

Future Ash Availability – Potential Consequences of Transformation of Australia's Energy Generation Portfolio to 2050

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ABSTRACT

There is a high level of uncertainty of the generation technologies which will be used to provide for Australia future electricity needs. A series of scenarios have been developed where various greenhouse gas and technology constraints were introduced. Prediction of the generation portfolio under these scenarios demonstrates that no single technological solution will be optimal. Rather than a single solution it is believed that a technological mix will evolve dependant on the economic, policy and environmental restraints which emerge over the next fifty years. The outcomes of the different predicted mixes of technology are evaluated in terms of the quantity and types of ash/slag which may be available. This evaluation has shown that ash quantities and availabilities are strongly dependant on generation technology selection. If no greenhouse gas emissions restrictions are imposed Australia is predicted to be producing by 2050 around 2.4 times the current annual fly ash tonnage. If emission reductions are required and IGCC and carbon capture by sequestration are adopted the potential mix of flyash and IGCC slag produced is predicted to be very different. In this scenario flyash production is largely overtaken by that of IGCC slag, although total ash and slag tonnages remain relatively steady. Conversely, if carbon sequestration proves infeasible and emissions reductions are mandated it is predicted that coal ash tonnages will decline to around 50% of current levels, although further ash tonnage may be produced from biomass combustion. The information provided by the study has the potential to inform policy development leading to improved sustainability outcomes for the energy generation sector.

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