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Energy Transitions Roundtable Proceedings

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INTRODUCTION AND BACKGROUND

On February 21, 2024, the University of Calgary School of Public Policy convened a full day roundtable event discussing the topic of "Seizing Opportunities in the Energy Transition." The condensed documentation and review provided here reflect the authors' synthesis of the content and opinions expressed during the day's events. As such, this interpretation is attributable to the authors and not to any of the named or unnamed speakers or audience members.

The organization of this paper mirrors the event schedule:

- **Morning Keynote Presentation**: Policy Integration and the Energy Transition in Alberta
- **Panel 1**: Key Factors Shaping the Energy Transition
- **Lunchtime Address**: Harnessing Competitive Advantages
- **Panel 2**: Transition Opportunities
- **Panel 3**: Meeting the Challenges and Barriers

The event was attended by over sixty invited individuals from government, non-profit, industry and academia. Outside of the keynote and lunchtime addresses, the event was conducted under Chatham House rule to encourage open and frank discussion.[1] Because of this, while we attribute statements to Nancy Southern (Chair and Chief Executive Officer, ATCO Ltd.) and Martha Hall-Findlay (School of Public Policy Director and Palmer Chair) as the keynote and lunchtime speakers (respectively), we do not attribute any comments to any panelist or any other participant in the conference.

In advance of the event, the School of Public Policy circulated a scoping paper to all participants, entitled "Seizing Opportunities in the Energy Transition," by Richard Masson (with research assistance from Dr. Kent Fellows and Dr. Robert Mansell).

In line with Chatham House Rules, we do not attribute specific statements to specific attendees. However, in addition to acknowledging the keynote and lunch address speakers, we would also like to acknowledge the panel moderators and panelists (in alphabetical order):

- Rhona DelFrari
  - Chief Sustainability Officer and Executive Vice-President, Stakeholder Engagement, Cenovus Energy
- Kent Fellows
  - Assistant Professor (Economics) and Graduate Program Director, Master of Public Policy, School of Public Policy
  - Fellow in Residence, CD Howe Institute
- Laura Kilcrease
  - Chief Executive Officer, Alberta Innovates
- Hal Kvisle
  - Director and Chair, ARC Resources Ltd.
  - former CEO of TC Energy

[1] Chatham House Rule mandates that participants are free to use any information shared during the event, but that statements made during the event must not be attributed to any specific individual or institution.

- Adam Legge
  - President, Business Council of Alberta
- Richard Masson
  - President, Planning Solutions
  - Executive Fellow, School of Public Policy
  - Chair of the 2023 World Petroleum Congress
- Jack Mintz
  - President's Fellow, School of Public Policy
- Katie Smith-Parent
  - Business Development Lead, Industry Diversification at Spartan Controls
  - Executive Director, Young Women in Energy
- Dale Swampy
  - President, National Coalition of Chiefs
- Peter Tertzakian
  - Deputy Director, ARC Energy Research Institute
- Harrie Vredenburg
  - Professor and Global Management and Suncor Energy Chair, Haskayne School of Business
- Deborah Yedlin
  - President and Chief Executive Officer, Calgary Chamber of Commerce

MORNING KEYNOTE PRESENTATION: POLICY INTEGRATION AND THE ENERGY TRANSITION IN ALBERTA

Keynote Speaker: Nancy Southern, Chair and Chief Executive Officer, ATCO Ltd.

Ms. Southern provided a broad overview of the key forces, opportunities, challenges and risks through the energy and emissions transition. Her keynote lecture also provided insight into the role, opportunities and challenges of ATCO Ltd. as a globally active utility company headquartered in Alberta.

As in other sections of this proceedings paper, the summary and review provided here reflect the authors' synthesis of the content and opinions expressed in Ms. Southern's keynote lecture and a subsequent moderated discussion with roundtable attendees. As such, the interpretation here is attributable to the authors and not necessarily to Ms. Southern.

POLICY INTEGRATION AS A FOUNDATION OF SOCIETY, AND CHALLENGES OF POLICY FRAGMENTATION

Ms. Southern began her remarks with the message that energy stands as a pivotal topic for Canada, transcending regional boundaries and impacting the entire nation's prosperity. Acknowledging that public policy serves as the bedrock of our society, it is essential to recognize its role as a catalyst for sustainable development rather than an oppressor inhibiting progress. Public policy endeavors to produce equitable outcomes for all citizens. All sectors of public policy (e.g., fiscal, monetary), are distinct but intertwined; thus, they must act in a complementary fashion. However, as it stands right now, the different public policy domains seem to be working against each other, with dire consequences as standards of living are slipping.[2]

NAVIGATING ALBERTA'S ENERGY TRANSITION

Ms. Southern's view is that Alberta stands at a crossroads regarding its energy transition, with diverse opportunities and complexities to navigate. Besides its geographic beauty, the province boasts abundant natural resources, Indigenous knowledge about the environment, and modern infrastructure, offering a robust foundation for business opportunities and technological advancements, for example in the areas such as carbon capture and storage (CCUS), hydrogen, artificial intelligence (AI) and direct air capture (DAC). However, critical questions loom regarding Canada's commitment to net-zero emissions by 2050. In fact, Alberta has not picked a path, and questions remain about whether the province wants to be net zero by 2050 and how the utilization of Alberta's natural resources helps in achieving this goal.

Resource industries are very important for both Alberta and Canada; indeed, they are critical determinants of our current and future prosperity (Masson 2024, section 5). Efforts to combine traditional energy extraction methods with innovative solutions underscore the importance of balancing the old and the new in Alberta's energy landscape. Ms. Southern indicated that while technological innovations hold promise for greener energy solutions, pragmatic policy frameworks are essential to facilitate their implementation and ensure their efficacy. She asserted that we cannot rely on technology alone as the only way forward; minerals are part of this transition. Both hydrocarbon extraction and production are critical for Canada's prosperity.

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[2] Various reports address Canada's declining productivity as measured in GDP per capita. One prominent example is the 2022 federal budget: "we are falling behind when it comes to economic productivity…This is a well-known Canadian problem—and an insidious one" (Government of Canada 2022, ix).

ADDRESSING REGULATORY MISALIGNMENT

Regulatory misalignment was a core theme of Ms. Southern's keynote, and one that was echoed and supported by the comments of many roundtable attendees. This misalignment is an impediment to transition, as it hampers progress and deters investment. Given her perspective as the CEO of ATCO, Ms. Southern spoke authoritatively on how the disjointed regulatory landscape poses challenges for utilities and impedes the adoption of modern technologies essential for enhancing efficiency and reliability in energy delivery.

Unlike in other jurisdictions, Alberta's energy sector lacks integration, leading to inefficiencies in energy consumption. The absence of peak demand reduction measures was evident during recent grid emergencies including a cold snap and the emergency alert issued just prior to the roundtable event on January 13, 2024 (Government of Alberta 2024). During this grid emergency the province was forced to issue emergency communications asking for voluntary demand reductions. This resulted in individual residential households reducing energy usage and taking 200 megawatts of demand off the system, thus avoiding rolling blackouts. If Alberta had demand-side management policies and infrastructure in place, and if consumers were able to discern responsibly when to use energy, the province could have avoided the emergency alert altogether by proactively reducing peak-load demand.

Technological innovations such as smart meters and sensors play a crucial role in enhancing grid resilience and preventing future emergencies. The recent emergency alert highlighted the importance of investing in such technologies to avoid future crises and ensure reliable, efficient and safe supplies for consumers.

CHALLENGES IN ENERGY INFRASTRUCTURE AND SAFETY

Alberta's vast territory presents unique challenges in maintaining energy infrastructure. Ms. Southern highlighted recent incidents including the deliberate destruction of electrical poles to underscore the risks associated with remote operations. This in turn highlights the need for modernized sensor technologies to prevent outages and mitigate safety hazards, particularly during emergencies like the devastating wildfires Canada has been experiencing during the last year.

Ms. Southern expressed that a holistic approach to energy policy is essential, considering the interconnectedness of various energy sources and their implications on economic, social and environmental factors. While there is a push towards electrification, Ms. Southern was emphatic that it is crucial to recognize the indispensable role of natural gas in supporting Alberta's energy backbone and to explore opportunities in hydrogen production to meet both domestic and international demands.

In addition, the keynote highlighted that investments in energy infrastructure are essential for ensuring the safety and well-being of Indigenous communities, many of which lack access to reliable energy sources. Supporting renewable energy initiatives and respecting traditional knowledge can foster Indigenous reconciliation while promoting sustainable development.

BALANCING RENEWABLE ENERGY GOALS WITH ENERGY SECURITY

The need to balance priorities was another major theme of Ms. Southern's keynote remarks. While renewable energy initiatives are essential for environmental sustainability, Alberta must balance its goals with energy security and affordability, especially during extreme weather events such as the then-recent cold snap. Natural gas remains a vital resource for heating, particularly in remote communities, where renewable alternatives may not be feasible.

Ms. Southern indicated that shifting towards a hydrogen economy presents opportunities for Alberta, given its existing infrastructure for natural gas production. Embracing hydrogen production alongside natural gas can support energy transition goals while creating job opportunities and export revenues.

Alberta possesses existing infrastructure conducive to hydrogen production, presenting a significant opportunity to capitalize on the global demand for clean energy solutions. Hydrogen production not only aligns with emission reduction goals but also creates job opportunities and enhances Alberta's export potential.

Countries such as Japan, Korea and Indonesia are increasingly demanding hydrogen as a clean energy resource, highlighting its global significance. While these nations may not have primary business interests in natural gas, their demand for hydrogen underscores its importance alongside natural gas in Alberta's energy policy considerations (Masson 2024, section 7).

CONSTITUTIONAL CHALLENGES AND INDUSTRY DYNAMICS

Returning to the theme of regulatory and legislative misalignment, Ms. Southern anticipated that constitutional challenges raised by the provinces against federal policies may further impede regulatory clarity in each jurisdiction.[3] Despite this uncertainty, industry and investment dynamics in Alberta remain active, emphasizing the need for proactive measures amid evolving legal frameworks.

Concerns over regulatory misalignment and policy discrepancies raise the risk of capital flight from Alberta. Maintaining an attractive business environment involves addressing these issues while upholding standards such as Indigenous partnerships and environmental sustainability.

During the recent cold snap, the limitations of renewable energy sources were evident, necessitating reliance on natural gas. This highlights the complexity of transitioning energy sources in extreme weather conditions. Affordability also emerges as a paramount concern, particularly in extreme weather conditions. Natural gas remains a cost effective and reliable heating and electricity generation option and highlights the sensibility of a diversified energy mix.

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[3] Recent examples include *References re Greenhouse Gas Pollution Pricing Act* (2021), in which the constitutionality of the Federal Government's greenhouse gas pricing legislation was upheld in a six-to-three decision, and the more recent conflicts between the government of Saskatchewan and the federal government relating to charging a carbon price on fuel used for home heating following the latter's decision to suspend carbon pricing on home heating oil (used predominantly in the Atlantic provinces) but not on natural gas used for home heating (Supreme Court of Canada 2021).

ADDITIONAL DISCUSSION

Following the prepared remarks, keynote speaker Nancy Southern was joined by Martha Hall-Findlay (School of Public Policy Director and Palmer Chair) in a fireside-chat format to engage with questions and comments from other participants.

This discussion started with an inquiry into the construction and expansion of interprovincial interties to bolster Alberta's electricity generation portfolio. Audience members indicated concern that regulators needed to allow these investments to occur, and that they should take a holistic approach to Alberta's grid. For example, increasing the interties across regions to enhance opportunities for cross-border trade could lead to lower prices and greater efficiency in both regions.[4] As a specific case, the discussion turned to the BC/Alberta intertie, which allows BC to use its hydroelectric reservoirs to store energy, purchasing electricity from Alberta at a discount when Alberta has excess wind and solar generation and then selling electricity back into the Alberta grid during periods of high prices in Alberta. This type of arbitrage is currently limited by the physical and regulated capacity of the interprovincial intertie linking the two provinces' electricity grids. Further, complexities arise from the incongruence of a competitive electricity market in Alberta and a fully regulated market in BC. Demand-side management was also raised again, as effective demand-side management reduces the overall "peak load" issue in electricity markets.[5]

The conversation then moved on to a discussion of rural, remote and Indigenous communities, specifically the potential for Small Modular Reactors (SMR) to assist in net-zero emissions electrification in these communities given that grid interconnection opportunities are limited and/or expensive. Participants generally agreed that SMRs are an important element of energy transition, with potential application to remote communities. However it is important to note that SMR construction is neither cheap nor small and cannot act as a "silver bullet" in terms of electrification or transition. Despite the associated emissions, many participants felt that natural gas provision may be a more practical short-term solution for remote communities to provide both heat and power. This point was highlighted with references to specific Indigenous communities that expressed concern about heating during the winter 2024 cold snap in Alberta. SMRs are also generally too big for the typical electricity load demand in Canada's rural, remote and Indigenous communities.

Continuing the electrification theme, the expected increase in Electric Vehicle (EV) adoption was raised as an issue. This precipitates the need for generation, transmission and distribution investments, a point that seems to be absent from government agencies advocating EV sales mandates without working to align policy and regulatory frameworks.

Responses to this comment generally focused on the conflict between affordability and investment. Specifically, maintaining low prices in the short run limits the provinces' ability to attract longer term investments. While rate shock (short term increases in electricity rates) is a significant social problem, the transition will require a pragmatic level of investment, which in turn requires a return on that investment paid for by either rate payers or taxpayers. The best way forward consists of persistent investments over a reasonable period with costs spread to a wide user base.

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[4] See for example: Antweiler (2016).

[5] The peak load problem refers to the fact that, for a grid to avoid all outages it needs to be engineered and built with sufficient capacity to generate and deliver electricity during periods of peak demand. This means that most of the time the grid has significant excess capacity. Reducing peak load therefor reduces the cumulative required capacity and by extension reduces the necessary capital expenditures.

The conversation also touched on the idea of hydrogen-fuelled vehicles. Participants noted that while hydrogen is expensive, so is electricity, and evidence shows that hydrogen, as a transportation fuel, may be well suited to fleet applications and potentially long-haul uses. One participant noted that the Edmonton International Airport has plans to convert its ground fleet to hydrogen-powered vehicles (Edmonton International Airport 2024).

Returning to broader decarbonization goals, one participant raised the importance of carbon capture and storage (CCUS) deployments across the Alberta economy. Ms. Hall-Findlay noted the importance of learning by doing in this space. Participants discussed the "hub" model as a useful way to realize both economies of scale and economies of scope. However, a CCUS hub won't just happen. Alberta announced hubs three years ago and has yet to make significant progress (Canadian Energy Regulator 2022).

PANEL 1: KEY FACTORS SHAPING THE ENERGY TRANSITION

The first panel was tasked with identifying the factors, both internal and external to Alberta, shaping the energy transition today. It was acknowledged by the speakers that Alberta has an obligation to do its part in getting to net zero, but not to the detriment of Canada's energy security or economic prosperity. So, the questions were: what role is Alberta to play, what are its strengths and weaknesses and what opportunities exist?

Several categories of factors shaping the energy transition became prominent as the discussion evolved. We have organized this section based on those categories.

As with other sections of this proceedings paper, the summary and review provided here reflects the authors' synthesis of the content and opinions expressed by the panelists and a subsequent moderated discussion with roundtable attendees.

GLOBAL OIL DEMAND

Alberta has obviously realized significant economic benefits from its hydrocarbon wealth, but as the energy transition continues, what will that look like going forward? One important consideration raised was the future global demand for hydrocarbons and the various forecasts of this demand. There was a general agreement from panellists that demand will begin to decline at some point, but disagreement on when and how fast this will occur. While this uncertainty is difficult to quantify, all agreed that its existence poses challenges for how Alberta manages its hydrocarbon resources.

While global population growth will drive some of this demand, the larger contributor is the relative increase in affluence in the developing world. Panellists argued that there is a moral imperative to address energy poverty in remote and developing communities, and that electrification is not feasible in some currently developing areas. As such, there is a continued role to play for hydrocarbons.

POLICY COMPLEXITY AND LAYERING, POLITICS AND INVESTMENT

Picking up on one of the core themes in Ms. Southern's keynote address, the panel commented on the complexity of the policy landscape governing the energy transition. The difficulty in navigating this landscape increases the costs of investment in the Alberta energy sector by way of the direct costs it imposes, but also because of the uncertainty that this complexity causes. If private capital cannot adequately quantify risk, it will require greater returns. Absent sufficient returns to offset policy uncertainty, private capital will seek a return elsewhere.

Ultimately, decarbonization requires investment capital. While public (government) funding is certainly one major source of this capital, optimizing the energy transition necessitates private capital market utilization as well. The expected road map for the current energy transition is very complex compared to the historical precedent for energy transition. Pancaking policy complexity on top of this exacerbates the situation.

Questions remain about how to simplify the policy landscape, but there was general agreement among the panel that simplification would be beneficial or even necessary to facilitate transition. Additionally, the divestment movement has resulted in less capital being available to Alberta hydrocarbon projects in the first place, which sharpens the need to gain access to the capital that is available. Removing the barriers to investment is as important as ever.

The panel commented on the politics of energy transition, noting that it is impossible to separate politics from policy. As a particular example, the panel returned to another theme introduced in the keynote: conflicts between the federal government and the provincial governments.

Policy conflicts are especially problematic where private capital markets are concerned since many of the investments that will be required to facilitate energy transition have time horizons longer than the typical tenure of a government. As such, working towards sustainable policy choices that are durable enough to withstand changes in government is important. Without certainty on a price of carbon, for example, private capital will be more reluctant to invest in CCUS.

CHARACTERISTICS OF ALBERTA

There are several characteristics specific to Alberta's oil and gas industry that are shaping how the province might address the energy transition. One theme that came up was the relative privilege of Alberta's position in the context of energy. It was observed that the province has access to virtually every primary source of energy imaginable, and that the history of Alberta is one of transition: from an agrarian society to one built on coal, to the development of the oilsands, to the current renewable energy boom and the phase-out of coal-fired power.

Alberta's economic strength has also led to an advantage in human capital, where the expertise in the province is well situated to take advantage of certain aspects of the energy transition, including hydrogen and CCUS. It was noted that Albertan expertise in CCUS is sought after globally.

CHARACTERISTICS OF ALBERTA'S OIL AND GAS SECTOR

While panellists noted opportunities for Alberta's oil and gas sector, they also raised challenges. Market access for Alberta hydrocarbons remains a concern if the province is to maximize its utilization of these resources, and this also affects investment. Questions remain on whether there is enough innovation potential in the market to take advantage of the energy transition. There are, however, incumbent energy players making relevant investments, such as the hydrogen joint venture by Suncor and ATCO in Fort Saskatchewan. The panel and other attendees maintained optimism that the industry is ready to participate in the energy transition.

ADDITIONAL DISCUSSION

A key point of discussion between audience and panel was the definition of "transition." The word is used a lot in discussions of energy and climate policy, but shared context is not always present. Panellists responded by indicating some of the challenges with differing interpretations of the word.

Panellists noted that it's important to distinguish between decarbonization and specific fuel usage since "reducing emissions" is not synonymous with "reducing petroleum usage;" technology breakthroughs may lower the emissions intensity or legacy fuel usage. In that context, the word "transition" and its connotations may not lead to constructive conversations. The "what" is decarbonization, and the "how" may include fuel switching, technological advances or other policy choices.

As part of this conversation, one panel discussed the privilege that Canada and Alberta have in this space. Given the relative energy abundance and the large and diverse talent pool, Canada has the luxury of discussing transition and decarbonization, whereas in much of the world the "transition" is more often considered a struggle to lift people out of energy poverty.

As a counter to that point, the panel recognized that capital is required for decarbonization (through technology or transition). This is a key struggle since capital is mobile and responds to policy risk and market uncertainty. Alberta may also suffer in this regard since investors interested in decarbonization are not likely to make investments in Alberta's legacy industries. The industry also struggles to attract investment for carbon capture (as an example) because of the federal and provincial policy risk (and because policies at these two levels are often seen as conflicting with each other).

It was also noted that many energy companies outside of Canada are state owned, allowing for direct government control, whereas Canada follows a free-market system. While the free-market system is seen as good for innovation, it can also negatively affect capital flow.

There was general agreement that the political energy consumed by conflicts between Alberta and the federal government has not led to productive or beneficial outcomes. Despite the perceived difficulties, the panel and attendees generally seemed to be of the view that policymakers should put efforts into reaching a consensus on durable policy that can be sustained long term, with a reasonable combination of both carrots and sticks for industry. Additionally, all panellists agreed that the layering and complexity of policies should be an area of concern for decisionmakers, and efforts should be made to reduce this complexity to better attract and reward private capital investments.

Finally, Alberta is the steward of one of the biggest and most valuable resources in the world, and legitimate efforts to decarbonize the industry are needed to realize the full potential of this wealth. This point emphasizes the importance of providing a competitive return on capital investment in the province through a mix of simplifying the regulatory and legislative environment and making the environment more durable with respect to changes in government.

LUNCHTIME ADDRESS: HARNESSING COMPETITIVE ADVANTAGES

Speaker: Martha Hall-Findlay, School of Public Policy Director and Palmer Chair

The lunchtime address was delivered by the School of Public Policy's newly appointed director and Palmer Chair, Martha Hall-Findlay. Ms. Hall-Findlay's address included prepared remarks on Alberta's competitive advantages and the role the School of Public Policy can and should play in helping Alberta capitalize on these competitive advantages.

As with other sections of this proceedings paper, the summary and review provided here reflects the authors' synthesis of the content and opinions expressed by Ms. Hall-Findlay and a subsequent moderated discussion with roundtable attendees.

IDENTIFYING COMPETITIVE ADVANTAGES

Ms. Hall-Findlay began the lunchtime address by observing that Alberta possesses a diverse array of competitive advantages across multiple sectors. Notably, the region stands out in energy, food production, water management, economics, social prosperity and international outreach. Recognizing and leveraging these strengths is essential for propelling the region's economic growth and global influence.

In navigating the complexities of policy formulation and decision making, data and evidence play pivotal roles. Objective analysis and empirical insights serve as the foundations for informed policymaking, enabling stakeholders to identify opportunities, address challenges and optimize resource allocation effectively. Commenting specifically on the value of the School of Public Policy and her role as director and Palmer Chair, Ms. Hall-Findlay was emphatic that the School of Public Policy's research areas fit perfectly into the provincial and federal policy formation goals.

She explained that the School of Public Policy focuses on energy, food, water, economics, social prosperity, international (geo)politics and trade. Appropriate focus across these disciplines requires that we blend them together as transdisciplinary exercises that examine and inform objective decisions that can be offered to governments and other decisionmakers.

CHALLENGES IN THE ENERGY DISCOURSE

In the latter half of her address, Ms. Hall-Findlay turned to a more focused discussion on the energy transition. She noted that the public discourse around transition, particularly in the context of oil and gas, presents a polarized narrative fraught with misperceptions and ideological divides. Addressing these challenges requires a nuanced approach that acknowledges both environmental concerns and the strategic importance of the energy sector in supporting global prosperity and security. Alberta's energy is essential for the manufacturing of fertilizers and petrochemicals.

Canada's role in the global energy landscape demands a recalibration, balancing domestic imperatives with international commitments. There is a growing importance of national security issues and the need for Canada to prioritize its own interests while engaging in global affairs. While Canada aims to set an example through its actions, it must not compromise its own interests in the process.

The discussion following the talk highlighted challenges in Canada's energy sector, including regulatory hurdles that have hindered infrastructure projects. There is concern that policies restricting fossil fuel production may be hindering Canada's economic prosperity, particularly in comparison to nations including Russia and Norway.

Embracing a pragmatic stance that prioritizes national interests while fostering collaborative partnerships with global stakeholders (e.g., Germany, South Korea) is paramount. Moreover, redefining Canada's energy narrative necessitates engaging younger demographics and fostering a sense of responsibility towards addressing global challenges such as energy poverty and food insecurity while creating a world in which we are reducing emissions.

Additionally, Ms. Hall-Findlay expressed a concern that Canada's universities and think tanks need to collaborate more. Important ideas get lost when things become a "one vs many" competition for attention. Businesses also need to get involved in the policy process. She used the example of the Creative Destruction Lab as a collaborative effort that was used to great positive effect during the COVID-19 pandemic to provide corporate collaboration in the provision of essential services and required rapid testing.[6]

PANEL 2: TRANSITION OPPORTUNITIES

The second panel was tasked with identifying opportunities that energy transition presents to Alberta. Specifically, the panellists addressed areas of adaptation, reorientation and new businesses to support and sustain Alberta's economic and social prosperity through the energy transition.

As with other sections of this proceedings paper, the summary and review provided here reflects the authors' synthesis of the content and opinions expressed by the panellists and a subsequent moderated discussion with roundtable attendees.

OPPORTUNITIES ASSOCIATED WITH THE NET-ZERO INITIATIVE

The panel discussion began with a summary and a reminder that the purpose of energy transition is decarbonization, which at a broad level may mean shutting down one energy system and establishing another nationally, with specific reference to electricity generation. However, the panel broadly indicated that the decarbonization goal reflects a global imperative, not a national one. It follows that making decisions sub-nationally may not have sufficient impact on our emission and climate change challenges.

Canada was once a leader and pioneer of nuclear development, but a 2009 report by Alberta's Nuclear Power Expert Panel highlighted the high upfront cost of nuclear development right before the American fracking revolution had started unlocking cheap hydrocarbon resources including natural gas (Nuclear Power Expert Panel 2009). Thereafter, the province and country stopped considering nuclear development until the much more recent development of Small Modular Reactor (SMR) technologies.[7]

Globally, the shift to electric vehicles (EVs) in wealthier nations contrasts with the reality that 80 percent of used cars, many still reliant on hydrocarbons, are exported to the Global South with half going to Sub-Saharan Africa. The transition to EVs in developed countries doesn't erase the need for decarbonized oil and gas to serve the ongoing global demand, especially as older vehicles continue to operate in developing regions.

Emerging oil markets like Guyana, Uganda and Namibia illustrate the balance between addressing energy poverty and climate change challenges.

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[6] See: *Recovery - Creative Destruction Lab*

[7] These discussions are still very much in their infancy. One panellist indicated that regulatory challenges persist, with SMR commercial/industrial deployment remaining fifteen to twenty years away.

Alberta boasts a diverse portfolio of hydrogen technologies, including blue and green hydrogen. Direct air capture (DAC) technology, pioneered by David Keith at the University of Calgary, provides a way to extract CO2 from the atmosphere for storage or to create synthetic fuels—a decarbonized solution suitable for today's vehicles and sustainable aviation fuels (SAF). While the future may herald hydrogen from renewables, current energy needs still depend on oil and gas, with DAC offering a viable Plan B for carbon mitigation. The question remains: which technology will prevail?

In the early 2000s, Alberta's oil companies, utilizing technologies like directional drilling refined within their own borders, expanded globally through direct foreign investment, meeting the rising energy demands. Now, as the world shifts towards decarbonization, there is potential for Alberta to again take the stage, this time exporting homegrown clean energy technologies.

This transition echoes the past, questioning if history will guide Alberta's destiny as a global energy developer, particularly in the realm of sustainable solutions. To replicate this growth trajectory, three critical players must synergize:

1. The business sector (established energy companies and innovative startups): Businesses must pivot towards developing and commercializing decarbonization technologies.
2. Government: As in oil sands development, governmental support is necessary for creating conducive policy environments, facilitating research, providing financial incentives and enabling international trade relations that drive global expansion.
3. Academia: Universities are the breeding ground for technological innovation and entrepreneurial talent. They should work in tandem with businesses and investors to bring promising ideas to market.

THE INNOVATION PIPELINE OF OPPORTUNITIES

The panel moved on to a discussion of recent innovation successes. Notwithstanding the challenges itemized by the keynote and earlier panel, panellists indicated that Canada already has a record of private investment successes in the cleantech startup space, evidenced by $800 million worth of investment across fifty-five deals in Q1-Q3 2023 nationally, with Edmonton and Calgary named top cities to watch in the country (Canadian Venture Capital Association 2023).

With respect to the oil sands hydrocarbon industry, Alberta is leveraging technological advancements to capitalize on bitumen beyond combustion to provide material inputs into the manufacture of carbon fibers for batteries and windmills, and vanadium as an alternative to lithium. Residual asphaltene continues to be useful in legacy applications such as road construction.

This shift is positioning Alberta as a leader in clean tech, with substantial private investment fuelling development. There is an expectation of continued growth in the global demand for carbon fiber, and no region is emerging or positioned to emerge as a single-source feedstock, despite Canada's vast bitumen reserves (third globally). As such, a continued focus on bitumen beyond combustion could markedly redefine Alberta's role in the global market, with the potential to significantly boost provincial revenue with a potential of generating more than $100 billion by 2050 (Alberta Innovates 2021).

Lessons from Texas and Alberta, where tax incentives have historically spurred the uptake of solar panels, show that with the right market conditions and innovation, significant strides toward carbon neutrality are possible. As evidenced by the shift from smaller-scale solar installations to larger, more energy-efficient setups, the panellist presenting on this point indicated that market forces can drive and are driving the transition to sustainable energy solutions.

BROADER BUSINESS OPPORTUNITIES IN ALBERTA ASSOCIATED WITH THE TRANSITION.

A discussion on the innovation pipeline necessarily begets a discussion on business opportunities. As such, the panel moved on to a discussion of the future of Alberta's business environment.

The panellist discussing this point indicated that, despite earlier critiques of policy misalignment and policy risk, in some areas provincial and federal strategies for the energy transition are aligning.

Provincially, Alberta's Emissions Reduction and Energy Development Plan highlights key areas such as low-emission oil and gas, hydrogen, geothermal, critical minerals, bioenergy, agriculture, forestry and nature-based solutions. Federally, Budget 2023 lays out eight clean economy priorities encompassing electrification, clean energy, manufacturing, emissions reduction, critical minerals, infrastructure, electric vehicles, batteries and support for major projects.

While we often focus on Alberta's hydrocarbon resources, the panellist discussing this point highlighted that Alberta's vast opportunities in renewable energy sectors positions the province as a potential leader in the global energy transition.

Specifically, Greengate Power has been instrumental in constructing some of the country's most significant renewable projects in Alberta. However, the current business environment poses challenges as Albert-based entrepreneurs struggle with approvals, garnering attention and securing financing. This point is not lost on the federal government; Federal Environment Minister Jonathan Wilkinson's speech during the opening ceremony of the 2023 Global Petroleum Show lamented the lack of decarbonization action and investment in the oil and gas sector.[8]

Returning to the theme of investment and regulatory uncertainty, the panel was generally in agreement that the key to unlocking Alberta and Canada's full economic and decarbonization potential lies in eliminating this struggle and creating an environment where businesses can thrive without the shadow of uncertainty. Addressing these hurdles by providing clear tax credits, contracts for differences, sensible regulations and a constitutionally sound approval system was presented by one panellist as crucial for turning potential into realized growth.

Industry has steadfastly communicated certainty requirements; therefore, the panellist speculated, governments, particularly the federal government, may lack a fundamental understanding of how investment decisions are made. This challenge extends beyond oil and gas, affecting sectors crucial to the energy transition, such as critical minerals, emissions reduction technologies, hydrogen production and large-scale electrification. Each of these sectors is hampered by the same policy and regulatory uncertainties.

The panellist presenting on this topic indicated two critical factors they see as essential for providing certainty in Canada's business environment:

1. **Canada must be willing to access its natural resources**. While immense manufacturing and technology opportunities are associated with emissions reductions and energy transition, virtually every opportunity is based on extracting, processing, refining, impacting or recycling Canada's natural resources. Wind, solar, geothermal and CCUS development require disturbance to land or underground geologies. LNG shipments require accessing underground reserves of natural gas. Biofuel synthesis requires harvesting trees, agriculture

[8] At the time of drafting of this paper, full text of the minister's speech is not available. (The Natural Resources Ministry only lists full text of speeches prior to 2022). However, these remarks were widely reported in the media at the time.

product or waste streams. The transition and a clean future ultimately depend on accessing the resources provincially and nationally.

2. **Canada must formulate a compelling and clear vision** for how Alberta and Canada will be positioned in the global energy and emissions transition. No one wants to buy from the reluctant and hesitant vendor who can't seem to get its act together. Therefore, Canada must be bold and visionary with an active global marketing campaign.

The federal government's seemingly contradictory stance—simultaneously enthusiastic yet dismissive about various energy and natural resource sectors—poses a significant branding challenge for Canada as it seeks to position itself as a global leader and attract investment. Despite having multiple strategies for hydrogen, critical minerals and various incentives, the absence of a unified vision, combined with an uncertain business environment, undermines Canada's attractiveness as a place for business. To overcome this, Canada must articulate a compelling and persuasive national vision that reflects a commitment to all energy sectors, supported by a stable and competitive business environment that inspires confidence among investors and stakeholders.

Agriculture focus is strong in Alberta, but it is clear there is little desire nationally for Canada to be a global leader, which impacts Canada's ability to be a biofuel leader. The recent provincial renewables approval pause was in part due to concerns about the alteration of landscapes and the future of those landscapes as productive in agricultural or other industrial uses. Some Alberta Indigenous communities have recently united to seek assurances that captured and sequestered carbon will not impact their lands, water formations and communities.

ADDITIONAL DISCUSSION

As with the prior panel, the discussion in panel 2 also turned to the question of attracting capital investment. The panel's response to audience comments was to note the importance the government can (and in some cases does) play in catalyzing decarbonization efforts, an interesting contrast to the earlier discussion on policy risk.

One panellist noted that the market often lacks the incentive to cover the high initial costs associated with significant transition. Drawing parallels with historical government-backed initiatives in nuclear energy and oil sands development, government investment is seen as vital to kickstart decarbonization projects.[9]

This led into a broader conversation about the appropriate role for government. One audience member relayed the argument for carbon pricing on large emitters as a mechanism to encourage efficient decarbonization was undermined by other government policies such as clean fuel standard. Panellists agreed, noting a need for policies that extend beyond the short-term nature of election cycles. The current environment, characterized by polarization and knee-jerk reactions, demands a shift towards longer-term policy frameworks which should aim to provide stability and clarity. Unfortunately, there's no clear direction on how to create policies that span multiple election cycles.

[9] The reference to oil sands development is an allusion to the Underground Test Facility, which was jointly funded by the government of Alberta, the Government of Ontario and the Canadian Federal Government (Government of Alberta 2024b).

PANEL 3: MEETING THE CHALLENGES AND BARRIERS

The third and final panel was presented with three question prompts: What are the key challenges and barriers to seizing these opportunities? What are the important policy and other issues to unlocking these opportunities? What should be the action plan priorities?

Some of the prevalent topics in this session include a revised carbon tax, engagement with local (Indigenous) communities and importance of natural gas in the energy transition.

As with other sections of this proceedings paper, the summary and review provided here reflects the authors' synthesis of the content and opinions expressed by the panellists and a subsequent moderated discussion with roundtable attendees.

CHANGES TO UNLEASH INDIGENOUS PARTICIPATION

While clean energy transition is the goal for the whole country, there are still communities in Canada that lack access to reliable infrastructure during winter months. For instance, some northern communities feel particularly left out of some of the transition opportunities. The panellist emphasized that more effort should be put into relationship-building with smaller communities, particularly Indigenous communities, that are openly opposed to energy projects. This can be done through transparent stakeholder engagement sessions in which the companies could engage those communities in conversations to understand their needs and develop projects that would bring them long-term prosperity in the form of investment and employment. One of the obstacles to this is the regulatory process, which does not require the companies to sign twenty-to-thirty-year leases, which would ensure longevity and security. Further, smaller communities, particularly First Nations, fear that their voices are not being heard, so it is important to give them a seat at the table and include them directly in project development process where they can be a part of the decision making affecting their livelihoods.

POLICIES AND OTHER CHANGES TO ADVANCE ECONOMIC OPPORTUNITIES AND SOCIAL PROSPERITY

During the panel, the 2020 pandemic and subsequent economic struggles were a significant topic of discussion. The panel highlighted Alberta's Economic Recovery Council, created to help the province get through that difficult time. Besides focusing on the oil and gas sector, the council reviewed various other sectors and explored available opportunities. One key finding was that the oil and gas sector outperforms other sectors in terms of GDP contributions per working hour. As a result, reductions in oil and gas employment would move labour to other sectors, but simultaneously decrease our GDP, since other industries are not as productive on a GDP-per-worker-hour metric. While the energy transition will not create more wealth, it can certainly help the province remain prosperous while developing other industries such as forestry and wood products, mining and quarrying, filmmaking, aerospace, finance, etc.[10]

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[10] One panellist presented specific numbers for GDP per working hour in each of these sectors, indicating that the oil and gas GDP per working hour is an order of magnitude greater than the other sectors mentioned. However, these figures appear to be sourced from a report that is not publicly available. Providing additional citation here would violate the Chatham House Rules under which the roundtable was conducted.

The panellist made three concrete suggestions on how to formulate policies that could allow Alberta to generate growth:

1. Smart regulations – regulation can increase confidence, but if the policies are not done right, it can also interfere with the industry's growth. Some policies, such as captive insurance, could help the industry build more confidence and generate growth.

2. Tax reform – the biggest tax reform in Alberta would be the introduction of a sales tax. With only 8 percent sales tax, the province could raise $8 billion, reduce personal taxes and fully eliminate income tax. This could encourage more people to move to Alberta, which is not necessarily bad for the province. The other option is corporate income tax reform; for example, to introduce business value tax (following an example from Italy at a regional level), low-rate tax applied to profits that could drive business in Alberta without losing revenue.

3. Smart spending – governments provide education, health and infrastructure, but Alberta has a big government-productivity problem. With smarter government spending, Alberta could increase its ability to do things, be more efficient and increase productivity using AI.

POLICIES AND OTHER CHANGES TO UNLOCK OPPORTUNITIES IN THE TRANSITION

The speakers agreed on the premise that the government's transition expectations are not realistic. Rather than trying to fully eliminate greenhouse gas emissions, the panellists felt that government should set more attainable objectives that balance environmental and standard of living goals, speculating that a 50-to-60 percent reduction in emissions was attainable at a reasonable short-term economic burden. There are still opportunities available that would give Alberta citizens and businesses real competitive advantage (for example, Alberta had the lowest gas price in North America for the past thirty years). Any time we can convert combustion of any other fossil fuels to natural gas, we will reduce emissions by 50 percent at a minimum. That is more practical way to reduce emissions.

Panellists also indicated that Alberta's advantage in electric power generation should be restored by better market design, better integration of wind, solar and natural gas, and better commercial arrangement with neighbouring provinces, namely BC, Saskatchewan and Manitoba. Beyond Canada, there is a strong global demand that Alberta could respond to by improving and upgrading some of its existing infrastructures.

With large reserves of natural gas in tight rock, the panellists think there is greater advantage here than in hydrogen exploration, particularly thanks to technological advancements that would allow us to tap into those reserves. Alberta is not ready yet to convert fully to hydrogen, so with those large gas reserves, we could achieve the government's goals and significantly reduce emissions.

Energy transition calls for clean energy, but some panellists expressed that Alberta closed certain industries, such as coal, too quickly, thus leaving billions of dollars in benefits behind. Rather than moving away from certain industries, a synergy should be found between wind, solar and natural gas. Finding a balance between clean energy transition while using the benefits still available in the oil and gas industry would help us address the challenges. There should be a synergy of wind, solar and natural gas such that the province would deliver fully reliable megawatts with 80 percent lower emissions.

Another example of successful policy was the outcome of the Copenhagen Climate Change Conference. While not making any significant commitments at the event, the former Federal Environment Minister (and Alberta Premier) Jim Prentice convened several Canadian experts to formulate a plan to phase out high emissions from coal slowly, adopting a reasonable clean fuel standard (with natural gas), and ultimately developing a plan aligned with the US (CBC News 2010). Unfortunately, the subsequent federal government overturned those plans in 2015.

ADDITIONAL DISCUSSION

The group suggested Alberta host a clean energy summit to convene experts who could provide balanced and reasonable solutions. There are 146 renewable projects in Alberta, which is more than double that of all the other provinces combined. Financially, the province can rely on its own resources without relying heavily on federal funding.

The idea that carbon tax should be removed was raised by one of the panellists, with specific reference to small businesses who face a carbon tax burden but who do not receive relief. While most speakers agreed that carbon tax was not well implemented, the panellist did clarify that it is affecting companies and producers more than individuals as it is not a consumer-facing tax.[11] A revised carbon tax is needed, but Canada should not necessarily follow the US Inflation Reduction Act (IRA) as we are less competitive than the US. We should not focus so much on subsidy support.

CONCLUDING REMARKS

While it is not possible to adequately summarize the entire discussion in a proceedings paper, the above stands as a condensed synthesis of major themes that emerged over the day's events. From a policy perspective, there are important roles for federal and provincial governments in promoting decarbonization, and efforts in this regard will be more effective if those levels of government can harmonize policy choices to work together instead of pancaking and laying complex policies on top of each other.

Roundtable participants perceived Canada (and Alberta specifically) as having a very strong and diverse talent base, and a valued resource endowment (in both hydrocarbons and other resources like wind and solar). Capital investment attractiveness remains a concern that the private sector and government need to discuss in a proactive manner.

Finally, and perhaps most relevant: a common theme in all the day's sessions was the importance of maintaining a focus on decarbonization as the objective, balanced against other socio-economic concerns. Transition is often interpreted as a need to shift off, or towards, specific energy sources. But the overarching purpose of these discussions remains a desire to reduce carbon emissions in an efficient and effective manner.

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[11] For context: large emitters are subject to an "Output Based Pricing System" designed to maintain an effective carbon tax at uniform marginal rate while also lowering the average carbon tax burden (Dobson et al. 2017). Additionally, households subject to the Federal Carbon Pricing Backstop receive household rebates to offset the carbon pricing burden (Winter et al. 2023). However, non-large emitter businesses that face carbon pricing costs for fuel and energy usage do not receive any form of relief under the current federal backstop except for small businesses that receive a grant.

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