Presentation 5 – Session 2

Advanced Reactor Development in Chinau

Kejun Jiang
Senior Researcher, Energy Research Institute (ERI)
National Development and Reform Commission, Beijing, China.

Biography

Kejun Jiang's research focus is energy, climate change mitigation and air pollution prevention policy assessment by using IPAC modeling, to support national five-year plans and long-term planning. He began his research in ERI from 1990 and led the development of Integrated Policy Assessment Model for China (IPAC). IPAC modeling team is now a leading research team on China's 2050 energy transition studies by providing benchmark research results. Major research focus includes energy and emission scenarios, energy policy, energy system, energy market analysis, and climate change, local environment policies and international negotiation.

He also was an author of IPCC for Special Report on Emission Scenario from 1997 and Working Group III Third Assessment Report, lead author for IPCC WGIII AR4 Chapter 3, and lead author for GEO-4 Chapter 2, CLA in WGIII of IPCC AR5, LA for IPCC AR5 Synthesis Report, CLA of IPCC Special Report on 1.5℃ Warning, Vice Co-Chair of GEO6. From 2010, he is author for UNEP Emission Gaps and lead author of IPCC AR6 WGIII. He also joined international research collaboration projects such as EMF, FP6, FP7 and H2020 research projects. He is member of Scientific Panel of UNEP CCAC, and Scientific Committee of IAMC.

He has a PhD in Social Engineering from the Tokyo Institute of Technology.

ABSTRACT

China is developing nuclear power generation in large scale. There is big potential to go if China wants to reach the air quality targets and climate change targets in Paris Agreement. In order to prepare for the future of nuclear power development, advanced nuclear power technologies are developed, under developing, and planned in China. By June 2019, there are 47 nuclear power units in operation, with 11 units under construction. There are 10 Third generation nuclear reactors in operation or under construction in China, accounts for 1/3 of the

world. The HTGR (200MW) was under construction and will put into operation next year. Several low temperature nuclear reactors for space heating were under construction, which are expected to play key role in air pollution prevention in China's cities. And pilot project for floating nuclear power plant is under construction. Nuclear fusion technology is also studied in China. This presentation will introduce the state of advanced nuclear technology development in China.

Advance Nuclear technology Development in China

Jiang Kejun

Energy Research Institute, China

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Advanced Nuclear Technologies in China

- Third Generation Nuclear Reactor: mainstream in China now
- Fourth Generation: under pilots
- Fifth Generation: speed up for R&D

Third Generation” commercial operation

- Sanmen #1, AP1000, June. 2018
- Sanmen #2, AP1000, Aug., 2018
- Haiyang #1, AP1000, Oct. 2018
- Taishan #1, EPR, 2018
- Taishan #2, EPR, 2019
- Haiyang #2, AP1000, Jan.2019

Third Generation: starting construction

Tianwan: 2 units of VVER-1200, 2019
Xudapu: 2 units of VVER-1200, 2019
Zhangzhou: 2 units of Hualong No.1, 2019
Taipingling: 2 units of Hualong No.1, 2019
Hainan Changjiang: Linglong No.1, 125MW, Small reactor, 2019

Third Generation: Hualong No.1, HPR1000

Fuqing: #5 and #6
Fangchenggang: #3 and #4
Ningde: #5 and #6
Changjiang: #3 and #4
Zhangzhou: #1 and #2

Forth Generation: projects

Shidaowan: HTGR, 200MW to be start commercial operation in 2020

Ruijin: HTGR, 600MW

Fujian Xiapu: CFR600, 600MW, Fast-neutron reactor, decided in 2017

Forth Generation: activities

TWR: office was established in NEA

Collaboration with Russia

Collaboration with US

Nuclear Fusion

ITER project

Chinese government supported R&D projects

Plan: 500MW Pilot project before 2035, after that, 1GW commercial unit

Slow progress, but there is potential to speed up by largely increasing investment in China

Other technologies

Molten-Salt Reactor: R&D in CAS

TWR: China institute of atomic energy(CIAE) and CNNC, possible 600MW in Xiapu, after CFR-600

Low Temperature Reactor for Heat Supply: under development, strong demand.