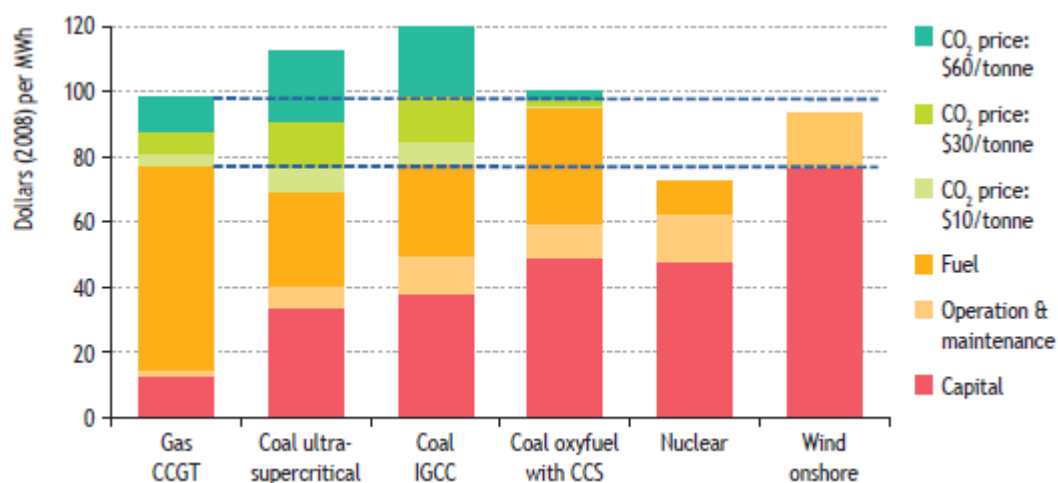


Marginal Abatement Cost Curves in the Power Sector

The long-run marginal cost (LRMC) interplay between various technologies is one of the key factors in the decision to invest in a particular technology and the main determinant for the marginal abatement cost curves. However, when it comes to investment there are many other elements that need to be considered. Given power generation assets typically have a long-life time, consideration must be duly given to factors such as environmental, energy security, resource availability (both physical and financial), up-front capital costs (e.g. Nuclear, CCS fitted plants) all in an era where there are many political uncertainties particularly around climate change as a global agreement (and its consequential implications) is sought. The 450 Scenario attempts to gather these threads together in a coherent way, assuming that there is a marked global push to significantly reduce emissions, while maintaining energy security, and importantly keeping prices affordable. The mitigation costs presented here represent the power generation sector for this 450 Scenario.

In many countries the cost of renewable technologies (particularly non-hydro renewable technologies) are not cost-competitive (with the exception of niche markets) with fossil fuel alternatives and require adequate policy support such as feed-in tariffs, or a carbon price on the fossil fuel competitors to make these solutions economic (Figure 1).¹ Options like nuclear are cost competitive; however, very high up-front capital costs, long lead-times (from gaining resource consent through to build), infrastructure constraints and political/public resistance to this technology limit its deployment. Countries with access to “cheap” coal need be incentivised to generate using cleaner technologies via means of a carbon price or through assisted finance for developing countries (e.g. Clean Development Mechanism or the like). Similarly, gas should be incentivised over coal for environmental reasons. Therefore, the mitigation abatement costs presented here are indicative and will vary between regions, including changing the relative ranking of some abatement options.

Figure 1: Long-run marginal cost of generation for gas-fired combined-cycle gas turbine (CCGT) power plants compared with other technologies and fuels in OECD countries in 2015-2020



Source: WEO-2009

¹ The data presented in Figure 1 presents averaged costs, which will vary between individual countries depending on their natural resource availability and domestic pricing for fossil fuels.