



Future without Nuclear Energy; Is It Feasible, Is It Sensible?

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The task of reducing CO₂ emission in order to keep the global temperature increase below 2 °C requires staggering changes in energy consumption and production. It appears, unfortunately, that before obvious and drastic effects of climate change occur, few governments have the strength to implement the energy strategies called for. However, by the time climate change becomes evident to wide public it may be too late or much more difficult. Energy policy is heavily politicized which creates another obstacle to timely action, as witnessed by backlash against nuclear energy following Fukushima accidents. Post Fukushima arguments for nuclear energy should concentrate on the features which give it a secure place in

the 21st century energy strategy, with highest safety standards understood. Its modern relevance comes from the, at present, unique ability, independent on external conditions, to produce large amounts of energy without emission of carbon dioxide. How long will this unique position last cannot be predicted with precision, but from the dynamics of their developments, large scale CCS is unlikely to be available before 2060/65 and nuclear fusion later still. We discuss the feasibility and desirability of the future without nuclear energy.

Our recent study (EP 2010) has shown that nuclear energy, even subject to stringent safety and technology constraints, can give substantial contribution to carbon emission reduction until 2065, thus providing time for a large scale introduction of renewable sources, CCS and possibly nuclear fusion. Maximum nuclear strategy limited by uranium resources and with conventional reactor technology without reprocessing we assumed in period 2025-2065, would contribute in 2065 with about 25.2 GtCO₂ emission reduction, respectively with 39% of the reduction needed to reduce emission from business as usual strategy (WEO 2009) to the level required to limit global temperature increase below 2 °C. Remaining reduction of 38.4 GtCO₂-eq, respectively 61% would have to be covered by new energy sources, energy efficiency and reduction of consumption. To achieve this by 2065 is a task requiring brave assumptions on development of new energy sources. Prediction on renewable sources development are given by several organizations such as EREC, GWEC, Solar Energy Council, and others. However, accepting their optimistic forecasts about wind and solar energy contribution in the years up to 2060/65, we show that renewable sources would not suffice to replace both coal and nuclear power plants. We do not see that it would be feasible and wise to enlarge the task by abandonment of nuclear contribution, especially in EU.

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