

CANADA'S TRADE IN RENEWABLE ENERGY PRODUCTS

Overview

Trade is an essential component of Canada's economic activity, accounting for about two-thirds of the economy and employing [3.3 million](#) people. In 2021, Canada's total exports from all industries were worth \$631.5 billion, with oil and gas extraction (not including oil sands) accounting for 18 percent of Canadian exports (see Table 1).

Policy discussions about how the Canadian economy should pivot away from its most significant export product – oil and gas (which brings in billions of dollars in export revenues to Canada) – towards renewable energy products calls for a closer scrutiny. Canada's share of global trade in renewable energy products can be an excellent barometer from which to gauge where Canada stands.

This Fact Sheet provides a snapshot of Canada's international trade in two major renewable energy products: solar panels and wind turbines. We analyze exports and imports of these products over the past decade and identify the significant trading partners for each. We also indicate which countries are the top exporters of solar panels and wind turbines.

Table 1

Canada's top exports

2021

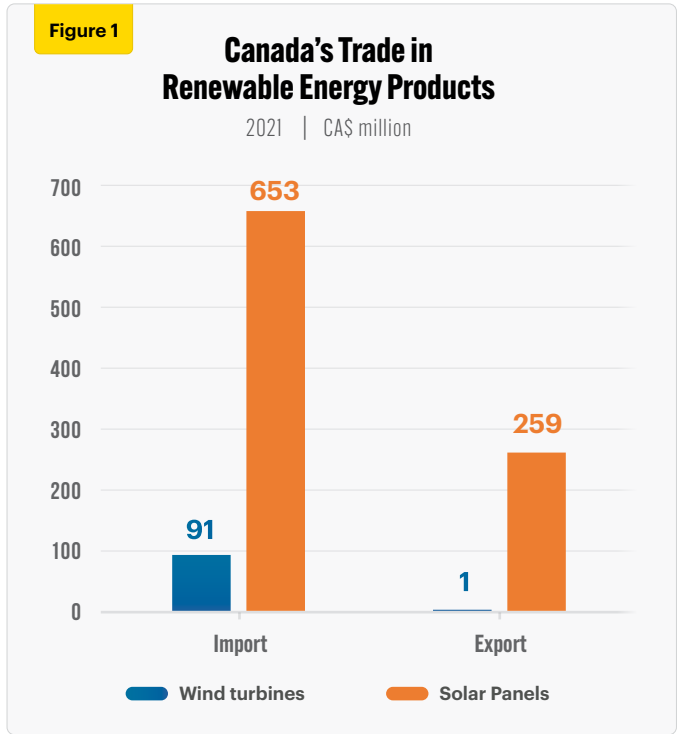
Industries (5-digit NAICS codes)	(CA\$ billions)
21111 - Oil and gas extraction (except oil sands)	116.7
33611 - Automobile and light-duty motor vehicle manufacturing	32.9
32411 - Petroleum refineries	21.3
21222 - Gold and silver ore mining	18.6
32111 - Sawmills and wood preservation	17.3
33641 - Aerospace product and parts manufacturing	15.4
32541 - Pharmaceutical and medicine manufacturing	13.2
33131 - Alumina and aluminum production and processing	12.5
33141 - Non-ferrous metal (except aluminum) smelting and refining	12.2
31161 - Animal slaughtering and processing	11.0
21239 - Other non-metallic mineral mining and quarrying	10.3
32521 - Resin and synthetic rubber manufacturing	10.2
21221 - Iron ore mining	10.1
33111 - Iron and steel mills and ferro-alloy manufacturing	9.8
31122 - Starch and vegetable fat and oil manufacturing	8.8
11114 - Wheat farming	8.3
32121 - Veneer, plywood, and engineered wood product manufacturing	8.0
21211 - Coal mining	7.7
32211 - Pulp mills	7.3
33991 - Jewellery and silverware manufacturing	7.0
11112 - Oilseed (except soybean) farming	7.0
32619 - Other plastic product manufacturing	6.6
31171 - Seafood product preparation and packaging	6.1
33361 - Engine, turbine, and power transmission equipment manufacturing	6.1
33451 - Navigational, measuring, medical, and control instruments manufacturing	5.7
Sub-total	390.3
Others	241.2
Total (All Industries)	631.5

Source: Government of Canada, Trade Data Online.

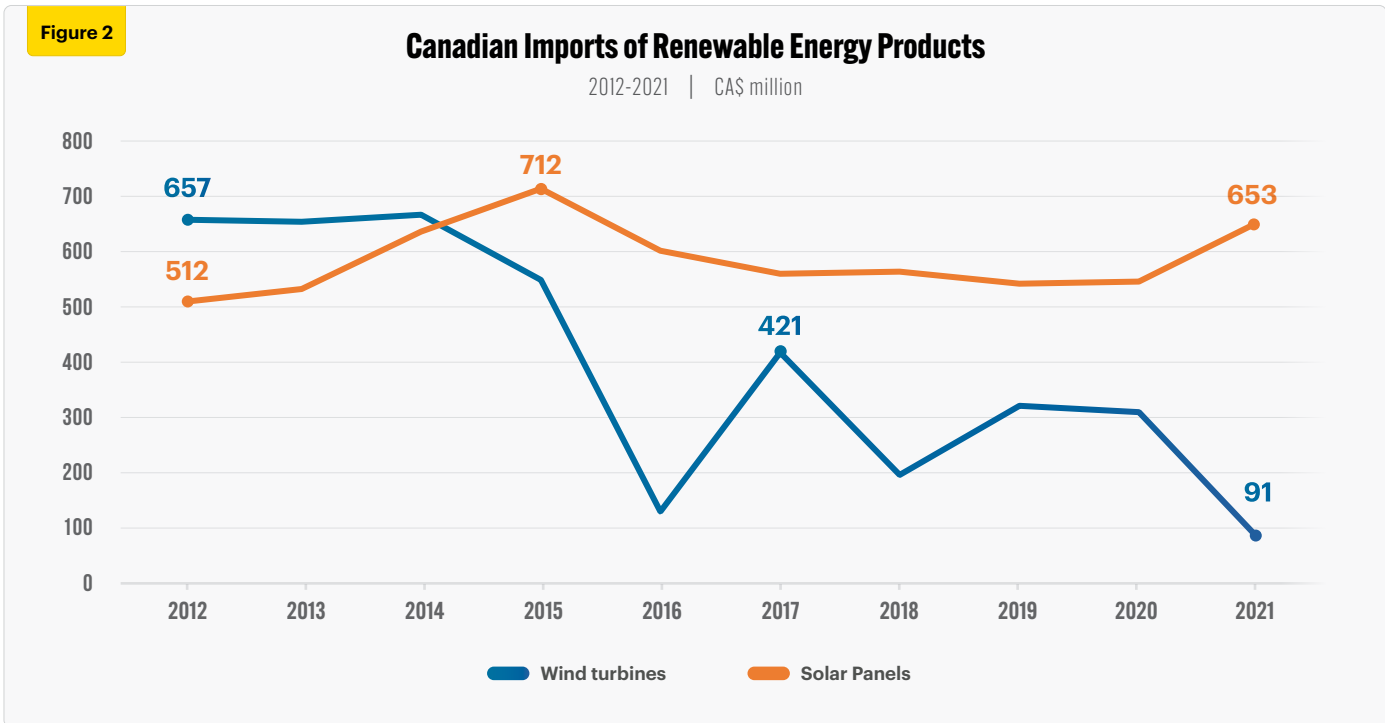
Trade in renewable products: Canada imports more solar panel and wind turbine products than it exports

In 2021, Canada imported solar panel products with a value of CA \$653 million and wind turbine products with a value of CA \$91 million. The value of the solar panels and wind turbines Canada imported was much higher than the CA \$260 million export value for both products (see Figure 1).

Canada's imports of solar panel products increased from CA \$512 million in 2012 to CA \$653 million in 2021, an increase of nearly 28 percent. In contrast, the country's imports of wind turbine products decreased drastically after 2014, falling to just CAD \$91 million in 2021 (see Figure 2).



Source: Government of Canada, Trade Data Online

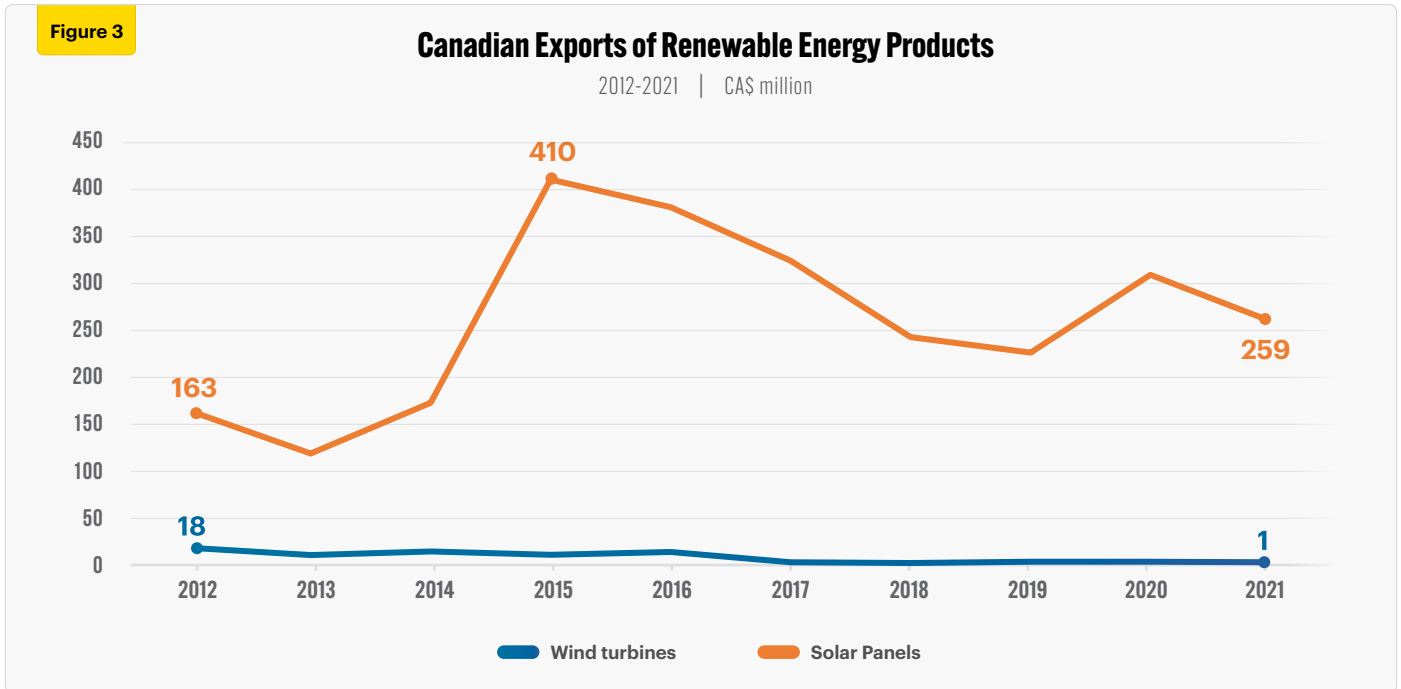


Source: Government of Canada, Trade Data Online.

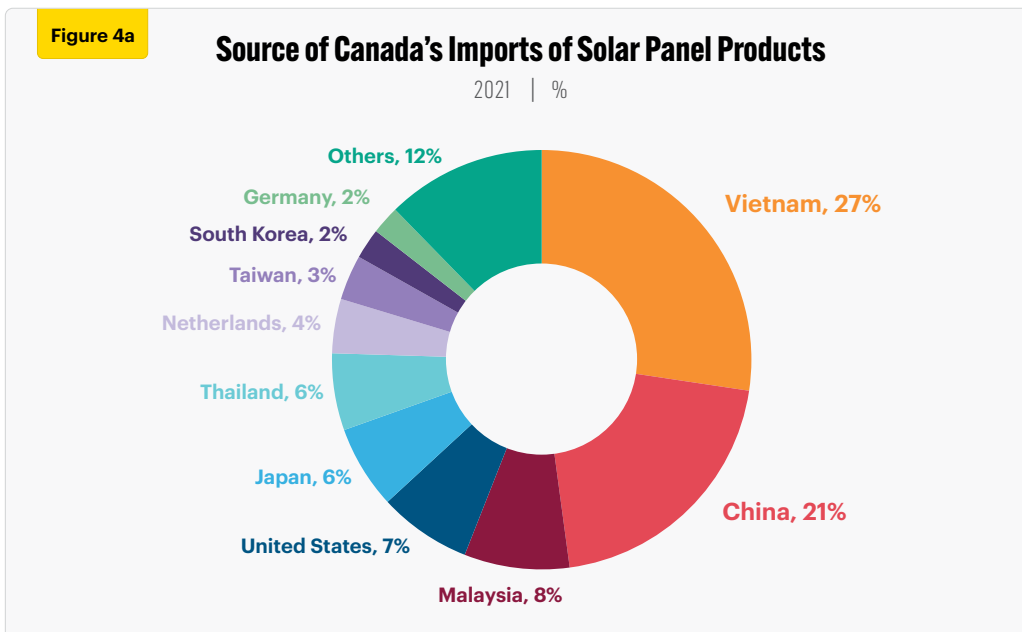
In 2012, the value of solar panel products that Canada exported was CA \$163 million. The value of these exported products reached a high of CA \$410 million in 2015, before falling to CA \$259 million in 2021. Meanwhile, between 2012 and 2021, the value of wind turbine products exported was relatively negligible; less than CA \$1 million worth in 2021 (see Figure 3).

Import and export partners for solar panels.

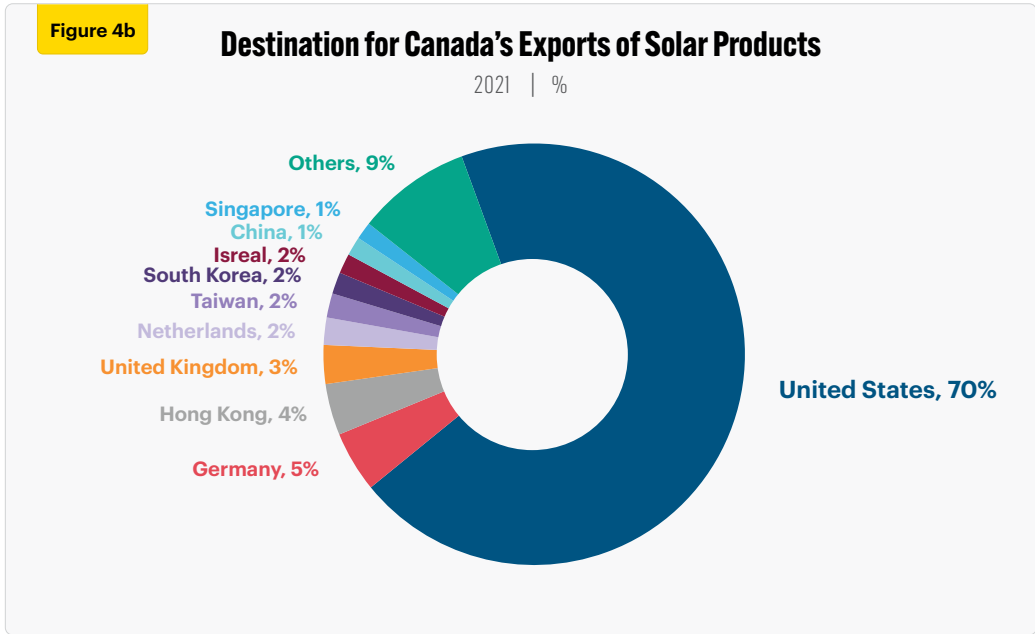
Vietnam (27 percent) and China (21 percent) combined were the origin of most imports of solar panels to Canada in 2021. The largest Canadian export destination for solar panels was the US (70 percent) in 2021 (see Figure 4a and Figure 4b).



Source: Government of Canada, Trade Data Online.

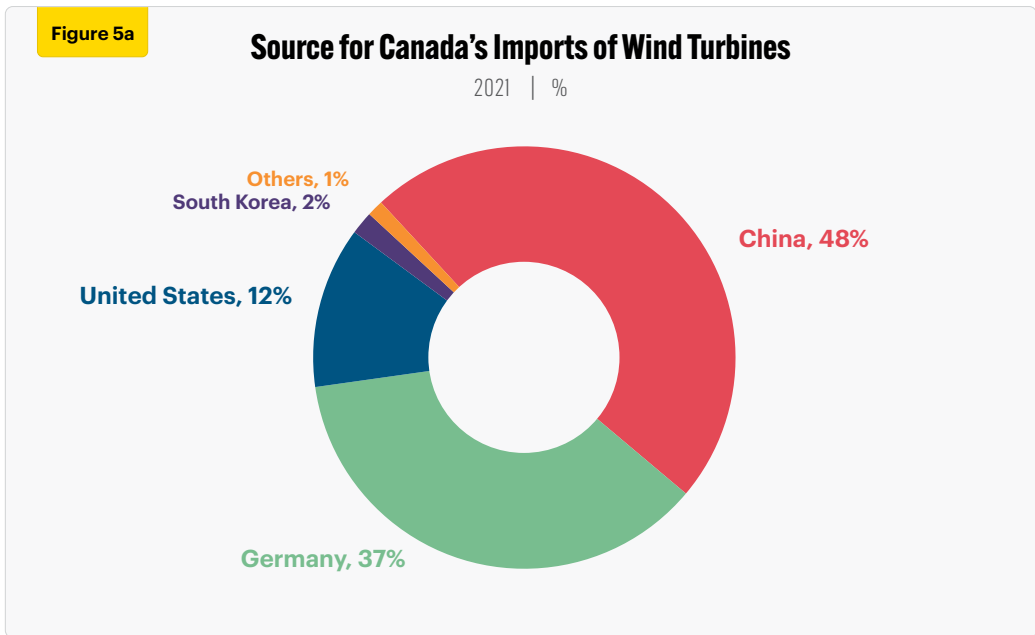


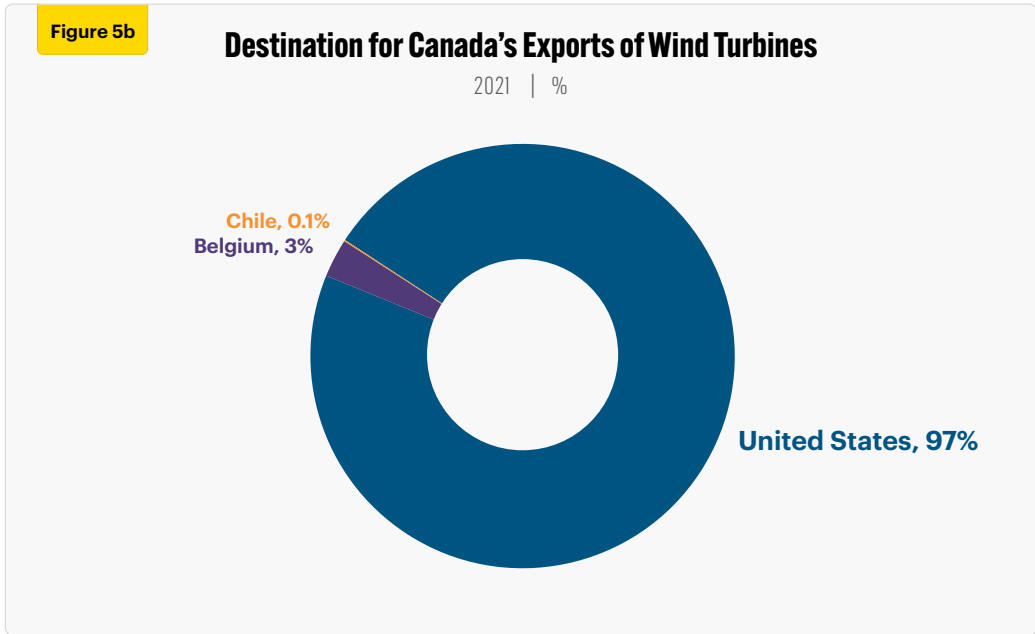
Source: Government of Canada, Trade Data Online.



Wind turbines: Import and export partners

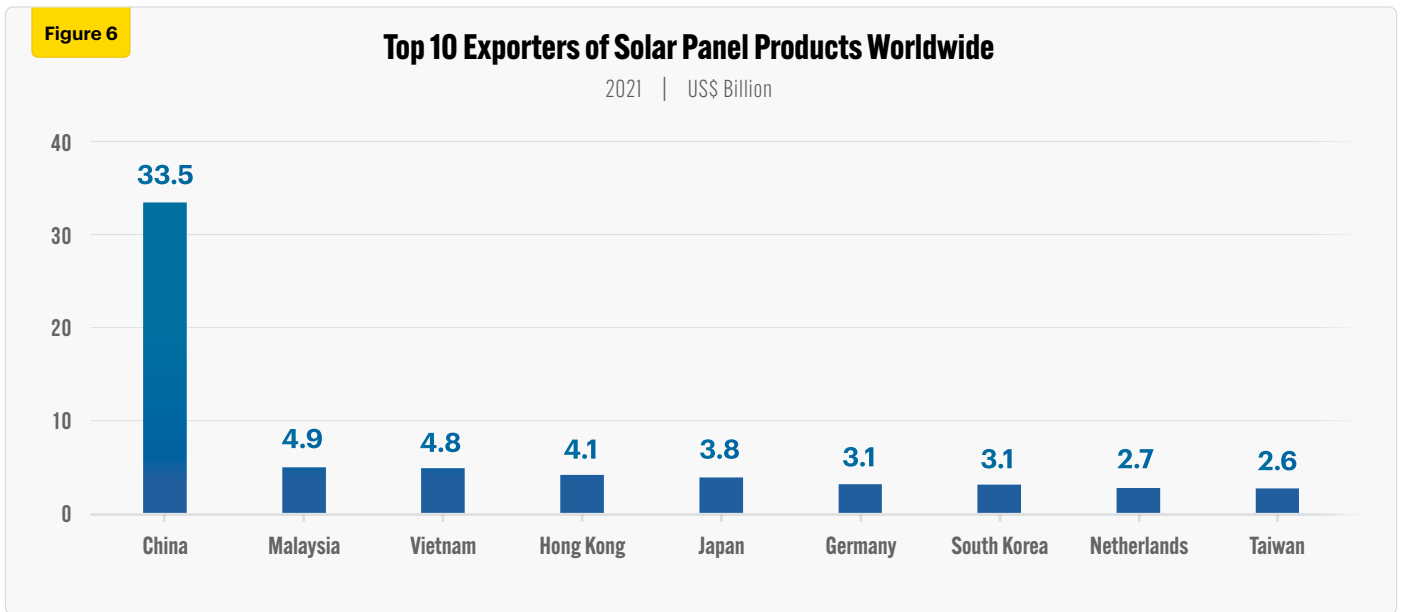
China (48%) and Germany (37%) were the primary suppliers of the wind turbine products Canada imported. The US was the primary destination of the relatively negligible wind turbines exports from Canada (see Figures 5a and 5b).



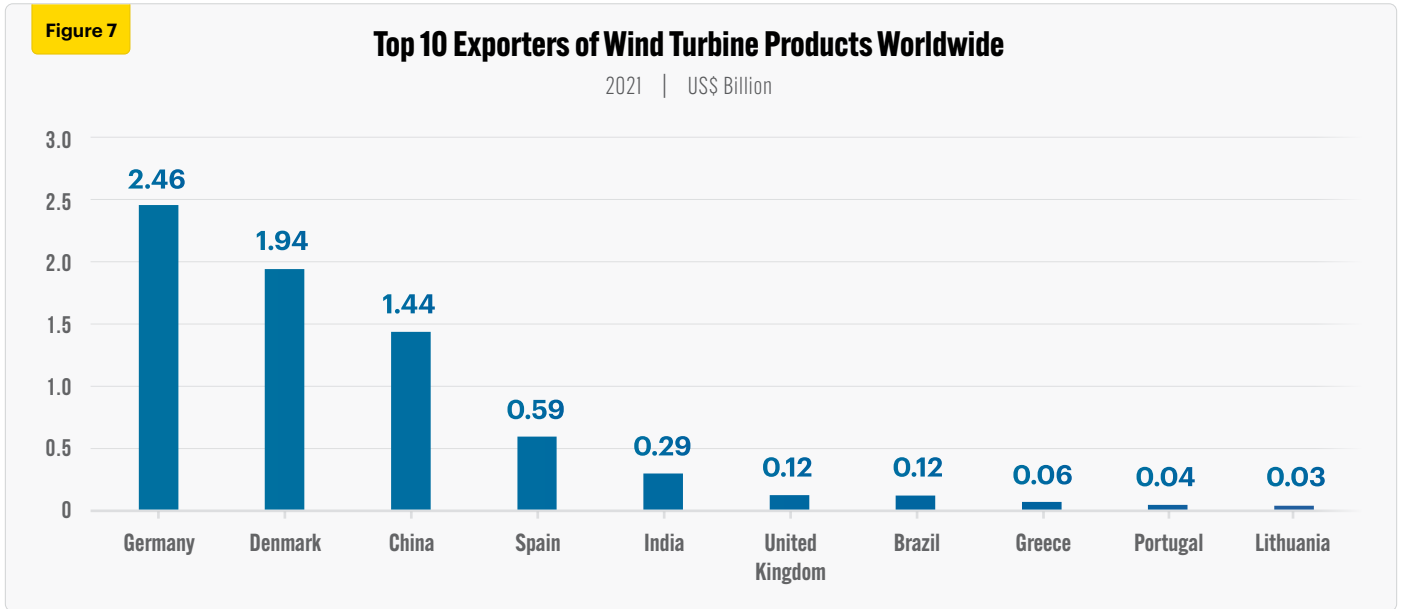


Major exporters of solar panels and wind turbines

China, Malaysia, and Vietnam were the largest worldwide exporters of solar panel products in 2021. China exported US \$33.5 billion of solar panel products, followed by Malaysia at US \$4.9 billion, and Vietnam at US \$4.8 billion (see Figure 6).



The top three exporters of wind turbine products worldwide were Germany (US \$2.46 billion), Denmark (US \$1.94 billion), and China (US \$1.44 billion) (see Figure 7).



Source: UN Comtrade.

Conclusion

Asian countries, particularly China, Malaysia, and Vietnam, are the largest exporters of solar panel products while European countries such as Germany and Denmark are the largest exporters of wind turbine products.

To date, Canada's export of solar panel and wind turbine products is still relatively small compared to other significant exporters.

Notes

This CEC Fact Sheet was compiled by Ven Venkatachalam and Lennie Kaplan at the Canadian Energy Centre (www.canadianenergycentre.ca). The Harmonized System (HS) product code used in the fact sheet for wind turbines is HS 850231 (electric generating sets—wind-powered) and for solar panels is HS 854140 (photosensitive semiconductor devices, photovoltaic cells, and light-emitting diodes). All percentages in this report are calculated from the original data, which can run to multiple decimal points. They are not calculated using the rounded figures that may appear in charts and in the text, which are more reader friendly. Thus, calculations made from the rounded figures (and not the more precise source data) will differ from the more statistically precise percentages we arrive at using source data. The authors and the Canadian Energy Centre would like to thank and acknowledge the assistance of two anonymous reviewers in reviewing the data and research for the initial edition of this Fact Sheet. Image credits: [Jason Blackeye](#)

References (All links live as of January 31, 2023)

Government of Canada (2022), Trade Data Online <<https://bit.ly/3WYoeep>>; Government of Canada (n.d.), “Just Transition” <<https://bit.ly/3vN2eZ0>>; Government of Canada (2020), *Canada's State of Trade* <https://bit.ly/3GAM5Lk>; UN Comtrade database (n.d.), International Trade Statistics <<https://bit.ly/3vQmPeR>>.

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