Energy in a Changing Climate

Renewable energy is not as reliable as nuclear

Climate scientists have presented us with a huge challenge that demands a massive collaborative effort from engineers and scientists all over the world. The scientists tell us we need to substantially reduce our greenhouse gas emissions. Even if we achieve this, we will still need to adapt to the changing climate.

Fortunately we are now blessed with a wonderful tool ideally suited to such a collaborative task. One that allows us to exchange ideas instantly and hold discussions with anyone, anywhere at minimal cost. It is, of course, the internet.

The internet relies on a very important energy carrier that happens to be the biggest cause of the problem that needs to be solved. That energy carrier (electricity) is the largest single source of all greenhouse gas emissions.

For the internet to work effectively it needs access to reliable electricity available every second of every day. From the computers in our homes and workplaces to the communication systems and internet servers around the world that connect us all together, all need a continuous and uninterrupted electricity supply. Electricity is really the life-blood of our modern technological society.

Two-thirds of the world's electricity comes from "polluting" coal and gas-fired power stations. These generators are the heart of our electricity supply. We need to be very careful that while seeking a solution to the problem of emissions that we don't stop that heart and interrupt the vital blood flow to our internet network. This could damage our capacity to work together on this mammoth problem.

The coal-fired power stations are really like a diseased heart that can pump the life-blood well enough but is poisoning our body with toxins. Closing down these coal plants would stop the toxic greenhouse gases but would also stop the life-blood flowing and kill the necessary tools of technological collaboration that we need to address the problems of climate change.

What we need is a heart transplant that won't kill the patient. Our heart surgeons have a few options available to them. They could replace the coal-heart with a wind-heart or a solar-heart. Both these heart options have reliability and stability issues. The wind-heart produces a variable blood flow and sometimes stops altogether. Most solar-hearts only works in the daytime and the blood stops flowing at night. There are some solar-hearts on the drawing board that could work all night but no one has built one yet and when they do they will be very expensive.

No competent surgeon would replace a coal-heart with a wind or daytime-only solar-heart without an alternative blood supply. To do so would undoubtedly kill the patient. They were

prepared to attempt this operation in Denmark because they had access to an excellent "blood bank" next door in Germany, Norway and Sweden to provide continuous transfusions to stabilise the patient when the transplanted wind-heart gets erratic – which it frequently does.

Alternatively, our surgeons could use a gas-heart. The gas-heart can do the same job as the coal-heart and produce less toxins but the climate scientists believe that even these reduced toxin gas-hearts will still eventually prove fatal. There are other more reliable hearts such as the biomass-heart and the hydro-heart but these transplants will only take in smaller patients like Norway. They won't be big enough to become the heart of Australia's electricity network.

Is spite of the risks, advocates of wind- and solar-hearts want the operation done as quickly as possible — even in Australia where no external "blood bank" exists. They say the technology problems with these hearts will be addressed in time. But if the internet dies in the meantime where will the technology revolution come from?

Maybe the best option open to the surgeons is to use a nuclear-heart. The current production version of the nuclear-heart will do exactly the same job as the existing diseased coal-heart without the carbon toxins. These current nuclear-hearts do produce a small amount of toxic waste, but the doctors think this is manageable and will not kill the patient or even make it sick. After all, they have been doing this operation for more than 50 years around the world and the mortality rate has been miniscule. There is a disadvantage with the current nuclear-heart in that it will probably only last 50-100 years but that will at least reduce greenhouse gases and keep the internet running so the climate problems can be addressed.

The next version of the nuclear-heart, the fast reactor nuclear-heart, is expected to be a available within a few decades. A fast reactor heart will last for thousands of years, leave even less toxic waste and can be regularly upgraded as technology improves. There is even a promise of a nuclear fusion-heart that will outlive the planet.

If you had to have a coal-heart transplant without waiting for new technology – which option would you chose?

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