

THE FUKUSHIMA DEBATE MISSES THE BROADER PICTURE

The crisis at the Fukushima Daiichi nuclear plants is a real tragedy. Tens of thousands of people have been evacuated around the plants, many of which continue to live in shelters with little comfort and privacy. And even worse, there are more than 27,000 people that are either dead or declared missing as a consequence of the earthquake and the tsunami.

The stream of media reporting on the status of the Fukushima plants is continuing, although ironically we are now in a situation where although the continuing release of radiation into the plant's immediate environment is accumulating to radiation levels that are worryingly high, the broader interest on the issue outside of Japan appears to have ebbed away. And that despite the fact that these problems will be with us for months, if not years.

What is still going strong in the media, however, is the debate on the future of nuclear energy. Some see the accident as a sign that we should stop all nuclear power plants – immediately – whereas others such as George Monbiot see the fact that the implications of this accident so far seem geographically limited as a sign to

support nuclear power. Unfortunately, this pro/contra nuclear is where the debate stops, and there appears little movement on either side.

It's about our energy future

What I am missing in this entire debate is the vision for our energy future. That's because a sustainable energy supply is a complex issue, where broad brush strokes such as pro or contra nuclear unfortunately don't help. Take the German government's decision to shut down seven of its oldest nuclear reactors: unlike the shutdown of nuclear reactors in Japan this hasn't led to power cuts in Germany. So where does the missing energy come from? This power is bought on the international market. So who can offer spare capacities of around seven gigawatts power or more? My guess is that most likely it's nuclear energy from elsewhere.... But short-term politics and Fukushima-related knee-jerk reactions aside, how do we envision our energy future?

What I mean by this questions is a clean, sustainable solution that works globally. A solution that doesn't include any sort of fossil fuel, and which works in the Third World as well as in the First. This won't be easy at all. Of course, there are countries like Norway that are in an enviable position – in Norway 98% of its electricity comes from hydropower. But would that work for China? Hardly.

Even though the huge Three Gorges Dam, which comes at significant environmental cost, has a production capacity of about 18 gigawatts of energy, averages out to less than 5% of China's energy demand.

Obviously, much more needs to be done to expand wind, hydro and solar power capacities. But again, this raises the question where such power is produced most efficiently, and how to transport it from one point to the other. In particular, to me it means that the entire electrical grid needs to be redesigned so that it can deal with the inevitable volatilities of renewables, as for example wind doesn't always blow, and the sun doesn't always shine. This can affect entire local areas so that in such situations considerable amounts of power have to be shifted around.

This leads to the often quoted argument that nuclear power is inevitable to provide a constant base load of electricity – a kind of fallback scheme. And nuclear certainly can deliver that. But as nuclear's proponents don't always seem to be willing to realise, there could be alternatives. For example, in times of strong winds, water can be pumped into reservoirs on mountains, to be released again in times of need.

But then again, do we want to build such reservoirs in significant quantities?

Again, we are talking gigawatts of power.

Or alternatively, if that seems undesirable, power could be stored more locally, for example in electrical batteries installed in each household. But that doesn't seem to be a solution that's possible beyond the most developed countries.

What about nuclear?

I have to say that I agree with those saying that in face of this once-every-couple-of-centuries event these 40-year-old reactors at Fukushima could have done much worse, namely failed completely uncontained. The tsunami as well as the earthquake were much higher than what the plant was built for.

And it also has to be clear that the Fukushima reactors are no comparison to the standards of modern designs. They require active cooling of the nuclear fuel, exactly the component that has failed, whereas new designs are passively cooled. Even in the event of power loss or the control room destroyed these reactors would be safe – although of course even for these next-generation reactors it should also be crystal clear that 100% safety doesn't exist.

There are other issues with nuclear energy of course, e.g. in dealing with spent fuel, in terms of nuclear proliferation and so on. But just as in the related case of systematic problems with renewables (such as the abundance of the chemical elements that go into wind turbines or into solar cells, as well as costs), I am confident that such solutions either exist or can be found.

At the same time, let's also not forget that under any circumstances, nuclear for the foreseeable future will not be a dominant energy form. In 2008, I interviewed the Deputy Director General of the IAEA, Tomihiro Taniguchi, and asked him about the future potential of nuclear energy. In his opinion, replacing the ageing nuclear reactors in a safe and secure way will be a challenging task in itself. Nevertheless, nuclear's share of about 13-14% of power generation is an important one, certainly nothing I like to be replaced by coal and gas.

So what next?

The best, and fastest way towards cleaner energy is to consume less. Other than that, we are facing difficult decisions. In the near term, this to me may well mean to implement next-generation nuclear energy, rather than to continue the burning of coal and gas – which let's face it will be the most likely alternative being pursued if we pull out of nuclear.

And clearly, we need to try harder in the development of renewables for clean energy. But other than that, where the best balance lies between different technologies, and what kind of timescales apply for the development of various alternatives to me seems a complex problem for which we have no clear answer yet. Solutions may vary from country to country.

And of course, yet another issue is how much alternative energy sources can replace other significant carbon dioxide emitters – petrol used in cars, or oil used in the heating of homes and so on.

As hard as the debate about nuclear energy is fought, it is only part of the problem. Nuclear for sure bears risks (less than what Fukushima suggests), but so do other technologies. While I believe that in the short-term we still need nuclear energy, I wouldn't be able to even guess whether that is still the case in the long-term. What I am certain about, however, is that we need to keep an open eye and base any decision on hard facts, not beliefs.

In my view, unless we take a detailed look at the system as a whole, we will fail to address the challenges ahead, and eventually the lights will go off. Maybe then we will start to look at the broader picture.

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