

Utility brief: Tracking the “Japan Effect” on energy mix decisions



Interview with Bain partner **Arnaud Leroi**, nuclear expert of our Global Energy & Utilities practice

Nuclear energy offers the most affordable path to low-carbon emissions – but after Japan’s nuclear crisis, the goal of achieving CO₂ reduction targets at low cost has become even more challenging, as countries and utilities question their energy choices. Arnaud Leroi, a partner with Bain & Company’s Global Utilities practice in Paris, shares some scenarios on how the supply of and demand for nuclear energy might play out over the next few years.

What is the fallout of the Fukushima crisis on nuclear programs across the globe?

Leroi: Governments are reacting in different ways. Nearly a dozen countries, including France, Russia, China and the United States, have confirmed that they will continue to include nuclear power in their energy mix. Many countries, such as India, Spain and Finland, are auditing the safety of their reactors. Other countries – Japan and Ukraine, for example – are reviewing their energy policies. Some countries have decided to postpone building new nuclear facilities; Italy, for example, recently announced a one-year moratorium. Finally, Germany and Switzerland want to totally exit nuclear power. Germany plans to shut down eight reactors this year and phase out nuclear power completely by 2022. Switzerland has committed to exit altogether, as well, but intends to specify the exit date only in the future, based on relevant boundary conditions of the transition to gas and renewables.

How will this flux affect the supply of and demand for nuclear energy over the next few years?

Leroi: It’s hard to say with any degree of certainty. We can only speculate about the future as countries audit their reactor fleets and review their national energy policies. The severest reaction would be for countries to freeze all new nuclear development programs. If public opinion worsens, leading to strong protests, and safety measures are drastically increased, then it is possible that we will experience a major nuclear freeze over the next five years or more. My personal belief is that this extreme scenario is unlikely. In countries like China, where the need

for energy is urgent and compelling, nuclear power will very likely remain in the country's energy mix.

What would happen in a more realistic scenario?

Leroi: It's probable that the world will not go to the extreme of a total nuclear freeze. Instead, it might shift to a new reality with two emerging trends. In one scenario, countries might cancel or defer new nuclear programs – that may be especially true for the countries whose use of nuclear energy was already a complex issue. In the other scenario, countries with long histories of nuclear energy use, like the US and Japan, might drastically reduce their nuclear programs.

Our work with utilities across the globe shows that five factors influence energy mix: the cost competitiveness of generating electricity through a particular resource, CO₂ emission levels, the security of supply, public acceptance of technologies and the additional value, such as creating local jobs, generated in a region.

After the Fukushima crisis, public acceptance rose to the top of this list, becoming a key factor in deciding the energy mix. But we need to remember that, in major developed economies, restoring employment levels and securing competitive energy sources are also critical. Therefore, I believe the main question will be how serious governments and regulators are about meeting CO₂ reduction targets. The United Kingdom's recent decision to continue with its nuclear power program points to the probability of a back-to-normal scenario.

What does your research show concerning the cancellations or delays of current nuclear projects?

Leroi: We've looked at most of the nuclear "new build" projects scheduled for 2009 through 2030. Up to 25 percent of these projects may be cancelled, and another 20 percent could be significantly delayed.

The cancellations and delays will likely occur in countries that are new entrants to the civil nuclear market, that are not strongly committed to CO₂ reduction targets or that face vigorous public objection to nuclear energy. Furthermore, countries that encounter problems justifying the financial investment in and the risk profile of nuclear plants or have access to other energy sources, like nonconventional gas, with a more attractive risk-reward profile are more apt to cancel or delay their nuclear programs. The highest number of cancellations will most likely occur in the US and Japan.

How will the Fukushima crisis affect the cost of generating power in the future?

Leroi: The cost of generating electricity will likely increase over the next few years regardless of the energy source. It's possible that the impact on costs will be even higher for nonnuclear sources, as countries turn to them to compensate for the reduction in nuclear energy. Demand for energy sources like gas, and to a lesser extent coal, is likely to be much higher. And given

the proportion of fuel in the total cost of generating electricity and the relatively high price-demand elasticity of these energies, their cost could potentially escalate further, despite the positive effect of nonconventional gas on the supply side.

By how much will costs rise? It's too early to tell. In the short to medium term, regulators and utilities will be focusing on improving energy efficiency to combat the increase in energy costs. In the medium to long term, they will have to evaluate these cost increases within their local environments and revisit their technology choices.