

It's time to put nuclear on the offensive – and make it the low carbon energy generation option of choice

Have you ever seen something that just amazed you? We were wowed by a recent YouTube video showing what the Chinese have achieved in turning conventional high-rise construction on its head. A 57 story building was built in 19 days – yes – 19 days! Who would ever believe this could be possible? I live in Toronto, a city that has been undergoing a huge hi-rise building boom over the last few years and the time it takes to build these tall towers can be measured in months and years, not days. This just shows what can be achieved when the imagination is let loose and innovation results in outcomes never before thought possible.

We first wrote about the importance of innovation in the nuclear sector last year. In its history nuclear power has shown incredible innovation, leading the way in a range of technologies especially with respect to delivering a level of safety and security not seen in any other industry. More recently there have been dramatic improvements in operations as the global fleet has reached a level of performance never even dreamed of in the early days of the industry. Current new build projects are using the most up to date methodology in modularization and other advanced construction techniques.

And yet when the IEA issued the 2015 version of its Energy Technology Perspectives (ETP 2105) report focusing on the need for energy technology innovation if the world is to address climate change; it doesn't mention this innovation, nor does it include discussion of potential future innovation with

respect to the nuclear option.

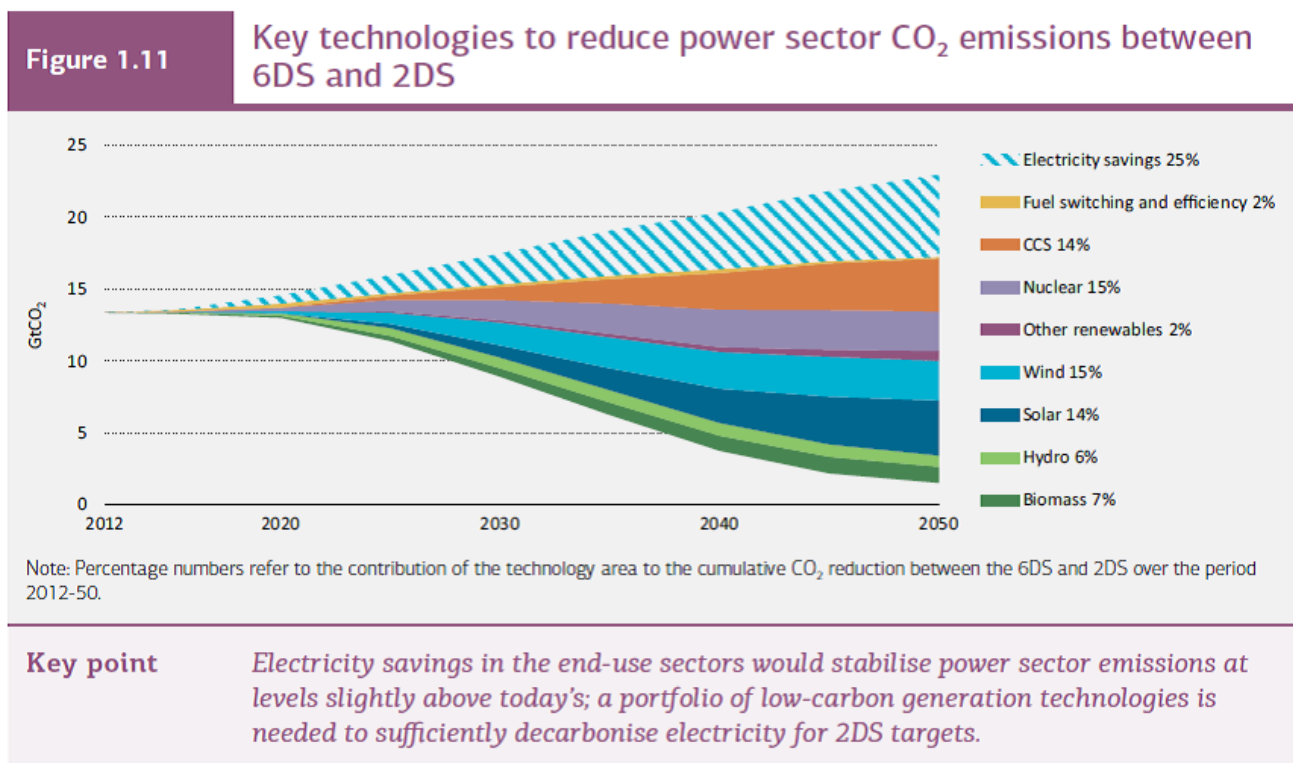
As stated, "Energy technology innovation is central to meeting climate mitigation goals while also supporting economic and energy security objectives. Ultimately, deploying proven, cost-effective technologies is what will make the energy system transformation possible. Continued dependence on fossil fuels and recent trends such as unexpected energy market fluctuations reinforce the role of governments, individually and collectively, to stimulate targeted action to ensure that resources are optimally aligned to accelerate progress. Establishing policy and market frameworks that support innovation and build investor confidence over the long term is a first-order task to deliver."

The report is clear when it says that *"Innovation support is crucial across the low-carbon technology spectrum"*. The discussion focuses on renewable technologies in the short term due their relative readiness and lack of a need for long term investment in development; and carbon capture (CCS) in the medium to longer term even though it requires substantive investment in development as it remains essential to address the large number of fossil plants being built and still in operation by 2050 that will require decarbonizing.

As usual, the same issues that have plagued nuclear for the last 30 years; primarily public acceptance issues, mute a positive discussion for the nuclear option. While recognizing its importance in achieving increased energy security, diversity of fuel supply and lower emissions, the report goes on to state *"this awareness has yet to be translated into policy support for long-term operation of the existing fleet and construction of new plants" ... "to recognize the vital contribution that nuclear energy can make."*

Yet the actual IEA scenarios have changed little from last year. As shown below, when considering technologies individually (rather than grouping into "renewables"), nuclear

actually plays the largest role of any single technology in meeting carbon reduction targets showing that, even as it stands today, the nuclear option is absolutely essential to moving to the IEA 2 Degree Scenario (2DS).



This can only be the case if nuclear is currently meeting its responsibility to be economic and reliable while being an essential large scale low carbon option. Given that we know the largest challenges in building new nuclear plants is related to their relatively high capital costs and long project schedules relative to other options; consider the role nuclear can play if improvements similar to those demonstrated in the Chinese YouTube video were implemented. Not marginal improvements, but mind blowing changes in approach that shake current thoughts about the costs and schedules of nuclear projects to their very core. This is the way forward. While discussion of next generation plants and SMRs is of interest, we need continued innovation that takes what we know now and improves it beyond what anyone can imagine.

The report shows that government investment in nuclear R&D has

been dropping and in renewables has been increasing. This investment must be refocused on project improvement and innovation rather than the traditional areas of research such as safety and waste management where it has been spent for decades. While important for the nuclear industry, too much of this spending is focused in these areas just to pander to the ongoing public beliefs that safety and waste issues remain unresolved. Rather, emphasis should be on continuing to improve new build project performance. Let's think about new build nuclear in the same way we think about renewable technologies; that more investment and research will lead to shorter construction schedules and lower costs. It is time to let the innovation genie out of the bottle, stop being on the defensive and move forward with great things. With changes like this, the nuclear share will grow well beyond current expectations bringing a real solution to climate change while keeping electricity bills low and system reliability high.

So remember, nuclear power is essential in achieving increased energy security, diversity of fuel supply and lower emissions; and is already expected to have the largest impact on meeting climate goals of any other single technology. Today's plants are economically competitive and provide safe and reliable electricity. Talking about investing in energy innovation without a discussion of investing in nuclear, when it's currently the best option available, is absurd. Governments need to recognize the incredible innovation already achieved by the nuclear option, and unleash even greater potential by investing in this well proven technology.