

Trip notes on the International Atomic Energy Agency Scientific Forum

28 September 2016



Vienna – city of Erwin Schrodinger and Wolfgang Pauli, the place where polio was isolated, home of the Vienna State Opera, and – according to *The Economist* – the second most liveable city in the world (after Melbourne).

I've come to this symphony of a city for the International Atomic Energy Agency's Scientific Forum, focused on the importance of nuclear science for global progress.

I've also had the opportunity to visit the IAEA laboratories at Seibersdorf, hard at work on nuclear technologies that can benefit developing countries around the world. It is inspiring to see how these projects are making measurable inroads on so many of the seemingly insurmountable challenges we face.

Where would we be without the radiotracers that diagnose cancers, the gamma rays that detect structural faults in everything from bridges to human bones, or the irradiation equipment that can sterilise the surgeon's tools or create the next generation sorghum to help feed the world?

Our health, our homes and our industries rely on the work of nuclear researchers, and Australia is home to some of the world's very best. So I had no shortage of material to cover in my seven minute address in the Forum's opening session.

I took my cue from the 1996 Nobel Laureate Richard Smalley, who put *energy* at the top of his list of the challenges that humans have to shoulder.

With energy we can pump water; with water we can grow food; with energy, water and food we can establish communities and pursue all the things that make life worthwhile. You could read human history as the story of energy innovation, each step in the technology powering a wave of human progress in turn. We needed kilns to power the Bronze Age; steam to power the Industrial Age; electricity to power the Information Age.

Progress has come at a price, in the form of climate change. The fact remains, without energy, we're straight back to the Stone Age. The challenge is not to reject the fruits of human ingenuity stretching back millions of years, but to channel that relentless tide in a way that ensures our world keeps getting better.

I call that world the Electric Planet.

It's the destination of a three-step journey. First, replace our current forms of electricity generation with clean technologies. Second, scale up to generate three times more electricity than we need today. Third, substitute clean electricity for petrol in cars and gas for heating in buildings. Do that, and we're well on the path to a zero emissions world.

The scalable generation technologies today are nuclear; and solar and wind – backed up with storage to get over the hurdle of intermittency.

Of course, there are costs and benefits on any path, and it falls to communities to decide where their best future lies.

My message to the Forum was that nuclear science is critical for nations like Australia, even if we do not see nuclear as part of our energy mix. Nuclear science is helping us to develop better batteries for storage; more efficient solar panels for electricity generation; and industrial practices that achieve a better outcome for the customer at a greatly reduced environmental cost.

The Australian Nuclear Science and Technology Organisation (ANSTO) is a wonderful flagship for this research, and I strongly encourage you to follow up some of the links I've suggested below.

With science, there is always a better way. We still have to choose, together, to take the journey.

FURTHER READING:

<http://www.ansto.gov.au/NuclearFacts/AboutNuclearScience/>

<http://www.ansto.gov.au/NuclearFacts/BenefitsofNuclearScience/index.htm>

<http://www.ansto.gov.au/AboutANSTO/WhatANSTOdoes/index.htm>