

## Agenda for Side Event of 63rd IAEA GC organized by JAEA

10:00 - 11:30, Wednesday, 18 September 2019 Room M7, M Building, Ground Floor, VIC

The path to the global deployment of Small Modular Reactor (SMR) based on Japan's High Temperature Gas-cooled Reactor (HTGR) technology and the expectation from the global nuclear community

-Toward forging international partnership-

#### Outline:

Japan Atomic Energy Agency (JAEA) has been performing R&D for SMR. HTGR design which Japan has developed as an SMR is mature enough for the near-term deployment. This side event aims to trigger off HTGR deployment plan through international partnership. Presentations and a panel discussion will focus on unique features of HTGR and what international collaborators can expect from the Japan's technologies.

Agenda: Moderator: Mr. N. Kobayashi, Director, JAEA Vienna Office

#### 10:00 Opening and Welcome Remarks

Mr. T. Kodama President, JAEA

Mr. D. Hahn Director, Division of Nuclear Power, Department of Nuclear Energy, IAEA Mr. Y. Chihara Deputy Director General, Ministry of Education, Culture, Sports, Science and

Technology, Japan

Mr. T. Nagasawa Director, Office for International Nuclear Energy Cooperation, Office for

Nuclear Technology and Human Resources, Agency for Natural Resources

and Energy, Ministry of Economy, Trade and Industry, Japan

Mr. K. Matsumoto Director, International Nuclear Cooperation Division, Disarmament, Non-

Proliferation and Science Department, Ministry of Foreign Affairs, Japan

#### 10:15 Panel discussion - Deployment of HTGR as an SMR

Moderator: Mr. N. Sakaba, Deputy Director, Strategy and Planning Office, Sector of Fast Reactor and Advanced Reactor Research and Development, JAEA

#### Presentations: 35 min

- HTGR development in Japan and excellent HTGR technology basis obtained from design, construction and operation of the HTTR
- Development experience through HTTR construction and future plan of the HTGR deployment
- Deployment activity in each country

#### Panel discussion: 30 min

- Requirement on HTGR for power generation and heat utilization, Expectation to Japan's HTGR technology, Attractive points and hurdles for HTGR deployment, etc.
- Possible cooperative R&D theme by using JAEA's facilities

Mr. K. Kunitomi Deputy Director General, Sector of Fast Reactor and Advanced Reactor

Research and Development, JAEA

Mr. J. Miyaguchi Deputy General Manager, Nuclear Energy System Division, Power Systems,

Mitsubishi Heavy Industries, Ltd.

Mr. H. Usui Technology Executive, Toshiba Energy Systems & Solutions Corporation
Mr. G. Wrochna International Cooperation Manager, National Centre for Nuclear Research

(NCBJ), Poland

Ms. C. Whitmill
Managing Director, Penultimate Power UK Limited, UK
Mr. M. Richards
Senior Technical Advisor, Ultra Safe Nuclear Corporation, USA

# 11:20 IAEA's activities on HTGR technology development, information dissemination and support to new-comer countries that wish to deploy nuclear power

Mr. F. Reitsma Team Leader (SMR Technology Development) Nuclear Power Technology

Development Section, Division of Nuclear Power, Department of Nuclear

Energy, IAEA

#### 11:25 Closing Remarks

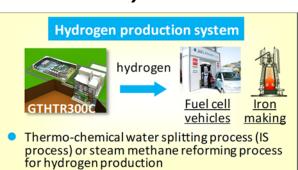
Mr. T. Shibata Group Leader, International Cooperation Group, Sector of Fast Reactor and

Advanced Reactor Research and Development, JAEA

#### 11:30 Reception



## Various HTGR systems





Renewable power variation may be absorbed by simple and efficient load following of HTGR power and additional hydrogen cogeneration

### High temperature steam for industry



Process heat Electricity



Chemical plant

Process heat can be supplied to chemical plant, petroleum refining plant, etc. and power can be produced by steam turbine

#### Multipurpose cogeneration



Hydrogen, desalination, electricity, etc

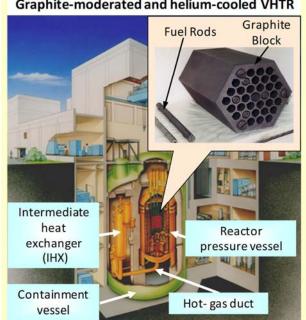


Cogeneration (power generation, hydrogen production, desalination, etc. ) can achieve 80% of heat utilization rate

# Japan's mature HTGR technologies; HTTR



Graphite-moderated and helium-cooled VHTR



# Major specification

Thermal power **30 MW** 

Coated fuel particle / **Fuel** 

Prismatic block type

**Core material** Graphite Coolant Helium **Inlet temperature** 395°C 950°C **Outlet temperature** Pressure 4 MPa

First criticality: 1998

Full power operation: 2001

50 days continuous 950°C operation: 2010 Loss of forced cooling test at 9MW: 2010



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