

**Nuclear versus Coal plus CCS: A Comparison of Two Competitive Base-load  
Climate Control Options** (*FEEM Note di Lavoro*, n. 2009.1, 2009; *Environmental modeling and  
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Authors: Massimo Tavoni and Bob van der Zwaan

**Abstract.** In this paper we analyze the relative importance and mutual behavior of two competing base-load electricity generation options that each are capable of contributing significantly to the abatement of global CO<sub>2</sub> emissions: nuclear energy and coal-based power production complemented with CO<sub>2</sub> capture and storage (CCS). We also investigate how, in scenarios developed with an integrated assessment model that simulates the economics of a climate-constrained world, the prospects for nuclear energy would change if exogenous limitations on the spread of nuclear technology were relaxed. Using the climate change economics model WITCH we find that until 2050 the growth rates of nuclear electricity generation capacity would become comparable to historical rates observed during the 1980s. Given that nuclear energy continues to face serious challenges and contention, we inspect how extensive the improvements of coal-based power equipped with CCS technology would need to be if our economic optimization model is to significantly scale down the construction of new nuclear power plants.

**Keywords.** Economic competition, electricity sector, nuclear power, coal power, CCS, renewables, climate policy