Projected Costs of Generating Electricity, 2015

- Joint study of the International Energy Agency (IEA) and the Nuclear Energy Agency (NEA) under the supervision of the Expert Group on Electricity Generating Cost (EGC) with member country responses to cost data survey
- Focus on levelised lifetime costs for broad set of generation technologies being built between now and 2020
- Does not include grid integration and variability issues covered by other IEA and NEA analyses
- Focuses on maintaining cross-country and time-series comparability
Methodology for International Comparisons

- Calculates the levelised cost of electricity (LCOE)
- Uses discount rates of 3%, 7% and 10%
- Assumes global markets for standardised electricity generation equipment
- Allows for country-specific factors:
  - licensing requirements, environmental requirements, and labour and fuel costs
- Allows for site-specific factors:
  - greenfield versus brownfield developments, infrastructure connections and cooling water, as well as wind and solar patterns
Contents of the Electricity Generating Cost Study

The report consists of three parts

- **Part I:** Methodology and data, including analysis of country-provided cost data
- **Part II:** Statistical and sensitivity analysis
- **Part III:** Boundary issues
  - **Chapter 8:** Financing issues
  - **Chapter 9:** Emerging generating technologies
  - **Chapter 10:** The system cost and system value of electricity generation
  - **Chapter 11:** Looking beyond baseload: The future of the *Projected Cost of Generating Electricity* series
Countries included in the study

- Austria
- Belgium
- Brazil
- China
- Denmark
- Finland
- France
- Germany
- Hungary
- Italy
- Japan
- Korea
- Netherlands
- New Zealand
- Portugal
- Slovak Republic
- South Africa
- Spain
- Switzerland
- Turkey
- United States
- United Kingdom
## Summary Statistics

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of plants</th>
<th>Net capacity (MW)</th>
<th>Overnight cost (USD/kWe)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Mean</td>
</tr>
<tr>
<td>Natural gas – CCGT</td>
<td>13</td>
<td>350</td>
<td>551</td>
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<tr>
<td>Natural gas – OCGT</td>
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<td>274</td>
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<tr>
<td>Coal</td>
<td>14</td>
<td>605</td>
<td>1 131</td>
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<tr>
<td>Nuclear</td>
<td>11</td>
<td>535</td>
<td>1 425</td>
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<tr>
<td>Solar PV – residential</td>
<td>12</td>
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<td>0.007</td>
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<tr>
<td>Solar PV – commercial</td>
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<tr>
<td>Solar PV – large</td>
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<td>21</td>
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<tr>
<td>Solar thermal (CSP)</td>
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<tr>
<td>Onshore wind</td>
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<tr>
<td>Offshore wind</td>
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<td>Biomass and biogas</td>
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<td>CHP (all types)</td>
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</table>
Overview of results – conventional and nuclear technologies

Note: Assumes region-specific fuel prices for US, Europe, Asia; 85% load factor; CO₂ price of 30 USD/tonne.
Overview of results – solar PV and wind
CCGTs: gas price dominates leading to different roles by region

In North America and the Middle East, low gas prices drive a rapid growth of the share of gas-fired generation.
Coal: financing and project costs matter more than carbon pricing at USD30/tCO$_2$

Access to financing has a major impact on the competitiveness of coal. Low regional investment costs provide robust competitiveness in Asia.
Nuclear: an attractive low-carbon technology in the absence of cost overruns and with low financing costs
Commercial rooftop solar: low financing cost helps, but bright sunshine and installation costs matter more
Onshore wind: good sites with good investment policies are winning
Beyond baseload – the limitations of LCOE
Market-based private investment makes up a small portion of total global investment
Conclusions from the Executive Summary (1/2)

This eighth edition of *Projected Costs of Generating Electricity* focuses on the cost of generation for 22 countries, and within these countries for a subset of technologies. Caution must therefore be taken when attempting to derive broad lessons from the analysis. Nevertheless, some conclusions can be drawn.

- First, the vast majority of the technologies included in this study are low- or zero-carbon sources, suggesting a clear shift in the interest of participating countries away from fossil-based technologies, at least as compared to the 2010 study.

- Second, while the 2010 study noted a significant increase in the cost of baseload technologies, the data in this report suggest that any such cost inflation has been arrested. This is particularly notable in the case of nuclear technologies, which have costs that are roughly on a par with those reported in the prior study, thus undermining the growing narrative that nuclear costs continue to increase globally.
Finally, this report clearly demonstrates that the cost of renewable technologies – in particular solar photovoltaic – have declined significantly over the past five years, and that these technologies are no longer cost outliers.

Increasingly, the plant-level costs of an individual technology are becoming of lesser importance. What is more and more relevant is the ability of a technology to ensure secure and cost-efficient supply at the system level.

Despite the general relevance of these conclusions, the cost drivers of the different generating technologies nonetheless remain both market- and technology-specific. As such, there is no single technology that can be said to be the cheapest under all circumstances. As this edition of the study makes clear, market structure, policy environment and resource endowment all continue to play an important role in determining the final levelised cost of any given investment.