



A Tale of Two Places

ALBERTA, CANADA AND DENMARK, EUROPEAN UNION

Contributed by William Kay @2015



A Tale of Two Places

This article discusses the Climate Change campaign's impact on two places: the Canadian province of Alberta^{1 2} and the EU member state, Denmark.^{3 4}

Note:

A. All currency amounts are in US dollars.

B. One barrel contains 169 litres.

C. 1,000 kilowatts (KW) is a megawatt MW. 1,000 MW is a gigawatt (GW).

¹ "Alberta in Canada" by TUBS - Own work This vector graphics image was created with Adobe Illustrator .This file was uploaded with Commonist. This vector image includes elements that have been taken or adapted from this: Canada location map.svg (by Yug).. Licensed under CC BY-SA 2.5-2.0-1.0 via Commons - https://commons.wikimedia.org/wiki/File:Alberta_in_Canada.svg#/media/File:Alberta_in_Canada.svg

² Pumpjack image licensed from Shutterstock

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⁴ "EU-Denmark" by NuclearVacuum - File:Location European nation states.svg. Licensed under CC BY-SA 3.0 via Commons - <https://commons.wikimedia.org/wiki/File:EU-Denmark.svg#/media/File:EU-Denmark.svg>

A Tale of Two Places

Alberta, Canada and Denmark, European Union

By William Kay

Alberta



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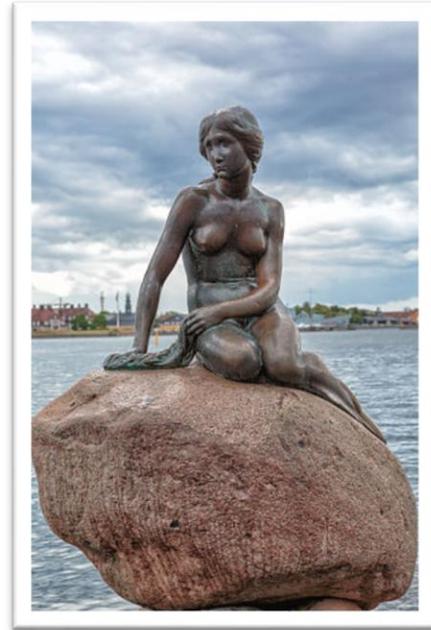
Alberta and Denmark are technologically modern, culturally liberal, constitutional monarchies with democratic customs. Their populations are roughly the same size. Alberta has 4.2 million citizens and Denmark, 5.6 million. Both are wealthy. Alberta has a per capita GDP of \$60,000 and Denmark, \$48,000.

Denmark, European Union



"Vor Frelsers Kirke-view8". Licensed under Public Domain via Commons -

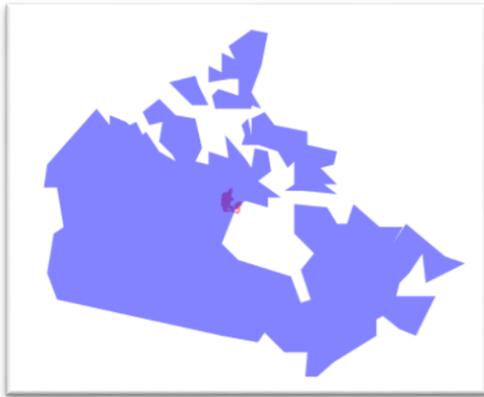
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"Copenhagen - the little mermaid statue - 2013" by Avda-berlin -

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Alberta is more ethnically diverse than Denmark. About 25% of Alberta's population are "visible minority" (of non-European extraction). The remaining 75% hail from a dozen European peoples. Denmark is 90% ethnic Dane. Denmark is also more religious, and much more religiously homogenous, than Alberta.



How Denmark fits into Canada



How Denmark fits into Alberta

The real differences between the two polities arise from the territories they control. Denmark covers 42,916 square kilometers. Alberta is 15

times larger (661,848 square kilometres). Moreover, the two territories have qualitatively different fossil fuel endowments.

Denmark's stake in the North Sea yields 55 million barrels of oil per year, but beyond that, Denmark has no oil or coal. To contrast: in the richest of Alberta's three main oilsands deposits, the Athabasca, petroleum is often close enough to the surface to be mined by open pit methods. The Athabasca field spans 40,000 square kilometres – an area the size of Denmark.



Alberta Oil Sands Mammoth Truck –
Resource work in Alberta involves temperature extremes from $-40^{\circ}\text{C}/\text{F}$ to $+35^{\circ}\text{C}$

Calculating the size of a fossil fuel resource requires estimating both the “ultimate” amount of the resource and then the amount that can be profitably extracted in the near future at contemporary prices with existing technology. A century ago coal mining was a pick, shovel and wheelbarrow affair; hence recoverable reserves were smaller than today. As technology progresses reserves increase.



Coal rich deposits in Canada in areas of light pink (Source: Coal Assoc of Canada)

Alberta’s “ultimate” coal resource is 2 trillion tonnes. The “potential” resource is 620 billion tonnes. “In-place” reserves are 94 billion tonnes. “Initial reserves” are 35 billion tonnes. This is low-sulphur, clean-burning, highly volatile, black coal.

In 2014 coal production was 34 million tonnes. Thus, even by the most parsimonious definition, Alberta’s reserves will last over 1,000 years. The “ultimate” coal resource will last 60 times longer.

Alberta is the world’s fourth largest natural gas producer. Conventional gas reserves are pegged at 223 trillion cubic feet. Coal bed methane reserves are 500 trillion cubic feet. Annual gas production is 4 trillion cubic feet.

Conventional oil reserves are somewhere between a “volume in-place” of 81 billion barrels and “established reserves” of 1.8 billion barrels.

Conventional oil production declined slowly from 1974 until 2011 when horizontal drilling and fracking reversed this trend. Current conventional oil production exceeds 200 million barrels per year.

Alberta's oilsands contain 1.6 trillion barrels of "unconventional" petroleum (bitumen). Proven reserves are 166 billion barrels. In 2014 oil sands output was 840 million barrels. This will rise to 1.5 billion barrels per year by 2024 if projects currently under development come to fruition. Since 1999 about \$150 billion has been invested in the oilsands.

In 2014 the Alberta Government received 30% of its revenues (\$7 billion) from oil and gas royalties. In that year upstream oil, gas and oilsands production employed 133,000 Albertans. Although there is much hand-wringing about over-dependence on unprocessed fuel exports, Alberta does host a substantial downstream petro-chemical industry.

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Extensive refining capacity In Alberta's Industrial Heartland:

http://lifeintheheartland.com/issue_industrial.html

Coal-fired Power Drives Industry in Denmark and Alberta

Affordable in Alberta – Expensive in Denmark

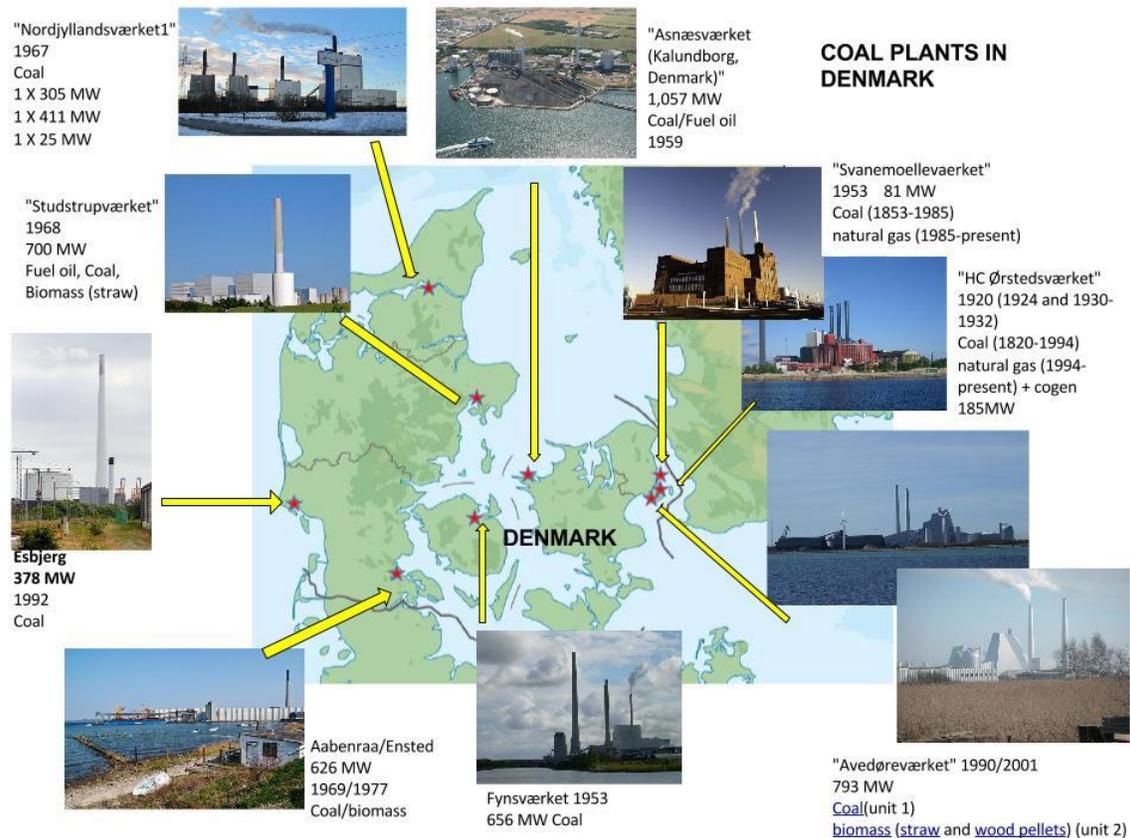
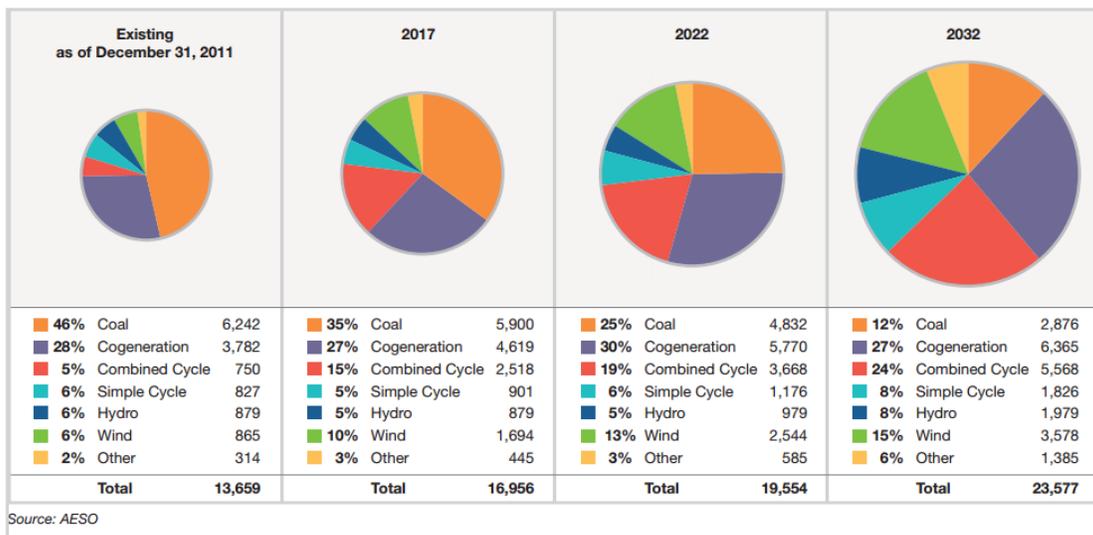


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Both Alberta and Denmark rely heavily on coal for electrical generation and neither has significant hydro-electric capacity. Denmark is densely populated and has no large rivers, hence its hydro-electric potential is nil. Sparsely-populated Alberta is traversed by seven large rivers but no significant hydro projects have been undertaken because the abundance of coal and gas renders hydro uneconomic.

(Alberta’s under-development is high-lighted by comparing its Peace River with Europe’s legendary Rhine. The Peace is 1,923 kilometers long and discharges 2,100 cubic metres of water per second. The Rhine is 1,230 kilometers long and discharges 2,500 cubic metres per second. Fifty cities line the Rhine. Four towns, with a total population of 10,000, grace the banks of the Peace.)

Figure 5.3.5-1: Generation Outlook – Installed Capacity (MW)



Alberta’s electrical generation mix forecast

Alberta has electrical generating capacity of 16,242 MW. Broken down by power source this is: natural gas (44%), coal (38.5%) and wind (9%). There are also small amounts of biomass, hydro and solar power. Renewables of all types account for 18% of capacity. Alberta’s 8 coal-fired power plants can generate 6,270 MW. Most of the 9,000 MW of capacity added since 1998 has been gas-fired.

“Capacity” refers to the maximum potential amount of electricity that can be generated from the source. Wind and solar rarely deliver their nameplate capacity as doing so requires perfect breezes and sunny skies. Actual electrical generation by source is: coal (55%), gas (35%), wind (5%), biomass (3%) and hydro (2%).



Southern Alberta Wind Farm

To appease the climate gods Albertans built Canada's first wind farm in 1993. They completed what was then Canada's largest wind farm (150 MW) in 2012.⁵ Presently, Alberta's 37 wind farms corral 941 turbines with a combined capacity of 1,471 MW. Beyond installing and maintaining imported turbines, Alberta has no wind industry.

⁵ Blackspring Ridge at 300 MW capacity opened in 2013 or 2014.

DENMARK



"DanishWindTurbines". Licensed under CC SA 1.0 via Commons - <https://commons.wikimedia.org/wiki/File:DanishWindTurbines.jpg#/media/File:DanishWindTurbines.jpg>

Denmark's 5,252 wind turbines have a combined capacity of 4,890 MW. 3,620 of those MWs are generated on land; 1,270 from off-shore. Wind accounts for 39% of actual domestic electrical usage; the highest percentage in the world. During periods of low demand wind power surges exceed 100% of demand.

Denmark's first commercial turbine began twisting in the wind in 1979. It was a Vestas 30 kilowatt model. Vestas is now installing 8 MW, 220 metre-high, off-shore models. The tower and turbine of these units weigh 1,300 tonnes. Their anchoring foundations weigh 4,000 tonnes.

Denmark's wind energy industry employs 29,000 workers and enjoys annual revenues of \$9 billion (not including electricity sales). 150,000 Danes either own turbines outright or, more commonly, own shares in local companies that own turbines.

Vestas, Siemens and DONG Energy dominate Denmark's wind industry but hundreds of small specialized firms work the supply chain. Research

and development into wind energy is financed by the big three, and by universities.

Vestas has built and installed 69,000 MW of wind turbines across 74 countries. Siemens Wind Power has 21,000 MW to its credit. (Siemens Wind was originally a Danish firm acquired by the German conglomerate in 2004. Most of its 7,800 employees remain in Denmark.)

DONG Energy, a 76% government-owned utility, supplies half Denmark's electricity from several coal and gas-fired plants. One third of the world's off-shore wind projects were built by DONG. Their 660 MW wind farm off Britain's west coast will be the world's largest. When DONG finishes the 2,080 MW of off-shore projects currently under construction they will have installed 5,089 MW off-shore.

As a sop to environmentalism, Denmark's fossil fuel power plants (7 coal and 2 gas) were accessorized with small bio-mass and wood-chip fired generators. Denmark also has 548 MW of solar PV capacity. Renewables of all types account for 20% of Denmark's total domestic energy usage and over 40% of its electrical generation.

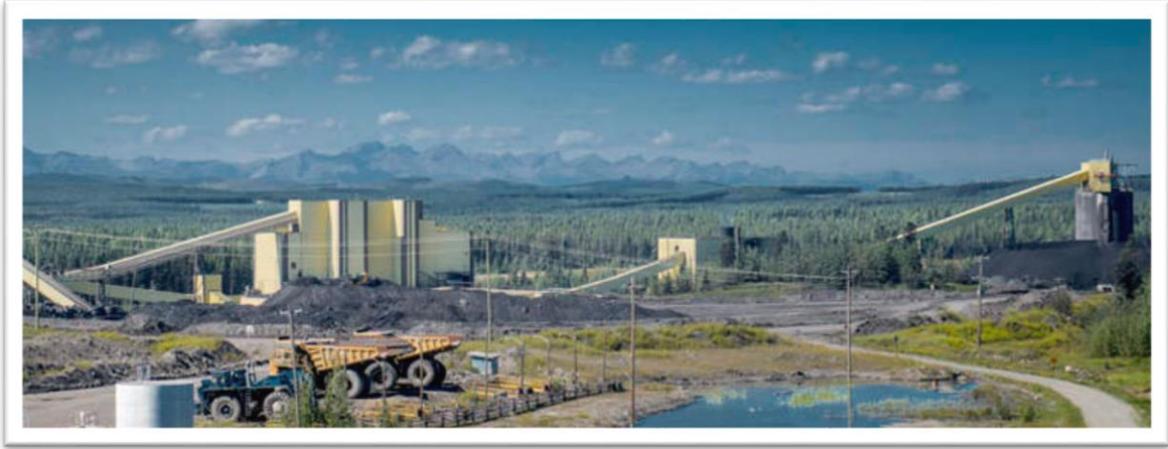
Nevertheless, Danish electricity remains 48% coal-fired. Co-generation from coal plants also heats boilers for centralized home-heating operations. **Denmark imports all its coal, at \$60 a tonne.**



"Lego Color Bricks" by Alan Chia - Lego Color Bricks.

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ALBERTA



Coal Valley Mine – near Edson, Alberta

<http://westmoreland.com/location/coal-valley-mine-alberta/>

Alberta digs up all its coal from Alberta Government-owned coal fields. Mine operators pay royalties averaging 20 cents a tonne.

Electricity prices in Alberta vary from **5 to 10 cents** per kilowatt hour.

Electricity costs **33 cents** a kilowatt hour in Denmark.

The Climate campaign hammered Alberta, in 2012, when, with minimal parliamentary discussion, the Federal Government announced its *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations*. The enabling legislation was the Environmental Protection Act (1999). The regs have not been constitutionally challenged even though historically electrical generation has been a provincial responsibility.

Effective July 1, 2015 proposed coal-fired generators are limited to 420 tonnes of carbon dioxide emissions per GW hour. Coal-fired generators typically emit 950 tonnes per GW hour. New coal-fired plants will require carbon capture and storage attachments which are prohibitively

expensive. Hence, no new coal-fired plants will be built anywhere in Canada; but it is Alberta where coal is most relied upon.

Climate campaigners struck again in November 2015 when Obama shot down the Keystone XL pipeline which would have piped diluted bitumen from Alberta's oilsands to US refineries. Keystone is one of five oilsands pipelines stymied by environmentalists whose principal pretext is Climate Change.

The image is a screenshot of the official website of Denmark. At the top left, the logo reads "DENMARK.DK" with ".DK" in green, and below it, "THE OFFICIAL WEBSITE OF DENMARK". To the right of the logo is a navigation menu with links: "Contact | Media | Visit | Study | Invest | Work". Below the logo and menu is a horizontal navigation bar with a green underline, containing the following categories: "QUICK FACTS", "SOCIETY", "LIFESTYLE", "MEET THE DANES", "GREEN LIVING", and "V". The main content area features an article titled "INDEPENDENT FROM FOSSIL FUELS BY 2050". The article text is as follows:

It is the Danish government's clear opinion that the green road is the one we all need to travel eventually. There is no denying, that there are strong reasons for action. In the coming decades more and more people around the world will achieve the means to a modern lifestyle, that they aspire to.

The global need for energy will continue to rise as a car, a fridge, a city break will become part of the lifestyle of many more people. Our lifestyle has in the past been driven by cheap and easy access to oil, coal and natural gas. That road is not an option, which will be open to us in the future. We will face ever increasing pressures from the twin forces of climate change and the hunt for finite and ever more marginal sources of fossil fuel. One would think, that these two forces ought to be a sufficient spur for action.

The Danish government having seen the writing on the wall has set an ambitious target of weaning Denmark off fossil fuels by 2050. Heeding the words of Winston Churchill, that "however beautiful the strategy, you should occasionally look at the results", the Danish government recently presented "Energy Strategy 2050", also referred to by the Danish minister of Climate and Energy, Dr. Lykke Friis, as a declaration of energy independence – independence from oil, coal and gas.

The strategy clearly defines the first steps towards this ambitious target. Most importantly it will lead to a decrease in Danish dependence on fossil fuels by 33 % in the coming 10 years alone. From 1980 till 2010 the share of renewable energy in Denmark rose from 3 % to 19 %. With this strategy the rise will continue to 33 % by 2020, meaning a full third of our energy will be produced by green energy primarily wind and biomass. Nuclear is – it should be mentioned - not a part of the fossil free Danish equation.

How large a share of wind power is compatible with a stable energy system? In the case of Denmark, that ceiling has not yet been reached. By 2020 nearly half of Danish electricity will be provided by wind power alone. Another 20 percent will come from biomass. By tying our electrical grid into a regional framework and by having a spare capacity backed by biomass, Denmark will continue to have a stable energy system.

Denmark is solidly on the other side of the barricade. A Danish Government web-page headlined: “*Independent from Fossil Fuels*” heralds a revamped government strategy to completely forsake fossil fuels by 2050. The primary components of this strategy are bicycling and wind power. Bicycling has a long history in Denmark but received state-sanctioned revitalization after the 1970s oil crisis. Their wind industry took off at the same time and for the same reasons.

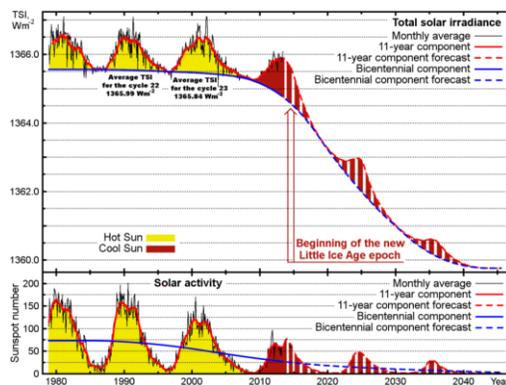
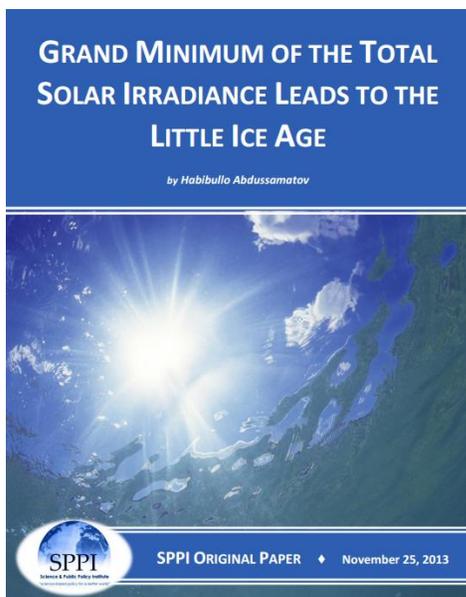
In Alberta “independence from fossil fuels” would cause economic collapse. Two thirds of its population would emigrate.

The Climate Change campaign favors regions without fossil fuels and with cultivated stakes in the renewable energy industry. The Climate campaign hurts regions rich in fossil fuels and possessing substantial infrastructure based on those fuels. Catastrophic Anthropogenic Global Warming is a premeditated, self-serving tissue of lies disseminated by governments from the former regions.

Conclusion

Climate sceptics were recently roused by the Reuters' report: *Russian Media take Climate Cue from a Skeptical Putin* (October 29, 2015). Here we were reminded that Russia's COP21 carbon dioxide emissions reduction pledge, decrypted, actually proposes to increase emissions. Russians will also, again, demand generous discounts for the alleged role their forests play as carbon sinks.

This brushing-off of Climate Change re-appears in Russia's media. While they do not engage in "climate silence" – as some critics allege – Russian journalists regularly air doubts about global warming. Because their media either ignore or question Climate Change, the Russian public generally disbelieve human action is causing catastrophic global warming.⁶



Russian scientist Habibullo Abdussamatov foresees imminent global cooling on the scale of a Little Ice Age.

The Russian media's treatment of this topic conforms to the opinions of Russia's political elite. A former senior advisor of Putin's recounts how

⁶ Many Russian scientists foresee an imminent cold spell of long duration "A Cold Spell Soon to Replace Global Warming" <http://sputniknews.com/analysis/20080103/94768732.html> Habibullo Abdussamatov predicts new Little Ice Age http://scienceandpublicpolicy.org/images/stories/papers/originals/grand_minimum.pdf

in the early 2000s his team extensively studied Climate Change only to conclude “*the anthropogenic role is very limited*” and “*the evidence presented for the need to ‘fight’ global warming was rather unfounded.*”

Putin, himself, on several occasions has quipped about the benefits of a warmer Russia. One critic bluntly asserts that Putin believes: “*there is no global warming, that this is a fraud to restrain industrial development of several countries including Russia.*”

This description of global warming is bang-on accurate; but we need not speak in generalities about which “several countries” are the targets of this exercise in neo-colonial under-development. Nor need we be coy about who is driving the Climate Change campaign; that would be Europe, aided and abetted by Japan, and by certain regional elites in the targeted countries. The targets are Russia, Brazil, Venezuela, and most importantly: the former colonial countries of the English-speaking world.

Europe (meaning the 28 EU members plus Norway and Switzerland) has a population of 521 million and a territory spanning 4.7 million square kilometres. The principle countries of the former colonial English-speaking world (USA, Canada, Australia and New Zealand) have a combined population of 396 million and a combined territory of 27.8 million square kilometres. Their population is 75% of Europe’s but they control six times the territory. Land mass provides natural resources including energy assets.

The USA has far larger coal deposits than any other country. Australia comes in forth regarding coal deposits and Canada tenth. Australia has by far the largest uranium reserves, followed by Canada, with the USA in fifth. Canada has the third largest petroleum reserves; the USA has the eleventh. Both Canada and the USA, separately, contain greater flows of fresh water than does Europe, and by quite a margin. These rivers bring an enormous untapped potential for hydro-electricity that Europe lacks. These countries are natural energy superpowers.

Few European countries possess exploitable coal reserves. Germany has the largest reserves but this is low-grade brown coal. Germany is actually a major coal importer. Europe's only coal exporter is Poland. Europe's oil reserves are found mainly in Norwegian and British North Sea deposits; but neither of their reserves make it into the global top 20. Europe's share of global uranium production is 0.4%.

Looking forward we see a world where access to reliable, affordable, abundant energy will be the primary economic advantage. This world will be powered petroleum, coal, uranium, natural gas and large-dam hydro-electric. Present trends continuing, the natural energy superpowers will drain Europe of its investors, entrepreneurs, tradespeople and laborers. The political campaign to suppress these energy sources, particularly oil, coal and gas, is an existential struggle for Europe. Herein lies the principal motive for the green energy revolution.

A parallel and overlapping motive arises from the eternal struggle between the landed estate and industrial capital. The green energy shift from petroleum to bio-fuels gives a windfall to rural landowners because it redirects cash flows away from petroleum corporations and toward wealthy farmers whose overpriced crops are squandered as fuel. Likewise, the green energy shift away from centralized power plants toward decentralized wind and solar projects also benefits landowners, especially rural landowners near major electricity markets, upon whose lands wind turbines and solar farms are usually situated.

First came the regulations and subsidies, then came the artificial constituency of industrial firms specializing in green energy infrastructure and services. These firms now number among the chief drivers of the Climate Change campaign. These firms are in great measure, directly or indirectly, owned or controlled by European governments and Europe's landed estate.

The climate-industrial complex is a construct of European governments overpowered by a resurgent landed estate. Painstakingly, meticulously, girder by girder, subsidy by subsidy, they assembled a towering edifice; impressive in scale, but alas, lacking in utility. Eiffel's tower is an apt symbol for COP21.



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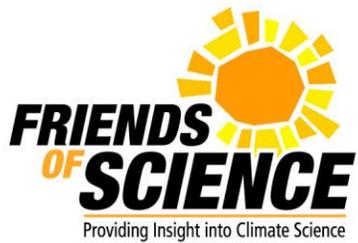
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“A Tale of Two Places” is part three of *“Post Paris: Climate Talks and Geopolitics”* is a trio of research papers contributed to Friends of Science Society by William Kay © 2015. Mr. Kay is author of the web-site “Environmentalism is Fascism.”
<http://ecofascism.com/>

These are Mr. Kay’s opinions based on his research.

About

Friends of Science Society is a non-profit, run by a volunteer board and funded by individual members. The organization has no industry affiliations and researches the evidence over the ideology on climate change science and policy. Friends of Science Society has spent a decade reviewing a broad spectrum of literature on climate change and have concluded the sun is the main driver of climate change, not carbon dioxide (CO₂). Friends of Science welcomes earth, atmospheric and solar scientists, engineers and citizens who challenge the alleged consensus on climate change.

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