

NUCLEAR'S FUTURE IN ENERGY

With Although begrudgingly, nuclear has now been accepted among the solutions in our climate and environment targets and energy's future. As a zero emission energy source, without the downfalls of intermittency or battery technology limits, nuclear power presents an essential solution for all energy needs, especially when it comes to developing countries. And yet there is a mounting opposition to nuclear power, a resistance to its adoption, or when already present, expansion, and an insistence in Europe and Japan for its total abandonment. In the light of this difficult realities, what did the energy leaders think can be expected from nuclear in the future?

Nuclear power is essential for achieving our COP21 goals.

Kirill Komarov, First Deputy Director General for Corporate Development and International Business of Rosatom, believes that the most important event for the nuclear industry has taken place in December 2015, in Paris, with the climate change conference's decision to significantly reduce CO₂ emissions. Paris was the first time where nuclear was explicitly accepted among green energy sources. Yukiya Amano, Director General of the International Atomic Energy Agency, pointed out how just by utilizing the nuclear power technology we avoid emitting 2 billion tons of CO₂. In the past 40 years, nuclear power prevented the emission of 60 billion tons of CO₂.

Nuclear presents a much better alternative in places where renewables are not viable.

Energy needs and realities differ greatly from one country to the next. Richard Lancaster, CEO of CLP Group, stressed that we shouldn't be thinking that there is a right solution that fits all. We shouldn't be thinking that decentralised renewable energy is any cleaner than centralised renewable energy or nuclear power. There are right solutions for each individual market. When we look at Hong Kong, for example, it's a densely populated city where land is very scarce. It is right on the tropic so there is very little consistent wind and the prominence of high rise buildings causes them to shade one another, making finding a place to put solar panels quite difficult. The most likely contribution Hong Kong can be expected to make would be shifting towards a cleaner mix of energy, using a combination of nuclear power and natural gas, rather than forcing renewables. Maintaining a level playing field for nuclear is a must for the future of our COP21 efforts.

Fukushima didn't create the same aversion everywhere.

While Shigeru Muraki, Vice Chairman of Tokyo Gas, talked about how, by 2020, the capacity of nuclear will be about half of the prior Fukushima numbers in Asia; Yukiya Amano pointed out how this past 5 – 6 years have shown that the Fukushima Incident did not entirely wipe out interest in the nuclear power. There are currently 30 nuclear

plants under construction, with more on the talks. IEA estimates up to 56% increase in the use of nuclear power by 2030.

Nuclear should not be a privilege for the select few developed world.

The development of nuclear power today is concentrated in a relatively small group of countries. As the final decision makers, sovereign states should have all the options available to them and nuclear power and the use of nuclear power should not be limited to developed countries. There is certainly proof of a shift taking place. As far as nuclear is concerned Europe is no longer the center of the world. After the Fukushima incident, the center of expansion for nuclear has shifted from Europe and US to Asia. Opposed to 30 countries who are currently in possession of nuclear power plants, 30 more, largely developing countries, are very interested in obtaining one themselves. As Fatih Birol from IEA noted, nuclear power can produce electricity without any interruptions and emissions, and so, presents a very viable option to developing countries with very high electricity demand growth rate.

Nuclear is a driver for technological advances and is likely offer us many leaps in other technology solutions.

Hans Wilhelm Schiffer, Executive Chair of the World Energy Resources programme of the World Energy Council, mentioned how there are many future reactor technologies in various stages of research and development – to note, in particular, the class of small modular reactors, which promise dramatic improvements in reactor flexibility and efficiency respectively. Thomas Klinger, Director of the Max-Planck-Institute for Plasmaphysik, has also introduced a future form of nuclear energy in the form of fusions, which, if the research bears fruits, will be able to supply a European family energy for an entire year with just a bottle of water. This extremely efficient fuel, one of its source being deuterium which can be found in the sea water, means there are more groundbreaking inventions yet to happen. Nuclear also offers an extremely handy environment for advancements through these researches in fields like climate change resistant plants and ocean acidification.

But it's not without its challenges.

Despite its many benefits, nuclear is not without its challenges. Lauri Virkkunen, President and CEO of Pohjolan Voima Oy, raised the question of nuclear waste management, which is considered to be major challenge for nuclear energy. In Nordic countries nuclear companies have been researching for decades a safe disposal for used fuel. Another challenge, as raised by Qin Sun, Chairman of China National Nuclear Corporation (CNNC), is adopting the necessary legislation to regulate nuclear energy. Security and cyber threats are also increasingly more tangible. Wang Binghua, President of CPI Group, pointed out how any security problem when it comes to nuclear will not only affect the country itself but the whole world. A culture of sharing, of opening up, will be critical in achieving optimum security and economic benefits. The strongest

determinant of nuclear's future, however, will be social acceptance. The Fukushima accident and growing public opposition in some regions, and the increasing cost of nuclear as a result of toughening security standards in its aftermath, creates a more challenging economic situation both to existing nuclear industry and its possible expansion. Highlighting its role in climate change mitigation could aid nuclear against the decreasing costs of natural gas and renewables.