How can Nuclear Power Build Trust in a time when denying science is rampant?

Recent public outcry as a measles outbreak has managed to impact much of North America has once again showed the nature of public deniers of science. In this case it is concerns about vaccinations that have led to numerous children falling sick with measles. While not considered a highly risky disease, some children get very sick and some may actually die. The main concern is that it is very contagious so that without vaccinations it moves quickly within a community to infect large numbers of people, greatly increasing the public risk.

This is only the most recent large scale public outcry where science is ignored. It is the same as those who deny climate change and those who deny the safety and benefits of nuclear power.



The role of nuclear power in combating climate change has once again been demonstrated in the most recent update of the IEA Nuclear Power Roadmap.

- Based on the 2 degrees Celsius (°C) scenario (2DS) – nuclear power would continue to play a major role in lowering emissions from the power sector, while improving security of energy supply, supporting fuel diversity and providing large-scale electricity at stable production costs.
- Global installed capacity would need to more than double from current levels of 396 gigawatts (GW) to reach 930 GW in 2050, with nuclear power representing 17% of global electricity production and a formidable growth for the nuclear industry.
- Governments have a role to play in ensuring a stable, long-term investment framework that allows capital-intensive projects to be developed and provides adequate

> electricity prices over the long term for all low-carbon technologies. Governments should also continue to support nuclear research and development (R&D), especially in the area of nuclear safety, advanced fuel cycles, waste management and innovative designs.

This means that a larger commitment to nuclear power is an important element of any strategy that has a chance of getting climate change under control.

The report also notes that public acceptance continues to be one of the major impediments to a stronger commitment to nuclear power in many markets. Concerns about safety, costs and waste disposal continue today; the same issues as they were back when I started work in this industry more than 30 years ago. While science can clearly demonstrate that nuclear power has benefited the environment, by avoiding significant amounts of pollutants and carbon emissions; is very safe; and that waste management is more of a social issue than a technical one: public attitudes remain very hard to change.

Generally the public has very different views on key issues than scientists. In this year's annual meeting of the American Association for the Advancement of Science (AAAS) a significant number of discussions were about how the public thinks about science issues and how scientists communicate about their work. On key issues the difference in opinion according to PEW research is striking. While 57% of the public believe that eating GMO food is unsafe, 88% of scientists believe the opposite. Only 68% of adults believe vaccinations should be mandatory while scientists are at 86%. And finally only 50% of the public believe that climate change is man-made while 87% of scientists believe in man-made climate change. Clearly there is a huge gap between science and public beliefs. We in the nuclear industry are not the only ones to suffer from this lack of effective communication.

I have long noted when told the industry must better educate

the public that in reality, the public does not want an industry science lesson which tends to be the approach most used in the past. In fact, when this approach fails, experts just shake their heads and try again. In reality what the public want to know is that the industry is safe, and that this safety is in the hands of experts that they trust to deliver upon this promise. We see that one of the largest impacts of the Fukushima accident in Japan is the loss of trust in both the utility and government by the population. The impact to the public of this is significant – the health impacts of the fear of radiation and the accident is far larger than the actual health impacts of any radiation to the public.

Trust is not something that is built overnight. It takes years, even decades to develop trust with the public – and only a moment to destroy it. People are skeptical (as they should be) and unfortunately are always ready to believe stories that discredit those they don't trust.

So why do I bring up the measles outbreak? Because we finally have an incident where the public seems outraged at deniers and supportive of science. Measles vaccinations are safe. Millions of doses have been safely given to children over decades. They save lives. And those that disagree have been putting not only their children at risk but also the children of their neighbours and colleagues. One has to ask, how can any educated, concerned adult put his or her own children at risk? Clearly they believe that the risk of vaccination is higher than the risk of the disease. In the midst of all of this, recent news surveys are showing that significant numbers of people still believe the vaccination can put their children at risk. This is just not the case given the science.

It was said best by a mother in Pickering Ontario who has already lost a young child to illness and who now has her baby at risk, *"If you have chosen to not vaccinate yourself or your child, I blame you," she writes. "You have stood on the*

shoulders of our collective protection for too long. From that high height, we have given you the PRIVILEGE of our protection, for free. And in return, you gave me this week. A week from hell. Wherein I don't know if my BABY will develop something that has DEATH as a potential outcome."

It is essential to understand these words. It is easy to oppose something when you are already benefiting from it. Yes, don't vaccinate your child because you know the risk of disease is low since all others are vaccinated, oppose GMO foods when you have ample safe food to eat while others are starving, and oppose climate change while you have reliable electricity and relatively clean air while others can't breathe and are the first to suffer the consequences.

There seems to be a large scale shift from public good to individual good in society these days. Trust in government, scientists and other institutions is very low. The public is not willing to accept that these institutions have their back so they quickly rush to beliefs that are not supported by science with the resulting ultimate negative impacts on society. To be fair these beliefs come because many of these institutions that were trusted in the past have let the public down. And in this day of instant news and social media, it is easy to attack, but then interest is lost by the time the truth comes out and only a small subset of those who read the original story of concern remain interested enough to see the truth when it comes out.

Trust – it is essential for the future of nuclear power. The public must trust the industry to deliver on its promise of developing and operating safe, reliable and economic nuclear plants. They must trust the government to provide a strong regulator to oversee the industry and ensure public safety. This industry is dependent upon this trust if it is to flourish.

Building trust in science is a task that goes well beyond the

nuclear industry. Yes, scientists have much work to do to build that trust with the public and government, but governments must then ensure that they use science as a basis for policy. While it remains reasonable to question the results of science, it is not reasonable to base policy on the assumption that science is wrong. Government in all countries need science advisers in key positions to ensure that real science is heard when policy is being made.

The media is also part of the solution. Poor reporting looking for the sensationalist point of view is not helpful. Science journalists must be the ones to cover science issues and they must take the time to report on them correctly. Just this week there was a fascinating editorial in the Canadian newspaper, the Globe and Mail when a reader complained about the lack of "balance" on the vaccination issue. The response by the Globe is important reading," *The reader is correct that news stories should be fair and balanced, but if The Globe were to include someone "credible" from the anti-vaxxer community, that would be false balance….False balance is when journalists twist themselves into a knot to try to balance scientific and expert views with someone whose views are not fact-based, expert or scientific….. False balance is not only poor journalism, it can harm the readers' understanding because it suggests there is a balance between the views. In politics, for example, it is important and responsible to offer fair weight to different parties' views. It is not responsible to offer equal weight to science versus flimsy beliefs*."

The issue is that most people today listen to those they are familiar with and trust and discount those they don't know. Therefore nothing is more important than the scientific community listening to and speaking with the public in a way that earns their trust. Getting this done is essential to all of our futures. The work ahead of us all to build trust in science is huge and it will take a long time but we must be relentless in our efforts to make this happen.

Given the public push back in this measles outbreak, we can ask – is this the beginning of a new opportunity for dialogue on issues that are supported by science? Is the public starting to understand that their beliefs may be hurting them more than helping? If so, then we need to ensure that the nuclear industry is continuing to deliver open, honest and transparent information in support of its benefits while clearly explaining the magnitude of the risks. Science is on our side. Now it’s time to make a strong case to the public.