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EXPLOITS VALLEY GREEN HYDROGEN PROJECT:

An economic impact assessment

Prepared by:
Jupia Consultants Inc.

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EXECUTIVE SUMMARY

Exploits Valley Renewable Energy Corporation (EVREC) is the proponent of the Exploits Valley Green Hydrogen project which could be a game changer in north-central Newfoundland bringing substantial economic benefits during the construction phase of the project and sustaining hundreds of jobs and associated economic benefits on an annual basis over at least a three-decade period. The company's objective is to produce cost-effective green hydrogen/ammonia from the 3+ GW wind farm. The initial goal is to produce 915,000 tonnes/year of green ammonia. Initially, the goal is to export to European markets, but other use cases are possible in the future.

The Exploits Valley region could use an economic boost

Section 2 discusses the state of the regional economy and population in Exploits Valley region[1]. The region's economy has struggled in recent years, particularly the private sector economy. Over the 10-year period between 2011 and 2022, the number of manufacturing jobs dropped by 22 percent, finance and insurance employment declined by 41 percent and transportation-related jobs were down 19%. In contrast, health care was the fastest growing sector – adding 650 more jobs over the decade.

This has contributed to the region now having one of the oldest populations in the country. The median age in the region targeted for the Exploits Valley Green Hydrogen project is among the oldest in the country. In just 20 years, the region has gone from a neutral natural population growth rate (as many births each year as deaths) to only 35 births per 100 deaths as of 2022.

The impact on the workforce has been significant as only about half of the adult population is employed at some point during the year and over 35 percent of the workforce is over 55 and heading towards retirement. A reliance on seasonal jobs and the public sector means the Exploits Valley region could use a boost in private sector investment. The Exploits Valley Green Hydrogen project will be a gamechanger.

The Exploits Valley Green Hydrogen project economic impact summary

Section 3 provides the detailed economic impact model. The model considers direct and indirect as well as induced economic impacts within the province and across the country. Outside of the oil and gas sector, the Exploits Valley Green Hydrogen project represents one of the largest private sector investments in recent history. The project will involve deploying nearly $12 billion into the wind farm, hydrogen and ammonia development facilities and other related infrastructure. The company will amortize that large scale investment over the 34-years.

[1] For the purposes of this report, the Exploits Valley region includes the towns of Grand Falls-Windsor, Bishop's Falls and Botwood along with several other smaller communities (see Section 2.1).

EXECUTIVE SUMMARY (CONT.)

Most of the capital investment will go towards international imports including wind turbines and other components and equipment that is manufactured elsewhere in the world. Even with the large-scale imports, the CAPEX phase of the project is expected to substantially boost the provincial and national economies. Just Newfoundland and Labrador will see a contribution to provincial GDP of an estimated $1.4 billion over the four-year period 2026-2029. It will require an average of 2,700 workers per year in Newfoundland and Labrador for the four-year period and will result in total employment income of more than $1.1 billion (from direct, indirect and induced economic impacts).

The CAPEX investment will result in over $800 million in household spending in local communities across the province during the construction phase. Governments will benefit from an estimated $403 million in new tax revenue. The Newfoundland and Labrador government alone can expect $216 million in tax revenue before considering the ongoing taxes and royalties from operations.

Table 1 shows the in-province and national impacts from the CAPEX phase. The country overall will see a $2.1 billion increase in GDP from the CAPEX along with $1.6 billion in employment income and nearly 16,000 full time equivalent person years of employment.

Table 1: Estimated CAPEX economic impacts – Exploits Valley Green Hydrogen project ($000s)
Total impact during the construction phase

	In-province	National
GDP contribution (over four years)	$1,377,400	$2,015,000
Employment income	$1,112,700	$1,571,800
FTE person years of employment	10,880	15,990
Household spending	$802,200	$1,138,400
Taxes		
Taxes on income	$290,600	$388,200
Indirect taxes	$112,700	$166,400
Total taxes	$403,300	$554,500
Taxes by level of government		
Municipal	$42,800	$71,000
Provincial	$216,300	$279,900
Federal	$144,200	$203,600
Total	$403,300	$554,500

The project proponent envisions the wind energy and hydrogen production activity to last more than three decades and provide a stable source of high paying jobs and tax revenue for governments. Table 2 shows the annual economic impacts from operations per year starting in 2029.

EXECUTIVE SUMMARY (CONT.)

On an annual basis, the operations of the wind farm, hydrogen/ammonia operations and other activities will boost provincial GDP by more than $188 million, employment income by $58 million and current household spending by over $42 million. In the province, there will be 637 full time equivalent (FTE) jobs supported each year – most of those in the Exploits Valley region. There will be an expected 248 direct jobs, another 260 indirect jobs and the rest will come from induced economic activity. The average salary of the direct and indirect jobs will be just under $100,000 per year (in $2024).

Table 2: Average annual OPEX economic impacts by activity area, $000s
In-province and national impacts
$2024

	In-province	National
GDP contribution	$188,687	$238,939
Total employment (FTE)	637	921
Total employment income	$58,585	$75,824
Household spending	$42,240	$54,930

Per year for a 34-year period.

These economic benefits from operations will be sustained for at least 34 years, the lifespan of the project. Over the 34-year timeframe, in $2024 dollars, the Exploits Valley Green Hydrogen project is expected to boost provincial GDP by a total of $6.4 billion from operations, support 21,700 person years of full-time equivalent employment and boost employment in Newfoundland and Labrador by an estimated $2.0 billion. Total household spending over the period will be an estimated $1.4 billion. These impacts do not include the economic activity associated with the spending of tax and royalty revenue on public services across the province.

The Exploits Valley Green Hydrogen project: Taxes and royalties

The taxes arising from operations come from a variety of sources including personal income tax payments, HST on goods and services and property taxes, among other levies. As developed in Section 3.2.2, the economic impact model estimates the annual operations associated with the Exploits Valley Green Hydrogen project will boost government coffers by just under $24 million per year of which $2.3 will go to municipal governments, $13 million to the Newfoundland and Labrador provincial government and $8.7 million to the federal government.

In addition, there will be corporate income tax payments. The federal portion of the taxes paid over the 34-year timeframe is net of Clean Hydrogen Investment Tax Credit (CHITC) tax credits. On an average annual basis, the project proponent estimates there will be $98 million in provincial corporate income tax payments. After the tax incentives, the average annual amount of federal corporate income taxes will be $32.7 million.

EXECUTIVE SUMMARY (CONT.)

The estimated water royalty payments over the life of the project were provided by the project proponent and are estimated to be just under $117 million per year. Other municipal taxes are expected to be approximately $3 million per year. The annual wind tax and water tax, using the Wind-Hydrogen Fiscal Framework, will be an expected $10.7 million and $1.1 million respectively. Based on the modelling done by the project proponent and this report's author, the total taxes and royalties arising from this project could total $9.8 billion or $288 million per year. The provincial government portion would be $8.2 billion or an average of $241 million per year.

Table 3: Annual and cumulative taxes arising from the Exploits Valley Green Hydrogen project operations, $000s
$2024

	Avg. annual	Cumulative
Taxes from operations	$24,000	$815,500
Municipal	2,200	76,400
Provincial	13,000	443,400
Federal	8,700	295,600
Corporate income tax expense	$130,900	$4,449,600
Provincial portion	98,200	3,337,200
Federal portion	32,700	1,112,400
Water royalty	$116,900	$3,974,500
Municipal taxes	$3,000	$101,500
Land charge	$1,200	$39,400
Wind tax	$10,700	$364,800
Water tax	$1,100	$37,800

Combined CAPEX & OPEX economic impacts – NL only

Section 3.4 shows that combining both CAPEX and OPEX economic activity, the entire project is expected to:

- Boost provincial GDP by $7.8 billion over the 34-year life of the project (in $2024), excluding the GDP impacts arising from spending the tax/royalty revenue;
- Contribute $3.1 billion employment income (in-province only);
- Support 10,900 person years of employment during the four years of construction and over 21,600 over the 34-year operating period;
- Boost annual household spending in NL by over $2.2 billion; and
- Municipal governments in the province can expect $220 million in tax revenue over the 38-year period (CAPEX and OPEX phases), the provincial government will receive an estimated $8 billion and the federal government another $1.6 billion just from the in-province activity.

EXECUTIVE SUMMARY (CONT.)

Table 4: Combined and cumulative economic impacts, Exploits Valley Green Hydrogen project, $Millions ($2024)
In-province impacts only

	CAPEX	OPEX	Combined
Provincial GDP contribution	$1,380	$6,420	$7,790
Employment income	$1,110	$1,990	$3,100
Person years of FTE employment	10,883	21,665	32,548
Household spending	$800	$1,440	$2,240
Taxes from construction and operations			
Municipal	$43	$76	$119
Provincial	$216	$443	$660
Federal	$144	$296	$440
Corporate income tax		$4,450	$4,450
Provincial portion		$3,340	$3,340
Federal portion		$1,110	$1,110
Water royalty		$3,970	$3,970
Municipal taxes		$101	$101
Land charge		$39	$39
Wind tax		$365	$365
Water tax		$38	$38

Source: Derived by Jupia Consultants Inc. See Appendix A.

Putting tax and royalty revenue to work

Section 3.5 looks at the potential impacts if the tax/royalty revenue was spent on the delivery of public services, specifically one-third on health care, one-third on education and one-third on public administration in the province. Based on typical economic multipliers, spending $241 million tax/royalty revenue would boost provincial GDP by an estimated $250 million (direct, indirect and induced effects combined), lead to $180 million in new employment income, support 2,400 jobs and over $130 million in additional household spending.

Further, the spending of $241 million on public services would induce another $31 million in tax revenue for the provincial government and $6.2 million for municipal governments.

EXECUTIVE SUMMARY (CONT.)

Table 5: The potential annual economic impacts from *spending* the taxes/royalties arising from the Exploits Valley Green Hydrogen project, $000s
$2024

	Education	Health care	Public administration	Total public spending
% breakdown by spending area	*33%*	*33%*	*33%*	*100%*
Provincial GDP contribution	$95,600	$79,700	$75,000	$250,200
Employment income	$74,200	$60,000	$46,300	$180,500
FTE employment	880	890	630	2,400
Household spending	$53,500	$43,300	$33,400	$130,100
Taxes	$0	$0	$0	$0
Taxes on income	$21,700	$17,500	$13,500	$52,700
Indirect taxes	2,000	1,800	1,800	5,600
Total taxes	23,700	19,300	15,400	58,300
Taxes by level of government		-	-	-
Municipal	$2,500	$2,000	$1,600	$6,200
Provincial	12,700	10,300	8,200	31,300
Federal	8,500	6,900	5,500	20,900

Direct, indirect and induced effects. Source: Developed by Jupia Consultants Inc. See Appendix A.

The strategic role of the Exploits Valley Green Hydrogen project

It is important to highlight just how important this project will be to the regional and provincial economies during construction and operations. Section 4 provides more details.

Economic benefit:	In context:
Will substantially boost provincial infrastructure investment	EVREC is expecting to deploy just under $12 billion (CDN$) worth of capital on this project over a four-year timeframe (most will be spent between 2026-2029), or an average of approximately $3 billion per year. To put this in context, the EVREC project should boost annual private sector capital expenditures by nearly 50 percent from the $6 billion per year baseline.
Adds a top private sector employer in the Exploits Valley region	This project is expected to bring 640 full time equivalent annual jobs in the province, most in the Exploits Valley region at an average salary twice the level of the average full-time job in in the region.

EXECUTIVE SUMMARY (CONT.)

Economic benefit:	In context:
Supports hundreds of small companies in the region	Adding tens of millions of dollars in household spending per year in the Exploits Valley region will provide a substantial ongoing boost to the local economy.
Helps attract highly skilled talent and meet local workforce needs	These high wage, highly skilled jobs will be attractive to trades workers and professionals looking to advance their careers. Many of these 500+ direct and indirect jobs are highly skilled workers who will bring with them families that will help support workforce needs in other sectors of the economy.
Drives substantial new tax revenue in the province	The Exploits Valley Green Hydrogen project is expected to generate an average of $241 million in new provincial government tax dollars each year. Municipal government, mostly in the Exploits Valley region, can expect an average of over $5 million in tax revenue each year during the life of the project.
Creates another major export industry for NL	The Exploits Valley Green Hydrogen project will create another major export sector for Newfoundland and Labrador. Green hydrogen will become a top five export sector by value for the provincial economy.
Positions the area as a Canadian green energy leader	The Exploits Valley Green Hydrogen project will position the region as a Canadian leader in green energy production.
Could lead to more industrial activity down the road	Once the energy infrastructure is in place, there is potential to develop future use cases for that energy that would create more economic activity in the province such as the processing of critical minerals, iron ore, data centres, etc.

Maximizing economic benefits in the province

The proponent will work hard to use local labour and develop a local supply chain for the project but there are several ways government, educational institutions and other related stakeholders can help to ensure the maximum economic benefits stay in the province. These include:

- Ensuring NL workers are deployed on this project both in CAPEX and OPEX phases.
- Ensuring there is a sufficient talent pipeline to meet CAPEX and OPEX demand.
- Working to match local and Canadian companies to supply chain opportunities including such areas as temporary housing.
- Looking to fill longer-term gaps in the local business community in the Exploits Valley region.

Section 4.2 provides more information on this topic.

1. INTRODUCTION TO THE EXPLOITS VALLEY GREEN HYDROGEN PROJECT

The regional economy in north-central Newfoundland has struggled in recent years and is facing a number of headwinds including an aging workforce. The Exploits Valley Green Hydrogen project could be a game changer bringing substantial economic benefits during the construction phase of the project and sustaining hundreds of jobs and associated economic benefits on an annual basis over at least a three-decade period.

1.1 Purpose of this report

The purpose of this report is to estimate the economic contribution of the proposed Exploits Valley Green Hydrogen project to the regional, Newfoundland and Labrador and national economies. The report looks at the direct, indirect and induced gross domestic product (GDP), income, jobs, taxes, household spending, and other impacts for both the capital expenditure phase of the project and the ongoing operations. Capital expenditures herein are referred to as CAPEX and operational expenditures as OPEX.

The multipliers developed by Statistics Canada are only published at the provincial and national levels and, therefore, the economic impacts are shown for Newfoundland and Labrador and the country overall. The level of CAPEX economic impact that accrues in Exploits Valley region will depend on how many workers live in the area and how many suppliers are local. Section 4 looks at how the various government and community partners can work with the project proponent to maximize the economic benefits in the Exploits Valley region and across the province.

1.2 Exploits Valley Green Hydrogen Project: Summary

Exploits Valley Renewable Energy Corporation (EVREC) is a subsidiary of Abraxas Power Corp., a global green energy developer with experience in related projects including raising funds and “creating value for stakeholders and communities where we reside”.

The geographic area for the green hydrogen project represents approximately 300 square kilometers in the Exploits Valley in central Newfoundland. The company is planning to leverage historical brownfield forestry sites logged for industrial purposes since the 1800s.

The wind energy project site is split into three main areas:

- Approximately 150 square kilometres of land surrounding the town of Botwood, to the north and west.
- Approximately 100 square kilometres of land in the Twin Lakes region, primarily falling to the north and west of the South Twin Lake.
- Approximately 50 square kilometres of land on the peninsula of Leading Tickles, either side of the Botwood Highway.

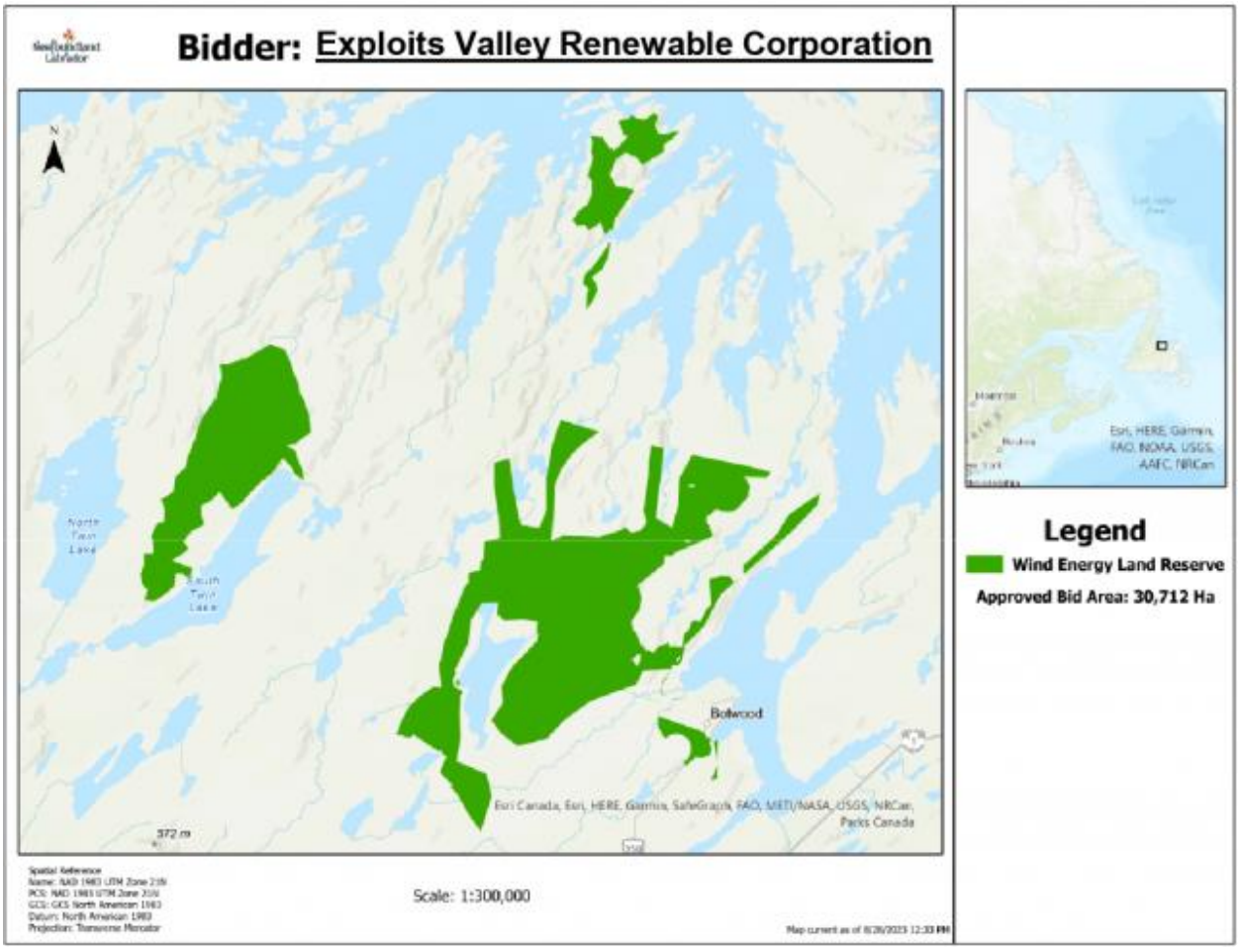
The company's objective is to produce cost-effective green hydrogen/ammonia from the 3+ GW wind farm. The initial goal is to produce 915,000 tonnes/year of green ammonia.

Initially, the goal is to export to European markets, but other use cases are possible in the future.

Although designed to be completely off-grid with no reliance on the transmission system, there is the capability to offer system services and grid forming benefits that can improve the province's electrical grid's performance, stability, and efficiency.

EVREC is in the middle of its permitting, engineering and survey process. Assuming the project gets the necessary approvals and financing, the company is planning to break ground in 2026 and exports to begin by 2029.

Figure 1: Map of EVREC Crown land allocation



Source: Government of Newfoundland and Labrador.

2. THE EXPLOITS VALLEY REGION NEEDS AN ECONOMIC BOOST

2.1 Exploits Valley region: Geographic definition

The Exploits Valley Green Hydrogen project will bring substantial benefits to Newfoundland and Labrador, specifically the Exploits Valley region. For the purposes of this report, the Exploits Valley region includes portions of Census Divisions 6 and 8 including the communities shown in Table 6.

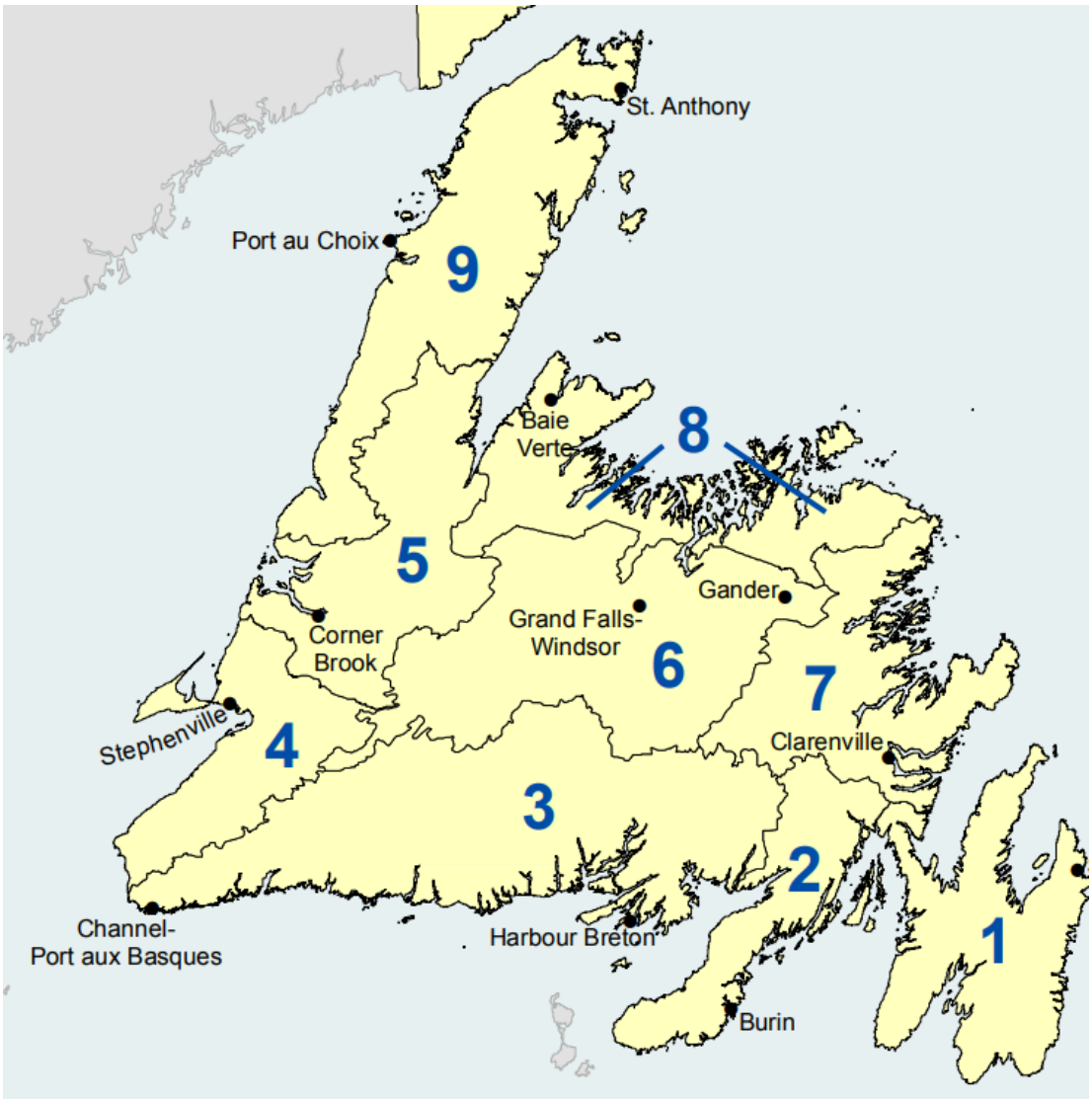
This area includes the largest town in central Newfoundland, Grand Falls-Windsor and two other towns with around 3,000 residents. The other communities are smaller. However, the population commutes within the region for work, shopping and services, and is a good representation of the regional economy.

Table 6: Communities included in the Exploits Valley region (for the purposes of this report)

	Pop. (2021)
Grand Falls-Windsor (Town)	13,853
Bishop's Falls (Town)	3,082
Botwood (Town)	2,778
Glenwood (Town)	739
Norris Arm (Town)	708
Badger (Town)	682
Appleton (Town)	620
Division No. 6, Subd. D	596
Point Leamington (Town)	574
Division No. 8, Subd. E	496
Northern Arm (Town)	371
Leading Tickles (Town)	296
Point of Bay (Town)	137
Total population of the region	24,932

In cases where the regional data is unavailable, the report uses information covering both Census Divisions 6 and 8 as shown in Figure 2 below. This region is labelled herein 'north-central Newfoundland'.

Figure 2: Census Division Map, Newfoundland

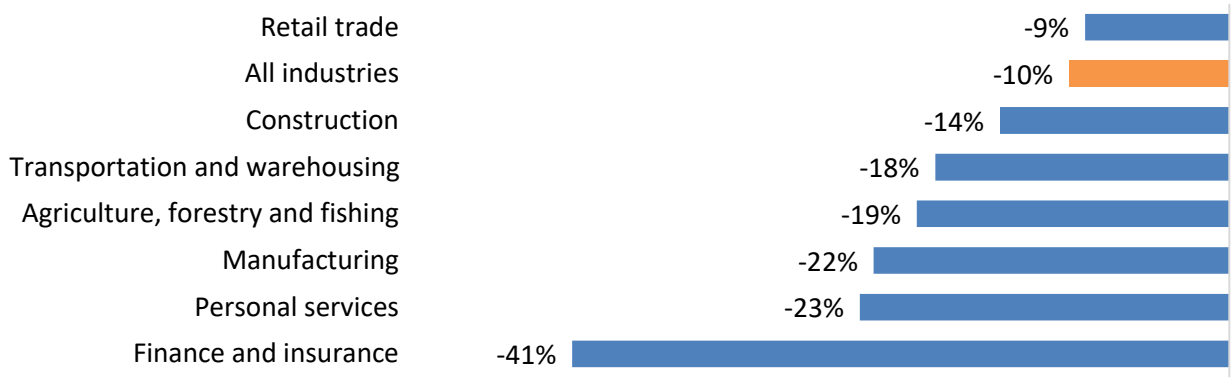


Source: Newfoundland and Labrador Statistics Agency (NLSA).

2.2 The private sector economy has struggled in recent years

The regional economy has struggled in recent years with the decline in the forest products sector and other industries. As shown in Figure 3, in the 10-year period 2011 to 2021, total employment in the region declined by 10 percent and several core industries have seen even greater declines. Manufacturing employment was down 22 percent, finance and insurance down 41 percent and transportation and warehousing down 18 percent. The decline in the population under 18 has translated into a 16 percent decline in employment in the education sector. Health care added 650 jobs between 2011 and 2021 and was the fastest growing sector by far in terms of absolute job growth.

Figure 3: Change in employment 2011-2021, selected industries, north-central Newfoundland



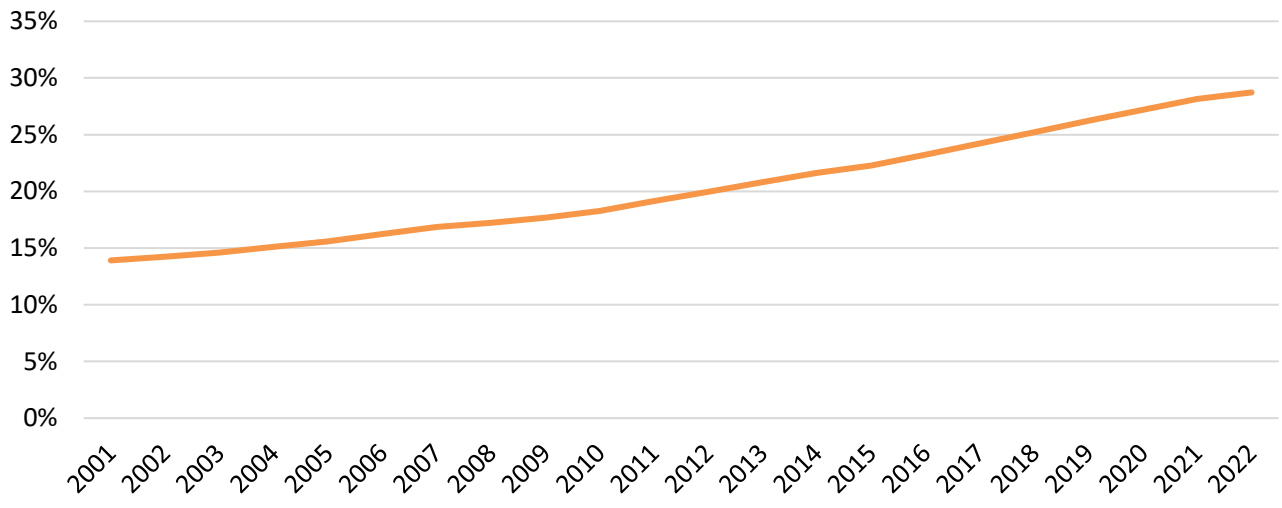
*Census Division 6 and 8 combined. Source: Statistics Canada.

According to Statistics Canada, across the entire Exploits Valley region there are only six employers with 200 or more workers, and they include three home health care providers, one hospital, a grocery store and a restaurant. If this project goes ahead, EVREC will be the largest private sector employer in the region.

2.3 The region is facing population and demographic challenges

The population living in north-central Newfoundland declined by only eight percent between 2001 and 2022. However, the population aged 65 and older has nearly doubled over the same timeframe. In 2001, 14 percent of the population was 65 or older and as of 2022 the share is just under 30 percent. The region is now one of the oldest regions in Canada. The population living in Division 6 has a median age of 49.5. Division 8 has a median age of 56.1 in 2022.

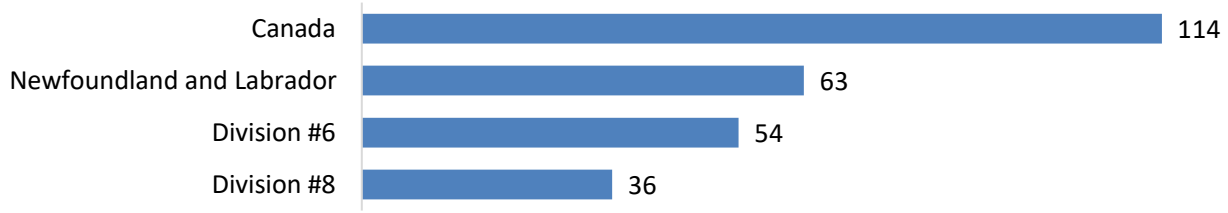
Figure 4: Share of the population aged 65 and older, north-central Newfoundland*



*Census Divisions 6 and 8. Source: Statistics Canada.

Among the more than 270 Census Divisions across Canada, Division 8 in north-central Newfoundland has the third lowest natural population growth rate with only 36 births for every 100 deaths. Only Queens County, Nova Scotia and La Haute-Gaspésie in Quebec had a lower natural population growth rate. Division 6 has a higher natural population growth rate, but at only 54 births for every 100 deaths, the area is still well below the replacement rate.

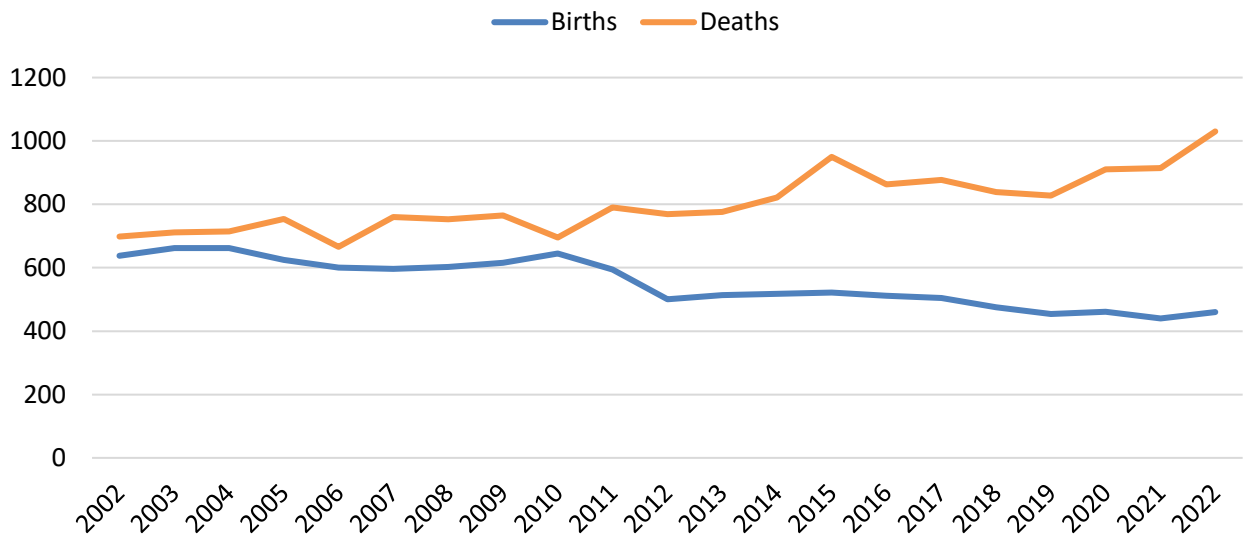
Figure 5: Natural population growth rate (births for every 100 deaths), 2022



Source: Statistics Canada Table: 17-10-0140-01.

Figure 6 shows the profound shift in natural population growth in the north-central Newfoundland region for the past 20 years. In just two decades, the region has gone from having about the same births and deaths each year to among the largest gaps between births and deaths in the country. In 2022, there were 1,030 deaths and only 460 births in the region.

Figure 6: Births and deaths by year, north-central Newfoundland



*Census Divisions 6 and 8 combined Source: Statistics Canada Table: 17-10-0140-01.

Another big challenge over the past 20 years has been the region's inability to curtail outward migration of young people or attract new people to live in the area. The net migration rate has been negative (more moving out to other parts of the province and the country than in) in all but two years between 2000 and 2020. The good news is that in the past two years net interprovincial migration has been positive.

2.4 Impact of economic stagnation on the workforce

The workforce in the Exploits Valley region is aging out. Of the 21,500 adults aged 15 and older living in the region, only 11,000 were employed at some point during 2019. This means that only just over half of the adult population worked during the year, considerably lower than the national level of 63 percent. To put this in perspective, if the Exploits Valley region had a similar 'employment' rate as the rest of the country, there would have been 2,500 more employed workers in 2019.

Figure 7: Share of the 15+ population who worked in 2019, selected jurisdictions

*As defined in Section 2.1 Source: Statistics Canada 2021 Census.

A further challenge for the Exploits Valley region is the large share of its workforce about to hit retirement. There are an estimated 4,500 participating in the workforce aged 55 and older. This means that approximately 35 percent of the workforce will likely retire in the next decade or so. There are not nearly enough young people in the area to take their place as they retire. It will be critically important to attract new workers and families to the region in the coming years just to replace those leaving the workforce.

Another challenge with the regional economy is its reliance on seasonal industries. In 2019, nearly 40 percent of all workers collected Employment Insurance income at some point during the year. There are many implications from the reliance on seasonal industries. In addition to lowering the income potential of the local population relative to areas with more people working year-round, it is making it harder to recruit staff even as the unemployment 'rate' in the area is between 20-25 percent.

2.5 The region needs new private sector industries offering stable, high wage jobs

The region has become more reliant on government income in recent years. As discussed above, there has been rapid growth in health care jobs. There has also been a rapid increase in the amount of government transfer income to individuals. This income includes the Canada Pension Plan, Old Age Security, Employment Insurance, and other government transfers. The 2021 Census reported that residents in the Exploits Valley region received approximately $271 million in 2020 directly from the government[2]. This represents 30 percent of all income received by individuals during the year. To put this in perspective, the average person in the Exploits Valley receives 68 percent more income from government than the average person across Canada. Residents living in the St. John's Census Metropolitan Area (CMA), by contrast, received on average less income from government compared to the country overall.

Figure 8: Share of total personal income from government transfers, 2020

Source: Statistics Canada 2021 Census.

It is clear the Exploits Valley region will need to attract thousands of people in the coming years to meet the demand for local jobs. Further, growth in the private sector will be an important way to rejuvenate the regional economy for the next generation.

As is developed below, the Exploits Valley Green Hydrogen project will create hundreds of high paying, year-round jobs. People will move to the region for these jobs, and many will bring spouses and children who can eventually fill other needed roles in the local workforce.

[2] Most of this income is from the federal government but there are provincial sources including workers compensation, social assistance, etc.

3. THE EXPLOITS VALLEY GREEN HYDROGEN PROJECT – A GAME CHANGER

This section looks at the economic impact of both the capital expenditures (CAPEX) and ongoing operating costs (OPEX) associated with The Exploits Valley Green Hydrogen project.

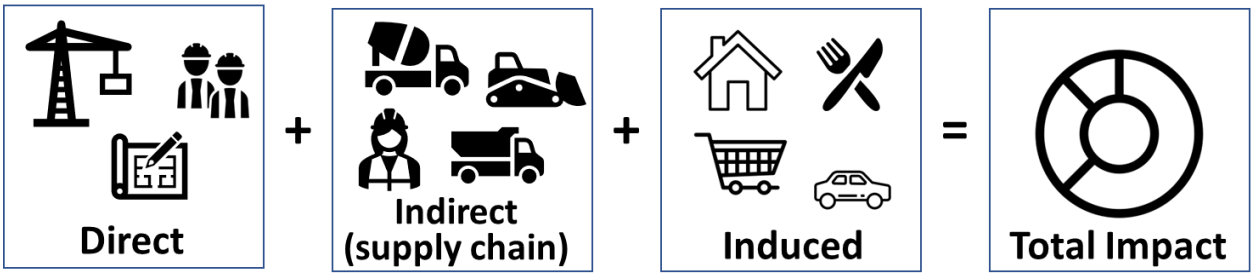
3.1 The economic impact model

The economic impact model used to estimate how the Exploits Valley Green Hydrogen project will impact the Newfoundland and Labrador economy, as well as the national economy, is based on Statistics Canada's Input-Output (I-O) tables which provide a detailed profile of how expenditures in specific sectors flow through the provincial and national economy as well as through international trade. The economic impact model evaluates the direct, indirect and induced economic impact, using the following parameters:

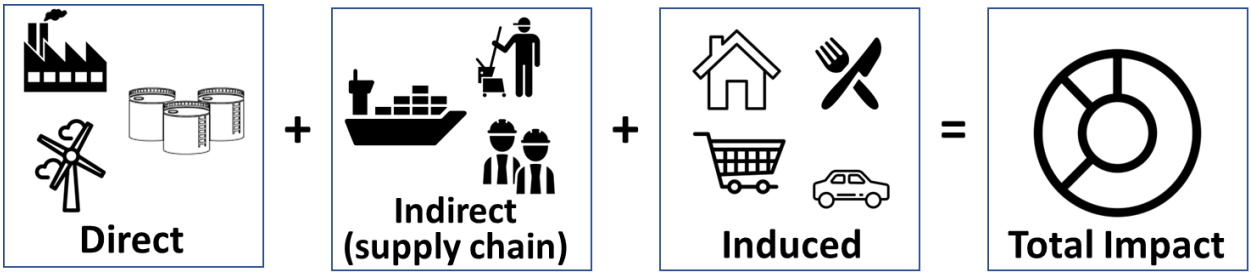
- *Direct impact* measures the value-added to the economy attributed directly from the wages earned and the revenues generated from the workforce spending in Newfoundland and Labrador and Canada.
- *Indirect impact* measures the value-added generated within the regional economy through firm and organizational demand for intermediate inputs or other support services (e.g., the supply chain).
- *Induced impacts* are derived when workers in the aforementioned industries spend their earnings. These purchases lead to more employment, higher wages and increased income and tax revenues, and can be felt across a wide range of industries.

Figure 9: Economic multipliers associated with The Exploits Valley Green Hydrogen project

CAPEX Phase:

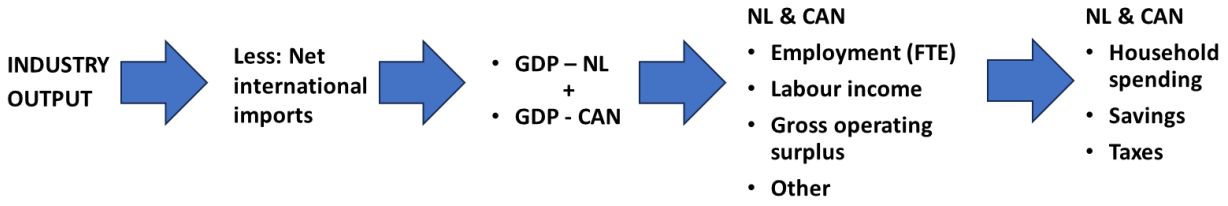


OPEX Phase:



The I-O tables trace the impact of economic activity (output shock) on the provincial and national economies (including imports and exports). In addition to the GDP and employment impacts, the economic impact model estimates the amount of tax revenue supported by the industry as well as consumer spending impacts.

Figure 10: Economic impacts by geography: The Exploits Valley Green Hydrogen project



The industries used in the model included (industry classification in brackets):

- Electric power engineering construction [BS23C300] – used for CAPEX*.
- Non-residential building construction [BS23B000] – used for CAPEX.
- Electric power generation, transmission and distribution [BS221100] – used for operational impacts associated with energy generation and transmission.
- Basic chemical manufacturing [BS325100] – used for operational impacts associated with the hydrogen plant.

**The expenditure profile for wind turbine construction is different than other forms of electric power engineering construction such as hydroelectricity or natural gas-fired production. Jupia Consultants worked with the Industry Accounts Division at Statistics Canada to reprofile the multipliers for the wind energy sector. Specifically, any economic impact associated with the manufacture of the wind turbines and related systems was removed from the model.*

International imports

The model assumes approximately 70 percent of the capital investment will be spent on international imports. This is based on input from the project proponent. These imports include the cost of wind turbines, electrical equipment and components, electric wire and cable and some fabricated metal products. It also includes the cost of specific imported equipment for the hydrogen electrolyzer and the ammonia plant. There is very little GDP and other economic impacts in Canada associated with the purchases of these imports. However, all the costs associated with land preparation, construction and installation are included in the model. Any wholesale margins as well as the cost of transportation and installation are also included.

3.2 The Exploits Valley Green Hydrogen project: CAPEX impacts

Based on methodology described in Section 3.1, the economic impacts from the capital investment spending associated with the Exploits Valley Green Hydrogen project are developed in this section.

Provided by the proponent, the total capital expenditures were set at $9 billion USD or $11.9 billion CDN. These expenditures include development costs, the building of the wind energy infrastructure as well as the hydrogen and ammonia plants. It also includes costs associated with grid integration and power storage and other project-related capital expenditures. As discussed above, a large share of this spending is on equipment and technology produced elsewhere in the world.

The project proponent provided a detailed breakdown of spending by expenditure area in the province, across the country and through international imports. The proponent also provided an estimate of the person hours of activity associated with each major spending area. This core input data was used, and multipliers applied to estimate the impacts below.

3.2.1 Infrastructure development: In-province impacts (CAPEX)

Table 7 shows the estimated CAPEX economic impacts associated with the five components of the project including deployment of the wind power project and energy storage and the development of the hydrogen, ammonia and solar plant. This is a capital-intensive activity as it requires site preparation and the construction of related infrastructure (bases, transmission infrastructure, etc.).

With the multiplier effects, the economic impacts from this spending are expected to be significant in Newfoundland and Labrador and the rest of Canada. Including direct, indirect and induced effects, the five CAPEX components are expected to boost provincial GDP by nearly $1.4 billion over the construction phase. This GDP will include $1.11 billion in employment income supporting 10,883 full time equivalent person years of employment in the province. Most of these jobs will be in the Exploits Valley region.

The vast majority of this income will turn into household spending on goods and services. The economic impact model estimates that over $802 million of the income generated from employment will stay in the province as household spending[3]. A more detailed analysis of this household spending is covered in Section 3.2.5.

The economic activity associated with the CAPEX phase is also expected to boost municipal, provincial and federal government tax revenues. In the province, municipalities are expected to generate $42.8 million in revenue and the provincial government another $216 million. The federal government is forecasted to receive $144 million not including impacts arising in other provinces.

[3] The model assumes that some of the workforce will come in from outside the province. However, the model predicts that around 70 percent of all employment income generated by the CAPEX phase will stay in the province and be spent on goods, services, taxes, etc.

Table 7: Estimated CAPEX economic impacts, infrastructure development: In-province impacts ($000s)
Total impact over construction phase

	Wind Power Project	Energy Storage	Hydrogen Plant	Ammonia Plant	Solar Plant	Total CAPEX
Provincial GDP contribution	$309,400	$70,600	$497,400	$489,200	$10,700	$1,377,400
Employment income	$174,100	$39,800	$450,100	$442,600	$6,000	$1,112,700
FTE person years of employment	1,740	400	4,380	4,310	60	10,880
Household spending	$125,600	$28,700	$324,500	$319,100	$4,400	$802,200
Taxes						
Taxes on income	$45,500	$10,400	$117,500	$115,600	$1,600	$290,600
Indirect taxes	$18,500	$4,200	$45,000	$44,300	$600	$112,700
Total taxes	$64,000	$14,600	$162,600	$159,900	$2,200	$403,300
Taxes by level of government						
Municipal	$6,800	$1,600	$17,200	$17,000	$200	$42,800
Provincial	$34,300	$7,800	$87,200	$85,800	$1,200	$216,300
Federal	$22,900	$5,200	$58,100	$57,200	$800	$144,200

Source: Developed by Jupia Consultants Inc. See Appendix A.

3.2.2 Infrastructure development: National impacts (CAPEX)

There are considerable economic impacts that will accrue elsewhere in Canada from the project's capital spending in Newfoundland and Labrador. This is due to a number of factors including labour imports, suppliers based elsewhere and other induced impacts outside the province. Again, the impacts shown below are based on primary input data provided by the project proponent and multipliers developed by Statistics Canada and modified where appropriate by Jupia Consultants.

Across the country, the CAPEX associated with the five components of the project including deployment of the wind power project and energy storage and the development of the hydrogen, ammonia and solar plant is expected to boost national GDP by just over $2 billion. This impact will occur over the life of the construction phase and includes direct, indirect and induced impacts.

This GDP will include $1.57 billion in employment income supporting just under 16,000 full time equivalent person years of employment across the country. The vast majority of this income will turn into household spending on goods and services. The economic impact model estimates that $1.14 billion of the income generated from employment will become household spending. A more detailed analysis of this household spending is covered in Section 3.3.3.

The economic activity associated with the CAPEX phase is also expected to boost municipal, provincial and federal government tax revenues across the country. In the province, municipalities are expected to generate $71.1 million in revenue and provincial governments another $280 million. The federal government is forecasted to receive $204 million including impacts arising in Newfoundland and other provinces.

The model predicts the bulk of economic impact benefits the province, but there certainly are national impacts as well.

Table 8: Estimated CAPEX economic impacts - Infrastructure development: National impacts ($000s)
Total impact over construction phase

	Wind Power Project	Energy Storage	Hydrogen Plant	Ammonia Plant	Solar Plant	Totals CAPEX
National GDP contribution	$436,300	$99,600	$737,700	$725,400	$15,900	$2,015,000
Employment income	$228,600	$52,200	$646,500	$635,800	$8,700	$1,571,800
FTE person years of employment	2,340	540	6,570	6,460	90	15,990
Household spending	$165,700	$37,800	$468,200	$460,400	$6,300	$1,138,400
Taxes						
Taxes on income	$59,500	$13,600	$157,800	$155,200	$2,200	$388,200
Indirect taxes	$25,500	$5,800	$67,600	$66,500	$900	$166,400
Total taxes	$85,000	$19,400	$225,400	$221,700	$3,100	$554,500
Taxes by level of government						
Municipal	$12,100	$2,800	$28,100	$27,700	$400	$71,000
Provincial	$42,800	$9,800	$113,800	$112,000	$1,600	$279,900
Federal	$30,200	$6,900	$83,400	$82,000	$1,100	$203,600

Source: Developed by Jupia Consultants Inc. See Appendix A.

3.2.3 Average annual CAPEX impacts

The CAPEX phase of the project is spread over a four-year timeframe. The average annual CAPEX economic impacts over the four-year period are shown in Table 9. The in-province GDP impact will average $344 million per year, employment income will be more than $278 million and FTE employment will be over 2,700 per year.

Household spending in the Exploits Valley region and across the province will exceed $200 million each year during the four-year construction phase. Governments will receive an estimated $139 million per year including $54 million for the provincial government in Newfoundland and Labrador and $10.7 million for municipal governments.

Table 9: Average annual economic impacts from the construction phase of the project ($000s)

	In-province	National
GDP contribution	$344,346	$503,750
Employment income	$278,171	$392,949
FTE person years of employment	2,721	3,998
Household spending	$200,562	$284,595
Taxes		
Taxes on income	$72,648	$97,046
Indirect taxes	$28,168	$41,591
Total taxes	$100,816	$138,637
Taxes by level of government		
Municipal	$10,691	$17,762
Provincial	$54,076	$69,966
Federal	$36,050	$50,909

Over a four-year timeframe. Source: Developed by Jupia Consultants Inc. See Appendix A.

3.2.4 Detailed assessment of supply chain benefits

In general, for every dollar of spending in Newfoundland and Labrador, there is a boost in output in the rest of Canada. This is particularly true for smaller jurisdictions such as Newfoundland and Labrador because it is a small province (by population) and relies on supply chains across the country. Statistics Canada reports the interprovincial output multipliers for the four key industries used in this report are:

- Non-residential building construction: $0.62
- Electric power engineering construction: $0.42
- Electric power generation, transmission and distribution: $0.40
- Basic chemical manufacturing: $0.40

This includes both indirect (supply chain) and induced effects. It means that for every $1.00 spent in non-residential building construction in Newfoundland and Labrador, output rises in the rest of the country by 62 cents. This results in considerable economic benefits outside of the province as detailed above.

To illustrate the interprovincial economic benefits, the CAPEX associated with the Exploits Valley Green Hydrogen project was analyzed at a detailed level for each province. This section is based on the profile of spending in related sectors in Newfoundland and Labrador and not necessarily equivalent to the Exploits Valley Green Hydrogen project's actual supply chain spending profile. It is meant to show a typical supply chain impact in the rest of Canada from a project such as this.

Based on this assumption, a project such as the Exploits Valley Green Hydrogen project could impact several industries across the country. The wholesale trade sector receives a substantial boost as project proponents and suppliers are purchasing goods used in the CAPEX phase of the project[4]. The model estimates the wholesale trade sector will generate $378 million worth of increased output in Canada outside the province. The model predicts there will be increased output in the fabricated metal product manufacturing sector of $68 million across the country (not including international imports). The truck transportation sector will see a significant rise in output across the country ($52 million).

Service industries will also benefit from this project. A typical project such as this would boost legal, accounting and architectural, engineering and related services sector spending elsewhere in Canada by over $32 million.

For a project this size and scale, the insurance industry can expect a nearly $41 million increase in output elsewhere in the country and the IT services and other professional, scientific and technical services will benefit from more than $38 million in new sector output.

Table 10: Modelled indirect and induced spending in the rest of Canada, selected industries
The Exploits Valley Green Hydrogen project infrastructure construction ($Million)*

Wholesale trade margins	$378.2
Retail trade margins	47.2
Fabricated metal product manufacturing	68.1
Other finance, insurance and real estate services	59.4
Truck transportation	52.3
Information services	37.7
Banking services	46.1
Accommodation and food services	31.2
Legal, accounting and architectural, engineering and related services	32.3
Electric power generation, transmission and distribution	17.4
Petroleum and coal product manufacturing	39.7
Insurance carriers	40.7
Cement and concrete product manufacturing	5.4
Administrative and support services	35.8
IT services and other professional, scientific and technical services	38.4
Other transportation	25.4
Electrical equipment and component manufacturing	33.5
Other	411.5
Total	$1,400.0

**does not include international imports.*
Source: Jupia Consultants Inc. based on data supplied by Statistics Canada.

[4] Please note this represents increased industry output and not the final GDP contribution by sector.

On a provincial basis, Ontario industries are the largest beneficiary with an expected $508 million in increased industry output followed by Quebec at $287 million. Nova Scotia is a significant beneficiary – particularly adjusted for the size of the economy. Firms and industries in that province can expect $183 million worth of increased industry output. Alberta and New Brunswick firms and industries can expect over $161 million and $116 million, respectively.

Table 11: Modelled indirect and induced spending in the rest of Canada, selected industries
The Exploits Valley Green Hydrogen project related infrastructure construction ($Million)*

Province:	Output boost:	Top sectors:
Ontario	$508.2	Wholesale trade, finance, insurance, IT services, truck transportation
Quebec	$287.2	Wholesale trade, fabricated metal, truck transportation, refined oil
Nova Scotia	$183.5	Wholesale trade, fabricated metal, retail trade
Alberta	$161.0	Wholesale trade, refined oil, professional services, IT
New Brunswick	$116.4	Wholesale trade, fabricated metal, truck transportation
British Columbia	$81.3	Wholesale trade, retail trade, IT services
Manitoba	$25.4	Wholesale trade, truck transportation
Prince Edward Island	$24.1	Wholesale trade, fabricated metal
Saskatchewan	$11.0	Wholesale trade

Source: Jupia Consultants Inc. based on data supplied by Statistics Canada.

3.2.5 Detailed assessment of NL household spending impacts

An important impact of the Exploits Valley Green Hydrogen project will be the boost to household spending. About 72 percent of all employment income in the province becomes current consumption, meaning it is spent annually on things like food, shelter, transportation and recreation. The rest goes to income taxes, savings and other non-current consumption. Table 12 shows how the $802.3 million in labour income induced by the CAPEX phase of the Exploits Valley Green Hydrogen project becomes household spending in Newfoundland and Labrador. This is based on typical household spending in the province. The amount spent in the Exploits Valley region will depend on a variety of factors such as how many local people are working on related projects, how many migrant workers from elsewhere in the province are purchasing goods and services in the local area, etc.

In total, the CAPEX phase of the Exploits Valley Green Hydrogen project is expected to boost current consumption by $802.3 million over the four-year timeframe. This will include nearly $129 million on food, $197 million on shelter, $170 million on transportation, $33 million on health and personal care, and $39 million on recreation.

How the ongoing operations associated with The Exploits Valley Green Hydrogen project will boost ongoing household spending in Newfoundland and Labrador is developed in Section 3.3.3 below.

Table 12: Household spending in NL induced by The Exploits Valley Green Hydrogen project CAPEX

Household spending category:	$M	Household spending category:	$M
Total current consumption in NL	$802.3	Health care	$23.1
Food expenditures	$128.8	Medicines & pharmaceutical products	$7.6
Food purchased from stores	$101.5	Eye-care goods and services	$1.5
Food purchased from restaurants	$27.3	Dental services	$2.4
Shelter	$196.8	Personal care	$10.3
Water, fuel and electricity	$44.9	Private health and dental plan premiums	$8.6
Insurance premiums	$3.1	Recreation	$39.4
Household operations	$68.7	Entertainment	$10.7
Communications	$39.0	Purchase of recreational vehicles	$8.5
Pet expenses	$9.0	Financial services	$5.5
Household furnishings/equipment	$27.3	Retirement and pension fund payments	$35.9
Clothing and accessories	$40.2	Gifts of money & charitable contributions	$16.1
Transportation	$170.2		
Purchase of automobiles/vans/trucks	$69.5		
Automobile/van/truck operations	$78.2		
Vehicle insurance premiums	$23.8		
Gas and other fuels	$35.9		

Source: Derived by Jupia Consultants Inc. See Appendix A.

3.3 The Exploits Valley Green Hydrogen project: Ongoing OPEX impacts

3.3.1 Annual OPEX economic impacts

After the construction phase, the Exploits Valley Green Hydrogen project will generate substantial ongoing economic benefits in the local area, the province and the country overall. These impacts involve the operations associated with wind energy production and transmission, the operations of the hydrogen and ammonia plant and other related operational expenditures. In addition, there will be economic activity in the supply chain (e.g., port activities, etc.) and through induced impacts.

To derive the economic benefits from operating costs, direct inputs were provided by the project proponent. These included operational costs by activity and person hours distributed by in-province, rest of Canada and international activity. The various economic multipliers were applied to spending in Newfoundland and Labrador and the rest of the country to derive the total impacts. Dollar values are shown in $2024 dollars. The annualized costs are shown for a 34-year timeframe. Costs of decommissioning are not included in this analysis.

Annual OPEX impacts by activity area: In-province

Table 13 shows the annual operating cost-related economic impacts related to the various activities associated with the Exploits Valley Green Hydrogen project. All dollar figures are shown in 2024$. The annual operating expenditures are expected to boost provincial GDP by $189 million per year.

The employment income from direct and indirect (supply chain) spending is expected to be $49.7 million per year and this will support an estimated $509 full time equivalent (FTE) jobs – mostly in the Exploits Valley Green Hydrogen region. With induced effects, annual employment income rises to $58.6 million per year and total employment to more than 637 FTEs. These will be high wage jobs with an average employment income of nearly $98,000 per year (direct and indirect jobs combined).

The annual household spending in Newfoundland and Labrador induced by the Exploits Valley Green Hydrogen project is expected to exceed $42 million. See Section 3.3.3 for a more detailed assessment of household spending impacts.

These economic benefits from operations will be sustained for at least 34 years, the lifespan of the project. After that, the project proponent could reinvest for a future generation. Over the 34-year timeframe, in $2024 dollars, the Exploits Valley Green Hydrogen project is expected to boost provincial GDP by a total of $6.4 billion from operations (in addition to the capital spending detailed in Section 3.2), support 21,700 person years of full-time equivalent employment and boost employment in Newfoundland and Labrador by an estimated $2.0 billion. Total household spending over the period will be an estimated $1.4 billion.

These impacts do not include the economic activity associated with the spending of tax and royalty revenue on public services across the province. This impact is developed in Section 3.5.

Table 13: Average annual OPEX economic impacts by activity area, $000s
In-province impacts only
$2024

	Wind power plant	Energy storage	Hydrogen plant	Ammonia plant	Grid power cost	Port operations	Total OPEX
Provincial GDP contribution	$79,537	$7,316	$64,301	$31,634	$680	$5,218	$188,687
Annualized direct FTE employment	149.0	16.5	31.4	42.3	1.5	7.2	248.0
Direct + indirect employment (FTE)	290.5	32.2	73.6	99.1	3.0	10.2	508.6
Total employment (FTE)	372.4	41.3	88.4	119.1	3.8	12.1	637.2
Direct employment income	$15,792	$1,453	$3,329	$4,485	$135	$594	$25,787
Direct + indirect income	$28,425	$2,615	$7,504	$10,108	$243	$776	$49,671
Total income	$34,741	$3,196	$8,301	$11,182	$297	$867	$58,585
Household spending	$25,048	$2,304	$5,985	$8,062	$214	$625	$42,240

Per year for a 34-year period.
Excluding tax impacts. See Section 3.3.2.
Source: Developed by Jupia Consultants Inc. See Appendix A.

Table 14: Cumulative OPEX economic impacts by activity area over the 34-year timeframe, $000s
In-province impacts only
$2024

Provincial GDP contribution ($2024)	$6.4 billion
Person years of FTE employment	21,700
Total employment income ($2024)	$2.0 billion
Total household spending ($2024)	$1.4 billion

Excluding tax impacts. See Section 3.3.2.
Source: Developed by Jupia Consultants Inc. See Appendix A.

Annual OPEX impacts by activity area: National

As with the CAPEX phase, there will be operational spending economic impacts in the rest of Canada. Using multipliers developed for each of the activity areas, the summary national impacts from the Exploits Valley Green Hydrogen project are shown in Table 15. The national GDP contribution will be an estimated 27 percent higher than the in-province impact only. Employment will rise by 45 percent from 637 FTEs supported in the province to 921 across the country. Employment income outside the province arising from operations will be an estimated $17.3 million per year or 29 percent higher than in-province.

Table 15: Average annual OPEX economic impacts by activity area, $000s
In-province and national impacts
$2024

	In-province	National
GDP contribution	$188,687	$238,939
Total employment (FTE)	637	921
Total employment income	$58,585	$75,824
Household spending	$42,240	$54,930

Per year for a 34-year period.
Excluding tax impacts. See Section 3.3.2.
Source: Developed by Jupia Consultants Inc. See Appendix A.

3.3.2 Taxation and royalty impacts

There will be a wide variety of taxes and royalties arising from the Exploits Valley Green Hydrogen project. There will be tax revenues induced from the operational spending including personal income tax, HST, property tax and other taxes and levies related to employment income in the province. In addition, there will be significant taxes and royalties generated as a result of the provincial government's Wind-Hydrogen Fiscal Framework.

The Wind-Hydrogen Fiscal Framework developed by the provincial government in Newfoundland and Labrador has five principles:

1. Provide a predictable and transparent fiscal system to inform investment decisions and resource development for wind-hydrogen projects.
2. An approach that provides a sharing of financial returns between investors and the province to achieve a balance between a) recognition of project investment and risk; and b) benefits the province for use of its resources – land, wind and water.
3. The framework design utilizes the following concepts: fees/payments occurring early in the project authorizations/permitting. Fee payments scale to size of project.

4. Water Royalty payments occurring later in the project during operations phase, after a project has recovered initial investment costs.
5. Taxes applicable to all wind projects producing electricity for the purposes of producing hydrogen.

The fiscal framework is based on three components, fees associated with use of Crown land, a tax on wind electricity, and water related revenues including a water use fee and a water royalty. The Crown Land Reserve Fee is an annual charge equal to 3.5 percent of the market value of reserved lands. The Crown Land Lease Fee represents an annual charge of seven percent of the market value of the lands. Wind Electricity Tax is an annual charge of $4,000 per megawatt on installed capacity and payments begin when the turbines are "in-service". It is applicable to all wind-hydrogen projects (≥ 5 megawatts) producing electricity for the purposes of producing hydrogen.

The Water Use Fee is an annual charge of $500 per 1000m3 of water licensed and used, and an annual charge of $50 per 1000m3 for water licensed and not used. The fees are adjusted annually by the Canadian Consumer Price Index.

The Water Royalty is a mechanism to share profits beyond an agreed upon rate of return to the project. It is applicable to hydrogen projects. Payments begin with cost recovery and rates are linked to revenue over cost index calculation (10 per cent to 25 per cent). The provincial government will have the ability to enter into agreements to modify terms in the same manner as offshore oil projects.

The estimated tax and royalty payments shown in Table 16 were developed using two sources including estimates from the project proponent (related to the elements of the Wind-Hydrogen Fiscal Framework) and tax multipliers developed by Jupia Consultants related to the annual operating expenditures.

Taxes from operations

The taxes arising from operations come from a variety of sources including personal income tax payments, HST on goods and services and property taxes, among other taxes and levies. The economic impact model estimates the annual operations associated with the Exploits Valley Green Hydrogen project will boost government coffers by just under $24 million per year of which $2.3 will go to municipal governments, $13 million to the Newfoundland and Labrador provincial government and $8.7 million to the federal government.

In addition, there will be corporate income tax payments. The federal portion of the taxes paid over the 34-year timeframe is net of the Clean Hydrogen Investment Tax Credit (CHITC) which will reimburse green hydrogen developers an amount equivalent to 40 percent of the cost of purchasing and installing "eligible equipment". The CHITC also includes a 15 percent tax credit on equipment that converts clean hydrogen into ammonia. On an average annual basis, the project proponent estimates there will be $98 million in provincial corporate income tax payments. After the tax incentives, the average annual amount of federal corporate income taxes will be $32.7 million.

The estimated water royalty payments over the life of the project were provided by the project proponent and are estimated to be just under $117 million per year. Other municipal taxes are expected to be approximately $3 million per year. The annual Wind tax and Water tax, using the Wind-Hydrogen Fiscal Framework, will be an expected $10.7 million and $1.1 million, respectively.

Table 16 also includes the cumulative amount of expected taxes and royalties to be paid over the 34-year timeframe. The total numbers will be significant. Based on the modelling done by the project proponent and this report's author, the total taxes and royalties arising from this project could total $9.8 billion or $288 million per year (for all levels of government combined).

Table 16: Annual and cumulative taxes arising from the Exploits Valley Green Hydrogen project operations, $000s
$2024

	Avg. annual	Cumulative
Taxes from operations	$24,000	$815,500
Municipal	2,200	76,400
Provincial	13,000	443,400
Federal	8,700	295,600
Corporate income tax expense	$130,900	$4,449,600
Provincial portion	98,200	3,337,200
Federal portion	32,700	1,112,400
Water royalty	$116,900	$3,974,500
Municipal taxes	$3,000	$101,500
Land charge	$1,200	$39,400
Wind tax	$10,700	$364,800
Water tax	$1,100	$37,800

Source: Developed by Jupia Consultants Inc. See Appendix A.

3.3.3 Household spending impacts

Just like the CAPEX impacts discussed above, the annual operations of the Exploits Valley Green Hydrogen project will provide a solid boost to household spending in the province, mostly in the Exploits Valley region. Table 18 shows how the $58.6 million in annual labour income induced by the project becomes household spending in Newfoundland and Labrador. This is based on the typical household spending in the province.

In total, the Exploits Valley Green Hydrogen project annual operations is expected to boost current consumption by $42.2 million. This will include $6.8 million on food, $10.4 million on shelter, $8.9 million on transportation, $1.7 million on health and personal care, and $1.2 million on recreation.

This excludes the estimated $130 million of induced household spending that would occur across Newfoundland and Labrador should the provincial government spend its tax/royalty revenue on public services.

Table 18: Annual household spending in NL induced by the Exploits Valley Green Hydrogen project OPEX ($2024)

Household spending category:	$Millions	Household spending category:	$Millions
Total current consumption in NL	$42.2	Health care	$1.2
Food expenditures	$6.8	Medicines & pharmaceutical products	$0.4
Food purchased from stores	$5.3	Eye-care goods and services	$0.1
Food purchased from restaurants	$1.4	Dental services	$0.1
Shelter	$10.4	Personal care	$0.5
Water, fuel and electricity	$2.4	Private health and dental plan premiums	$0.5
Insurance premiums	$0.2	Recreation	$2.1
Household operations	$3.6	Entertainment	$0.6
Communications	$2.0	Purchase of recreational vehicles	$0.4
Pet expenses	$0.5	Financial services	$0.3
Household furnishings/equipment	$1.4	Retirement and pension fund payments	$1.9
Clothing and accessories	$2.1	Gifts of money & charitable contributions	$0.8
Transportation	$8.9		
Purchase of automobiles/vans/trucks	$3.7		
Automobile/van/truck operations	$4.1		
Vehicle insurance premiums	$1.3		
Gas and other fuels	$1.9		

Source: Derived by Jupia Consultants Inc. See Appendix A.

3.4 Combined CAPEX and OPEX economic impacts

The Exploits Valley Green Hydrogen project represents a large-scale infrastructure investment of nearly $12 billion. The installation of wind turbines, investment in electricity transmission infrastructure, the building of the hydrogen plant and ammonia facilities along with other capital investment is expected to boost provincial GDP by nearly $1.4 billion over a four-year period. The annual operations of the facilities and energy infrastructure will boost provincial GDP by a total of $6.4 billion over a 34-year operational period ($2024). Combined, the Exploits Valley Green Hydrogen project will boost the provincial economy by $7.8 billion. Importantly, this does not include the impacts associated with government spending tax and royalty revenue in the province.

This economic activity from CAPEX and OPEX will boost employment income by an estimated $3.1 billion and support 32,548 full time equivalent person years of employment over the 38-year period.

Municipal governments in the province can expect $220 million in tax revenue over the 38-year period (CAPEX and OPEX phases), the provincial government will receive an estimated $8 billion and the federal government another $1.6 billion from the in-province activity alone.

Table 19: Combined and cumulative economic impacts, Exploits Valley Green Hydrogen project, $Millions ($2024)
In-province impacts only

	CAPEX	OPEX	Combined
Provincial GDP contribution	$1,380	$6,420	$7,790
Employment income	$1,110	$1,990	$3,100
FTE employment	10,883	21,665	32,548
Household spending	$800	$1,440	$2,240
Taxes from construction and operations			
Municipal	$43	$76	$119
Provincial	$216	$443	$660
Federal	$144	$296	$440
Corporate income tax		$4,450	$4,450
Provincial portion		$3,340	$3,340
Federal portion		$1,110	$1,110
Water royalty		$3,970	$3,970
Municipal taxes		$101	$101
Land charge		$39	$39
Wind tax		$365	$365
Water tax		$38	$38

Source: Derived by Jupia Consultants Inc. See Appendix A.

3.5 The potential economic impacts associated with the spending of tax/royalty revenue

The economic impact model does not include the potential economic activity associated with the spending of government tax revenue. This revenue could be used to fund public capital investment (roads, schools, hospitals, etc.) or government operations (teachers' salaries) or even to pay down debt.

Table 17 looks at the potential impacts if the tax/royalty revenue was spent one-third on health care, one-third on education and one-third on public administration in the province.

Spending $241 million supports a considerable amount of economic activity in the province. Based on this simple model, it would boost provincial GDP by an estimated $250 million (direct, indirect and induced effects combined), lead to $180 million in new employment income, support 2,400 jobs and over $130 million in additional household spending.

Further, the spending of $241 million on public services would induce another $31 million in tax revenue for the provincial government and $6.2 million for municipal governments.

Table 17: The annual economic impacts from spending the taxes/royalties arising from the Exploits Valley Green Hydrogen project, $000s
$2024

	Education	Health care	Public administration	Total public spending
% breakdown by spending area	*33%*	*33%*	*33%*	*100%*
Provincial GDP contribution	$95,600	$79,700	$75,000	$250,200
Employment income	$74,200	$60,000	$46,300	$180,500
FTE employment	880	890	630	2,400
Household spending	$53,500	$43,300	$33,400	$130,100
Taxes	$0	$0	$0	$0
Taxes on income	$21,700	$17,500	$13,500	$52,700
Indirect taxes	2,000	1,800	1,800	5,600
Total taxes	23,700	19,300	15,400	58,300
Taxes by level of government		-	-	-
Municipal	$2,500	$2,000	$1,600	$6,200
Provincial	12,700	10,300	8,200	31,300
Federal	8,500	6,900	5,500	20,900

Direct, indirect and induced effects. Source: Developed by Jupia Consultants Inc. See Appendix A.

4. THE STRATEGIC IMPACT OF THE EXPLOITS VALLEY GREEN HYDROGEN PROJECT

4.1 The economic benefits in context

The Exploits Valley Green Hydrogen project will have a sizable impact on the Newfoundland and Labrador economy both from the capital spending phase and from the ongoing operations. This section highlights just how important this project will be to the regional and provincial economy in a number of areas.

Economic benefit:	In context:
Will substantially boost provincial infrastructure investment	EVREC is expecting to deploy just under $12 billion (CDN$) worth of capital on this project over a four-year timeframe (most will be spent between 2026-2029), or an average of approximately $3 billion per year. To put this in context, according to Statistics Canada, the entire private sector in Newfoundland and Labrador spends an average of just under $6 billion per year on non-residential investment. Therefore, the EVREC project should boost annual private sector capital expenditures by nearly 50 percent from the $6 billion per year baseline. Another way to look at the impact is to compare the annual capital expenditures to past periods of investment in the provincial utilities sector. Over the past 10 years, the utilities sector in Newfoundland and Labrador invested $1.64 billion per year on capital expenditures. This included almost the entire investment in the Lower Churchill Falls hydroelectricity project. During the 2026-2029 timeframe, the Exploits Valley Green Hydrogen project is expected to generate an annual average $3 billion in capital spending.
Adds a top private sector employer in the Exploits Valley region	This surge in capital investment will leave behind nearly 640 full time equivalent annual jobs in the province, most in the Exploits Valley region. The direct jobs are expected to be 250 with another nearly 260 in the supply chain and another 130 from induced effects. As discussed earlier in this report, there are very few large employers in the region. This project will be the anchor private sector employer for the next generation. Further, the average salary associated with these jobs will be twice the level of the average full-time job in the region. Based on 2021 Census data, the $58.6 million in expected employment income in the province is an amount equivalent to 10 percent of all employment income earned in the Exploits Valley region each year. Not all the workers will live in the area, but this still represents a substantial boost to employment income. **This doesn't include the potential impact of government spending of the tax/royalty revenue.**

Economic benefit:	In context:
Supports hundreds of small companies in the region	According to Statistics Canada, there are over 800 private sector employers in the Exploits Valley region. This includes 137 retail firms, 108 personal services firms and 29 restaurants. Adding tens of millions of dollars in household spending per year in the region will provide a substantial ongoing boost to the local economy[5]. Assuming most of the household spending is generated in the region, this represents a boost of between 4% and 6% of total annual household spending on current consumption[6]. It is likely this substantial new household spending will increase the need for more entrepreneurs.
Helps attract highly skilled talent and meet local workforce needs	As discussed in Section 2 above, these high wage, highly skilled jobs will be attractive to trades workers and professionals looking to advance their careers. Many of these highly skilled workers will bring with them families that will help support workforce needs in other sectors of the economy.
Drives substantial new tax revenue in the province	Newfoundland and Labrador needs new sources of sustained, private sector revenue. The provincial budget is heavily reliant on oil and gas revenues as offshore royalties alone accounts for nearly 20 percent of own-source revenue each year (not including corporate income tax and induced taxes from the sector). The Exploits Valley Green Hydrogen project is expected to generate an average of $241 million in new tax dollars each year for the provincial government over the 34-year operating period (in $2024 dollars). Municipal government, mostly in the Exploits Valley region, can expect an average of over $5.2 million in tax revenue each year during the life of the project.
Creates another major export industry for Newfoundland and Labrador	The Exploits Valley Green Hydrogen project will create another major export sector for Newfoundland and Labrador. Based on international export data by sector tracked by Statistics Canada, green hydrogen will become a top five export sector by value for the provincial economy behind oil and gas, iron ore, refined iron and seafood production.
Positions the area as a Canadian green energy leader	The Exploits Valley Green Hydrogen project will position north-central Newfoundland as a Canadian leader in green energy production.
Could lead to more industrial activity down the road	Once the energy infrastructure is in place, there is potential to develop future use cases for that energy that would create more economic activity in the province such as the processing of critical minerals, iron ore, data centres, etc.

[5] The impact model forecasts $42 million in household spending per year but that is a provincial-wide figure. It is likely the spending in the Exploits Valley region will be at least $30 million assuming most employees live in the region.

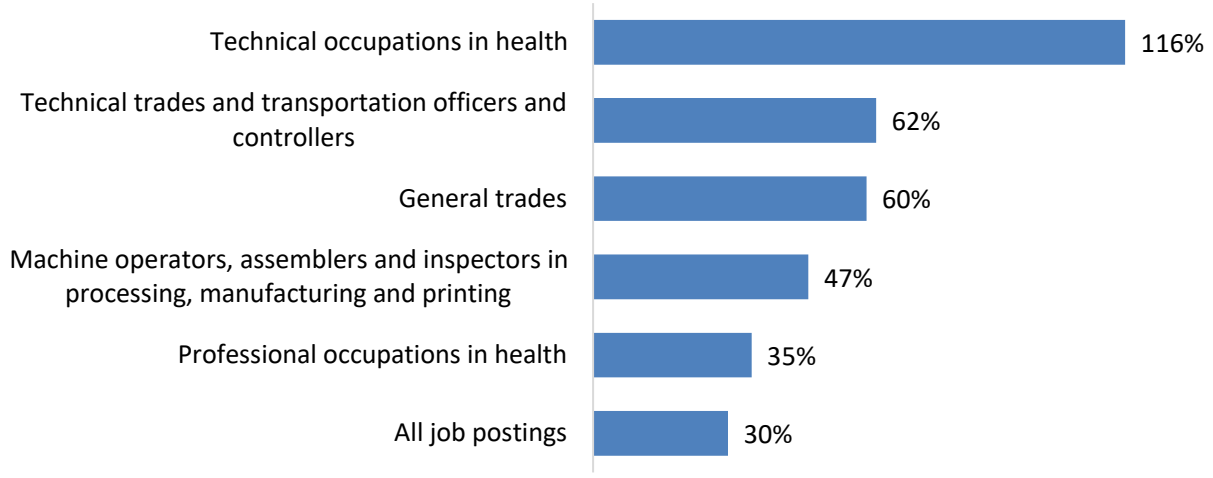
[6] 6% would represent 100% of current consumption occurring in the Exploits Valley, while 4% would represent 65% staying in the region.

4.2 Maximizing economic benefits

It is important for the proponent, government, education and community stakeholders to work on maximizing the economic benefits from the Exploits Valley Green Hydrogen project. North-central Newfoundland is a small economy with limited population and many of the economic benefits from both the CAPEX and OPEX phases of the project could leave the region as the project proponent and its suppliers may have to bring in workers and purchase a higher level of goods and services outside the region and province relative to the expenditures predicted by the economic impact model.

The area is already facing a tightening labour market. According to the job postings tracking firm Lightcast, there were nearly 3,400 unique job postings in Divisions 6 and 8 during 2023 up nearly 30 percent over the previous year.

Figure 11: Increase in unique job postings by selected occupational group, 2022-2023, North-central Newfoundland*



*Census Divisions 6 and 8 combined. Source: Lightcast.

A deliberate strategy to ensure the maximum number of Newfoundlanders and Labradorians can work jobs related to both the CAPEX and OPEX should be developed. Further, a detailed supply chain development strategy will ensure that Newfoundland and Labrador companies can maximize the benefits of this project to the local economy.

5. CONCLUSION: THE EXPLOITS VALLEY GREEN HYDROGEN PROJECT AND THE FUTURE

It is not often a project of this size comes along in places like the Exploits Valley region. Because the region is ideal for wind energy and downstream hydrogen/ammonia production, the economic case is solid.

The Exploits Valley Green Hydrogen project represents a new anchor industry for the area, similar to other large projects in the past. It will provide substantial economic benefits to the province in the near term and a stable source of high paying jobs for the long term.

It will be important for the project proponent and its partners to ensure the maximum level of economic benefits remains in the province and the ongoing economic benefits accrue to the communities in the Exploits Valley region.

APPENDIX A: THE ECONOMIC IMPACT MODEL AND SOURCES

The data sources used in the preparation of this report include:

Statistic:	Source/Description:
Direct, indirect and induced GDP, employment and income estimates	Uses Statistics Canada Input-Output multiplier and impact estimates at the M industry level. Provincial Input-Output Multipliers, 2020. Catalogue no. 15F0046XDB. Industry Accounts Division. Statistics Canada. Includes multipliers for: output, gross domestic product (GDP) at market prices, taxes on products, labour income, wages and salaries, employers' social contributions, labour income of unincorporated sector, taxes on production and employment. The specific NAICS industries used are described in Section 2 above.
Tax multipliers	Using a model developed by Jupia Consultants Inc. based on a variety of sources including: • Induced HST revenue: Based on the ratio of HST collected to total provincial personal income in 2022 (Source: provincial budget documents and Statistic Canada). • Induced personal income taxes paid: Derived using several sources including Statistics Canada personal tax-related tables and its Survey of Household Spending (SHS) for 2021. • Property taxes paid (from employment income): Derived using Statistics Canada's Survey of Household Spending (SHS) for 2021. • Indirect taxes: Derived using Statistics Canada multipliers for the various sectors used in the model as described in Section 2.1. These indirect taxes are levied on the business activity and include such tax areas as: business property taxes, fuel taxes, vehicle license fees, land transfer taxes, and any sales taxes arising out of the corporate activity. Corporate income tax estimates by year and amount were provided by EVREC. The Crownland reserve fee (3.5%), Crownland lease fee (7%) and wind electricity tax data, and water royalty estimates were provided by the proponent.
Household spending impacts	Derived using Statistics Canada's Survey of Household Spending (SHS) for 2021.
Industry GDP statistics	Gross domestic product (GDP) at basic prices, by industry. Source: Statistics Canada Table: 36-10-0402-01.
Various labour market characteristics	Statistics Canada 2021 Census and annual wage reports.

Municipal and provincial total own-source revenue as well as spending by category	GNL Main Estimates published by the Department of Finance.
Business counts	Source: Statistics Canada business counts, June 2023.
Export data	Source: Trade Data Online.
Occupational wage data	Statistics Canada 2021 Census.
Average household spending	Source: Statistics Canada Table: 11-10-0222-01.
Capital investment by sector	Capital and repair expenditures, non-residential tangible assets, by industry and geography. Source: Statistics Canada Table: 34-10-0035-01.
Employment by sector	Source: Statistics Canada 2021 Census and the annual Labour Force Survey.

APPENDIX C: ABOUT JUPIA CONSULTANTS INC.

New Brunswick, Canada-based Jupia Consultants Inc. is a full-service research and planning support consultancy specializing in the area of economic development. For over two decades the firm has been working with companies, communities, industry associations, economic development agencies and government departments across Canada.

This report was prepared by David Campbell. David is the President of Jupia Consultants Inc. and has more than 25 years' experience as a consultant working with industry, not-for-profit organizations and governments across Canada. His focus areas include economic development strategy, economic impact analysis, population growth, cluster development and investment attraction. David was formerly Chief Economist with the Government of New Brunswick. In that role, he led the development of economic policy and economic development strategy for the provincial government.

David is a columnist with Brunswick News, a published author, and writes weekly for the It's the Economy, Stupid blog as well as co-presents the weekly podcast Insights with Don Mills and David Campbell. In recent years, he has had the opportunity to collaborate with multiple think tanks and policy research organizations including the Conference Board of Canada, Public Policy Forum and the Donald J. Savoie Institute at the Université de Moncton.

For more information visit www.jupia.ca.