

French nuclear revolution is rusting away

[Henry Ergas](#) 12:00AM December 6, 2019



Illustration: Eric Lobbecke

It is ironic that just as President Emmanuel Macron, along with the UN Secretary-General and a bevy of “world leaders” at the UN Climate Change Summit, calls for a dramatic acceleration in the transition to low-emissions sources of energy, France’s nuclear power industry faces a future that is more uncertain than ever.

The problems gripping the industry were highlighted late last month in an official report prepared by the former president and chief executive of PSA Peugeot Citroen, Jean Martin Folz.

While the report’s focus is on the difficulties that have plagued the construction of a new reactor at Flamanville in northwestern France, its implications reach much further.

With nuclear power plants accounting for more than 70 per cent of its overall electricity generation, no country is as dependent on nuclear energy as is France.

The decision to rely so massively on nuclear energy was taken in 1974, after the oil shock of the previous year had underlined France's vulnerability to Middle Eastern oil. Prime minister Pierre Messmer launched a crash program that led to the construction of 56 reactors in just 15 years.

Thanks to those reactors, France has extremely low electricity costs, a highly reliable electricity supply and carbon emissions that, per unit of delivered power, are barely one-fifth the European average.

Adding to the benefits, as France's neighbours scramble to make greater use of wind and solar power, with all their problems of intermittency, the country's exports of baseload power have soared, making France the world's largest net exporter of electricity.

Now, however, most of France's generators are approaching the final decade of their useful life. Planning for their replacement has been a stop-start affair, with the Greens' increasingly strident opposition to nuclear power deterring successive governments from taking action.

As a result, only the Flamanville plant received the go-ahead, with construction beginning in 2007 for an expected entry into service in 2012. Virtually from the outset, the project was beset by woes. At this stage, the total costs of construction are four times greater than initially estimated, while the plant will not enter service before the end of 2022.

The problems stem partly from the sheer complexity of the new reactor, which is the first of its kind to be built in France.

Additionally, the catastrophe at Fukushima in 2011 led to regulatory

changes that necessitated costly redesigns. And the project has suffered more than its fair share of mismanagement, aggravated by a byzantine allocation of responsibilities between EDF, the main French electricity utility, which oversaw the project, and many layers of subcontractors.

However, as the Folz report shows, the primary cause of the difficulties lies in the erosion of the industry's skill base during the long hiatus from the end of the crash program in 1990 to the initiation of Flamanville.

In effect, while the difficulties were mounting at Flamanville and at its sister project at Olkiluoto in Finland, two reactors of the same type were being built at Taishan in China by the China General Nuclear Power Corporation.

Those reactors also experienced cost overruns and delays, however they were hardly on the scale of their European counterparts and both plants have successfully entered service.

Nor is that surprising: while the Taishan projects were under way, six other reactors were completed in China and 10 more were in the pipeline.

Unlike Flamanville and Olkiluoto, the Taishan projects were therefore able to draw on a deep pool of specialist skills, along with an army of Chinese suppliers who were used to meeting the nuclear industry's demanding technical requirements.

There is, at this point, no prospect of France scaling up its nuclear program to the levels required to achieve the scale economies that made such a difference at Taishan. The cost blowout at Olkiluoto drove Areva, the "national champion" of France's nuclear industry, into bankruptcy.

Even with an injection of \$7.3bn in public funds EDF, which acquired Areva, lacks the balance sheet strength to underwrite new projects, while the French government's borrowing ability is hampered by its already too

high levels of debt.

To make matters worse, the regulated prices at which EDF has to sell the power it generates mean that it cannot charge its European clients the full value of the baseload it supplies.

As for global investors, who might provide the debt financing EDF would require, they are wary of projects that are risky in themselves and that, despite the French industry's impeccable safety record, face implacable hostility from Europe's increasingly powerful Greens.

Given those constraints, the government has announced a modest plan to eventually build six additional reactors. So far, however, there are no actionable decisions beyond the completion of Flamanville. And work on the next generation of reactors, which is already well-progressed in China, has been quietly downgraded, making it likely that there will no fourth generation reactor of French design.

The consequences for France itself are far-reaching. Beginning in the late 1950s, French firms succeeded in one high-technology market after the other by developing or acquiring a rather basic design (including the Westinghouse Pressurised Water Reactor, the Mirage jet fighter and the TGV high-speed train) that they upgraded while producing it on a large scale.

That era is over, and there is every sign France is struggling with almost all the major projects it has in train.

The Folz report should therefore come as an ominous warning for our submarine project, as it identifies French industry's serious managerial and technological weaknesses in a range of areas, such as precision welding, that are crucial to that project's success.

But there are global implications as well. As the International Energy

Agency recently concluded, there is a “compelling” economic case in Europe for nuclear power, “even if the decrease in wind and solar PV costs accelerates”. However, that case has little chance of prevailing and in 10 to 20 years there are unlikely to be any Western suppliers of civilian nuclear power plants, with the possible exception of South Korea and Japan.

Meanwhile, China is acquiring a lead that will cement its dominance of the technology globally, with major spillover benefits to its military program, including its rapidly expanding nuclear-powered navy.

And, as China’s exports of nuclear technology rise, so will the risks of proliferation.

None of that, however, will sway the environmental groups, which have managed, in one Western democracy after the other, to destroy the industry that offers the only reliable form of low-emissions generation.

Then again, there is no risk whatsoever of the Chinese government allowing these self-styled saviours of humanity to get in its way. More’s the pity.