UPDATE

AUSTRALIAN ELECTRICITY GENERATION TECHNOLOGY COSTS – REFERENCE CASE 2011

BACKGROUND

ACIL Tasman was engaged by the Australian Energy Market Operator (AEMO) to conduct a review for both AEMO and the Federal Department of Resources, Energy and Tourism (DRET), of generation cost data provided within the report "*Australian Electricity Generation Technology Costs – Reference Case 2010*" (AEGTC) authored by the US based Electric Power Research Institute (EPRI). This update used data previously provided by EPRI and amended it to reflect latest technical developments and Australian market conditions following a Stakeholder Reference Group (SRG) consultation. The SRG was established by the Australian Energy Market Operator (AEMO) to provide technical and commercial advice to the broader Energy White Paper modelling project. Representatives on this group included fossil fuel and renewable energy associations and companies as well as scientific bodies and end-users. This cost data was used in modelling work for AEMO's National Transmission Development Plan (NTDP), released in December 2010.

For the purposes of this update Levelised Cost of Electricity (LCOE) ranges have been derived from a broad range of inputs taken from the ACIL Tasman report noted above. These LCOE ranges are based on a number of assumptions which have been used to provide Australia-wide results; these include high/low assumptions on energy prices, capital costs, utilisation rates (i.e. capacity factors) and, where applicable, costs of CO_2 transport and storage. While the LCOE's are a useful measure to compare individual technologies it does not represent costs of actual projects due to site specific factors.

The accompanying spreadsheets provide the basic data required to compare individual technologies as well as calculated LCOE ranges for each technology. Further information on energy price assumptions or site specific factors and constraints, i.e. wind resources, are provided in the full ACIL Tasman report which can be found at http://www.aemo.com.au/planning/0400-0019.pdf

RESULTS

Costs for new and less mature renewable and low emission technologies are expected to decline more rapidly than mature technologies that typically emit higher levels of greenhouse gas emissions. Global market conditions and supply and demand for individual technology components, and the outcomes of on-going research and development, are significant sources of uncertainty, and are expected to continue to have a significant influence on all technology costs into the future.

The costs of the various electricity generation technologies are each expressed as a Levelised Cost of Electricity (LCOE). Levelised costs are a convenient and frequently used technique for comparing the cost of different generation technologies, based on a common set of assumptions. An LCOE is the price at which electricity must be generated from a specific plant to break even, taking into consideration costs incurred over the life of the plant (capital cost, cost of capital/financing, operations and maintenance costs, cost of fuel).

The levelised cost and technology performance data for 2015 and 2030 are summarised in Figures 1 and 2. These levelised costs do not model the implications of a carbon price.

It should be noted that the use of particular electricity generation technologies is primarily a decision for participants in electricity markets, although existing or future Government policies (e.g. Large Renewable Energy Target, Carbon Price Framework) may impact on the commercial viability of various technologies..

Figure 1 shows that in 2015 mature technologies - e.g. pulverised coal (PC), combined cycle gas turbines (CCGT) - are generally at the low end of the cost range. A notable exception is Open Cycle Gas Turbines (OCGT), which fulfil a discrete role in the electricity market, supplying electricity during periods of peak demand.

Figure 1: LCOE for Electricity Generation Technologies - 2015

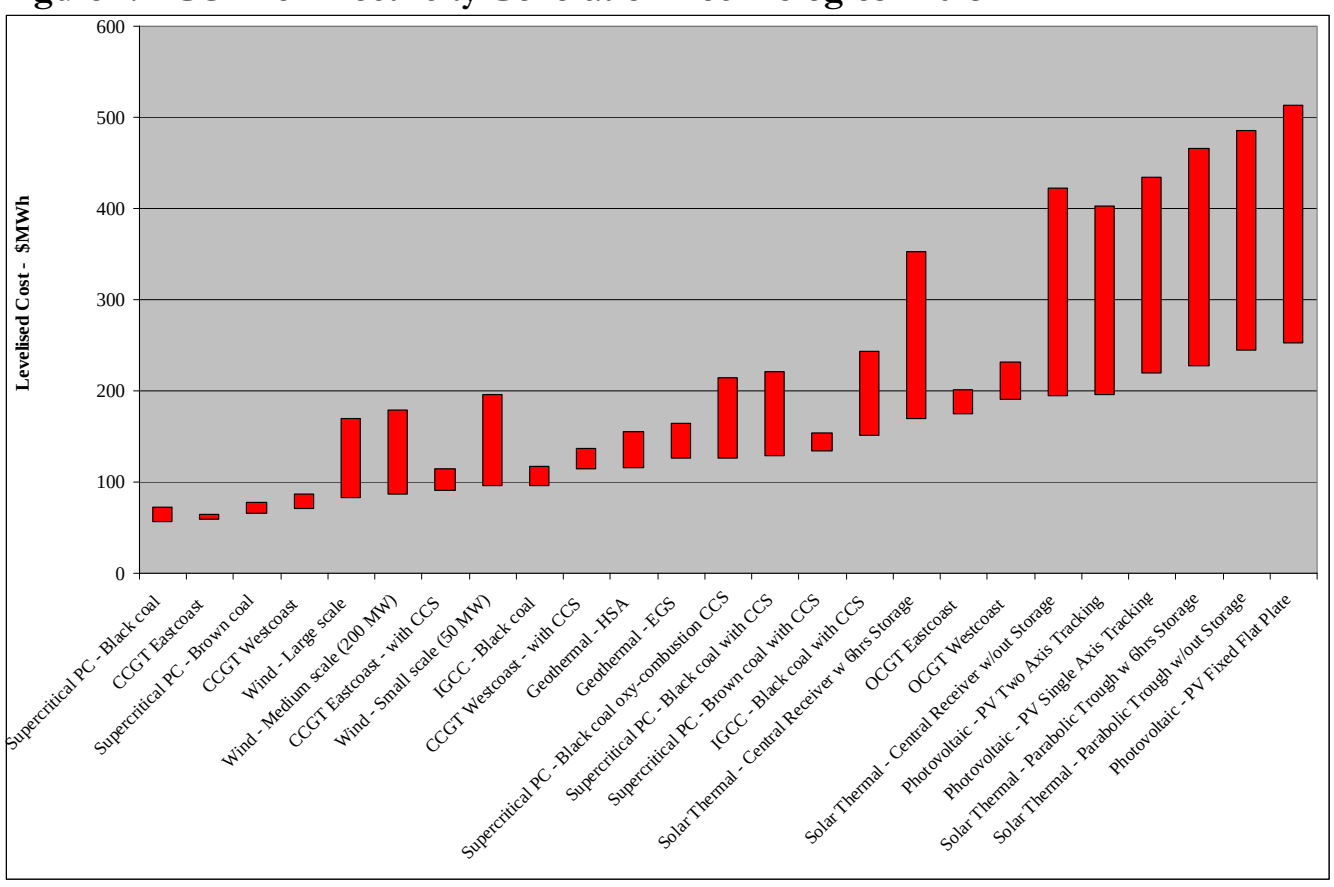
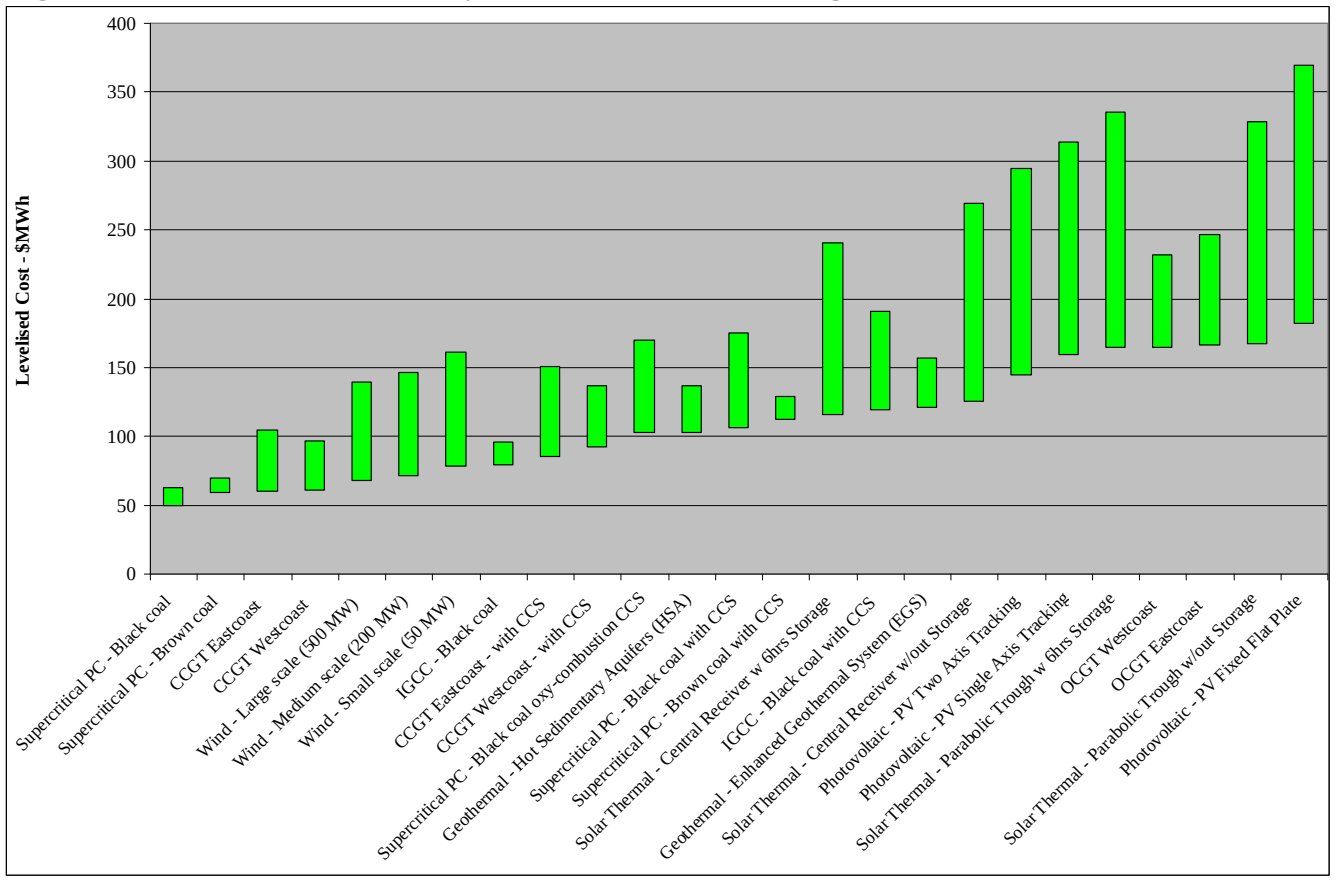


Figure 2 shows that the overall band of levelised costs across all technologies is projected to narrow considerably by 2030. This is largely driven by the fact that the emerging technologies at the top end of the range in 2015 have more significant cost reduction opportunities than the more mature technologies.

Figure 2: LCOE for Electricity Generation Technologies - 2030



NEXT STEPS

Further cost updates are currently underway, with a full update planned for later in 2011. This update will encompass a detailed stakeholder consultation process to ensure that a transparent dataset can be established that can be readily understood and embraced by industry stakeholders and energy modellers.