CLIMATE CHANGE MITIGATION: THE ENERGY TECHNOLOGY CHALLENGE

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Recent IEA forecasts of energy demand over the next thirty years reveal that between now and 2030 world energy demand growth will be about 60% higher than it is today under a business as unusual scenario. That same forecast anticipates that this demand will be satisfied, as energy demand is today, with fossil fuels – their share of energy supply actually increases from 80 to 82%. This likely reality for the next 30 years contrasts with the requirements of stabilizing carbon dioxide concentration which the IPCC has demonstrated must be very near net zero emissions for almost all stabilised concentration levels frequently considered in international negotiations. Finally, it is important to appreciate that physical capital has quite different economic lifetimes – appliances normally turnover within a few years, electricity generating plants frequently last more than 50 years, and transformation of an urban transportation system may take more than a century.

The contrast between likely emissions trends, the realities of capital stock turnover rates, and the environmental imperative is important for many reasons including for understanding the nature of the technology challenge facing us. Certainly we know that the existing capital structure is not acceptable from a climate change perspective. New energy producing and using technologies will be necessary. Some exist or are nearly commercial, but others will be needed if we are to meet the energy demand forecast and at the same time the climate challenge. We will need new technologies and we will need them to penetrate the global market at unprecedented rates. The historic paradigm of technology development and diffusion in industrialised economies, followed by North-South transfer through competitive markets may not be enough to stabilise concentrations within an acceptable time horizon.

International cooperation in both R&D and in diffusion will supplement the historically successful model of private market transfer. R&D cooperation is likely to be amongst countries of the North and the South with R&D establishments. Cooperation on diffusion will certainly only supplement and strengthen the primary mechanisms of private markets, not supplant them nor even represent the dominant form of transfer. Instead, cooperation on international diffusion will most likely draw on successful experiences that seek to address the particular risk faced by new technologies. Such cooperation will attempt to transform and energise markets, not replace them. This presentation will discuss some of these lessons of past cooperation that may well provide the basis for accelerating the restructuring of the global energy capital configuration.