

Intelligence MEMOS



From: Benjamin Dachis and Aaron Jacobs
To: Members of Alberta's Energy Diversification Advisory Committee
Date: October 27, 2016
Re: **HOW DIVERSIFIED IS ALBERTA'S INNOVATION?**

Congratulations on your appointment to this important committee. With a mandate that seeks to "explore opportunities to increase the value of energy resources, create jobs and attract new investment", one topic that is surely on your minds is innovation, and whether the province's inventors focus exclusively on the energy sector.

We measured innovation by looking at patents filed by individuals and companies in the province, and find evidence to suggest that this is not the case; innovations produced by Albertans are more widely diverse than we might expect.

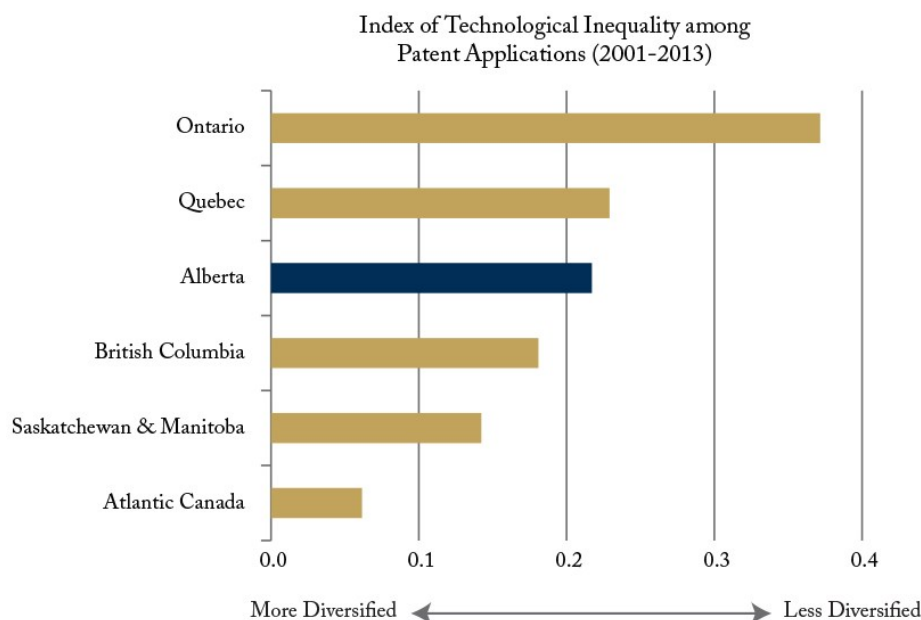
Patent applications are assigned codes for each area of technology they touch on. For example, "devices for wireless communication networks" was the most popular code in Ontario for many years, whereas codes related to technologies for obtaining oil are common in Alberta.

We measure diversification among technology codes using a Gini index. An index of 1 means that all of the province's inventors are filing patents in the same area of technology. An index value closer to zero means inventors are spreading their efforts more equally over many different areas of technology. Because a Gini index is often used to measure how much of a country's income is in the hands of a small number of people, we call this our "Index of Technological Inequality" (see the chart below).

So, which provinces have the most diverse innovation mix by this measure? Alberta is considerably more diversified than Ontario, and about on par with Quebec. These three provinces are also the leaders in patent applications per capita, which is to say they have been relatively more innovative than other provinces.

The index shows that despite the dominance of the energy sector in Alberta's economy, its diversity of innovation has not suffered. Although a large number of the province's patent applications are related to energy, these energy industry-bound patents are filed under a wide set of technological categories. In other words, the province's investment in its comparative advantage in the energy industry seems to have been successful in generating value through a diversity of innovations.

In asking what role diversity and innovation in the energy sector can play in Alberta's long-term future, a close look at patent applications shows that the province is already generating a wide array of innovative new technologies.



Source: Authors' calculations from the C.D. Howe Institute Patent Database.

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