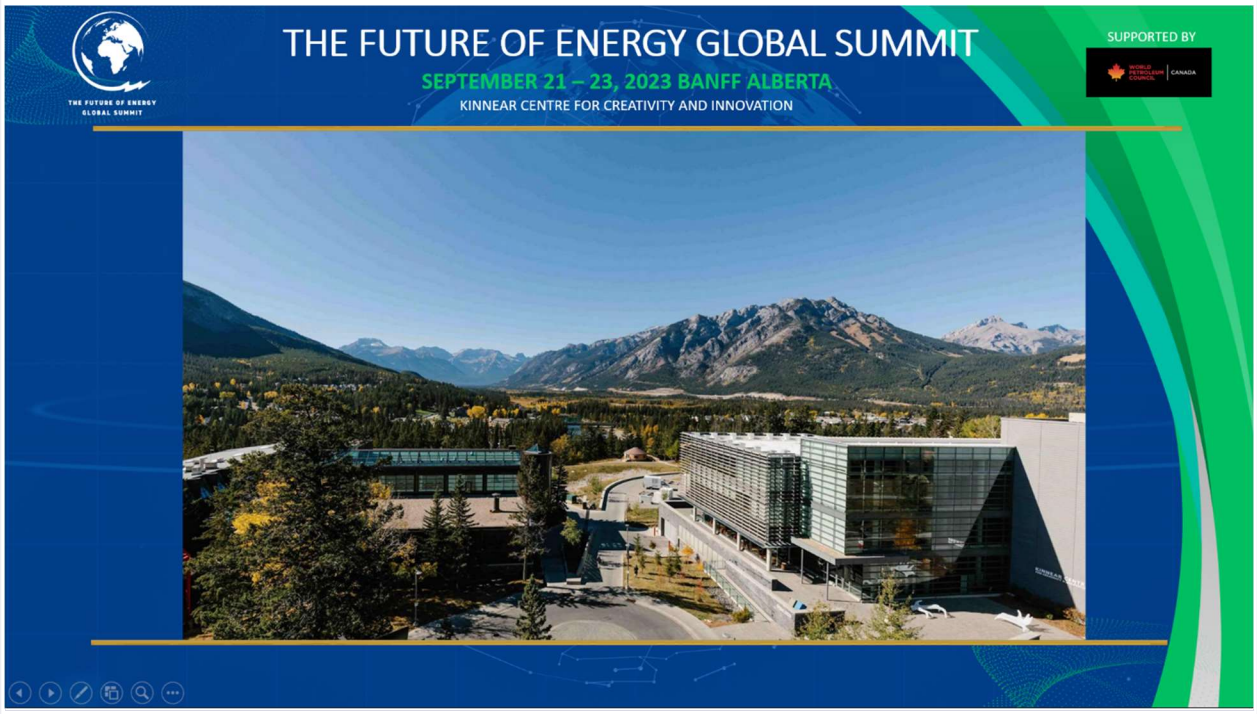
THE FUTURE OF ENERGY
GLOBAL SUMMIT

Navigating the Energy Transition: Insights from the Banff Global Energy Summit 2023

White Paper
On Global Energy Perspectives and Innovations



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1. Preface

Convergence of Global Energy Perspectives
Reflecting on the Banff Global Energy Summit 2023

The inaugural Banff Global Energy Summit 2023, set against the stunning picturesque backdrop of the Canadian Rockies at the Kinnear Centre for Creativity and Innovation in Banff, Alberta, marked a unique moment in the global dialogue about the future of energy. This summit brought together a diverse array of voices from around the world to discuss, debate, and envision pathways towards a sustainable energy future.

The Banff Global Energy Summit 2023 was not just a conference; it was a confluence of diverse perspectives, a melting pot of ideas, and a symposium of the world's most forward-thinking energy minds. From industry leaders to policy makers, from innovators in clean technology to advocates of traditional energy sources, the summit brought together a spectrum of voices, all united by a common goal – to chart a pragmatic and sustainable path forward for global energy.

In creating this White Paper (document), my intention is to provide readers with more than just a summary of proceedings. It is to offer a window into the dynamic and often complex world of energy transition, to present a tapestry of viewpoints, and to reflect the rich discussions that took place. The summit's focus on factual understanding, the exploration of diverse energy sources, and the emphasis on collaboration across sectors are themes that resonate throughout this report.

I extend my deepest gratitude to the Committee Members and Volunteers of the Banff Global Energy Summit 2023 for their impeccable planning and execution of an event of this magnitude. Their commitment to fostering a non-political platform for open dialogue has been instrumental in the success of this summit. I also wish to acknowledge the invaluable contributions of all the speakers, panelists, and participants, whose insights and expertise have been the lifeblood of this summit.

As you navigate through this document, I encourage you to approach the content with an open mind and a willingness to engage with the complex, yet fascinating world of energy. Whether you are a stakeholder in the energy sector, a policy maker, a student, or simply an interested reader, I hope this report provides you with a comprehensive understanding of the current state and future possibilities of global energy, as envisioned by some of the brightest minds in the field.

In closing, I look forward to the continued dialogue and collaborative efforts that will undoubtedly stem from the discussions at the Banff Global Energy Summit 2023. It is my sincere hope that this document serves as a valuable resource and a catalyst for further conversation and action in the ever-evolving narrative of global energy.

James S. Kinnear

Conference Chair

2. Acknowledgments

We wish to acknowledge that the Banff Global Energy Summit 2023 was held on the traditional territory of the Stoney Nakoda Nations. The Stoney Nakoda consists of the Bearspaw, Chiniki, and Goodstoney First Nations. This land is also acknowledged as being part of Treaty 7 territory, an historic agreement signed in 1877 between several First Nations of the Plains and the Crown in Canada.

We extend our deepest gratitude to everyone who contributed to the success of the Banff Global Energy Summit 2023. Our heartfelt thanks go to James S. Kinnear, the Conference Chair, whose vision and leadership were instrumental in shaping this event. His guidance and dedication were pivotal in bringing together diverse perspectives and expertise to the forefront of the energy conversation.

We also appreciate the tireless efforts and dedication of the Conference Committee members, who worked diligently to ensure a seamless and impactful summit. Their commitment to excellence set the stage for a truly enlightening and productive event.

A special acknowledgment is due to the numerous volunteers who generously gave their time and energy. Their commitment and enthusiasm played a crucial role in creating a welcoming and engaging atmosphere for all attendees.

We are profoundly thankful to the keynote speakers, panelists, and moderators for sharing their insights, expertise, and perspectives on the critical issues surrounding the future of energy. Their contributions were not only enlightening but also pivotal in driving forward the conversation on energy transition and sustainability.

Additionally, we would like to acknowledge the support of various organizations, sponsors, and partners. Their collaboration and backing were vital in bringing this summit to fruition and in fostering a platform for meaningful dialogue and exchange.

Our sincere appreciation goes to the Banff Center, and the Kinnear Centre for Creativity and Innovation, for hosting this summit. Their exceptional facilities and support helped create an environment conducive to learning, discussion, and networking.

We also acknowledge this White Paper was developed using AI assistance (ChatGPT, an AI language model created by OpenAI). ChatGPT's role encompassed content analysis, summarization, creating initial drafts, and serving as a content writer. This AI-assisted

approach complemented the human-led editorial and design processes, enhancing the efficiency and breadth of content creation and narrative flow for the White Paper.

Together, we have taken significant steps towards understanding and navigating the complexities of the global energy landscape. We look forward to continuing this journey and building upon the foundations laid at this year's summit

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3. Executive Summary

The Banff Global Energy Summit 2023 was a gathering of global energy leaders, experts, and innovators. This white paper captures the essence of the summit's discussions, focusing on the diverse aspects of the energy transition and the future of energy.

Key Highlights

1. **Misconceptions about the Energy Industry:**

   The summit effectively addressed misconceptions through various perspectives, including Indigenous views on resource sustainability and realistic discussions on the role of oil and gas. This helped clarify misunderstandings about the environmental impact and scalability of different energy sources.

2. **Navigating the Energy Transition:**

   The summit's exploration of diverse energy sources, such as renewables, nuclear, and traditional sources like oil and gas, highlighted how these can coexist and complement each other in a sustainable energy future.

3. **Fact-Based Understanding of Energy Sources:**

   Presentations and discussions were grounded in factual information, providing data-driven insights into global energy requirements, the economic impact of energy initiatives, and the potential of new technologies.

4. **Collaboration Across Energy Sectors:**

   The concept of 'co-opetition' was emphasized, highlighting the importance of collaboration and competition within the energy sector for holistic solutions to the challenges of the energy transition.

5. **Financing and Investment in Energy Transition:**

   The summit focused on the financial aspects of the energy transition, discussing investment mobilization towards sustainable initiatives, including in areas like nuclear and geothermal energy.

6. **Policy and Regulatory Frameworks:**

   Discussions highlighted the need for supportive policies and regulations, especially for emerging sectors like nuclear and geothermal energy, facing unique challenges.

7. **Technological Innovations and Trends:**

   The summit provided a platform for discussing emerging technologies and trends in the energy sector, including advancements in battery storage, hydrogen energy, and carbon capture and storage.

8. **Global Energy Security and Affordability:**

   The summit addressed the challenge of balancing sustainable energy practices with maintaining energy security and affordability, considering the reliability of various energy sources.

Path Forward:

The summit concluded with a forward-looking perspective, emphasizing the ongoing need for innovation, collaboration, and strategic planning in the energy sector. The future of energy is envisioned as a balanced mix of traditional and renewable sources, with nuclear, geothermal, and AI-driven technologies playing a crucial role in achieving a secure and sustainable energy future.

As we conclude, it becomes increasingly evident that the journey towards a sustainable energy future is an urgent and collective endeavor, requiring the participation and commitment of all stakeholders – from industry leaders and policymakers to innovators and the broader community. The Summit not only sets the stage but also underscores the pressing need for continued dialogue and proactive action.

In closing, we extend our heartfelt thanks to all participants for their valuable contributions and look forward to building on the momentum generated by this Conference.

4. Introduction

4.1. Overview of the Conference Objectives and Themes

The Banff Global Energy Summit 2023, presented a unique gathering of global energy leaders, innovators, and policymakers. The summit's primary objectives were to dispel common misconceptions about the energy industry, particularly around the viability, scalability, and environmental impact of various energy sources. It aimed to foster a comprehensive understanding of the energy transition, exploring how diverse energy sources, including renewables like solar and wind, as well as traditional sources such as oil and gas, can coexist and complement each other in a sustainable energy future.

The themes of the summit were carefully chosen to reflect the multifaceted nature of the energy sector. They encompassed a range of critical topics, from the financing and investment challenges in the energy transition to the role of policy and regulatory frameworks in facilitating this shift. The summit also provided a platform for discussing technological innovations and trends, such as advancements in battery storage, hydrogen energy, small modular nuclear reactors, and carbon capture and storage. Central to these discussions was the balancing act between global energy security and affordability, a critical challenge amidst the transition to more sustainable energy practices.

4.2. Importance of the Energy Transition Dialogue

The dialogue on energy transition is more than a mere exchange of ideas; it is a crucial step towards shaping a sustainable future. The Banff Global Energy Summit 2023 recognized this importance and brought together diverse perspectives to address the complex challenges of the energy transition. The summit's discussions highlighted the need for a holistic approach, one that acknowledges the interconnectedness of environmental, economic, and social factors in energy decisions.

In an era where political and ideological biases often cloud judgment, the summit's emphasis on a fact-based understanding of energy sources was a refreshing and necessary approach. It provided a non-political platform for frank and open discussions about the future of energy, focusing on information and understanding. This approach is vital for making informed decisions that will shape the future of energy, not just for the current generation but for those to come.

The summit also underscored the importance of collaboration across energy sectors. Recognizing the traditionally siloed nature of the industry, it advocated for a 'co-opetition' approach, where entities engage in both cooperative and competitive activities, driving innovation and efficiency while maintaining healthy market dynamics.

In conclusion, the Banff Global Energy Summit 2023 set the stage for continued dialogue and action, emphasizing the collective responsibility of global leaders, innovators, and communities in navigating the energy transition towards a more sustainable and equitable world.

4.3. Conference Objectives

1. **Misconceptions about the Energy Industry:** Address and clarify common misconceptions surrounding the energy industry. It will focus on demystifying aspects related to the viability, scalability, and environmental impact of different energy sources.

2. **Navigating the Energy Transition:** A key objective will be to explore how various energy sources, including renewables like solar and wind, along with traditional sources such as oil and gas, can collectively contribute to a sustainable energy future. The summit will delve into how these diverse energy sources can coexist and complement each other in the evolving energy landscape.

3. **Fact-Based Understanding of Energy Sources:** Address the importance of basing discussions and decisions on factual, evidence-based information. This approach will be central to making informed and unbiased decisions about the future of energy, especially in a context often influenced by political and ideological biases.

4. **Collaboration Across Energy Sectors:** Recognizing the segmented nature of the energy industry, the summit will seek to foster collaboration across different sectors. Collaboration is essential for developing holistic solutions that address the complex challenges of energy transition.

5. **Financing and Investment in Energy Transition:** The financial aspects of energy transition will be a major focus, discussing how to mobilize and direct investments towards sustainable energy initiatives. The summit will explore various funding mechanisms and investment.

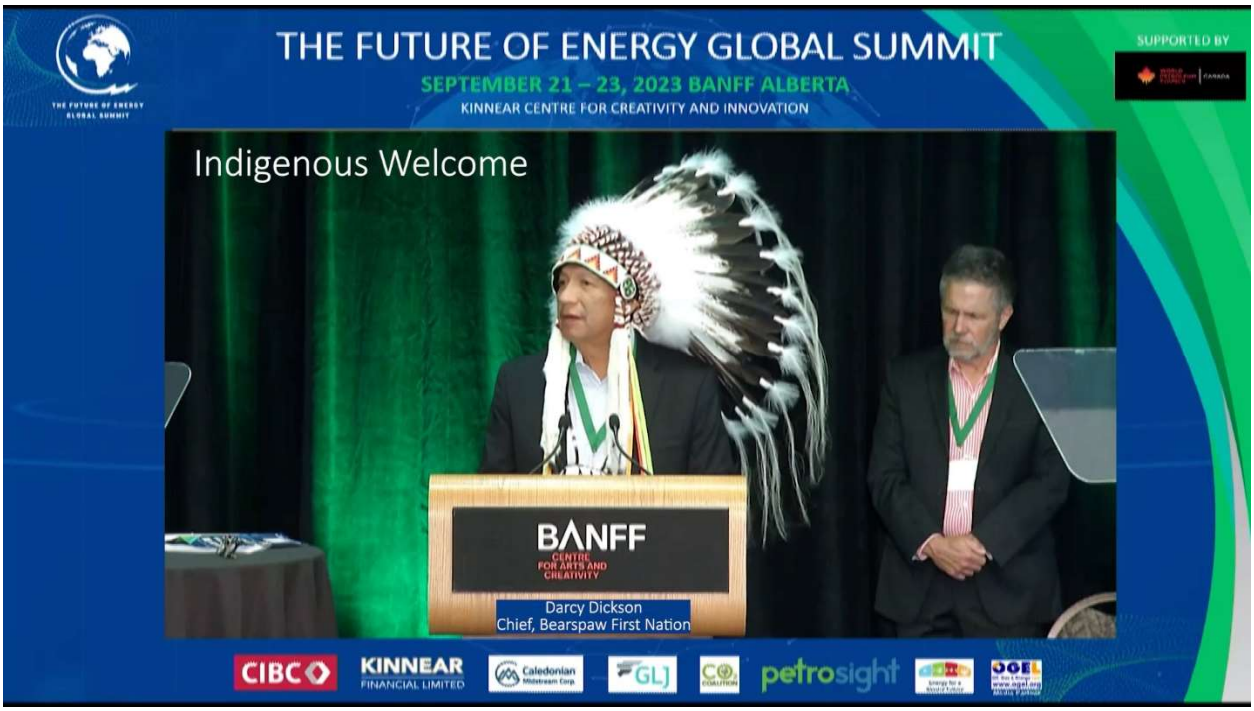
6. **Policy and Regulatory Frameworks:** Focus on understanding the policy and regulatory frameworks that support the energy transition. Discussions will revolve around how governments and international bodies can facilitate a shift towards cleaner energy sources.

7. **Technological Innovations and Trends:** Provide a platform for discussing emerging technologies and trends in the energy sector. This includes advancements in areas like battery storage, hydrogen energy, small modular nuclear reactors, and carbon capture and storage, showcasing the role of innovation in the energy sector.

8. **Global Energy Security and Affordability:** Address the critical challenge of maintaining energy security and affordability. It will explore strategies to ensure that the global shift towards more sustainable energy practices does not compromise the reliability and affordability of energy supplies.

5. Topic Summaries

5.1 Indigenous Opening Remarks: Darcy Dickson



Topic: Indigenous Opening Remarks
Keynote Speaker: Darcy Dickson, Chief, Bearspaw First Nation

Key Points

1. **Acknowledgment of Traditional Lands:** Chief Darcy Dickson began by acknowledging the traditional lands of the Stoney Nakoda people in Banff, emphasizing the sacredness of these lands for the Indigenous communities.
2. **Historical Context:** He recounted the history of the Stoney Nakoda people, their guidance to European explorers, and the significance of the area's geographical features, many of which bear Stoney names.
3. **Importance of the Summit's Theme:** Chief Dickson highlighted the critical nature of the summit's theme, which he interpreted as focusing on sustainable resource utilization. He stressed the importance of this issue for both current and future generations.

4. **Indigenous Perspective on Resource Use:** He shared insights into the traditional ways his people utilized the land's resources sustainably and how they were self-sufficient before treaty signings and subsequent government policies.
5. **Transition from Traditional to Modern Resource Management:** Chief Dickson discussed the transition from a traditional lifestyle to one where his community began to rely on government provisions. He mentioned the discovery of natural gas on their reserve, which brought significant revenue but also challenges in managing these resources sustainably.
6. **Current Approach to Resource Development:** Emphasizing a shift in approach, Chief Dickson expressed a desire for his community to work as joint partners with industry, choosing their collaborators and structuring deals autonomously.
7. **Climate Change and Future Collaboration:** Acknowledging the impact of climate change and the decline in traditional resources, he called for collaborative efforts to develop sustainable solutions for energy concerns.
8. **Invitation for Partnership and Collaboration:** Chief Dickson welcomed the attendees and expressed hope for the creation of new connections and partnerships, highlighting the readiness of his and other First Nations to work together on global and local energy issues.

Chief Darcy Dickson keynote provided an Indigenous perspective on energy development, emphasizing the importance of sustainable resource management, economic reconciliation through partnerships, and the willingness of Indigenous communities to engage in collaborative solutions for energy and environmental challenges.

Alignment with Conference Objectives

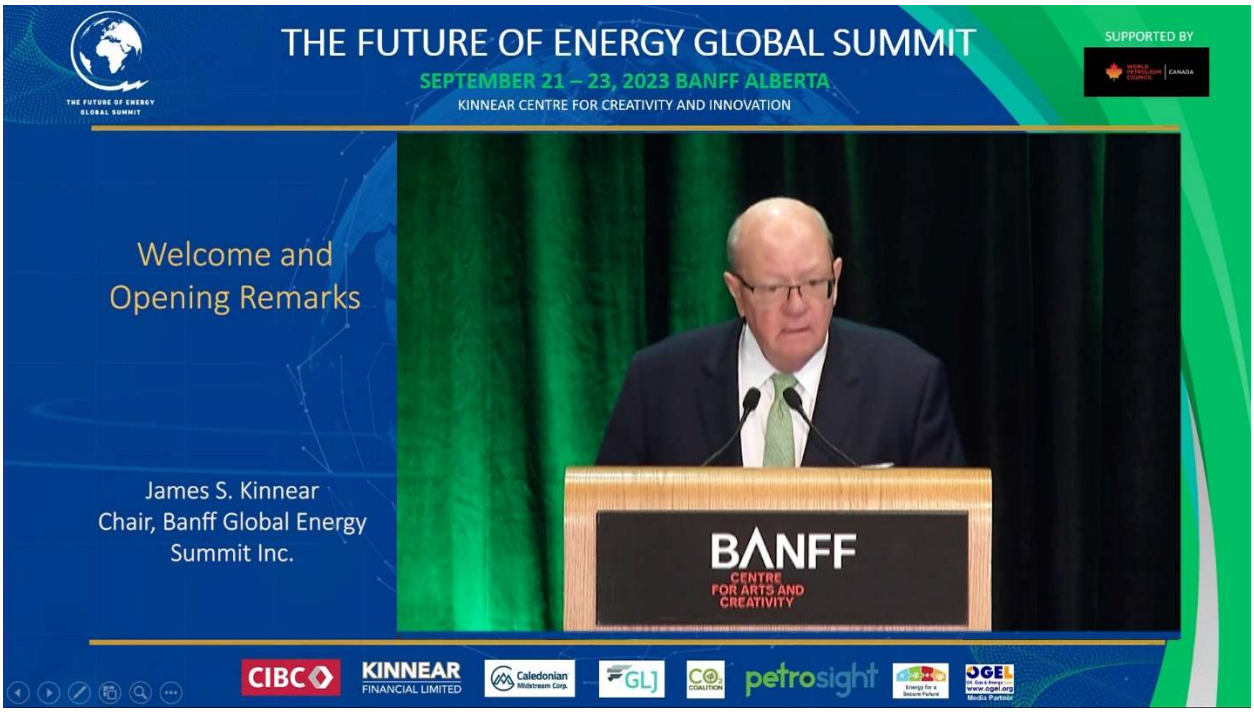
1. **Misconceptions about the Energy Industry**: Chief Dickson's speech addressed misconceptions by providing an Indigenous perspective on resource use and sustainability. This perspective is often overlooked in discussions about the energy industry, thus contributing to clearing up common misconceptions, particularly regarding the environmental impact and sustainability of different energy sources.
2. **Navigating the Energy Transition**: The speech highlighted the importance of sustainable resource utilization, which is a critical aspect of the energy transition. Chief Dickson's emphasis on the need for sustainable management of resources aligns with the summit's focus on how different energy sources can contribute to a sustainable energy future.

3. **Fact-Based Understanding of Energy Sources**: By sharing the historical context and traditional ways of resource utilization of the Stoney Nakoda people, the speech contributed to a fact-based understanding of energy sources, particularly from an Indigenous perspective.
4. **Collaboration Across Energy Sectors**: Chief Dickson's call for collaborative efforts and his invitation for partnership and collaboration with industry and other stakeholders align with the summit's objective of fostering collaboration across different sectors. This approach is essential for holistic solutions in the energy transition.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summary, the discussion of transitioning from traditional to modern resource management and the desire for economic reconciliation through partnerships implies a consideration of the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The speech indirectly touched on the importance of policy and regulatory frameworks that support the energy transition, especially in the context of Indigenous partnerships and autonomous structuring of deals with industry collaborators.
7. **Technological Innovations and Trends**: The speech did not explicitly address technological innovations and trends in the energy sector, but the broader context of sustainable energy development implies a consideration of these aspects.
8. **Global Energy Security and Affordability**: The acknowledgment of climate change, the decline in traditional resources, and the call for sustainable solutions contribute to the theme of balancing global energy security and affordability amidst the energy transition.

Chief Darcy Dickson's keynote aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition from an Indigenous perspective, focusing on factual understanding, and highlighting the need for collaboration and sustainable resource management in the energy sector.

Topic Summaries

5.2. Welcome and Opening Remarks: James S. Kinnear



Topic: Welcome and Opening Remarks
Keynote Speaker: James S. Kinnear, Chair, Banff Global Energy Summit Inc.

Key Points

1. **Acknowledgment and Gratitude**: Kinnear opened the summit by expressing gratitude to the attendees, speakers, panelists, and volunteers for their contributions to the event.
2. **Significance of the Summit**: He highlighted the importance of the summit as a platform for sharing knowledge, ideas, solutions, and discussing the challenges of the global energy transition.
3. **Emphasis on Factual Information**: Kinnear stressed the need for discussions to be grounded in factual information rather than opinions or rhetoric, to foster open and meaningful conversations.
4. **Global Energy Requirements**: He raised awareness about the increasing global energy requirements due to population growth, enhanced per capita consumption, and efforts to alleviate energy poverty.

5. **Financial Considerations**: Kinnear mentioned the varying estimates for the cost of meeting global green initiatives, raising questions about financing and who bears the cost.
6. **Alberta's Emission Reduction Goals**: He noted Alberta's progress in reducing emissions, with a target to substantially reduce emissions by 2050, and discussed the region's contribution to global emissions.
7. **Call for Collaboration and Ingenuity**: Kinnear called for collaboration, cooperation, and ingenuity within the energy sector to find paths forward that ensure energy security, affordability, and lower emissions.
8. **Encouragement for Engagement**: He concluded by encouraging attendees to engage in meaningful conversations and to continue seeking solutions, emphasizing Alberta's potential leadership role in achieving global emission reduction goals.

Alignment with Conference Objectives

1. **Misconceptions about the Energy Industry**: Kinnear's emphasis on the importance of factual information over opinions and rhetoric aligns with the summit's goal of clearing up common misconceptions about the energy industry. His discussion on the complexity and challenges of the global energy transition also contributes to this objective.
2. **Navigating the Energy Transition**: Kinnear addressed the global energy transition, highlighting the need for sharing knowledge, ideas, and solutions. His focus on the challenges and complexities of this transition, including the financial aspects and the impact of population growth on energy requirements, aligns with the summit's focus on how different energy sources can contribute to a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The keynote's emphasis on the importance of factual information and the discussion of various estimates for the cost of meeting global green initiatives contribute to a fact-based understanding of energy sources.
4. **Collaboration Across Energy Sectors**: Kinnear called for collaboration, cooperation, and ingenuity within the energy sector to find paths forward that ensure energy security, affordability, and lower emissions. This aligns with the summit's objective of fostering collaboration across different sectors.
5. **Financing and Investment in Energy Transition**: The discussion about the varying estimates for the cost of meeting global green initiatives and questions

about who bears these costs directly address the financial aspects of the energy transition.

6. **Policy and Regulatory Frameworks**: While not explicitly mentioned in the summary, the implications of Kinnear's speech suggest a recognition of the importance of policy and regulatory frameworks in supporting the energy transition, especially in the context of Alberta's emission reduction targets.
7. **Technological Innovations and Trends**: The speech did not explicitly address technological innovations and trends in the energy sector, but the overall context of the energy transition implies a consideration of these aspects.
8. **Global Energy Security and Affordability**: Kinnear's focus on energy security, affordability, and the challenges posed by population growth and energy poverty directly relates to the theme of balancing global energy security and affordability amidst the energy transition.

James S. Kinnear's keynote aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing financial aspects, and highlighting the need for collaboration and policy support in the energy sector.

Topic Summaries

5.3. The Challenges and Opportunities of Energy Transition: Mark Carney

Topic: The Challenges and Opportunities of Energy Transition
Moderator: James S. Kinnear, Chair, Banff Global Energy Summit Inc.
Panel Member: Mark Carney, OC, UN Special Envoy for Climate Action and Finance and Co-Chair for the Glasgow Finance Alliance for Net Zero

Key Points

1. **Capital for Paris Agreement and Net Zero Targets:** Mark Carney highlighted the need for approximately an additional $3 trillion per year for a quarter of a century to meet the Paris Agreement and net zero targets. This figure is above the repurposing of investments in conventional energy. The investment represents an additional 1.5% of GDP, a feasible number for economies. Carney believes market ingenuity will likely reduce these costs over time.

2. **Canadian Green Initiatives' Global Impact:** Despite Canada contributing about 1.8% of global emissions, Carney emphasized Canada's potential role in being part of global energy solutions. He mentioned Canada's expertise in carbon capture and storage, hydrogen economy, and new nuclear technology. Carney stressed that Canada's contribution would be significant in creating new energy industries and export markets.

3. **Incentives and Penalties for CO2 Emitting Countries:** Carney discussed the importance of commitments made at Paris and Glasgow Climate Summits. He mentioned the financial sector's role in focusing on real-world decarbonization. Future penalties may include trade restrictions, like the European Union's Carbon Border Adjustment Mechanism, which will impose tariffs on high-emission imports.

4. **Global Coordination on Emissions Reduction:** Carney talked about the need for incentives to shut down coal plants in Asia and replace them with lower emission sources. He mentioned the potential for carbon credits to improve project economics and emphasized the importance of countries committing to net zero.

5. **Canadian Enterprises and Carbon Taxes**: Carney argued that being low carbon is increasingly a determinant of competitiveness. He highlighted Canada's advantageous position due to its extensive trade agreements and the potential to leverage its plan to decarbonize. Carney encouraged aggressive promotion of Canada as a low-risk investment destination and an energy superpower.

6. **Investing in Canada:** Carney concluded by advocating for investment in Canada, emphasizing its status as an energy superpower and its potential to be central to global energy solutions. Throughout the chat, Carney emphasized the importance of global cooperation, innovative financing, and the pivotal role countries like Canada can play in the energy transition.

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Alignment with Conference Objectives

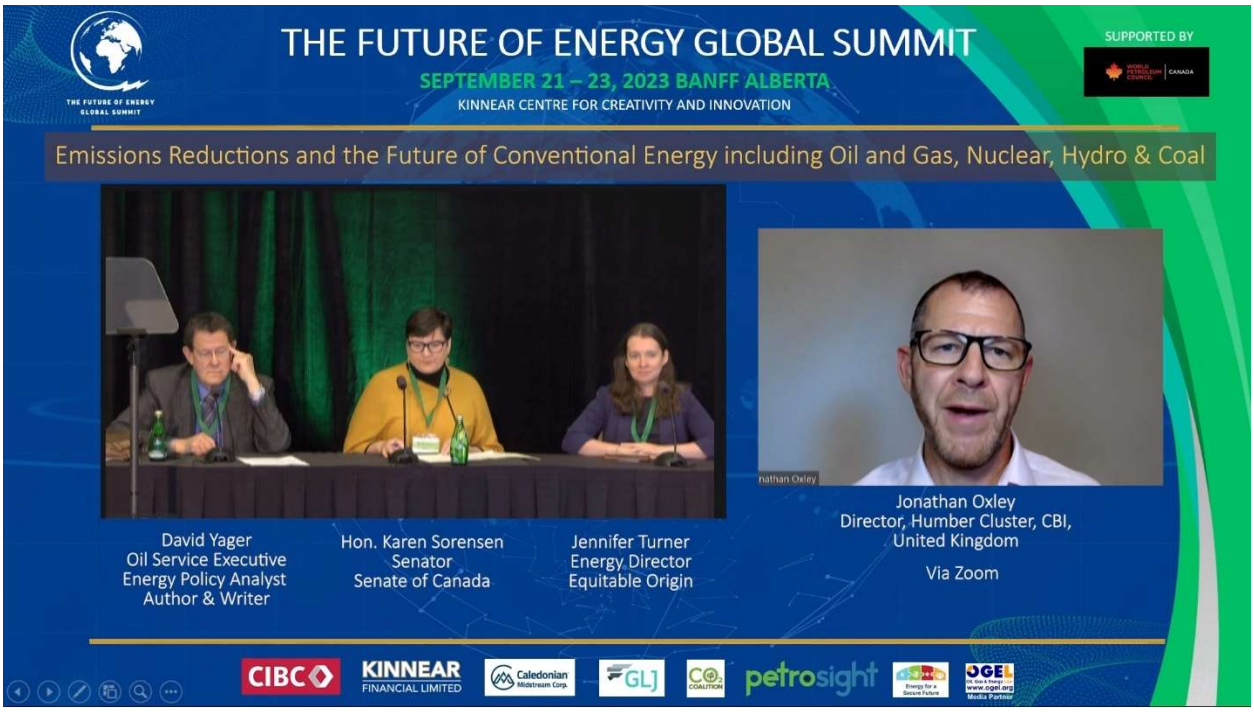
1. **Misconceptions about the Energy Industry**: The chat addressed misconceptions by discussing the actual financial requirements for the energy transition and the role of countries like Canada in global emission reduction, despite its small share of global emissions. This aligns with the summit's goal of clearing up common misconceptions about the energy industry.
2. **Navigating the Energy Transition**: The discussion on the significant investment required for the energy transition, Canada's potential role in it, and the need for global coordination in emissions reduction directly contributes to understanding how different energy sources can coexist and complement each other in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: Carney's emphasis on the financial aspects of the energy transition, including the need for an additional $3 trillion per year, provides a fact-based understanding of the economic scale of the transition, crucial for making informed decisions about the future of energy.
4. **Collaboration Across Energy Sectors**: The chat highlighted the need for global cooperation and coordination, particularly in incentivizing the shutdown of coal plants in Asia and replacing them with lower emission sources. This demonstrates the importance of collaboration across different sectors.
5. **Financing and Investment in Energy Transition**: The discussion directly addressed the financial aspects of the energy transition, discussing the substantial investments required and the role of the financial sector in supporting decarbonization.
6. **Policy and Regulatory Frameworks**: While not explicitly detailed in the summary, the implications of discussions on commitments made at international climate summits and mechanisms like the EU's Carbon Border Adjustment Mechanism suggest an engagement with policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The chat touched on Canada's expertise in carbon capture and storage, hydrogen economy, and new nuclear technology, aligning with the summit's objective of discussing emerging technologies and trends in the energy sector.

8. **Global Energy Security and Affordability**: The emphasis on Canada's role in global energy solutions and the need for a balanced approach that considers economic competitiveness indicates a consideration of global energy security and affordability.

The fireside chat with Mark Carney aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the financial and collaborative aspects of the energy transition, and highlighting the significant role that countries like Canada can play in this global effort.

Topic Summaries

5.4 Emissions Reductions and the Future of Conventional Energy: David Yager



Topic: Emissions Reductions and the Future of Conventional Energy
Keynote Speaker: David Yager, Oil Service Executive, Energy Policy Analyst, Author & Writer

Key Points

1. **The Complexity of Energy Transition:** Yager's speech underscores the complexity and challenges of transitioning from fossil fuels to renewable energy sources. His reference to the definition of energy transition by S&P Global and Cambridge highlights the multifaceted nature of this shift, involving not just technological changes but also significant economic and policy implications.
2. **The Role of Major Energy Companies:** The example of BP announcing its exit from the oil business and commitment to net zero by 2050 illustrates a significant shift in the strategies of major energy companies. This move by BP represents a broader trend in the industry towards embracing renewable energy and reducing carbon emissions, signaling a potential change in the global energy landscape.

3. **Gap Between Ambition and Reality**: Yager points out the discrepancy between ambitious global decarbonization goals and the actual progress made. Despite the public discourse and commitments to reducing reliance on fossil fuels, the data he presents shows that fossil fuels still dominate the energy mix. This highlights the challenges in implementing large-scale energy transitions.
4. **Importance of Collaboration:** The need for intense collaboration between industry, governments, NGOs, and other stakeholders is a recurring theme in Yager's speech. He emphasizes that achieving the goals of the energy transition requires concerted efforts across different sectors and disciplines.
5. **Critical View of Current Trends:** Yager offers a critical perspective on the current state of the energy transition, questioning the practicality of the theoretical plans for decarbonization. He invites a realistic assessment of what is being done versus what needs to be done, suggesting that current efforts may not be sufficient to meet the set targets.
6. **Continued Relevance of Conventional Energy:** While discussing emissions reduction, Yager acknowledges the ongoing importance of conventional energy sources like oil, gas, nuclear, hydro, and coal. He implies that these sources will continue to play a significant role in the global energy mix, at least in the near future.
7. **Data-Driven Approach:** Yager's emphasis on being a "data guy" and his presentation of specific figures and trends indicate a data-driven approach to understanding and discussing energy policy. This approach is crucial for making informed decisions in the complex field of energy transition.

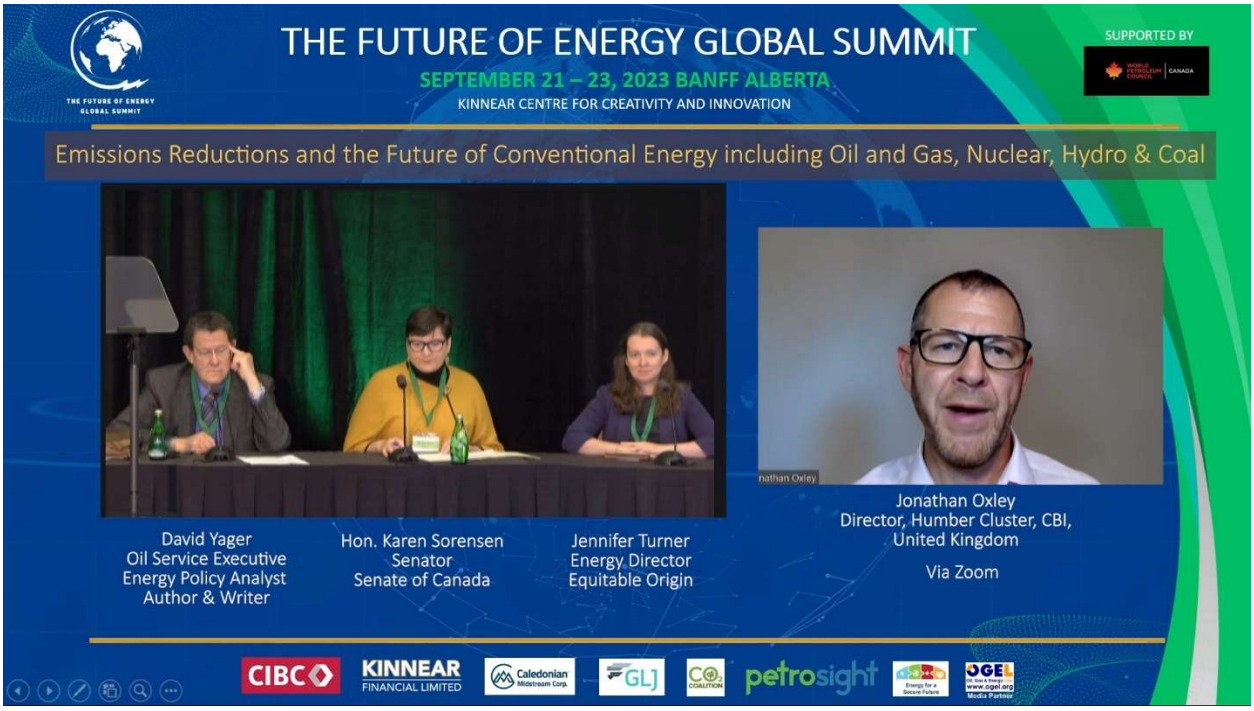
David Yager's keynote provides a nuanced and critical perspective on the energy transition, highlighting the challenges and realities of moving towards a more sustainable energy future. His insights call for a pragmatic approach that balances ambitious goals with the practicalities of implementation.

Summary of Panel Discussion: Emissions Reductions and the Future of Conventional Energy

Moderator: David Yager, Oil Service Executive, Energy Policy Analyst, Author & Writer

Panel Members:

1. Jonathan Oxley, Director, Humber Cluster, CBI, United Kingdom
2. Hon. Karen Sorensen, Senator, Senate of Canada
3. Jennifer Turner, Energy Director, Equitable Origin



Key Points

1. **Ambitious Targets and Pragmatic Approaches:** Jonathan Oxley emphasized the ambitious targets for CO2 emission reductions and the need for pragmatic approaches that consider people, policies, and profitability. He highlighted the challenges in balancing net zero goals with maintaining public consensus, especially during electoral seasons.
2. **Role of Legislation and Policy:** Senator Karen Sorensen discussed the importance of understanding legislative processes and the impact of policies on industries and communities. She stressed the need for realistic legislation that considers the practicalities of implementation.

3. **Interconnectedness in Energy Transition:** Jennifer Turner pointed out the compartmentalized nature of discussions in energy transition. She emphasized the need for a broader view that includes understanding people, communities, and the integrity of emissions reporting.
4. **Financial Challenges and Sustainability:** The panel discussed the financial implications of the energy transition, including the potential for a 'debt wall' and the impact of rising costs on individuals and communities. The conversation also touched on the importance of including environmental reconciliation and addressing accusations of greenwashing.
5. **Infrastructure and Transition Challenges:** Yager highlighted the significant infrastructure built around fossil fuels, making it challenging to transition to alternative energy sources. The panel discussed the need for diverse energy tools and low-regret choices in the transition process.
6. **Global Perspective on Energy Consumption:** The panel addressed the differing views on the future of oil, with a focus on the disparity between OECD and non-OECD countries. The discussion underscored the challenge of speaking for the global population and the importance of considering the needs of different regions and communities.
7. **Canada's Role in Global Sustainability:** Turner highlighted Canada's potential role in global sustainability efforts, emphasizing the country's relative trustworthiness and the importance of collaboration and communication in finding solutions.

The panel discussion, moderated by David Yager, delved into various aspects of emissions reductions and the future of conventional energy sources. The conversation covered the complexities of transitioning to a sustainable energy future, the role of policy and legislation, financial challenges, and the importance of a global perspective. The panelists emphasized the need for pragmatic, inclusive approaches and highlighted Canada's potential role in the global sustainability landscape.

Alignment with Conference Objectives

1. **Misconceptions about the Energy Industry**: Yager's speech and the panel discussion addressed common misconceptions by providing a realistic view of the current state of energy transition, emphasizing the ongoing importance of conventional energy sources alongside renewables. This helps clarify misunderstandings about the viability and scalability of different energy sources.
2. **Navigating the Energy Transition**: Both the keynote and the panel explored how various energy sources, including traditional and renewable, contribute to a sustainable future. The discussions around the role of oil, gas, nuclear, hydro, and coal in the context of a decarbonizing world align with this objective.
3. **Fact-Based Understanding of Energy Sources**: Yager's data-driven approach and the panel's emphasis on factual information and realistic assessments of energy policies and trends demonstrate a commitment to a fact-based understanding of energy sources.
4. **Collaboration Across Energy Sectors**: The emphasis on the need for intense collaboration between different sectors, as highlighted in Yager's speech and the panel discussion, aligns with the summit's goal of fostering cross-sector collaboration.
5. **Financing and Investment in Energy Transition**: The panel's discussion on financial challenges, including investment trends and the impact of rising costs, addresses the summit's focus on financing and investment in the energy transition.
6. **Policy and Regulatory Frameworks**: The importance of understanding and shaping effective policy and regulatory frameworks was a theme in the panel discussion, particularly in the context of legislative processes and their impact on the energy industry.
7. **Technological Innovations and Trends**: While the transcripts do not explicitly mention discussions on specific emerging technologies, the overall focus on the energy transition likely touched on relevant innovations and trends in the sector.

8. **Global Energy Security and Affordability**: The panel's global perspective, including the discussion on the differing views of OECD and non-OECD countries and Canada's role, touches on the challenges of maintaining energy security and affordability during the transition.

David Yager's keynote speech and the panel discussions align well with the conference's objectives, addressing key themes such as misconceptions in the energy sector, the complexities of the energy transition, the need for fact-based approaches, collaboration across sectors, financial aspects, policy frameworks, and global energy challenges.

Topic Summaries

5.5 Global Innovation and Growth Opportunities in Energy: Harish Consul

Topic: Global Innovation and Growth Opportunities in Energy
Keynote Speaker: Harish Consul, Founder & CEO Ocgrow Ventures

Key Points

1. **Introduction:** Harish Consul, founder and CEO of Ocgrow Ventures, opened his keynote by acknowledging the leadership and vision of Jim Kinnear and the conference organizers. He emphasized the importance of discussing the future of energy from a venture capital fund's perspective, particularly in the clean tech space.
2. **Story on Electric Vehicles:** Consul shared a story about the challenges of electric vehicle (EV) infrastructure in Canada, highlighting the difficulties his friend faced while traveling from Vancouver to Calgary in a Rivian EV due to inadequate and malfunctioning charging stations.

3. **Broader Energy Sector Perspective:** He pointed out that light transportation is just a small part of the global energy sector, which also includes power generation, agriculture, forestry, industrial emissions, and more. Consul stressed that oil and fossil fuels will not be phased out soon, and demand in other sectors is rising.
4. **Growth in Clean Energy:** Despite the ongoing importance of conventional energy, Consul acknowledged the significant growth in clean energy and innovations aimed at reducing emissions. He mentioned various areas within clean tech, such as wind, solar, hydro, renewable fuels, carbon capture and storage, nuclear fission and fusion, and battery technology.
5. **Venture Capital in Clean Tech:** Consul discussed the venture capital perspective, emphasizing the need for cost reduction in clean tech deals to be competitive with conventional deals. He noted that capital allocation in clean tech is at an all-time high, surpassing conventional energy investments.
6. **Digitization in Energy Sector:** The keynote also touched on the role of digitization, data analytics, and generative AI in accelerating innovation in the energy sector.
7. **Alberta's Leadership in Clean Tech:** Consul highlighted Alberta's global leadership in clean tech innovation, mentioning the province's role in developing low-carbon energy companies and hydrogen technologies. He pointed out that Alberta is home to companies producing not just carbon-neutral but carbon-negative hydrogen.
8. **Panel Introduction:** Consul introduced his colleagues Rick and Ian, who would discuss growth opportunities and innovations in clean tech, particularly in hydrogen production involving direct air capture combined with sequestration.
9. **Moderator Introduction:** Melanie Clarence, a partner with Crowe Ventures specializing in life sciences, clean tech, and renewables, was introduced as the moderator for the panel discussion.

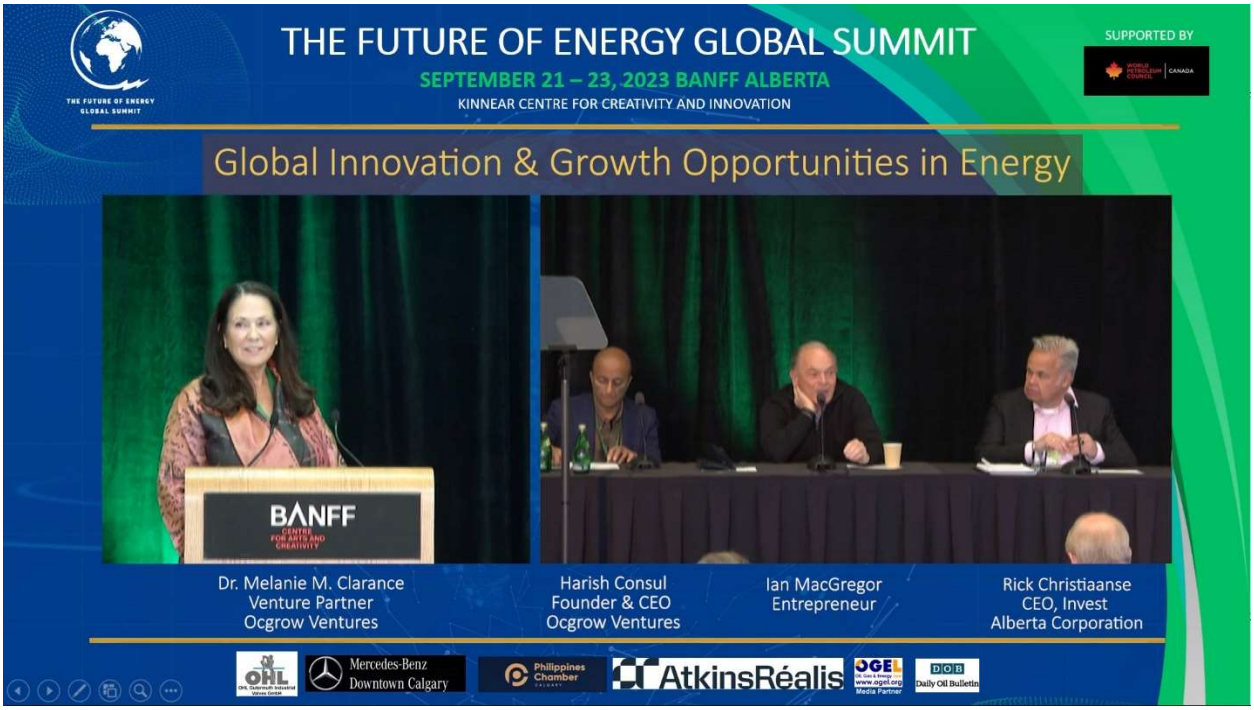
Harish Consul's keynote focused on the evolving landscape of the energy sector, emphasizing the continued importance of conventional energy alongside the growing significance of clean tech innovations. He highlighted the challenges and opportunities in the transition to cleaner energy sources, particularly in the context of Alberta's leadership in clean tech and hydrogen technology.

Summary of Panel Discussion:

Topic: Global Innovation and Growth Opportunities in Energy

Moderator: Dr. Melanie M. Clarance, Venture Partner, Ocgrow Ventures
Panel Members:

1. Harish Consul, Founder & CEO Ocgrow Ventures
2. Rick Christiaanse, CEO, Invest Alberta Corporation
3. Ian MacGregor, Entrepreneur



Key Points

1. **Introduction and Backgrounds:**
   - Dr. Melanie M. Clarance introduced the panel, highlighting Harish Consul's extensive experience in venture capital and his involvement in green hydrogen projects.
   - Rick Christiaanse and Ian MacGregor were introduced as key figures in Alberta's energy sector, with MacGregor's background in refining and carbon capture.
   - Alberta's Leadership in Clean Tech: Rick Christiaanse emphasized Alberta's leading role in North America for clean tech and clean energy investment. He

discussed the welcoming business environment in Alberta and the province's technical expertise. The panel discussed Alberta's potential in small nuclear technology and its role in achieving net-zero carbon.

2. **Innovations in Hydrogen and Carbon Capture:**
   - Ian MacGregor shared his experience with the Sturgeon Refinery and the Alberta Carbon Trunk Line, highlighting their roles in carbon capture and hydrogen production.
   - MacGregor introduced his new venture, "Hydrogen, Naturally," focusing on producing carbon-negative hydrogen through a gasification process using low-value forest fiber.
3. **Investment Climate and Opportunities in Alberta:**
   - Harish Consul noted the attractive investment climate in Alberta, with low taxes and increasing venture capital inflows.
   - The panel discussed the importance of creating high-paying jobs in Alberta, especially in the context of reconciliation and economic development.
4. **Challenges and Future Directions:**
   - The panel acknowledged the challenges in infrastructure for electric vehicles and the need for more efficient energy solutions.
   - Ian MacGregor emphasized the importance of practical solutions for carbon capture and utilization, aiming for cost-effective methods.
5. **Global Recognition and Collaboration:**
   - Rick Christiaanse highlighted Alberta's global recognition for its innovative approaches in energy and the willingness to collaborate with international partners.
   - The panel discussed the potential for Alberta to contribute significantly to the global energy transition through technology and innovation.
6. **Closing Remarks:**

   The panelists emphasized the need for practical solutions and real-world applications to drive the energy transition forward.

The panel discussion focused on Alberta's role in leading clean tech innovation, the potential for hydrogen and carbon capture technologies, and the importance of practical solutions in the energy sector. The panelists highlighted Alberta's welcoming business environment, its potential for job creation, and the need for collaboration to achieve global energy goals.

Alignment with Conference Objectives

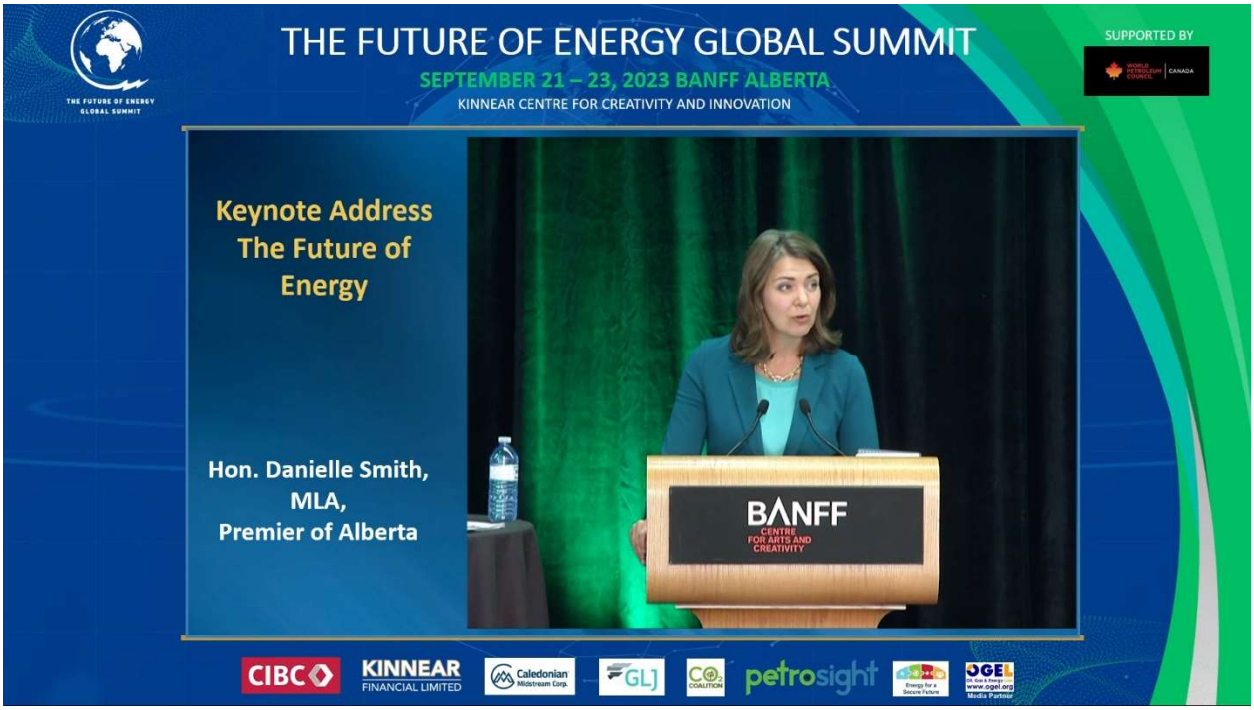
1. **Misconceptions about the Energy Industry**: The discussions addressed misconceptions by highlighting the evolving landscape of the energy sector, particularly the growth in clean energy and innovations aimed at reducing emissions. This aligns with the summit's goal of clearing up common misconceptions about the viability, scalability, and environmental impact of different energy sources.
2. **Navigating the Energy Transition**: The focus on Alberta's leadership in clean tech, the potential in small nuclear technology, and innovations in hydrogen and carbon capture directly contributes to understanding how different energy sources, including renewables and traditional sources, can coexist and complement each other in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The keynote and panel provided factual information about the investment climate in Alberta, the role of digitization in the energy sector, and specific initiatives like "Hydrogen." This supports the summit's objective of promoting a fact-based understanding of energy sources.
4. **Collaboration Across Energy Sectors**: The emphasis on Alberta's willingness to collaborate with international partners and the discussion of collaborative research and development in clean tech demonstrate the importance of cross-sector collaboration for holistic solutions in the energy transition.
5. **Financing and Investment in Energy Transition**: The discussion of venture capital inflows into clean tech and the attractive investment climate in Alberta addresses the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: While not explicitly detailed in the summaries, the implications of discussions on Alberta's business environment and the challenges in infrastructure for electric vehicles suggest an engagement with policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The keynote speech and panel discussion directly align with this objective, highlighting Alberta's role in leading clean tech innovation, the potential for hydrogen and carbon capture technologies, and the importance of practical solutions in the energy sector.

8. **Global Energy Security and Affordability**: The panel's focus on Alberta's potential to contribute significantly to the global energy transition through technology and innovation contributes to the broader theme of global energy security and affordability.

Harish Consul's keynote and panel discussions align well with the conference objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing financial aspects, and highlighting technological innovations and collaboration in the energy sector.

Topic Summaries

5.6. The Future of Energy: Hon. Danielle Smith, Premier of Alberta



Summary of the Keynote Speech
Topic: The Future of Energy
Keynote Speaker: Hon. Danielle Smith, ECA, MLA, Premier of Alberta

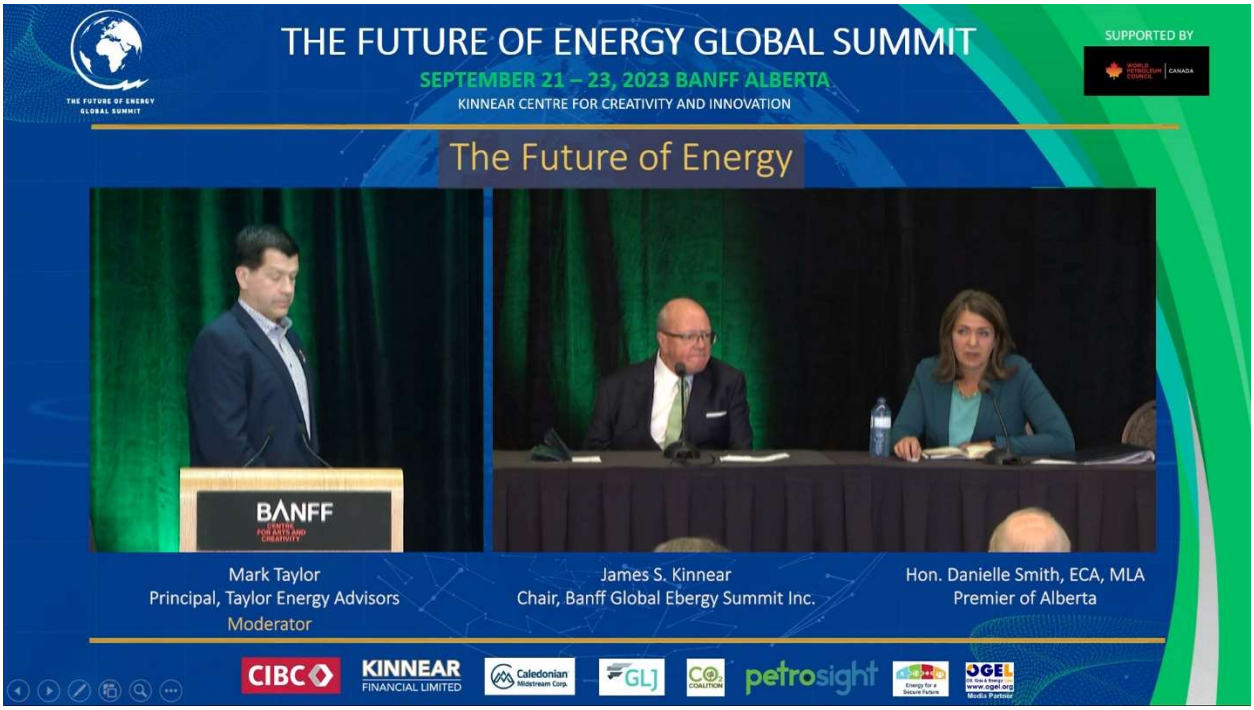
Key Points

1. Global Energy Needs and Realism: Premier Smith emphasized the need for a realistic understanding of global energy needs, warning against fantasy-driven approaches that could lead to economic and energy scarcity.
2. Oil and Gas in the Energy Mix: She asserted that oil and gas would remain core components of the world's energy mix even by 2050, challenging the notion of peak oil demand.
3. Energy Poverty and Emissions: Smith highlighted the dual challenge of addressing energy poverty and reducing emissions, advocating for technologies that can be transferred globally.

4. Alberta's Role and Initiatives: The Premier discussed Alberta's initiatives in hydrocarbon output, hydrogen production, and carbon capture, utilization, and Carbon Capture, Usage and Storage (CCUS) technologies.
5. Indigenous Participation: Smith stressed the importance of including Indigenous communities in energy projects, citing the Alberta Indigenous Opportunities Corporation's role in facilitating investments.
6. Collaboration and Investment: The Premier called for collaboration within the industry and with international partners, particularly in the Middle East, to attract investment and share technology.
7. Federal Government Relations: Smith expressed a desire for a more cooperative relationship with the federal government, emphasizing Alberta's jurisdiction over its resources and energy grid.
8. Environmental and Economic Balance: The speech highlighted the need to balance environmental concerns with economic and energy security, advocating for a pragmatic approach to the energy transition.

Summary of the Panel Discussion
Topic: The Future of Energy
Moderator: Mark Taylor, Principal, Taylor Energy Advisors
Panel Members:

1. Hon. Danielle Smith, ECA, MLA, Premier of Alberta
2. James S. Kinnear, Chair, Banff Global Energy Summit Inc.



Key Points

1. **Collaboration and Competition in Energy Transition (Co-opetition**): Premier Smith emphasized the significance of "co-opetition" in the energy sector, a strategic blend of cooperation and competition. She highlighted the challenges posed by the industry's traditionally siloed nature and underscored the importance of jurisdictions and companies working together in certain areas while maintaining competitiveness in others. This approach, as Premier Smith pointed out, is crucial for navigating the complex landscape of the energy transition, where collaboration can drive innovation and efficiency, yet competition remains essential for market dynamics and growth.

2. **Stakeholder Support for Large Projects:** The panel addressed the challenges of gaining local stakeholder support for large energy projects, emphasizing the need for social license and the potential role of Indigenous equity stakes.
3. **Energy Security, Affordability, and Emissions Reduction:** Both panelists agreed on the necessity of balancing energy security, affordability, and emissions reduction, with Premier Smith highlighting Alberta's commitment to carbon neutrality by 2050 without abandoning oil and gas.
4. **Challenges with Federal Government Policies:** The Premier criticized the federal government's approach to energy policies, particularly regarding the net-zero electricity grid target and its impact on Alberta.
5. **Investment and Economic Opportunities:** The panel discussed the potential for attracting investment in large-scale energy projects and the economic opportunities arising from Alberta's energy initiatives.
6. **Future of Alberta's Energy Sector:** Premier Smith outlined Alberta's future in the global energy landscape, focusing on its role in providing cleaner, reliable energy and the importance of integrated supply chains.

Alignment with Conference Objectives

1. **Misconceptions about the Energy Industry**: Premier Smith's emphasis on a realistic understanding of global energy needs and the ongoing importance of oil and gas in the energy mix helps address misconceptions about the viability and scalability of different energy sources. This aligns with the summit's goal of clearing up common misconceptions.
2. **Navigating the Energy Transition**: The discussion of Alberta's initiatives in hydrocarbon output, hydrogen production, and CCUS technologies, as well as the challenges and opportunities in the energy transition, contributes to understanding how different energy sources can coexist and complement each other in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The keynote and panel provided factual information about the global energy landscape, the role of oil and gas, and the potential of emerging technologies like hydrogen and CCUS, supporting the summit's objective of promoting a fact-based understanding of energy sources.
4. **Collaboration Across Energy Sectors**: The concept of "co-opetition," as highlighted by Premier Smith, demonstrates the importance of collaboration across different sectors, recognizing the need for both cooperative and competitive strategies in the energy industry.

5. **Financing and Investment in Energy Transition**: The discussion of attracting investment in large-scale energy projects and the economic opportunities arising from Alberta's energy initiatives addresses the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The keynote touched on the relationship with the federal government and the desire for a more cooperative approach, which aligns with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The panel's focus on Alberta's role in providing cleaner, reliable energy and the importance of integrated supply chains touches on technological innovations and trends in the energy sector.
8. **Global Energy Security and Affordability**: The necessity of balancing energy security, affordability, and emissions reduction, as agreed upon by the panelists, contributes to the broader theme of global energy security and affordability.

Premier Danielle Smith's keynote and panel discussion align well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, and highlighting the need for policy support, technological innovation, and collaboration in the energy sector.

Topic Summaries

5.7. A Pragmatic Path to Prosperity. Net Zero does not mean Net Losses: Hon. Peter MacKay

Summary of Keynote Speech
Topic: A Pragmatic Path to Prosperity. Net Zero does not mean Net Losses.
Keynote Speaker: Hon. Peter MacKay, PC, KC, Strategic Advisor with Deloitte Canada and Counsel with McInnes Cooper

Key Points

1. **Introduction and Context:** Peter MacKay emphasized the importance of action over talk in addressing climate change. He acknowledged the complexity of climate issues and the need for a realistic approach.
2. **Climate Change Reality:** MacKay recognized the reality of climate change, citing personal experiences in the Arctic and the visible changes over the years. He stressed the urgency of addressing climate change due to its profound impact on the planet.

3. **Canada's Role and Challenges:** He discussed Canada's position in the global context, noting that while Canada is not a major contributor to global emissions, it still plays a crucial role in the global effort to reduce emissions. • MacKay criticized the current federal approach, suggesting it could lead to economic deterioration rather than progress.
4. **Energy and Clean Tech:** The speaker highlighted the potential of clean technology as a $2.5 trillion opportunity, with Canada having significant potential in this area. He pointed out the challenges in commercializing clean tech, including the time it takes and the need for strategic partnerships and public support.
5. **Military Dependence on Fossil Fuels:** MacKay touched on the military's dependence on fossil fuels, emphasizing the need for energy security and the challenges in transitioning to alternative energy sources in this sector.
6. **Global Emissions and Canada's Contribution:** He compared Canada's emissions to global emitters like China and the U.S., emphasizing the disproportionate impact of these larger emitters compared to Canada.
7. **Economic Impact and Policy:** MacKay criticized the carbon tax for its impact on working Canadians and advocated for investment in new technologies and carbon capture. • He called for a coherent industrial policy to support clean tech growth and innovation.
8. **Canada's Potential and Path Forward:** The speaker concluded by emphasizing Canada's potential in natural resources, technology, and innovation. He urged for a balanced approach that considers economic, social, and environmental factors in pursuing climate goals.

Overall Message: Peter MacKay's speech focused on the need for a pragmatic and realistic approach to achieving net zero emissions. He highlighted the importance of Canada's role in the global context, the potential of clean technology, and the challenges in policy and economic impacts. MacKay advocated for a balanced strategy that leverages Canada's strengths in natural resources and innovation while addressing the global urgency of climate change.

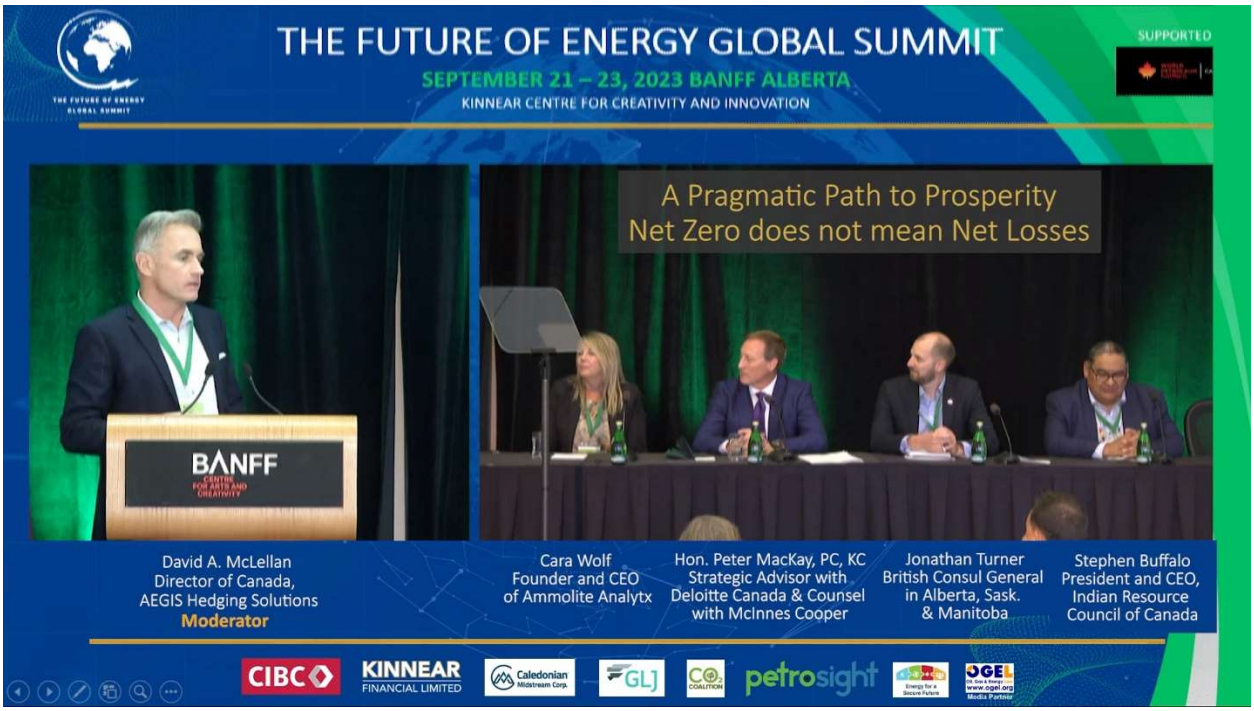
Summary of Panel Discussion

Topic: A Pragmatic Path to Prosperity. Net Zero does not mean Net Losses.

Moderator: David A. McLellan, Director of Canada, AEGIS Hedging Solutions

Panel Members:

1. Cara Wolf: Founder and CEO of Isolate Analytics, a cybersecurity company.
2. Hon. Peter MacKay, PC, KC, Strategic Advisor with Deloitte Canada and Counsel with McInnes Cooper
3. Jonathan Turner: British Consul General based in Calgary.
4. Stephen Buffalo: President and CEO of the Indian Resource Council of Canada (IRC).



Key Points

1. **Cara Wolf's Insights on Cybersecurity:** • Emphasized the current and growing threat of cyber-attacks, particularly in Canada. • Stressed the need for Canadian companies to improve their cybersecurity measures. • Highlighted the importance of developing Canadian-built security technologies and not relying solely on American solutions.

2. **Peter MacKay's Perspective:** • Discussed the importance of acknowledging and addressing climate change. • Emphasized the need for a balanced approach that doesn't harm the oil and gas industry. • Highlighted the role of First Nations as stewards of the land and the importance of their participation in the industry.
3. **Jonathan Turner's UK Perspective:** • Shared insights on the UK's approach to reducing emissions and the challenges faced, especially in light of rising energy prices. • Discussed the UK's commitment to net zero and the pragmatic approaches being taken, including new policies and business models.
4. **Stephen Buffalo on Indigenous Participation:** • Talked about the historical and ongoing challenges faced by Indigenous communities in Canada. • Emphasized the desire for Indigenous communities to be self-reliant and not dependent on federal funding. • Stressed the importance of partnerships and equity opportunities for Indigenous communities in natural resource development.
5. **Discussion on Energy Prices and Social Impact:** • The panel discussed how policies aimed at reducing emissions can lead to increased energy prices, impacting the standard of living. • Addressed the need for a pragmatic approach that balances environmental goals with economic and social realities.
6. **The Role of Technology and Innovation:** • The importance of technology and innovation in the transition to sustainable energy sources was highlighted. • Discussed the need for investment in new technologies and the challenges in commercializing clean tech.

Overall Message: The panel discussion provided diverse perspectives on the path to achieving net zero emissions without incurring net losses. It emphasized the importance of cybersecurity in protecting critical infrastructure, the role of Indigenous communities in resource development, and the challenges faced by countries like the UK in balancing environmental goals with economic realities. The discussion underscored the need for pragmatic solutions, collaboration, and innovation in addressing climate change and energy transition.

Alignment with Conference Objectives

1. **Misconceptions about the Energy Industry**: MacKay's speech and the panel discussion addressed misconceptions, particularly around the impact of climate policies on the oil and gas industry and the role of cybersecurity in the energy sector. This aligns with the summit's goal of clearing up common misconceptions about the energy industry.
2. **Navigating the Energy Transition**: The discussions covered various aspects of the energy transition, including the need for a balanced approach that supports traditional energy sources while moving towards renewables. This contributes to the broader conversation about how different energy sources can coexist and complement each other.
3. **Fact-Based Understanding of Energy Sources**: The presentations provided factual information about the realities of climate change, the global and Canadian context of emissions, and the potential of clean technology. This supports the summit's objective of basing discussions and decisions on factual information.
4. **Collaboration Across Energy Sectors**: The panel's emphasis on the need for collaboration, including the participation of Indigenous communities in the industry and the importance of partnerships in natural resource development, demonstrates the importance of collaboration across different sectors.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions on the economic viability of clean technology and the challenges in commercializing it touch on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The keynote and panel discussions highlighted the need for balanced energy policies and the importance of regulatory support for energy projects, aligning with the summit's focus on policy and regulatory frameworks.
7. **Technological Innovations and Trends**: The focus on cybersecurity and the potential of clean technology aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.
8. **Global Energy Security and Affordability**: The discussions around the economic impact of climate policies and the need for energy security, especially in the context of the military's dependence on fossil fuels, contribute to the broader theme of global energy security and affordability.

Peter MacKay's keynote and the panel discussions align well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations and collaboration in the energy sector.

Topic Summaries

5.8. The Future of Energy International Panel: Jakub Chełstowski

Topic: The Future of Energy International Panel
Keynote Speaker: Jakub Chełstowski, Marshal of Silesian Voivodeship

Mark Taylor introduced Marshal Jakub Chełstowski, highlighting the need for collaboration in achieving net-zero emissions and recognizing the unique challenges and paths of different regions. Chełstowski, as the Marshal of Silesia, Poland, represents a region similar to Alberta in its reliance on coal mining.

Keynote Address by Jakub Chełstowski: Marshal Chełstowski discussed the significant industrial transformation occurring in Silesia, the largest industrial area in Central Europe, focusing on transitioning from traditional energy systems to zero-emission sources.

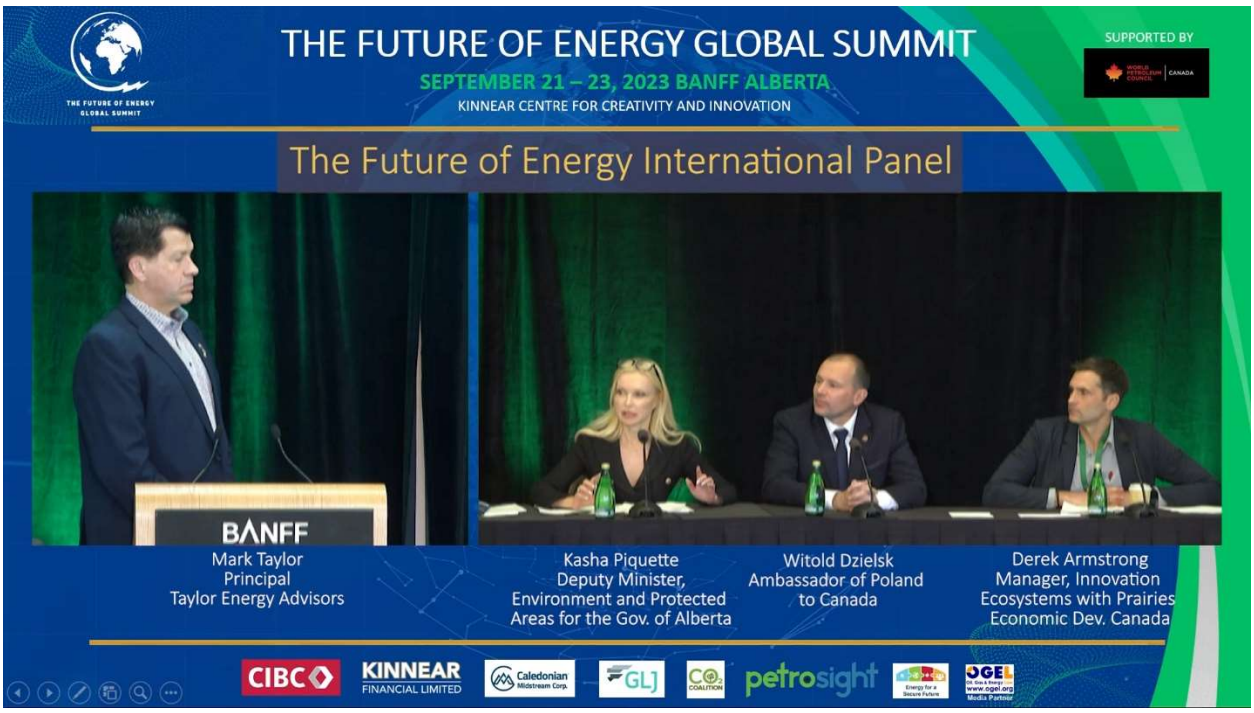
Key Points

1. **Ambitious Goals for Energy Transition:** Silesia aims to replace its traditional coal-based energy system with renewable energy sources. Despite renewables currently constituting only a small fraction of Silesia's energy mix, the region is committed to increasing this share.
2. **Economic Growth and Transition:** Chełstowski highlighted Silesia's economic growth, with a 45% increase in GDP over the last decade. He emphasized the region's role as a major electricity provider and a center for Polish industrial technology.
3. **Workforce Transition:** The Marshal noted the significant reduction in the mining workforce, from 400,000 to 70,000, underscoring the need for new employment opportunities in modern and green industries.
4. **Focus on Innovation and Green Industry:** Silesia is investing in innovation and green industry as the future of the region. The Marshal stressed the importance of developing smart specializations in key industries like energy, ICT, medicine, and green economy.
5. **Regional Innovation Strategy:** The regional innovation strategy for 2030 aims to create an environment conducive to innovation, generating new jobs and strengthening Silesia's regional and international position.
6. **Strategic Flagship Projects:** Silesia plans to implement strategic projects as new economic drivers, supported by the Just Transition Fund.
7. **Response to the War in Ukraine:** The conflict in Ukraine has prompted Silesia to double its efforts towards energy independence, emphasizing the need for secure and peaceful energy solutions for future generations.
8. Transformation of Coal Mines: • Chełstowski showcased the transformation of a former coal mine in Katowice into a museum, symbolizing the region's shift from its coal-mining past to a more diversified and sustainable future.

Conclusion: Marshal Jakub Chełstowski's keynote addressed the significant challenges and ambitious goals of Silesia in its energy transition journey. He emphasized the importance of innovation, green industry, and strategic investments in transforming the region's traditional coal-based economy into a modern, sustainable one. The Marshal's vision for Silesia reflects a broader global trend of regions adapting to the changing energy landscape while ensuring economic growth and job creation.

Summary of Panel Discussion: The Future of Energy International Panel
Moderator: Mark Taylor, Principal, Taylor Energy Advisors
Panel Members:

1. Kasha Piquette, Deputy Minister of Environment and Protected Areas, Government of Alberta
2. Witold Dzielski, Polish Ambassador to Canada
3. Derek Armstrong, Director of Policy Planning and External Relations for Prairies Economic Development Canada Discussion



Key Points

1. **Global Problem of Emissions:** Kasha Piquette emphasized that emissions are a global issue, requiring collaborative efforts. She highlighted the significant impact of a single incident in the Baltic Sea on global emissions, underscoring the need for sustainable energy solutions.
2. **Energy Security and Independence:** Witold Dzielski discussed Poland's journey towards energy independence and diversification, moving away from coal and Russian energy dependence. He mentioned Poland's focus on nuclear energy and renewables, including collaborations with Canada in these areas.

3. **Economic Opportunities in Energy Transition:** Derek Armstrong from Prairies Economic Development Canada spoke about the economic potential in the energy transition. He highlighted the role of incentives and collaboration in fostering innovation and economic growth in Alberta, particularly in clean tech and energy transition sectors.
4. **Infrastructure and Collaboration Challenges:** The panel discussed the challenges and opportunities in building energy corridors across Canada for better resource distribution and export. The importance of infrastructure in supporting energy transition and the difficulties in executing large-scale projects in Canada were highlighted.
5. **Poland's Nuclear Energy Ambitions:** Ambassador Dzielski elaborated on Poland's plans for nuclear energy development, including large plants and small modular reactors. He noted the potential for collaboration with Canada in this area and the importance of nuclear energy in Poland's energy mix.
6. **Importance of Oil and Gas in Energy Transition:** The panel recognized the critical role of the oil and gas sector in the energy transition process. The need for the sector's involvement in developing and implementing sustainable energy solutions was emphasized.
7. **International Cooperation for Energy Security:** The discussion underscored the need for international cooperation in ensuring energy security, particularly in the context of current geopolitical tensions. The panelists agreed on the importance of diversifying energy sources and reducing reliance on single suppliers.
8. **Challenges in Building Infrastructure:** The panel acknowledged the difficulties in executing large infrastructure projects in Canada, citing examples of stalled or slow-progressing projects. The need for a more efficient and collaborative approach to infrastructure development was discussed.

The panel highlighted the complexities of the energy transition, emphasizing the need for global collaboration, innovation, and a balanced approach that includes both traditional and renewable energy sources. The discussion also brought to light the challenges in infrastructure development and the potential economic opportunities in the energy sector.

Alignment with Conference Objectives

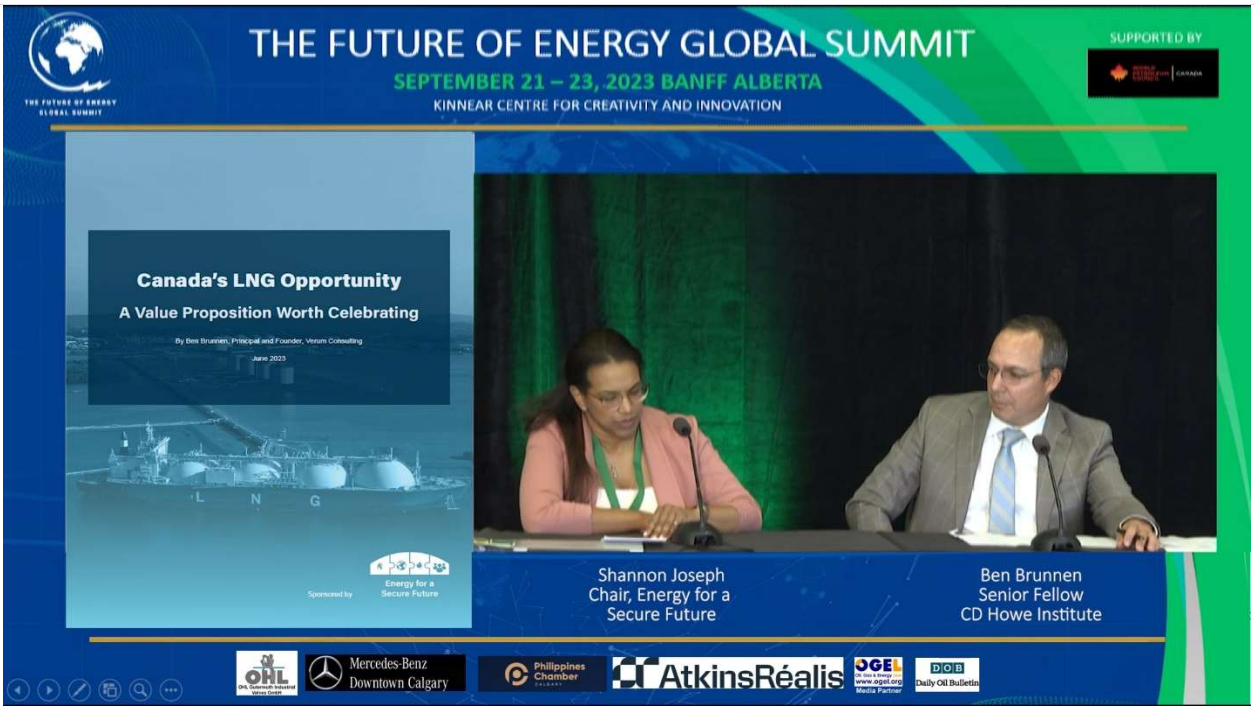
1. **Misconceptions about the Energy Industry**: Chełstowski's discussion on Silesia's transition from coal to renewable energy sources and the panel's broader conversation on global emissions, energy security, and the role of oil and gas in the energy transition likely addressed misconceptions about the viability and environmental impact of various energy sources.
2. **Navigating the Energy Transition**: The keynote and panel discussions directly contribute to this objective by exploring how different regions, like Silesia and Poland, are transitioning from traditional energy sources to renewables and nuclear energy. This showcases how diverse energy sources can coexist and complement each other in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The discussions, grounded in the specific experiences of Silesia and Poland, along with insights from Canadian perspectives, suggest a fact-based approach to understanding these energy sources, free from political and ideological biases.
4. **Collaboration Across Energy Sectors**: The emphasis on collaboration, particularly in the context of international cooperation for energy security and the transition to green industries, aligns with the summit's goal of fostering cross-sector collaboration.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions on strategic projects supported by the Just Transition Fund and economic opportunities in the energy transition touch on the financial aspects of moving towards sustainable energy.
6. **Policy and Regulatory Frameworks**: The panel's discussion on government policy's role in promoting alternative energy solutions and the challenges in building infrastructure indicates an engagement with policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The summit's objective of highlighting technological innovations is met through discussions on Poland's nuclear energy ambitions, including large plants and small modular reactors, as well as Silesia's focus on green industry and innovation.

8. **Global Energy Security and Affordability**: The focus on energy independence, diversification, and the need for secure and peaceful energy solutions for future generations contributes to the broader discussion of maintaining energy security and affordability during the transition to more sustainable practices.

Marshal Jakub Chełstowski's keynote and the panel discussions align well with the conference's objectives, addressing key themes such as clearing misconceptions, exploring diverse energy sources, emphasizing fact-based understanding, fostering cross-sector collaboration, discussing financial strategies, engaging with policy frameworks, and highlighting technological innovations in the energy sector.

Topic Summaries

5.9. Canada's Liquid Natural Gas (LNG) Opportunity: Shannon Joseph



Topic: Canada's Liquid Natural Gas (LNG) Opportunity
Panel Moderator: Shannon Joseph, Chair, Energy for a Secure Future
Panel Member: Ben Brunnen, Senior Fellow, CD Howe Institute

Key Points

1. **Genesis of Energy for a Secure Future:** Shannon Joseph explained the inception of Energy for a Secure Future, which emerged after Russia's invasion of Ukraine. This initiative aims to address energy, environment, affordability, and geopolitics comprehensively.
2. **Global Need for LNG:** Ben Brunnen highlighted the ongoing global demand for LNG, citing IEA forecasts. Despite the growth in renewables, hydrocarbons, particularly natural gas, will remain significant in the energy mix.
3. **Environmental Benefits of LNG:** LNG is favored for its lower emissions compared to other hydrocarbons. It's seen as a crucial backstop for intermittent renewable sources like wind and solar.

4. **Energy Security and Geopolitical Shifts:** The panel discussed the importance of LNG in the context of energy security, especially following the geopolitical shifts due to the Ukraine crisis. The reliability and affordability of LNG make it a sought-after energy source.
5. **Canadian LNG in the Global Context:** Canada's potential in the global LNG market was discussed, emphasizing its environmental leadership and ESG (Environmental, Social, and Governance) credentials. The panel also touched on the competitive edge Canada has over the U.S. in terms of environmental standards.
6. **Indigenous Partnerships and Benefits:** The discussion highlighted the significant role of Indigenous partnerships in the LNG sector in Canada, particularly in British Columbia. These partnerships have evolved from traditional impact benefit agreements to ownership and regulatory roles.
7. **Policy and Regulatory Recommendations:** The panel suggested a full-value proposition approach for Canada's LNG, emphasizing the need for consistent government policy, regulatory reform, and recognition of the global emissions reduction potential of Canadian LNG.
8. **Economic Impact of Canadian LNG:** Brunnen provided an economic analysis of increasing LNG capacity, highlighting the potential for significant revenue generation, job creation, and government revenues.
9. Challenges and Solutions for Canadian LNG: The panel addressed the challenges facing Canadian LNG, including policy uncertainty and regulatory hurdles. Solutions proposed included depoliticizing the regulatory process, defining clear evaluation criteria, and aligning fiscal and climate tools.
10. **Audience Interaction:** The panel engaged with the audience on topics like the carbon tax and its impact on carbon capture initiatives, and the role of the courts in shaping future energy policy and regulation.

The panel discussion provided a comprehensive overview of the opportunities and challenges in the Canadian LNG sector, emphasizing its potential role in global energy security, environmental benefits, and economic growth, while also acknowledging the need for policy and regulatory reforms to realize this potential.

Alignment with Conference Objectives

1. **Misconceptions about the Energy Industry**: The panel addressed misconceptions by discussing the environmental benefits of LNG and its role in the global energy mix, which aligns with the summit's goal of clearing up common misconceptions about the energy industry, particularly regarding the viability and environmental impact of LNG.
2. **Navigating the Energy Transition**: The discussion on the ongoing global demand for LNG and its role as a backstop for renewable sources like wind and solar contributes to understanding how traditional energy sources like natural gas can coexist and complement renewables in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The panel provided factual information about the global need for LNG, its environmental benefits, and the economic impact of Canadian LNG, supporting the summit's objective of promoting a fact-based understanding of energy sources.
4. **Collaboration Across Energy Sectors**: The emphasis on Indigenous partnerships in the LNG sector in Canada and the need for consistent government policy and regulatory reform demonstrates the importance of collaboration across different sectors, including government, Indigenous communities, and the energy industry.
5. **Financing and Investment in Energy Transition**: The economic analysis of increasing LNG capacity, potential revenue generation, job creation, and government revenues directly addresses the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The panel's suggestions for policy and regulatory reforms, including a full-value proposition approach for Canada's LNG and the alignment of fiscal and climate tools, align with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: While the panel discussion primarily focused on LNG, the broader context of the energy transition implies a consideration of technological innovations and trends in the energy sector.

8. **Global Energy Security and Affordability**: The discussion on the importance of LNG in the context of energy security, especially following geopolitical shifts, and its potential role in global energy solutions contributes to the theme of balancing global energy security and affordability.

The panel discussion on "Canada's Liquid Natural Gas (LNG) Opportunity aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting the financial, collaborative, and global aspects of the energy sector.

Topic Summaries

5.10. Energy Security – Infrastructure, Cyber, Supply and AI (Artificial Intelligence): Devon Smibert

Topic: Energy Security - Infrastructure, Cyber, Supply and AI (Artificial Intelligence)
Keynote Speaker: Devon Smibert, Founder, Restiv Technology

Summary of Keynote:
Devon Smibert, CEO of Rest of Technologies, focused his keynote on the intersection of cybersecurity, technology innovation, and the energy sector's transition towards net zero. He emphasized the importance of a stable and reliable energy foundation, affordability, and the role of technology in achieving these goals.

Key Points

1. **Hierarchy of Energy Needs:** Smibert presented a hierarchy of energy needs, emphasizing the foundational importance of reliable and affordable energy. He linked this to the broader goals of transitioning to net zero, highlighting the need for a prosperous economy to support this transition.
2. **Role of AI and Technology:** He discussed the significant role of AI and technology in accelerating the transition to net zero. Smibert referenced the potential of AI to contribute to productivity gains by 2035 but cautioned that its impact would vary across sectors.
3. **Importance of People in Technology Projects:** Smibert stressed that the success of technology projects often hinges on people-related factors. He advocated for including people in the transition journey, ensuring they are trained and prepared for new job opportunities that arise from technological shifts.
4. **Efficiency in Technology Investments:** He highlighted the need for efficiency in technology investments, especially in AI and energy transition projects. Smibert warned against burning resources on ineffective AI experiments and poorly planned energy investments.
5. **Fail Fast Approach in Projects:** Advocating a 'fail fast' approach, Smibert suggested quickly terminating ineffective projects to learn from them, rather than persisting with uncertain, large-scale investments.
6. **Cybersecurity in Critical Infrastructure:** The keynote addressed the increasing frequency and impact of cyberattacks on critical infrastructure. Smibert pointed out the growing boldness in such attacks, especially from state-sponsored actors, and the real threat they pose.
7. **Vulnerability to Cybercrime:** He warned that businesses, even if not directly targeted, could fall victim to cybercrime due to vulnerabilities. Smibert likened this to leaving a car unlocked, making it an easy target for criminals.
8. **Call for Panel Discussion:** Smibert concluded by inviting other panelists to discuss cybersecurity and technology-related topics further.

Conclusion: Devon Smibert's keynote addressed the critical aspects of energy security, emphasizing the role of technology and AI in the energy sector's future. He highlighted the importance of considering human factors in technology adoption, the need for efficient investment, and the growing threat of cybersecurity breaches in the energy sector.

Summary of Panel Discussion

Topic: Energy Security - Infrastructure, Cyber, Supply, and AI (Artificial Intelligence)

Moderator: Hon. Peter MacKay, PC, KC, Strategic Advisor with Deloitte Canada and Counsel with McInnes Cooper

Panel Members:

1. Devon Smibert, CEO of Rest of Technologies
2. Cara Wolf, Founder and CEO of Ammolite Analytx
3. Michele Taylor, CEO of Sovereign Tech and Power Corp

Key Points

1. **Critical Infrastructure Security:** Michele Taylor emphasized the need for hardening critical infrastructure security, treating it as a utility-grade necessity. She highlighted the gap in securing data and infrastructure in the field, suggesting the integration of data centers and cybersecurity facilities in these areas.
2. **Cybersecurity Challenges and Solutions:** Cara Wolf discussed the sophistication of cyber threats, including the use of AI in malware and the risks posed by nation-state actors. She stressed the importance of incident

response plans and hiring third-party security experts for robust cybersecurity measures.

3. **Regulatory Environment and Standards:** The panel discussed the need for better regulatory frameworks and standards in cybersecurity. Michele Taylor suggested that corporations demand higher service levels from vendors, ensuring utility-grade security.
4. **Role of AI in Cybersecurity:** AI's role in cybersecurity was highlighted, with a focus on its use in anomaly detection and surveillance. The panel also touched on the potential of AI in hardening environments and automating security processes.
5. **Learning from Other Countries:** Devon Smibert praised Israel for its approach to cybersecurity, noting their success in creating a robust ecosystem of cybersecurity startups. Cara Wolf admired the American approach for its risk-taking and investment in technology.
6. **Canada's Cybersecurity Posture:** The panel discussed Canada's cybersecurity capabilities, comparing them unfavorably with other nations. Devon Smibert pointed out Canada's delayed and limited response in developing cyber warfare capabilities.
7. **Advice for Businesses:** The panelists advised businesses to assume cyberattacks will happen and to prepare accordingly with incident response plans. They also emphasized the importance of due diligence in selecting cybersecurity solutions and partners.
8. **Challenges in Cybersecurity Education and Training:** There was a discussion on the gap in cybersecurity education, with a call for more focus on security by design in software engineering and computer science programs.
9. **Quantum Threat and Opportunities:** The impending threat of quantum computing to current encryption methods was mentioned, along with the opportunity for Canada to leverage its expertise in quantum AI.

Conclusion: The panel highlighted the critical importance of cybersecurity in the context of energy security, infrastructure, and AI. The discussion underscored the need for robust security measures, better regulatory frameworks, and the importance of preparing for emerging threats like quantum computing. The panelists also emphasized the need for collaboration, learning from global best practices, and investing in education and training to strengthen cybersecurity capabilities.

Alignment with Conference Objectives

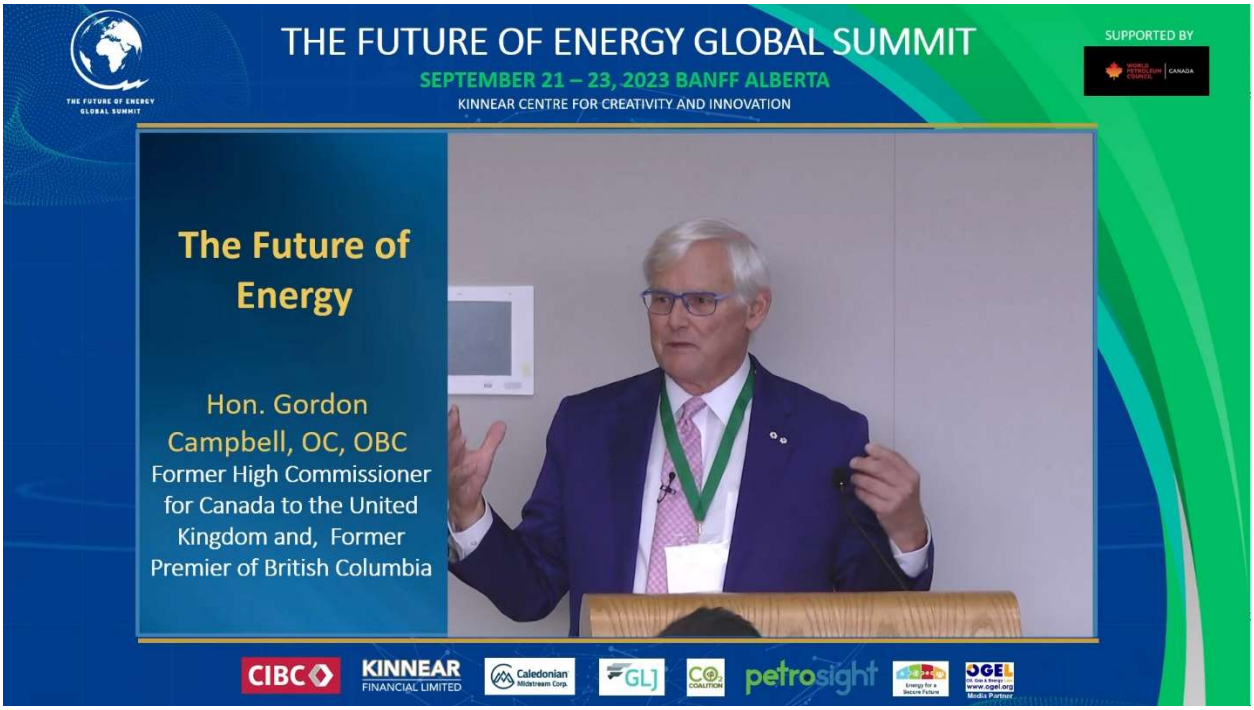
1. **Misconceptions about the Energy Industry**: Smibert's keynote and the panel discussion addressed misconceptions related to the role of technology, AI, and cybersecurity in the energy sector. They highlighted the importance of these aspects in ensuring energy security and the transition to net zero, which might help clarify misunderstandings about the technological and security dimensions of the energy industry.
2. **Navigating the Energy Transition**: While the focus of the keynote and panel was more on cybersecurity and technology rather than on diverse energy sources, the discussions indirectly contribute to understanding the energy transition. The emphasis on AI and technology as tools to accelerate the transition to net zero touches on how these innovations can support various energy sources in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The discussions, particularly around the role of AI and the need for robust cybersecurity measures, contribute to a fact-based understanding of the challenges and solutions in the energy sector, especially regarding infrastructure and technology.
4. **Collaboration Across Energy Sectors**: The emphasis on cybersecurity and the need for a collaborative approach to tackle cyber threats aligns with the summit's goal of fostering cross-sector collaboration. The panel's discussion on learning from other countries' approaches to cybersecurity also reflects this objective.
5. **Financing and Investment in Energy Transition**: This aspect was not directly addressed in the summaries provided. However, the emphasis on efficient technology investments and the potential impact of AI on productivity could be tangentially related to financing and investment strategies in the broader context of energy transition.
6. **Policy and Regulatory Frameworks**: The panel's discussion on the need for better regulatory frameworks and standards in cybersecurity directly aligns with this objective, highlighting the importance of policy in supporting the energy transition and protecting critical infrastructure.
7. **Technological Innovations and Trends**: Both the keynote and the panel discussions strongly align with this objective, focusing on AI, cybersecurity, and the potential threats and opportunities posed by emerging technologies like quantum computing.

8. **Global Energy Security and Affordability**: The discussions around cybersecurity in critical energy infrastructure and the role of technology in ensuring a stable and reliable energy foundation contribute to the broader theme of global energy security. The emphasis on affordability in Smibert's speech also touches on this objective.

Devon Smibert's keynote and the panel discussions align well with several of the conference's objectives, particularly in addressing misconceptions about the energy industry's technological aspects, discussing the role of technology and cybersecurity in the energy transition, emphasizing the need for collaboration, and focusing on policy, regulatory frameworks, and technological innovations.

Topic Summaries

5.11. The Future of Energy: Hon. Gordon Campbell



Topic: The Future of Energy
Keynote Speaker: Hon. Gordon Campbell, OC, OBC, Former High Commissioner for Canada to the United Kingdom and, Former Premier of British Columbia

Key Points

1. **Introduction by James S. Kinnear:** James S. Kinnear thanked the panelists, speakers, and the organizing committee for their contributions to the conference's success. He highlighted the participation of students from the University of Calgary, emphasizing the importance of nurturing young talent in the energy sector.
2. **Hon. Gordon Campbell's Address:** Campbell began his speech with an anecdote about a medium-sized tomato, using it to illustrate the amount of energy required in everyday items. He emphasized the perpetual presence of energy in our lives and its role in maintaining quality of life.

3. **Global Energy Needs and Challenges**: He discussed the global need for energy, particularly in developing countries, and criticized policies that hinder the distribution of resources like natural gas and fertilizers. Campbell stressed the importance of energy in addressing global hunger and poverty.
4. **The Need for New Thinking and Action:** Drawing inspiration from Abraham Lincoln, Campbell urged the audience to think and act anew in response to current challenges. He emphasized the need for innovative approaches to energy and climate issues.
5. **Canada's Historical Achievements and Potential:** Campbell recounted Canada's historical achievements, such as building the transcontinental railway and the St. Lawrence Seaway, to illustrate the country's potential for large-scale projects and innovation.
6. **Public Conversation and Understanding:** He highlighted the importance of public conversation and understanding, stressing the need to communicate in a language that the general public can understand.
7. **Action-Oriented Approach and Government's Role:** Campbell advocated for an action-oriented approach to energy challenges, emphasizing that government should facilitate rather than hinder progress.
8. **Environmental Goals and Canadian Identity:** He identified common environmental goals among Canadians, such as clean water, air, and arable land, and called for unity in achieving these goals.
9. **Challenges with Electric Vehicles and Material Needs:** Campbell discussed the practical challenges associated with the widespread adoption of electric vehicles, including the need for materials like cobalt, lithium, and copper.
10. **Call for Leadership and Reimagining Canada's Role:** He called for leadership and a reimagining of Canada's role in the global energy landscape, urging the audience to think beyond current limitations and to act decisively.
11. **Democratic Participation and Vision for the Future:** Campbell concluded by encouraging participation in democracy and envisioning a future where Canada leads by example in addressing global energy and environmental challenges. In summary, Hon. Gordon Campbell's keynote speech at the conference on "The Future of Energy" emphasized the enduring importance of energy in our lives and the need for innovative, action-oriented approaches to address global energy challenges. He highlighted Canada's historical achievements as a foundation for future success and called for leadership, unity, and reimagining Canada's role in the global energy landscape.

Alignment with Conference Objectives

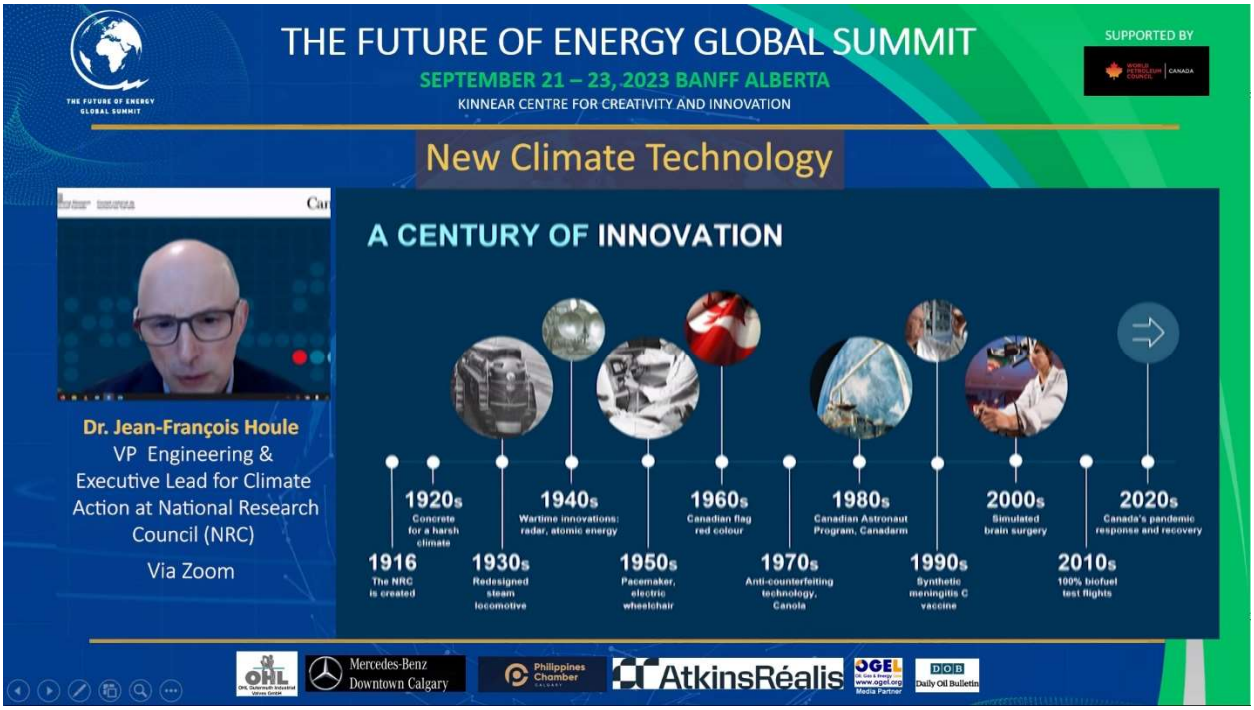
1. **Misconceptions about the Energy Industry**: Campbell's discussion on the global need for energy and the challenges in distributing resources like natural gas and fertilizers helps address misconceptions about the energy industry, particularly regarding the viability and scalability of different energy sources. This aligns with the summit's goal of clearing up common misconceptions.
2. **Navigating the Energy Transition**: The emphasis on the need for new thinking and action in response to current energy challenges contributes to understanding how different energy sources can coexist and complement each other in a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: Campbell's speech, which included practical challenges associated with electric vehicles and the need for materials like cobalt, lithium, and copper, provides a fact-based understanding of the complexities involved in transitioning to different energy sources.
4. **Collaboration Across Energy Sectors**: While not explicitly detailed in the summary, Campbell's call for unity in achieving common environmental goals and his emphasis on public conversation and understanding suggest the importance of collaboration across different sectors.
5. **Financing and Investment in Energy Transition**: The keynote touched on the challenges and opportunities in the energy sector, which implicitly involves discussions about financing and investment, especially in the context of transitioning to cleaner energy sources and the adoption of electric vehicles.
6. **Policy and Regulatory Frameworks**: Campbell advocated for an action-oriented approach where the government facilitates rather than hinders progress, which aligns with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The discussion on electric vehicles and the materials needed for their production touches on technological innovations and trends in the energy sector, particularly in the context of battery technology.

8. **Global Energy Security and Affordability**: Campbell's speech, which highlighted the global need for energy and the importance of addressing energy challenges, contributes to the broader theme of global energy security and affordability.

Hon. Gordon Campbell's keynote aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, and highlighting the need for policy support, technological innovation, and collaboration in the energy sector.

Topic Summaries

5.12. New Climate Technology: Dr. Jean-François Houle



Topic: New Climate Technology
Keynote Speaker: Dr. Jean-François Houle, Vice-President of Engineering and Executive Lead for Climate Action at National Research Council (NRC)

Key Points

1. **Introduction and Background:** Dr. Jean-François Houle, a key figure at the National Research Council of Canada (NRC), discussed the role of NRC in advancing technology related to climate change. He highlighted the NRC's history and its evolution in responding to various national needs through science and technology.
2. **NRC's Mandate and Operations:** Dr. Houle outlined the NRC's threefold mandate: advancing science and technical knowledge, supporting government policy-making with scientific expertise, and aiding business innovation. He explained how the NRC operates through research labs and a national funding program, the Industrial Research and Assistance Program (IRAP).

3. **Collaborative Research Programs:** The NRC focuses on collaborative research in areas like disruptive technologies for economic and environmental challenges, supporting superclusters, and R&D programs in partnership with academia and industry.
4. **IRAP's Role and Impact:** IRAP provides funding and advisory services to small companies for R&D, helping them connect with international initiatives and global value chains. Dr. Houle emphasized the program's success in fostering revenue growth and employment.
5. **NRC's Research Facilities and Focus Areas:** The NRC has 24 sites across Canada, focusing on various sectors including clean energy transition, digital technology, emerging technologies, and specific industrial sectors like transport and manufacturing. 6. Commitment to Climate Action: Dr. Houle discussed the NRC's commitment to climate action, focusing on clean energy production and storage, industrial decarbonization, low-carbon transportation, and climate adaptation.
6. **Advanced Clean Energy Programming:** The NRC's programs aim to accelerate the discovery of new processes and materials, particularly in battery technology and hydrogen fuel. They also focus on grid integration and fuel switching.
7. **Critical Battery Materials Initiative:** This initiative aims to accelerate the discovery of new battery materials and processes, with a focus on critical minerals found in Canada.
8. **Materials for Clean Fuels Challenge Program:** This program focuses on next-generation materials for CO2 conversion and hydrogen production, using artificial intelligence for materials discovery.
9. **Clean and Energy Efficient Transportation:** The NRC is working on aerodynamics, lightweighting vehicles, and power generation technologies for transportation.
10. **Low Emission Aviation Program:** This program aims to decarbonize the aviation industry through hybrid and hydrogen-based technologies.
11. **Engagement and Collaboration Opportunities:** Dr. Houle encouraged collaboration with the NRC, highlighting opportunities for SMEs through IRAP and for enhancing R&D in various sectors. Dr. Houle addressed questions from the audience, discussing the role of AI in experimental development, intellectual property concerns in federal funding, and the NRC's engagement in public-private partnerships.

Dr. Jean-François Houle's keynote provided a comprehensive overview of the National Research Council of Canada's efforts in advancing climate-related technologies, emphasizing the importance of collaboration, innovation, and the development of new materials and processes to address climate change challenges.

Alignment with Conference Objectives

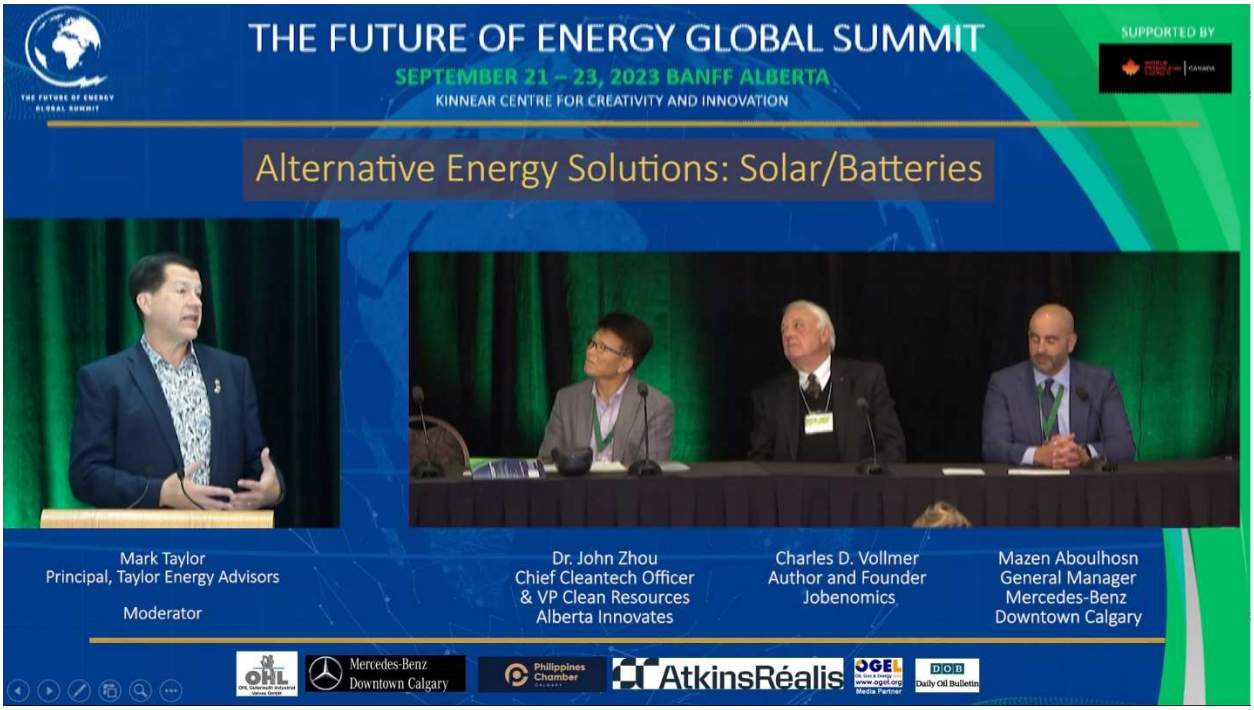
1. **Misconceptions about the Energy Industry**: Dr. Houle's discussion on the National Research Council of Canada's (NRC) role in advancing technology related to climate change helps address misconceptions about the viability and scalability of new climate technologies. This aligns with the summit's goal of clearing up common misconceptions about the energy industry.
2. **Navigating the Energy Transition**: The speech's focus on the NRC's commitment to climate action, including clean energy production and storage, industrial decarbonization, and low-carbon transportation, contributes to understanding how different energy sources, including emerging technologies, can contribute to a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: Dr. Houle's presentation on the NRC's research facilities, focus areas, and specific initiatives like the Critical Battery Materials Initiative and Materials for Clean Fuels Challenge Program provides a fact-based understanding of energy sources and technologies, crucial for making informed decisions about the future of energy.
4. **Collaboration Across Energy Sectors**: The emphasis on collaborative research programs and the NRC's role in partnering with academia, industry, and government aligns with the summit's objective of fostering collaboration across different sectors for holistic solutions in the energy transition.
5. **Financing and Investment in Energy Transition**: The discussion of the NRC's Industrial Research and Assistance Program (IRAP) and its role in providing funding and advisory services to small companies for R&D addresses aspects of financing and investment in the energy transition.
6. **Policy and Regulatory Frameworks**: While not explicitly detailed in the summary, the NRC's support for government policy-making with scientific expertise implies engagement with policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The keynote speech directly aligns with this objective, highlighting the NRC's efforts in advancing new climate technologies, including battery technology, hydrogen fuel, and low emission aviation programs.

8. **Global Energy Security and Affordability**: The focus on developing new processes and materials for clean energy production and storage, as well as the emphasis on industrial decarbonization and climate adaptation, contributes to the broader theme of global energy security and affordability.

Dr. Jean-François Houle's aligns well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations and collaboration in the energy sector.

Topic Summaries

5.13. Alternative Energy Solutions: Solar/Batteries: Chuck Vollmer



Topic: Alternative Energy Solutions: Solar/Batteries
Keynote Speaker: Chuck Vollmer, Author and Founder of Jobenomics

Introduction
Chuck Vollmer, known for his work in promoting green startup businesses and job creation. Vollmer's experience and commitment to enabling companies to move towards green solutions were highlighted, along with his personal background, including his military service and long-standing marriage.

Vollmer is the founder of Jobenomics, a non-profit grassroots movement focused on job creation, particularly in underserved communities. He has been actively involved in various initiatives, including energy, with a significant focus on solar and batteries.

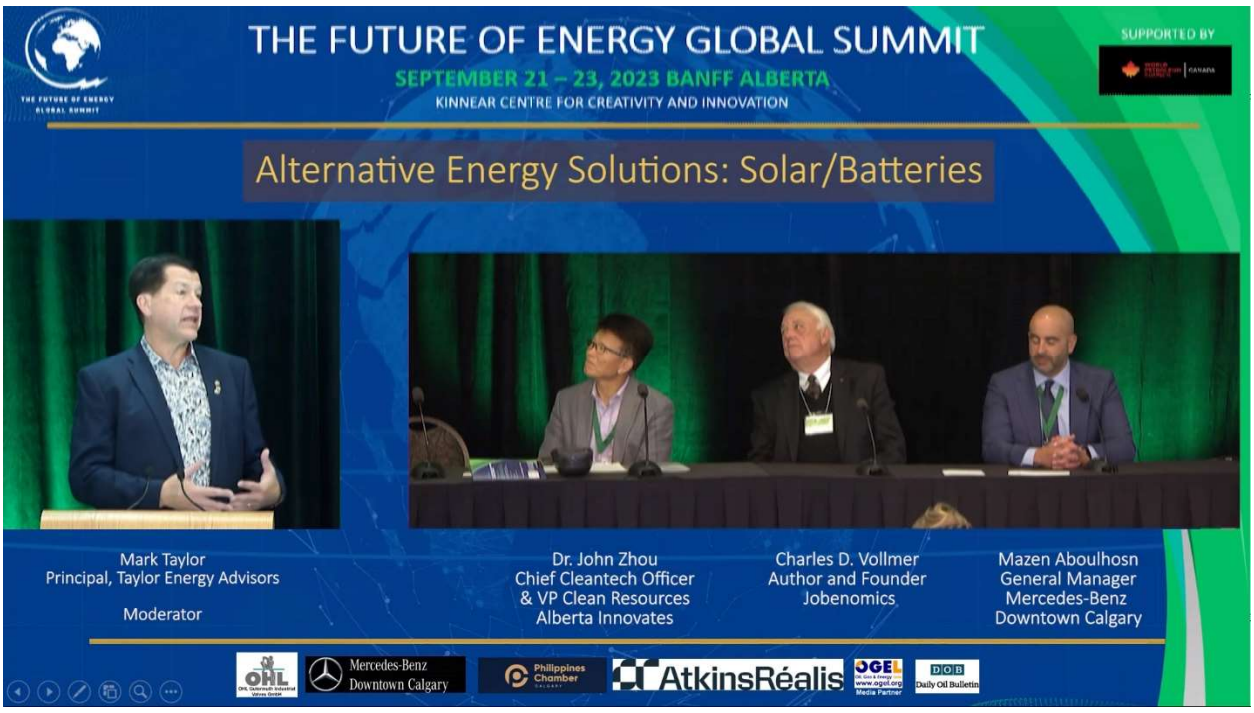
Key Points

1. **Jobenomics Initiatives:** Vollmer discussed Jobenomics' various initiatives, including their work in Canada with partners like Economic Development Alberta and indigenous communities. He emphasized the organization's role in mass-producing businesses and securing funding.
2. **Alternative Fuel Station Microgrid and Virtual Power Plan:** Vollmer presented a detailed plan developed for California, focusing on alternative fuel stations and microgrids. The plan involves importing Chinese equipment like lithium-ion battery packs and solar panels, with an emphasis on building manufacturing facilities in the United States.
3. **Battery Storage and Solar Power:** Vollmer highlighted the importance of battery storage in managing energy generated from solar and wind, particularly addressing issues of intermittency and curtailment. He discussed the need for large-scale battery storage systems to support the growing number of electric vehicles.
4. **Infrastructure and Manufacturing Plans:** Vollmer shared plans for building manufacturing facilities for battery storage systems and other components, with potential locations in the United States and Canada. He emphasized the importance of local manufacturing to support energy initiatives.
5. **Affordable Housing and Energy Solutions:** Vollmer discussed plans to integrate battery storage, solar panels, and chargers into affordable housing, making homes more energy-efficient and potentially self-sufficient.
6. **Commercial Battery Storage Systems:** He proposed the use of commercial battery storage systems to manage energy costs for businesses, reducing reliance on the grid and mitigating demand charges.
7. **Funding and Implementation Models:** Vollmer outlined various models for funding and implementing these energy solutions, including energy as a service, infrastructure as a service, and construction debt financing. He emphasized the potential for these models to support sustainable infrastructure development in various communities, including indigenous areas.

Conclusion: Chuck Vollmer's keynote addressed the critical role of alternative energy solutions, particularly solar and batteries, in driving green initiatives and job creation. He highlighted the importance of local manufacturing, infrastructure development, and innovative funding models in making sustainable energy solutions accessible and efficient. Vollmer's approach combines practical business strategies with a focus on underserved communities, aiming to create a more sustainable and inclusive economic future.

Summary of Panel Discussion
Topic: Alternative Energy Solutions: Solar/Batteries
Moderator: Mark Taylor, Principal, Taylor Energy Advisors
Panel Members:

1. Dr. John Zhou, Chief Clean Tech Officer, Alberta Innovates
2. Chuck Vollmer, Founder of Jobenomics
3. Mazen Aboulhosn, General Manager, Mercedes-Benz Downtown Calgary



Key Insights

1. **Electric Vehicle Adoption and Range Anxiety:** Mazen Aboulhosn shared his personal journey from skepticism to advocacy for electric vehicles (EVs). He highlighted the cultural and practical barriers to EV adoption, especially in oil and gas-dependent regions like Alberta. Range anxiety and charging infrastructure were discussed as major concerns for potential EV buyers. Aboulhosn's road trip in an electric Mercedes-Benz SUV from Calgary to Los Angeles served as a practical demonstration of EV capabilities and limitations.
2. **Infrastructure and Charging Needs:** The panel discussed the need for more robust charging infrastructure to support the growing number of EVs. The

"chicken and egg" dilemma of infrastructure development versus EV adoption was highlighted. Chuck Vollmer emphasized the importance of developing alternative fuel stations and microgrids to support EVs, particularly for on-the-go charging needs.

3. **Bitumen Beyond Combustion:** Dr. John Zhou introduced the concept of "bitumen beyond combustion," exploring how bitumen can be used in high-value products like carbon fiber and activated carbon, contributing to decarbonization efforts. Zhou presented a vision where bitumen could be a key component in future battery technologies, such as sodium-ion batteries, which could be more cost-effective and environmentally friendly than current lithium-ion batteries.
4. **Government Policy and Consumer Choice:** The panelists discussed the role of government policy in promoting EVs and alternative energy solutions. Aboulhosn argued for a balanced approach that respects consumer choice and avoids mandating specific vehicle types. The importance of providing incentives and creating an environment conducive to EV adoption, rather than imposing strict regulations, was emphasized.
5. **Future Technologies and Innovations:** The panel touched on future technological developments, such as wireless charging roads and solar panels integrated into infrastructure. • Innovations in battery technology, including the potential shift from lithium-ion to alternative battery chemistries, were discussed as critical for the future of EVs and renewable energy storage.

Conclusion: The panel discussion on alternative energy solutions, particularly focusing on solar and batteries, highlighted the complexities and opportunities in the transition to electric vehicles and renewable energy. The insights from Mazen Aboulhosn and Dr. John Zhou provided practical perspectives on EV adoption challenges, the potential of bitumen in clean technology, and the importance of supportive infrastructure and policies. The discussion underscored the need for integrated solutions and innovative technologies to drive forward the sustainable energy transition.

Alignment with Conference Objectives

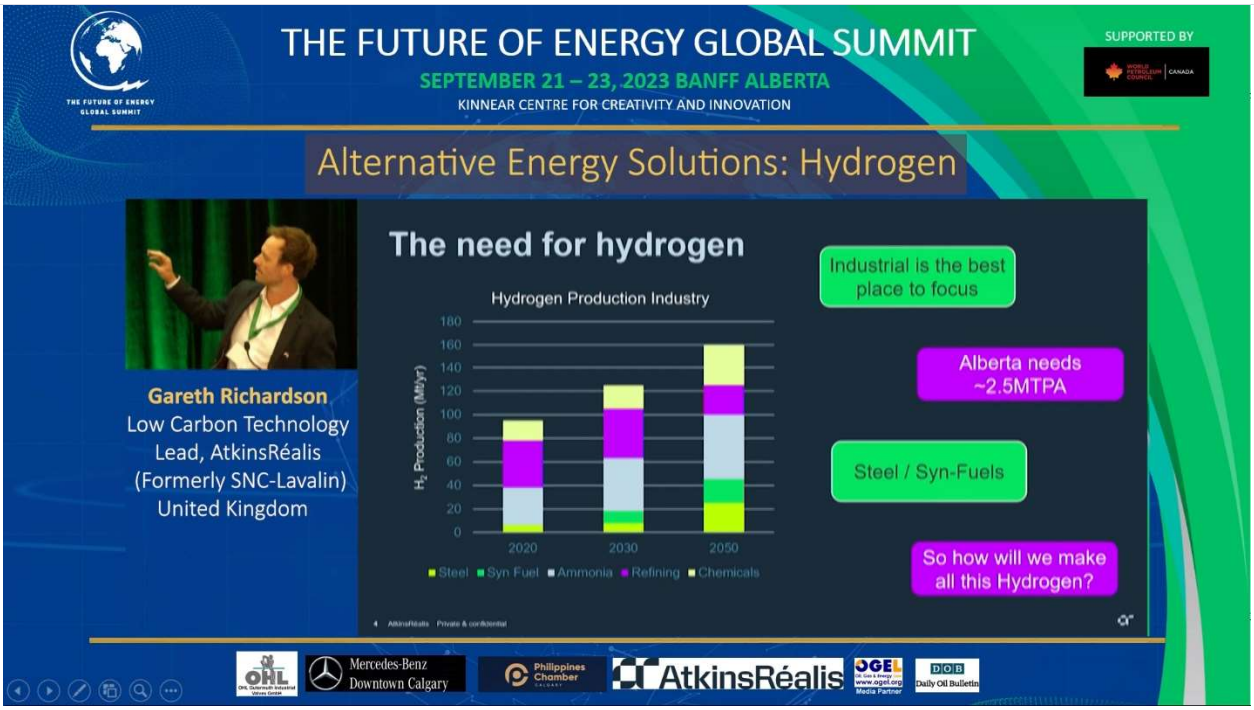
1. **Misconceptions about the Energy Industry**: Vollmer's focus on solar and battery technologies, as well as the panel's discussion on electric vehicles (EVs) and alternative uses of bitumen, likely addressed misconceptions about the viability and environmental impact of these energy sources. This includes clarifying the practicality and scalability of solar energy and battery storage solutions.

2. **Navigating the Energy Transition**: The keynote and panel discussions directly contribute to this objective by exploring how renewable energy sources like solar, as well as innovations in battery technology, can complement traditional energy sources. The concept of "bitumen beyond combustion" introduced by Dr. John Zhou also fits into this narrative of diverse energy sources coexisting.
3. **Fact-Based Understanding of Energy Sources**: Vollmer's presentation, grounded in practical initiatives and real-world applications, along with the panel's discussion on EVs and bitumen, suggests a fact-based approach to understanding these energy sources, free from political and ideological biases.
4. **Collaboration Across Energy Sectors**: Vollmer's work with various partners and the panel's diverse representation, including perspectives from the automotive industry and clean tech, demonstrate collaboration across different sectors of the energy industry.
5. **Financing and Investment in Energy Transition**: Vollmer's discussion on funding and implementation models for solar and battery solutions, as well as the panel's broader discussion on the energy transition, touches on the financial aspects of moving towards sustainable energy.
6. **Policy and Regulatory Frameworks**: The panel's discussion on government policy's role in promoting EVs and alternative energy solutions indicates an engagement with policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The summit's objective of highlighting technological innovations is met through discussions on solar power, battery storage, EVs, and potential future battery technologies. The mention of wireless charging roads and solar panels integrated into infrastructure also aligns with this goal.
8. **Global Energy Security and Affordability**: While not explicitly mentioned, the focus on renewable energy sources, EV adoption, and efficient energy storage solutions contributes to the broader discussion of maintaining energy security and affordability during the transition to more sustainable practices.

Chuck Vollmer's keynote aligns well with the conference's objectives, addressing key themes such as clearing misconceptions, exploring diverse energy sources, emphasizing fact-based understanding, fostering cross-sector collaboration, discussing financial strategies, engaging with policy frameworks, and highlighting technological innovations in the energy sector.

Topic Summaries

5.14. Alternative Energy Solutions: Hydrogen: Gareth Richardson



Summary of Keynote Speech:
Topic: Alternative Energy Solutions: Hydrogen
Keynote Speaker: Gareth Richardson, Low Carbon Technology Lead, AtkinsRéalis (Formerly SNC-Lavalin), United Kingdom

Key Points

1. **Global Emissions and Net Zero Goals:** Gareth Richardson highlighted the current global failure in reducing emissions effectively. He emphasized the consensus on moving towards net zero, albeit with varying target years.
2. **Hydrogen's Role in Decarbonization:** Richardson presented a framework for hydrogen use, noting its current primary role as a feedstock in industries like refining and ammonia production. He stressed the increasing challenges in hydrogen applications as one moves down the technology ladder.
3. **Industrial Demand for Hydrogen:** The keynote focused on the industrial need for hydrogen, particularly in ammonia production, refining, and chemicals.

Richardson predicted future growth areas in steel production and fuel creation, including e-fuels and methanol.

4. **Hydrogen Production Methods:** The discussion covered various hydrogen production methods, with a focus on the predominance of fossil fuel-based production. Richardson noted the potential shift towards cleaner production methods by 2050, including electrolysis and blue hydrogen (from natural gas with carbon capture).
5. **Water Usage in Hydrogen Production:** Highlighting the water intensity of hydrogen production, Richardson compared electrolysis and steam methane reforming, noting the significant water requirements of both methods.
6. **Cost Factors in Hydrogen Production:** The cost of hydrogen production was discussed, with energy cost being a crucial factor. Richardson provided insights into the cost implications of different production methods, including nuclear, pyrolysis, and natural gas-based methods.
7. **Nuclear Energy for Hydrogen Production:** Richardson, with his background in nuclear energy, advocated for nuclear power as a cost-effective method for hydrogen production, especially using high-efficiency electrolyzers.
8. **Challenges and Opportunities:** The keynote addressed the challenges in hydrogen production, including the need for infrastructure and the variability of renewable energy sources. Richardson also pointed out the opportunities for sector coupling, such as integrating hydrogen production with other industries like battery manufacturing.

Conclusion: Gareth Richardson's keynote speech provided a comprehensive overview of the current state and future potential of hydrogen as a key player in the global energy transition. He emphasized the importance of hydrogen in industrial applications and the need for innovative and efficient production methods to meet the growing demand while aligning with net zero goals. Richardson also highlighted the critical role of energy costs and the potential of nuclear energy in the hydrogen production landscape.

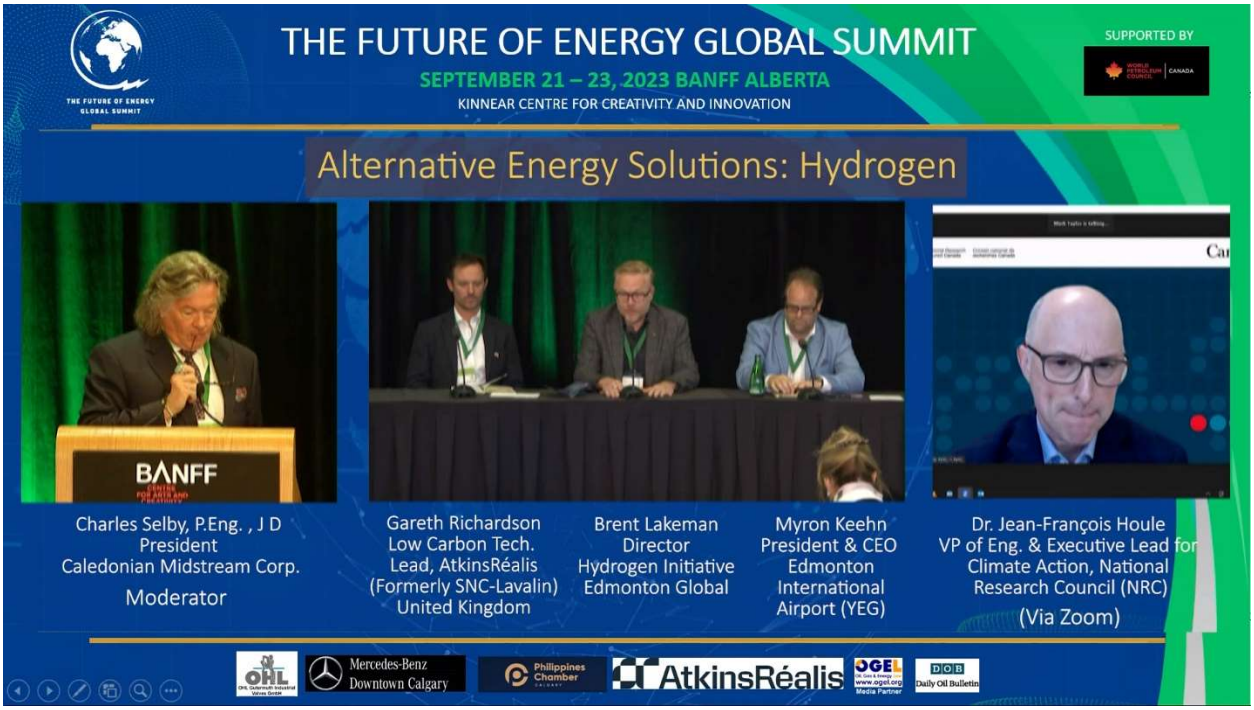
Summary of Panel Discussion

Topic: Alternative Energy Solutions: Hydrogen

Moderator: Charles Selby, P.Eng. J D, President Caledonian Midstream Corp.

Panel Members:

1. Gareth Richardson, Low Carbon Technology Lead, AtkinsRéalis (Formerly SNC-Lavalin), United Kingdom
2. Brent Lakeman, Director Hydrogen Initiative, Edmonton Global
3. Myron Keehn, President and CEO of Edmonton International Airport (YEG)
4. Dr. Jean-François Houle, Vice-President of Engineering and Executive Lead for Climate Action at National Research Council (NRC)



Key Points

1. **Hydrogen's Inevitability and Applications:** Charles Selby opened the discussion emphasizing the inevitability of a hydrogen future and its varied applications. He highlighted the distinction between carbon and carbon dioxide in environmental

impacts, underscoring the potential of blue hydrogen from methane and the intriguing possibilities of pyrolysis.

2. **Pyrolysis and Graphite Production:** Selby discussed pyrolysis, a process that yields hydrogen and pure carbon (graphite), noting its significance in battery anodes and supercapacitors. He mentioned the economic viability of this method, even without government subsidies, due to the sale of byproduct graphite.
3. **Edmonton's Role in Hydrogen Development:** Brent Lakeman, from Edmonton Global, spoke about Edmonton's position as a leader in hydrogen development, citing significant investments and projects in the region. He emphasized the focus on building hydrogen demand, particularly in transportation.
4. **Hydrogen in Aviation:** Myron Keehn from the Edmonton Airport Authority discussed hydrogen's critical role in decarbonizing aviation, a challenging sector. He mentioned ongoing projects and future plans for hydrogen-powered aircraft and the importance of sustainable aviation fuel.
5. **Research and Development Support:** Dr. Jean-François Houle highlighted the role of research institutions in supporting hydrogen technology development. He mentioned the National Research Council's involvement in testing and certifying new technologies, including hydrogen aircraft.
6. **Economic Opportunities and Infrastructure Utilization:** The panelists discussed the economic opportunities in hydrogen and the potential of repurposing existing infrastructure for hydrogen production and distribution.
7. **Challenges in Scaling Hydrogen Demand:** The discussion also touched on the challenges of rapidly commercializing hydrogen technologies and scaling up demand, especially in the transportation sector.
8. **Future of Hydrogen in Various Sectors:** The panelists explored the future of hydrogen in various sectors, including its role in creating sustainable aviation fuel and the potential for Alberta to lead in this space.

Conclusion: The panel discussion on hydrogen as an alternative energy solution highlighted the significant role hydrogen is expected to play in the energy transition, particularly in hard-to-decarbonize sectors like aviation. The discussion underscored the economic viability of hydrogen production, especially through methods like pyrolysis, and the importance of building infrastructure and demand. The panelists also emphasized the need for collaborative efforts across sectors to realize the full potential of hydrogen in the energy landscape.

Alignment with Conference Objectives

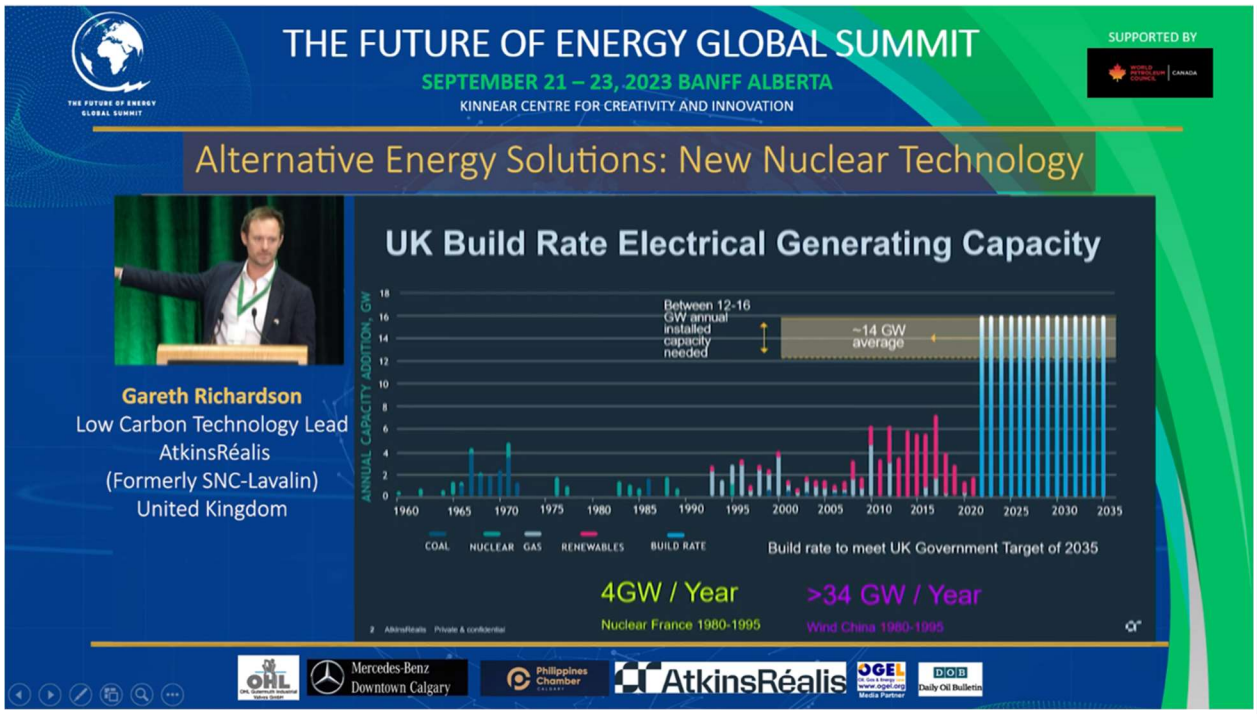
1. **Misconceptions about the Energy Industry**: Richardson's keynote and the panel discussion addressed misconceptions about hydrogen energy, particularly its role in decarbonization, production methods, and applications. This aligns with the summit's goal of clearing up common misconceptions about various aspects of the energy industry.
2. **Navigating the Energy Transition**: The discussions on hydrogen's role in decarbonizing various sectors, including hard-to-decarbonize ones like aviation, contribute to the broader conversation about how different energy sources can contribute to a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The emphasis on factual information, such as hydrogen production methods, water usage, and cost factors, supports the summit's objective of basing discussions and decisions on factual information.
4. **Collaboration Across Energy Sectors**: The panel's focus on the role of research institutions, the involvement of Edmonton Global and the Edmonton Airport Authority, and the discussion on sector coupling indicate a recognition of the importance of collaboration across various sectors.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions on the economic viability of hydrogen production methods like pyrolysis and the potential of repurposing existing infrastructure touch on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The discussions about government regulation, particularly in the context of hydrogen development and the need for clear regulatory frameworks, align with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The focus on new hydrogen technologies, such as pyrolysis and the potential of hydrogen in various sectors, aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.

8. **Global Energy Security and Affordability**: The potential of hydrogen to provide a stable and abundant energy source for various applications, including industrial processes and aviation, contributes to the broader theme of global energy security and affordability.

Gareth Richardson's keynote and the panel discussions align well with the conference's objectives, particularly in addressing misconceptions about hydrogen energy, exploring its role in the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations in the hydrogen sector.

Topic Summaries

5.15. Alternative Energy Solutions: New Nuclear Technology: Gareth Richardson



Topic: Alternative Energy Solutions: New Nuclear Technology
Keynote Speaker: Gareth Richardson, Low Carbon Technology Lead, AtkinsRéalis (Formerly SNC-Lavalin), United Kingdom

Key Points:

1. **Misconceptions about Nuclear Energy:** Gareth Richardson highlighted common misconceptions about nuclear energy, emphasizing its environmental benefits and efficiency.
2. **Decarbonizing Electricity Systems:** Discussed the challenges in achieving government targets for decarbonizing electricity systems. He noted the UK's struggle to meet its 2035 target due to insufficient build rates of new generation capacity.

3. **Comparative Build Rates:** France's success in building nuclear power (4 gigawatts per year) and China's rapid deployment of wind energy were cited as examples of effective energy infrastructure development.
4. **Political Focus and Long-Term View:** Emphasized the need for political focus and a long-term view to achieve significant build rates in energy infrastructure.
5. **Nuclear Power Plant Efficiency:** Discussed the high operating temperatures of various nuclear reactors and their efficiency in generating both electricity and heat.
6. **Domestic and Industrial Heating:** Analyzed the cost-effectiveness of nuclear energy for domestic and industrial heating, suggesting that nuclear power could be the cheapest source for these purposes.
7. **Location and Distribution of Nuclear Heat:** Addressed the logistical aspects of using nuclear heat for industrial purposes, emphasizing the need for proximity between nuclear plants and heat demand sites.
8. **Potential of Nuclear Energy in Alberta:** Highlighted the potential for using nuclear reactors for industrial heat in Alberta, including the possibility of cogeneration for both heat and electricity.
9. **Challenges in Major Project Delivery:** Discussed the challenges in delivering major projects like nuclear power plants, stressing the importance of advanced planning and government involvement.
10. **Social License and Planning for Nuclear Projects:** Concluded with the need to obtain social license and proper planning to successfully implement nuclear projects.

Conclusion: Gareth Richardson provided an insightful overview of the potential and challenges of new nuclear technology as an alternative energy solution. He emphasized the need for political commitment, advanced planning, and public acceptance to leverage nuclear energy effectively for both electricity generation and industrial heating.

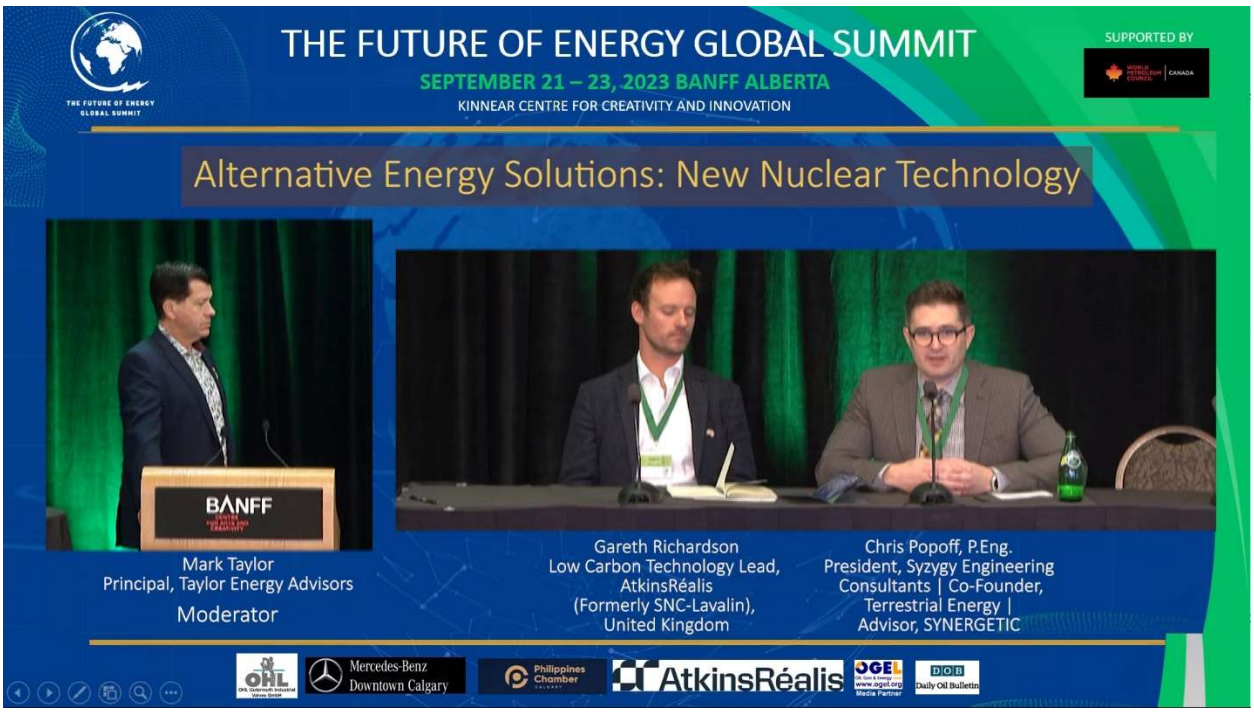
Summary of Panel Discussion

Topic: Alternative Energy Solutions: New Nuclear Technology

Moderator: Mark Taylor, Principal, Taylor Energy Advisors

Panel Members:

1. Gareth Richardson, Low Carbon Technology Lead, AtkinsRéalis (Formerly SNC-Lavalin), United Kingdom
2. Chris Popoff, P.Eng., President, Syzygy Engineering Consultants, Co-Founder, Terrestrial Energy, Advisor, SYNERGETIC



Key Points

1. **Safety and Efficiency of Nuclear Power:** Gareth Richardson emphasized the safety and efficiency of nuclear power, debunking common misconceptions. He highlighted the small volume of nuclear waste produced and the safety measures in place. • Chris Popoff echoed these sentiments, stressing the importance of understanding nuclear power as a safe and efficient energy source.
2. **Government Regulation and Nuclear Development:** The panel discussed the impact of government regulation on nuclear energy development. Gareth noted that while regulations have made nuclear plants safer, they have also increased costs. However, he mentioned that regulations in Canada are quite effective,

allowing for flexibility in design. Chris Popoff raised concerns about the current economic models that discount the future, arguing for a long-term view in energy planning, consistent with nuclear energy's potential.

3. **Challenges in Gaining Social License:** The discussion touched on the difficulty of gaining social license for nuclear projects due to public fear and misconceptions. The panelists agreed that better public education and information dissemination are crucial.
4. **Nuclear Waste Management:** Gareth Richardson addressed concerns about nuclear waste, explaining that the volume of waste is relatively small and manageable. He mentioned ongoing efforts in recycling nuclear fuel and the potential for future waste reduction technologies. Chris Popoff highlighted the potential of using spent nuclear fuel as a resource, suggesting that nuclear technology could evolve into a closed-loop system.
5. **Future of Nuclear Technology in Canada:** The panel discussed the future of Small Modular Reactors (SMRs) in Canada, with Gareth predicting operational SMRs by the 2030s. He also mentioned the potential for using existing Canadian nuclear technology (CANDU reactors) for quicker deployment. Chris Popoff emphasized the need for a clear regulatory framework to encourage industry investment in nuclear technology.
6. **Economic and Industrial Implications**: The panelists discussed the economic benefits of nuclear energy, particularly in providing a stable and abundant energy source for industrial growth. They also touched on the potential of nuclear energy in providing heat for industrial processes, highlighting its versatility beyond electricity generation.

Conclusion: The panel concluded that nuclear energy is a safe, efficient, and viable option for future energy needs. The challenges lie in overcoming public misconceptions, establishing clear regulatory frameworks, and embracing a long-term view of energy planning. The potential for nuclear technology, especially in the context of SMRs and existing Canadian nuclear capabilities, presents significant opportunities for Canada's energy sector.

Alignment with Conference Objectives

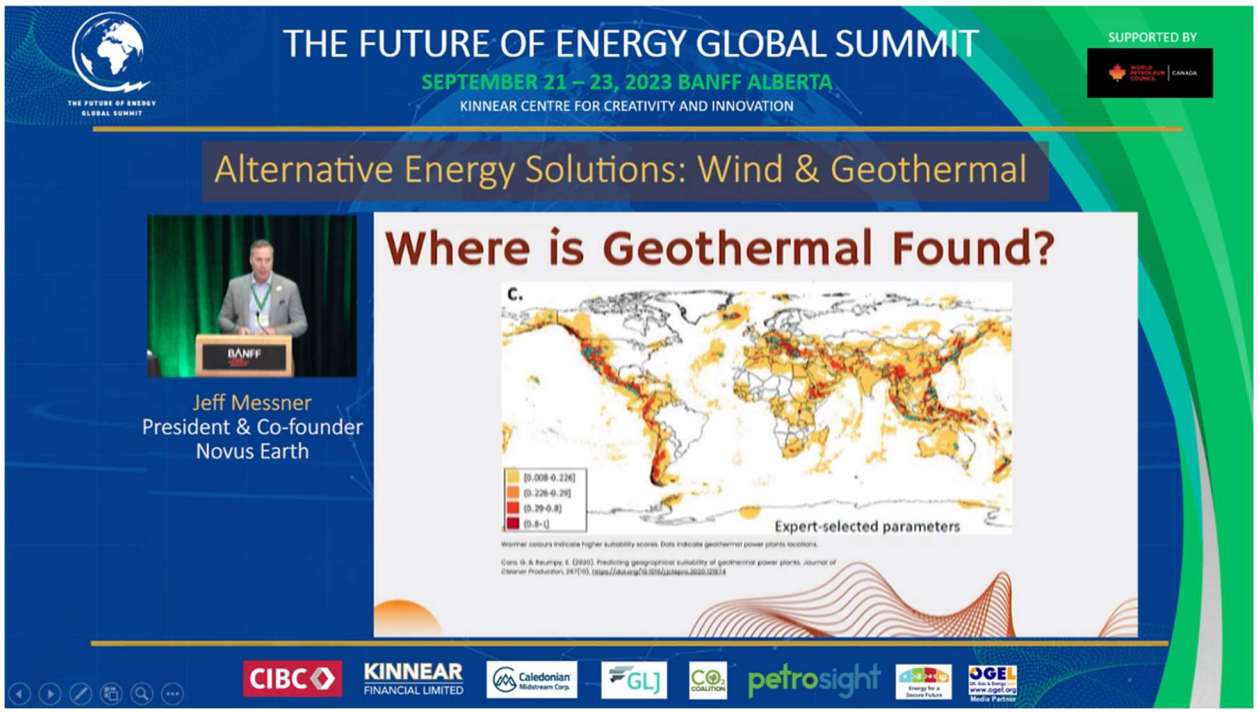
1. **Misconceptions about the Energy Industry**: Richardson's keynote and the panel discussion directly addressed misconceptions about nuclear energy, particularly regarding its safety, efficiency, and waste management. This aligns with the summit's goal of clearing up common misconceptions about various aspects of the energy industry.
2. **Navigating the Energy Transition**: The discussions on nuclear energy's role in decarbonizing electricity systems and its potential for providing heat for industrial processes contribute to the broader conversation about how different energy sources, including nuclear, can contribute to a sustainable energy future.
3. **Fact-Based Understanding of Energy Sources**: The emphasis on factual information, such as the comparative build rates of nuclear power in different countries and the manageable nature of nuclear waste, supports the summit's objective of basing discussions and decisions on factual information.
4. **Collaboration Across Energy Sectors**: While the focus was primarily on nuclear energy, the discussions about government regulation, social license, and the need for public education indicate a recognition of the importance of collaboration across various sectors, including policy, public engagement, and industry.
5. **Financing and Investment in Energy Transition**: The panel's discussion on the economic benefits of nuclear energy and the need for clear regulatory frameworks to encourage industry investment touches on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The discussions about the impact of government regulation on nuclear energy development and the need for clear regulatory frameworks align with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The focus on new nuclear technologies, such as Small Modular Reactors (SMRs) and the potential use of existing Canadian nuclear technology (CANDU reactors), aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.

8. **Global Energy Security and Affordability**: The potential of nuclear energy to provide a stable and abundant energy source for industrial growth, as well as its role in energy security and affordability, contributes to this objective.

Gareth Richardson's keynote aligns well with the conference's objectives, particularly in addressing misconceptions about nuclear energy, exploring its role in the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations in the nuclear sector.

Topic Summaries

5.16. Alternative Energy Solutions: Wind and Geothermal: Jeff Messner



Topic: Alternative Energy Solutions: Wind and Geothermal
Keynote Speaker: Jeff Messner, President and Co-Founder of Novus Earth

Summary of Keynote Speaker Presentation

Jeff Messner's keynote presentation focused on the potential and applications of geothermal energy, particularly in Canada. He emphasized the vast amount of heat available beneath the Earth's surface and the relatively untapped potential of geothermal energy in Canada compared to other parts of the world.

Key Points

1. **Geothermal Energy Basics:** Geothermal energy harnesses the Earth's heat. The Earth's core temperatures are comparable to the surface of the sun, offering a significant heat source.
2. **Geothermal Distribution:** Traditionally, geothermal energy has been utilized along tectonic boundaries, such as the Ring of Fire. However, advancements in

technology have made it possible to harness geothermal energy in other areas, including Canada.

3. **Canadian Geothermal Potential:** In Canada, particularly in areas like Hinton, Alberta, there are substantial geothermal resources. Despite this, Canada has only recently started to harness geothermal energy for electricity generation.
4. **Closed Loop Geothermal Systems:** Novus Earth is working on closed-loop geothermal systems, which are location agnostic and offer broader applications compared to traditional geothermal systems.
5. **Direct Use of Geothermal Energy:** Beyond electricity generation, geothermal energy has various direct applications, such as in agriculture (e.g., greenhouse heating), district heating, industrial processes, and more. These applications are widely used globally but are underutilized in Canada.
6. **Economic and Environmental Benefits:** Geothermal energy is renewable, sustainable, emits low or no greenhouse gases, and offers a reliable and continuous energy source. It is also cost-effective and has a smaller surface footprint compared to other renewable sources like solar or wind.
7. **Geothermal in Canada's Energy Mix:** Messner highlighted the lack of significant geothermal energy utilization in Canada, despite its potential. He presented a case for integrating geothermal energy into Canada's energy mix, especially for direct use applications.
8. **Economic Comparison with Natural Gas:** Messner compared the economics of geothermal energy with natural gas, factoring in the rising carbon tax in Canada. He demonstrated that geothermal energy could be more cost-effective than natural gas, especially considering future carbon pricing.

Jeff Messner's presentation underscored the untapped potential of geothermal energy in Canada, highlighting its environmental benefits, versatility in applications, and economic viability, especially in the context of rising carbon taxes and the need for sustainable energy solutions.

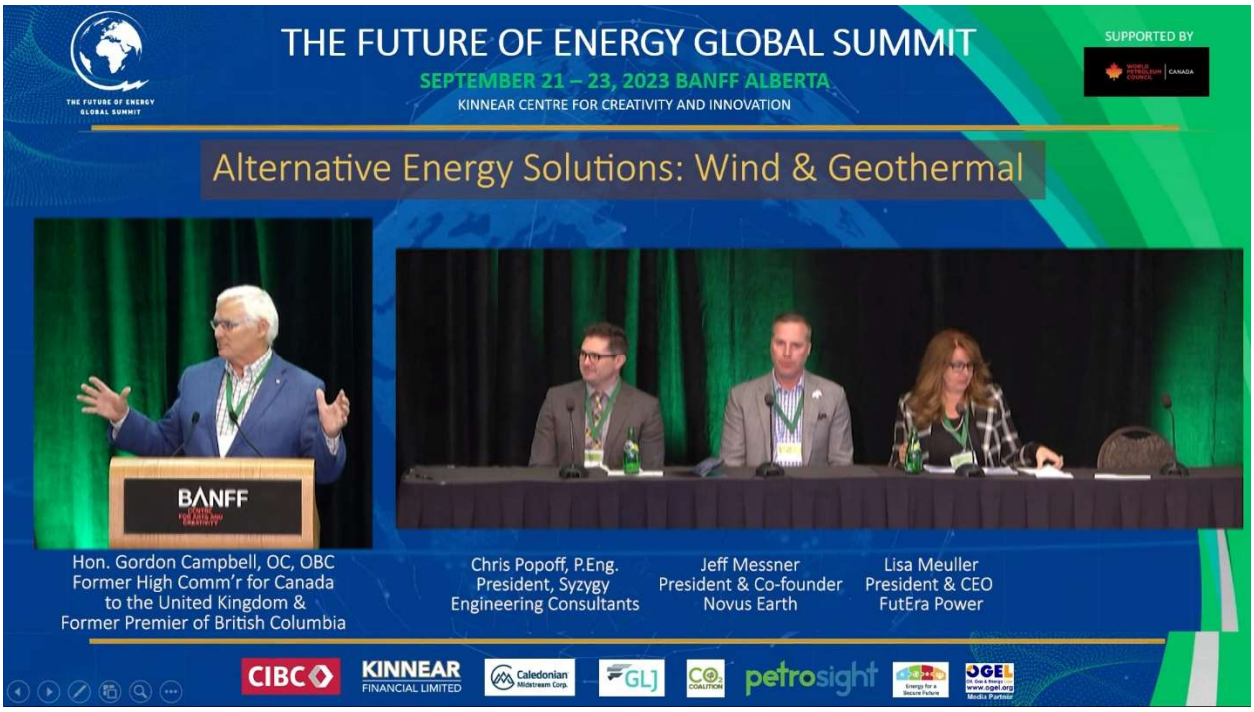
Summary of Panel Discussion

Topic: Alternative Energy Solutions: Wind and Geothermal

Moderator: Hon. Gordon Campbell, OC, OBC, Former High Commissioner for Canada to the United Kingdom and, Former Premier of British Columbia

Panelists:

1. Chris Popoff, P.Eng., President, Syzygy Engineering Consultants, Co-Founder, Terrestrial Energy, Advisor, SYNERGETIC
2. Jeff Messner, President and Co-Founder of Novus Earth
3. Lisa Meuller, President and CEO FutEra Power



Key Points

1. **Utilizing Canada's Natural Energy Assets:** The panel discussed the need to leverage Canada's natural energy resources, particularly geothermal energy. They emphasized the importance of moving from discussion to action and building upon the available resources.
2. **Geothermal Energy in Canada:** Lisa Mueller highlighted the untapped potential of geothermal energy in Canada. She shared her experience in initiating geothermal projects, emphasizing the need for practical solutions and regulatory support.

3. **Challenges and Opportunities:** The panelists discussed the challenges in geothermal energy development, such as high upfront costs and technical risks. They also explored opportunities, including using existing oil and gas infrastructure for geothermal projects.
4. **Economic and Environmental Benefits:** Jeff Messner pointed out the economic viability and environmental benefits of geothermal energy, particularly in direct use applications like heating and industrial processes.
5. **Learning from Global Practices:** The panelists mentioned Iceland as a model for geothermal energy utilization, noting the differences in geological conditions but acknowledging the learnings that can be applied in Canada.
6. **Innovation and Technology Development:** Lisa Mueller emphasized the need for innovation in technology to harness geothermal energy more effectively, particularly in lower-temperature resources.
7. **Role of Nuclear Energy:** Chris Popoff discussed the potential of nuclear energy in complementing geothermal and other renewable sources, highlighting the need for a diverse energy mix.
8. **Public Perception and Education:** The panelists stressed the importance of changing public perception and educating the younger generation about the potential and benefits of geothermal and other alternative energy sources.
9. **Call to Action:** The panel concluded with a call to action for Canada to dream bigger and harness its geothermal potential, emphasizing the need for practical action and innovative thinking in the energy sector.

Alignment with Conference Objectives

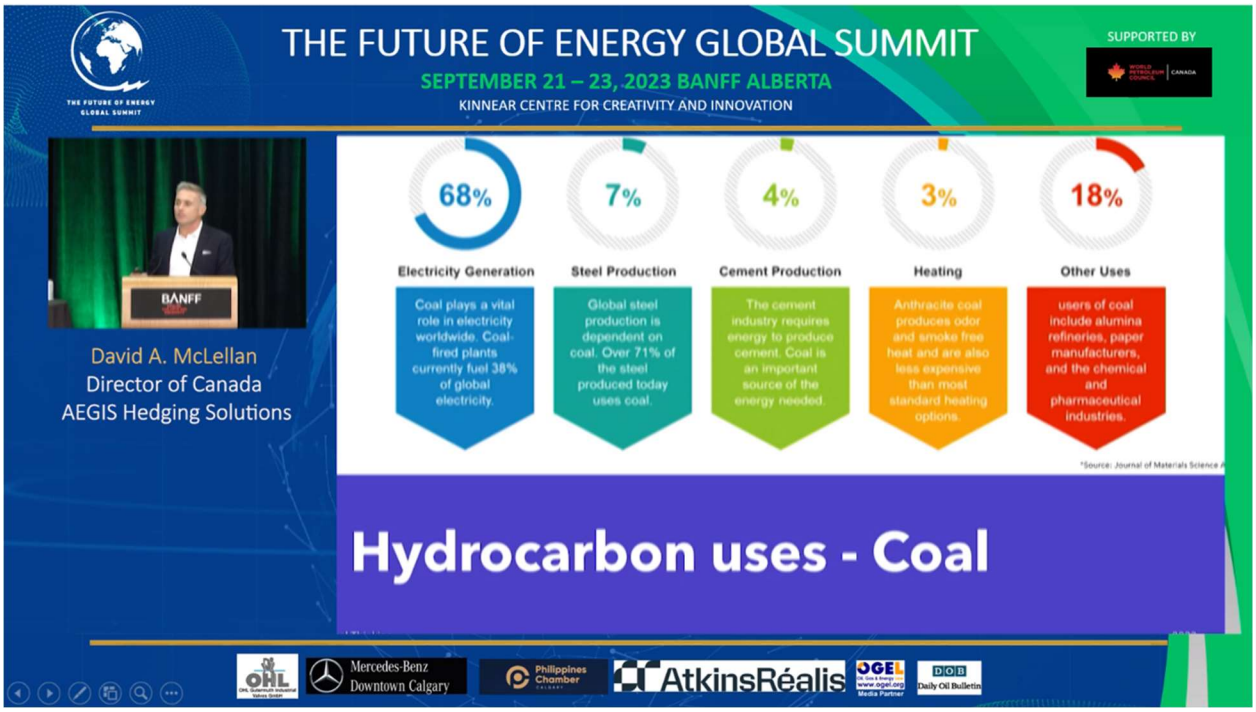
1. **Misconceptions about the Energy Industry**: Both the keynote and the panel discussion addressed misconceptions about geothermal energy, particularly its viability, scalability, and environmental impact. This aligns with the summit's goal of clearing up common misconceptions about various aspects of the energy industry.
2. **Navigating the Energy Transition**: The discussions on geothermal and wind energy contribute to the broader conversation about how different renewable energy sources can contribute to a sustainable energy future. The emphasis on leveraging Canada's natural energy assets, particularly geothermal, aligns with the summit's focus on diverse energy sources coexisting and complementing each other.

3. **Fact-Based Understanding of Energy Sources**: The presentations provided factual information about geothermal energy, such as its basics, distribution, potential in Canada, and economic and environmental benefits. This supports the summit's objective of basing discussions and decisions on factual information.
4. **Collaboration Across Energy Sectors**: The panel's discussion on leveraging existing oil and gas infrastructure for geothermal projects and the need for regulatory support indicates a recognition of the importance of collaboration across various sectors, including policy, public engagement, and industry.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions on the economic viability of geothermal energy and the challenges of high upfront costs suggest a focus on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The discussions about the need for practical solutions, regulatory support, and innovative thinking in policy for geothermal energy development align with the summit's focus on understanding and shaping policy and regulatory frameworks that support the energy transition.
7. **Technological Innovations and Trends**: The focus on innovation in technology to harness geothermal energy more effectively and the potential of closed-loop geothermal systems aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.
8. **Global Energy Security and Affordability**: The potential of geothermal energy to provide a stable, renewable, and sustainable energy source contributes to the broader theme of global energy security and affordability.

Jeff Messner's keynote and the panel discussions align well with the conference's objectives, particularly in addressing misconceptions about geothermal energy, exploring its role in the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations in the geothermal sector.

Topic Summaries

5.17. Current and Future Trends in Energy Transition, Competitiveness, ESG, Industry Consolidation, and New Project Developments: David McLellan



Summary of Keynote Speech
Topic: Current and Future Trends in Energy Transition, Competitiveness, ESG, Industry Consolidation, and New Project Developments
Keynote Speaker: David A. McLellan, Director of Canada, AEGIS Hedging Solutions

Key Points

1. **Background and Experience:** David McLellan shared his diverse career journey, transitioning from the military to finance, and eventually to the oil and gas industry. He highlighted his experience in innovative energy projects and his move to the U.S. to engage with the shale revolution.

2. **Energy Transition Realities:** McLellan emphasized that the so-called energy transition is more of a shift in the energy mix rather than a complete transition. He pointed out the significant change in the U.S. energy landscape, transitioning from a major energy importer to a leading exporter.
3. **Global Energy Consumption:** The keynote addressed the correlation between GDP per capita and energy consumption in various countries, highlighting the disparities and the continued dominance of hydrocarbons in the global energy mix.
4. **Hydrocarbon Utilization:** McLellan discussed the extensive uses of hydrocarbons beyond just fuel, suggesting that these resources will not be phased out soon due to their varied applications.
5. **Environmental Impact and Adaptation:** He acknowledged the measurable impact of CO2, methane, and nitrous oxide emissions on the environment but argued for a balanced view that recognizes human adaptability and resilience.
6. **Improvements in Global Health and Poverty:** McLellan highlighted the significant global progress in reducing extreme poverty and improving health, attributing these achievements partly to increased energy availability.
7. **Challenges in Energy Policy**: He critiqued the fear-driven narrative around climate change and advocated for a more positive and solution-oriented approach. McLellan stressed the importance of considering economic trade-offs in energy policy and the need to prioritize reliable and affordable energy.
8. **Call for Balanced Discussion:** In concluding, McLellan called for a balanced discussion on energy policy, emphasizing the need to weigh the costs and financial trade-offs of achieving net-zero goals against other societal needs.

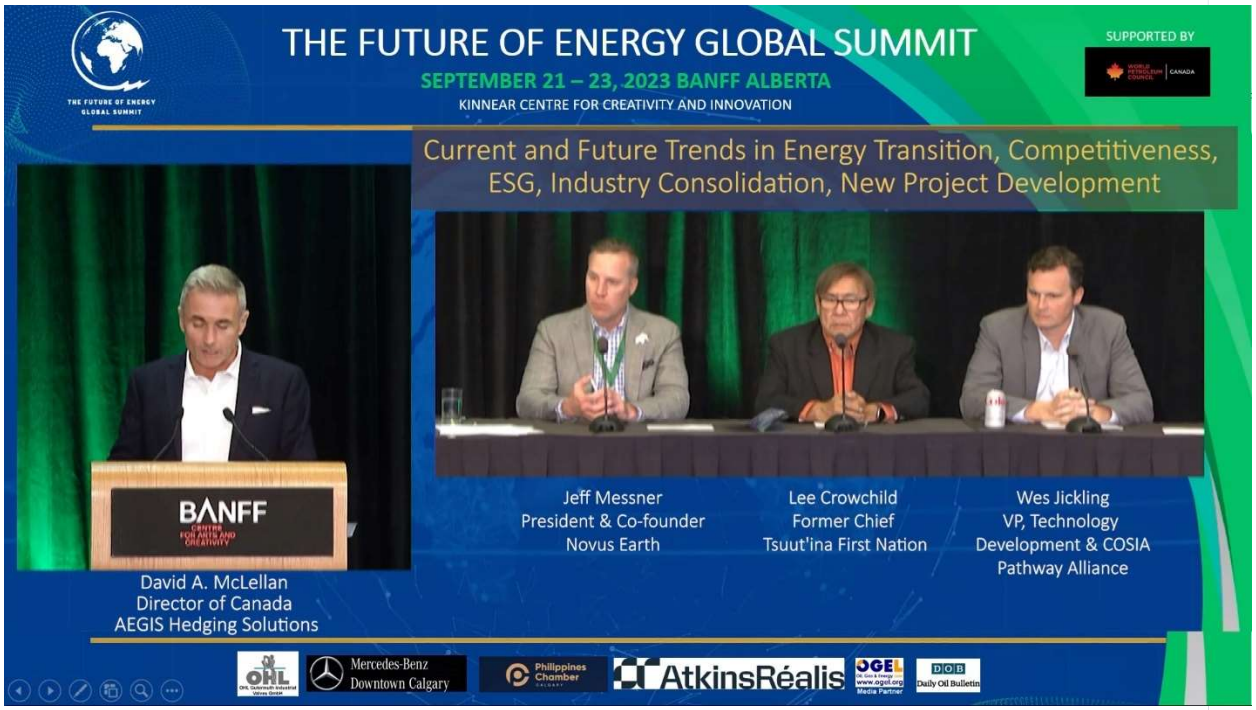
Overall Message: David McLellan's speech focused on the complexities of the energy transition, highlighting the continued importance of hydrocarbons, the need for realistic and balanced energy policies, and the importance of considering economic and societal impacts in the pursuit of environmental goals.

Summary of Panel Discussion
Topic: Current and Future Trends in Energy Transition, Competitiveness, ESG, Industry Consolidation, and New Project Developments

Moderator: David A. McLellan, Director of Canada, AEGIS Hedging Solutions

Panel Members:

1. Jeff Messner, President of Novus Earth, a geothermal company.
2. Lee Crowchild, Former Chief of Tsuut'ina Nation.
3. Wes Jickling, Vice President of Technology Development for the Pathways Alliance.



Key Points

1. **Jeff Messner:** Messner discussed the role of Novus Earth in the energy sector, emphasizing the importance of geothermal energy and its potential contributions to the energy mix. He highlighted the need for more interaction and better engagement with Indigenous communities in energy projects.

2. **Lee Crowchild:** Crowchild presented a comparison between Western and Indigenous models of engagement and decision-making, emphasizing the importance of considering Indigenous perspectives in energy and environmental policies. He stressed the need for genuine engagement with First Nations communities from the beginning of any project, rather than as an afterthought. Crowchild highlighted the historical context and the impact of colonization on Indigenous peoples, urging a deeper understanding and respect for Indigenous rights and perspectives in nation-building and energy projects.
3. **Wes Jickling:** Jickling spoke about the Pathways Alliance and its commitment to reducing greenhouse gas emissions in the oil sands industry. He outlined the collaborative efforts of oil sands producers in environmental performance, including land, water, and air quality improvements. Jickling emphasized the importance of continuous improvement and transparency in environmental monitoring and research, involving local communities in the process. He discussed the Pathways Alliance's goal for a carbon pipeline and storage hub, highlighting the ongoing negotiations and engagements with Indigenous communities along the pipeline route.
4. **Moderator's Summary:** McLellan wrapped up the discussion by acknowledging the complexity of achieving perfection in individual, corporate, and governmental efforts. He applauded the industry and participants for striving towards improvement and better understanding of objectives, including more inclusive engagement with Indigenous communities.

Overall Message: The panel highlighted the diverse perspectives and challenges in the energy sector, particularly around the need for more inclusive and genuine engagement with Indigenous communities. It emphasized the importance of collaboration, continuous improvement, and respect for different viewpoints in navigating the energy transition and environmental stewardship.

Alignment with Conference Objectives

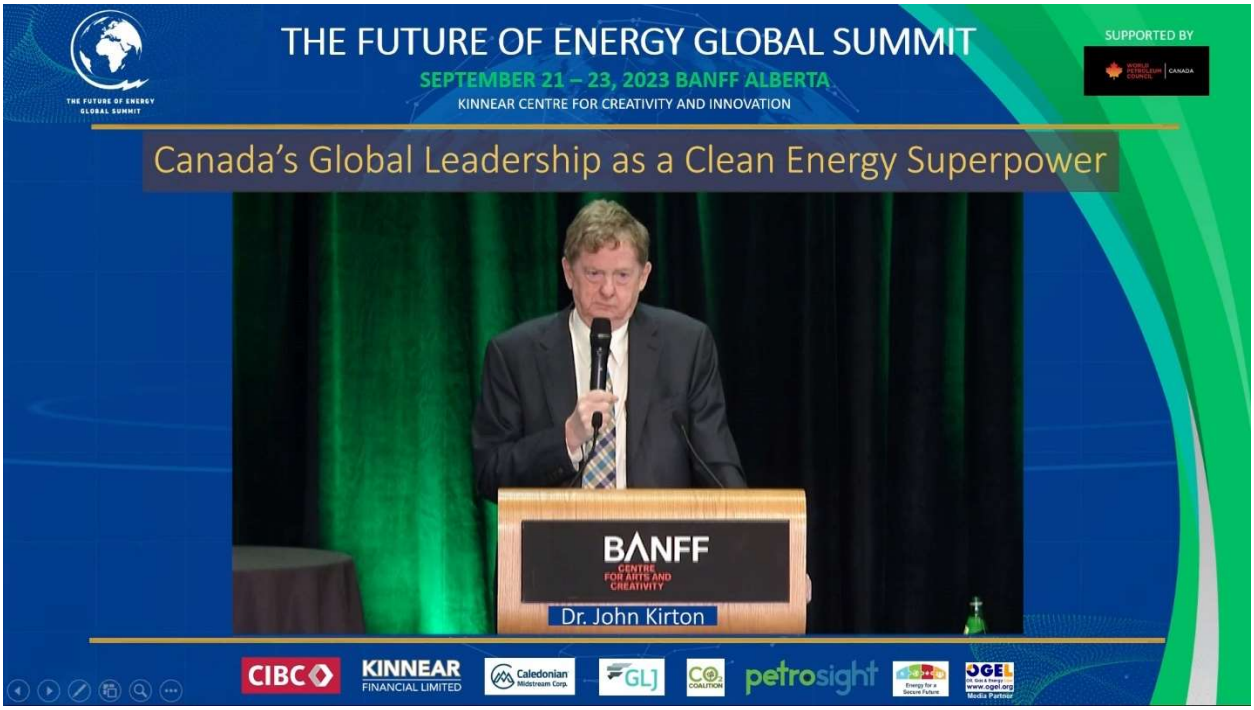
1. **Misconceptions about the Energy Industry**: McLellan's speech and the panel discussion addressed misconceptions, particularly around the role and future of hydrocarbons in the energy mix and the potential of geothermal energy. This aligns with the summit's goal of clearing up common misconceptions about the energy industry.

2. **Navigating the Energy Transition**: The discussions covered various aspects of the energy transition, including the shift in the energy mix, the role of geothermal energy, and the efforts of the oil sands industry to reduce emissions. This contributes to the broader conversation about how different energy sources can coexist and complement each other.
3. **Fact-Based Understanding of Energy Sources**: McLellan's presentation on global energy consumption and the panel's discussion on the practical aspects of energy projects provide a fact-based understanding of energy sources, crucial for making informed decisions about the future of energy.
4. **Collaboration Across Energy Sectors**: The panel's emphasis on the need for genuine engagement with Indigenous communities, as well as collaborative efforts in environmental performance in the oil sands industry, demonstrates the importance of collaboration across different sectors.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions on the economic aspects of energy sources, such as the comparison between geothermal energy and natural gas, touch on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: The keynote and panel discussions highlighted the need for balanced energy policies and the importance of regulatory support for energy projects, aligning with the summit's focus on policy and regulatory frameworks.
7. **Technological Innovations and Trends**: The focus on geothermal energy and its potential applications, as well as the mention of ongoing projects and innovations in the oil sands industry, aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.
8. **Global Energy Security and Affordability**: The discussions around the continued importance of hydrocarbons and the potential of geothermal energy contribute to the broader theme of global energy security and affordability.

David McLellan's keynote and the panel discussions align well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting technological innovations and collaboration in the energy sector.

Topic Summaries

5.18. Canada's Global Leadership as a Clean Energy Superpower: Dr. John Kirton



Summary of Keynote Speech by Dr. John Kirton
Topic: Canada's Global Leadership as a Clean Energy Superpower
Keynote Speaker: Dr. John Kirton, Director and founder of the Global Governance Program at Trinity College/University of Toronto, Professor Emeritus of political science and a Senior Fellow of the Bill Graham Centre for Contemporary International History

Key Points

1. **Canada's Energy Superpower Status:** Dr. Kirton reiterated former Canadian Prime Minister Stephen Harper's assertion that Canada is a clean energy superpower, a claim supported by evidence and relevant today for leading the clean energy transition.
2. **Urgency of Clean Energy Transition:** Highlighted the urgent need for a clean energy transition due to the hottest summer recorded globally, extreme weather

events, and the deadly threat of climate change. Emphasized that two-thirds of greenhouse gas emissions are from burning fossil fuels, necessitating a shift to clean energy.

3. **Global Problem, Global Solutions:** Stressed that climate change is a global issue requiring global solutions. Noted that major polluters like China, the United States, India, the European Union, and Russia must act, but Canada's role is crucial due to its high per capita emissions.
4. **Canadian Public's Desire for Leadership:** Canadians want to lead in the clean energy revolution, not just follow other nations.
5. **Global Governance of Energy:** Discussed the inadequacy of global governance structures like the United Nations in addressing energy and environmental issues. • Highlighted the role of the G7 and G20 in global energy governance, with the G7 being more effective in compliance with energy commitments.
6. **Canada's Natural Advantages:** Canada's geographical features, including oceanic coastlines and freshwater resources, position it well for renewable energy sources like wind, tidal, and hydroelectric power. Mentioned Canada's potential in nuclear energy, given its uranium reserves.
7. **Canada's Leadership in Global Initiatives:** Canada has historically led initiatives like the Powering Past Coal Alliance and had a significant role in the Paris Agreement. Proposed actions for Canada to take, including ending fossil fuel subsidies, getting G7 members to join the Powering Past Coal Alliance, and working towards the Sustainable Development Goals.
8. **Looking Ahead:** Dr. Kirton expressed optimism about Canada's potential to lead in clean energy, especially with the upcoming G7 summit hosted by Canada in two years.

Conclusion: Dr. John Kirton's speech emphasized Canada's potential and responsibility as a clean energy superpower. He highlighted the urgency of transitioning to clean energy due to climate change and the role Canada can play in global energy governance and initiatives. The speech underscored the need for Canada to lead by example and take decisive actions in the global effort to combat climate change.

Summary of Q&A Key Questions and Responses:

1. **Fossil Fuel Subsidies: Question:** Clarification on what constitutes a fossil fuel subsidy.
   Response: Dr. Kirton explained that subsidies are complex and come in various forms. The G20 has made progress in identifying and agreeing on certain

subsidies. The debate includes both producer and consumer subsidies. The reference point for subsidies is often the global market price.

2. **Commitment to Eliminating Subsidies: Question**: Concerns about the lack of progress in eliminating subsidies and setting realistic goals.
   Response: Dr. Kirton acknowledged the frustration and noted the G7's timetable for eliminating fossil fuel subsidies by 2025. He emphasized the need for political leaders to keep each other accountable.
3. **Frameworks for Collaboration: Question**: The state of frameworks to support coordination and collaboration in energy transition.
   Response: Dr. Kirton suggested leveraging G7 and G20 platforms for collaboration. He mentioned the Joint Energy Transition Partnership (JETP) and the importance of including diverse countries in these discussions.
4. **Career Uncertainty in Energy Sectors: Question**: Concerns about career prospects in the energy sector due to uncertainties in the industry.
   Response: Dr. Kirton advised flexibility and adaptability in career paths. He emphasized the importance of transitioning to cleaner energy sources while considering the economic impacts on communities.
5. **Canada's Role in G7 and G20: Question:** How Canada can exercise its influence in G7 and G20, especially given its status as an energy superpower.
   Response: Dr. Kirton highlighted Canada's potential to lead in renewable energy and its influence in global discussions. He mentioned Canada's role in initiatives like the Powering Past Coal Alliance and its ability to convene and lead discussions.
6. **Alternative Views on Climate Change: Question**: Addressing alternative viewpoints that question the severity of climate change.
   Response: Dr. Kirton trusted the consensus of the Intergovernmental Panel on Climate Change and other authoritative bodies. He emphasized the real-life impacts of climate change and the need for action based on scientific consensus.
7. **Defining Subsidies:**
   Question: Further clarification on what is considered a subsidy in the energy sector.
   Response: Dr. Kirton referred to detailed work by organizations like the IMF and OECD for definitions and assessments of subsidies. He acknowledged the complexity of the issue and the need for a consensus on defining and addressing subsidies.

Conclusion: The Q&A session after Dr. Kirton's keynote addressed various aspects of Canada's role in global energy leadership, the complexities of fossil fuel subsidies, and the challenges of transitioning to clean energy. Dr. Kirton emphasized the importance of international collaboration, the need for clear and actionable goals, and the significance of Canada's influence in global energy discussions. The session also highlighted the diverse perspectives on climate change and the necessity of adapting to evolving career landscapes in the energy sector.

Alignment with Conference Objectives

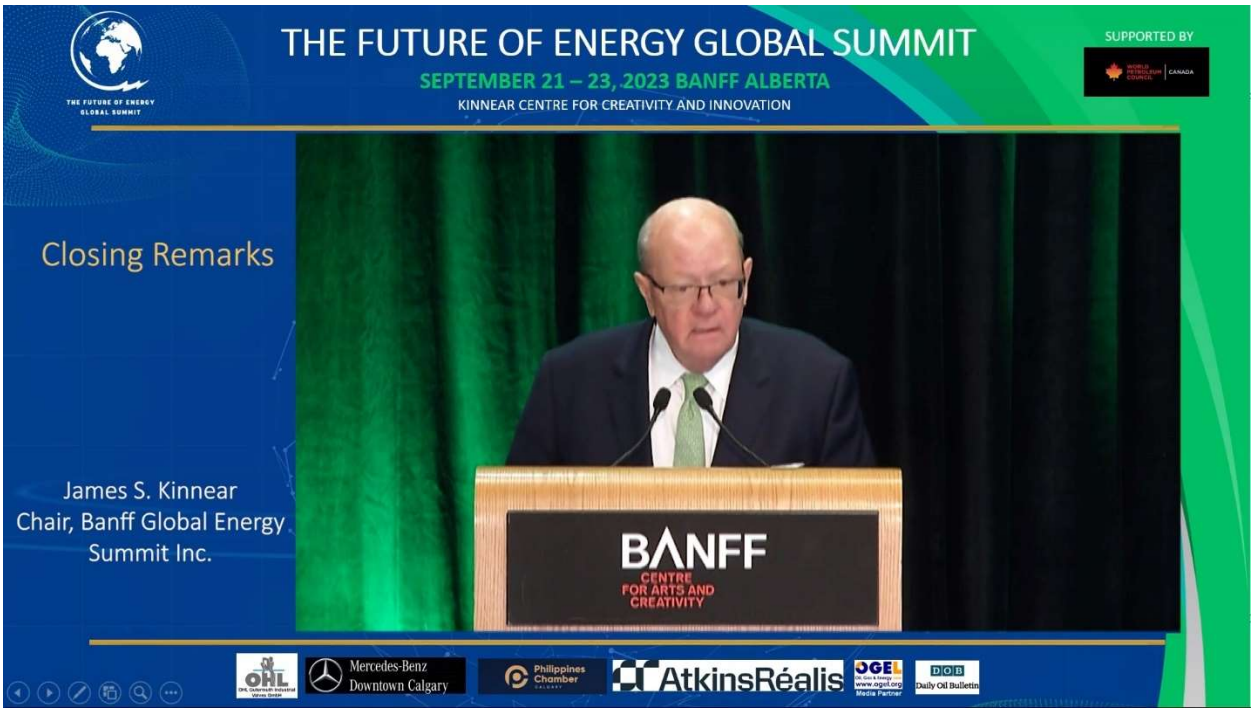
1. **Misconceptions about the Energy Industry**: Kirton's speech and the Q&A session addressed misconceptions about Canada's role in the global energy landscape, particularly in terms of its potential as a clean energy superpower and the realities of fossil fuel subsidies. This aligns with the summit's goal of clearing up common misconceptions about the energy industry.
2. **Navigating the Energy Transition**: The discussions covered the urgency of the clean energy transition and Canada's potential leadership role in this area. Kirton's emphasis on the need for global solutions to climate change and the role of major economies in this transition contributes to the broader conversation about how different energy sources can coexist and complement each other.
3. **Fact-Based Understanding of Energy Sources**: The keynote and Q&A session provided factual information about global emissions, the impact of climate change, and the complexities of fossil fuel subsidies. This supports the summit's objective of basing discussions and decisions on factual information.
4. **Collaboration Across Energy Sectors**: The emphasis on global governance structures like the G7 and G20, and the need for international collaboration in energy transition, demonstrates the importance of cross-sector collaboration. The discussion about Canada's potential role in leading global initiatives aligns with this objective.
5. **Financing and Investment in Energy Transition**: While not explicitly detailed in the summaries, the discussions around the economic potential of clean technology and the challenges of fossil fuel subsidies touch on the financial aspects of the energy transition.
6. **Policy and Regulatory Frameworks**: Kirton's speech and the Q&A session highlighted the need for coherent industrial policies to support clean tech growth and innovation, as well as the role of international bodies in shaping energy policies. This aligns with the summit's focus on policy and regulatory frameworks.

7. **Technological Innovations and Trends**: The focus on clean technology as a significant opportunity and the potential of renewable energy sources like wind and tidal power aligns with the summit's objective of discussing emerging technologies and trends in the energy sector.
8. **Global Energy Security and Affordability**: The discussions around Canada's role in global energy governance and the need for a balanced approach that considers economic, social, and environmental factors contribute to the broader theme of global energy security and affordability.

Dr. John Kirton's keynote and the Q&A session align well with the conference's objectives, particularly in addressing misconceptions about the energy industry, exploring the complexities of the energy transition, focusing on factual understanding, discussing policy and regulatory frameworks, and highlighting the potential for global leadership in clean energy.

Topic Summaries

5.19. Closing Remarks: James S. Kinnear



Topic: Closing Remarks
Keynote Speaker: James S. Kinnear, Chair, Banff Global Energy Summit Inc.

Key Points

1. **Gratitude and Appreciation**: Kinnear expressed his gratitude to all participants, including speakers, panelists, and volunteers, for their contributions to the summit's success.
2. **Reflection on the Summit's Achievements**: He reflected on the success of the summit in achieving its objectives, particularly in fostering open discussions and sharing diverse experiences and insights related to the energy transition.
3. **Acknowledgment of the Banff Center**: Kinnear praised the Banff Center, specifically the Kinnear Centre for Creativity and Innovation, for its exceptional facilities and support in hosting the summit.
4. **Alberta's Role in Energy Development**: He acknowledged Alberta's progress and potential leadership in developing innovative energy solutions and technologies.

5. **Encouragement for Future Collaboration**: He encouraged attendees to continue the dialogue and collaboration initiated at the summit, emphasizing the importance of ongoing efforts in addressing global energy challenges.
6. **Looking Forward**: Kinnear concluded with a forward-looking statement, expressing anticipation for future summits and the continued evolution of discussions and solutions in the energy sector.

6. Conclusions

6.1. Summary and Key Insights

As the inaugural Banff Global Energy Summit 2023 concludes, we look back on the diverse range of discussions, insights, and perspectives that have been exchanged throughout this event. The summit has not only served as a platform for exploring the multifaceted nature of the global energy landscape but has also underscored the critical importance of collaborative efforts in navigating the complexities of the energy transition.

The diverse range of topics covered during the summit, from the future of traditional energy sources like oil and gas to the burgeoning potential of renewables such as solar, wind, and hydrogen, LNG. Nuclear and geothermal highlights the multifaceted challenges and opportunities that lie ahead. The insights from our keynote speakers and panelists have illuminated various pathways towards a more sustainable and secure energy future, emphasizing the need for innovation, pragmatism, and a balanced approach to energy policy and development.

Key Insights

1. **Misconceptions about the Energy Industry:**

   The summit effectively addressed misconceptions through various perspectives, including Indigenous views on resource sustainability and realistic discussions on the role of oil and gas. This helped clarify misunderstandings about the environmental impact and scalability of different energy sources.

2. **Navigating the Energy Transition:**

   The summit's exploration of diverse energy sources, such as renewables, nuclear, hydrogen, geothermal, solar and traditional sources like oil and gas, highlighted how these can coexist and complement each other in a sustainable energy future.

3. **Fact-Based Understanding of Energy Sources:**

   Presentations and discussions were grounded in factual information, providing data-driven insights into global energy requirements, the economic impact of energy initiatives, and the potential of new technologies.

4. **Collaboration Across Energy Sectors:**

   The concept of 'co-opetition' was emphasized, highlighting the importance of collaboration and competition within the energy sector for holistic solutions to the challenges of the energy transition.

5. **Financing and Investment in Energy Transition:**

   The summit focused on the financial aspects of the energy transition, discussing investment mobilization towards sustainable initiatives, including in areas like nuclear and geothermal energy.

6. **Policy and Regulatory Frameworks:**

   Discussions highlighted the need for supportive policies and regulations, especially for emerging sectors like nuclear and geothermal energy, facing unique challenges.

7. **Technological Innovations and Trends:**

   The summit provided a platform for discussing emerging technologies and trends in the energy sector, including advancements in battery storage, hydrogen energy, and carbon capture and storage. Also, emerging AI-driven technologies will play a crucial role in achieving a secure and sustainable energy infrastructure.

8. **Global Energy Security and Affordability:**

   The summit addressed the challenge of balancing sustainable energy practices with maintaining energy security and affordability, considering the reliability of various energy sources.

6.2. Forward Outlook

The summit concluded with a forward-looking perspective, emphasizing the ongoing need for innovation, collaboration, and strategic planning in the energy sector. The future of energy is envisioned as a balanced mix of traditional and renewable sources, with nuclear, geothermal, and AI-driven technologies playing a crucial role in achieving a secure and sustainable energy future. The discussions also highlighted the importance of continued dialogue, research, and policy development to effectively navigate the complexities of the energy transition.

These broad themes encapsulate the diverse range of topics and perspectives presented at the summit, reflecting the multifaceted nature of the global energy transition. The

discussions also brought to light the necessity of fostering a fact-based understanding of energy sources, free from the constraints of political and ideological biases.

The summit has reinforced the notion that the energy transition is not a zero-sum game but a complex inter-connected evolution that requires co-opetition – a strategic blend of cooperation and competition. This approach is vital for achieving holistic solutions that address environmental concerns while ensuring economic viability and energy security.

As we conclude, it becomes increasingly evident that the journey towards a sustainable energy future is an urgent and collective endeavor, requiring the participation and commitment of all stakeholders – from industry leaders and policymakers to innovators and the broader community. The Summit not only sets the stage but also underscores the pressing need for continued dialogue and proactive action.

In closing, we extend our heartfelt thanks to all participants for their valuable contributions and look forward to building on the momentum generated by this Conference.

7. References and Links

7.1 Banff Energy Summit Website

https://banffenergysummit.com/

7.2 Banff Global Energy Summit 2023 Agenda

https://banffenergysummit.com/Agenda.html

7.3 Bios for Speakers and Panelists

https://banffenergysummit.com/Speakers-and-Panelists.html

7.4 Sponsors

https://banffenergysummit.com/Official-Sponsors.html

7.5 Conference Committee Members and Volunteers

1. Lorraine Steele
2. Corry MacGregor
3. Richard Graham
4. Bill Whitelaw
5. Mark Taylor
6. Grace Yan
7. Diana Signorile
8. Jacqueline Langford
9. Sally Elliott
10. David Kinnear
11. George Jung
12. James Walls
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18. Kathy Schmid
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