Experiences from nuclear projects around the world

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Nuclear energy in a global perspective
November 24, 2015
Nuclear Energy’s Role in Mitigating Climate Change

Did You Know?

Comparison of lifecycle greenhouse gas emissions of various electricity generation sources

<table>
<thead>
<tr>
<th>Source</th>
<th>CO₂eq/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>490</td>
</tr>
<tr>
<td>Solar PV</td>
<td>41</td>
</tr>
<tr>
<td>Concentrated Solar Power</td>
<td>27</td>
</tr>
<tr>
<td>Hydro</td>
<td>24</td>
</tr>
<tr>
<td>Offshore Wind</td>
<td>12</td>
</tr>
<tr>
<td>Nuclear</td>
<td>12</td>
</tr>
<tr>
<td>Coal</td>
<td>820</td>
</tr>
</tbody>
</table>

Source: IPCC 2014
Nuclear Energy in Europe

131 nuclear power plants in the EU

14 EU Member States

600 million tons of CO₂eq per year avoided in the EU due to nuclear generation

55% of the EU’s low-carbon electricity

Essentially available 24/7, 365 days/year

800,000 jobs supported by the nuclear industry in Europe

EU’s total primary energy production

- Solid fuels: 20%
- Gas: 17%
- Oil: 9%
- Non-renewable waste: 1%
- Renewable: 24%
- Nuclear: 29%

Source: Eurostat 2015
Customer Needs and Expectations

- **Clean, secure** and **diverse** energy supply
- Efficient and reliable generation to power future economic growth
- Highest levels of safety
- Strong reference plant design established
- Licensed in country of origin
- Multiple plants built and operating
- Commitment to sustainable localization
- Vendor ability to add value throughout plant lifetime

Westinghouse AP1000™ plant is designed to meet customer needs by generating safe, clean, reliable electricity for many decades
Westinghouse Global Capabilities and Experience

Operating Plants Business
Delivers operating plant products and services, including global field services, instrumentation and control, welding and machining, and installation-related functions

Decommissioning, Decontamination & Remediation
Deploys global technologies and forms local partnerships to carry out long-term projects

New Plants & Major Projects
Delivers both new-plant projects and major projects for new and operating plants on a global basis

Nuclear Fuel & Manufacturing
Designs and delivers fuel for PWR, BWR, VVER and AGR reactors, and oversees manufacturing operations worldwide

Engineering Center of Excellence
Supports all product lines by driving common engineering capabilities and accelerating innovation

Westinghouse technology is the basis for nearly 50 percent of nuclear power plants operating worldwide!
Westinghouse in Europe

- 1962: First Pressurized Water Reactor (PWR) in Europe was built by Westinghouse.

- 60% of nuclear power plants in the EU are based on Westinghouse technology.

- 25 commercial reactors designed and supplied by Westinghouse across Europe.

- 4,000 highly-skilled and trained people across Europe, plus an additional 1,500 contractors.

- 54 out of the 58 French reactors are based on Westinghouse licensed technology.

- 65 nuclear reactors in Europe are currently fuelled by Westinghouse (PWR – including VVER, BWR, AGR and Magnox).

- We have operations in 10 European countries.

- Our AP1000® reactor is the safest, most efficient and reliable design currently available in the worldwide marketplace.
AP1000 Plant Value Proposition

Proven Technology and Innovative Passive Safety Systems

Passive safety replaces mechanical and electrical systems – harnesses natural forces like gravity, convection and condensation to achieve safe shutdown.

Delivery Certainty

Standard design, experience from current projects and modular construction enable “n-th of a kind” delivery performance.

Regulatory Certainty

Reviewed by multiple countries; first Generation III+ reactor to receive design certification from the U.S. NRC.
Simpler Design Requires Less Equipment & Less Concrete, and Fewer Human Resources

50% Fewer Valves  35% Fewer Pumps  80% Less Pipe  45% Less Seismic Building Volume  85% Less Cable Volume

Comparison of Buildings

- No safety related pumps
- No safety related AC power
- Eliminates safety related support systems: HVAC, cooling, pneumatics.
The AP1000 PWR: Designed for Certainty
Modular Construction Leads to a Shorter Construction Schedule

Modular construction means more work done in parallel

Shorter schedule – Increased safety – Improved quality
Current Westinghouse New Build Opportunities

Westinghouse New Plant Activity:

Emerging - ▶️  Active - 🔴

Americas
- Brazil
- Canada
- Argentina
- Mexico
- United States

Europe
- United Kingdom
- Bulgaria
- Poland
- Czech Republic
- Turkey

Asia
- China
- India
- Vietnam
- China
- Indonesia
- Malaysia
- Thailand
An Emerging Global Fleet

- Eight **AP1000** units under construction in China and U.S.
- Shareholder agreements signed for additional units
China AP1000 Plant Progress

Sanmen Site – January 2015

Sanmen1 View – May 2015

Haiyang 1 – December 2014

Haiyang 2 Reactor Vessel Lift – September 2014

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U.S. AP1000 Plant Progress

Vogtle 3 Nuclear Island – February 2015

Vogtle 3 CA01 Module Assembly – February 2015

V.C. Summer 2 SG Delivery – January 2015

V.C. Summer Site – December 2014

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Summary

• Long-term safe, clean, power generation is dependent upon:
  – Globally reducing dependence on fossil fuels
  – Introducing clean, renewable energy forms
  – Providing safe, clean, reliable baseload generation of nuclear power

• AP1000 plant technology and delivery experience are ready to meet the need for safe, clean, reliable energy

• Eight AP1000 units under construction in China and U.S.

• Shareholder agreements signed for additional units

AP1000 plant technology and delivery experience are ready to meet the need for safe, clean, reliable energy!

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Thank you!