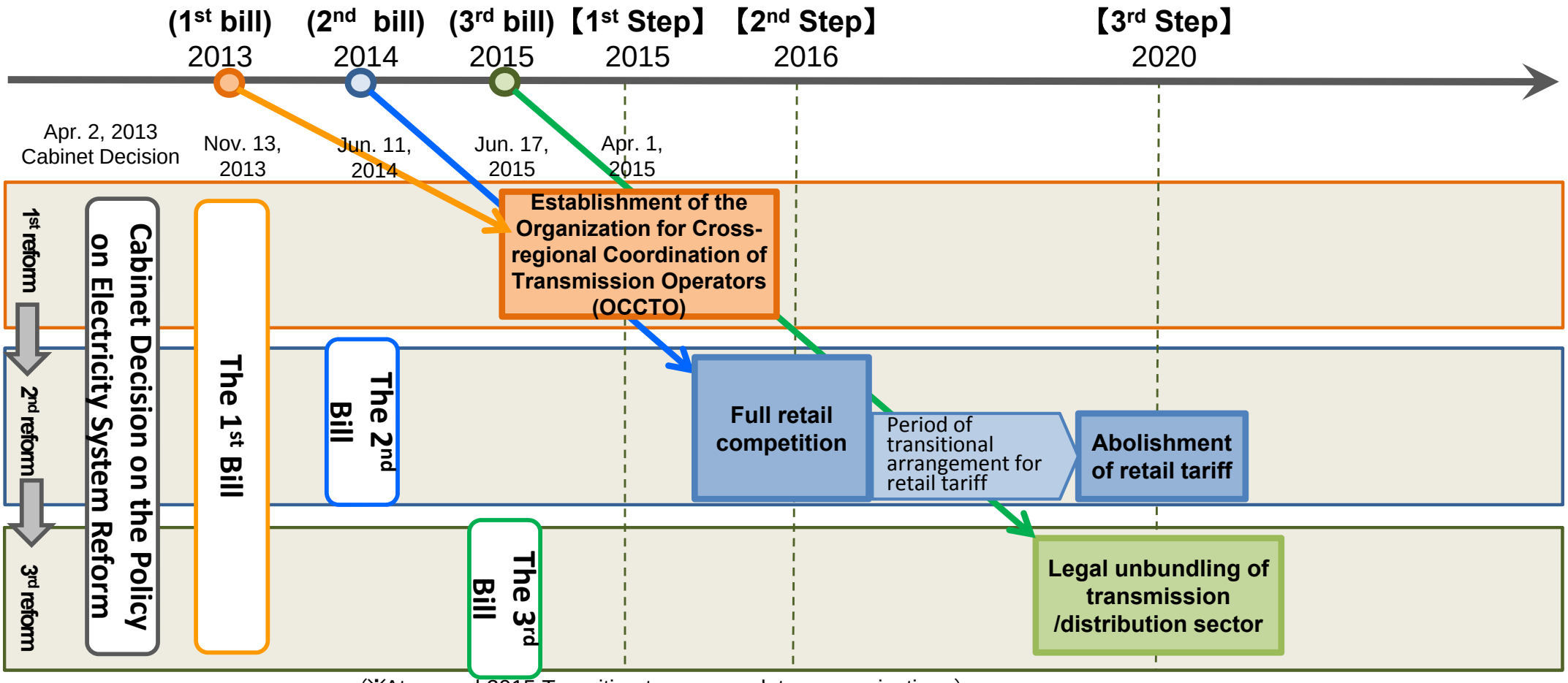
1) Establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO)
2) Action programs for 2nd and 3rd Reforms etc.

2nd Reform: Passed in Ordinary Diet in 2014

1) Full retail competition
2) Revision of applicable and regulations associated with the abolishment of General Electricity Utility system

3rd Reform: Ordinary Diet in 2015

1) Legal unbundling of transmission/distribution sectors
2) Code of Conduct



(※At around 2015:Transition to new regulatory organizations)

7. Contribution to Peaceful Use of Nuclear Power and Nuclear Non-proliferation in the World

＜Description in the Strategic Energy Plan of Japan＞

①GOJ will promote dialogues with the international community on such occasions as meetings of the IAEA, where information will be promptly and accurately disseminated. As nuclear power generation is expected to be increasingly used in emerging nations, including Asian nations, it is a responsibility that Japan must fulfill and the world expects it to fulfill to make proactive contributions to improvement of nuclear safety, peaceful use of nuclear power, nuclear non-proliferation and nuclear security in the world, by sharing the experiences and lessons learnt from the TEPCO's Fukushima nuclear accident. It is imperative for Japan to proactively contribute to formulating international standards of nuclear safety, such as the IAEA standards. Japan will contribute to improvement of nuclear safety in the world by continuing to share nuclear technologies with our enhanced safety and improved safety culture with other countries based on the experiences and lessons learnt from the accident, while confirming that a proper consideration is given to nuclear facilities' safety secured mainly by hosting countries in reference to the Convention on Nuclear Safety and the IAEA safety standards when public finance is offered on providing nuclear power technologies to overseas, including exports of nuclear power plants.

②By making use of its experience as a non-nuclear armed country, Japan will also actively contribute to strengthen nuclear nonproliferation through reinforcement of the IAEA safeguards and stringent export control and international nuclear security through actively participating global initiative such as nuclear security summits. In particular, in the non-proliferation field, it is important to intensify the efforts toward the nuclear non-proliferation by promoting international collaboration in enhancing proliferation resistance of nuclear fuel, and R&D to strengthen technology of nuclear forensics, detection and safeguards, etc. Japan will go through these efforts in cooperation with the countries such as the U.S. and France. GOJ will also set up an integrated implementing body to support development of human resources, institutional infrastructure and others for countries that will newly introduce nuclear power, through cooperation with international organizations such as the IAEA.

(Ref.) Expectations for Japan's Nuclear Technology after Fukushima

Japan is committed to **securing non-proliferation as well as nuclear safety and security in the world** by providing proven technologies with US allies, given growing influence of Russia and China in the world nuclear market.

●The 3rd Armitage-Nye Report issued by CSIS on August 15, 2012 (Excerpt)

(i) A permanent shutdown will also stymie responsible international nuclear development, **as developing countries will continue to build nuclear reactors.** --- **China could eventually emerge as a significant international vendor. As China plans to join Russia, South Korea, and France in the major leagues of global development in civilian nuclear power, Japan cannot afford to fall behind** if the world is to benefit from efficient, reliable, and safe reactors and nuclear services.

(ii) **Japan and the United States have common political and commercial interests in promoting safe and reliable civilian nuclear power domestically and internationally.**

(iii) **Safe, clean, responsibly developed and utilized nuclear power constitutes an essential element in Japan's comprehensive security.** In this regard, U.S.-Japan cooperation on nuclear research and development is essential.