



Economic footprint of the Airbus A220 Programme in Québec and Canada

Report prepared by PwC for
Airbus Canada

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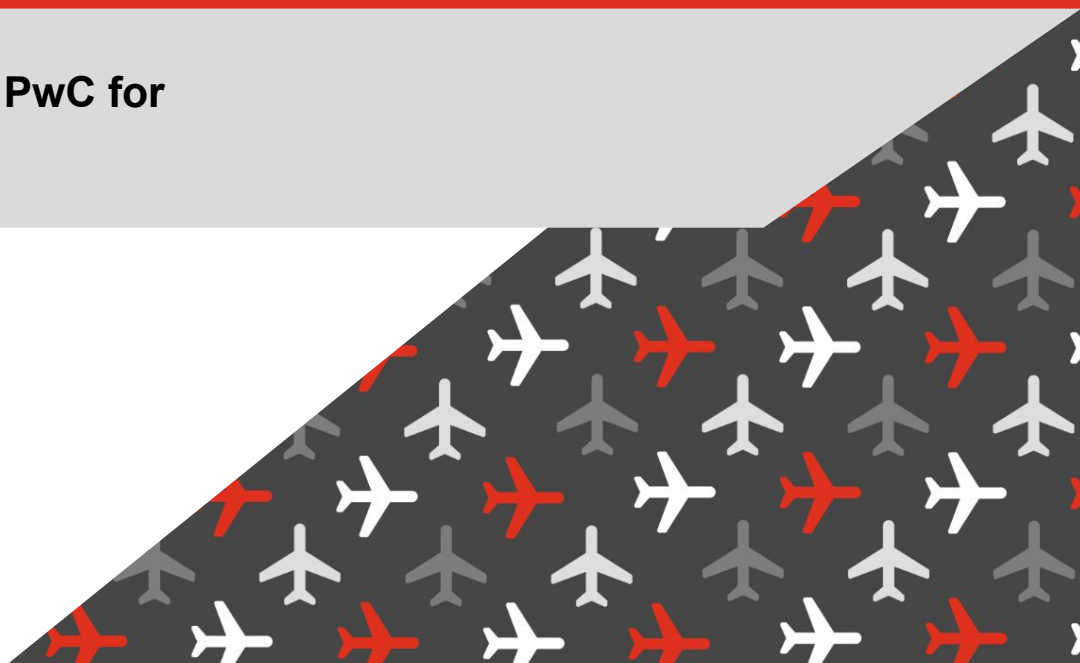




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Notice to the reader: This report merely provides calculations and observations on the economic footprint and impacts of Airbus Canada’s A220 Programme. PwC has relied upon the completeness, accuracy, and fair presentation of all information and data obtained from Airbus Canada and the various sources set out in our report, which were not audited or otherwise verified.

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Economic footprint of the Airbus A220 Programme in Québec and Canada

About this report

Airbus, a leading entity in the aerospace industry, is a significant contributor to aircraft manufacturing and innovation around the globe. In 2018, Airbus SAS acquired a majority stake in the C Series Aircraft Limited Partnership (CSALP), which was subsequently renamed Airbus Canada Limited Partnership (Airbus Canada). This limited partnership owned the C Series program, which was subsequently rebranded the A220.

Airbus Canada has retained the services of PricewaterhouseCoopers LLP (PwC, we, us or our) to calculate the economic footprint associated with the A220 Programme in Quebec and in Canada. In that context, we calculated the economic footprints of the following Airbus Canada activities:

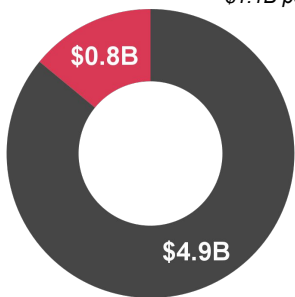
- 2018-2022 A220 manufacturing activities.
- 2023-2038 A220 projected manufacturing activities.

Note: All monetary values are presented in 2023 Canadian dollars unless otherwise stated. The evaluation of the economic footprint was made based on data and assumptions provided by Airbus Canada. Future impacts were discounted at an 8.9% discount rate. Please refer to Appendix A for more information on methodology.

Summary of results – Economic footprint of the A220 Programme

2018 to 2022 operations

\$5.7B in GDP
over the period
or an average of
\$1.1B per year



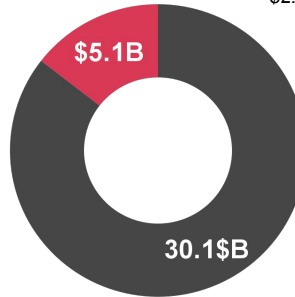
33,000
jobs supported
across the supply
chain, or an average
of 6,600 per year

jobs supported
across the supply
chain, or an average
of 6,600 per year

● Québec
● Rest of Canada

2023 to 2038 operations

\$35.2B in GDP
over the period
or an average of
\$2.2B per year



248,000
jobs to be
supported across
the supply chain, or
an average of
15,500 per year

jobs to be
supported across
the supply chain, or
an average of
15,500 per year

● Québec
● Rest of Canada



\$1.3B In tax revenues for governments
over the period, or an average of
\$260M per year



\$7.8B In tax revenues for governments
over the period, or an average of
\$488M per year

10% of Québec's Aerospace and parts manufacturing GDP between 2018 and 2022 is a result of Airbus Canada's activities¹

Airbus Canada: supporting high-value jobs and strengthening exports



Supporting high value-added jobs

Average wage of Airbus Canada's employees dedicated to the A220 Programme in Québec is:

87% higher than the average salary for all industries in Québec.²



Enhancing global trade through exports

The aerospace sector stands as Québec's premier contributor to exports. From 2018 to 2022, the A220 Programme was responsible for:

60% of the export value of "Aerial Vehicles and Spacecraft" produced in Québec.³

Economic footprint stemming from the manufacturing activities of the A220 aircraft from 2018 to 2022

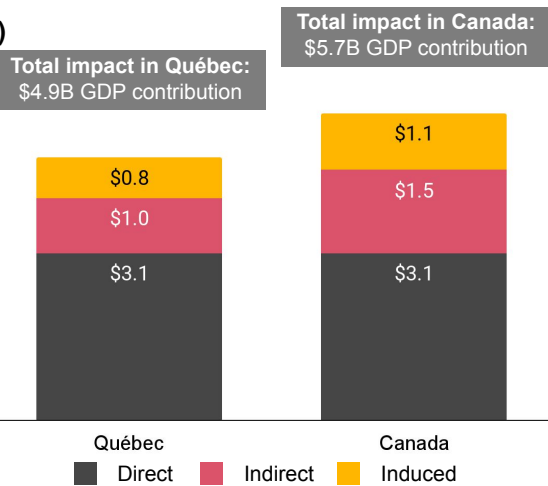
The A220 Family, comprising the A220-100 and the A220-300, is part of Airbus' global family of commercial aircraft, and has been in service since 2016. The A220 has a maximum range of around 3,450 nautical miles⁴.

As of September 2023, Airbus has received a total of 806 orders for its aircraft from about 30 international customers. To date, 287 of these aircraft have been delivered to 18 different airlines. Some of the most prominent of these include SWISS, airBaltic, Air France, Delta Air Lines, and Air Canada. In 2022, 53 aircraft were delivered, and in 2023, 41 aircraft have been handed over to operators so far, with 519 orders remaining. Looking forward, Airbus anticipates that at least 7,000 single-aisle aircraft within the 100-150 seat segment will be delivered over the next 20 years.

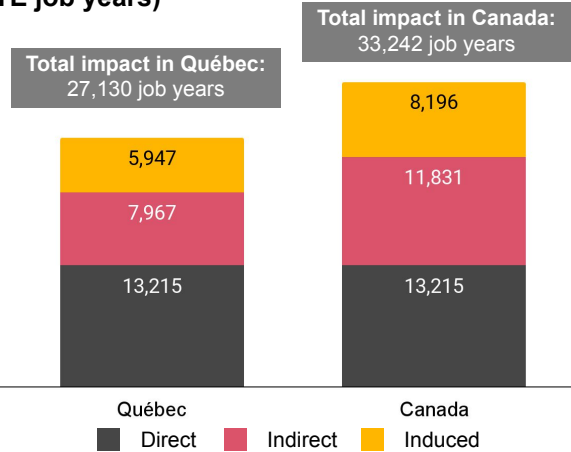
We calculated that the total economic footprint (direct, indirect, and induced impacts)⁵ generated in Canada from Airbus Canada's A220 manufacturing activities from 2018-2022 was \$5.7B⁶ in GDP. This economic activity supported 33,242 job years (which corresponds to 6,600 full-time equivalent jobs over the period), and \$3.5B in labour income. Taxes generated in relation to these activities were calculated to amount to a total of \$1.3B, of which \$631M was accrued to provincial governments, \$522M was accrued to the federal government, and the remaining \$120M was accrued to municipal governments.

Economic footprint facilitated by Airbus Canada's manufacturing activities for the A220 over the 2018 to 2022 period

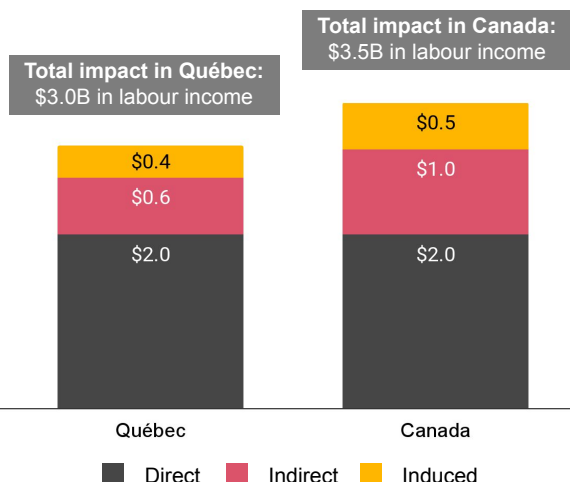
GDP (in \$B)



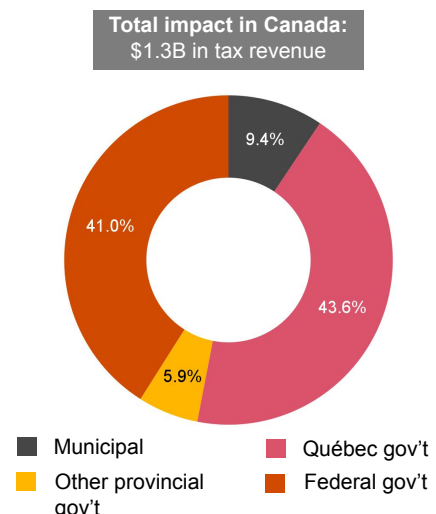
Jobs (FTE job years)



Labour income (in \$B)



Federal, provincial and municipal tax impact (in \$B)



Airbus Canada's contribution to Canada's economic growth is expected to continue in the years to come



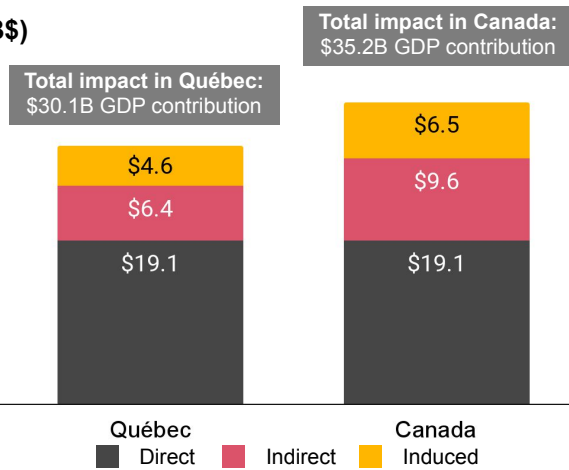
Airbus Canada's A220 Programme is expected to continue to contribute to Canada's economic growth at least through to 2038⁷. Based on sales projections provided by Airbus Canada, we have calculated the total economic impact generated in Canada by its manufacturing activities from 2023 to 2038:

- Over this period, the production of A220 aircraft is projected to contribute \$35.2B to the national GDP, with an average annual contribution of \$2.2B. The province of Quebec is expected to be the primary beneficiary, generating approximately 85% of this economic activity.
- In terms of employment, the production of A220 aircraft is estimated to support 247,770 job-years throughout Canada, equating to an annual average of 15,500 full-time jobs, with the vast majority based in Quebec. These jobs are anticipated to generate \$21.2B in employee earnings.
- Government revenues have been calculated at a total of \$7.8B, of which \$3.9B will be attributed to provincial governments, \$3.2B to the federal government, and \$736M to municipal governments.

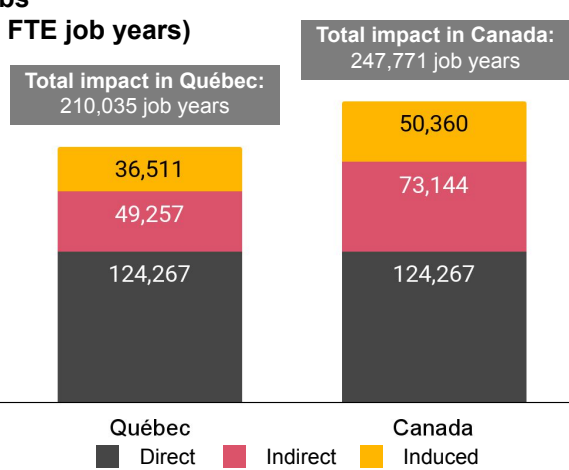
The economic footprint assessment presented in this study relates solely to the manufacturing activities of Airbus Canada. It does not consider the maintenance and operation activities of the A220 aircraft carried out by Airbus's Canadian clients, nor the associated impact on their service providers.

Projection of the economic footprint facilitated by Airbus Canada's manufacturing activities for the A220 over the 2023 to 2038 period

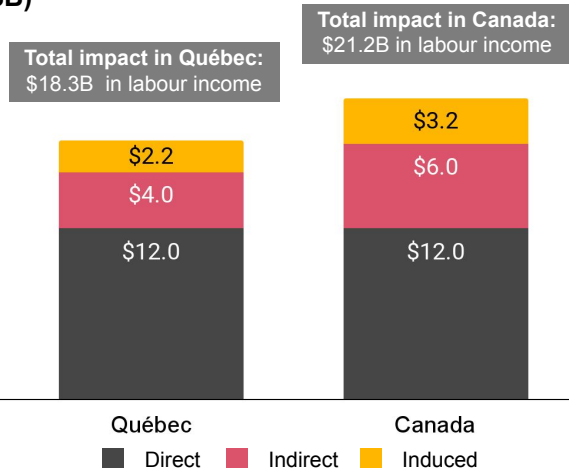
GDP (in B\$)



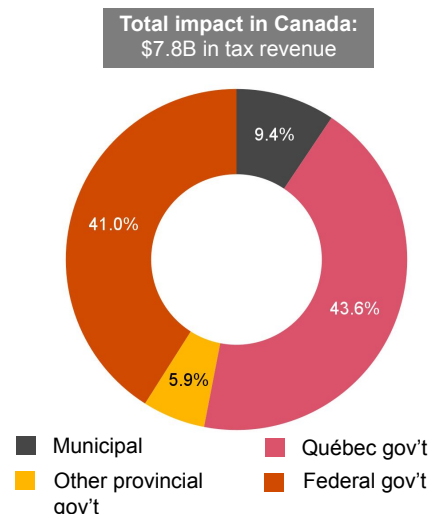
Jobs (in FTE job years)



Labour income (in B\$)



Federal, provincial and municipal tax impact (in B\$)



The A220 Programme contributes to Québec's status as a global aerospace powerhouse

The A220 Programme has played a pivotal role in enhancing Québec's position in the global aerospace sector. From 2015 to 2022, Canada's aerospace sector, which is concentrated in Québec, went from sixth place to third place in PwC's global Aerospace Manufacturing Attractiveness Rankings⁸. One factor underlying this increase in aerospace competitiveness was the production rate ramp-up of the A220 Programme, which, in recent years, represented a significant share of aerospace investment in Québec. Indeed, the Programme represents 7.5% of Canada's aerospace and parts manufacturing GDP between 2018 and 2022. The following is a summary of key areas in which the A220 contributed to Québec's current position in the aerospace sector:



Technological leadership

Technological innovations stemming from the A220 Programme have significantly advanced aerospace technology:

- Pratt & Whitney geared turbofan engines specially designed for the A220 to reduce emissions, noise and fuel burn
- The use of advanced structural materials results in a weight savings of over 2,000 pounds. This includes advanced aluminium alloy for the fuselage and advanced composite for wings, centre wing box, empennage, rear fuselage and nacelle
- The aircraft features an advanced flight deck, a fly-by-wire flight control system, and integrated avionics
- Electro-mechanically controlled brakes
- The interior design offers a wide body feel in a single-aisle aircraft, ensuring passenger comfort with the widest seats in its class



Environmental leadership

The A220 Programme set new standards in environmental performance:

- 25% fewer CO₂ emissions per seat (up to 120,000 tons of CO₂ emissions per aircraft) compared with previous generation of small single-aisle aircraft
- About 50% fewer NOx emissions than CAEP/6 standards
- A220-100 and A220-300 are estimated to be 75% recyclable
- Suppliers are encouraged to be ISO 14.001 certified⁹
- The Mirabel manufacturing plant is following LEED standards¹⁰
- It is the quietest commercial jet in its class¹¹



Human capital

The Airbus workforce dedicated to the A220 grew from approximately 2,000 employees in 2018 to the current total of about 3,000 employees, marking a 50% growth and the creation of 1,000 new jobs over the last few years

Moreover, in Québec, the A220 Programme has enhanced skill development in science and engineering, fostering innovation and bolstering Québec and Canada's global competitiveness. Airbus Canada has fostered robust collaborations with academic institutions since 2021, including:

- The Polytechnique Montréal Talent Attraction Program, with an annual commitment of \$30,000 from 2023 to 2025
- A multi-year scholarship initiative launched in 2021 in partnership with McGill University and Polytechnique Montréal
- Awarding two merit scholarships at ÉNA (École nationale d'aérotechnique)

Airbus Canada is also dedicated to fostering workforce diversity. In 2023, Airbus Canada set a target to ensure that 33% of their new recruits are women, with a comparable proportion being young professionals.



Appendices

Appendix A: Data sources and approach

Data sources

Data and assumptions on operational spending related to the A220 Programme were provided to us by Airbus Canada.

For the years 2018 to 2022, we used quantitative data on operational spending, as well as direct employment data provided by Airbus Canada. For the 2023 to 2038 period, we used forecasts based on growth assumptions provided by Airbus Canada. The 2023 to 2038 impacts were corrected for inflation using the Bank of Canada's yearly target rate of 2% and a discount rate of 8.9%, which is the halfway point between Airbus SE's weighted average cost of capital and the Bank of Canada long-term bond yields.

PwC has not verified the accuracy of this data or assumptions.

Input-output analysis

To calculate the economic footprint of Airbus Canada's manufacturing activities related to the A220 Programme, we used PwC input-output based on Statistic Canada Supply and Use tables. The analysis was performed on data provided by Airbus Canada.

The fundamental philosophy behind economic impact analysis is that spending on goods and services has attendant impacts throughout the economy. For instance, Airbus's manufacturing activities will generate demand for the inputs to this process (such as equipment and labour), which in turn generates additional demand that extends beyond the initial spending. Our analysis permits the estimation of this cascading effect by using the input-output model of the Canadian economy.

The input-output model used for the purpose of this report estimates the relationship between economic activity for a given good or service and the resulting impacts throughout the economy (including demand for other goods and services and tax revenues). For the purpose of this report, economic impacts were estimated for the following measures of economic activity:

- **GDP (also known as value-added)** – the value added to the economy, or the output valued at basic prices less intermediate consumption valued at purchasers' prices. GDP includes only final goods in order to avoid double-counting of products sold during a certain accounting period.
- **Employment** – the number of jobs created or supported.
- **Labour income** – the amount earned by the employment expected to be generated (including social benefits such as employer contributions towards pensions and employment insurance).
- **Payroll tax revenue** – the amount of revenue collected by provincial and federal governments for personal income taxes.

Economic impacts are typically estimated at the direct, indirect, and induced levels:

- Direct impacts are those that result directly from Airbus Canada's expenditures on labour and capital, as well as gross operating profits.
- Indirect impacts arise from the activities of the firms providing inputs to Airbus Canada's suppliers (in other words, the suppliers of its suppliers).
- Induced impacts are the result of consumer spending by employees of the businesses stimulated by direct and indirect expenditures.

In applying the input-output analysis, we made the following key assumptions:

- Spending breakdown associated with the A220 Programme is similar to that in the industry as a whole (aerospace product and parts manufacturing).
- Employment levels from 2023 to 2038 will follow the number of employees per manufactured plane between 2020 and 2022.
- There will be no productivity gains between 2023 and 2038 that would lower the expenditure per manufactured plane.
- Labour income for direct employees will remain constant in real terms over the forecast period.
- Maintenance activities are not included in the economic impact assessment.

Appendix B: Limitations

Limitations

Data limitations and verification: PwC has relied on data and information provided by Airbus Canada. PwC has relied upon the completeness, accuracy, and fair presentation of all information and data obtained from Airbus Canada and the various sources set out in our report, which were not audited or otherwise verified. The findings in this report are conditional upon such completeness, accuracy, and fair presentation, which have not been verified independently by PwC. Accordingly, we provide no opinion, attestation, or other forms of insurance with respect to the results of this study.

Where the information or data provided is not sufficient to conduct the analysis that has been requested, we have made assumptions, as noted throughout the report.

In addition, PwC has relied on Airbus Canada for information about its technological leadership, environmental leadership, and human capital commitments. PwC has not verified this information.

Technology assessment: We are not technical experts and are not in a position to assess the technical aspects of Airbus Canada activities. Thus, any statement in this report regarding the technical aspects reflects our understanding based on discussions with Airbus Canada.

Receipt of new data or facts: PwC reserves the right at its discretion to withdraw or revise this report, should we receive additional data or be made aware of facts existing at the date of the report that were not known to us when we prepared this report. The findings are as of October 2023, and PwC is under no obligation to advise any person of any change or matter brought to its attention after such date, which would affect our findings.

This study is not a recommendation: Our report is not intended to provide a recommendation to the reader. It merely provides calculations and observations on the economic footprint and impacts of Airbus Canada manufacturing activities.

Input-output analysis: Input-output analysis does not address whether the inputs have been used in the most productive manner or whether the use of these inputs in this industry promotes economic growth more than their use in another industry or economic activity. Nor does input-output analysis evaluate whether these inputs might be employed elsewhere in the economy if they were not employed in this industry at the time of the analysis. Input-output analysis calculates the direct, indirect, and induced economic impacts that can reasonably be expected to affect the economy based on historical relationships within the economy. This analysis does not take into account fundamental shifts in the relationships within the economy that may have taken place since the last publication of the Supply and Use Tables by Statistics Canada in 2019, nor shifts that may take place in the future.

Use limitations: This report has been prepared solely for the use and benefit of, and pursuant to a client relationship exclusively with, Airbus Canada. We understand that Airbus Canada may share our report with third parties. This report can be released to third parties and/or the public only in its entirety. Any commentary or interpretation in relation to this report either requires PwC's written consent or has to be clearly identified as the interpretation of Airbus Canada or third parties. In addition, these parties are required to add a link to the full deliverable. PwC accepts no duty of care, obligation, or liability, if any, suffered by Airbus Canada or any third party as a result of an interpretation made by those parties of this report.

Further, no other person or entity shall place any reliance upon the accuracy or completeness of the statements made herein. In no event shall PwC have any liability for damages, costs or losses suffered by reason of any reliance upon the contents of this report by any person other than Airbus Canada.

This report and related analysis must be considered as a whole: Selecting only portions of the analysis or the factors considered by us, without considering all factors and analysis together, could create a misleading view of our findings. The preparation of our analysis is a complex process and is not necessarily susceptible to partial analysis or summary description. Any attempt to do so could lead to undue emphasis on any particular factor or analysis.

We note that significant deviations from the above-listed major assumptions may result in a significant change to our analysis.

Appendix C: Endnotes

| Page | Reference | Source/Note |
|------|-----------|--|
| 3 | 1 | Calculated by taking the ratio of Airbus Canada's 2018-2022 GDP impacts in the aerospace and parts manufacturing on the industry's total GDP in Canada during the same period. |
| 3 | 2 | Annual industry salaries were calculated by using Statistics Canada average hourly wage data and assumed 35 hours worked per week and 47 weeks worked per year, for a yearly total of 1,645 hours. |
| 3 | 3 | Calculated based on data shared by Airbus Canada and export values published by Statistics Canada for the product category "AERIAL VEHICLES; SPACECRAFT/THEIR LAUNCH VEHICLES, NDA" |
| 4 | 4 | Airbus (2023). A220 Family: Purpose Built for Efficiency. https://www.airbus.com/sites/g/files/jlcbta136/files/2023-09/Airbus-A220-Facts-and-Figures-September-2023_0.pdf |
| 4 | 5 | Direct impacts result from business expenditure on suppliers and employees. Indirect (Canadian suppliers) impacts arise from the activities of businesses providing inputs to the A220's suppliers (in other words, the suppliers' suppliers). Induced (consumer spending by employees) impacts result from consumer spending by employees of the businesses stimulated by the direct and indirect expenditures. Total economic impacts are equal to the sum of direct, indirect and induced economic impacts. |
| 4 | 6 | Dollar values in this report are in 2023 Canadian dollars unless otherwise noted. |
| 5 | 7 | Production forecasts are only available until 2038, so our economic footprint represents 2018 to 2038. Forecasts from 2023 to 2038 were discounted at an 8.9% discount rate. |
| 6 | 8 | The rankings were determined through the combination of seven category ranks: labour, infrastructure, industry, geopolitical risk, economy, cost and tax policy. For more information, please refer to: https://www.pwc.com/us/en/industries/industrial-products/library/assets/pwc-2022-aerospace-manufacturing-attractiveness-rankings.pdf |
| 6 | 9 | ISO 14001 is the international standard that specifies requirements for an effective environmental management system (EMS). |
| 6 | 10 | LEED certification provides independent, third-party verification that a building, home or community was designed and built using strategies aimed at achieving high performance in key areas of human and environmental health: location and transportation, sustainable site development, water savings, energy efficiency, material selection and indoor environmental quality. |
| 6 | 11 | Air Canada https://www.aircanada.com/ca/en/aco/home/fly/onboard/fleet/a220.html#/sustainability |



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