
*Alberta Federation of Labour written submission to the
Standing Committee on Natural Resources study:*

Creating a Fair and Equitable Canadian Energy Transformation

*Gil McGowan
President
Alberta Federation of Labour
June 10, 2022*



Table of Contents

DISRUPTING THE GLOBAL ECONOMY: LONG-WAVE INNOVATION	4
ENERGY, TRANSPORTATION SECTOR DISRUPTION AND ENERGY TRANSITION	6
How do energy transitions work?	6
The Gestation Phase	7
When Key Technologies Introduced to Market	7
The Disruptive Phase.....	7
Approximate Inflection Points for Key Technologies	8
Market Dominance Phase.....	8
When Key Technologies are Likely to Dominate Market.....	8
Transportation is All-In on Electricity	9
Exponential growth of EV adoption	10
ALBERTA DISRUPTED - AN EXISTENTIAL THREAT TO OIL AND GAS	11
Alberta's Kodak mistake.....	11
What if Canadian oil and gas companies are wrong?	12
THE RESPONSE TO DISRUPTION ALBERTA REALLY NEEDS	14
1. Adopt assertive, long-term industrial policies.....	15
2. Adopt a proactive labour market policy	16
3. Implement a public investment policy with an emphasis on public ownership ..	16
RECOMMENDATIONS	16
1. Help Oil and Gas Workers, Communities	16
2. Preserve As Many Oil and Gas Jobs As Possible.....	17
3. Transition Bitumen and Gas from Feedstock for Liquid Fuels to Feedstock for Manufacturing Materials.....	17
4. Invest Heavily in Emerging Clean Energy Sector.....	17
CONCLUSION	18

Oil and gas is the foundation of Alberta's economy, with 139,000 direct employees and hundreds of thousands more indirectly supported by the industry. The resource is owned by the people of Alberta and Albertans should be front and centre when deciding the future of the hydrocarbon sector, which is facing an existential crisis as the energy transition accelerates.

Energy's future is clean, abundant, cheap electricity and low-carbon fuels like hydrogen, not fossil fuels. That future is arriving faster than anticipated. What was once expected to happen during the early 2030s (the rise of electric vehicles, for example) is happening today. A combination of new, efficient, low-cost technologies and ever more aggressive climate policies will ensure that trend continues.

According to BloombergNEF's EV Outlook 2022, the internal combustion engine has already peaked. Fewer vehicles every year will be fueled by gasoline and diesel. Growth in ground transportation, which accounts for half of all oil demand, will be electric or hydrogen. If technologies and policies remain as they are today, by 2050 oil demand for transportation will decline by 25 million barrels per day, a 25 per cent drop from the current total demand of 100 million barrels per day. If global governments are serious about net-zero emissions, demand will fall 75 per cent by mid-century, according to the International Energy Agency's net-zero by 2050 scenario.

Can Alberta oil remain competitive? We don't know. No government department or independent economist has modelled whether Canadian oil and gas can survive long-term low prices. Oil companies' model for their own purposes, but don't release their calculations so their assumptions cannot be independently verified.

We do know that an oversupply of just 1.5 to 2 million barrels per day crashed oil prices in late 2014, with prices plunging from a high of over \$100 a barrel to \$26.70 by 2016. Shortly after the crash, overproduction and reduced shipping capacity caused huge price differentials between the global price of oil and Alberta oil — at its peak, the differential was up to almost \$46. The provincial government had to restrict production by 325,000 barrels per day to prop up prices. The COVID-19 pandemic worsened the situation, causing a massive decrease in demand for oil to the extent that prices were actually negative for a few days. Albertans remember these years as a giant economic bust. Unemployment was high, government revenue dried up, and prospects were bleak.

Those examples suggest that Alberta won't fare well after 2030, which is less than a decade away. In the energy sector, that's the blink of an eye. The UCP government

barely acknowledges the energy transition, let alone that it poses an existential threat to the Alberta economy. There is no energy plan, no climate plan (it ripped up the NDP's Climate Leadership Plan after forming government in 2019), no labour market plan to help workers adapt to the fast-approaching new reality. Instead, Premier Jason Kenney is doubling down on the status quo, calling for more pipelines and much higher raw oil and gas exports.

That approach will end in catastrophe for Alberta and its workers.

A new approach is needed. One that doesn't leave the fate of the provincial economy to markets alone. An approach that is based upon a new vision, planning, and public investment. Workers need to be front and centre, not excluded or treated as an afterthought.

Alberta has just eight short years to change course. Every year, every month, every day that we tarry is lost time while the window to act slowly closes.

DISRUPTING THE GLOBAL ECONOMY: LONG-WAVE INNOVATION

Many economists believe that the global economy is being disrupted by the 6th long wave of innovation (see Figure 1). An innovation wave begins when new technologies are introduced to markets, disrupting existing business models. The current wave is likely to be shorter and more intense because of the volume and sophistication of innovations like artificial intelligence, robotics, automation and clean tech. These innovations will accelerate the impact of new energy technologies like wind and solar power, battery storage, smart grids, and e-mobility that underpin the energy transition.

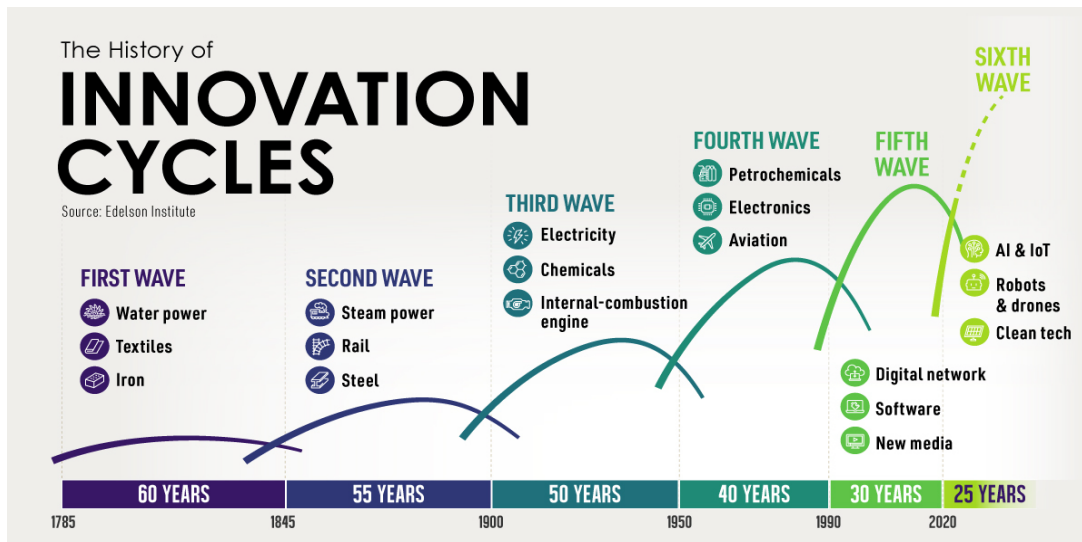


Figure 1: Innovation Cycles (source: Edelson Institute)

The greatest degree of disruption will likely occur during the 2020s as many of the new technologies pass the inflection point on their S-curves (see below for an explanation of S-curves). Disruption in one sector will reinforce disruption in other sectors. For example, artificial intelligence will enable more efficient power grids, autonomous vehicles, and the digitalization of oil and gas operations. This will lead to geometric innovation, which will be supported by the unprecedented levels of human capital (science, engineering, patents, technical expertise, etc.) that characterize the 6th wave.

The takeaway for Alberta is that the two sectors most germane to the provincial economy, energy and transportation, are arguably the most disrupted at this stage of the 6th wave. The rise of low-cost, abundant, cheap electricity will ensure there is enough fuel to support the electrification of transportation. And smart grid innovations will help utilities build out the infrastructure needed to supply that clean energy where and when it's needed. Disruptive battery innovations like new chemistries will dramatically improve the range and lower the cost of EVs while supporting the diffusion of many new forms of e-mobility, like robo-taxis.

Alberta oil and gas leaders believe they have decades to surf the innovation waves of the energy transition. In fact, they have only years, a decade at most. The disruption unleashed by the 6th wave of innovation will almost surely catch them by surprise. The COVID-19 pandemic and Russia's invasion of Ukraine are shocks that will further accentuate and accelerate the 6th wave.

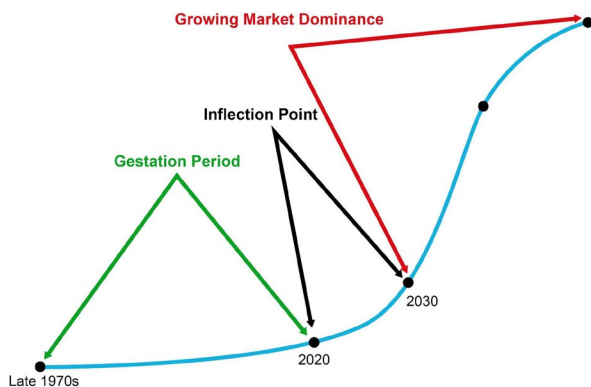
ENERGY, TRANSPORTATION SECTOR DISRUPTION AND ENERGY TRANSITION

In the simplest sense, an energy transition is the substitution of one source of energy for another. For example, cheap petroleum and the internal combustion engine displaced steam and animal-power during the first half of the 20th century while new energy sources (natural gas, nuclear) were added during the second half. The current energy transition involves switching from coal, oil, and gas to clean electricity and low-carbon fuels like hydrogen.

This energy transition is different from the previous one for three reasons. The first is the climate change imperative to transition off fossil fuels and achieve net-zero greenhouse gas emissions by 2050. Government policy will play a much bigger role in this transition. The second is that the lower costs (a few cents per kilowatt-hour) of renewable electricity from wind and solar coupled with the higher efficiency of electric motors and heat pumps, for example, create greater value for consumers. Third, the scope and complexity of the global energy system is so much greater than in the past.

How do energy transitions work?

Energy transitions start when a new group of technologies emerge whose costs are significantly lower (often by one-tenth to one-quarter) than existing technologies. These technologies also offer significantly more value for adopters.



Transitions follow a pattern that looks like an S-curve: 1) adoption of new technologies is very slow at first because they are expensive and unreliable; 2) when the technologies eventually become competitive, there is a decade of intense disruption as the new technologies begin to displace the old ones; 3) The disruptive decade is then followed by decades of moderate growth as the new technologies push the old one mostly or completely out of the market.

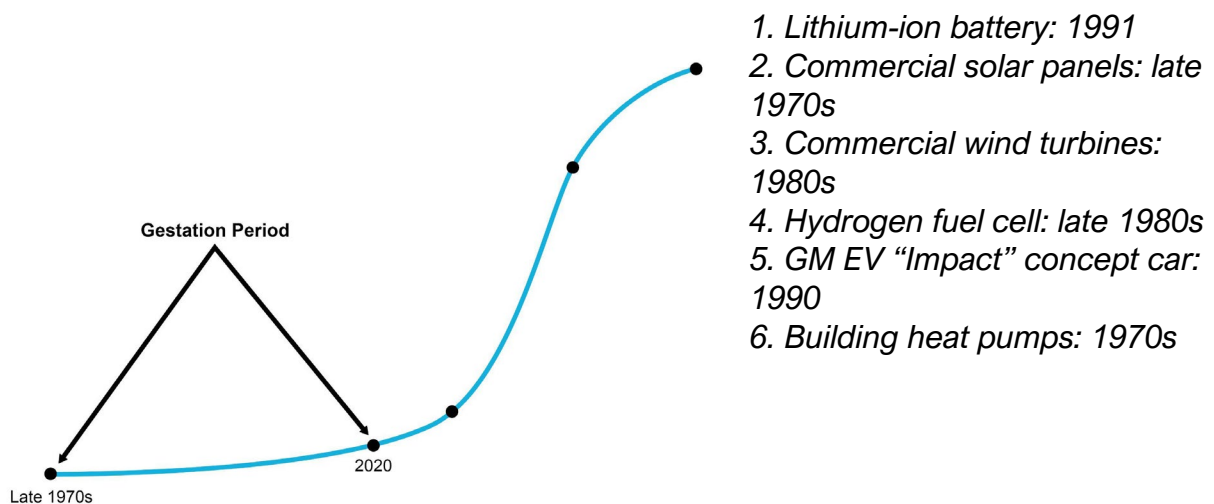
We cannot emphasize this enough: the gestation phase of this transition is already mostly completed and the disruptive phase has begun. Wind, solar, and storage (primarily batteries) are disrupting the power sector. Light-duty electric cars and trucks are disrupting the transportation sector, with medium-duty (e.g. buses, delivery vans) EVs already being adopted in large numbers.

The 2020s are the disruptive decade of this transition.

The Gestation Phase

This phase is very slow and characterized by plenty of experimentation and failure. The types of adopters that buy the new technologies during this phase include Innovators (think kids camping out for three days in front of the Apple store to get the latest iPhone) and Early Adopters (also buying the latest iPhone, just not camping out to be first in line). These two groups make up about 15 per cent of all consumers.

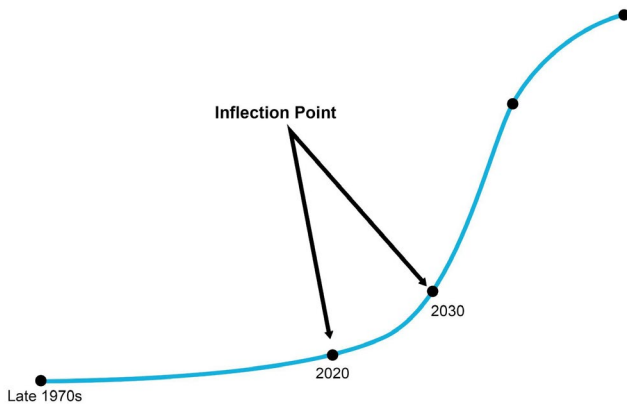
When Key Technologies Introduced to Market



The Disruptive Phase

This is when change begins in earnest. Think of crude oil in the modern context. Public opinion is against it because of climate change and opposition from environmentalists. Investors hesitate to commit capital. And governments pass policies that favour oil's competitor, clean electricity, and penalize hydrocarbons because of greenhouse gas emissions.

Approximate Inflection Points for Key Technologies

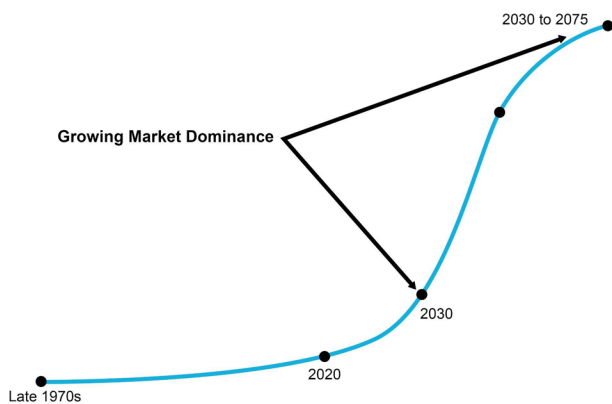


1. Lithium-ion battery packs for EVs: early to mid-2020s
2. Commercial solar panels: 2020
3. Commercial wind turbines: 2020
4. Hydrogen fuel cell: 2030
5. GM EV "Impact" concept car: 2022 to mid-2020s
6. Building heat pumps: 2020s

Market Dominance Phase

Eventually, the new energy technologies push out the old technologies and dominate their markets. The speed of this process varies depending upon the technology. For example, demand for natural gas is expected to last longer than oil because it burns cleaner than coal and oil, and it is used to heat buildings, something electric technology isn't as good at yet.

When Key Technologies are Likely to Dominate Market

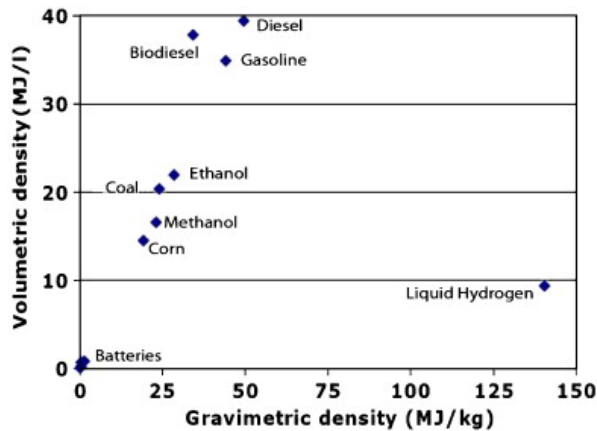


1. Lithium-ion battery packs for EVs: early to mid-2020s
2. Commercial solar panels: from late 2020s
3. Commercial wind turbines: from late 2020s
4. Hydrogen: 2030 to 2040
5. Electric vehicles: from late 2020s
6. Building heat pumps: 2030s

Transportation is All-In on Electricity

“...the strategy for most OEMs is clear; there is no alternative but to fully commit to electrification.” - Source: “Pivoting to an Electrified Future The Automotive Industry Amps Up,” IHS MarkIt/S&P Global

The triumph of electricity as a ground transportation fuel is rooted in the relative efficiencies of the internal combustion engine and petroleum vs. electric motors and batteries.



The thermal efficiency of gasoline ICEs ranges between 20 per cent and 30 per cent, rising to 40 per cent to 50 per cent for diesel ICEs. That means between 50 per cent and 80 per cent of the energy in the fuel is wasted. For practical purposes, raising ICE efficiency is impossible; that energy density is fixed and cannot be improved (see graphic to left).

The thermal efficiency of an electric motor is very high, well over 90 per cent in an EV, but the energy density of batteries is well below that of gasoline and diesel (see graphic).

Until the past few years, the ICE/petroleum combination was more economical than the electric motor/battery combination because of the incredibly high energy density of gasoline and diesel.

But the rising energy density and falling costs of batteries have eroded the ICE advantage to the point where the cost per kilometre driven is much lower for an EV. Energy density is forecast to continue rising for the next decade or more thanks to vigorous innovation that will also cause EV battery packs to fall from their current \$132 per kilowatt hour (kWh) to under \$50 within a decade.

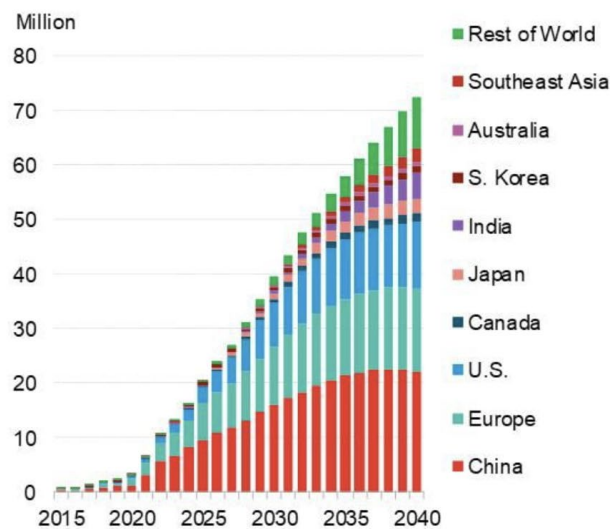
No wonder most major automakers have said they will abandon the internal combustion engine between 2030 and 2035. The major manufacturers have committed \$336 billion by 2026 and \$411 billion by 2030 to the switch to electric. This list doesn't include smaller manufacturing companies like Volvo or countries like China and India that have large automobile manufacturing sectors. Nor does it include medium-duty (think

delivery vans and garbage trucks) and heavy-duty (think semi-trucks) vehicles. Or buses, two and three-wheeled vehicles, and autonomous vehicles like robo-taxis.

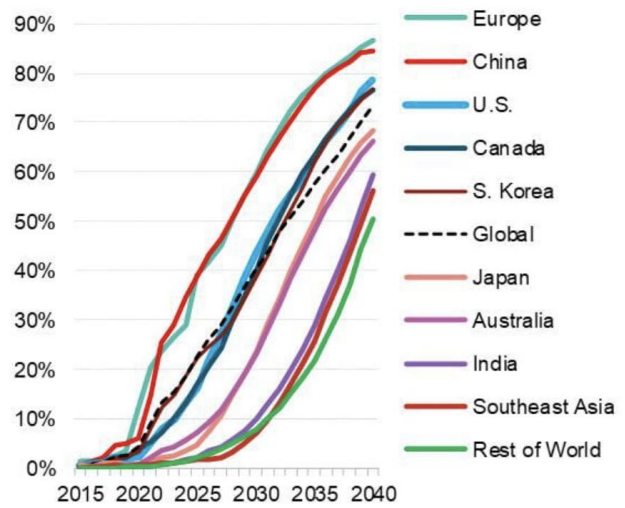
If capex is destiny, then the future of global automakers is self-evident. The message from transportation manufacturers to the oil industry couldn't be clearer: we prefer electricity as a fuel.

Exponential growth of EV adoption

Global long-term passenger EV sales by market - Economic Transition Scenario



Global long-term EV share of new passenger vehicle sales by market - Economic Transition Scenario



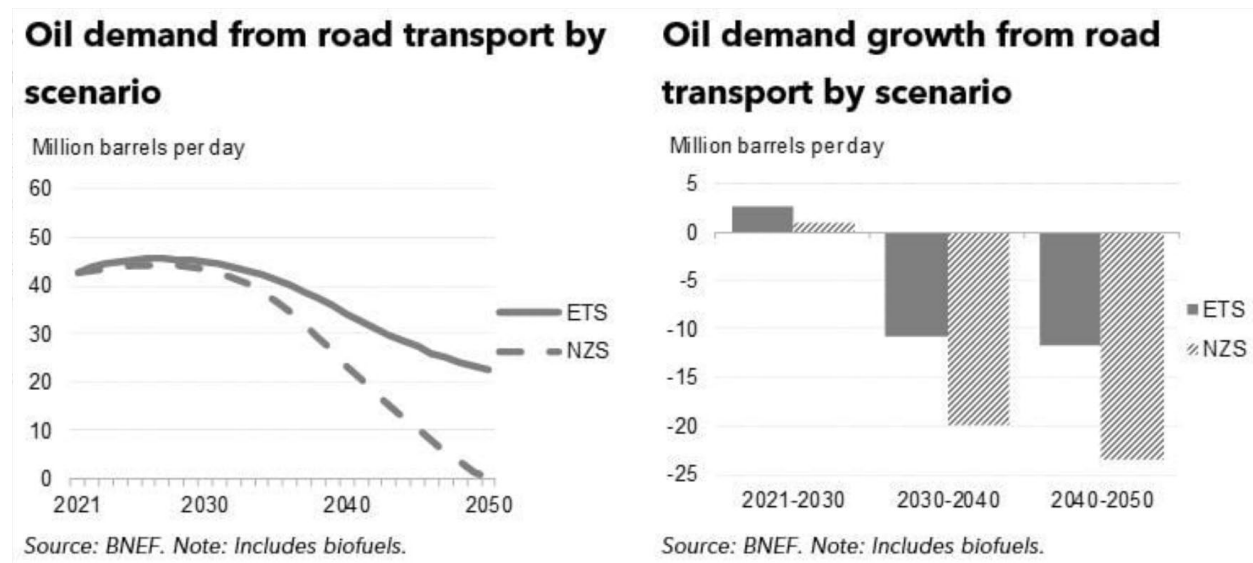
Source: BNEF. Note: Europe includes the EU, the U.K. and EFTA countries. EV includes BEVs and PHEVs.

The two graphs above demonstrate that exponential growth of global EV sales has already begun and will intensify over the next 18 years (Bloomberg EV Outlook 2022).

BloombergNEF says demand for electric vehicles has increased so rapidly that every six months tens of millions of units are being added to forecasts. In 2021, EVs comprised 10 per cent of global autos sales, which experts consider to be past the inflection point on the adoption S-curve.

As EV adoption speeds up in other transportation sectors, and low-carbon fuels are developed for aviation and marine shipping, demand for oil will peak by the early 2030s, according to the IEA. But the great unknown is the decline curve after the peak. Will it be gradual or steep? Only a few years ago, economists leaned toward the view that it would be gradual because EV adoption was slower. But the rapid push to electrify

transportation over the past few years suggests that decline will be more pronounced than previously thought.



ALBERTA DISRUPTED - AN EXISTENTIAL THREAT TO OIL AND GAS

“What happened over the last several years was I think there was a lot of ambition that we could really move the (energy) transition along very fast...And I think we’re finding out that this is a many, many decade transition and it’s probably going to look more like diversification than it is like transition.” - Alex Pourbaix, CEO, Cenovus Energy, JWN Energy, June 7, 2022.

Consulting firm Wood Mackenzie says that oil and gas prices will last most of the 2020s, but it will be the last boom. This view supports Pourbaix’s narrative of a slower transition, at least in the near-term. But is the Alberta hydrocarbon sector competitive after 2030?

Alberta’s Kodak mistake

Eastman Kodak, the leading film photography company for most of the 20th century, is an example of a business model ruined by innovation disruption. In this case, digital photography. The accepted wisdom is that Kodak failed because management did not see digital coming. In fact, Kodak was a digital photography leader, developing the

world's first digital camera in 1975. As digital cameras became popular in the 1990s, the company under-estimated the threat, but still tried to respond.

Management's mistake was to innovate within its existing business model, introducing products like photo frames that tried to make digital photography more convenient for consumers. The disruption that destroyed Kodak was the iPhone's launch in 2007. Four years later, the photography quality of the iPhone 4S convinced consumers they no longer needed point-and-shoot cameras. A few months later, Kodak filed for bankruptcy.

Like Kodak, almost all Alberta oil and gas incumbents are trying to innovate within their existing business models by driving down costs and greenhouse gas emissions. The mantra within Calgary corporate boardrooms is "cost and carbon-competitiveness." This approach has had some success. Much progress has been made lowering production costs, but emissions have proved to be a more difficult challenge.

Even if we assume that Alberta producers achieve their goals, those efforts don't address the innovation occurring within the energy and transportation sectors that is external to their business models. If ground transportation shifts from gasoline and diesel to electricity to fuel passenger and commercial vehicles, permanently destroying market demand for oil, being better oil and gas companies won't protect them from failure.

Can Alberta companies compete in a long-term low-price environment? We don't know. The companies model their competitiveness out to 2050, but don't publicly share the data and assumptions for independent evaluation. No government department, academic economist, or private consulting group appears to have modelled Canadian oil producer viability at \$20 or \$30, a plausible oil price scenario as demand falls. Policymakers are flying blind, relying on industry assurances that all will be well.

What if Canadian oil and gas companies are wrong?

Alberta oil and gas employment peaked at 175,000 direct jobs in 2012 and fell to 137,000 in early 2022. An Ernst & Young study suggests that number will be under 100,000 by 2040, though Alberta experts say the job losses will mostly happen by 2030. At the same time, oil production is expected to rise another 700,000 barrels per day by 2030.

What Alberta oil companies are telling investors is that they expect prices to remain high, costs to fall, and the excess profit will be given back to shareholders. In fact, this is already happening.

What this means is that the last great Alberta oil and gas boom will benefit capital (roughly half of the investors are foreign) while labour suffers. We cannot say this too strongly: supporting the Alberta oil and gas status quo is not in the best interests of Alberta workers. While the Alberta oil patch parties during this last boom, the energy transition is setting the stage for the final bust.

Now let's talk about what happens when the energy transition destroys the status quo.

Will Alberta oil companies be competitive in US markets with OPEC or Latin American producers of heavy crude oil? In a worst-case scenario, by 2040 many Alberta oil companies will have failed, destroying even more jobs and saddling governments with hundreds of billions in environmental liabilities, like orphan wells and unreclaimed oil sands tailings ponds.

What are the chances of a worst-case scenario instead of the best case?

An axiom of this energy transition is that almost every agency's modeling is too conservative. Even BloombergNEF, considered to be one of the most accurate forecasters, must continually revise projections upward because it cannot keep up with the accelerating trends in key sectors like power and transportation.

Here are three signs that Alberta could be facing a worst-case scenario instead of the best case.

One, clean energy costs are plummeting. According to the authoritative Lazard levelized cost of energy studies, the cost of wind energy declined by 72 per cent from 2009 to 2021 and the cost for solar dropped by 90 per cent. Wind and solar are now the lowest cost forms of electricity generation. Even four years ago in Alberta, wind energy auctions came in under \$40 per megawatt hour (MWh). Now we see regions in the USA where wind is \$10 per MWh and Solar is well under \$20. According to the IEA, "renewables are set to account for almost 95 per cent of the increase in global power capacity through 2026."

The reason for falling prices? Clean energy industries are throwing tremendous resources at scientific research and engineering. The number of innovative startups has

exploded. And governments across the world are in a race to ensure that their countries don't get left behind in the switch to the technologies and industries.

Two, the amount of capital being invested in the switch to clean technologies is staggering. Basically, follow the money. And the huge funds that drive much of the global economy, managed by capitalists like Larry Fink of Blackrock Inc., are voting with their wallets.

Three, governments around the world agree that humans must transition off fossil fuels. Policymakers' promises don't always match their actions, but every year the commitment to net-zero by 2050 gets stronger and stronger. After COP26 last fall, the world is now on a trajectory to hit 2.1C warming by 2100. Many commentators think even more stringent policies will be forthcoming in future COPs.

THE RESPONSE TO DISRUPTION ALBERTA REALLY NEEDS

The Alberta economy needs to be retooled for the 21st century. We cannot afford to take a hands-off approach to economic disruption and the energy transition, letting market forces dictate the fate of the provincial oil and gas sector and the rise of the emerging clean energy economy.

The model for Alberta is Canada during the Second World War, when the federal "Minister of Everything" CD Howe retooled Canadian industry for the war effort using a combination of government directives, incentives, and public ownership. Howe demonstrated what can be done by an activist state during a time of intense disruption. Interventionist industrial policy worked well during the post-war period until it was abandoned during the 1970s. The American New Deal, the Marshall Plan to rebuild post-war Western Europe, the rise of Japan and South Korea as manufacturing powerhouses, even Prime Minister John A. MacDonald's National Policy (which built the Canadian Pacific Railway to unite Canada from coast to coast), are all historical examples of using the state and industrial policy to foster economic development and growth.

Currently, national and sub-national governments around the world are using similar strategies in response to economic disruption and energy transformation. The European Union recently released the REPowerEU plan to accelerate the transition away from fossil fuels in response to Russian militarism. Despite continued reliance on

fossil fuels, China is aggressively promoting the build out of renewable energy and “new energy” technologies, becoming the world leader in solar panels, wind turbines, batteries, and electric vehicles as a result. Even the United States, acknowledging that low-carbon industries are the foundation of the 21st century economy, is spending tens of billions to subsidize the switch from coal, oil, and gas.

Why would Alberta ignore these examples?

Yet, the UCP government is making the same mistake as the Alberta oil and gas industry by supporting innovation within existing business models instead of innovating outside them, which is the source of global economic disruption. For example, consider the government’s hydrogen strategy, which is based entirely on “blue” hydrogen made from natural gas and is intended to prop up provincial producers by creating new demand. Or, support for carbon capture utilization and storage, which may reduce emissions but also enables the oil sands to continue with a business-as-usual approach.

If this strategy continues, an argument can be made that within this decade the hydrocarbons sector will be severely disrupted by the global forces described above. Instead of an orderly transition in which Alberta mitigates risk from disruption while taking full advantage of new opportunities, the province will suffer a disorderly transition dictated by collapsing global markets for oil (and later) natural gas. The consequences for Alberta workers will be disastrous.

The people of Alberta, through their elected representatives, must direct the provincial government’s plan for an orderly response to the energy transition.

The Alberta Federation of Labour is proposing three general principles to guide the provincial government’s response to the energy transition challenge.

1. Adopt assertive, long-term industrial policies

Alberta needs to channel its inner CD Howe. The provincial government must demonstrate visionary leadership and develop plans, then boldly implement them, rather than simply acting as a facilitator like it does now. Frankly, citizens don’t trust private investors and corporations to act in the public interest. Alberta needs to move fast before capital is allocated and clean energy opportunities are lost. Many of those opportunities will be to build infrastructure, like expanding the power grid or building new facilities. Projects take time to design, approve, and build. The best time to have

started them is yesterday, the second-best time is today, and the worst time is long into the future or not at all.

2. Adopt a proactive labour market policy

Industrial policy only works if you also have a labour market policy that supports it. If Alberta sets out to deliberately retool its economy, then the government must ensure there are the workers needed. Labour policies must identify the types and numbers of workers needed for the planned industrial development pathways. We cannot just assume enough trained workers will show up when new businesses open. The European approach of “active labour market policies” where governments connect people with actual jobs should be a model for Alberta.

3. Implement a public investment policy with an emphasis on public ownership

Public ownership has fallen out of favour over the past 40 years, but the time has come to once again use this highly successful policy tool. In the past, crown corporations ensured that citizens received reliable, affordable, equitable provision of essential public services. Alberta can tap that history to build a new generation of crown corporations designed to invest in key areas and own the assets, wholly or in partnership with private capital. Alberta has used public ownership in the past when private capital could not develop new industries, like the oil sands, or could not develop them in an equitable fashion, like telecommunications. It is time to return to tried and tested strategies like public ownership that have worked well for Alberta and can do so again.

Based on these principles, the Federation is proposing a four-point plan.

RECOMMENDATIONS

1. Help Oil and Gas Workers, Communities

What can Alberta do to adapt to the energy transition? The first thing is to help oil and gas workers and communities.

Alberta’s coal transition strategy is often held out as a model for transition strategies. Unfortunately, what worked for coal CANNOT and SHOULD NOT be used as a full template for the energy transition, for three reasons.

One, scale: about 2,000 workers in Alberta were affected by the coal phase out, while the Alberta oil and gas sector currently employs 130,000 people. Two, representation:

almost all the workers in the coal-fired power sector were union members, but outside of oil-sands related construction and downstream facilities like refineries, most workers in oil and gas are NOT unionized. Three, full-time vs. part-time: coal workers were mostly full-time, permanent, long-term employees and it was clear that they were losing their jobs because of government policy. In the oil and gas sector, many jobs are short-term and temporary and it won't be clear cut why their jobs are being lost.

A new strategy should be developed that includes government, industry and business, and workers through their unions.

2. Preserve As Many Oil and Gas Jobs As Possible

Alberta oil and gas producers have enormous environmental liabilities that should be addressed during the 2020s while companies are still highly profitable. Let them invest in cleaning up their mess in our province instead of sending more and more profits to shareholders. Some of those windfall profits could pay for reducing emissions, like building the infrastructure for carbon capture storage and utilization. Both these suggestions could create thousands of good-paying jobs.

3. Transition Bitumen and Gas from Feedstock for Liquid Fuels to Feedstock for Manufacturing Materials

For example, Alberta Innovates is only a few years away from launching a commercial process to turn oil sands bitumen into cheap and plentiful carbon fiber. The provincial innovation agency says that the value of a barrel of bitumen increases from \$30 when refined to over \$200 when turned into material, including asphalt binder and activated carbon.

These good-paying potentially union jobs would be on top of existing employment in the oil and gas sector.

4. Invest Heavily in Emerging Clean Energy Sector

The fourth thing Alberta can do is invest heavily in the emerging clean energy sector: wind and solar, storage (batteries and more), and green hydrogen, for example. Economists predict that wealthy economies like Canada will need two to three times as much electricity by 2050. Alberta has the best solar and wind resources in Canada.

The recent Alberta Energy Transition report from Calgary Economic Development estimates that investing in the cleantech sector alone can create 170,000 new jobs by

2050. The sectors considered to be clean tech include ag-tech, CCUS (carbon capture, utilization and storage), digitalization, electrification, energy efficiency, and hydrogen.

CONCLUSION

Alberta faces a choice. The province can take control of its future, plan for the economic disruption caused by the 6th wave and the energy transition, invest in new industries and business models, support workers (and the communities they live in) as they transition to new jobs, and become more prosperous than ever before. Or, it can allow global markets, over which it has no control or influence, to dictate its economic fate. But Albertans must make the choice quickly.

The pandemic and Russian aggression have accelerated global disruption more than expected. By 2030, decisions will have been made, capital will have been invested, and the new economic and business models will be mostly in place. At that point, Alberta will have fewer, and far less attractive, options.

The situation is dire and the need to act is urgent.

