Westinghouse Electric Co.
Global Nuclear Outlook

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2010 Tulane Engineering Forum
Session B - Fueling Our Energy Future in a Carbon Constrained World, Part 1

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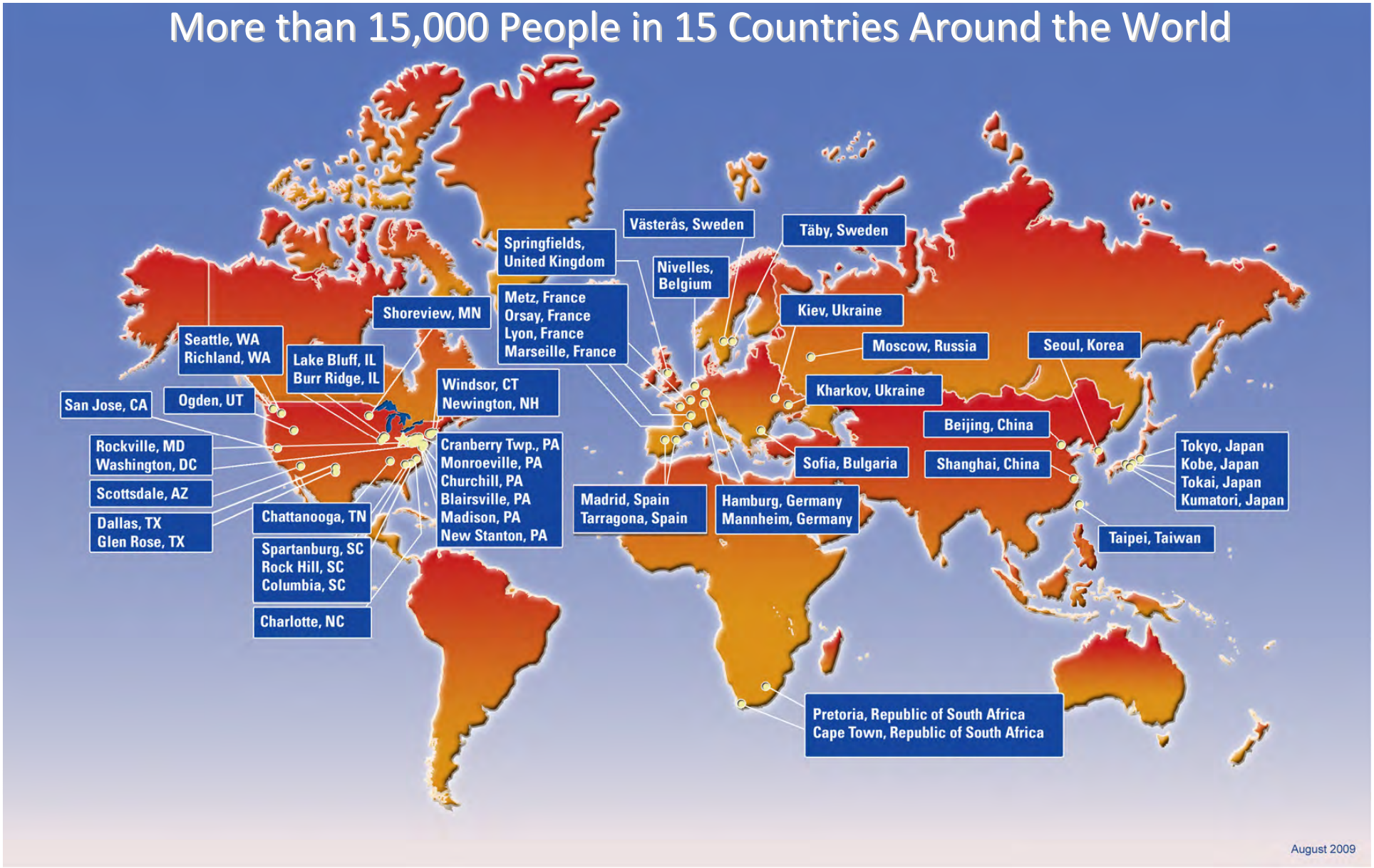
Westinghouse is a Global Company



Reactor Technology Portfolio

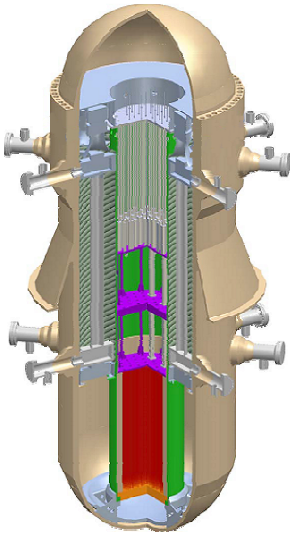
AP1700
(1700+ MWe)

Large, Passive Plant

AP1000
(1117 MWe)

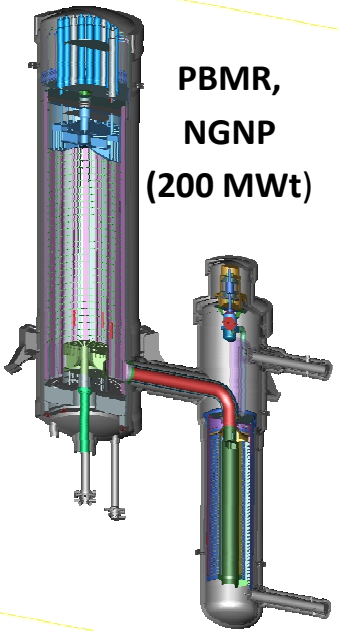
New, Advanced LWRs

Integral Modular (~300 MWe)



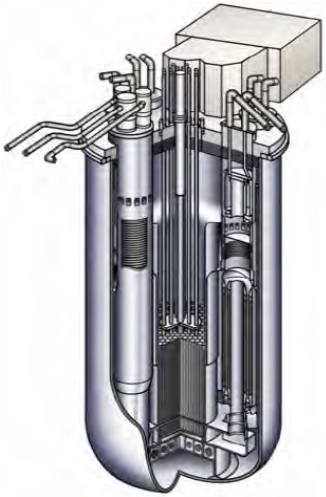
Small Modular Reactors

PBMR, NGNP (200 MWt)



High-Temperature Gas Reactors

4S, ARR, others
(10-1200 MWe)



Fast Spectrum Reactors

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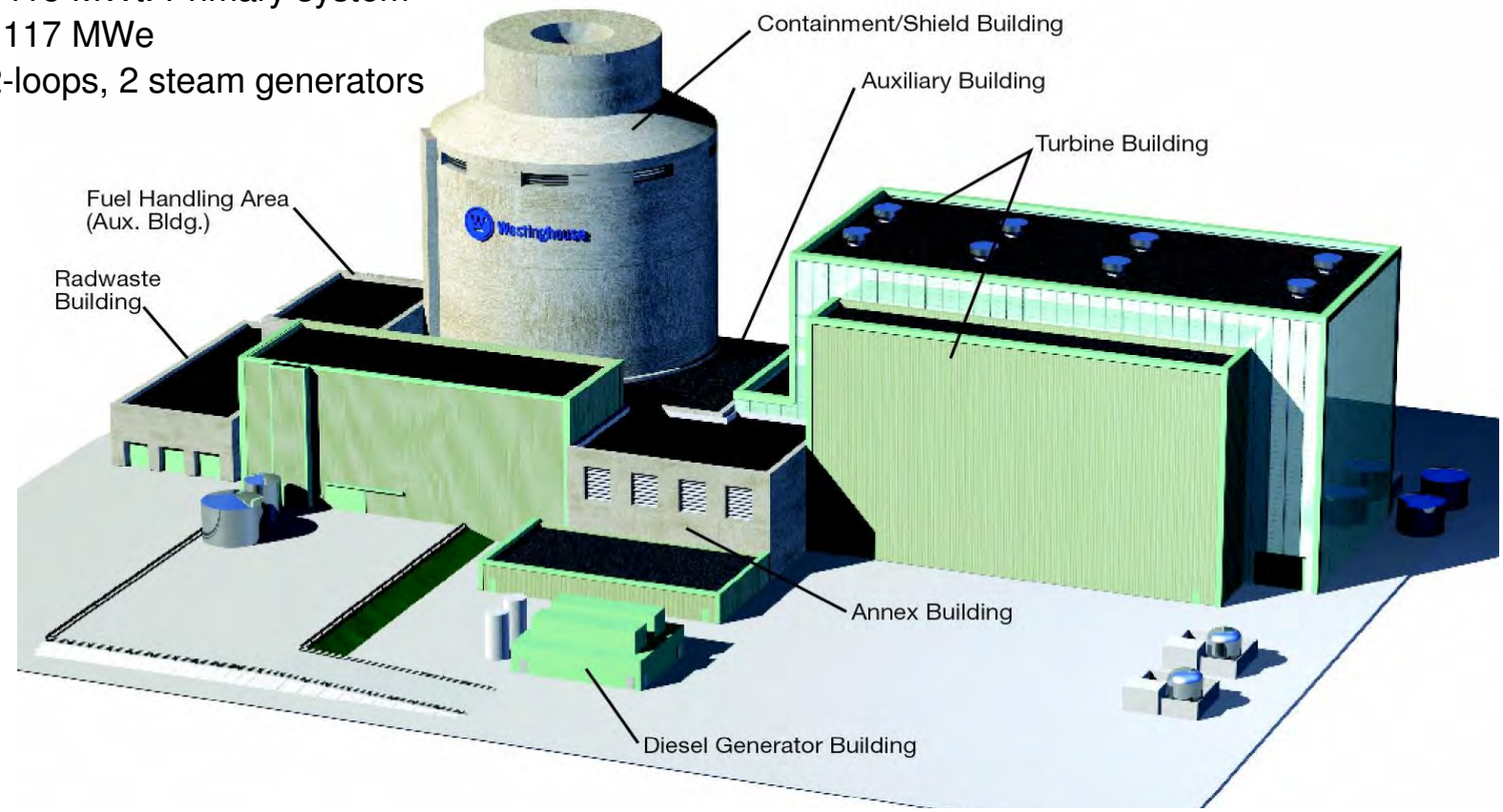
The Westinghouse AP1000™

A compact station
- 3415 MWt. Primary system
- 1117 MWe
- 2-loops, 2 steam generators



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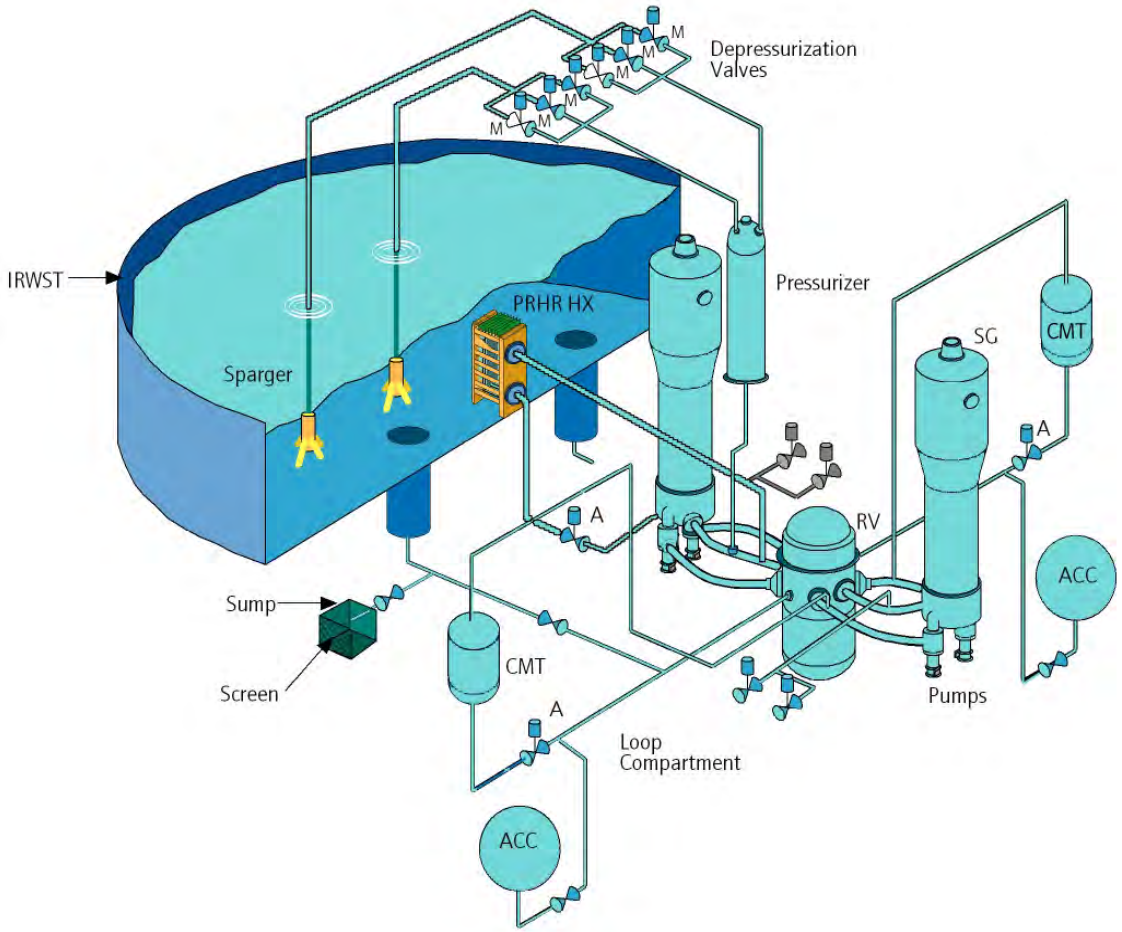
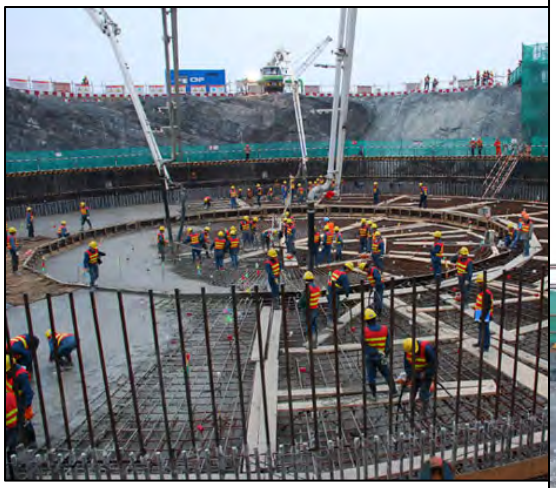
Passive Core Cooling System

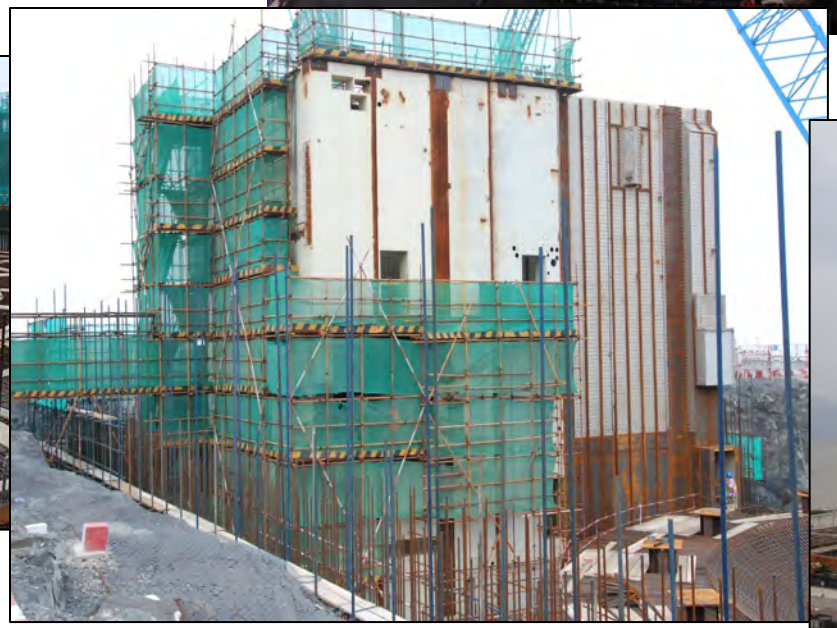
- AP1000 safety does not rely on AC power
  - Passive decay heat removal
  - Passive safety injection
  - Passive containment cooling
- Long term safe shutdown state:
  - 72 hours without operator action



AP1000™: 10 Worldwide EPC Contracts

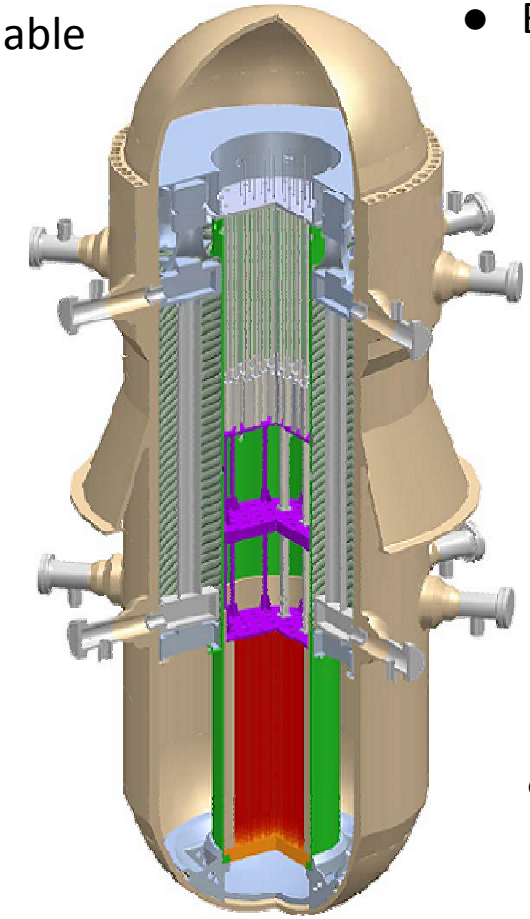
- Progress in AP1000™ construction
- Modular construction





The Call for Small Modular Reactors: Clean, Reliable Energy Options

- Clean, safe, reliable electricity
- Distributed electricity needs
- Utilities with little nuclear operation experience
- Slow demand growth
- Limited infrastructure
- Easier equity ownership



- Baseload generation
- State mandated RPS requirements
- Resource constraints, e.g., land, cooling water
- Financing limitations
- Replacement for aging fossil-fueled plants
- Grid limitations

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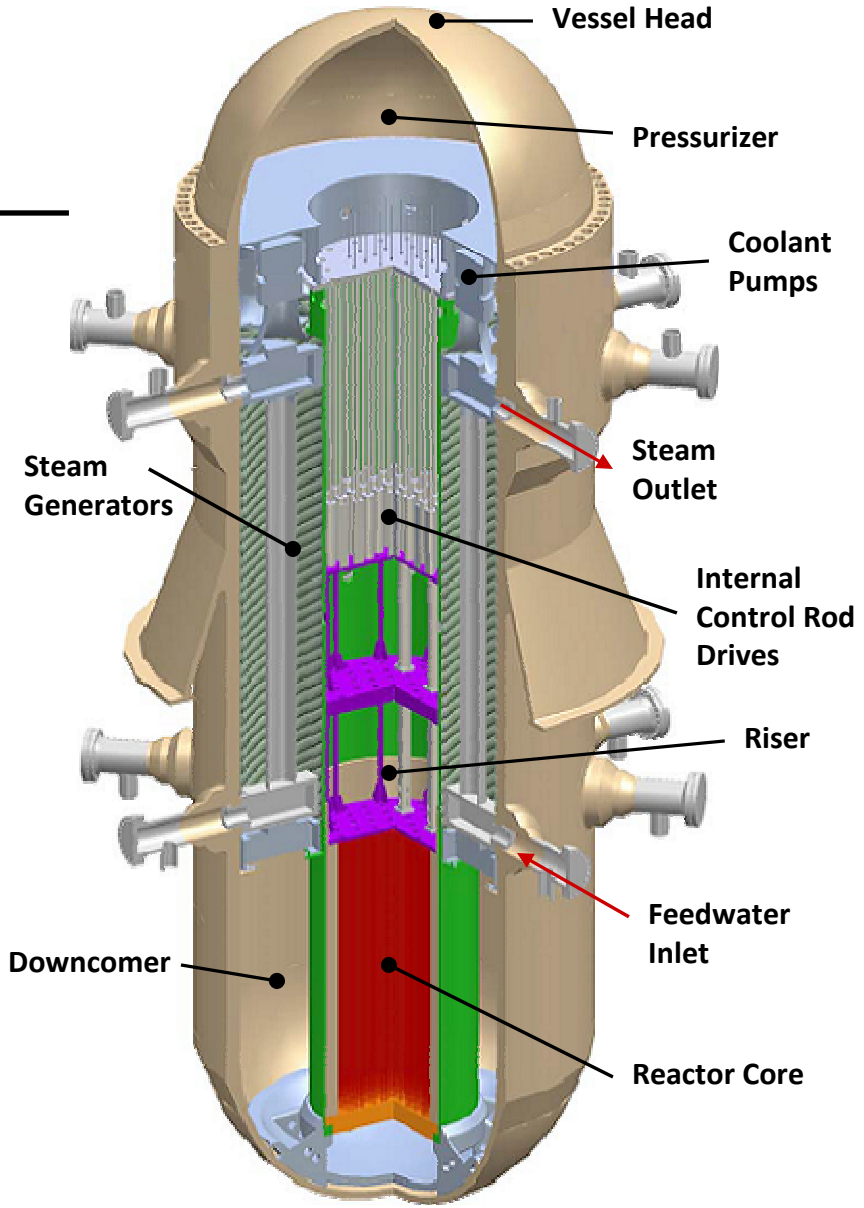
Integral, Small Modular Reactors

- Advanced, Integral PWR
- Helical-coil steam generators
- Axial flow fully immersed primary coolant pumps
- Internal control rod drive mechanisms
- Integral pressurizer with large volume-to-power ratio
- Elimination of all major piping in primary system
- Large reactor vessel water inventory
- Large safety margins



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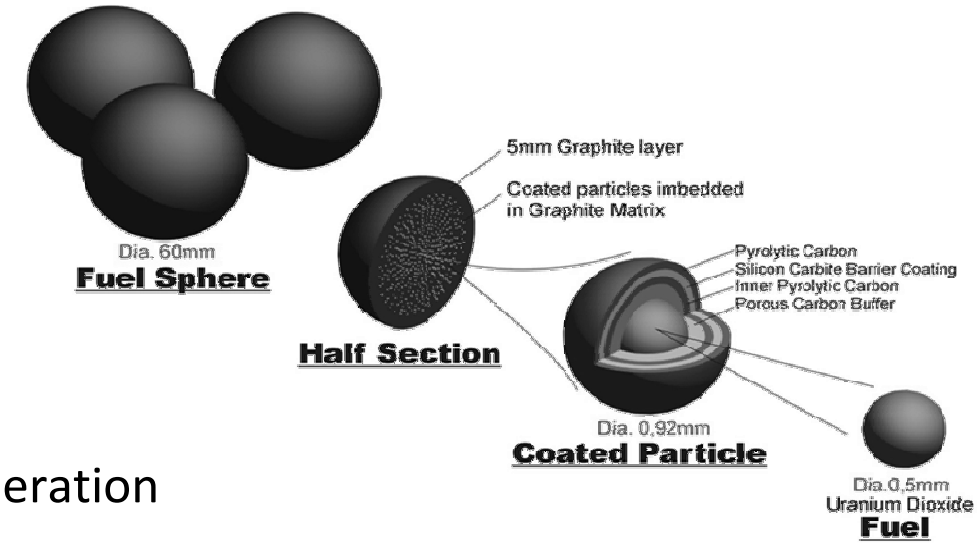
PBMR-CG
HTR for Co-Generation



- He-cooled HTR
- >700 ^{o}C outlet temperature
- 200 MWt, $\leq$ 80 MWe
  - MWe output varies with co-generation
- TRISO fuel in “pebble” form
  - Online refueling
- Co-generation applications have gained strong interest from prospective clients (e.g., SASOL, Oil Sands, NGNP, Eskom)
  - Applicable to broad range of process steam applications
- Selected by U.S. DOE as Next Generation Nuclear Plant Phase I candidate
  - $40M cost-shared award currently under negotiation with DOE

Investors include: South Africa Government, Eskom, Industrial Development Corporation and Westinghouse Electric Company

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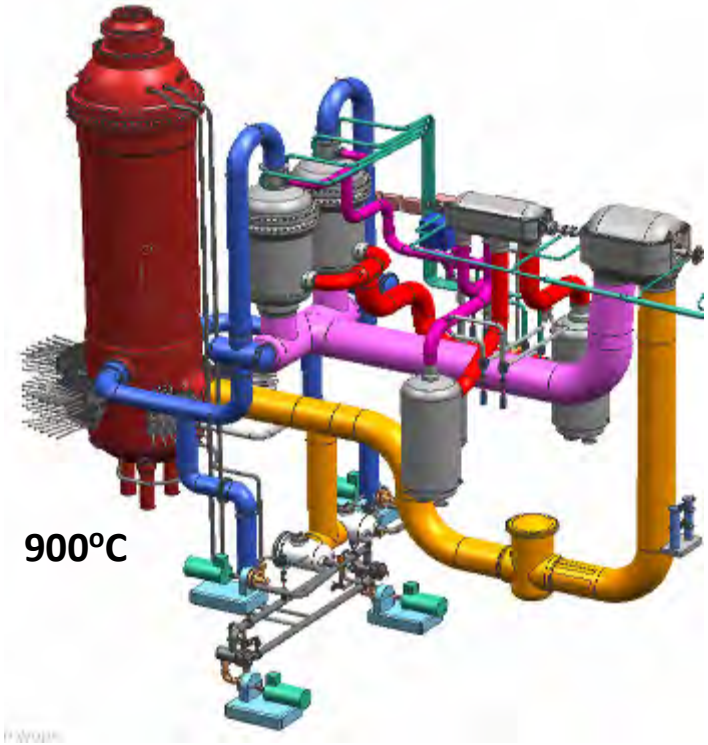
PBMR-CG
Revised Product Offers Decreased Complexity

400 MWt

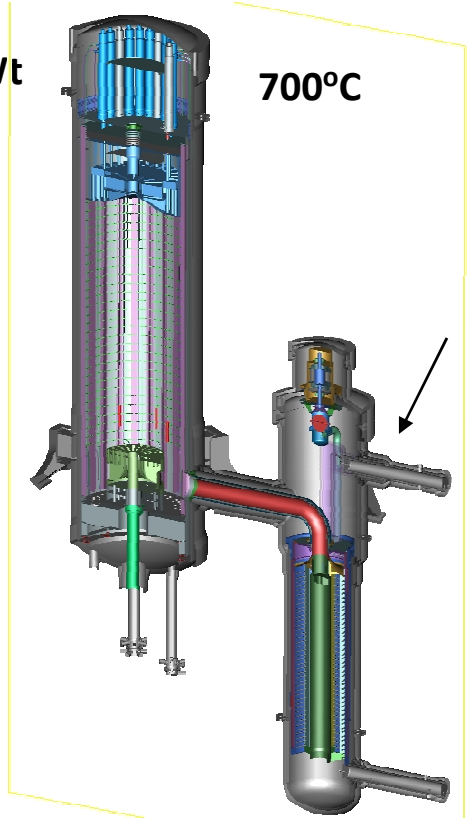


900°C

Direct Brayton Cycle

200 MWt

700°C



Steam Generator (indirect Rankine cycle)

Co-generation Steam Plant

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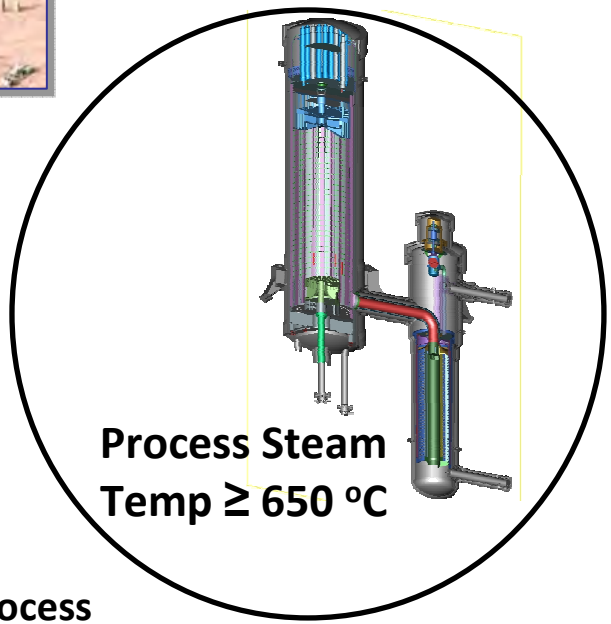
PBMR-CG Product Range

Steam Methane Reforming

SAGD/EOR Steam Supply



CTL process developments

Water splitting with DOE HyS funded development

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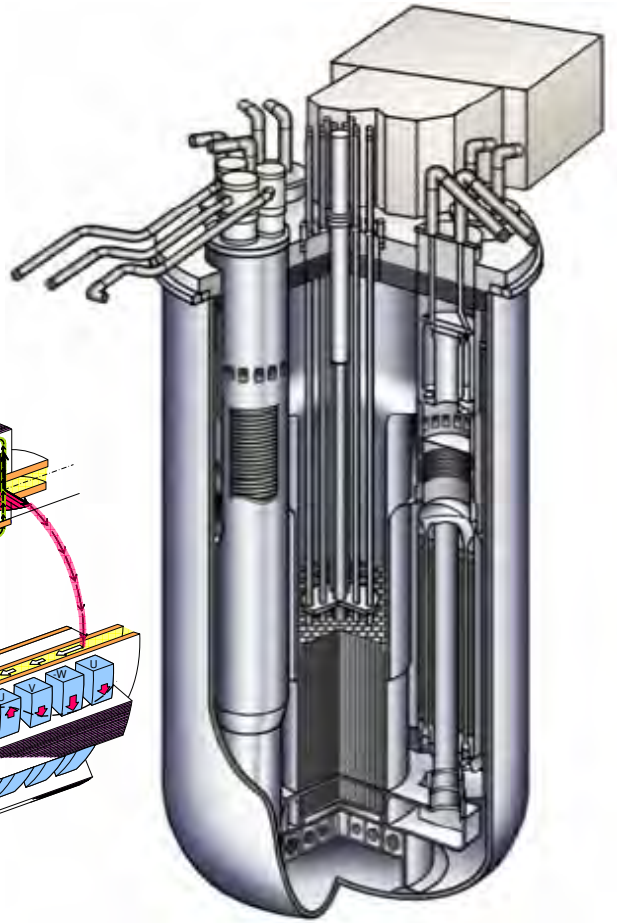
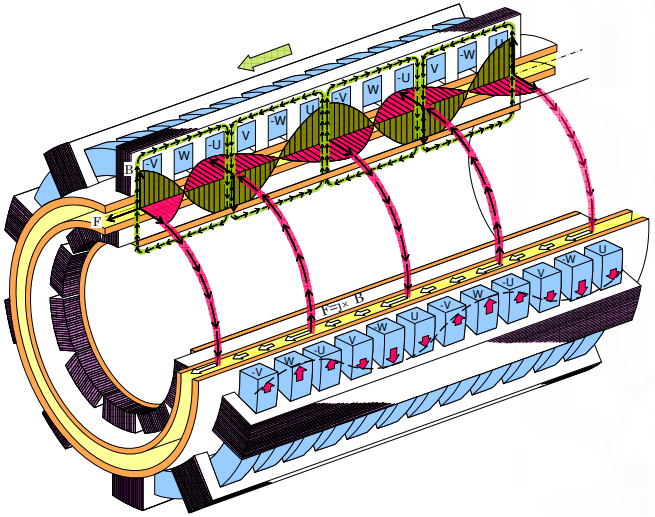
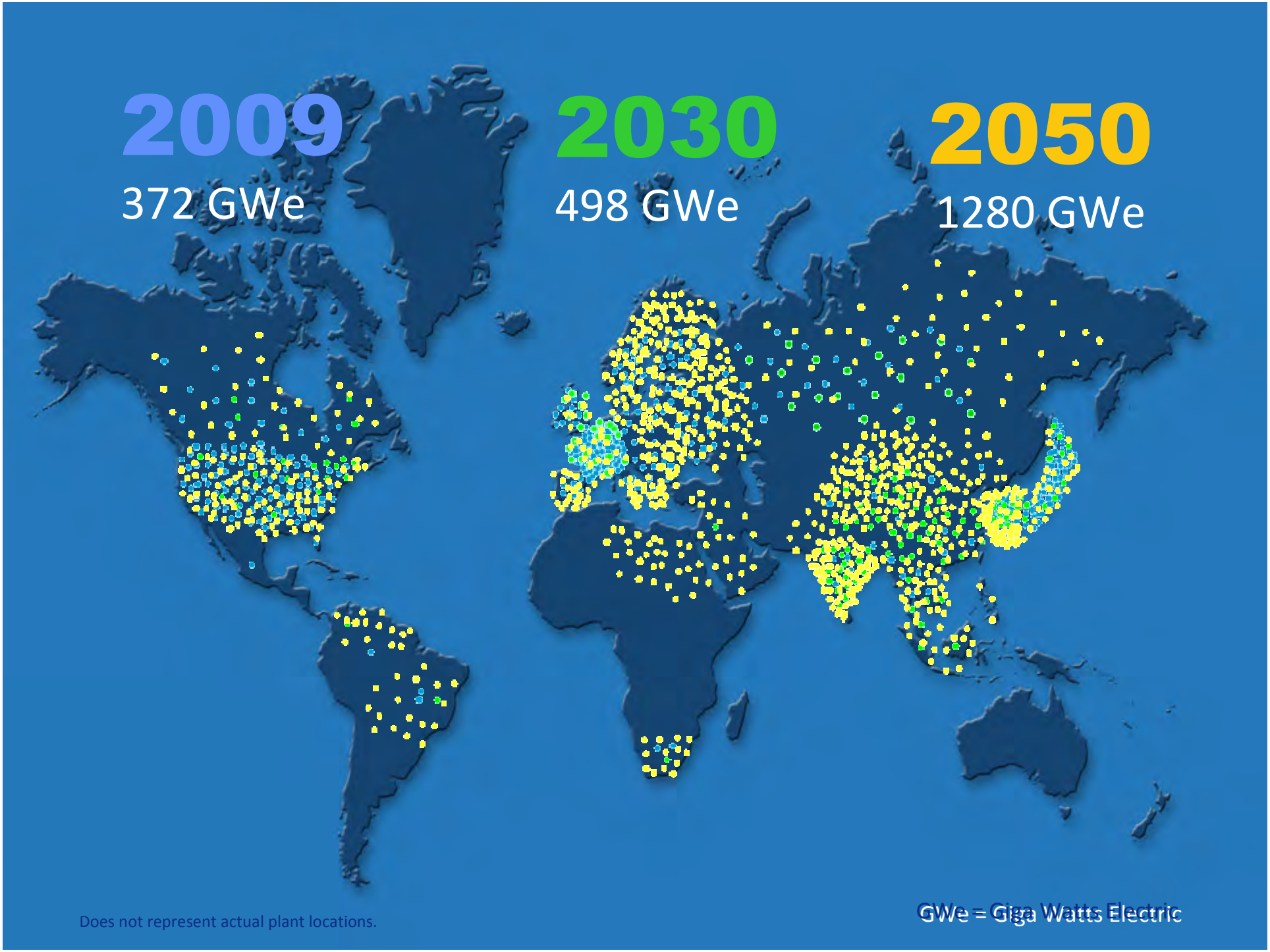
Westinghouse/Toshiba
Advanced Recycle Reactor

- Na-cooled fast reactor with passive safety systems
- Designed to trasmutate spent nuclear fuel
- Developed under GNEP program
- Pool-type configuration
  - Double-walled steam generators eliminate need for intermediate HX loop



- 1000 MWt/410 MWe
- 510 ^{o}C outlet temperature
- Conversion Ratio < 1.0
  (flexible CR built-in)




2009
372 GWe
2030
498 GWe
2050
1280 GWe
Does not represent actual plant locations.
GWe = Giga Watts Electric