REGIONAL SPOTLIGHT

Atlantic Canada

Close-up on the bio-economy

LABOUR MARKET INTELLIGENCE

BioTalent™ Canada

Igniting the bio-economy's brainpower

BioTalent Canada

BioTalent Canada supports the people behind life-changing science. Trusted as the go-to source for labour market intelligence, we guide bio-economy stakeholders with evidence-based data and industry-driven standards. We are focused on igniting the industry's brainpower, bridging the gap between job-ready talent and employers, and ensuring the long-term agility, resiliency and sustainability of one of Canada's most vital sectors.

Recently named one of the 50 Best Workplaces in Canada with 10–50 employees and awarded a Great Place to Work® Certification 2021, BioTalent Canada practices the same industry standards it recommends to its stakeholders. These distinctions were awarded to BioTalent Canada following a thorough and independent analysis conducted by Great Place to Work®.

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Report Partners

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About this report

BioTalent Canada's 2021 series of labour market intelligence (LMI) reports, *Close-up on the bio-economy*, aims to provide the perspective bio-economy organizations need to find, recruit, train and retain talented teams based on real, meaningful understanding of the labour market.

Building on the last national full LMI study conducted in 2013,[1] the new series gives a much-needed update on the complex, multi-dimensional bio-economy, the companies within it, and the skills and talent they require. Its insights are based on surveys, stakeholder roundtables and interviews, an environmental scan and extensive data analysis.

For the first time, the data offers deeper insights into the labour market conditions specific to individual regions within Canada. This report looks at **Atlantic Canada** (which includes New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador), including labour supply projections and labour market outlooks based on econometric models to estimate hiring requirements.

The study considered three time periods for its economic forecasts: immediate (to explore pandemic-related changes between 2019 and 2020), short term (2021 to 2024) and medium/longer term (2025 to 2029).

Due to the small sample size of bio-economy companies in the region, all data and comparisons in this report should be interpreted with caution.

1 *Sequencing the Data*, 2013. A previous LMI report, *Splicing the Data*, was published in 2008.

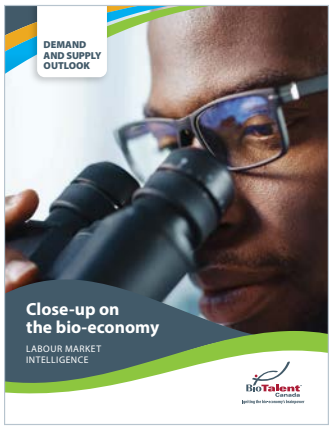
Other reports in the series

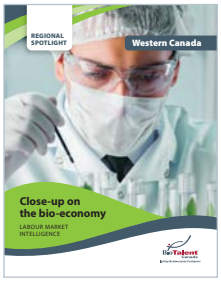
The *Close-up on the bio-economy* LMI series is published as part of BioTalent Canada's mission to provide bio-economy stakeholders with valuable, evidence-based labour market intelligence and job-ready human resources.

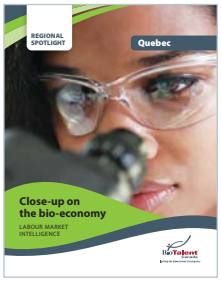
It includes:

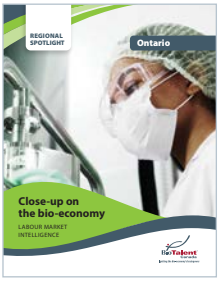
- **National LMI report**
- **Demand and Supply Outlook**
- **Regional spotlights** (Atlantic Canada, Quebec, Ontario, Prairies, Western Canada)
- **Metro hub spotlights** (Greater Montreal, Greater Toronto Area, Metro Vancouver)
- Research briefs on topics such as bio-economy education and work-integrated learning

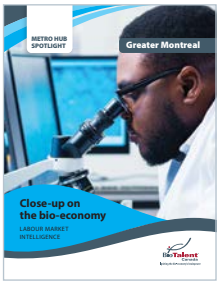
Visit biotalent.ca/LMIStudy to download these and other LMI reports, briefs and articles.

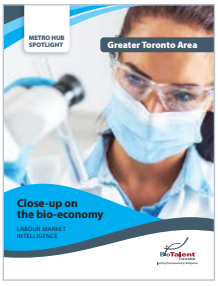


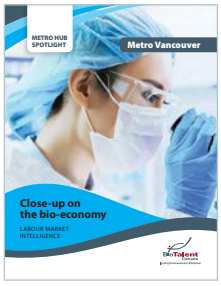












Research partners

The following researchers contributed to the development of this research and report:

- DPM Research Inc.
- Prism Economics & Analysis Inc.
- EKOS Research Associates Inc.
- Ipsos

Executive summary

Atlantic Canada's bio-economy is likely to require **3,300 additional workers by 2029**. Companies will be challenged to fill positions due to its relatively small size in a highly competitive national labour market that tends to attract candidates to larger urban centres. Management, finance and administration capacity will be a particularly urgent area of need across all sub-sectors.

A reflection of Canada's overall bio-economy

Atlantic Canada's bio-economy consists of roughly **900 establishments** that collectively employed some **10,800 people** in 2019. Similar to most other regions, its companies are mainly **small or medium-sized businesses**: 60% have 20 employers or fewer, and 53% generate annual total gross revenues of less than $1 million. As in much of the rest of the country, **bio-health companies** account for more than half (53%) of Atlantic Canada's bio-economy.

Atlantic Canada's bio-economy workforce covers a wide range of occupations, with **R&D and manufacturing** together accounting for more than half of all jobs. The distribution of employees across sub-sectors mirrors the distribution of companies, with bio-health accounting for the largest proportion.

High demand in bio-health and agri-bio

The Atlantic Canada bio-economy is **expected to grow slightly** during the 2021 to 2029 forecast period. Current estimates indicate there will not be enough workers to meet labour need by 2029, with significant pressure existing now and mounting throughout the decade. Most of these new hires will be required by the bio-health sub-sector, with a significant number also needed in agri-bio.

Some of the most severe shortages are expected in bio-manufacturing and processing. Forecasts suggest Atlantic Canada employers will be able to fill only 25% of job openings in these areas between now and 2029. The shortage is expected to intensify as Canada seeks to expand its manufacturing sector in response to the lack of capacity highlighted by the COVID-19 pandemic.

While **labour shortages are expected for all bio-economy job functions** throughout the forecast period, three areas stand out as likely to experience persistent, severe shortages until 2029 and beyond:

- Management, finance and administration jobs
- Research and development jobs
- Manufacturing and production jobs

How Atlantic Canada can address the shortfall

As domestic university degree completions are expected to decline throughout the forecast period, strategies other than recruiting new graduates will be needed to meet the demand for labour — such as recruiting skilled immigrants and looking beyond traditional talent pools.

The Atlantic Canada bio-economy has a tremendous **opportunity to seek talent from under-represented groups**. On average, women make up roughly one-third (31%) of Atlantic Canada's bio-economy workers overall. Other equity-seeking groups have less representation: internationally educated professionals make up 16% of the bio-economy workforce, visible minorities and recent immigrants represent 10% of the workforce each, and Indigenous workers and people with disabilities each make up just 1% of the bio-economy workforce.

As many employers have difficulty retaining employees in the region, **work-integrated learning may be an important lever** for creating stronger attachments to the area among graduates and strengthening the talent supply.

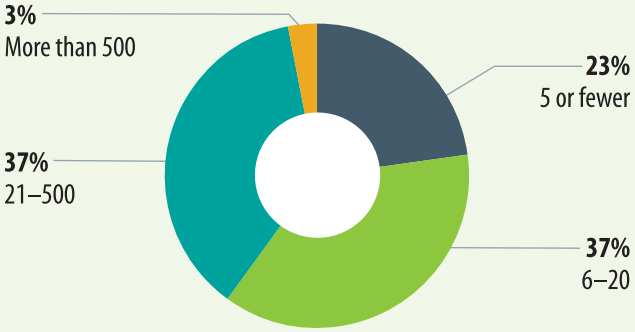
Who makes up the Atlantic Canada bio-economy?*

THE COMPANIES

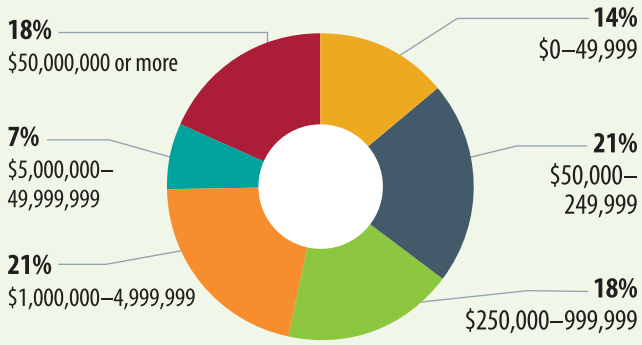
~900 bio-economy organizations

Most are small to medium-sized

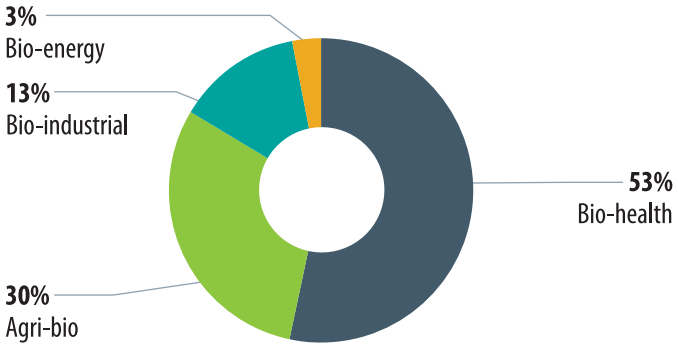
Number of employees



Annual total gross revenue†



Bio-health is the biggest sub-sector†



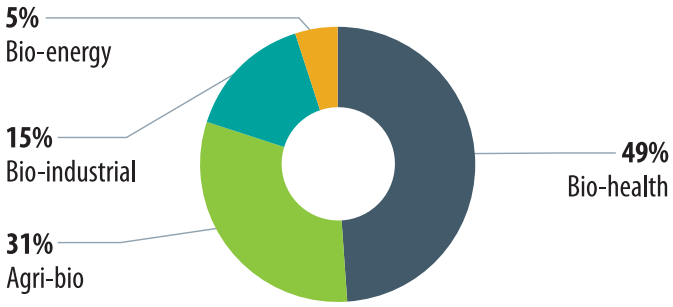
* *Atlantic Canada includes New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador.*

† *Percentages may not add up to 100% due to rounding.*

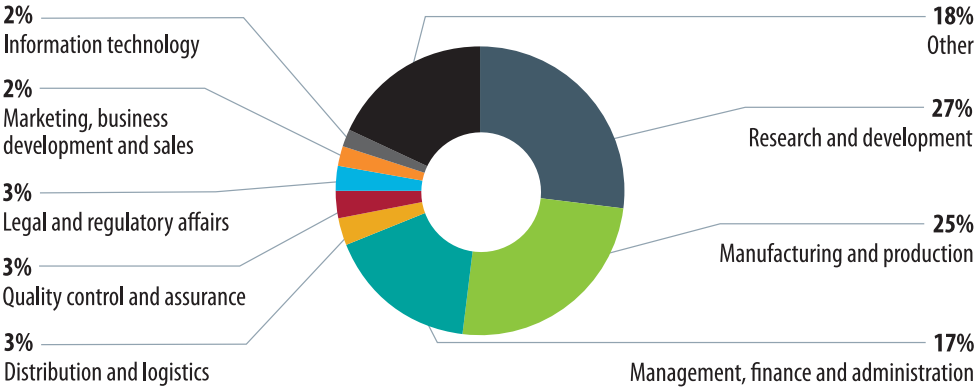
THE PEOPLE

~10,800 workers

Nearly half work in bio-health



Jobs are concentrated in R&D and manufacturing



The sector has an opportunity to improve diversity

- Women: **31%**
- Recent immigrants‡: **10%**
- Internationally trained professionals: **16%**
- People with disabilities: **1%**
- Visible minorities: **10%**
- Indigenous people: **1%**

8% of undergraduate... **8%** of master's... **5%** of doctorate...

...students in Canadian bio-economy-related programs go to school in Atlantic Canada

‡ *Recent immigrants are those who have been in Canada less than five years.*

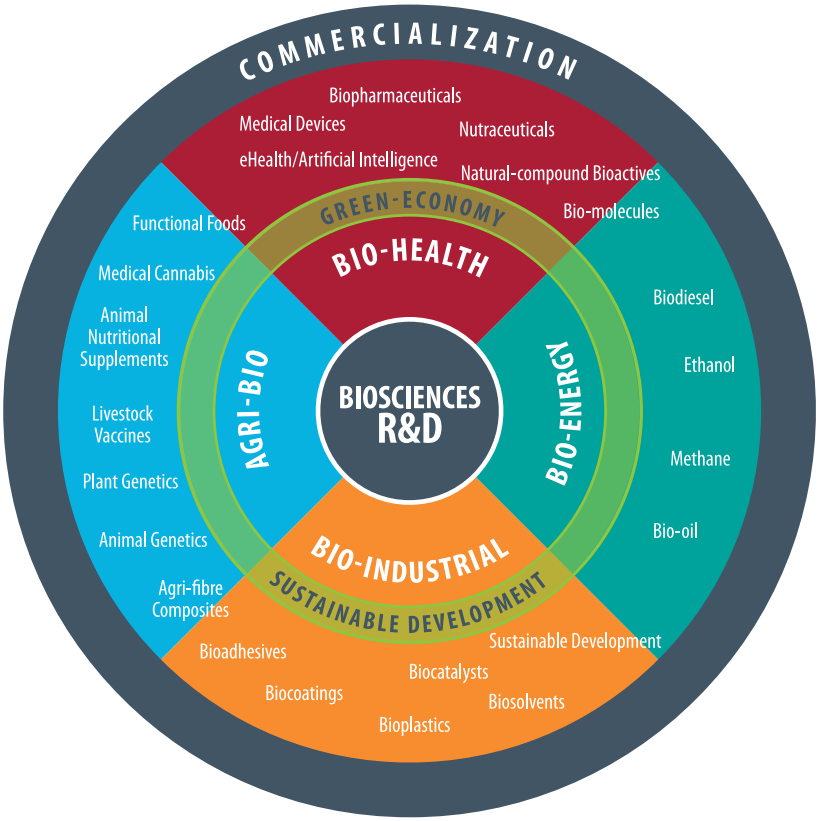
Note: Due to the small sample size of bio-economy companies in the region, all data and comparisons in this infographic should be interpreted with caution.

DEFINING THE BIO-ECONOMY

The bio-economy today

The bio-economy is defined as the economic activity associated with the invention, development, production and use of primarily bio-based products, bio-based production processes and/or biotechnology-based intellectual property. It includes the use of resources from agriculture, forestry, fisheries/aquaculture, organic waste and aquatic biomass.

The field is multidisciplinary in that it cuts across the bio-health, bio-energy, bio-agriculture (agri-bio) and bio-industrial (chemicals and materials) sub-sectors. These four are all rooted in their own foundations of research and development and all have products, processes or intellectual property that are involved in the "green" or sustainable development economy as well, to a greater or lesser extent. The bio-economy sub-sectors share a common objective: the commercialization of resultant bio-products, processes and/or intellectual property.



The **bio-health** sub-sector encompasses the invention, development, manufacturing, commercialization and use of products that improve therapeutics, diagnostics, prevention and health administration, as well as the development and production of nutraceuticals and applications of medical cannabis. Research and development activities contribute to the development of new products, bio-based technologies and intellectual property related to the production of bio-health products and technologies.

The **bio-energy** sub-sector encompasses the invention, development, production, commercialization and use of renewable fuels through the conversion of organic material into heat or power. Research and development activities contribute to the development of new products, bio-based technologies and intellectual property related to the production of bio-energy.

The **bio-industrial** sub-sector encompasses the invention, development, manufacturing, commercialization and use of goods for industrial use, such as bio-chemicals and bio-materials, through the conversion of organic material. Research and development activities contribute to the development of new products, bio-based technologies and intellectual property related to the production of bio-industrial products. Among others, the development and production of biocatalysts are an integral part of this sub-sector.

The **agri-bio** sub-sector encompasses the invention, development, production, commercialization and use of new or modified products resulting from the manipulation, modification or alteration of the natural features of plants and crops, animals and/or other food sources. Research and development activities contribute to the development of new products, bio-based technologies and intellectual property that support improved quality, yield and efficiency in the agricultural sector and food production.

Profile of the Atlantic Canada bio-economy

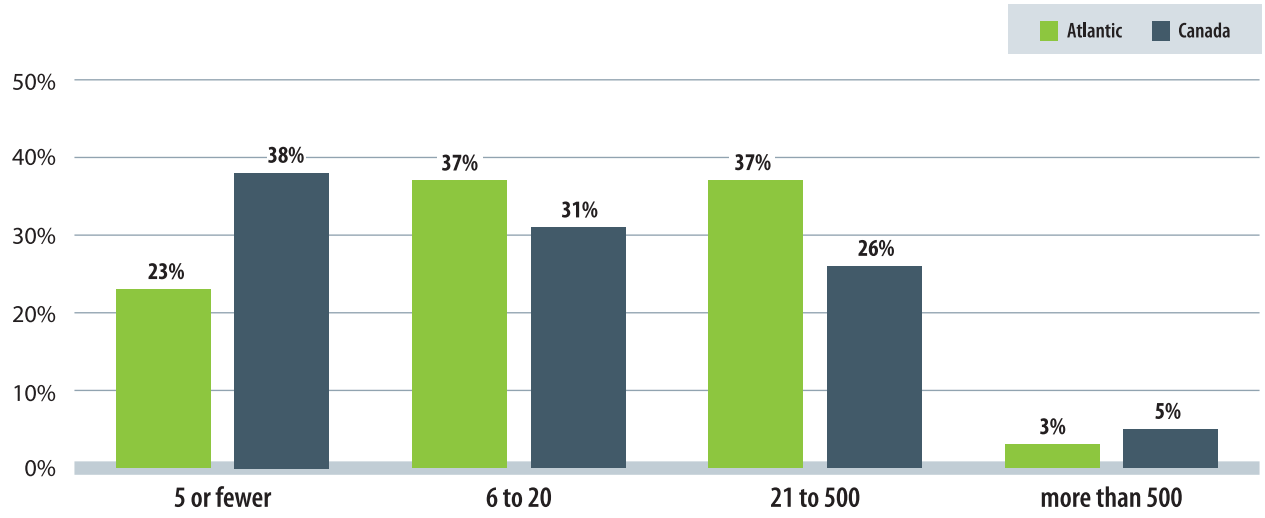
The bio-economy in Atlantic Canada contains some 900 organizations, accounting for 6% of Canada's bio-economy companies. These organizations collectively employed around 10,800 people in 2019. It includes commercial businesses as well as hospital and university research institutions.

Employers

Atlantic Canada's bio-economy companies are slightly larger than the national profile. Of the organizations surveyed by BioTalent Canada, **more than one-third (37%) had 6 to 20 full-time employees and another 37% had 21 to 500 employees**. The share of very small companies (5 employees or fewer) is less than one-quarter (23%).

Revenue figures are mostly similar between Atlantic Canada and the rest of the country, with the exception of companies making $5 million or more. Of those who responded to this question on the survey, just two reported total gross revenue of $5 million to $50 million in 2020, **while five companies reported total gross revenue of $50 million or more**. Given the small sample size for this question (28), these proportions may not be reflective of the Atlantic bio-economy as a whole.

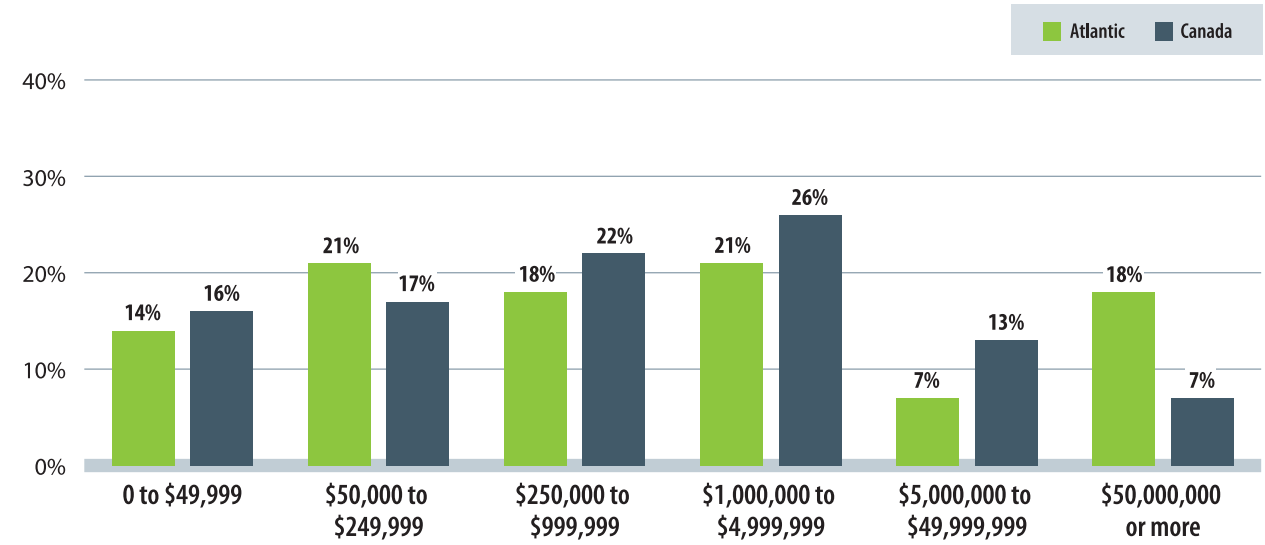
FIGURE 1. Bio-economy companies by number of full-time employees, Atlantic Canada vs. national



Source: BioTalent Canada, Survey of Employers 2020

The overwhelming majority of bio-economy companies are small or medium-sized businesses.

FIGURE 2. Bio-economy companies by annual total gross revenue, Atlantic Canada vs. national

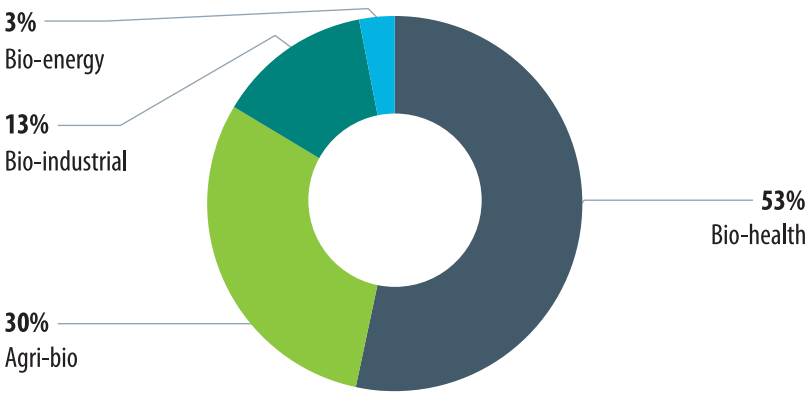


Source: BioTalent Canada, Survey of Employers 2020

More than one-third (38%) of the Atlantic Canada bio-economy companies surveyed have been in business for more than 25 years.

As is the case nationally, **bio-health is by far the largest sub-sector** in the Atlantic Canadian bio-economy, accounting for more than half (53%) of all companies. Nearly one-third (30%) are in agri-bio.

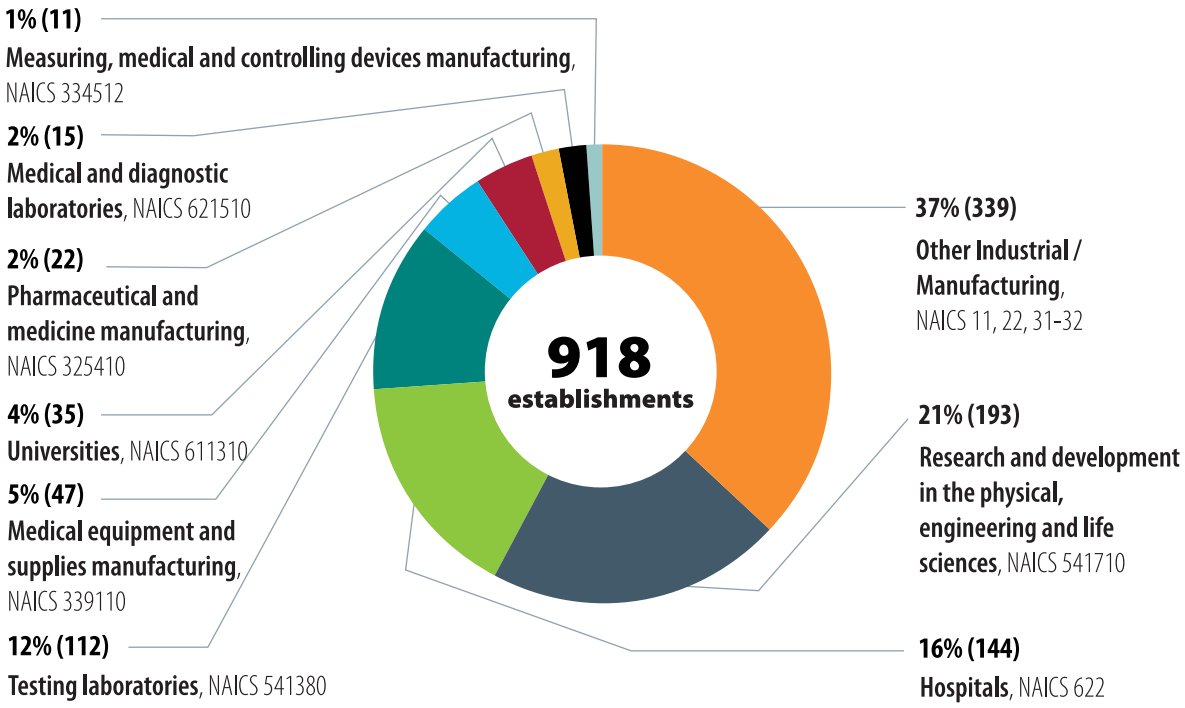
FIGURE 3. Companies by primary sub-sector, Atlantic Canada



Note: Percentages may not add up to 100% due to rounding.
Source: BioTalent Canada Survey of Employers (2020)

Around one-third of Atlantic Canada companies are in agri-bio.

FIGURE 4. Atlantic Canada bio-economy establishments by NAICS industrial sector



Source: BioTalent Canada Modeling and Projections (2020)

The North American Industry Classification System (NAICS) gives a different and complementary view of the Atlantic Canada bio-economy and its areas of focus. Other industrial/manufacturing (NAICS 11, 22, 31–33) makes up more than one-third (37%) of bio-economy establishments. The next largest segment is physical, engineering and life sciences R&D (NAICS 541710), at 21%.

Workers

R&D and manufacturing account for more than half of Atlantic bio-economy jobs overall (27% and 25%, respectively). In agri-bio and bio-industrial, close to half (40% and 45%, respectively) of all jobs are in manufacturing and production.

Employment in Atlantic Canada's bio-economy is highly concentrated in bio-health. Nearly half (49%) of all employees work in this sub-sector, with a further third (31%) in the agri-bio sub-sector.

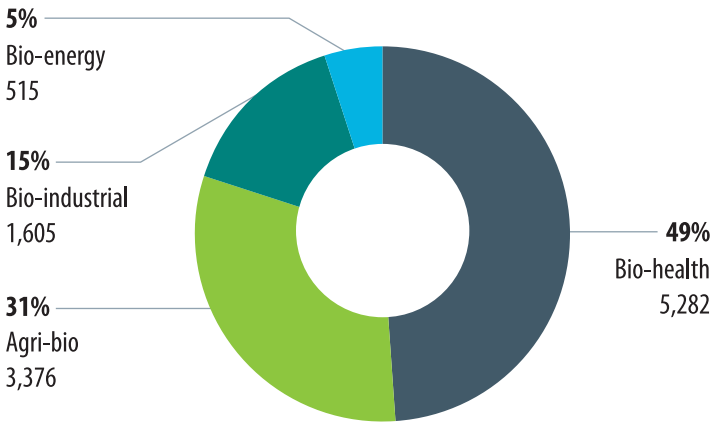
TABLE 1. Employment by job category and sub-sector, Atlantic Canada

Job category	Total	Agri-bio	Bio-energy	Bio-health	Bio-industrial
Research and development	**27%**	17%	46%	33%	19%
Manufacturing and production	**25%**	40%	25%	9%	45%
Management, finance and administration	**17%**	28%	13%	13%	13%
Distribution and logistics	**3%**	3%	2%	2%	4%
Quality control and quality assurance	**3%**	2%	2%	3%	4%
Legal and regulatory affairs	**3%**	4%	5%	3%	1%
Marketing, business development and sales	**2%**	3%	1%	2%	3%
Information technology	**2%**	1%	2%	2%	1%
Other	**18%**	2%	4%	32%	11%

Percentages may not add up to 100% due to rounding.

Source: BioTalent Canada Modeling and Projections (2020)

FIGURE 5. Bio-economy employment estimates by sub-sector, Atlantic Canada

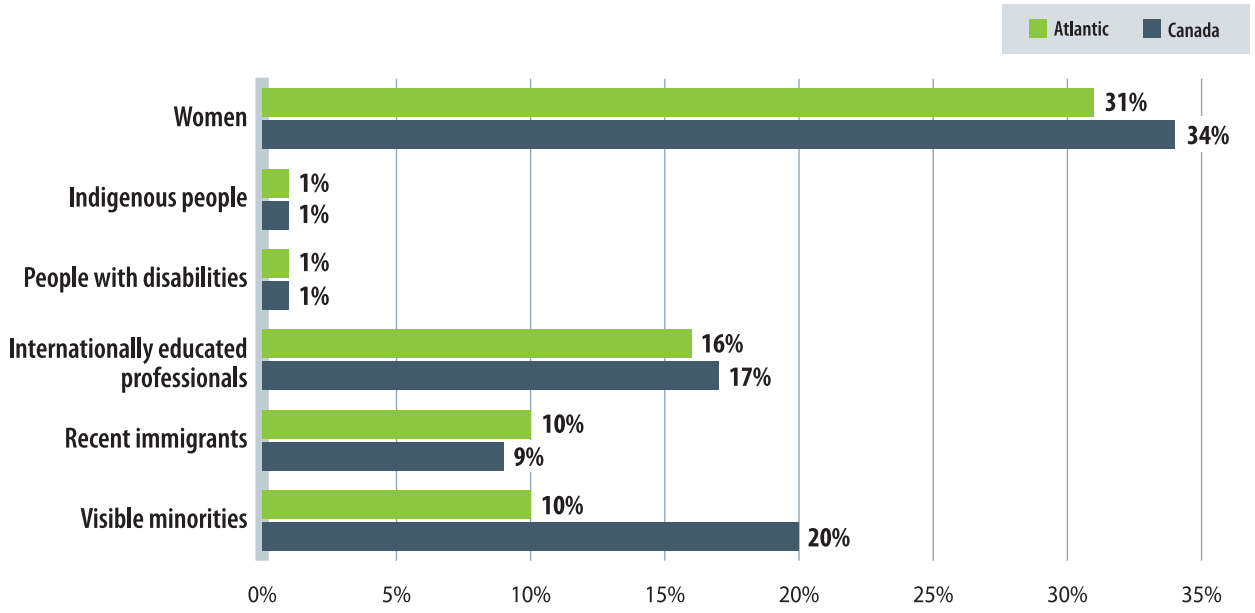


Source: BioTalent Canada Modeling and Projections (2020)

Equity and diversity in the workforce

Representation of equity-seeking groups in Atlantic Canada's bio-economy is similar to that of the country overall, with the exception of visible minorities, who make up an average of 10% of the Atlantic bio-economy workforce. **Women account for roughly one-third (31%) of bio-economy workers** in Atlantic Canada. Other groups have less representation, with internationally educated professionals (IEPs) making up 16% of the bio-economy workforce and recent immigrants (those who have been in Canada less than five years) 10%. People with disabilities and Indigenous workers represent 1% of the workforce each. These findings suggest under-represented populations could be important sources of new talent for the bio-economy going forward.

FIGURE 6. Average proportions of workers by equity-seeking group status, Atlantic Canada



Source: BioTalent Canada, Survey of Employers 2020

For deeper perspective on the bio-economy labour market in other regions across Canada, see our series of regional LMI spotlights at biotalent.ca/LMIStudy.

anessa

Diversity opens the doors to opportunity

Diversity hiring is on a lot of people's minds these days. More and more businesses recognize it's the right thing to do *and* good for the bottom line. For companies aiming at international markets — such as Fredericton-based anessa — diverse staffing can also be a powerful market wedge.

Company profile: anessa

Location: Fredericton, NB

Employees: 16

Bio-economy sub-sector: Bio-energy

Since 2015, anessa has been providing innovative decision-support software solutions to assess the feasibility of proposed biogas projects and optimize existing biogas plants.

Q: What's your focus at anessa?

AMIR AKBARI, PRESIDENT AND CEO: We help de-risk renewable energy projects and make them more appealing for investors. Our software platforms help all stakeholders involved in biogas projects, including biogas project developers, operators, investors and engineers gauge the feasibility of potential projects and run existing ones as efficiently as possible.

Q: What's been key to your success so far?

AA: We've found having a variety of backgrounds on the team helps us maintain a creative, vibrant culture and build a better product. We've always made diversity a priority, especially with our business so focused on the international market. Our 16-person team includes eight different nationalities. That gives us a window into how to tailor our approach for different regions. When we arrive at the table with some sense of the culture and language of the international companies we're planning to work with in multiple international markets, we're off to a good start.

Q: What's most important when managing a diverse team?

AA: The first thing is to make it meaningful. Don't just hire people for the sake of being able to call your team diverse. It's important everyone has opportunities to take on real responsibilities — even if sometimes they don't have a lot of experience. For example, we brought on an intern as a junior engineer. She was dedicated and rose to every challenge we offered, and now she's one of our integral team members and leads our customer support activities.

"Diversity is about more than just hiring for the numbers. It's really important that everyone on the team gets opportunities to take on real responsibilities."

Q: What's your biggest HR challenge?

AA: Finding people with soft skills and who are the right fit with our team and culture is always hard. We need people who can think out of the box, be creative and be team players. That's not something you can necessarily measure by reviewing resumes or results from traditional university exams. Our education system needs to provide opportunities for students to work on team-based projects and solve real problems, to experience how things happen in the real world. Technical skills are easier to teach on the job. We recruit many fresh graduates from universities and colleges, and if someone comes in with the right core skills but we need to train them on a few technical ones, that's no problem. Teaching the soft skill sets is more challenging.

Q: What would expand your talent pool?

AA: We need to find ways to to attract more women and candidates from non-traditional quarters. We recently posted for a software developer position, and fewer than 10 percent of the applicants were women. That shocked me. I know the talent is there, but there's clearly a gap we need to bridge. I also think it would help if there were bio-economy specialization streams in certain post-secondary programs. Why not have a bio-energy specialization in mechanical or chemical engineering, for example? That would help develop skill sets the bio-economy needs. And not just in engineering. Marketers, administrators, lawyers and others who understand the bio-economy would be tremendously useful.

Q: What effect has COVID-19 had on your hiring?

AA: It's really changed the competition for talent. On the one hand, it's easier to interview and hire workers from more remote areas. At the same time, it's easier for local workers to take jobs with companies in California or China or anywhere else. For positions we do want to ultimately have on site in our offices, we have to find new ways to attract and retain people. Fortunately, workers today are often looking for more than just compensation. Many want to work for a company whose purpose they believe in. So the fact that we're actively working to address waste and energy — two elements that contribute to climate change, one of humanity's biggest issues — is a big point in our favour.

Atlantic Canada labour market outlook

Estimates suggest the Atlantic Canada bio-economy will need an additional 3,300 workers by 2029[2]. Based on anticipated conditions, labour supply will not be sufficient to meet that demand.

While the overall economy in Atlantic Canada declined as a result of COVID-19, losses were concentrated mainly in the food services, tourism and retail sectors; the bio-economy was not as strongly affected. Employment in the region's bio-economy is expected to grow slightly but steadily at around 0.7% per year over both the short and medium/longer terms, reaching **more than 11,500 workers by 2029**.

Youth (those under 25 years old)[3] have historically been critical to the labour supply, but the youth share of the population in Atlantic Canada has been declining steadily since 2000 and will likely continue to do so, while the share of individuals aged 55 years and older continues to rise. This combined trend is concerning for the future bio-economy because **a strong supply of youth is needed to age into the workforce and replace older workers**. This makes immigration key to meeting labour demand. Currently, only 10% of Atlantic Canada's bio-economy workers are recent immigrants and 16% are IEPs, suggesting an opportunity to expand recruitment from these populations.

Although the COVID-19 pandemic led to a slight drop in immigration to Atlantic Canada in 2020, numbers are expected to recover by 2022. The number of immigrants arriving with post-secondary degrees has grown steadily since 2003 and is expected to reach 4,900 per year by 2029. **The number of international students is also on the rise**, particularly in engineering and related technologies.

For more detail on bio-economy labour needs in Canada, read our demand and supply outlook at biotalent.ca/LMIStudy.

2 *While this report focuses primarily on private sector employers, all forecasts and modelling include actual and potential workers from the public, education and private sectors.*

3 *The definition of "youth" varies depending on the source. While BioTalent Canada typically defines "youth" as under 30, the source data for this report defines youth as under 25.*

Employment demand and skills requirements

While employment in the Atlantic Canadian bio-economy is expected to grow over the forecast period, the individual sub-sectors will experience their own patterns of expansion and contraction.

TABLE 2. Employment outlooks by sub-sector, Atlantic Canada

Year	Overall	Bio-health	Bio-industrial	Agri-bio	Bio-energy
% change 2019 to 2020	**+0.6%**	+4.3%	(-5.3%)	(-2.4%)	0.0%
Employment 2020	▲ **10,900**	▲ 5,500	▼ 1,500	▼ 3,300	▶ 500
Employment 2024	▲ **11,200**	▲ 5,600	▲ 1,600	▲ 3,400	▶ 500
Employment 2029	▲ **11,500**	▲ 5,800	▶ 1,600	▲ 3,600	▼ 480

Source: BioTalent Canada Modeling and Projections (2020)

Bio-health was the only sub-sector that grew in 2020.

Bio-health

Bio-health was the only sub-sector in Atlantic Canada that grew in 2020, largely due to increased pharmaceutical and medicine manufacturing. Employment is expected to remain above pre-pandemic levels throughout the forecast period despite a slight contraction (0.9%) in 2021. The bio-health sub-sector is expected to employ approximately 5,600 workers by 2024 and more than **5,800 workers by 2029**.

Bio-industrial

Employment in Atlantic Canada's bio-industrial sub-sector decreased in 2020 but is expected to recover nearly all losses in 2021. Annual growth in this sub-sector is expected to be modest in the short term (0.7%), growing to 1,600 workers by 2024, then weaken to 0.1% over the medium/longer term, with total employment remaining stable at **1,600 workers by 2029**.

Agri-bio

Agri-bio employment in Atlantic Canada fell in 2020, largely due to losses in aquaculture because of reduced demand for seafood from the tourism and hospitality industries. Employment in the sub-sector is expected to recover, growing annually by 1.1% through the short term, reaching 3,400 workers by 2024, and then by 0.9% for the remainder of the period, reaching **3,600 workers by 2029**.

Bio-energy

Bio-energy employment in Atlantic Canada was largely unaffected by the pandemic, remaining stable at 500 workers in 2020. In line with the national trends driven by competition from alternative energy sources and a decline in energy consumption overall, employment in the sub-sector is expected to fall to **480 workers by 2029**.

The Atlantic Canada bio-manufacturing gap

COVID-19 highlighted a significant gap in the Canadian bio-economy: bio-manufacturing and processing capacity. While much of that gap is felt throughout the country in health-related sectors (e.g., those that produce personal protective equipment and pharmaceuticals such as vaccines), in Atlantic Canada, the need is sharpest in agri-bio.

Estimates suggest Atlantic Canada will need an additional 1,050 bio-manufacturing workers by 2029 — more than half of whom (56%) will be needed for the agri-bio sector. Another third (30%) will be needed in the bio-industrial sub-sector. Only 25% of those positions will be fillable by predicted supply during this time period.

To fill the shortages, the bio-economy will need to develop new strategies, such as training workers from other sectors and more actively recruiting from outside traditional labour pools, including people from demographic groups under-represented in the bio-economy such as Indigenous persons, newcomers to Canada and persons with disabilities.

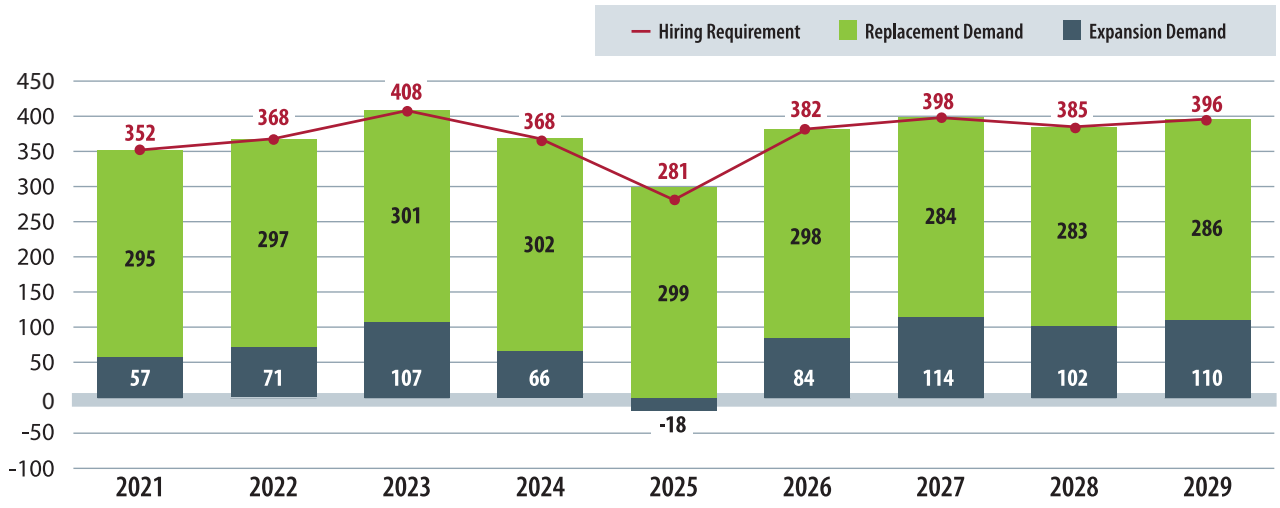
Expansion and replacement

Most of the requirement for 3,300 additional workers across Atlantic Canada's bio-economy between 2021 and 2029 will be to replace retirees or individuals leaving the workforce for other reasons — in other words, to fill *replacement demand*. Yet a portion will also be needed to fill new jobs as their industries grow (*expansion demand*).

While **replacement demand is expected to remain relatively stable across the forecast period, expansion demand is expected to fluctuate slightly**. Expansion demand is weak in 2021 as the bio-economy contracts to pre-pandemic levels. In 2025, a slight negative expansion is expected as the economic recovery results in higher interest rates, which will likely lead to reduced investment (including in labour) in the bio-economy.

While every sub-sector needs to hire for management, finance and administration roles, the need is especially great in bio-energy — the only sub-sector where that job category tops the list. Manufacturing personnel are the greatest need in bio-industrial and agri-bio, while the most needed job category in bio-health is "other", including nursing and related medical professions. More than one-third (35%) of anticipated bio-health job openings fall under this category.

FIGURE 7. Hiring requirement outlook by demand type, Atlantic Canada



Source: BioTalent Canada Modeling and Projections (2020)

TABLE 3. Hiring requirements by sub-sector from 2021 to 2029, Atlantic Canada

Sub-sector	Workers needed	Demand type	Key roles
Bio-health	1,500	Mostly replacement	▸ Other, including nursing and related medical professions (35%) ▸ R&D (22%) ▸ Management, finance and administration (14%)
Bio-industrial	500	Two-thirds expansion in 2021, then nearly all replacement	▸ Manufacturing (63%) ▸ Management, finance and administration (22%) ▸ R&D (10%)
Agri-bio	1,200	Mostly replacement	▸ Manufacturing (49%) ▸ Management, finance and administration (31%) ▸ Legal and regulatory affairs (11%)
Bio-energy	<100	All replacement	▸ Management, finance and administration (66%) ▸ R&D (33%)

Source: BioTalent Canada Modeling and Projections (2020)

TABLE 4. Hiring requirements by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total	%
Manufacturing and production	240	110	120	100	80	100	100	100	100	**1,050**	**31%**
Research and development	(-180)	70	80	70	50	80	90	90	90	**440**	**13%**
Management, finance and administration	110	80	90	80	60	80	80	80	80	**740**	**22%**
Distribution and logistics	10	10	20	10	10	10	10	10	10	**100**	**3%**
Marketing, business development and sales	(-20)	10	10	10	10	10	10	10	10	**60**	**2%**
Quality control and assurance	20	10	10	10	10	10	10	10	10	**100**	**3%**
Information technology	10	10	10	10	<10	10	10	<10	10	**70**	**2%**
Legal and regulatory affairs	80	10	10	10	10	10	10	10	10	**160**	**5%**
Other	90	60	70	70	50	70	80	80	80	**650**	**19%**
Total	**360**	**370**	**420**	**370**	**280**	**380**	**400**	**390**	**400**	**3,370**	**100%**

Source: BioTalent Canada Modeling and Projections (2020)

Anticipated employment demand can be combined with expected supply to model where labour needs will be most acute throughout the forecast period. Overall, **70% of surveyed companies across all sub-sectors reported already experiencing some or significant challenges recruiting and retaining qualified staff**. The outlook suggests these will continue and likely worsen through to 2029.

Overall labour market ratings by job category are calculated by comparing hiring requirements in each forecast year to the number of expected new bio-economy workforce entrants in the same year. A three-tiered rating scale shows the severity of the hiring challenges:

Level 1

Labour supply is **greater than 75%** of labour demand.
Low to moderate labour shortages are expected.

Level 2

Labour supply is **between 25% and 75%** of labour demand.
Moderate to serious labour shortages are expected.

Level 3

Labour supply is **less than 25%** of labour demand.
Serious to severe labour shortages are expected.

Tables 5–9 show that **nearly all job categories are expected to face serious-to-severe labour shortages throughout the forecast period**. This is true across all sub-sectors except bio-energy, which will have very few hiring needs throughout the forecast period. Yet even with these limited needs, some roles in that sub-sector will still be difficult to hire for.

Some shortages could be mitigated by more active recruitment of new graduates from relevant fields, but this will not fully address demand. Additional strategies, such as recruiting skilled immigrants and looking beyond traditional pools to attract candidates with a wider variety of backgrounds, will be required.

TABLE 5. Overall bio-economy labour market ratings outlook by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029
Manufacturing and production	3	3	3	3	3	3	3	3	3
Management, finance and administration	3	3	3	3	3	3	3	3	3
Distribution and logistics	3	3	3	3	3	3	3	3	3
Quality control and assurance	3	3	3	3	3	3	3	3	3
Legal and regulatory	3	3	3	3	3	3	3	3	3
Information technology	3	3	3	3	3	3	3	2	3
Marketing, business development and sales	1	3	3	3	3	3	3	3	3
Research and development	1	2	2	2	2	2	2	2	3
Other	2	2	2	2	2	2	2	2	2
Overall	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**

Source: BioTalent Canada Modeling and Projections (2020)

TABLE 6. Bio-health labour market ratings outlook by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029
Distribution and logistics	3	3	3	3	3	3	3	3	3
Quality control and assurance	3	3	3	3	3	3	3	3	3
Information technology	3	3	3	3	3	3	3	3	3
Legal and regulatory	3	3	3	3	2	3	3	3	3
Manufacturing and production	3	3	3	3	N/A	3	3	3	3
Marketing, business development and sales	3	3	3	3	N/A	3	3	3	3
Research and development	1	2	3	2	2	2	3	3	3
Management, finance and administration	2	3	3	2	1	2	2	2	3
Other	2	2	2	2	2	2	2	2	2
Overall	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

Source: BioTalent Canada Modeling and Projections (2020)

TABLE 7. Bio-industrial labour market ratings outlook by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029
Management, finance and administration	3	3	3	3	3	3	3	3	3
Research and development	1	3	3	3	3	3	3	3	3
Distribution and logistics	1	3	3	3	3	3	3	3	3
Marketing, business development and sales	1	3	3	3	3	3	3	3	3
Manufacturing and production	3	3	3	3	3	2	2	2	2
Legal and regulatory	3	3	3	2	3	2	2	2	3
Quality control and assurance	3	1	2	1	1	N/A	2	2	1
Information technology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other	3	3	3	3	3	3	3	3	3
Overall	**3**	**2**	**3**	**2**	**2**	**2**	**2**	**2**	**2**

Source: BioTalent Canada Modeling and Projections (2020)

TABLE 8. Agri-bio labour market ratings outlook by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029
Manufacturing and production	3	3	3	3	3	3	3	3	3
Distribution and logistics	3	3	3	3	3	3	3	3	3
Management, finance and administration	3	3	3	3	3	3	3	3	3
Quality control and assurance	3	3	3	3	3	3	3	3	3
Legal and regulatory	3	3	3	3	3	3	3	3	3
Marketing, business development and sales	1	3	3	3	3	3	3	3	3
Research and development	1	2	2	2	2	2	2	2	2
Information technology	N/A	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A
Other	1	1	1	1	1	1	1	1	1
Overall	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

Source: BioTalent Canada Modeling and Projections (2020)

TABLE 9. Bio-energy labour market ratings outlook by job function, Atlantic Canada

Job function	2021	2022	2023	2024	2025	2026	2027	2028	2029
Legal and regulatory	3	3	3	3	3	3	3	3	3
Research and development	1	3	3	3	3	3	3	3	3
Management, finance and administration	3	2	1	2	1	2	1	2	1
Manufacturing and production	1	1	2	1	1	1	1	1	1
Information technology	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Quality control and assurance	1	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A
Distribution and logistics	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A
Marketing, business development and sales	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A
Other	2	3	3	N/A	3	2	2	N/A	N/A
Overall	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

Source: BioTalent Canada Modeling and Projections (2020)

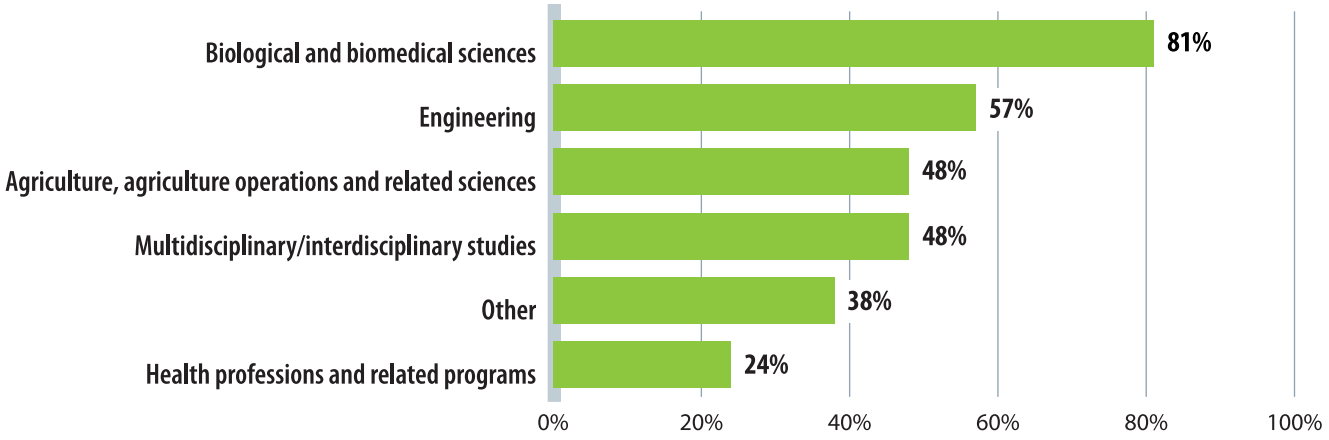
Nearly all job categories will face serious-to-severe labour shortages throughout the forecast period.

Education and the talent supply

Bio-economy employers seek a wide range of educational backgrounds. **Biological and biomedical science programs are at the top of the list**: more than 80% of Atlantic Canadian bio-economy employers recruit from these fields, while more than half (57%) recruit from engineering programs. Many also look for workers with backgrounds in agriculture and related sciences, as well as multi- or interdisciplinary backgrounds, indicating the need for staff with specialized technical skills who also understand the broader business context.

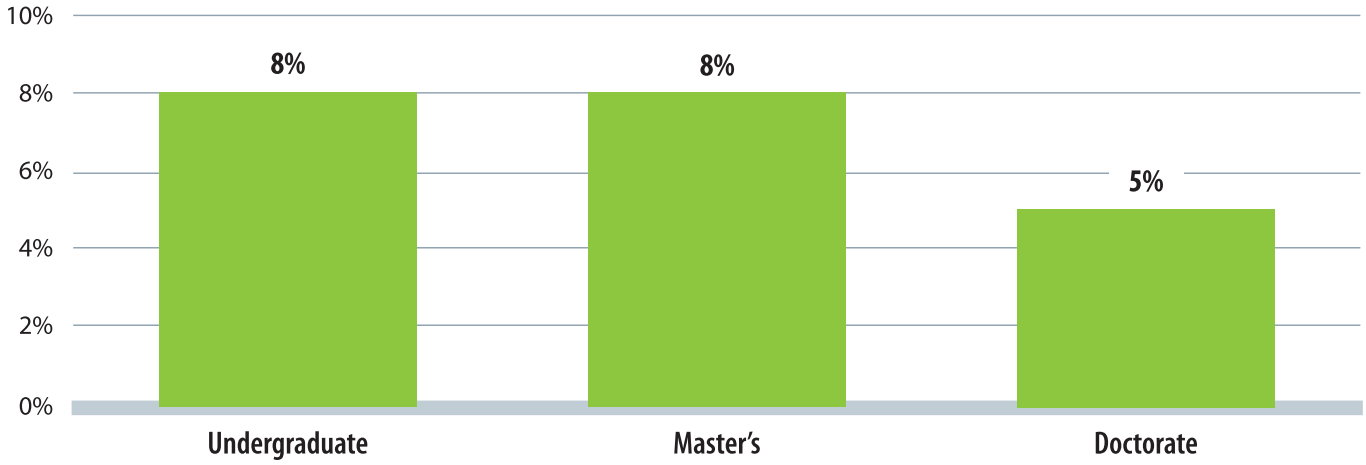
Atlantic Canada accounts for only a small number of the country's university- and college-level programs related to the bio-economy, and student enrolment numbers reflect that distribution. In 2016–2017, less than 10% each of Canada's undergraduate, master's and doctorate bio-economy students were enrolled in institutions in Atlantic Canada.

FIGURE 8. Top fields of study sought by bio-economy employers, Atlantic Canada



Source: BioTalent Canada, Survey of Employers 2020

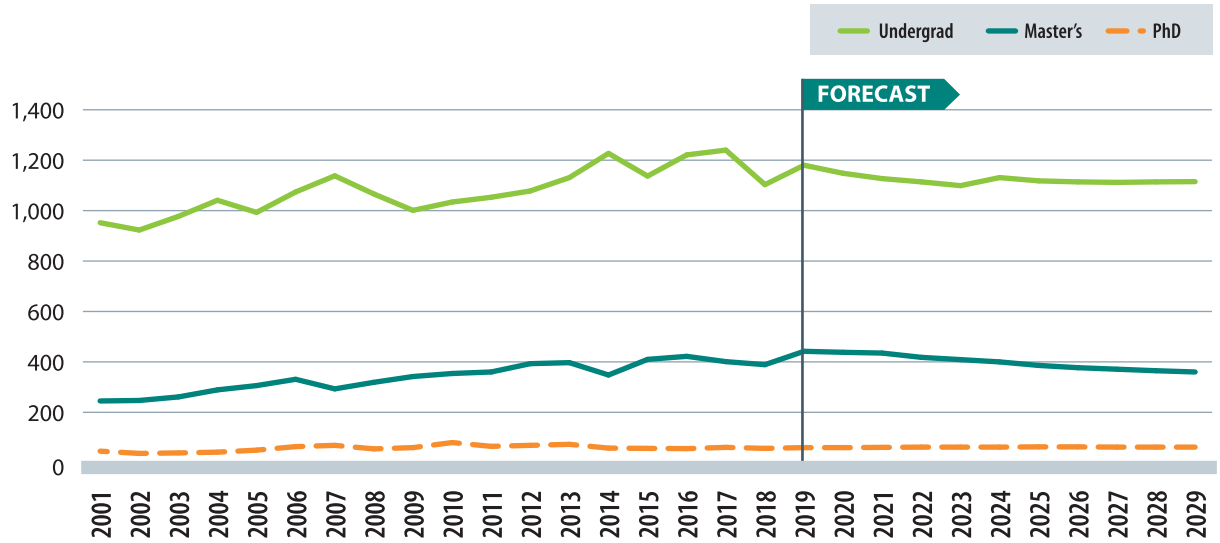
FIGURE 9. Atlantic Canada's share of total enrolment in bio-economy-related university programs in Canada



Source: Customized PSIS data, Statistics Canada 2019

Despite the decline in the post-secondary-aged (20–24 years old) segment of the population, **domestic enrolment in post-secondary education is expected to remain relatively constant in the long term**, with undergraduate degree completions rising by just 1% by 2029. Master's completions will decline by 7% during this period, and doctorate completions will see no significant year-over-year change.

FIGURE 10. Domestic degree completions by study level, Atlantic Canada



Source: BioTalent Canada Modeling and Projections (2020)

Atlantic student immigration programs

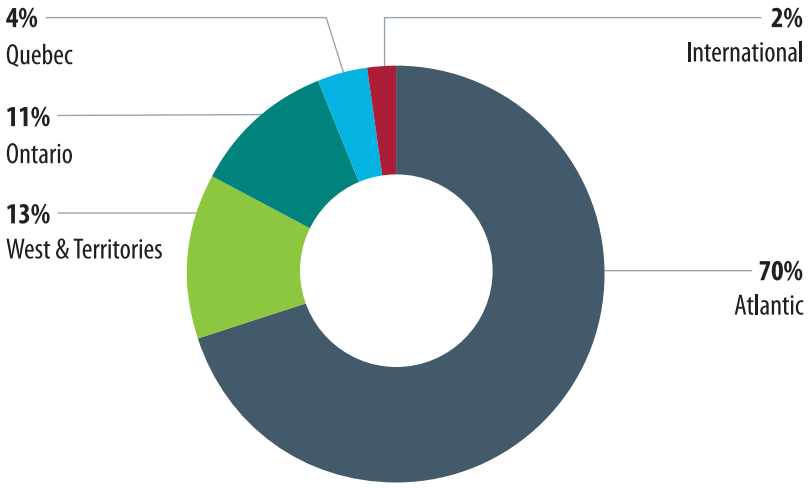
In Atlantic Canada, international students pursuing graduate degrees can apply for permanent residency through the **Provincial Nominee Program**, even without a job offer in hand. Under the **Atlantic Immigration Pilot**, introduced in 2017 and recently made permanent, students who have completed a qualifying degree and have a job offer from a recognized employer may apply for permanent residency.

Nova Scotia's **International Graduate Entrepreneur** stream is available by invitation to students who have completed at least two years of study at a post-secondary institution in Nova Scotia and have owned and managed a business for at least one year.

As in the rest of the country, international students make up a large and growing share of Atlantic Canada's post-secondary enrolments, particularly in engineering and related technology programs, as well as physical and life sciences. Some of them are likely to remain in Atlantic Canada as immigrants, particularly following changes to federal immigration rules in 2005 that made it easier for students to work and convert to "landed" status.

While bio-economy companies in Atlantic Canada are often able to hire local graduates for entry-level positions, it can be challenging to retain them, as many choose to move on to larger urban centres elsewhere in the country after spending a few years in the region. Adding to the challenge is the higher-than-average percentage of graduates who leave the region immediately after finishing school. **Approximately 70% of the 2015 graduates from Atlantic Canadian universities in bio-economy related fields of study were working in the same region in 2018**. Work opportunities in the Western/Prairie regions and Ontario attracted approximately 13% and 11% of Atlantic Canada's 2015 graduates, respectively.

FIGURE 11. Work regions for Atlantic university graduates in bio-economy related fields of study



Source: Statistics Canada, National Graduate Survey 2018

Skills and training needs

Employers in Atlantic Canada's bio-economy reported that **graduates from local post-secondary institutions are generally well prepared for work with very few skills gaps.** This may be due to collaboration between companies and institutions to ensure educational programs are aligned with industry needs. Employers did note that, based on industry trends, future employees will need stronger skills in data science, artificial intelligence and cybersecurity. The vast majority (86%) of bio-economy companies in Atlantic Canada offer some form of in-house training to ensure employees have the required learning, including onboarding training and job shadowing/rotations. About two-thirds (67%) of employers actively support continuing education.

Work-integrated learning (WIL) — including co-ops, work placements, internships and clinical placements — were cited by Atlantic Canadian employers as a potential strategy to **improve retention by creating early bonds with students that could encourage them to stay in the region**. Several innovative approaches to WIL are being used in Atlantic Canada, including:

- *Joint technical programs* that allow students to apply college credits to a university program (and vice versa) so they graduate with both technical diplomas and university degrees
- *Programs designed to meet specific regional needs,* particularly those related to the ocean-based professions of the "blue economy"

HR challenges in Atlantic Canada

Bio-economy employers in Atlantic Canada rank HR among their top five obstacles to company development. Nearly three-quarters report skills and labour shortages in research and technical areas (72%) and two-thirds report management-level skills and labour shortages (61%). Among their HR-specific difficulties, **around half (49%) of Atlantic Canada's bio-economy employers list lack of qualified candidates with required specialized skills sets or experience as a top challenge**.

Main issues

49%
Lack of qualified candidates with required specialized skill sets or experience

32%
Lack of qualified candidates with practical/non-academic skills

24%
Loss of candidates and employees to large, well-known organizations

24%
Lack of applicants

19%
Insufficient capital or resources to pay competitive wages to attract and retain qualified candidates

Source: BioTalent Canada, Survey of Employers 2020

What are the skills gaps?

- **Soft skills:** The most critical skills gaps among candidates and new employees are problem-solving, collaboration and communication.
- **Technology skills:** Companies in Atlantic Canada noted the growing importance of data science, artificial intelligence and cybersecurity skills as specialized software platforms take on ever-expanding roles in the sector.

How are companies recruiting?

Atlantic Canadian bio-economy employers rely on similar methods for hiring as employers across the country: job banks or other online resources (71%) and personal contacts and employee referrals (67%). Like the bio-economy overall, employers in Atlantic Canada could connect with a larger, more diverse talent pool if they expanded their approaches to include strategies with broader reach.

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Conclusion

Atlantic Canada employers report little difficulty recruiting for entry-level positions (thanks to strong collaboration with the region's post-secondary institutions). But graduates often don't stay in the region. Employers believe this could be improved by **enhancing and expanding work-integrated learning programs** to help create better bonds with graduates, which could encourage workers to stay in the region longer.

Companies in most sub-sectors of Atlantic Canada's growing bio-economy are already struggling to fill management, finance and administration roles, with R&D and manufacturing roles also proving difficult to staff. Their challenges are expected to worsen throughout the decade due to an aging population, a highly ompetitive labour market and difficulty keeping candidates in the region.

As well, with many immigrants choosing to settle in Atlantic Canada, employers could mitigate some of their hiring challenges and improve organizational diversity by **adjusting their recruitment strategies to reach more of these immigrants**.

See our **national LMI report** for more information on labour market conditions for Canada's bio-economy, including recommended actions employers can take to address the labour shortages expected over the next decade. Our **demand and supply outlook** takes a closer look at anticipated hiring needs along with the supply available to bio-economy employers, while additional regional spotlights provide more details on the labour market outlooks for Western Canada, the Prairies, Ontario and Quebec. For these and other reports, visit biotalent.ca/LMIStudy.

A ready mechanism

BioTalent Canada is prepared to support employers that lack the internal human resource capacity for talent recruitment, retention and development. BioTalent Canada has delivered numerous successful programs that have contributed to the growth of Canada's bio-economy labour market and to building a stronger, more sustainable sector. These include:

- Wage subsidy programs, including the Student Work Placement Program, Science and Technology Internship Program – Green Jobs, Science Horizons Youth Internship Program, Career Starter Program and BioReady™ Paid Internship Program
- Job matching platforms, including the bio-economy-specific job board, The PetriDish™
- Programs for internationally educated professionals, including the BioSkills Recognition Program and BioReady™ designation
- Skills courses, including the Essential and Technical Skills Fundamentals courses
- National Occupational Standards, a set of profiles documenting the skills, education and credentials required for specific bio-economy roles, to help employers recruit and retain the right talent, even with limited in-house human resource capacity

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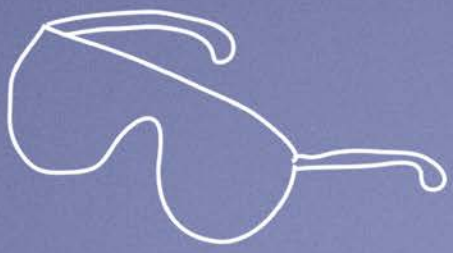

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