

Light and Water: Seeking Truths About Our Energy Future:

An Examination of the Facts and Fables about the Peace River Site C Project

By Chris Aikman

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In the long conversation we are having over the future of energy, some egregious claims have been repeated (without examination) so many times that they have become accepted as currency.

As an example, let's examine a recent online article entitled "In the Dark: Lies from BC Hydro: What BC Residents Have and Have Not Been Told About Site C Dam and Electricity Prices". The article is by Norman Farrell, and it was posted on February 17, 2017 at this site:

<https://in-sights.ca/2017/02/17/in-the-dark-lies-from-bc-hydro/?platform=hootsuite>

In this discussion below, I have copied the text of Farrell's article (unbolded text, indented), followed by a more correct answer (bolded text) to his claims:

1. "BC Needs More Electricity" – the Biggest Lie. BC Hydro assessed hundreds of options as part of their Integrated Resource Plan, and Appendices (RODAT). Conservation or Demand Side Management can contribute more in savings than the entire Site C project would provide. And all the savings are at the point of use and save transmission and distribution losses – a bonus of at least another 6% to 8%. This is 1100MW of capacity, or 5100 GWh of electricity per year. The average capacity of Site C is only 580 MW!

– In addition there are 400 MW of savings BC Hydro did not include, that are routinely used to manage demand peaks. Plus, there is Burrard Thermal, roughly 1000 MW!

– There are over 1000 MW's that BC is entitled to under the Columbia River Agreement!

– There are hundreds of small generators that could be utilized during peak periods, a few hours a year.

TRUTH:

British Columbia needs about four times it's present electrical capacity if we are to have any hope of replacing fossil energy with green energy. That is because we presently use about four times as much fossil energy as we do from our already green, sustainable hydroelectricity. Even if we could magically "conserve" 100% of our present electrical energy use, that wouldn't reduce our consumption of fossil fuels unless we migrate building heat and light, transportation energy, etc away from fossil sources. In fact ALL our energy use can be supplied by electricity rather than fossil, except for aviation which presently accounts for about 2% of global CO2 emissions. Yes, we should reclaim our Columbia River electricity entitlement to displace fossil energy, but that alone won't suffice to supply the need if we truly want to phase carbon dioxide emissions out of our energy systems.

2. The "Real" Cost of Site C – No figures are given for getting the electricity to people – another 1 to \$2 Billion – maybe more?

The "original cost" of Site C was projected to be \$8.8 Billion. This is equivalent to \$95/MWh, at the point of interconnection, in the Peace region. This was artificially reduced by BC Hydro choosing another more favourable discount rate, from 6% to 5%, creating the illusion of a lower cost for power, \$58 to \$61/MWh. Adding the cost of transmission and distribution to most of the customers, in the Lower Mainland, is another \$1 to \$2 Billion. The actual cost of Site C is now \$145/MWh according to leading economists. Site C is about the 20th of 200 projects in cost. Conservation is the least expensive at one third to half the cost of Site C, followed by many lower cost renewables: small projects better suited to matching any increases in demand.

TRUTH:

“Economics is about the ways we manage supply and demand, which means it is really about everything.”

(see: <http://www.mauldineconomics.com/connecting-the-dots/souped-up-food-production-the-next-big-thing#.WLWqivlXf04.twitter>)

What are the cheapest sources of energy today? The answer is solar photovoltaic electricity, followed closely by wind energy. Clearly, they are the main answer to a carbon-free energy future. But wind and sun are not always available. So the real cost is set by supply and demand: these sources can supply all the energy we need, but not necessarily when we need it. Without hydro-reservoir energy backup, we will have to build 1 megawatt of fossil energy capacity to back up every megawatt capacity of wind or solar. Gas-fired generation might appear cheaper than hydroelectric, but it's obvious this path can never make us fossil-free. Yes, nighttime energy will cost more than daytime energy. That's a reality we must recognize, and plan for.

In the solar & wind era of energy production, electricity will be produced all over the map, not just at a few locations. So the need for trunkline transmission will actually be reduced most of the time. However we will need to modernize our transmission network to a topology more like the internet (with widely distributed producers & consumers) than our present unidirectional, trunkline transmission system.

3. What are the Risks? Interest Rates, Demand for Electricity, Cost Over-runs.

Demand – If the “need” for electricity drops, and a project that is not needed begins with has to be paid for. Wrong assumptions guarantee wrong answers. Mistakes today result in major corrections needed tomorrow. Big mistakes today can result in disastrous consequences tomorrow. When interest rates rise, the project costs will also increase. Remember 1981 when interest rates rose to 18% – that doubles the cost every 4 years! What about inflation, technical complications and wage increases? They will also increase the cost of the project.

TRUTH:

The need for electricity will rise spectacularly if we are to have any hope of avoiding global climate disaster. In Canada, fossil energy still provides about 80% of our primary energy supply, and most of that must be replaced by electricity from sustainable sources.

4. Is New Power Cheaper than Saving Power? NO! Not by a long way.

Conservation – “wasting less” can save as much power as Site C will generate. It will do it at roughly half the cost according to BC Hydro’s own numbers! With an average capacity of 580 MW, the real cost per kW from Site C is \$8.8 Billion/580 MW, or over \$15,000/kW! It is worthwhile for BC Hydro to invest up to \$15,000 to ensure that they could save a single kW of electricity at peak times. That would be serious DSM!

New power will be expensive. Just the interest cost on \$8.8 Billion at 5% is \$440 million / yr.

TRUTH: As noted above, even 100% conservation of our current electrical use (an impossible goal) will not of itself avert climate disaster. And, new electrical power is amazingly inexpensive.

5. Double the Number of Jobs, from Conservation

Conservation – wasting less, will create more than double the number of jobs that Site C will. These jobs will be geographically diverse – across the province wherever electricity is presently used. Under a “Conservation strategy”, workers will not have to relocate for short term assignments, they can stay where they are, keeping families intact and making a difference to their communities.

TRUTH: Solar and wind energy are the greatest job creators in the world today, period.

6. No Utilities Commission Review

The BC government decided and legislated that the Site C power project would be built. The BC Utilities Commission, which until now, oversees every electricity rate review, addition, change or removal, was specifically excluded from reviewing the Site C project. Why? Because the government knew there was no justification for Site C, and rammed it through. No questions asked!

TRUTH:

We will need Site C power whatever the BCUC considers. However it is true that the BCUC would be a potentially useful citizen's forum on how we can expedite our migration to sustainable energy, since the role of BC hydro and other energy utilities must be drastically redefined.

7. Follow the Money – Who “Wins”

On an \$8 Billion project, a lot of people are going to make a lot of money!! Premier Christy Clark and her Cabinet Ministers will be well looked after when they retire from politics, and their patrons remember how much money flowed into their hands during this project, and possibly into re-election campaign funds as well. Watch and see.

TRUTH:

Yes, we should follow the money. So many “environmental” organizations have leapt onto the “stop Site C” bandwagon, we need to ask where the bulk of their funding is coming from. Obviously the fossil fuel industry, which has amassed all the greatest wealth accumulations since the industrial revolution began, feels very concerned about the solar revolution that threatens their very existence. They would be happy to fund, indirectly through intermediary agencies, any organization that will stop the advance of the sustainable energy revolution. Could this actually be happening now? Read “Dark Money” by Jane Meyer if you want the answer.

https://www.nytimes.com/2016/01/13/books/review-jane-mayers-dark-money-about-the-koch-brothers-fortune-and-influence.html?_r=0

There are so many false myths (see #10 as an example) circulating about green energy it is hard not to believe that the “invisible hand” of the fossil fuel industry is doing everything it can to obfuscate and mislead, in order to block the sustainability revolution.

We need to wake up to the fact that British Columbia, with its abundant rainfall and mountains, is especially endowed for generation and STORAGE of electrical energy. The sun shines down on the whole planet, but only places of mountains and rainfall have the ability to massively store non-fossil energy. If we take advantage of this gift of nature, all the world will benefit from climate stability, while British Columbians will be the biggest winners financially.

8. Pork Barrel Politics? “Let’s pretend this is a good idea, and it will create jobs!” It will be our “legacy” project.

For an unnecessary project, with no economic or financial benefit, and a “real” legacy of trespassing and denying First Nations their constitutional treaty rights, flooding an irreplaceable farmland valley, contributing to greenhouse gas emissions and worsening climate change conditions, it is morally obscene for any politician to pretend that this project is of “lasting benefit”.

TRUTH: This project is NOT unnecessary. Please get over this related set of lies.

9. Future Rate Increases – Let Our Children and Grandchildren Pay.

New Supply – BC Hydro’s internal criteria for new projects is that they must be “Incremental” as well as “Lowest Cost”. How is an 1,100 MW massive dam and power plant either incremental or lowest cost? BC Hydro’s own analyses show conservation is the lowest cost! It is also incremental. It was rejected in favour of Site C. Lowest cost, incremental, conservation will reduce future rate increases.

New Connection Costs – Utility rates need to reflect the ongoing cost of new supply. How then, can BC Hydro justify huge incurred costs, with a tiny increase of connection cost?. 200 amp service, or 25kW, costs \$496, or \$500; 400 amp service or 50kW costs \$798, \$800 nominally. Thus BC Hydro is sending a message that it will only cost \$300 for an extra 25k W of capacity. That is about \$12/kW. Remember the \$15,000?

Assuming that Site C will cost about \$8 Billion for 1000 MW of capacity, that would be equivalent to \$8000 per kW, actually \$15,000 (see point 4 above). Yet they are offering it to large residential homeowners with spas, point of use water heaters, air conditioning, and other large loads – radiant floor heating, electric stoves, clothes dryers and water heaters, at \$12/kW. How is that message consistent with a cost of new supply at over \$8000, more than 600 times greater? Wrong messages will not reduce demand, and eventually must be paid for, with massive rate increases.

Recent BCUC hearings attempted to determine an appropriate allocation for residential rates, using an approximate 50:50 split between energy and capacity costs, to be reflected by a rate which is then 50:50 energy and capacity. The folly of these 2015-2016 Rate Design hearings is that a 1100 MW addition, from Site C, is only a 10% capacity/demand increase but results in a 40% increase in debt. What happens to the 50:50 split in 8 years when a 40% increase in costs must be attributed?

A 10% increase in capacity should only result in a 10% increase in costs, ideally. By spending 4 times that amount, 40% debt increase, the capacity allowance should also increase by 4 times, thus the 50:50 split today will be completely wrong in 8 years. Wrong calculations will result in wrong rates, distortions and future corrections are then needed.

TRUTH: The cheapest energy today is (and forever will be) solarPV plus wind plus stored hydro. But all three must happen together to be successful. It should also be noted that our children and grandchildren will need a planet to live on. Good planets are hard to find.

10. Is Site C Really “Green”? No! It is An Environmental Disaster – It Floods Farmland, and Reservoirs Generate CO₂, Methane and Mercury-Contaminated Fish

In a report on the Columbia River Treaty, it was noted that reservoirs require substantial mitigation; there are several recommendations about the nature of these effects. Yet BC Hydro and the Province of BC appear to have ignored these recommendations, as if they do not apply to the “pet project” Site C.

Reservoirs are known to generate CO₂ and methane, as biological processes decompose algae, plant material and flooded riverbed areas. In upstream reservoirs on the Peace, fish are no longer safe to eat because of mercury contamination, another biological process of decomposition in the reservoirs. Traditional First Nations’ food supplies are substantially affected, and have been since these other power plants were developed years ago.

TRUTH:

It is really sad that you are perpetrating the false and damaging myth that reservoirs create CO₂. Carbon dioxide comes from two sources: 1) the carbon cycle of photosynthesis (uptake) and organic decay (release), matched processes that largely remain in balance, and 2) fossil fuels, dug from the crust of the Earth where they have been stored for many millions of years.

Everything on the Earth's surface has some role in the carbon cycle. Reservoirs may be the locale for hydrocarbon decay, but they do not add to it. Decay under water releases methane instead of carbon dioxide, which sounds serious, except free methane has a very short lifetime in the atmosphere before it is oxidized to CO₂. It is item #2, fossil fuels, which form the problem. Nature spent hundreds of millions of years storing carbon in the crust. We thought we could release all that carbon back into the atmosphere in a couple of centuries without consequence. Obviously, that was and is false thinking.

The story is simply this: nature uptakes CO₂ as biomass via photosynthesis, and releases it during decay. It doesn't matter quantitatively whether that biomass is washed through hydro reservoirs, or whether the biomass passes through the intestines of cattle and pigs: the amount released back to the atmosphere will be the same. The only thing that matters is to stop digging carbon out of the Earth's crust and burning it. And that requires us to build solar farms, wind farms, and

hydro reservoirs so as to harvest and store energy. The sun continuously delivers 10,000 times more energy to Earth than we use for all human activity. There is no energy shortage, only a shortage of imagination as to how we collect, store and use it.

Mercury contamination: In the past, methyl-mercury contamination of watersheds occurred when uncleared forests and vegetation were drowned by flooding This mistake will not happen again: Site C is being cleared before the reservoir starts to fill in 2022.

11. Farming Forever? – Flooded Valleys Cannot be Farmed, or “Un-Flooded”

There are 50,000 acres of productive farmland and forests, enough to feed a million people, which will be lost forever. There are hundreds of families and wildlife supported by this farmland, which will be devastated by such an ill-conceived and completely unnecessary project.

The BC Government legislated the removal of this land from the Land Reserve, with no review, as part of the project approval process. This prevented normal reviews and project justification. There is no precedent for such an outrageous act of parliament. They completely ignored their own guidelines and policies.

TRUTH:

The most hilariously outrageous claims have been made that we will starve without the Peace River Valley as farmland. In fact the land to be flooded has never produced that much food; most of it was never farmed or farmable, and what was farmed was mainly for grazing.

Canada's food supply is not limited by arable land, but by economics. Canada's economics in terms of supply and demand and open markets will be vastly more robust with sustainable energy, which is not proprietary, not capital-intensive, not restricted by transportation systems. Sustainable energy will not only avert dangerous climate change, it will vastly reduce economic inequalities. That means, it will deliver a much healthier economy.

12. First Nations Betrayed – Was BC Hydro Invited to Destroy Heritage, Cultural lands, Artifacts and a Way-of-life?

Perhaps the greatest travesty is that both the Federal and Provincial Governments, and BC Hydro, have not complied with the Treaty rights of the First Nations people that will be affected. This is completely unconscionable. Both governments have ignored the needs and wishes of these people. “Mitigation” has been relegated to “buy-offs”. How do you “mitigate” the destruction of a way of life that has endured thousands of years? What does the concept of “heritage” mean, and imply, and what are the consequences of destroying a culture?

TRUTH: The courts, including the Supreme Court of Canada, have ruled otherwise, nine times so far. And remember, Canada's courts have a very strong record of defending aboriginal and treaty rights.

13. What about Geothermal? – “BC Hydro does not have enough data”. During the Joint Review Panel (Federal-Provincial) process it was revealed that BC Hydro had not seriously evaluated the possibility of using geothermal power – “they did not have enough data”. This is inexcusable!

There are hundreds of geothermal power plants around the world. Ormat, one of the leading equipment suppliers and developers, state that “industry average” costs for a 50MW plant are in the range of \$200 – \$250 million US. With an exchange rate of .75 that is under \$350 million Canadian. With a plant output steady at 50MW, it would take 580MW/50MW per plant = 11.6 plants, which would cost in the order of \$4 Billion, less than half the cost of Site C. And it would not be an “all or nothing” case. 50MW plants could be installed as demand grows, not one huge dam – all or nothing! The industry average cost of power is in the order of 5 cents to 7 cents/kWh, as confirmed by the Canadian Geothermal Association. Site C will be in the order of 10 Cents/kWh, possibly more.

TRUTH: Geothermal is a great idea. But we can't say that it will prove cost effective until we've built a few such systems. So far we have none, though the concept has been around a long time.

14. BC Hydro “Accounting” – Living off the Credit Card!

BC Hydro is using “deferral accounts” to hide the real cost of operations and Site C. This is “living off the credit card”, or using “equity” in your house to borrow money to live on. What happened in 2007-2008? People could not afford the payments and sent the US into a depression; the world into a recession. BC Hydro is aiding in creating the next recession – we cannot use debt financing, hidden from public scrutiny without serious financial implications!

TRUTH: Investing in that which will provide a sounder future is always a good choice. Saving the planet is a good economic choice.

15. “Water, Water, Everywhere” – Dammed Water is a Commodity

Under NAFTA, “Free Trade”, Canada cannot restrict exports of “commodities” to the US. Once dammed, the Peace River becomes water, subject to NAFTA. And a thirsty US, with droughts, wants our water.

TRUTH: This argument is totally disconnected from reality. We do have choices, and we choose not to export bulk water.

16. Cumulative Impacts of Projects

When the Joint Review Panel reviewed the “Environmental Impacts” of Site C, the boundaries of the “affected areas” were cleverly designed to exclude existing industry and commercial activities. Thus BC Hydro’s Site C dam was not seen to have a “cumulative impact”. By ignoring the truth, the conclusion was much more easily reached – that cumulative impacts generally were not significant.

TRUTH:

Cumulative impacts are important. In the three decades since climate change became a hot topic, we have made astoundingly little progress towards resolving the climate issue. If you want to talk cumulative impacts, we can scarcely imagine the full cumulative impacts resulting from a world of 7.5 billion people where much of the planet is no longer habitable.

We now have the technological and economic conditions where a rapid transition to solarPV electricity can become our primary energy source, all over the globe. We are right now, simultaneously, at three tipping points in energy, economics and climate. The only thing holding us back from the correct choice for all three crises is the need for capacity for massive storage of non-fossil energy. That is why building hydro reservoir capacity should and must be a vital part of our sustainable future.

Summary:

Actually, there is one other factor holding us back from a rapid resolution of the energy/economics/climate crises, and that factor is political will.

Is it not astounding that in British Columbia, a jurisdiction with enviable opportunities for clean energy storage and generation, not one political party, not even those claiming to be environmental leaders, has acknowledged and embraced this advantage?

British Columbia is facing a provincial election on May 9, 2017. Ask your candidates what they see as necessary leadership for a rapid conversion to non-fossil energy. What role do they see for BC Hydro? What regulatory changes are needed for citizens to become energy producers, not merely energy consumers? Do they recognize Site C as a vital component of the sustainable energy future that awaits us?

Politicians everywhere, and certainly those in British Columbia are no exception, share an extraordinary auditory ability to hear the voices of big money above the cacophony of all other voices. And Big Money speaks as the voice of the fossil fuel industry, where it has resided for the past 150 years. So, alas, be prepared to be disappointed by the answers your candidates will offer you.

But in the end it will be citizens (whether encouraged by their governments or not) who will define how we source and use energy. Many jurisdictions of the world have come to recognize this fact. Hopefully, British Columbians will soon do likewise.

Additional reading:

<http://dreamgreen.ca/einsteinslegacy.html>

<http://www.dreamgreen.ca/WhySiteC.html>

<http://www.dreamgreen.ca/20reasons.html>

<http://www.dreamgreen.ca/sourceorsink.html>

<http://www.dreamgreen.ca/siteC.html>