OREGON AND NUCLEAR ENERGY

Key Facts

- U.S. nuclear power facilities generate 20 percent of our electricity while emitting no greenhouse gases
- Oregon State University and Reed College are both home to research reactors that are helping to advance nuclear energy and train future engineers
- America’s nuclear facilities employ nearly 100,000 workers, including 350 NuScale Power employees and contractors in Oregon

Infrastructure for Clean, Reliable Electricity

Nuclear energy produces electricity for one in five homes and businesses across the United States, with nearly 100 reactors in 30 states. It protects air quality and public health because it emits no greenhouse gases. Nuclear energy generates nearly 20 percent of our nation’s electricity and provides more than 55 percent of our emission-free power, making it an essential partner to renewable energy. That makes it a good future energy choice for Oregon.

Nuclear is also America’s most reliable source of electricity, producing power over 92 percent of the time over the past three years and ensuring power is available whenever it is needed. Nuclear energy is a vital part of U.S. infrastructure that keeps electricity prices and grids stable. It ensures that consumers are not overly reliant on just one or two sources of electricity.

Supporting Jobs and the Economy

- American innovators are developing new nuclear technologies that have the potential to create additional jobs and bring in export dollars.
- NuScale Power, headquartered in Portland, is developing a new modular reactor design.
- Nuclear power saves consumers an average of 6 percent on their electricity bills and contributes approximately $60 billion to the country’s GDP annually.

Sources of Electricity in Oregon

Other includes petroleum, biomass and geothermal along with hydro, wind and solar if they account for less than 3% of electricity generated.

Source: ABB Velocity Suite / U.S. Energy Information Administration

continued —
Comparison of Life Cycle Emissions
Tons of Carbon Dioxide Equivalent per Gigawatt-Hour

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Tons of CO2e/GWh</th>
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<tbody>
<tr>
<td>Coal</td>
<td>979</td>
</tr>
<tr>
<td>Gas</td>
<td>462</td>
</tr>
<tr>
<td>Biomass</td>
<td>253</td>
</tr>
<tr>
<td>Solar PV</td>
<td>53</td>
</tr>
<tr>
<td>Geothermal</td>
<td>42</td>
</tr>
<tr>
<td>Hydro</td>
<td>26</td>
</tr>
<tr>
<td>Nuclear</td>
<td>13</td>
</tr>
<tr>
<td>Onshore Wind</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Annex III: Technology-specific cost and performance parameters. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Edenhofer, O., et.al, Cambridge University Press, 2014. The numbers shown are the median of studies examined by the IPCC in grams CO2e per kWh and are converted to tons CO2e per GWh.

Nuclear Is Clean Air Energy

- The use of nuclear energy in 2018 prevented the emission of 528 million metric tons of carbon dioxide. This equals the amount released in a year by 112 million passenger cars.
- Nuclear energy is the only clean air electricity source that can produce large amounts of electricity around-the-clock.
- Numerous studies demonstrate that nuclear energy’s life cycle greenhouse gas emissions are comparable to renewable energy, such as wind and hydropower, and far less than coal or natural gas-fueled power plants.
- The nation’s nuclear energy facilities also prevented the emission of 346,485 short tons of sulfur dioxide and 286,516 short tons of nitrogen oxide in 2018.

<table>
<thead>
<tr>
<th>Emissions Prevented</th>
<th>Quantity Prevented in 2018</th>
</tr>
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<tbody>
<tr>
<td>Sulfur dioxide (SO2)</td>
<td>346,485 short tons</td>
</tr>
<tr>
<td>Nitrogen oxide (NOX)</td>
<td>286,516 short tons</td>
</tr>
<tr>
<td>Carbon dioxide (CO2)</td>
<td>528 million metric tons</td>
</tr>
</tbody>
</table>

Source: U.S. Environmental Protection Agency and U.S. Energy Information Association

Managing Used Nuclear Fuel

- Each nuclear energy facility stores used fuel safely and securely on-site, awaiting consolidated storage and disposal by the U.S. Department of Energy. As of 2016, Oregon has contributed approximately $79 million to the federal Nuclear Waste Fund.
- There are 359 metric tons of used nuclear fuel in storage at nuclear plant sites in Oregon.
- All the used nuclear fuel produced by the nuclear energy industry over 60 years—if stacked end to end—would cover an area the size of a football field to a depth of less than 10 yards.

Used fuel at nuclear energy facilities is cooled in secure steel-lined concrete pools filled with water.

After the cooling period, nuclear energy facilities store used fuel safely on-site in steel and concrete vaults.

Committed to Safety

- America’s nuclear energy facilities are among the safest and most secure industrial facilities.
- The independent U.S. Nuclear Regulatory Commission regulates and monitors plant performance in three areas: reactor safety, radiation safety and security.
- After more than 60 years of commercial nuclear energy production in the United States and more than 4,000 reactor years of operation, there have been no radiation-related health effects linked to the operation of nuclear energy facilities.

Used fuel at nuclear energy facilities is stored on-site in steel and concrete vaults.