Panel on Innovations and Advances in Nuclear Technologies

The Status of HTR-PM, a 200MWe High Temperature Gas-cooled Reactor demonstration plant constructed in China

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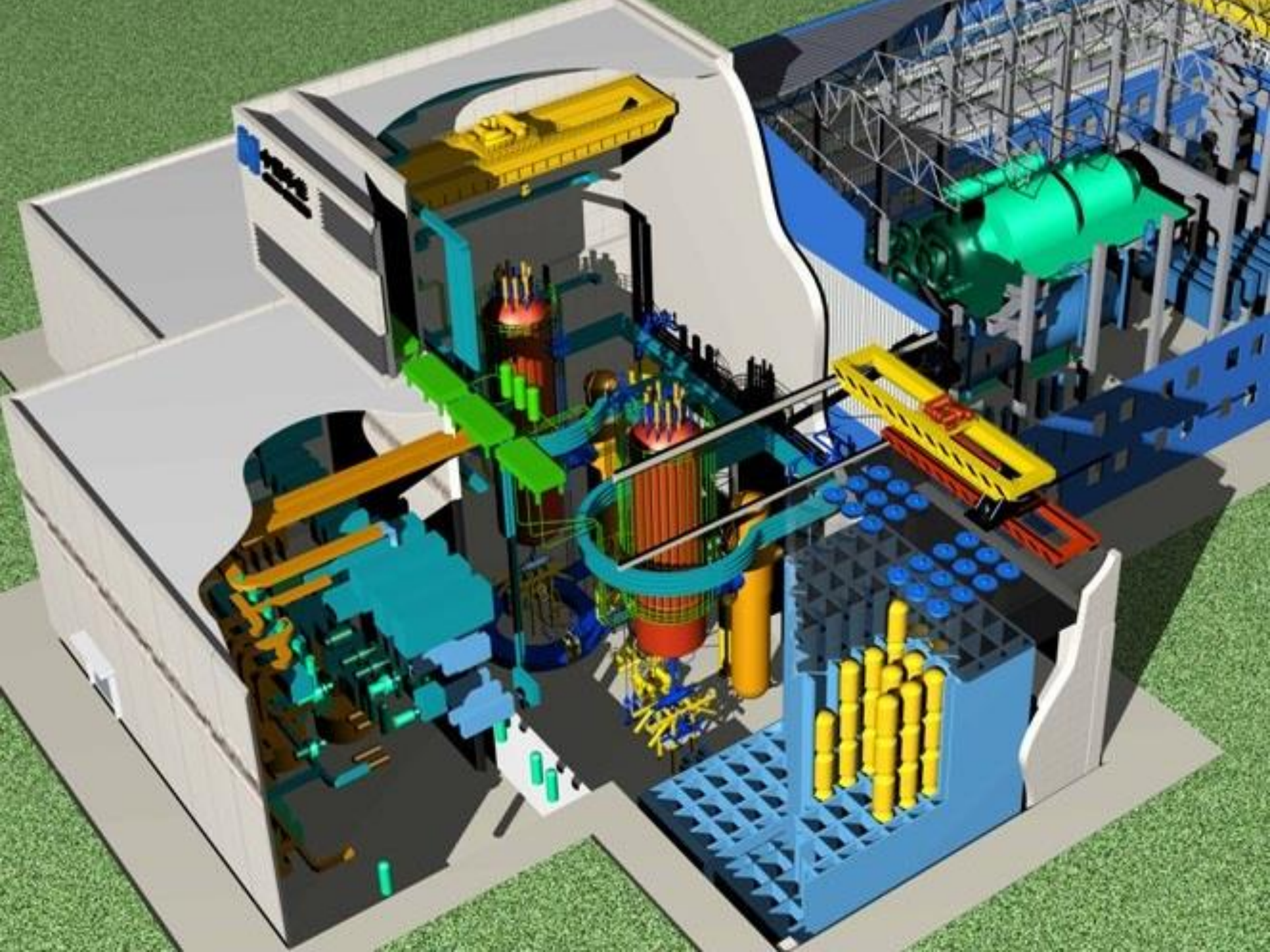
1, Construction

- 2012/12/09 : FCD
- 2015/06/30 : Reactor plant
- 2015/12 : Full scope simulator
- 2016/03/20 : 1st RPV installed
- 2016/08 : Start fuel production
- 2016/09 : 2nd RPV installed
- 2016/10 : Reverse transmission power
- 2017/10 : 1st reactor module installed

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2, Demonstration Test

- Control Rods Driving Mechanism, finished
- Small Sphere Absorption System, finished
- Control Room, finished
- Helium Circulator, finished
- Spent fuel canister, finished
- Fuel Handling System, finished
- Steam Generator, finished

Full Scale Fuel Handling System Test, 500 hours automatic operation， 7MPa helium hot condition, finished

Steam Generator tests was finished, 1/19, Primary Loop 10MWt 7.0MPa 250/750℃ Helium, Secondary Loop 13.25MPa 205/570℃ Steam

3, Fuel

- INET demo production facility, 100000/Year, 2010/10
- Irradiation test of fuels, Petten, The Netherland,
  - From 2012/09/08/ to 2014/12/30 ,
  - 351个efpd ,
- Commercial fuel plant, 300000/Year, Baotou, CNEC fuel plant
  - 2013/03/ started construction
  - 2016/03/ finished plant installation and commission
  - 2016/08/ started production
  - 2017/07/ 200000 fuels have been produced


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4, Components

- Reactor Pressure Vessels, on site
- Metallic reactor internals, on site
- Full Scope Simulator, on site
- Distributed Control System, on site
- Reactor Protection System, on site
- Control Rods Driving Mechanisms, on site
- Small Sphere Absorption Systems, on site
- Helium Circulators, in schedule
- Fuel Handling System, on site
- Steam Generator, in final installation


家科技重大专项—华能石岛湾核电厂高温气冷堆示范工程压力容器胜利出厂
发展绿色电力 奉献清洁能源
全球首台HTR-PM压力容器
华能石岛湾高温气冷堆示范工程

5, Remarks

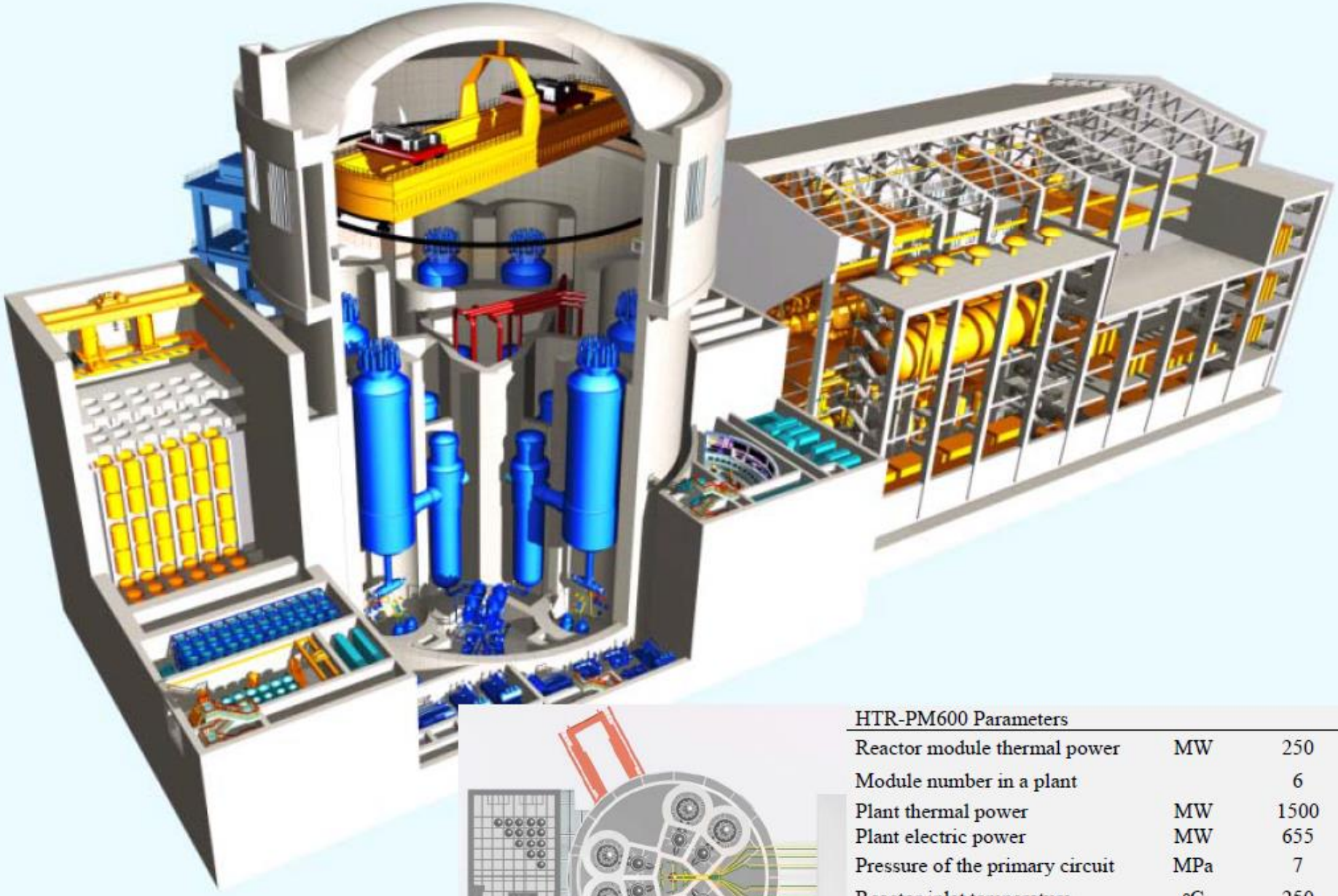
Role of HTR-PM in China

- **Supplement to PWRs**, Especially to replace Coal-fired Power Plant in population dense region
- **Co-generation** of steam and electricity, Hydrogen production
- **Technology Innovation**

HTR-PM600

- 6 reactor modules connect to one steam turbine,
  - the same safety features,
  - the same major components,
  - the same parameters,

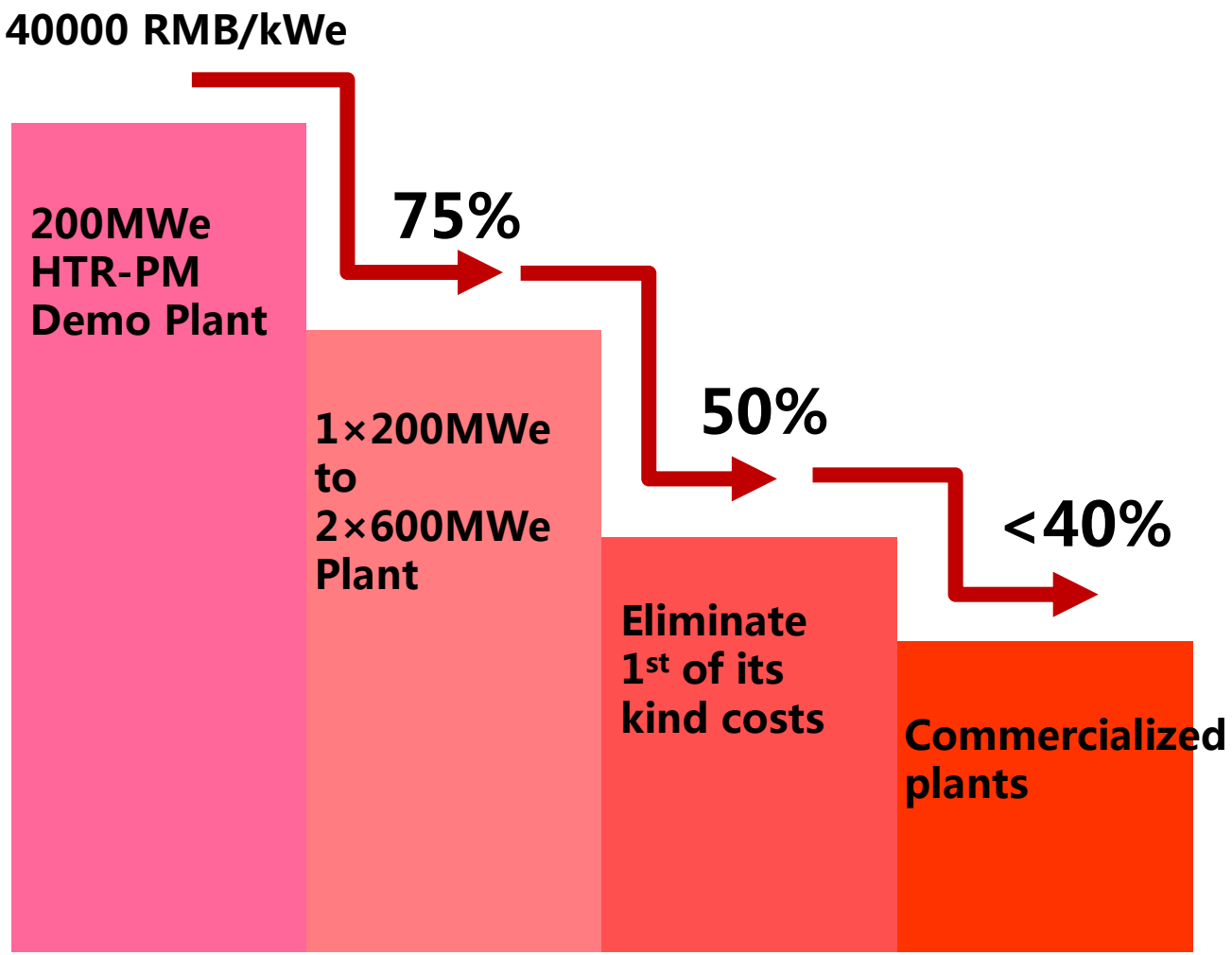
  comparing with HTR-PM demonstration plant;
- the same site footprint and the same reactor plant volume comparing with the same size PWRs.



HTR-PM600

HTR-PM600 Parameters		
Reactor module thermal power	MW	250
Module number in a plant		6
Plant thermal power	MW	1500
Plant electric power	MW	655
Pressure of the primary circuit	MPa	7
Reactor inlet temperature	℃	250
Reactor outlet temperature	℃	750
Feed water temperature	℃	205
Steam temperature	℃	566
Steam pressure	MPa	13.24

Reduce Costs



HTR-PM will provide:

- **Proven Technology and Budget;** the world first 200MWe pebble-bed modular high temperature gas-cooled reactor demonstration plant(HTR-PM) is under construction in China.
- **Generation IV Safety;** eliminate off-site emergency response through a Meltdown-Proof Reactor. It is Gen-IV+SMR.
- **Huge Market Potential;** provide 200, 600MWe high efficiency power plant and co-generate steam up to 560℃.