

CONSEQUENCES OF GOVERNMENT MISSTEPS IN RENEWABLE ENERGY POLICIES

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ABSTRACT

The world has seen rapid changes to energy policies in recent times. These regulations and policy changes are having a strong influence on renewable energy development. The purpose of this research is to discover the real-world connections of how the policy uncertainties impact the growth of renewable energy investment. The research concentrates on policies for solar and wind with specific focus on Alberta. The research assists with findings from the expert interviews (n = 12) on which of the global best practices can be adopted in Alberta for speedier recovery from the uncertainty created by putting a pause on renewable projects approval (moratorium). The research concludes with the findings that there is indeed an adverse impact on renewable investment due to policy uncertainties and recommends the government of Alberta to form an expert task force for developing an integrated energy system plan to meet NetZero commitments with technology neutral approach.

RESEARCH QUESTION

How do the policy uncertainties influence and impact the growth of renewable energy investments and deployments? The renewable energy for the purpose of this capstone project comprises a mix of solar and wind (excluding hydro, geothermal and biomass). This study assesses the impact as resultant of erroneous or disengaged policy decision or due to policy discords between federal, provincial and municipality government.

This research extends into the work done by Jordan et al. which investigates political and policy incoherence at national and provincial level impacting the implementation of low carbon technologies and emissions outcome (Jordaan et al., 2019; Jordaan et al., 2017). It takes some further cues from the work done and findings around effects of uncertainty in energy policy on renewable energy growth (Appiah-Otoo, 2021; Liu et al., 2019; Khan & Su, 2022). It also delves into findings wherein countries spend on multitude of renewable energy policies, but without coordination between different levels of government or a concerted effort to ensure that the policy instruments are effective (Pischke et al., 2019).

This research concentrates on policies/practices from across countries with similar renewable energy market structure and federal-provincial-municipality dynamics like Alberta and through evaluation of the scholarly literature validates the impact due to uncertainties on energy transition.

SECONDARY RESEARCH QUESTION

In addition to the primary research question, this study employs additional secondary questions that ask renewable energy experts in Alberta what they think would work well and providing recommendations as best practices ideas. This research identifies what experts/investors believe the Alberta government should do to accelerate renewable energy development and energy transition.

The subset of secondary questions would focus and try seeking opinion/ideas about topics pertaining:

- 1) How can public-private partnerships (PPP) play a role in mitigating the adverse effects of policy?
- 2) What are the implications for hydrogen economy and for enabling other green electricity dependent industries like datacenters, artificial intelligence, quantum computing.

SUSTAINABLE DEVELOPMENT GOALS



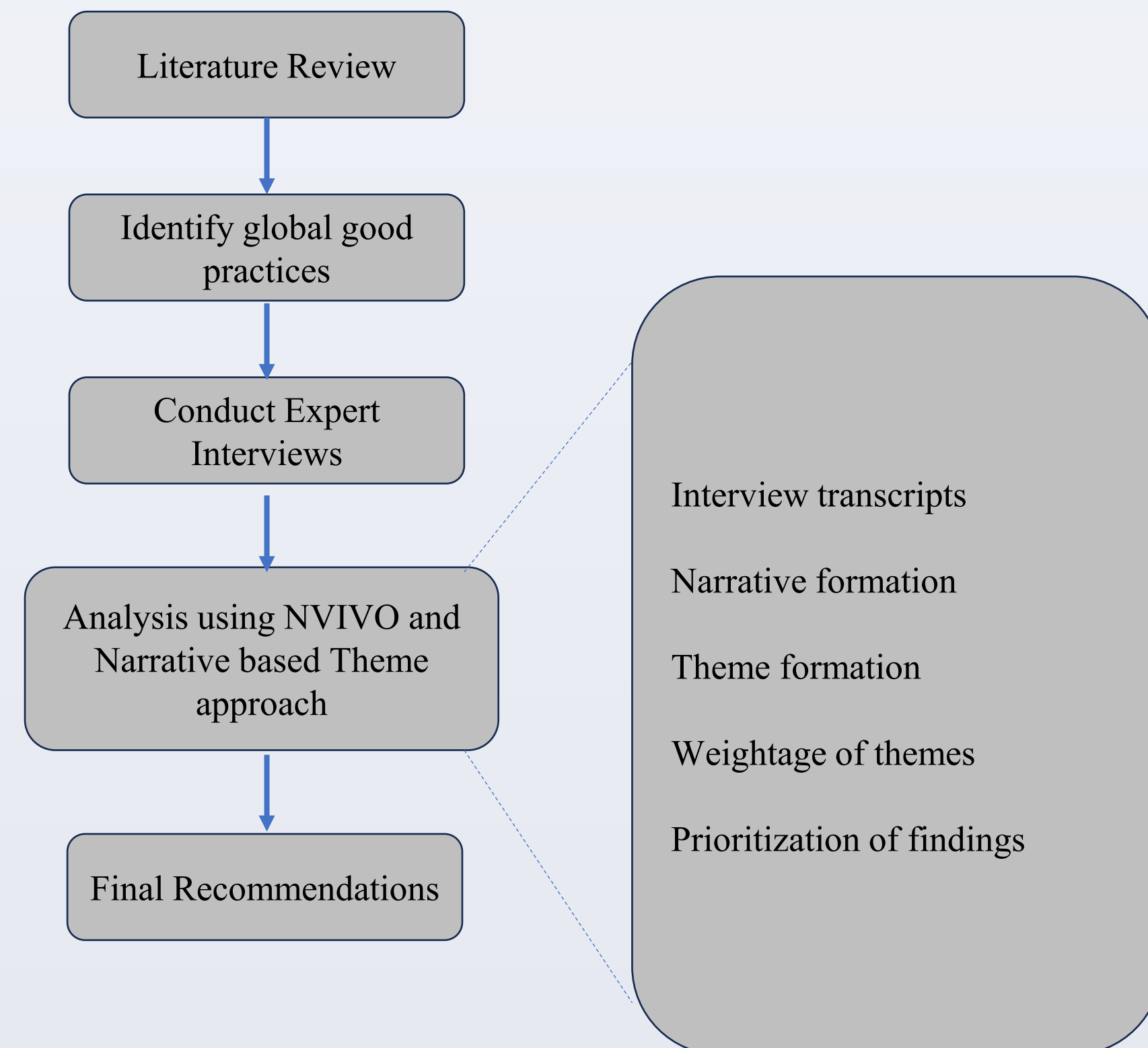
-UN Sustainable Development Goals (SDGs): 7, 8, 9, 12 and 13

-Multidisciplinary

1. Environment: Responsible Renewable (RE) project development (land use, reclamation, etc)
2. Energy: De-carbonized electricity generation
3. Economy: Cooperative community & Indigenous lead development (economic reconciliation)
4. Policy: Climate and Net-Zero Policy; Electricity & Transmission regulatory reforms

METHODOLOGY

The literature review and data collection for this research is mainly based on secondary sources from various peer reviewed journal papers, news articles, industry or associations specific records, and government published information. Following the secondary literature research, further research was followed to identify the best practices and recommendations to support the growth of renewables in provinces or countries like Alberta.

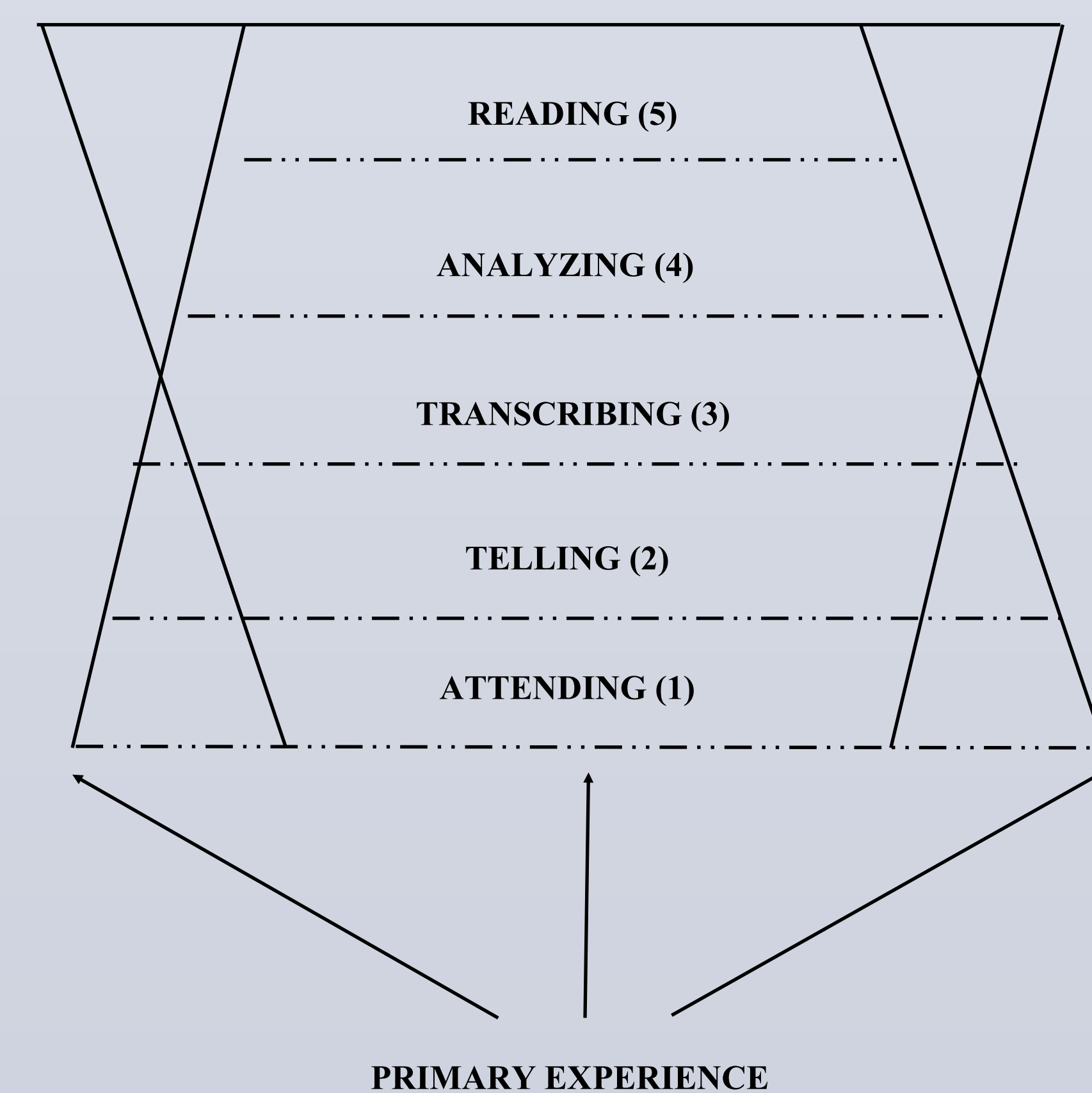


The research incorporates both qualitative and quantitative data analysis to capture question-based narratives and scientific data respectively. Primary sources include data analyzed from interviews with subject matter experts from industry, policy makers, academia, regulatory, technology enablers, community and government. The author was mindful of representing the diversity of views and the experts (who all chose to be anonymous) reflect a reasonable diversity of experience and leadership within their field of expertise in renewables and energy sector.

Expert interviews are one of the means of revealing why investors and developers make certain decisions and what matters most to them when it comes to investment priorities. Experts mostly hold information about challenges/factors and solutions to resolve moratorium effects that may not be revealed through other investigative methods. Rubin and Rubin (2012) and Holland (2023) put it this way, "qualitative interviews with experts have operated like night-vision goggles, permitting us to see that which is not ordinarily on view and examine that which is often looked at but seldom seen." Von Soest (2022) and Holland (2023) describe expert interviews as an effective mechanism for discerning information and applied specifically to seek insights. The researcher in this study conducts expert interviews to seek renewables industry sentiments/thinking, their expectations from government/regulators and providing insights into their investment decision criteria.

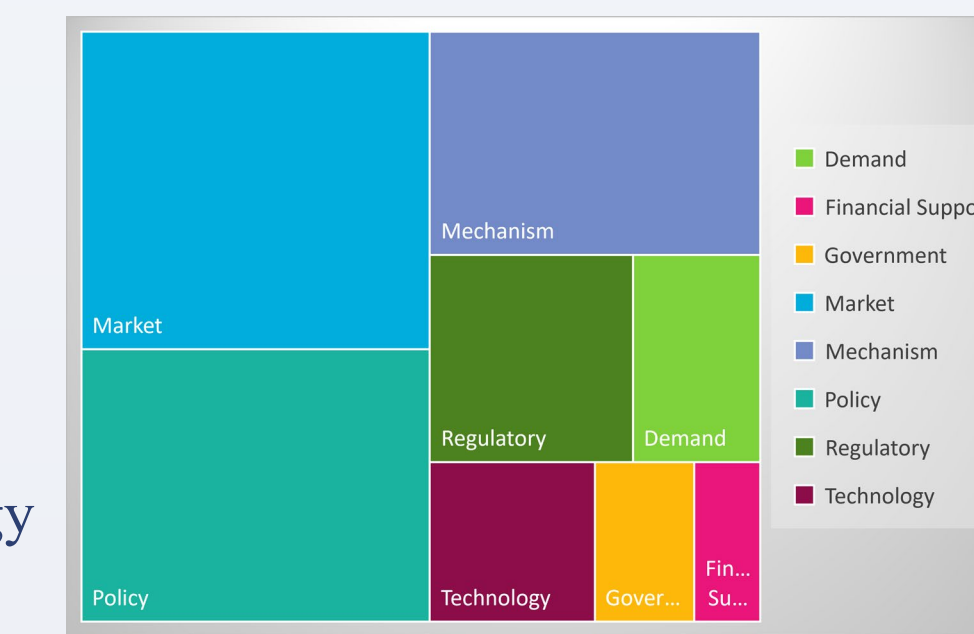
- Narrative transcribing & Analysis
- Creating themes through research & analysis

The Qualitative Researcher's Companion-Miles & Huberman



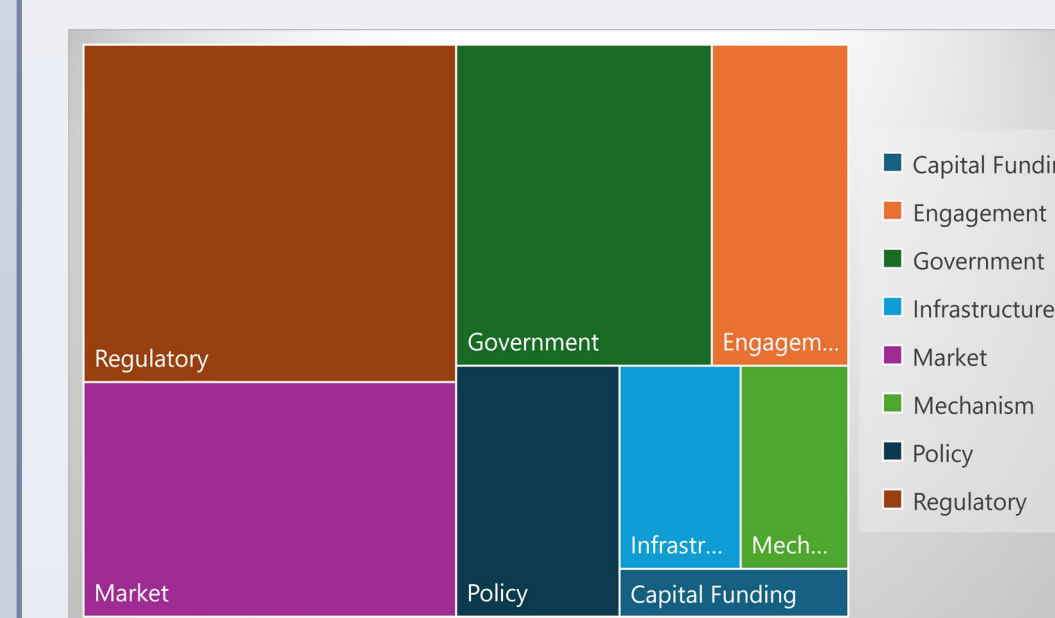
DISCUSSIONS AND FINDINGS

Govt of Alberta (GoA) Doing Well in Past



Market- Electricity de-regulation, open, merchant & competitive trading accelerated the adoption of renewable energy in Alberta.

Current Challenges/ Sentiments Post Moratorium



Regulatory- There is still much ambiguity on the design/rules of future electricity market as well no clarity on the land use, reclamation security, transmission costs.

Current Positives in Alberta



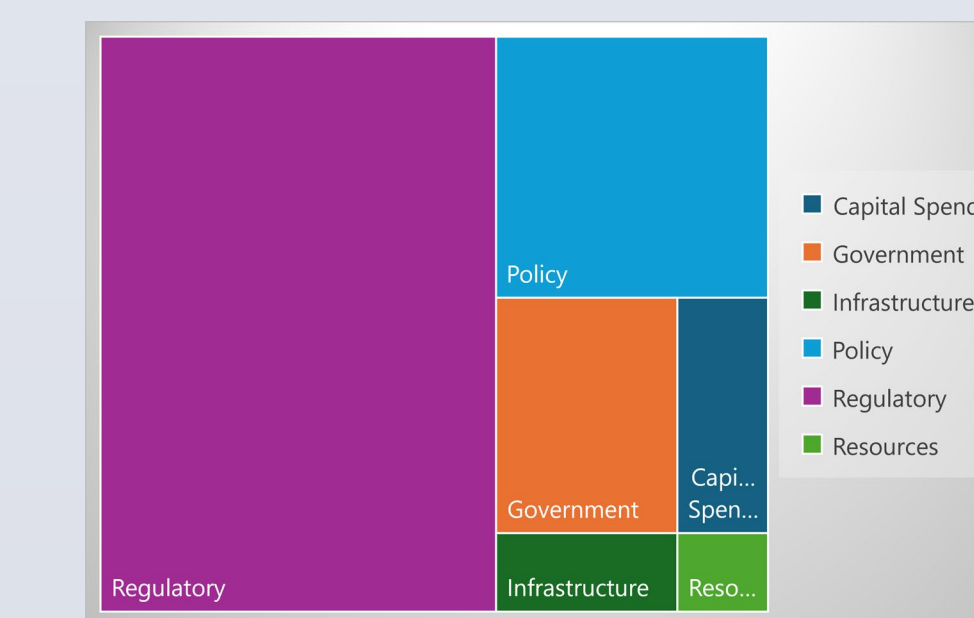
Resources- Alberta has got good and abundance of wind and solar conditions.

Factors Attracting Investors to Other Jurisdictions



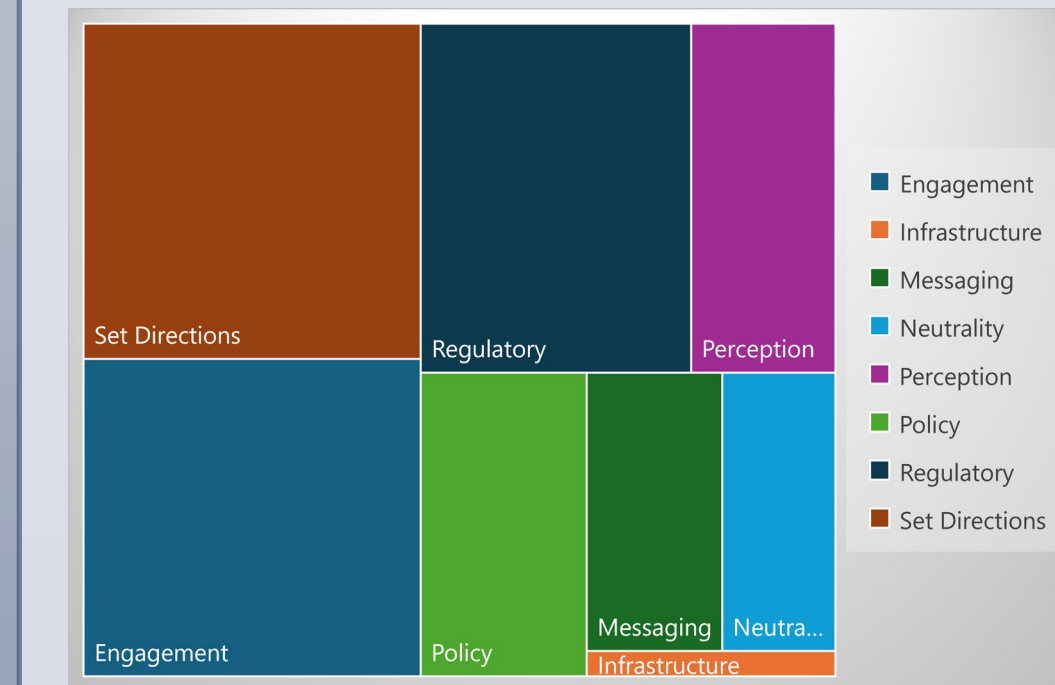
Government- Government from other provinces are providing encouragement and predictability for renewable energy development, investors are not experiencing similar trust in AB.

Top Barriers for Renewables Growth in Alberta



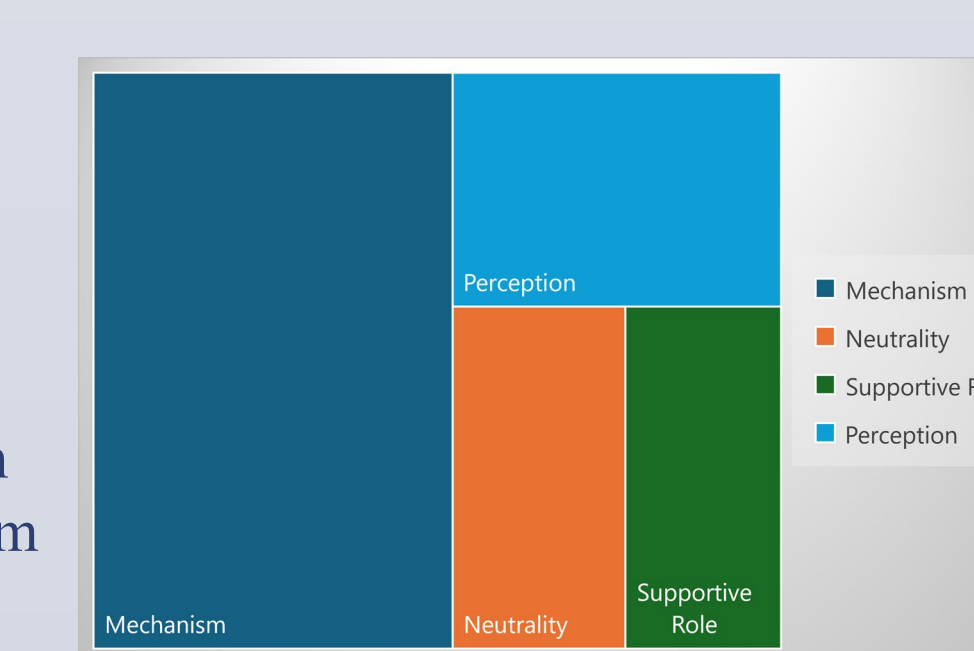
Regulatory- Non-clarity on restructured electricity market, transmission capacity to avoid generation congestion and transmission cost sharing.

Expectations Others Have from Govt of Alberta (GoA)



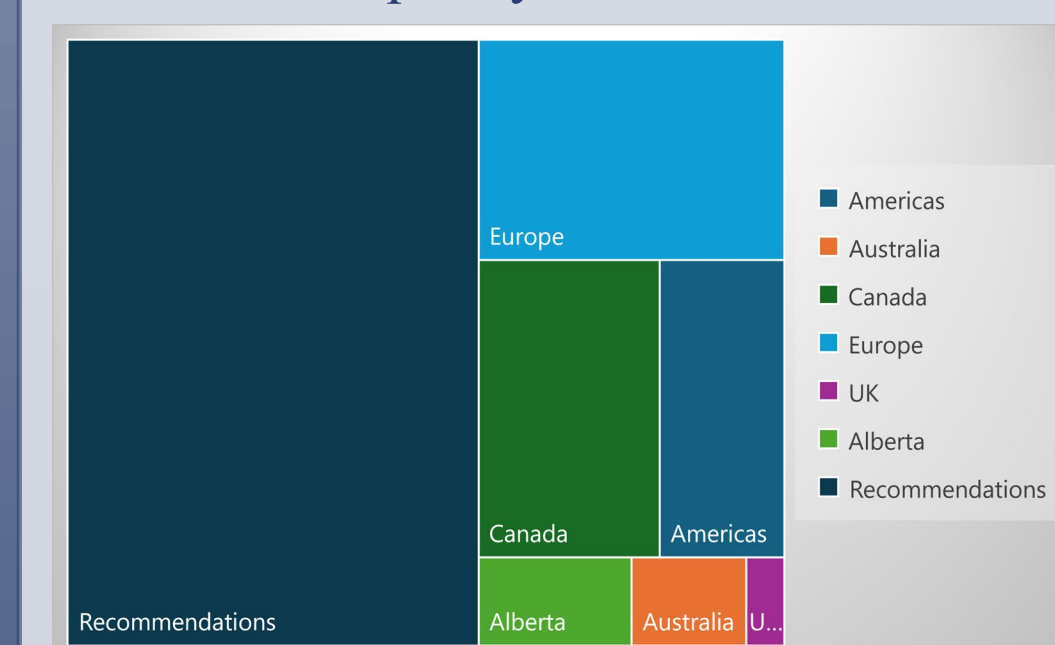
Set Directions- Clarity and directions sought from government on electricity market, transmission regulations and costs.

Expectations Others Have from Renewables Industry



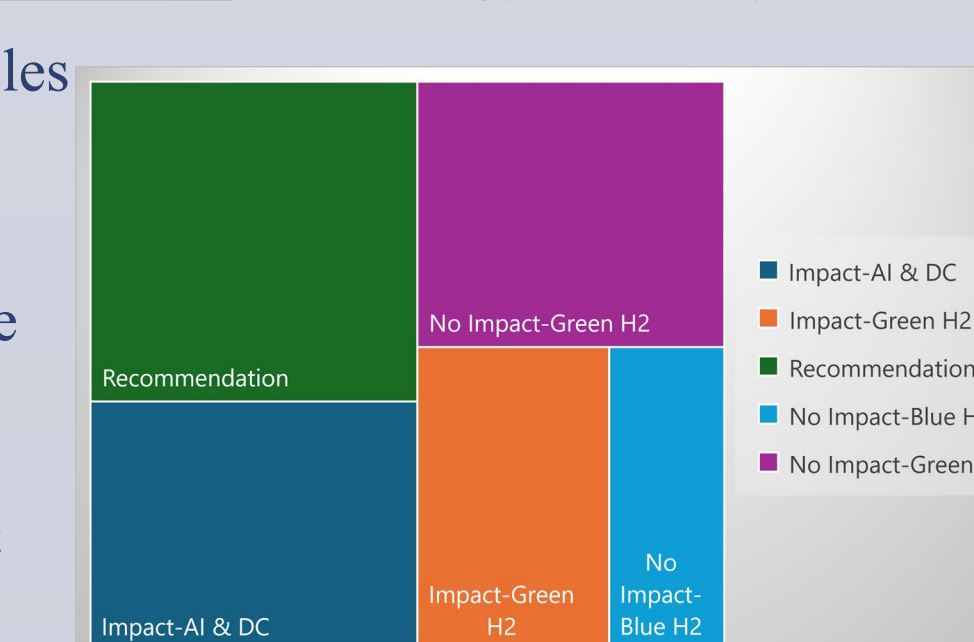
Mechanism- Undertake development of projects in a responsible, ethical manner with high standards of professionalism meeting or exceeding legislated standards of quality.

Global Best Practices for Renewables Development



Government should set the clear objectives for NetZero. Work on holistic/integrated electricity policy (for open market with technology neutrality).

Economy Enabled by Renewables Energy



Impact on Artificial Intelligence (AI) and Datacentre (DC) - Integrated thinking for decarbonized electricity for DC and AI hubs needed.

CONCLUSIONS

• The Government of Alberta (GoA) must give immediate positive market signal and clarify the directions & timelines for electricity market and transmission regulatory reforms so that the renewable industry investors are able to do project risk-return analysis with more certainty. This action will address regulatory ambiguity and if any concerns are still unresolved the government must engage with industry to seek feedback and further refine the reforms to encourage renewable industry growth. This experts' recommendation is also seconded by research findings as per Khan & Su (2022) whose study suggest that market ambiguity adversely affects the macroeconomy by impeding investment and eventually leading to a decline in renewable energy development and economic growth. The continued ambiguity and lengthy period of uncertainty can dampen investor confidence and sway them away (Shivakumar et al., 2019).

• The Government of Alberta (GoA) must talk and act neutral towards industries and technologies to de-carbonize the electricity market. This aligns well with both the Inflation Reduction Act policy as rolled out by the USA Federal government (McLaughlin et al., 2023) and the policies set by the European Union (EU Law, 2024; EU Commission, 2024).

• The Government of Alberta (GoA) must have a clear and legislated goal towards Netzero electricity grid. It's crucial to have a positive and strong alignment with the Federal to set clear directions for industries and regulators/planners. It's critical that the multi-level of government bodies work in alignment towards a common climate goal to encourage renewable energy development (Jordaan et al., 2019). Also, one should learn from European Union on their member alignment, coordination as well as setting up of common legislated goals to ensure that market gets a clear direction 107 and sense of commitment from the government actions (EU Law, 2024; EU Commission, 2024; Melliger & Lilliestam, 2021).

• Renewables (RE) industry must engage with GoA, municipalities and communities to educate on RE and communicate positive work being done. They must create community champions and undertake project development in a very responsible manner. Multiple studies have emphasized the importance of stakeholder engagement and acceptance, especially at the local level (Carlisle et al., 2015; Wüstenhagen et al., 2007; Thomas et al., 2022; Ellis et al., 2023).

Overall, the Government of Alberta must form an expert task force (inclusive of Indigenous community knowledge expert) to plan the de-carbonized electricity for achieving NetZero in a holistic manner

LIMITATIONS AND FUTURE WORK

• This study with its focus on wind and solar can be further improved by including geothermal, bioenergy and hydroelectricity (including pumped hydro for storage). The importance of holistic approach in energy system of systems planning is emphasized across the experts' feedback and validated through the findings of European Union's adoption of directives (EU Law, 2024; EU Commission, 2024).

• The study findings in future can also be expanded with non-renewables like nuclear (including Small Modular Nuclear Reactors-SMR), hydrogen as molecule & electron and Virtual Power Plants (VPPs). Though some of these are at slightly lower technical readiness level (TRL), they are being piloted/deployed in combination with renewable energy systems to improve the reliability and affordability through various policy initiatives in USA and EU (McLaughlin et al., 2023; EU Law, 2024; EU Commission, 2024).

• The Delphi method of engagement & research having experts being part of the group to debate and recommend the best solution could be also explored as an alternate way

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