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SWITZERLAND

Phaseout may cost $37 billion going the renewables route

THE COST TO the Swiss economy if the "power without the atom" initiative to phase out nuclear power (which accounts for about 40 percent of national production) passes a referendum would be an extra SFr 62 billion ($37 billion) if the replacement strategy was based on renewables (solar and wind power).

A second slower phaseout initiative, called "moratorium plus," in which existing nuclear plants are allowed to operate for some time, but a hold is put on new plant construction, would cost SFr 46 billion ($28 billion).

These results come from a study undertaken by Germany's Bremer Institute of Energy for the operators of Switzerland's five nuclear units. In addition to the renewables option, the study also assessed the alternative of meeting the shortfall caused by shutting down the nuclear plants by improvements in energy efficiency and conservation. The reference scenario is the continued operation of the existing plants until the end of their lifetimes (about 50 years for the Mühleberg and the two Beznau units, and 60 years for Gösgen and Leibstadt).

In a study of nuclear phaseout in Switzerland, the renewables option, as well as energy efficiency and conservation, were assessed.

At a press conference to present the report, held on January 16 in Berne, Switzerland, Silvio Borner of the Center for Science and Economics at the University of Basel, explained why the study was undertaken. About a year ago, after the two initiatives were accepted by the authorities for placing on a future ballot, the nuclear operators commissioned the Bremer Institute to assess the costs of replacing nuclear power with combined-cycle natural gas plants, which seemed the most appropriate technology to use. That analysis calculated an extra cost to the economy of SFr 40 billion ($24 billion). This study, however, was criticized for not considering technological improvement in renewables and energy efficiencies.

To answer this criticism, the Bremer team, led by Wolfgan Pfaffenberger, was asked to examine the possibilities of meeting the conditions of both initiatives with the two options. The renewables option involved constructing solar powered (photovoltaic) plants with a total generating capacity of 3000 MWe, about the same as the five nuclear units produce, and 1000 MWe of wind-powered generators. However, because of the limited availability of these sources (only 10–12 percent), the Bremer team concluded that an equal amount of fossil-fueled capacity (probably combined heat and power) would have to be built. In the second option, improvements in energy efficiency are introduced over time to compensate for the loss of nuclear generation.

Because the two non-nuclear options will involve some increase in emissions of greenhouse gases and other effluents, there is an additional cost required to compensate for this. The team gave the benefit of any doubts to the

non-nuclear options, assuming reductions in costs and improvements in capabilities. For example, the cost of photovoltaic cells would be lower than at present and improvements in the efficiency of combined-heat and power plants would be large. Some increase in the price of natural gas was included, however.

The conclusion was that using the renewables option the cost would be SFr 62.1 billion ($37 billion) for the "power without the atom" initiative and SFr 46.2 billion ($28 billion) for the "moratorium-plus" initiative, dependent on the rate of the nuclear phaseout. The "forced" energy efficiency option would cost SFr 47.6 billion ($29 billion) and SFr 33.2 billion ($20 billion), respectively. The results of the first study, based on replacing nuclear generation with gas-fired plants, were SFr 40.1 billion ($24 billion) and SFr 28.6 billion ($17 billion), respectively.

Borner made the general point that replacing nuclear by any combination of options is possible, but only at an enormous economic and ecological cost, not least of all to the international competitiveness of Swiss industry as well as the cost to the environment.