

# localnews

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## LIVING

# When bad turns out to be good

## Scientific thumbs up for fracking, nuclear power deserve due consideration

In my last column, I argued that it is in society's interest to make decisions on the basis of the best consensus-based science available. We simply cannot afford the luxury of having unjustified anti-science biases. Unless we as lay people can somehow prove that scientists are clearly wrong, who are we to say that we don't agree with their findings? According to Mark Lynas, a British environmentalist who went from being a fierce opponent of GMOs to one of their strongest supporters, being anti-science essentially comes down to believing in conspiracy theories. "You really have to believe that hundreds or even thousands of scientists across the world are somehow in collusion to pull the wool over the eyes of the public."

### U.S. STYLE CONSERVATIVES

Fallacious reasoning and harbouring certain anti-science attitudes is not restricted to conservative-minded people. It does exist – albeit to a lesser degree – among so-called “liberals” too. However, even using labels such as liberal or conservative is problematic. Many of us are clearly a mixture of both elements. I know that I am. In fact, it's probably inaccurate to use the term “conservative” in Canada at all right now. The so-called conservatives that constitute our federal government are clearly a different breed and far more ideological in their thinking than anything we've seen in Canada before. The lack of respect for science (especially when it relates to climate change and environmental degradation) and for statistical findings (e.g., statistics show that most crime rates are actually decreasing) is much closer to the thinking of American Republicans than to Canadian “conservatives” of the past: think of Brian Mulroney, Bill Davis and Robert Stanfield.

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Anti-science thinking is a huge impediment in properly addressing climate change and the havoc it will visit upon both the natural and man-made world. If we are to have any hope of avoiding a truly devastating climate future we have to rationally consider every low-carbon option available for generating electricity. Unfortunately, wind, solar, natural gas, hydro or nuclear all have very real downsides. The only way we can decide which are the “least bad” is to look at what the science is telling us. Although I fully support both solar and wind-generated power, and see them playing an increasingly important role in the future, I'm not convinced they are ready to usher in a low-carbon economy on their own, especially not in Ontario where wind is running into so much opposition.

### FRACKING

Based on the reading I have done, there appears to be a fairly robust scientific consensus that the two most realistic low-carbon energy options in the short-term are natural gas and nuclear. Let's talk about natural gas first. The most rapidly increasing source of natural gas is shale gas. A controversial technology known as hydraulic fracturing or “fracking” has offset declines in production from conventional gas reservoirs. Fracking is a means of releasing gas and oil from an underground rock formation by blasting it with pressurized, chemically-treated water and sand. The liquid mixture cracks open the rock and liberates methane, or natural gas, which then rises



**DREW MONKMAN**

### OUR CHANGING SEASONS

back up the pipe. It's not hard to see why fracking sets off alarm bells with some environmentalists: Big, powerful gas and drilling companies making piles of money by infusing toxic chemicals into the ground that might end up in our drinking water and endanger our health. This is not to mention the staggering amounts of water that are used. And, yes, there have been problems. In Pennsylvania, for example, wells have been contaminated with methane and companies have been fined.

However, most of the science is showing that it's not the underground water blast after the drilling is done that is the problem. Where water supplies have become polluted, the trouble seems to stem from poor drilling practices. According to Chris Mooney, a science journalist and author of *The Republican Brain*, most of the science is telling us that the fracking technology itself is innocent and that the problem lies in a poor job of installing the well casing. This is a layer of cement that fills the gap between the gas pipe and the wall of the hole. It is supposed to stop buoyant gas from rising up along the outside of the pipe. Mooney explains, “the study that best documents the clear risks that drilling poses to groundwater also seems to absolve fracking itself.” He is referring to a 2011 paper on “gas migration” by Robert Jackson in the *Proceedings of the National Academy of Sciences USA*.

### CLEANER OPTION

Obviously, no one is saying that direct contamination from fracking won't ever occur. What we should really be opposed to, however, is reckless and improperly regulated drilling and casing practices. The bottom line in all of this is that natural gas is still a far cleaner fuel than oil or coal and emits less than half the carbon dioxide per kilowatt hour than coal-fired plants. If you base your thinking on the best currently available science and weigh the costs and benefits, fracking makes sense. It's also why the Obama administration supports this technology, as it does nuclear energy.

The threat of climate change is also making nuclear look pretty good these days. Like burning natural gas, it is one of the few options that is “scalable” – easily expanded to adapt to increased energy demand. Granted, nuclear is scary, at least at first glance: ionizing radiation traveling great distances and posing a risk of cancer later in life. Obviously, radiation at high doses is a huge threat. But, according to Chris Mooney at least, the majority of scientists believe that there is a degree of radiation exposure below which damaging health effects aren't likely to occur. Even the Fukushima Dai-ichi meltdown in Japan two years ago has ended up being far less serious than initially feared. Any long-term effects on people are now believed to be minimal.

Most nuclear scientists tend to think that the risks have been overblown, especially when compared to staying on our present coal-intensive track. “Amongst nuclear experts, you get a distinct sense that society has overestimated these risks, overplayed them, wasted in some cases resources in pursuing reductions in risk where money would be better spent elsewhere,” says Hank Jenkins-Smith, a political scientist at the University of Oklahoma who

studies scientists' views on the nuclear issue, and why they are different from those of the public.

To be fair, the debate is not fully resolved. A minority of scientists posit that there is no truly safe dose of radiation. All nuclear scientists agree, however, that policy makers should adopt a more stringent standard – just to be safe – when it comes to public policy for nuclear plants, waste disposal and sequestration. They are supporting the “precautionary principle” given that some uncertainty remains.

### EMOTIONAL RESPONSE

Human beings are all guilty to some extent of what is called “motivated reasoning.” This is the concept that ideas strike us first of all on an emotional level, well before they strike us intellectually. As a result we often ignore the scientific proofs because they are an affront to us emotionally. Furthermore, rather than engaging in a rational search for information to confirm or disconfirm our emotionally comfortable belief, we end up seeking out information that confirms what we already believe. This is not hard to do in the age of the Internet.

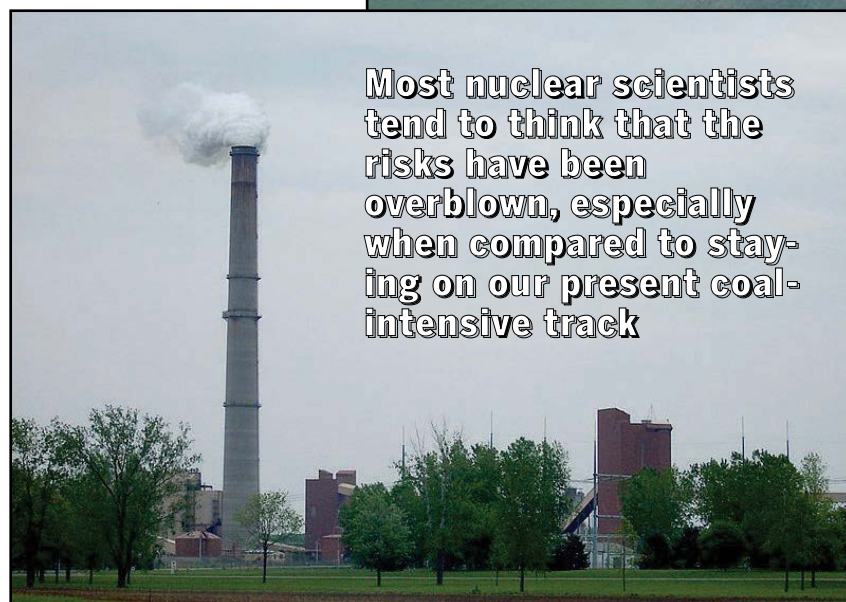
There is some good news,

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though. People who tend to be open in their thinking are usually amenable to changing their minds when presented with new evidence, even on contentious issues like fracking. However, according to Mooney, a number of motivated-reasoning studies have shown that “conservatives” – for lack of a better word – seem to show more bias in favour of their pre-existing views (or a stronger rejection of reality) than liberals. All of this has profound implications for liberals and scientists who hold Enlightenment values and want to share their knowledge with the larger public, a large segment of which is conservative. Facts alone won't win the day, nor will vigor-



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Wikimedia photos

A nuclear power plant in Eurajoki, Finland (top), coal-fired generation in New York State (above) and fracking for natural gas on the Haynesville Shale near Shreveport, Louisiana.

into stories that move people. A data dump is worse than pointless; it's counterproductive. But a narrative can change heart and mind alike,” according to Mooney. We need to tell uplifting stories about what a low-carbon future can look like and admit that some of us possibly over-reacted with regards to the dangers of nuclear energy and fracking. Maybe then we can

begin to move towards a more inclusive, common front where science is the foundation of our fight against climate change.

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