

# Overview of Nuclear Energy Policy Direction in Japan

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# Aiming to Carbon-Neutral in Japan

## 2050 Carbon-Neutral Declaration and 2030 Climate Goal

- In October 2020, Prime Minister Suga declared that by 2050 Japan will aim to reduce greenhouse gas emissions to net-zero, that is, to realise a carbon-neutral, decarbonised society.
- At Leaders Summit on Climate in April 2021, Prime Minister Suga announced that Japan aims to reduce its GHG emissions by 46 percent in FY 2030 from its FY 2013 levels.

### Remarks at Leaders Summit on COP26 (Nov. 2021)

Japan aims to reduce its greenhouse gas emissions by 46 percent in the fiscal year 2030 from its fiscal year 2013 levels, and that Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50 percent.



# Nuclear Energy Policy Direction in Japan (December 2022)



## 1. All-out Efforts for Restarting NPPs

- Voluntary Improvements on Safety, Coexistence with Local Communities



## 2. Maximum use of Existing Reactors

- Develop a Framework for NPP Operation Period, under the premise of safety



## 3. Develop/Construct of Next-gen Advanced NPPs

- Target on rebuilding the site which has been decided DCM (decommissioning),
- Improve in NPP Business Env and HRD, Promote Intl' R&D (incl. SMR)



## 4. Accelerate Back-end Process

- Promote Fuel Cycle, Steady & Efficient DCM, Efforts for Final Disposal



## 5. Maintain/Strengthen Supply-chain

- Reinforce JPN Supply-chain, by Support to Industry for join in Intl' Projects



## 6. Contribute to Solve Common Intl' Issues

- Cooperation among like-minded countries, Ensuring Nuclear Safety in Ukraine<sub>2</sub>

In 9<sup>th</sup> Jan 2023, METI and the USDoE released a joint statement on energy security and cooperation for the clean energy transitions.

## <Paragraph of Nuclear in the Joint Statement>

- DOE noted the significance of the Government of Japan's announcement of its "Draft Future Nuclear Energy Direction and Action Guidelines" in December 2022.
- METI and DOE intend to cultivate opportunities for **cooperation on nuclear energy, such as development and construction of next-generation advanced reactors including Small Modular Reactors (SMRs)** both within each country and third countries.
- Both countries also intend to work on maximizing use of existing reactors and **building robust nuclear component and fuel supply-chains**, including uranium fuel among like-minded countries.

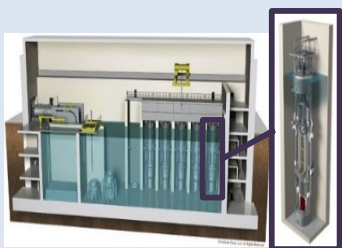


# Pursuing Competition among Various Technologies

- Through **NEXIP** and other programs, METI supports various types of nuclear reactor technologies including **international cooperation projects**.
- The Japan Atomic Energy Agency (JAEA) possess **important test facilities**.

## Small Modular LWR

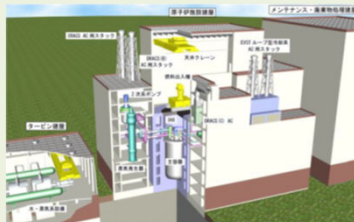
- Smaller size, modular type
- Passive safety
- ➔ ✓ Affordable capital cost
- ✓ Smaller EPZ\*



\*:Emergency Planning Zone

## Fast Reactor

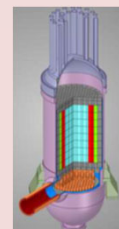
- Sodium-cooled reactor
- Fast neutrons
- ➔ ✓ Effective use of resources
- ✓ HLW\*\* management



\*\* :High-level Radioactive Waste

## High Temperature Gas-cooled Reactor

- Helium gas-cooled reactor (chemically stable)
- Coated particle fuel
- Very high temperature
- ➔ ✓ Heat/hydrogen use
- ✓ Smaller EPZ



### France



Fast reactor R&D cooperation based on simulations and experiment

### U.K.



High-temperature Gas-cooled Reactor

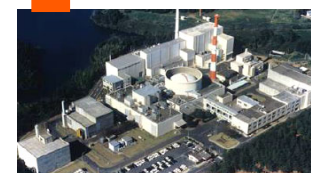
### U.S.



Versatile Test Reactor (VTR) cooperation



## International Cooperation



Jojo:  
Experimental Fast Reactor



HTTR:  
Experimental HTGR

## JAEA's Facilities

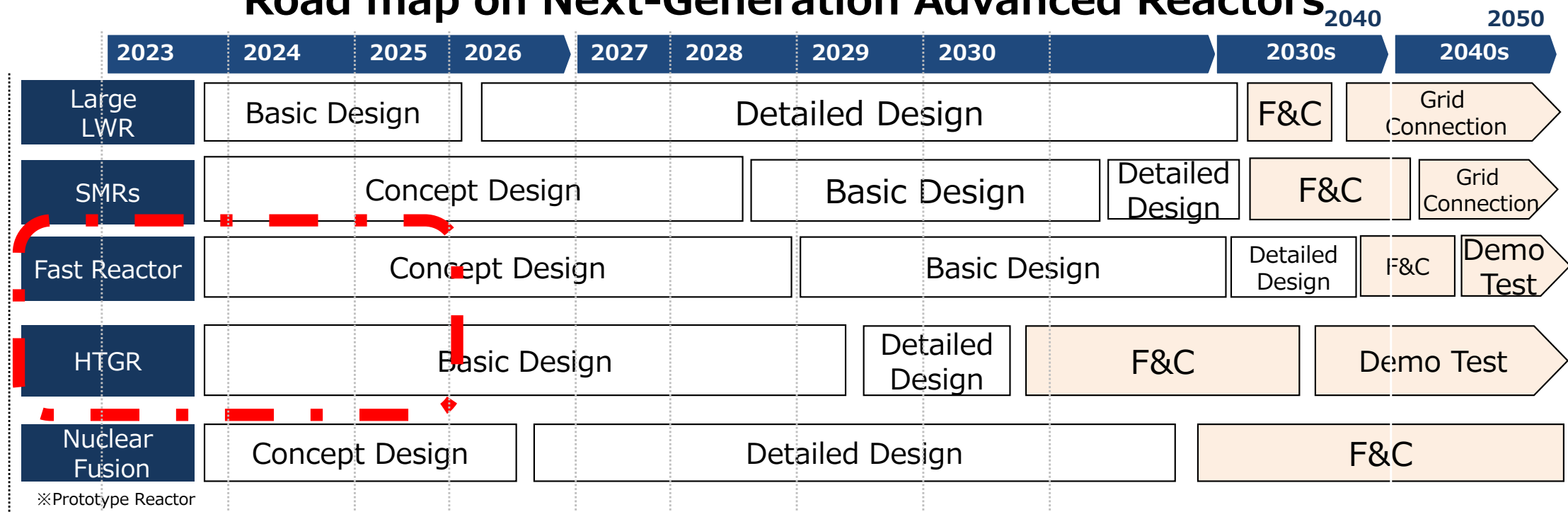




# Develop of Next-gen Advanced NPPs

- In order to accelate GX(Green Transformation) , GoJ has announced to establish budget proposal GX bond(provisional translation)
- The Amount of bonds is ¥20 trillion the next 10years (2023-2034)

## Road map on Next-Generation Advanced Reactors



※F&C, Fabrication & Construction

● Fast Reactor

Demonstration and Development Project

[\$357mil for 3years(2023-2025)]

● High-Temperature Gas-cooled Reactor

Demonstration and Development Project

[\$335mil for 3years(2023-2025)]

# Ex. Underlying Techs for Safety, after 2011

## High-temp. Resistant Corium Shield

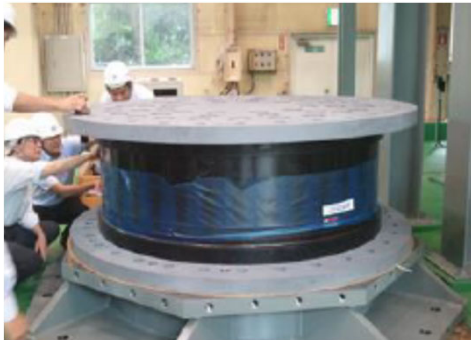
- ✓ Catching Melted-fuel in Accident
- ✓ Installed in Kashiwazaki-Kariwa NPP, Unit 6/7



## Seismic Isolation System

- ✓ Improve safety by standardizing seismic design
- ✓ Reflected in Tech Guideline by JEA\*

\* Japanese Electric Association



## Accident Tolerant Fuel

- ✓ R&D on Coated Cladding Tubes (ex. Cr)
- ✓ Plans Irradiation Tests w/ intl' partners



# Conclusions

- Japan uses nuclear power to achieve energy transition and energy security.
- Based on Nuclear Energy Policy Direction in Japan, METI and DOE intend to cultivate opportunities for cooperation on nuclear.
- GoJ is considering to issue a ¥20 trillion government bond to achieve carbon neutrality, including R&D of nuclear energy (Fast Reactor, HTGR etc).



*Thank you for your attention!*

