

# The World Nuclear Industry Status Report 2007

## CONCLUSIONS

*by*

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## Conclusions

The status and perspectives of the nuclear industry in the world have been subject to a large number of publications and considerable media attention over the last few years. The present report attempts to provide solid elements of key information for intelligent analysis and informed decision-making.

As of 1 November 2007 there are 439 nuclear reactors operating in the world. That is five less than five years ago. There are 32 units listed by the International Atomic Energy Agency (IAEA) as “under construction”. That is about 20 less than in the late 1990s.

In 1989 a total of 177 nuclear reactors had been operated in what are now the 27 EU Member States. That number shrank to 146 units as of 1 November 2007.

In 1992 the Worldwatch Institute in Washington, WISE-Paris and Greenpeace International published the first *World Nuclear Industry Status Report*. As a first updated review in 2004 showed the 1992 analyses proved correct. In reality, the combined installed nuclear capacity of the 436 units operating in the world in the year 2000 was less than 352,000 megawatts – to be compared with the forecast of the International Atomic Energy Agency from the 1970s of up to 4,450,000 megawatts. Today the 339 worldwide operating reactors total 371,000 megawatts. Nuclear power plants provide 16% of the electricity, 6% of the commercial primary energy and 2-3% of the final energy in the world – the tendency is downwards – less than hydropower alone. Twenty of the 31 countries operating nuclear power plants decreased their share of nuclear power within the electricity mix if compared with 2003.

The average age of the operating power plants is 23 years. Some nuclear utilities envisage reactor lifetimes of 40 years or more. Considering the fact that the average age of all 117 units that have already been closed is equally about 22 years, the doubling of the operational lifetime seems already rather optimistic. However, we have assumed an average lifetime of 40 years for all operating reactors and those that are currently under construction<sup>1</sup> and have calculated how many plants would be shut down year by year (see graph 6). The exercise enables an evaluation of the number of plants that would have to come on-line over the next decades in order to maintain the same number of operating plants.

In addition to the units currently under construction with a scheduled start-up date, 69 reactors (42,000 MW) would have to be planned, built and started up until 2015 – one every month and a half – and an additional 192 units over the following 10-year period – one every 18 days. The result has not changed from the 2004 analysis.

Even if Finland and France build a European Pressurized water Reactor (EPR), China went for an additional 20 plants and Japan, Korea or Eastern Europe added one or the other plant, the overall worldwide trend will most likely be downwards over the next two or three decades. With extremely long lead times of 10 years and more, it is practically impossible to maintain or even increase the number of operating nuclear power plants over the next 20 years, unless operating lifetimes would be substantially increased beyond 40 years on average. There is currently no basis for such an assumption.

Lack of trained workforce, massive loss of competence, severe manufacturing bottlenecks (a single facility in the world, Japan Steel Works, can cast large forgings for reactor pressure vessels) lack of confidence of international finance institutions, strong competitors from highly dynamic natural gas and renewable energy systems exacerbate the aging problems of the industry.

Two years after construction start, the world’s largest nuclear builder’s show case pilot project, AREVA’s EPR reactor Olkiluoto-3 in Finland, is two years behind schedule and €1.5 billion (50%) beyond budget.

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<sup>1</sup> The calculation excludes reactors that do not have a scheduled start-up date. That concerns 11 of the 31 units listed by the IAEA as under construction.

In June 2005, the trade journal Nuclear Engineering International published the analysis of the 2004 Edition of the World Nuclear Industry Status Report under *their* headline. “*On the way out - In sharp contrast to multiple reporting of a potential ‘nuclear revival’, the atomic age is in the dusk rather than in the dawn*”.

At the end of 2007, we have nothing to add.



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