

Watt's Happening?

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The 4th Great Energy Revolution

Energy. We depend on it entirely and always have – for heat, light, and now for transportation and communications. Starting with simple fire, we have moved through a series of energy revolutions, each more profound than the last. Today the fourth great revolution has begun.

Carbon-based fossil fuels have brought us to levels of prosperity and abundance unimaginable just a century ago. Today, however, harvesting and burning these fuels on such a massive scale show signs of backfiring, as the build-up of greenhouse gases continues to warm the planet and throw our weather badly out of whack. New, cleaner energy sources are needed.

The good news is that a transition from carbon fuels to renewable energies from the sun and wind will not mean unemployment and hardship. To the contrary, this revolution, now well underway in most of the world (Canada's a bit behind but catching up) will mean more jobs, a higher standard of living for more people, and a cleaner environment. Particularly for those nations, companies and individuals that see this revolution as the immense opportunity that it is. A look at history confirms this.

FOURTH ENERGY REVOLUTION

The move from oil and gas to renewables like solar and wind is not our first great energy revolution. In fact, as a civilization, we're getting pretty good at this energy transition thing.

Let's remember that we started out with renewables, long, long ago in a galaxy far, far away. Wind, water and wood power brought us to the beginning of the fossil fuel age in the 1800's. Think windmills, water wheels, and great sailing ships.

These early renewables were used to build the devices that allowed us to enter the coal era, an immense energy transition that took about 70 years to complete.



The 34 wind turbines of Bear Mountain Wind Park near Dawson Creek, BC produce enough power for 34,000 homes. The fourth great energy revolution has begun.

Then we used coal energy to make the materials and devices (think coal-fired steam engines) that allowed us to tap into newly discovered oil and gas reserves. Oil and gas were harder to get at than coal, but they were much more concentrated forms of stored energy, easily piped and pumped. A major shift again.

Oil and gas brought us into yet another new, higher level of industrial efficiency and productivity – an era in which electrical energy began to dominate

– the era in which we are now living.

The move from coal to oil and gas also took about 70 years. Each energy transition has given us an energy source more efficient and more powerful than the one before. In spite of warnings, threats and complaints from vested energy interests at the time, an unexpected economic boom accompanied each transition. Those nations and individuals who invested early in the new energy technologies became the world leaders of the new energy era. Those who did not fall behind, or disappeared altogether.

HALF WAY THERE

We are now well into the next great energy transition: from coal, oil and gas to renewable energies from the sun, wind, earth and tides.

These energies will replace the old ones because they are better: they are constantly and automatically renewed by the forces of nature and therefore require no actual fuel; they produce no pollution during operation; they are widespread, allowing regions, cities and even individuals to

become energy producers, not just consumers.

Most importantly renewables are perfectly suited to producing the ultimate energy form: electricity. Electricity is what I call “Perfect Fire.” A simple wire can transport immense quantities of energy over vast distances at essentially the speed of light. Thanks to today’s powerful technologies, we can now do pretty well anything with electricity that we used to do with carbon fuels . . . and much more. We’re headed for an electrical and electronic world powered by non-polluting and immensely abundant renewable energy.

Perhaps we are about half way through the usual 70-year transition time frame. Like the rest of life on this little planet, we are beginning to use our unlimited energy “income” instead of our finite (and problematic) energy “capital”.

Driven by climate change, a good dose of common sense, and an immense worldwide market for clean energy, the fourth great energy revolution has begun.

It’s back to renewables, back to the future, again.

***Watt’s Happening?* Quick Facts:**

China continues to lead:

China continues to lead the world in renewables. In 2015 it installed 30.5 GW worth of wind, nearly half of all new wind turbines installed world-wide last year. How much power is that? About the equivalent of 30 Site-C dams. Oh, and they installed about the same in solar last year too!

US is growing with wind too:

In the US, wind power delivered slightly more than two-thirds of all new electricity generation capacity in 2015. Wind added 8.6 GW of juice last year, surpassing 7.3 GW of solar and 6 GW of natural gas.