

Advancing Solar Energy in Alberta: An Assessment of Municipal Solar-Friendly Policies and Implications for Leadership in Renewable Energy Adoption

Yiming (Sebastian) Hu | Supervised by Dr. David Ince, University of Calgary, and Heather MacKenzie, Solar Alberta

Abstract

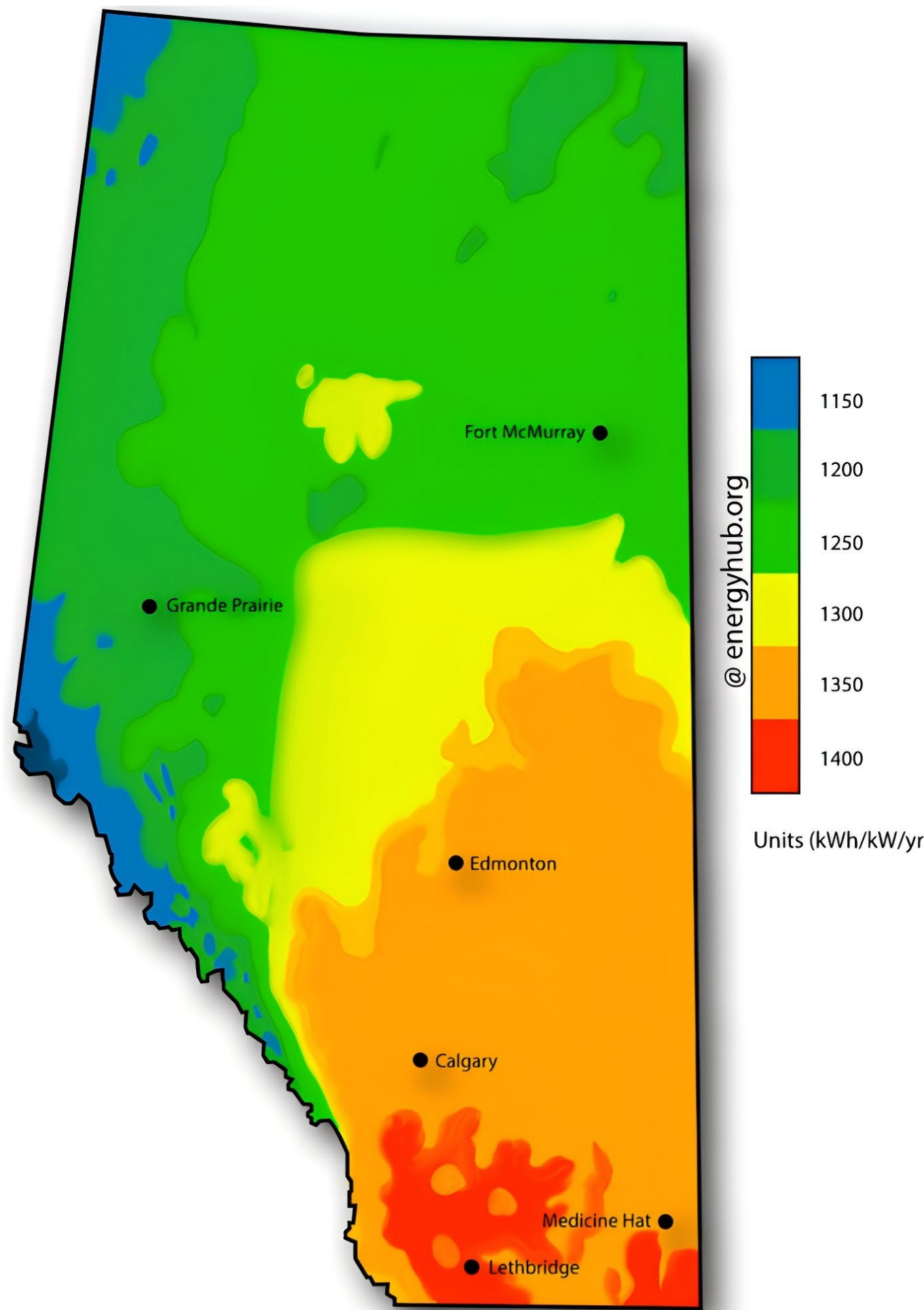
- The report assesses how Alberta municipalities adopt solar-friendly policies in response to rising solar demand.
- Methods include stakeholder interviews, document analysis, and a scorecard across seven criteria (loans, incentives, bylaws, permitting, accountability, efficiency, education).
- The findings show that Edmonton, Banff, Grande Prairie, and Calgary are leaders, while smaller towns like Banff and Canmore outperform expectations and larger cities such as Lethbridge and Red Deer fall behind.
- The research identifies best practices, highlights policy gaps, and provides recommendations to support municipalities in advancing solar adoption.

Research Question

- To what extent have Alberta's municipalities adopted solar-friendly programs and policies?
- Which cities are leading the way in supporting solar energy initiatives?

Introduction & Motivation

- Solar-friendly policies are defined as municipal initiatives such as streamlined permitting, financial incentives, and community engagement programs that make solar energy adoption more accessible.
- In Alberta, all forms of local government, cities, towns, villages, and specialized municipalities, operate under the Municipal Government Act and can adopt such policies.
- The primary motivation for solar-friendly policies is environmental sustainability, since solar energy displaces fossil fuels, reduces greenhouse gas emissions, and supports a clean and affordable grid.
- Solar energy also generates positive economic and social impacts by lowering energy bills, creating jobs, and fostering local resilience through community and Indigenous ownership.



Provincial Solar Energy Map (Alberta), Energy Hub

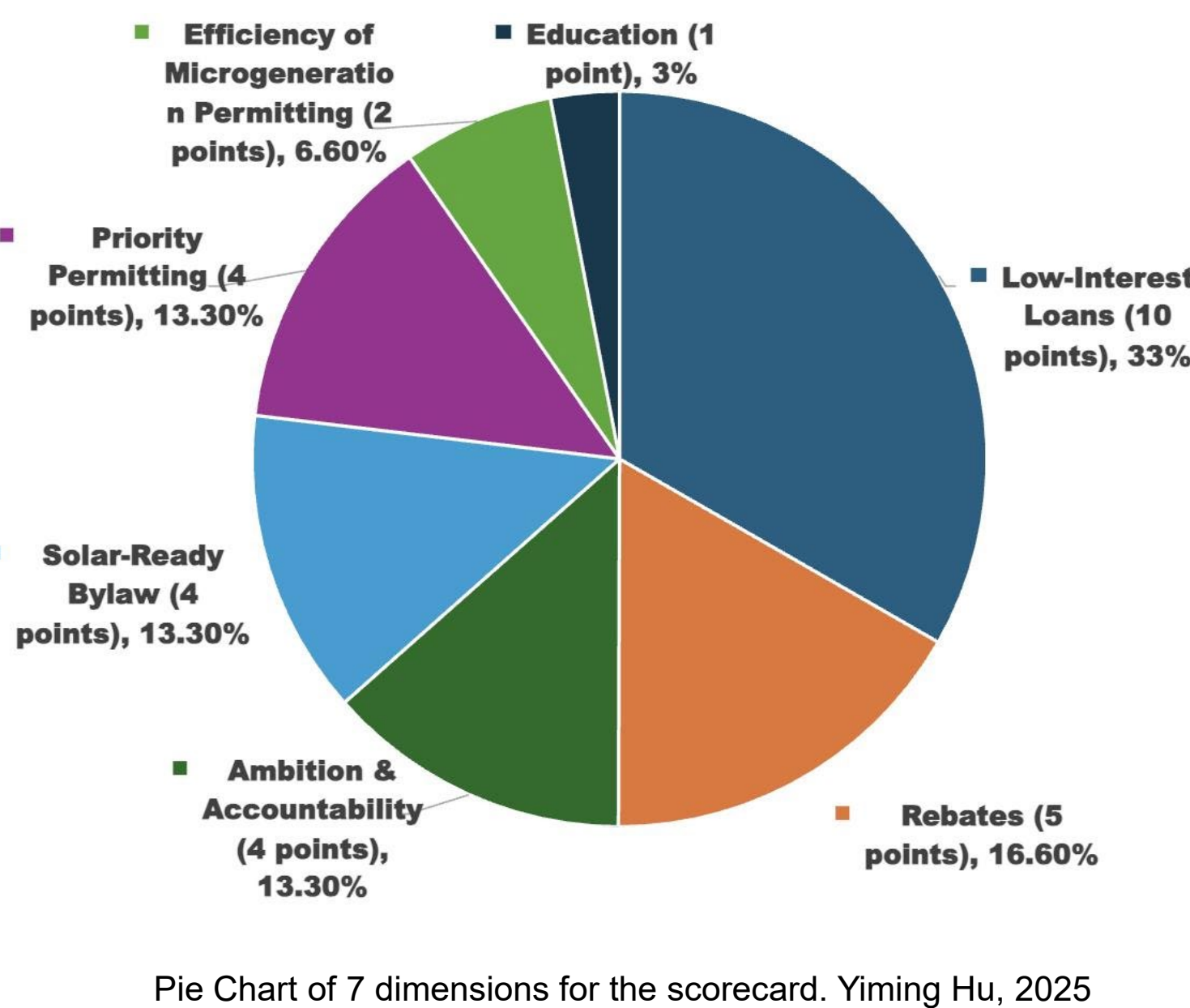
Sustainable Development Goals



Methodology

- 11 municipalities in Alberta
- 8 Largest Municipalities (based on 2024 population)
Calgary, Edmonton, Lethbridge, Red Deer, Airdrie, St. Albert, Grande Prairie, and Medicine Hat
- 3 municipalities of the research team's interest
Banff, Canmore, and Innisfail

Qualitative Analysis	Quantitative Scoring	Data Validation and Reliability
<ul style="list-style-type: none">Municipal documents: climate action plan, energy strategies, incentive programs, bylaws, permitting guidelines	<ul style="list-style-type: none">7 dimensions assessed in the scorecardTotal 30 points	<ul style="list-style-type: none">Triangulation, peer review, and transparent methodology



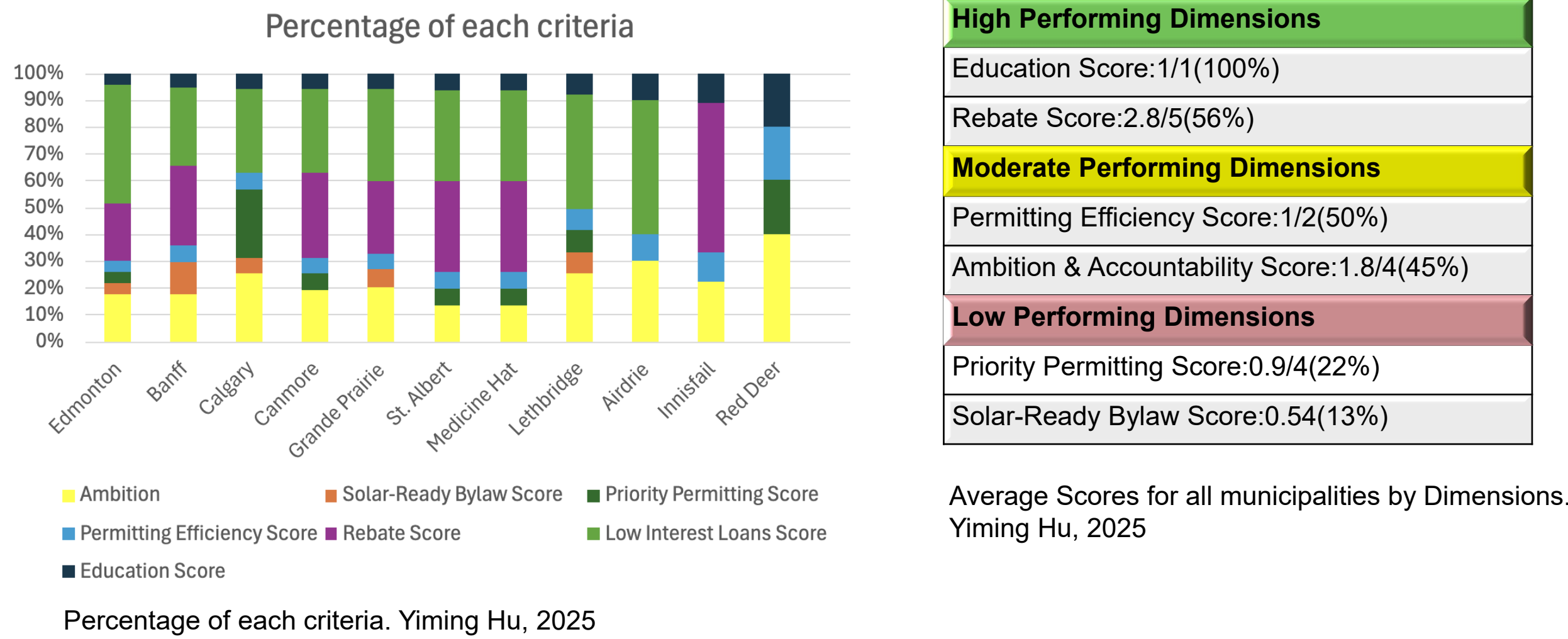
Pie Chart of 7 dimensions for the scorecard. Yiming Hu, 2025

Results

Municipality (Population 2024)	Ambition & Accountability Score (4)	Solar-Ready Bylaw Score (4)	Priority Permitting for Green Building Score (4)	Permitting Efficiency for Microgenerator Score (2)	Rebate Score (5)	Low Interest Loans Score (10)	Education Score (1)	Score (out of 30)	Score Percentage (out of 100%)
Edmonton (1,610,899)	3	1	1	1	4	9	1	20	67%
Banff (8305)	2	2	0	1	4	4	1	14	46%
Calgary (1,306,764)	3	1	4	1	0	4	1	14	46%
Grande Prairie (70,385)	2	1	0	1	4	5	1	14	46%
Canmore (15,990)	2	0	1	1	4	4	1	13	43%
St. Albert (72,316)	1	0	1	1	4	4	1	12	40%
Medicine Hat (63,271)	1	0	1	1	4	4	1	12	40%
Lethbridge (106,550)	2	1	1	1	0	4	1	10	33%
Airdrie (85,505)	2	0	0	1	0	4	1	8	27%
Innisfail (7985)	1	0	0	1	5	0	1	8	27%
Red Deer (100,844)	1	0	1	1	0	0	1	4	13%

Scorecard Table. Yiming Hu, 2025

Results



High Performing Dimensions
Education Score:1/1(100%)
Rebate Score:2.8/5(56%)
Moderate Performing Dimensions
Permitting Efficiency Score:1/2(50%)
Ambition & Accountability Score:1.8/4(45%)
Low Performing Dimensions
Priority Permitting Score:0.9/4(22%)
Solar-Ready Bylaw Score:0.54(13%)

Average Scores for all municipalities by Dimensions. Yiming Hu, 2025

- Financial mechanisms such as rebates and low-interest loans are the most decisive contributors to municipal solar performance, while regulatory tools like solar-ready bylaws and priority permitting remain underdeveloped.
- Administrative capacity, technical expertise, and financial resources strongly influence municipal performance, with smaller municipalities often lacking staff and resources.
- Cultural and community values, such as Banff's UNESCO heritage restrictions, shape solar adoption by balancing heritage preservation with renewable energy goals.

Conclusion

- Alberta municipalities have made moderate but uneven progress in implementing solar-friendly policies.
- Foundational measures like public education and rebates are widespread, but more advanced tools such as solar-ready bylaws and priority permitting are rare.
- The Clean Energy Improvement Program (CEIP) is an effective financing tool but is inconsistently adopted across municipalities.
- The current policy landscape enables incremental solar growth but does not yet create conditions for widespread and sustained adoption.
- Broader coordination among municipalities and provinces could transform local policy successes into national momentum.

Limitation & Future Research

- This study focuses on eleven municipalities, so the findings are not fully generalizable across Alberta, especially for rural and Indigenous communities.
- Reliance on publicly available documents means unpublished or internal policies may not have been captured, limiting completeness.
- A longitudinal study after the 2025 municipal elections could reveal whether leading municipalities sustain or lose momentum in solar adoption.
- Future studies should also integrate the role of Distribution Facility Owners (e.g., ENMAX, EPCOR) in microgeneration permitting and interconnection processes for a more comprehensive analysis.

Works Cited

Alberta Municipalities. (2025). *A NEW WAY TO PAY for renovations that make a difference*. <https://ceip.abmunis.ca/>

Canada Energy Regulator (CER). (2023, November 28). *Market snapshot: Which cities have the highest solar potential in Canada?* [https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshots-which-cities-have-highest-solar-potential-in-canada.html?undefined&wdisable=true#:~:text=Of%20the%20major%20cities%2C%20Victoria%20\(5.68\)](https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshots-which-cities-have-highest-solar-potential-in-canada.html?undefined&wdisable=true#:~:text=Of%20the%20major%20cities%2C%20Victoria%20(5.68))

International Renewable Energy Agency, & International Labour Organization. (2024, October). *Renewable energy and jobs: Annual review 2024*. <https://www.ilo.org/publications/renewable-energy-and-jobs-annual-review-2024>

Patel, S., & Parkins, J. R. (2023). Assessing motivations and barriers to renewable energy development: Insights from a survey of municipal decision-makers in Alberta, Canada. *Energy Reports*, 9, 5788-5798. <https://doi.org/10.1016/j.egyr.2023.05.027>