



WEEKEND READING

Shedding the light on what's happening - our world - our finances - our times

An Electrifying Future

We're looking at electrical power generation this week.

Wildfires fanned by hurricane force winds devastated Lahaina, Maui this week. The death toll is already at over 50, with local officials fearing the worst. Over 1,000 buildings were razed to the ground.

The devastation of Lahaina is a terrible reminder of the potential losses a changing climate can bring. The event confirms our comments on where we think Canadian government resources need to be focused. We believe our national and local governments need to focus on what Canadians can control within our borders.

The late 20th century boom in energy supplies of all kinds, driven by dramatic productivity gains in hydro-carbon energy, favored centralized, utility-scale electrical power. The resulting abundant and dependable electricity enabled many of our lifestyle improvements. Refrigerated transport brought us fresh goods from 1,000s of miles away. Electrical power keeps those goods cool and fresh in a super-store, then at home. Computers are finicky things requiring much more stable power sources than was common in the first half of last century. We've discovered that energy boom has a cost, air pollution from the wasted, unused portion of hydrocarbon's available energy dumped into the atmosphere.

Most North Americans don't give electrical power much thought. Canadians flick a switch and the lights come on. Power is (currently) so abundant and cheap (in Canada), we don't bother to turn the lights off when we leave the room. Our water is heated, and if future regulations bear out, 100% of our homes will be heated and cooled by electrical power. Our cars are to be electric. Power demand will rise. Few of us consider power demand costs until it hits our wallets, let alone the effect on industry and jobs.

We think this will change.

From NBF's Daily Energy Note Aug 9, 2023

Musk says US electricity demand will triple by 2045 as a result of EV adoption. That is a big number, and well ahead of utilities like PG&E who see more like a 70% rise over the next 20 years while McKinsey suggests electricity demand in the US will double by 2050. And the US National Renewable Energy Laboratory put the number at 60% vs. 2022 assuming 88% of cars on the road in 2050 are EVs.

From an article in the WSJ: **Elon Musk Says We Need Way More Electricity. Is He Right? Aug 8, 2023**

<https://www.wsj.com/articles/elon-musk-says-we-need-way-more-electricity-is-he-right-b51316ca>

"In theory, the U.S. has an enormous pipeline of power projects in the works: over 2,000 gigawatts of planned capacity and storage, nearly all of it renewable, were in the grid connection queue at the end of 2022, according to the Lawrence Berkeley National Lab. Incentives in the newly minted Inflation Reduction Act and the 2021 bipartisan infrastructure law should help dramatically boost clean power construction: Total generation capacity of all types, including gas and coal, was only about 1,200 gigawatts in 2022.

But in reality, investment in electric power construction has slowed sharply this year—just as overall U.S. manufacturing investment is ramping up, in part due to tax credits from the IRA and other related industrial-policy legislation like the CHIPS semiconductor law. Real, annualized private manufacturing construction investment rocketed higher in the second quarter of 2023, according to figures from data provider CEIC. But private power-sector construction investment actually fell. Total clean power installations were down 19% year over year in the first half of 2023 according to the American Clean Power Association, and newly announced purchasing power agreements were down 47% in megawatt terms.

A big part of the problem appears to be rising waiting times for grid connections—an issue that is part politics and part a consequence of the nature of wind and solar plants, which require more grid development because of their intermittency and oft far-flung locations. A lack of clear legal guidelines on who should pay for long-distance transmission lines and how to resolve permitting disputes could strangle the renewable build-out in its crib, unless Congress or federal regulators act quickly. This year's unexpectedly strong surge in manufacturing investment raises further uncomfortable questions. The 2018 NREL scenarios assumed that U.S. industrial energy demand growth would remain tepid through 2050, even as EV power demand soars. But if U.S. industrial policy succeeds, for better or worse, in triggering a sustained manufacturing investment boom over the next decade, those projections could prove too conservative. And that is before accounting for a potential artificial intelligence arms race or other electricity-intensive new technologies that could come out of left field.

- Nathaniel Taplin"

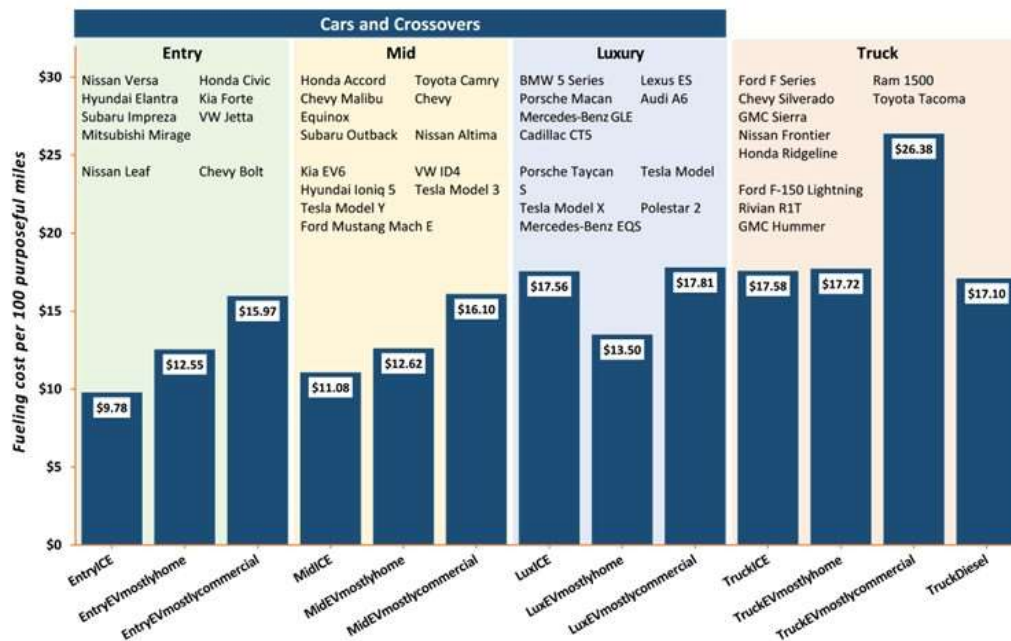
We've predicted increased building code restrictions and rising temperatures would increase home air-conditioning demand. We believe regulatory enforced electrification of transportation will dramatically increasing the demand load on electrical power utility grids. We advised concurrent government regulations are replacing near proximity, centralized, stable electrical power sources with irregular, decentralized ones. An irregular power supply drawn from greater distances requires more redundancy and infrastructure. Redundancy means lower productivity per unit of energy available.

Enduring productivity gains come from working smarter, not harder. Productivity enables a business to thrive, enhancing the income of their owners. Profits breed competition. Competitors need workers enhancing their value, forcing the owners to share the benefits. Gains in productivity enable wage gains. The resulting earnings buy more goods at cheaper cost. Improved productivity is the only path to improved lifestyles. Falling productivity means inflation. Sound familiar? This why we harp on productivity and power.

Speaking of costs, we found the following chart and commentary comparing the current cost of fueling ICE vs EV's in the USA on Allan Brooke's Energy Musings Aug 8, 2023 posting.

<https://energy-musings.com/energy-musings-august-8-2023/>

Anderson Economic Group Vehicle Fueling Cost Comparison, Q2 2023



Source: Energy Musings Allan Brooks, AEG.

“The AEG calculates four categories of costs for fueling EVs and ICE vehicles. Their detailed methodology is designed to capture real-world U.S. driving conditions, as opposed to an estimated cost or by surveying personal experiences. The four cost categories include:

- The cost of underlying energy (gas, diesel, electric).
- State excise taxes charged for road maintenance.
- The cost to operate a pump or charger.
- The cost to drive to a fuel station (deadhead miles).

AEG explained that state excise taxes and the cost to pump are embedded in the retail fuel price for ICE vehicles. Each segment's calculation reflects the cost per 100 'purposeful' miles, which are miles driven after considering the cost of driving to a commercial gasoline or electric charging station if not charging at home. By adjusting assumptions about the



frequency of using commercial charging locations that impacts costs for EVs, AEG develops 24 fueling cost scenarios.

These costs are compiled and compared. There are three groupings of passenger cars reflecting price levels, fuel efficiencies, vehicle sizes, etc. There is also a comparison grouping for trucks. The conclusions of the 2Q 2023 analysis are shown in the accompanying chart published by the AEG, along with representative models for each category.

For Entry and Mid vehicles, ICE vehicles were cheaper to fuel than charging mostly at home, and much cheaper compared to mostly commercial charging. For the Luxury category, ICE vehicles were more expensive to fuel than comparable EVs charged mostly at home, but slightly cheaper than those EVs charged mostly at commercial charging stations.

One wonders how this fueling analysis might change in the second half of 2023 if oil prices remain elevated or go higher. For the first six months of 2023, the average Weekly U.S. All Grades All Formulations Retail Gasoline Prices (Dollars per Gallon) reported by the Energy Information Administration was \$3.59. For July and the first week of August, the average price is 5% higher. For the Entry and Mid categories, ICE vehicles were 22% and 12% cheaper than EVs charged mostly at home, so higher gasoline prices do not suggest a complete erosion of their fueling cost advantage. We also assume that residential electricity prices will increase in the second half of the year. While Rhode Island is not a needle-mover for U.S. electricity demand and prices, its residential customers will be paying 24% more for their power this fall and winter than during last spring and summer. We know other states also have seasonal pricing and are going through periodic rate increase determinations, too.

Mr. Brooks notes “...Entry and Mid vehicles, ICE vehicles were cheaper to fuel than charging mostly at home”. This assumes the EV owner has ready access to EV charging at their residence. This can be an issue in a mobile home park or apartment block.

This kind of comparison becomes skewed in Canada where electrical power is dominated by government-controlled entities – think BC Hydro. In British Columbia electrical power is subsidized by taxpayers. Voters don’t like power bill increases. Political pressure to shield voters from cost increases forces those costs onto the Crown corporation. As the corporation can’t go broke the losses are ultimately born by the government. They become buried in debt schedules. Simple math says that can’t continue, but the piper’s payment could be well beyond the tenure of current leaders. ‘Someone else’ pays.

Canadians driving gasoline-powered ICE engine cars have the opposite experience, paying Provincial road and carbon taxes out of their disposable income – now. The resulting ‘savings’ for EV drivers are thus a false economy as their savings end up as government deficits and ultimate debt. Like voters, most drivers don’t care. Their pocketbook matters, not ‘someone else’s’. Productivity suffers.

Advocates counter: ‘There are no jobs and no money on a dead planet’.

Our stance has been that when consumers/voters face the results of reduced productivity, they would rebel. Unfortunately, this opens the door to populist politicians of all stripes, blaming Big Business, Capitalist Greed, Progressive Elites or even immigration for the outcomes of lost productivity. Their solution is to impose more regulations and more tax, promising to hand the money to the downtrodden. In reality, tax revenues fall short of promises made. The result is rising debt and interest service costs. The rising debt service requires yet more tax revenue. Rinse and repeat. We're seeing this in Canada. There is no free lunch and there is no 'someone else's money'. Venezuela is an extreme example.

We've poured over the regulatory energy and associated tax policy changes. We don't see productivity gains. We see rising costs. In some cases, rising costs are a policy target. A belief those costs won't be inflationary is mysterious.

Example: Oddly, nobody in New York City wants to see wind turbine towers dotting Central Park. They want them at least 20 Kms (13 miles) offshore, far enough over the visible horizon not to impose on the view from a 30-meter (100 foot) tall ocean front mansion on Long Island.

Servicing remote wind turbines and transmitting the power with associated line-loss through an extremely hostile, saltwater environment is far more expensive than adding capacity to an additional natural gas fired power plant already near the city. We've not seen debates on national energy security in times of conflict. Offshore wind towers would be an obvious target during hostilities. Building wind towers in the bucolic splendor of upstate New York enrages NIMBY's. The result will be higher cost power, not lower. Back to the subsidy idea. Maybe even mailing out cheques.

The risks seemed obvious. Rising demand vs. an unstable supply means wider swings in the prices for power, leading to increasing costs. Increased cost with reduced predictability increases the required profit to manufacturers. Businesses must increase prices, reduce capital expenditures, and reduce operating costs. Wages are typically the largest line-item cost for businesses (and governments). Rising inflation with suppressed wages. I graduated high school in 1975. It was hard finding work. The 1970's were an example of increasing the cost of energy without increasing productivity.

We've seen work analyzing global shipping costs. Heavy Fuel oil power shipping costs roughly \$750 per ton. Methanol and Ammonia power comes in \$1,200 per ton. Hydrogen power comes in at \$7,000 per ton. Do the math.

Data source here: <https://energy-musings.com/energy-musings-july-19-2023/>

The build-out to full power coverage after redundancies will be eye-wateringly expensive. We've predicted power prices could rise much faster and higher than has been claimed. Pick your scenario. Based on today's technology, none are likely to result in cheaper, faster, more abundant, or more productive electrical power. We also predict this will change. Humans are crafty. When we need something, we figure out how to get it.

Raising these concerns is not 'climate denial'. We're just following supply vs. demand. We need to understand the challenges and where the solutions will come from. We've paid particularly close attention to two areas in North America, Texas (demand) and the US Eastern Seaboard offshore wind projects (supply). Both areas are confirming our concerns.

'Texas Power Use Hits New High Again Amid Heat Wave' Reuters Aug 7, 2023

<https://www.usnews.com/news/us/articles/2023-08-07/texas-power-use-hits-record-high-again-amid-heat-wave#>

'US offshore wind power development expanding beyond the East Coast in 2023' S&P Global

<https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/051723-us-offshore-wind-power-development-expanding-beyond-the-east-coast-in-2023>

How has the pursuit of alternative electrical power worked for investors?

We've warned that capital was flowing into 'green' funds without careful consideration of productivity or investment returns. We've also warned that artificially low borrowing costs were leading to malinvestment. Putting these two factors together is a recipe for a mess...eventually.

From 2015 to 2022 the Govt of Canada's 10-year maturity borrowing cost was 1.8% or lower. Mortgages and commercial loans are priced off that borrowing yield. Commercial borrowing was as low as 2.5% while personal mortgages were close to 1.25%. Both rates were at or below inflation for much of that period. IE 'free' money. In a background of very low borrowing costs any idea can work (for a while). If your cost of capital is 2%, making a 3% return = a 50% return on costs. It's easier to convince investors to be patient when their alternative is basically zero after inflation.

Money begets more money. The more prices rise the more investors suffer Fear Of Missing Out (FOMO). Throw in some 'madness of crowds' + FOMO and Voila you get no-limit money with no questions asked.

The current 10 yr Govt of Canada borrowing cost is 3.6%. Prime commercial lending rates have expanded above the govt yield to around 5.5% - closer to the long-term average of Govt Cda yield +1-2%. Rising rates discourage malinvestment. The accountants have their revenge. Risk becomes pricier. Current higher risk lending rate are north of 7%. If the cost of capital climbs to 7-8%, that 'someday' 3% return is a fish sandwich that's been left in the sun for 2 days. Operating losses are no longer tolerated. Investors flee.

This week Canadian energy producer Algonquin Power announced a dramatic shift in their business goals.

Press Release

Algonquin Power & Utilities Corp. Will Pursue Sale of Renewable Energy Group Following Strategic Review; Announces 2023 Second Quarter Financial Results

Company Release – 8/10/2023

	Three months ended			Six months ended		
	June 30			June 30		
<i>All amounts in U.S. \$ millions except per share information</i>	2023	2022	Change	2023	2022	Change
Revenue	\$ 627.9	\$ 619.4	1 %	\$1,406.5	\$1,352.6	4 %
Net earnings attributable to shareholders	(253.2)	(33.4)	NM	16.9	57.6	(71) %
<i>Per common share</i>	(0.37)	(0.05)	NM	0.02	0.08	(77) %
Cash provided by operating activities	261.4	135.3	93 %	294.7	301.6	(2) %
Adjusted Net Earnings ¹	56.2	109.6	(49) %	176.0	250.7	(30) %
<i>Per common share</i>	0.08	0.16	(50) %	0.25	0.36	(31) %
Adjusted EBITDA ¹	277.7	289.2	(4) %	618.7	619.4	— %
Adjusted Funds from Operations ¹	154.2	180.3	(14) %	367.8	400.6	(8) %
Dividends per common share	0.1085	0.1808	(40) %	0.2170	0.3514	(38) %

¹ Please refer to "Non-GAAP Measures" below for further details.

Source: company website

The company posted a 253 million loss for the quarter that saw earnings decline. The company is following a pattern by suddenly exiting the 'alternative energy' space with large losses to show for it.

Algonquin Power (AQN-TSX-\$10.13) monthly ranges – 20 years



Source Refinitiv – Steve Hilberry NBF

Last trade around \$10. When this stock was first issued in Nov/2003 it went public at \$10.00 Other than annual distributions, at current prices, there has been no price return for 20 years.

While investors must keep their Big Boy and Big Girl pants on and have only themselves to blame for their own losses, much can be tied to overly loose lending + unrealistic policy goals. NOTE: Unrealistic, not undesirable.

With any supply constraint there will be losers, winners, and money to be made. We're focused on existing suppliers of what we think will become more valuable. We think the demand for hydrocarbon energy has been incorrectly discounted. We own conventional energy companies Suncor (SU-\$42.79), Chevron (CVX-\$162.51), Exxon (XOM-\$111.54), the SPDR Energy Fund (XLE-\$89.43), and Australia's BHP Group (BHP-\$59.16). We think energy delivery demand will increase. We own energy transmission companies Enbridge (ENB-\$49.00), TC Energy (TRP-\$48.97) Pembina Pipeline (PPL-\$41.85). We think electrical power demand will climb. We own electrical and natural gas energy utility companies Capital Power (CPX-\$40.22), Emera (EMA-\$51.76) and Fortis (FTS-\$54.50). We believe manufacturing companies engaged in energy expansion industrial construction and small-scale power generation will profit. We own Caterpillar (CAT-\$284.72) and Cummins (CMI-\$239.40). We think rising temperatures will increase air conditioning demand. We own Carrier Global (CARR). Sadly, we may see rising costs leading to a fade of the global trade 'Peace Dividend'. This could result in heightened geopolitical tensions. Is Russia's invasion of Ukraine the cause or result of these factors? Maybe both. We own defense contractor Raytheon (RTX-\$87.57). Most of the above names are up significantly since we bought them.

We also believe we will be required to change our minds on many of the above. The ability to move, and the timing will be key to making and keeping the money.

DISCLOSURE: I own all of the above names, hold them in family accounts and for client accounts over which I have discretionary trading authority. I, we have traded in all of them within the past 60 days. Such ownership is not to be construed as a solicitation to purchase securities.

We're giving readers a summer break. The next Weekend Reading will be posted Sept 8, 2023. Anna's YouTube postings will continue. School's out for two weeks.

Steve & Anna Hilberry



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FOR THE RECORD August 11, 2023

DOW INDUSTRIALS:	35,305
S&P 500:	4,471
S&P/TSX COMP:	20384
WTI:	\$83.38
LOONIE IN \$USD:	\$0.7451 \$US

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