2022 Cleantech Industry Survey Results

Natural Resources Canada

Clean Technology Data Strategy

Canada

Acknowledgements

Canada

The 2022 Cleantech Industry Survey was developed with support from:

Employment and Social Development Canada / Emploi et Développement social Canada

OCTIA
Ontario Clean Technology Industry Association

EDC
Export Development Canada
Exportation et développement Canada

FORESIGHT CANADA

eco canada

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Innovation, Science and Economic Development Canada / Innovation, Sciences et Développement économique Canada

écotech Québec

Ontario
Ministry of the Environment, Conservation and Parks

Statistics Canada / Statistique Canada

CLEAN GROWTH HUB

Overview

Canada

Population	Sample	Response rate
		
2427 Canadian pure-play cleantech companies	**640** unique survey responses	**26.4%** by industry and province

The 2022 Cleantech Industry Survey was completed by Natural Resources Canada to better understand the challenges and barriers that Canadian cleantech companies are facing. This was a targeted survey sent out to 2427 pure-play cleantech companies that were identified through the Clean Technology Data Strategy. The online survey was conducted between September 20, 2022, to November 14, 2022, and used a combination of emails, newsletters, phone calls and social media to obtain a response rate that was >25% for each province and cleantech industry within the taxonomy.

Pure-play cleantech companies are defined as companies that are predominantly engaged in developing and/or using innovative technologies that provide environmental benefits.

For more information on the Clean Technology Data Strategy and the Government of Canada's cleantech taxonomy, please visit us at www.canada.ca/cleantech-data.

Methodology

Canada

R&D

RESEARCH & DEVELOPMENT

Any early-stage activities undertaken to design new products/ services or improve existing offerings before market entry (TRL 1-5)

D&T

DEMONSTRATION & TESTING

The evaluation of firm technology to reach operational requirements (TRL 6-8)

C&S

COMMERCIALIZATION & SCALE-UP

The product has moved from laboratory to market for purchase (TRL 9+)

EXP

EXPORT FIRMS

The firm has moved (at least some of) its product sales to international markets

SP

SERVICE PROVIDERS

The firm does not produce or manufacture goods but is an enabler of the cleantech sector (e.g. suppliers, installers of existing cleantech)

As some cleantech companies have several products at different stages of development, it can be difficult to understand the context of the challenges they are facing. For this survey, respondents were asked to self-identified their stage of development for their **core** cleantech product or service. Based on their selection, the respondent received 11-13 survey questions tailored to their selected stage of development.

Executive Summary - Key Findings

	Greatest Overall Challenge	Target Markets	Challenges with Hiring
Survey Finding	 36% of cleantech firms reported that raising capital is their greatest overall challenge	 Surveyed firms primarily sell to utilities (38%), followed by manufacturing (35%)	 56% of cleantech firms reported rising salaries and wage costs as the greatest barrier to hiring and retaining employees
Context	It is widely acknowledged that access to capital is one of the more significant issues in the Canadian cleantech sector. Canadian private investors are scarce, and firms are dependent on patient capital, often from public sources, to innovate and de-risk technology.[1,2]	Net-zero electricity is an objective outlined in the Government of Canada's 2030 Emissions Reduction Plan. Cleantech firms and utilities continue to play a key role in expanding renewable and non-emitting energy across Canada, which reduces emissions from other sectors, such as industry, buildings, and transportation.[3]	The CTDS Industry survey was conducted in the Fall of 2022, at an inflationary peak not seen since the 1980s (6.9% in October 2022), which saw a historically low unemployment rate (5.2% in October 2022) and record setting wage increases (+5.6% YoY since October 2021) across Canada.[4,5]

Executive Summary - Key Findings

	Most Sought-After Skills	Challenges with IP	Equity, Diversity, & Inclusion (EDI)
Survey Finding	 69% of cleantech firms reported looking to hire from applied & technical sciences (e.g. engineers, product designers, chemists)	 ~50% of cleantech firms reported high fees and lengthy approval processes as the greatest challenges to securing patents	 At the management level, only 13% of cleantech firms are owned or managed by women and 2% by Indigenous peoples
Context	It is estimated that applied sciences and related occupations will make up ~25% of environmental job openings to 2029.[6] The Government of Canada has a suite of initiatives to support the growing demand to fill STEM-related jobs as businesses shift towards innovating and modernizing.[7]	Securing a patent through the Canadian Intellectual Property Office takes an average of 6 years, costing SMEs close to $1000.[8] While SME's and universities benefit from reduced fees, maintaining an active patent for 20 years can cost an additional $3,000 to $5,000.[9] Depending on the complexity of the invention, legal fees can significantly increase the total cost of filling and protecting an invention.	When comparing to the overall environmental and cleantech workforce, women and Indigenous peoples represented 36% and 6% respectively in 2020.[10] These ratios have remained constant over the past decade: female and Indigenous representation in the workforce were 33% and 4% in 2009, respectively.[10]

Executive Summary - Additional Insights

Canada

Based on the survey responses:

1. **Hiring:** 38% of cleantech firms struggle finding the right skilled employees on the market
2. **Hiring**: Atlantic Canada and Manitoba are the provinces where firms most struggle with finding resources to train employees (48%, 51%) and a lack of interest in offered jobs (32%, 31%)
3. **Commercialization**: Access to funding (50%) and lack of regulatory drivers to adoption (44%) are the greatest challenges to clean technology commercialization in Canada
4. **Federal Procurement:** 61% of cleantech firms are unaware of federal procurement opportunities
5. **Navigating government**: Lengthy approval processes (61%) and excessive paperwork (58%) are the greatest challenges companies face when accessing government programs and funding
6. **Export**: Funding international visits (25%) and finding private foreign customers (22%) are the greatest barriers to exporting
7. **EDI**: 28% of firms in the waste and recycling industry are owned or managed by women, compared to 13% for overall survey respondents.

Canada

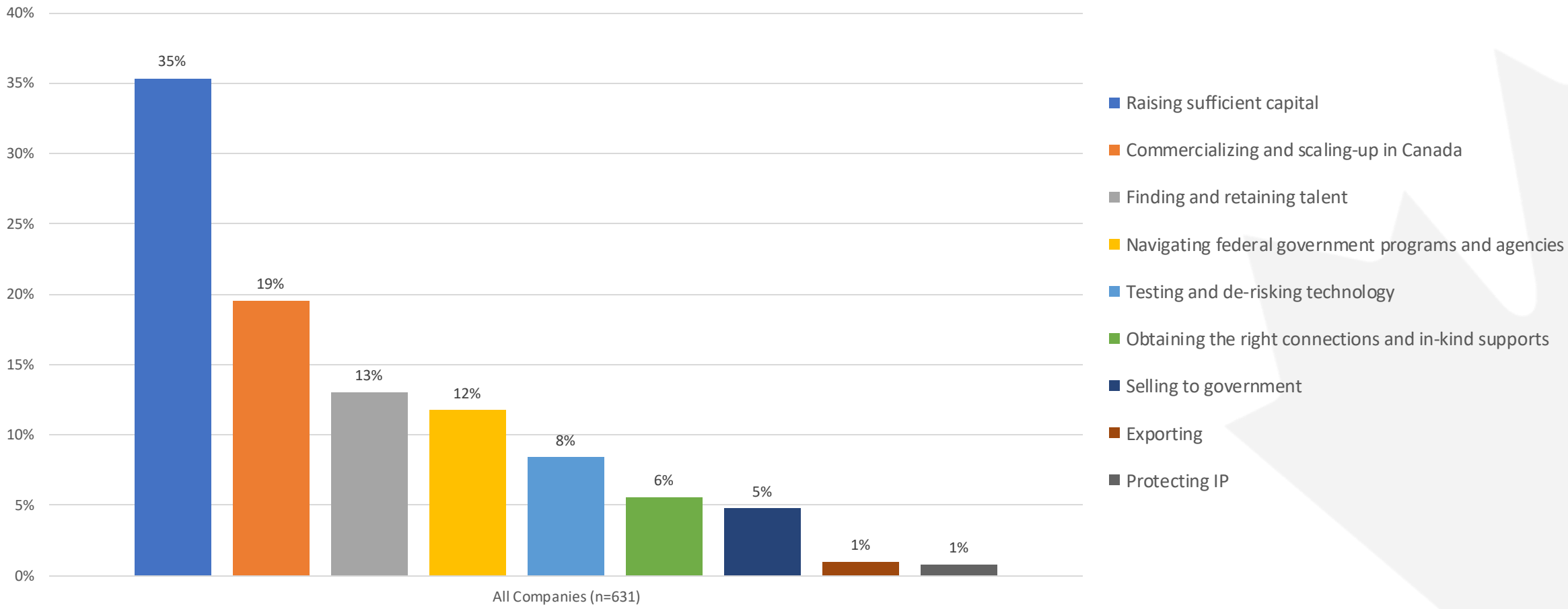
Results

Overall and by stage of development

[Greatest Challenge] Raising sufficient capital (35%) is by far the greatest barrier to growth for cleantech companies

Canada

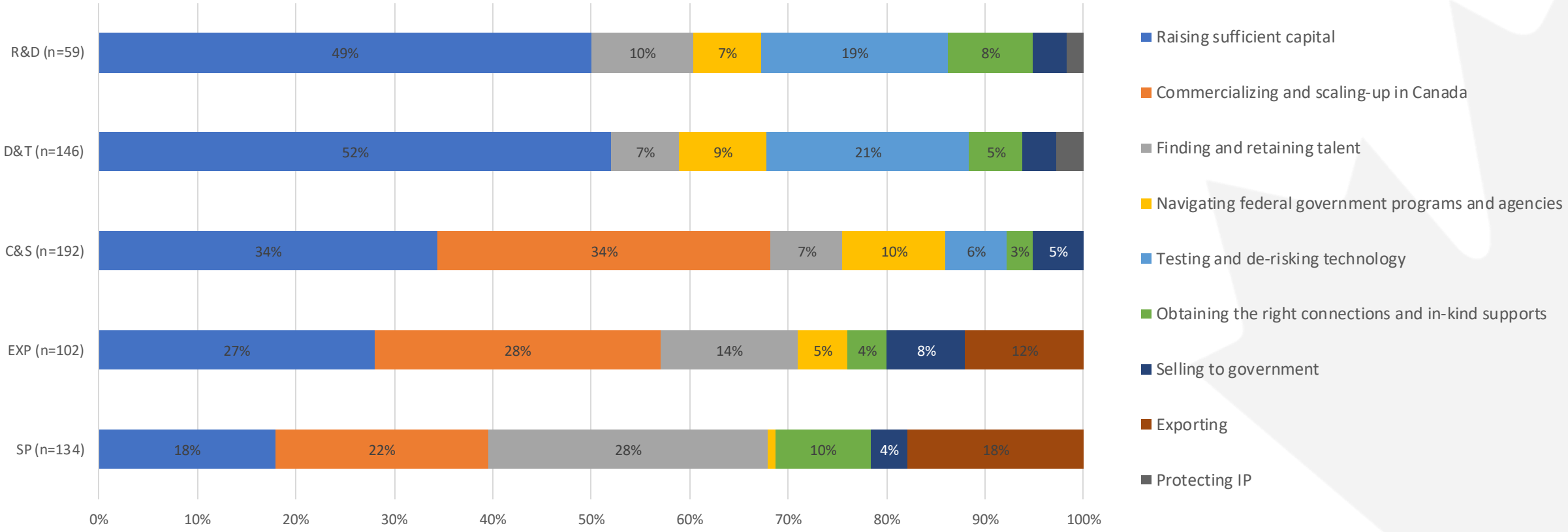
Among the following categories, which was the most difficult to navigate? (select one)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Greatest Challenge] Raising sufficient capital becomes less of an issue for commercialized, export, and service provider companies, which instead require non-financial support to expand into new markets

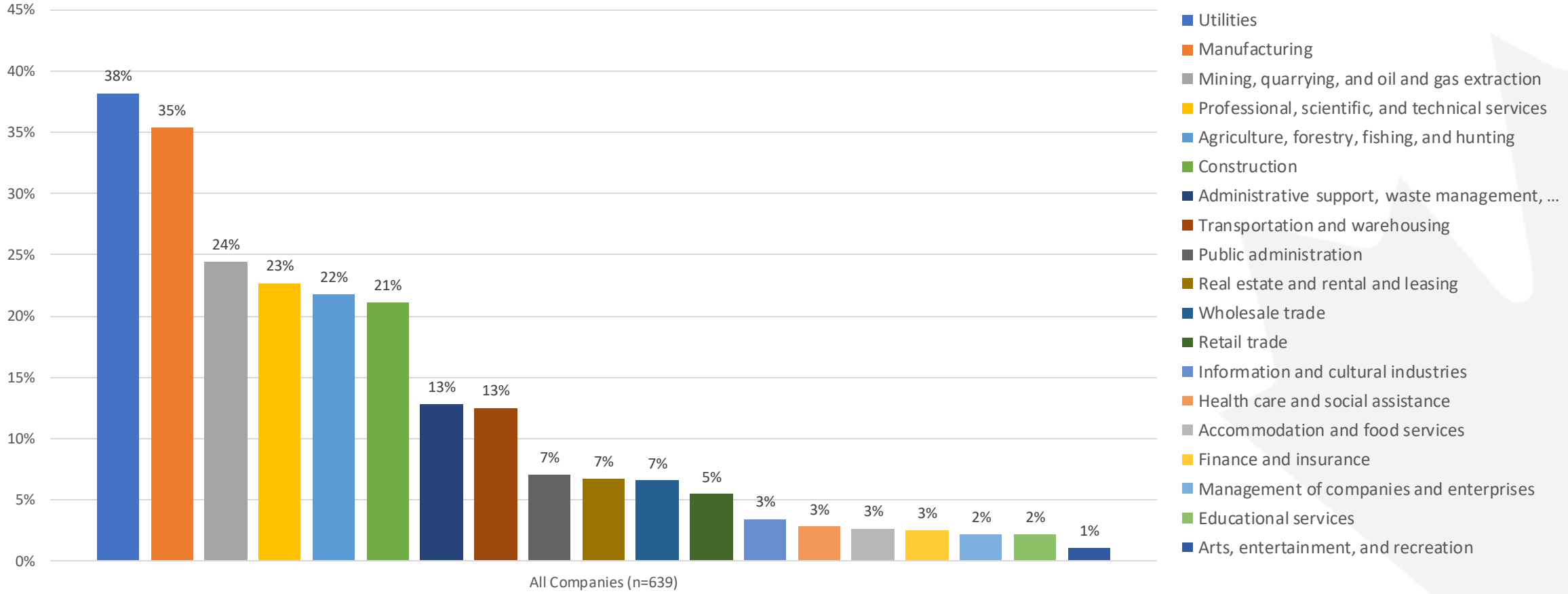
Among the following categories, which was the most difficult to navigate? (select one)
(by stage of development)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Target Industries] Most cleantech companies serve utilities (38%) and manufacturing (35%) industries

Which of the following best describes the market(s) that your company targets and sells to? (select all that apply)

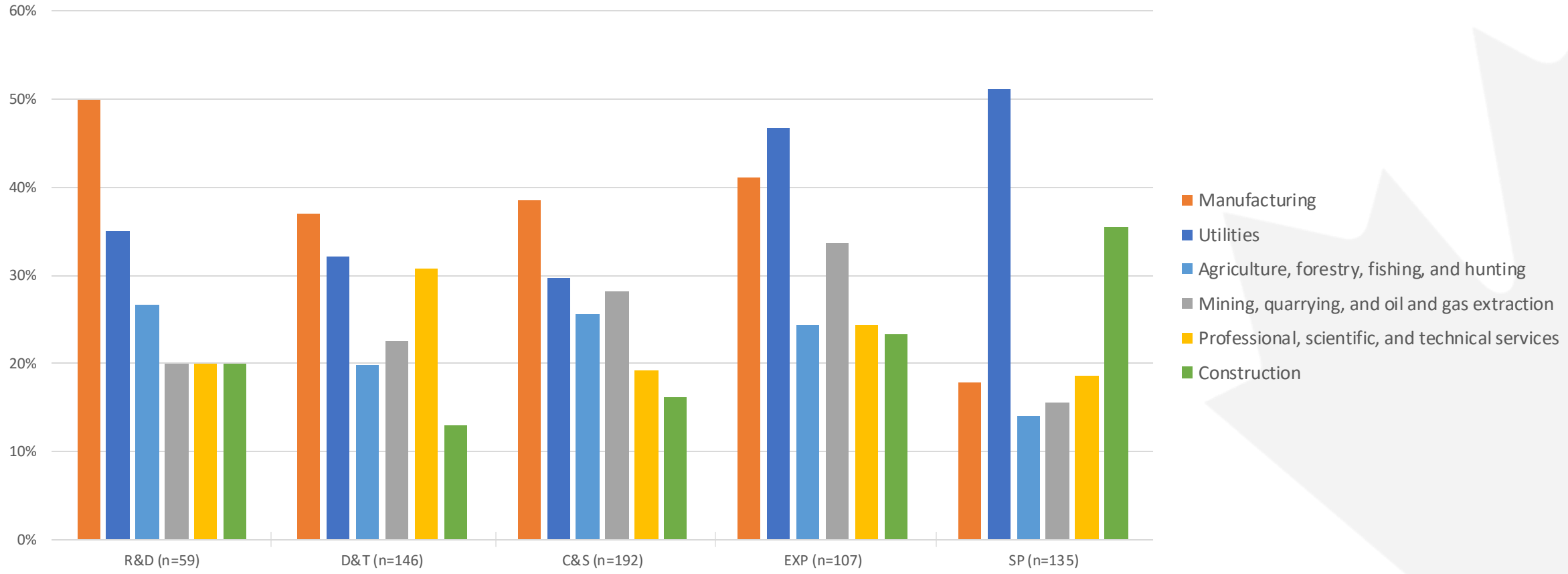


Source: CTDS Industry Data Survey (September 20 – November 14, 2022), North American Industry Classification System (2022)

[Target Industries] R&D companies primarily target manufacturing (50%) while exporters and service providers primarily target utilities (47%, 51%)

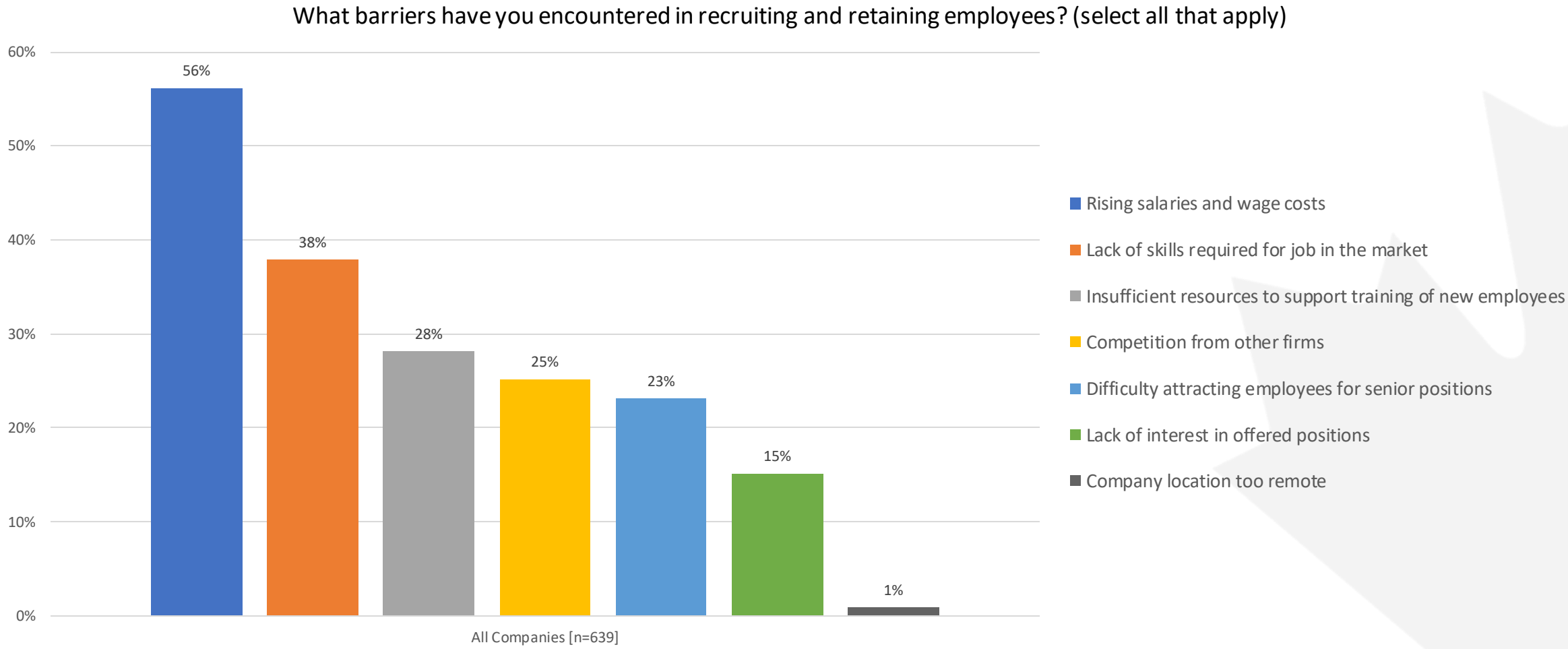
Which of the following best describes the market(s) that your company targets and sells to? (select all that apply)

(top 6, by stage of development)



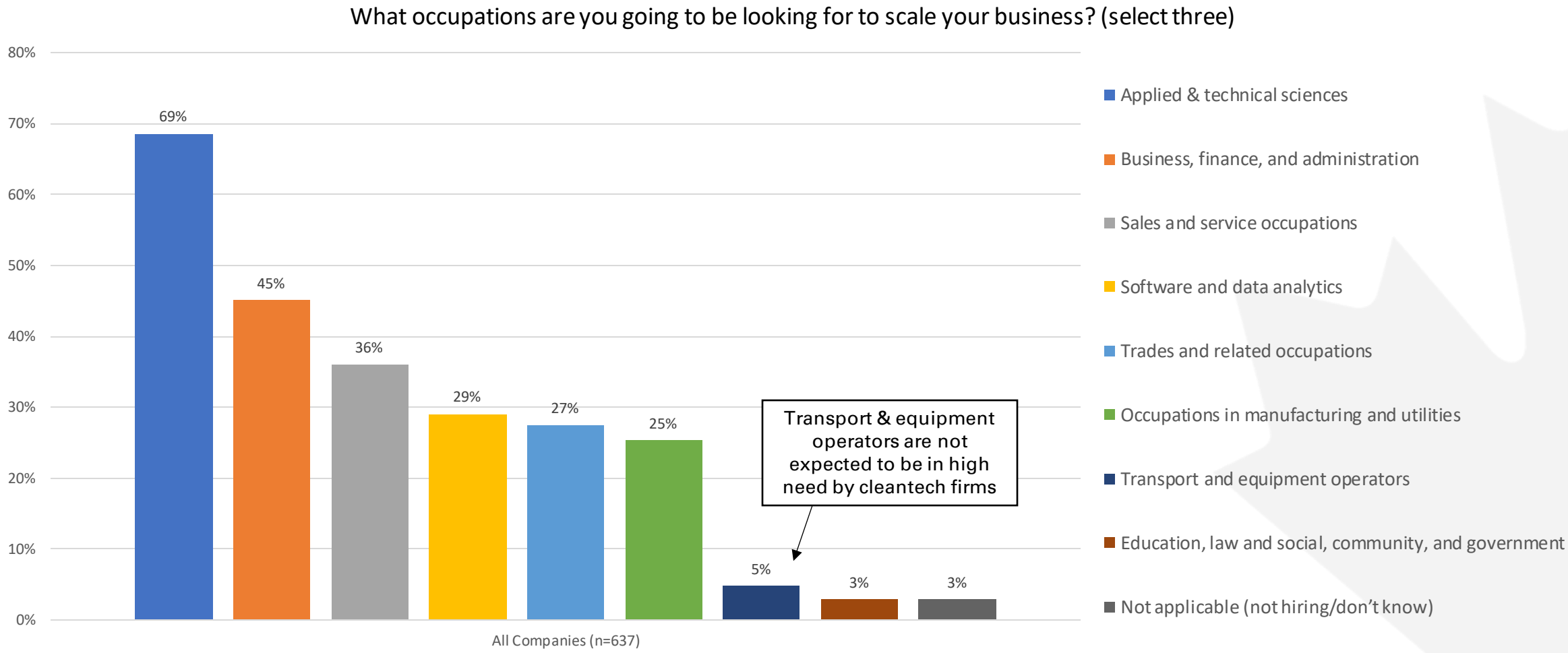
Source: CTDS Industry Data Survey (September 20 – November 14, 2022), North American Industry Classification System (2022)

[Hiring Issues] Rising salaries and wage costs is the primary labor concern for cleantech companies (56%)



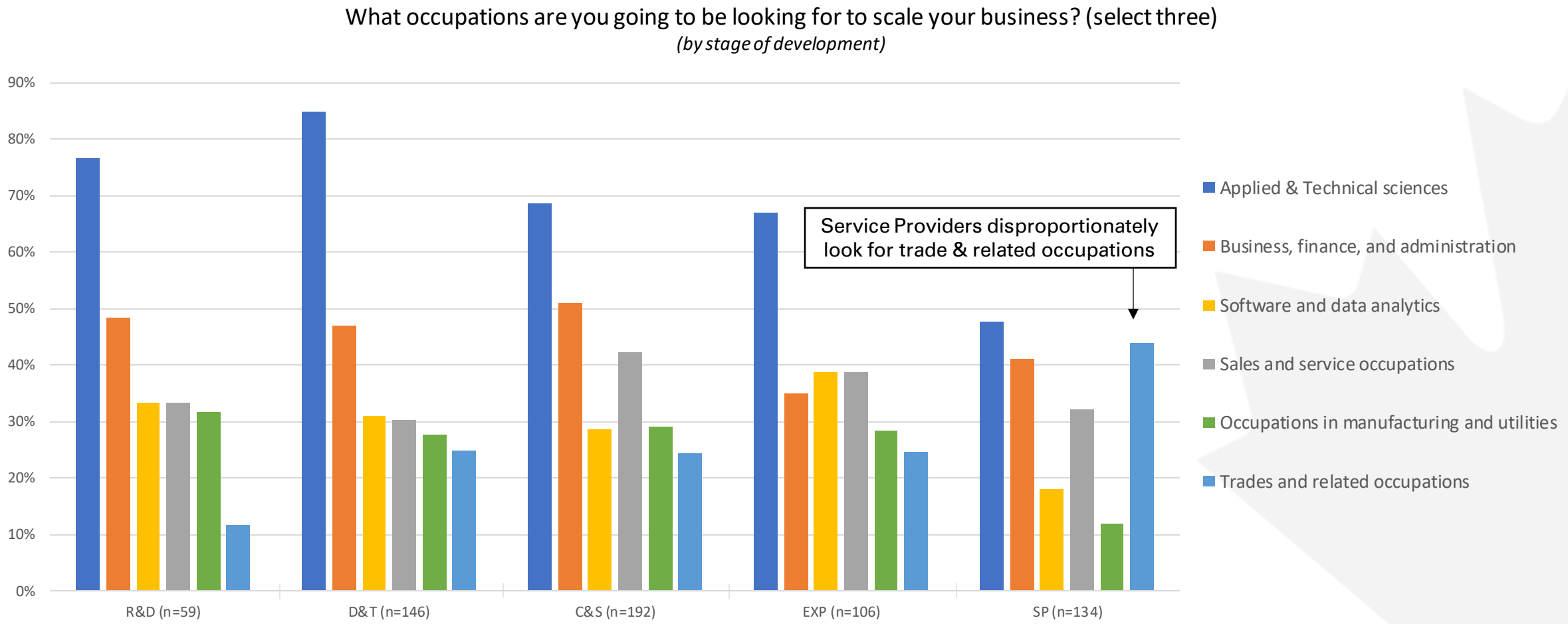
Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Skills Needed] 69% of companies are looking for professionals in applied & technical sciences (e.g. engineers, product designers, chemists)



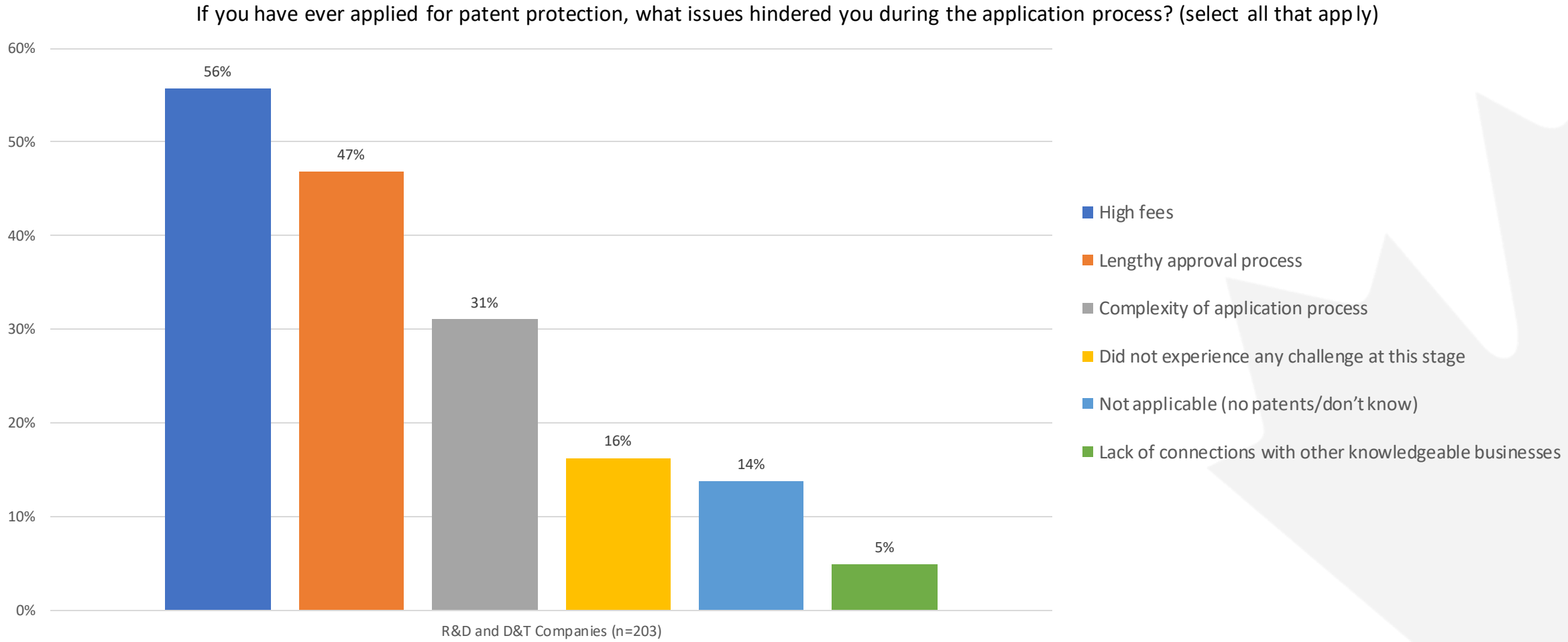
Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Skills Needed] Applied & technical scientists are most needed in the early stages of innovation, and least needed by service providers



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

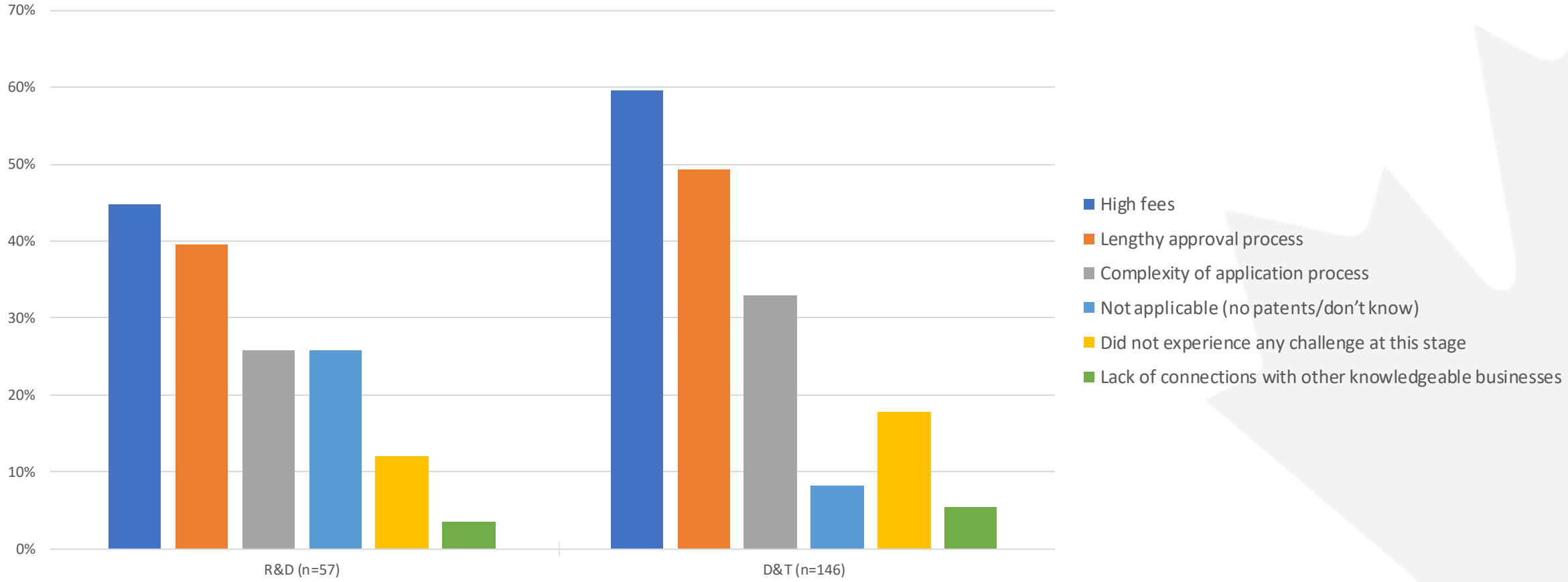
[Patent Problems] The time and money required to secure patent protection are major challenges for firms at the R&D and D&T stages



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Patent Problems] Similar trends across stages of development, R&D companies have less patents than D&T companies

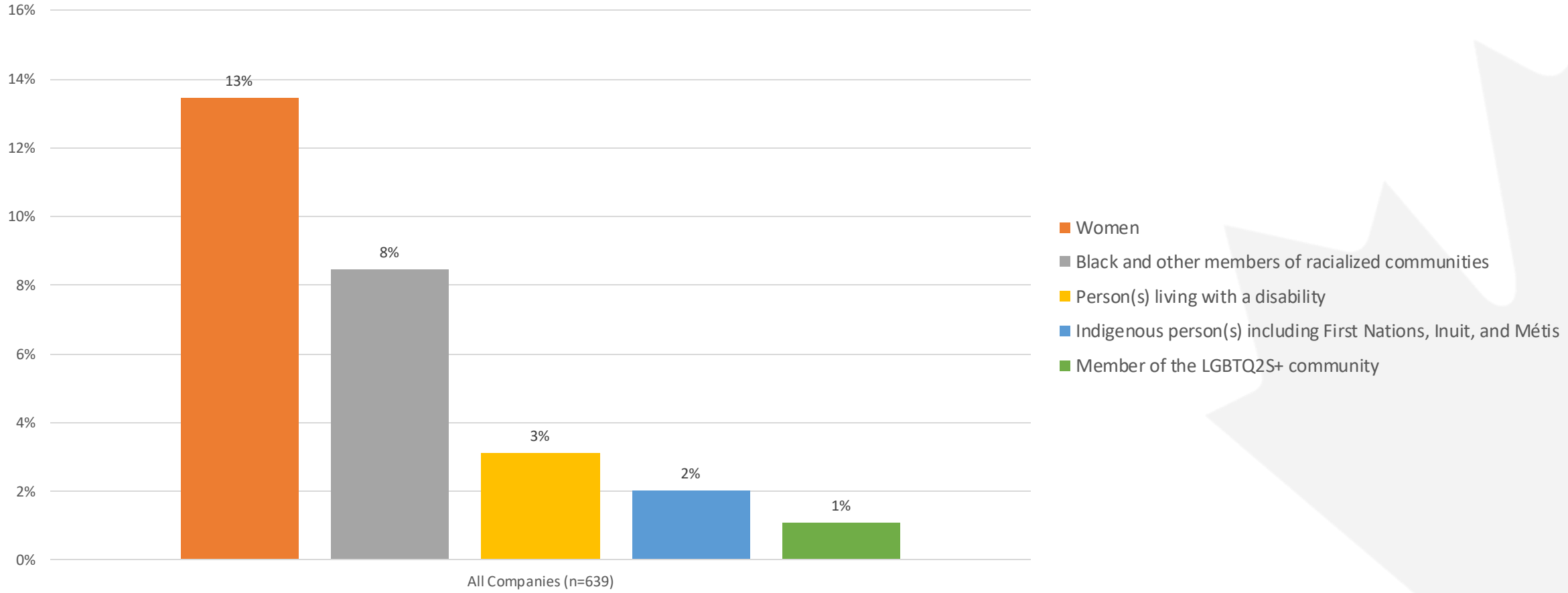
If you have ever applied for patent protection, what issues hindered you during the application process? (select all that apply)
(by stage of development)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[EDI] 13% of cleantech companies are owned by women but most others lack diversity at the management level

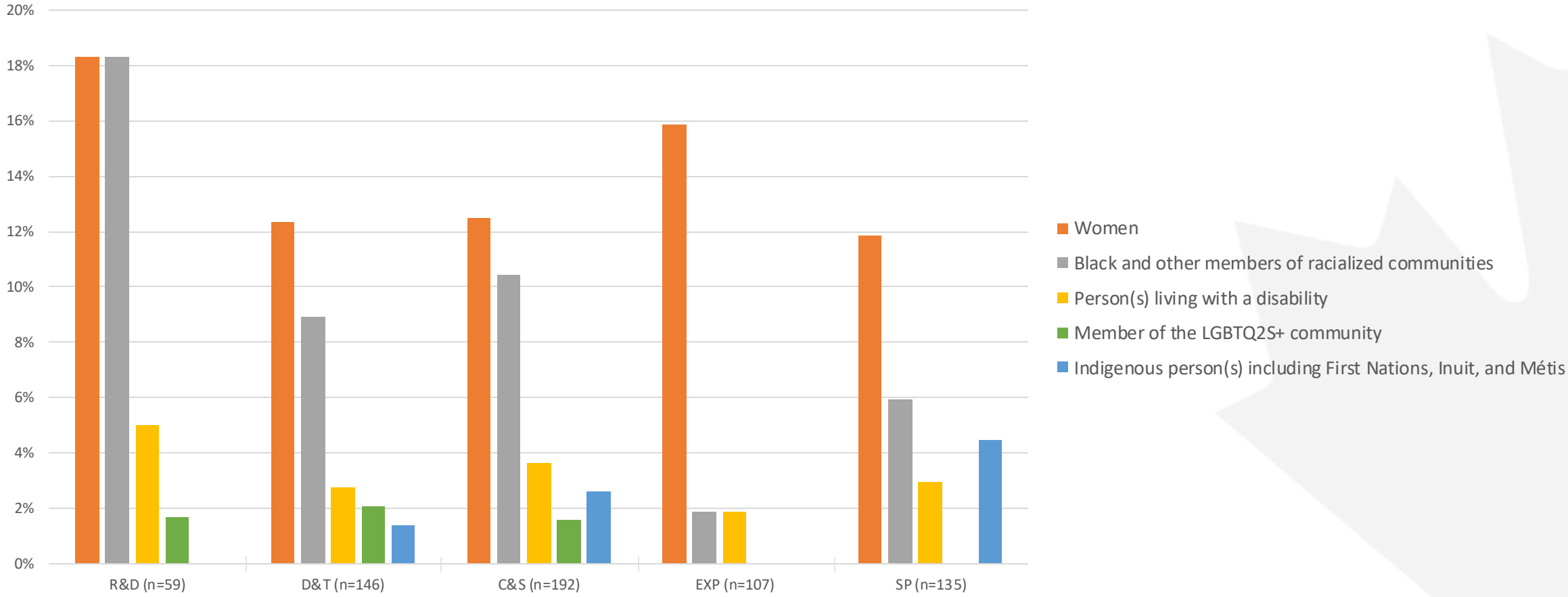
Is your company over 50% owned, managed and/or controlled by person(s) who self-identify as... (select all that apply)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

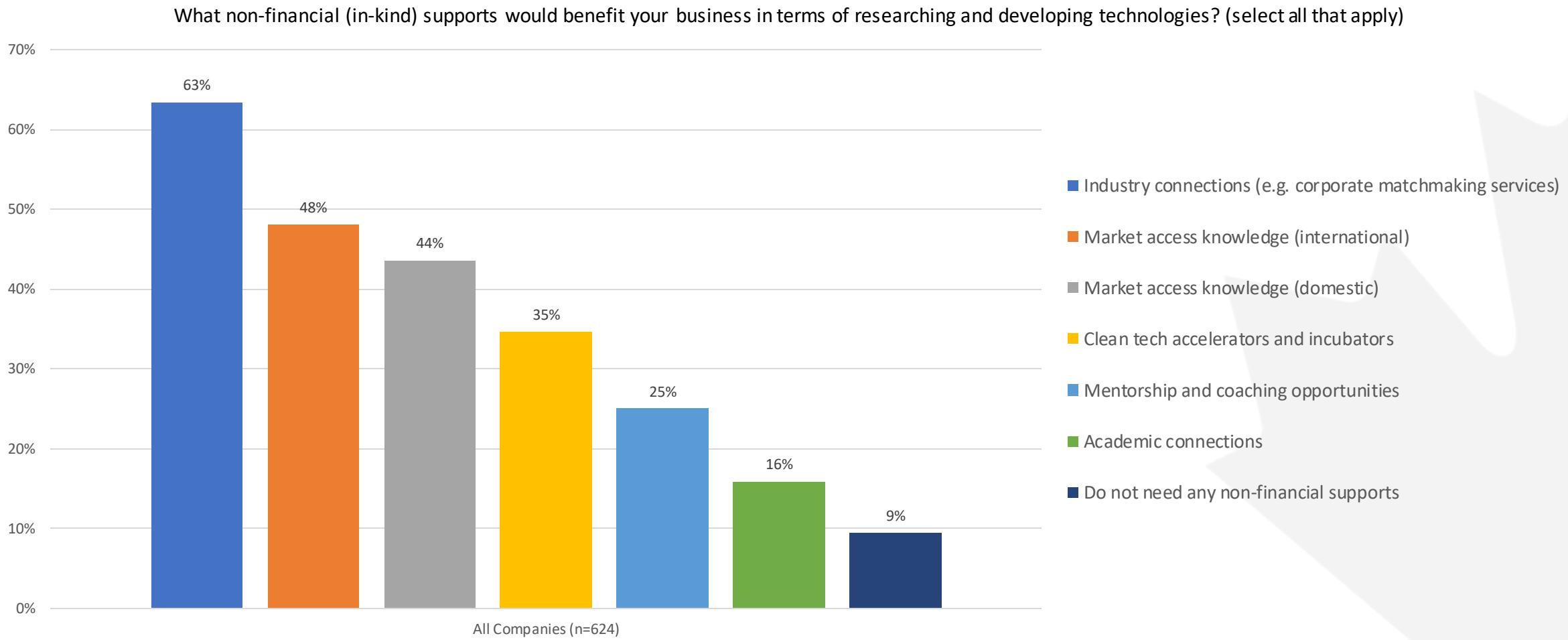
[EDI] R&D cleantech companies are the most diverse by stage of development (18% women, 18% Black and other members of racialized communities)

Is your company over 50% owned, managed and/or controlled by person(s) who self-identify as... (select all that apply)
(by stage of development)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

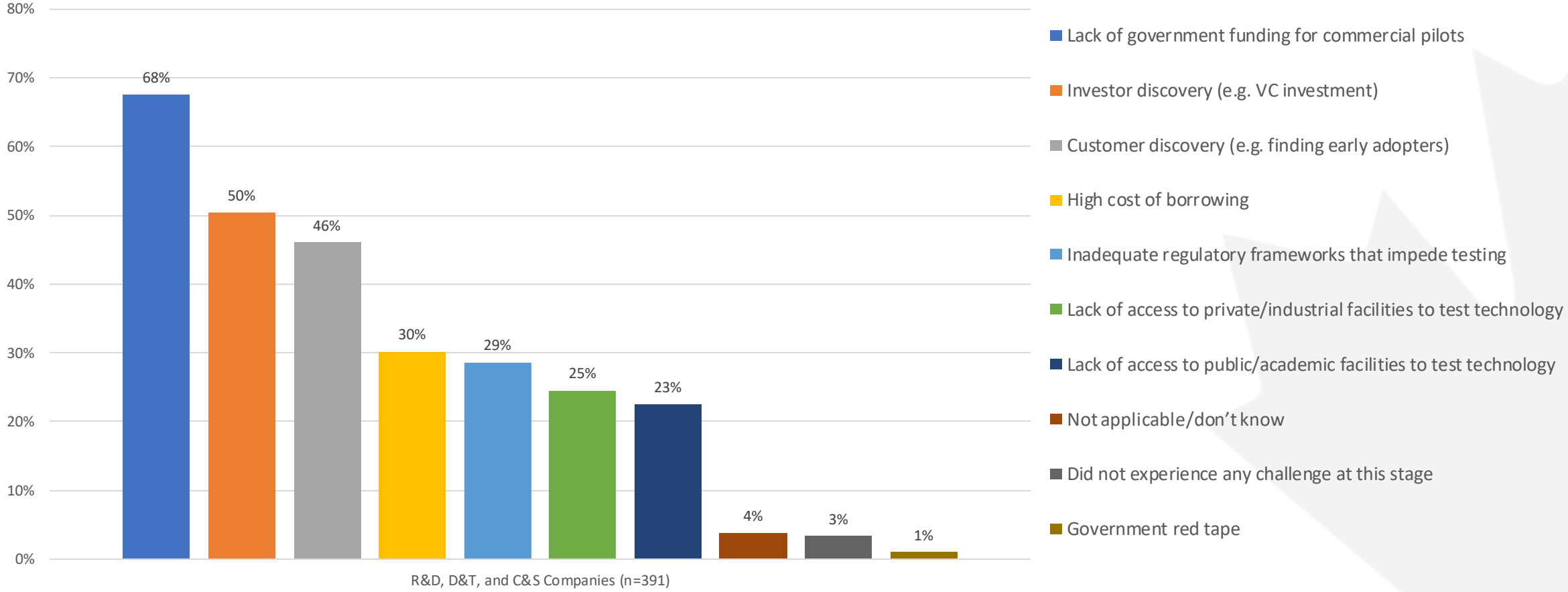
[Non-financial Supports] Industry connections (63%) stand out as the primary in-kind support needed by cleantech companies



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Issues at Demonstration] Access to funding, from government (68%) & investors (50%) is the greatest barrier for cleantech firms during the demonstration & testing stage

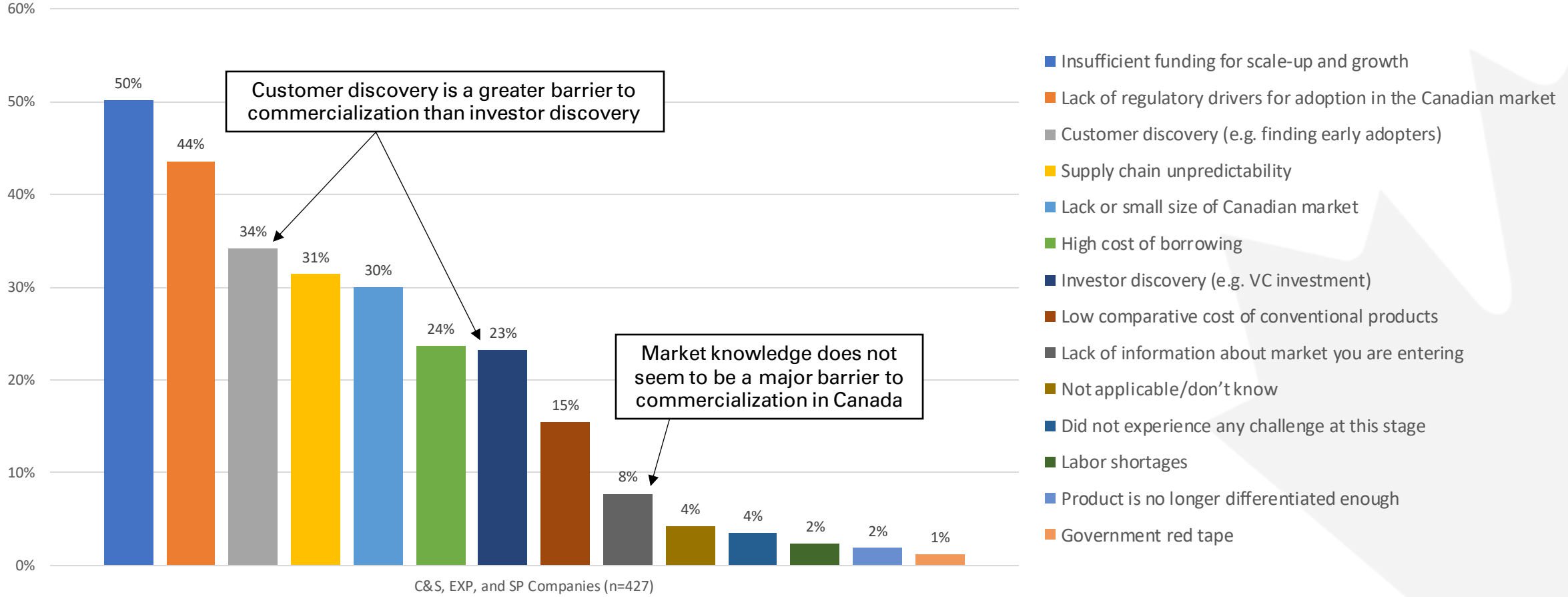
What are the primary challenges you are facing in preparation for the demonstration and testing phase? (select all that apply)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Issues at Commercialization] Investor discovery is not a major challenge to commercialization (23%), yet 50% of cleantech firms struggle with finding enough funding for scale-up and growth

What are your major struggles with commercialization in Canada? (select all that apply)

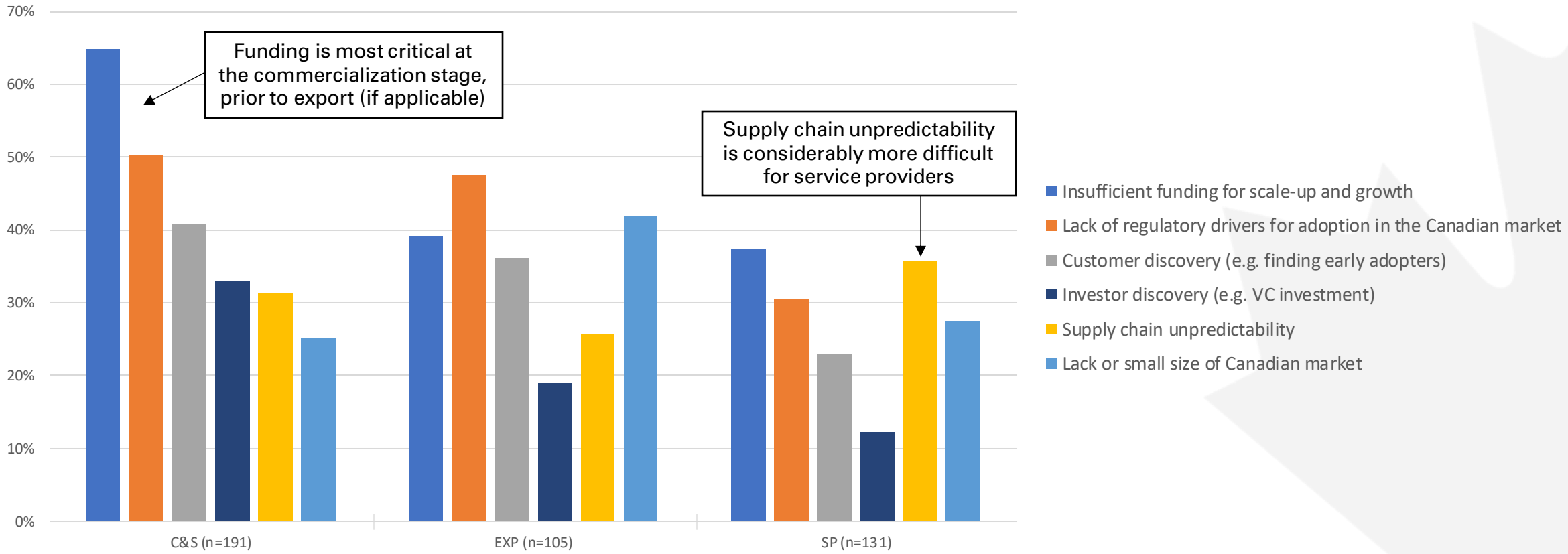


Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Issues at Commercialization] Customer and investor discovery are nearly twice as challenging for firms at the commercialization stage (41% & 32% respectively) than for service providers (22% & 12%)

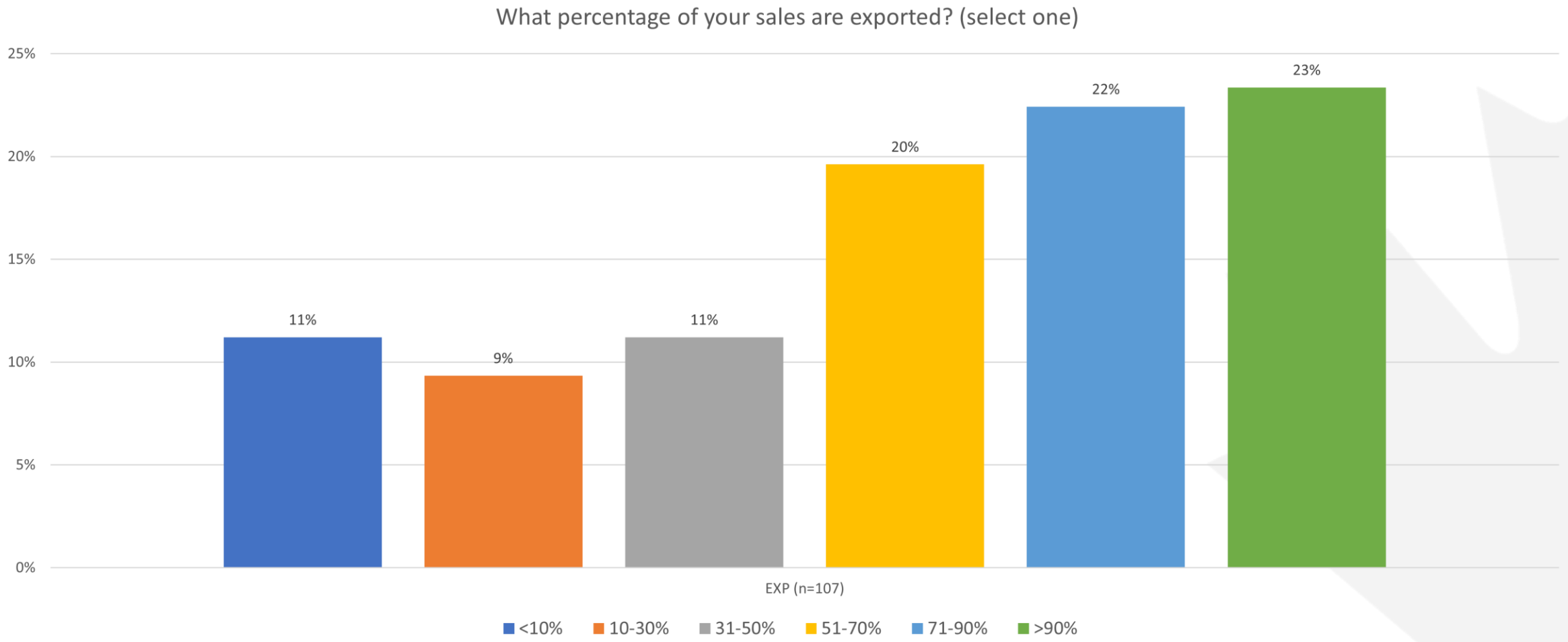
What are your major struggles with commercialization in Canada? (select all that apply)

(top 6, by stage of development)



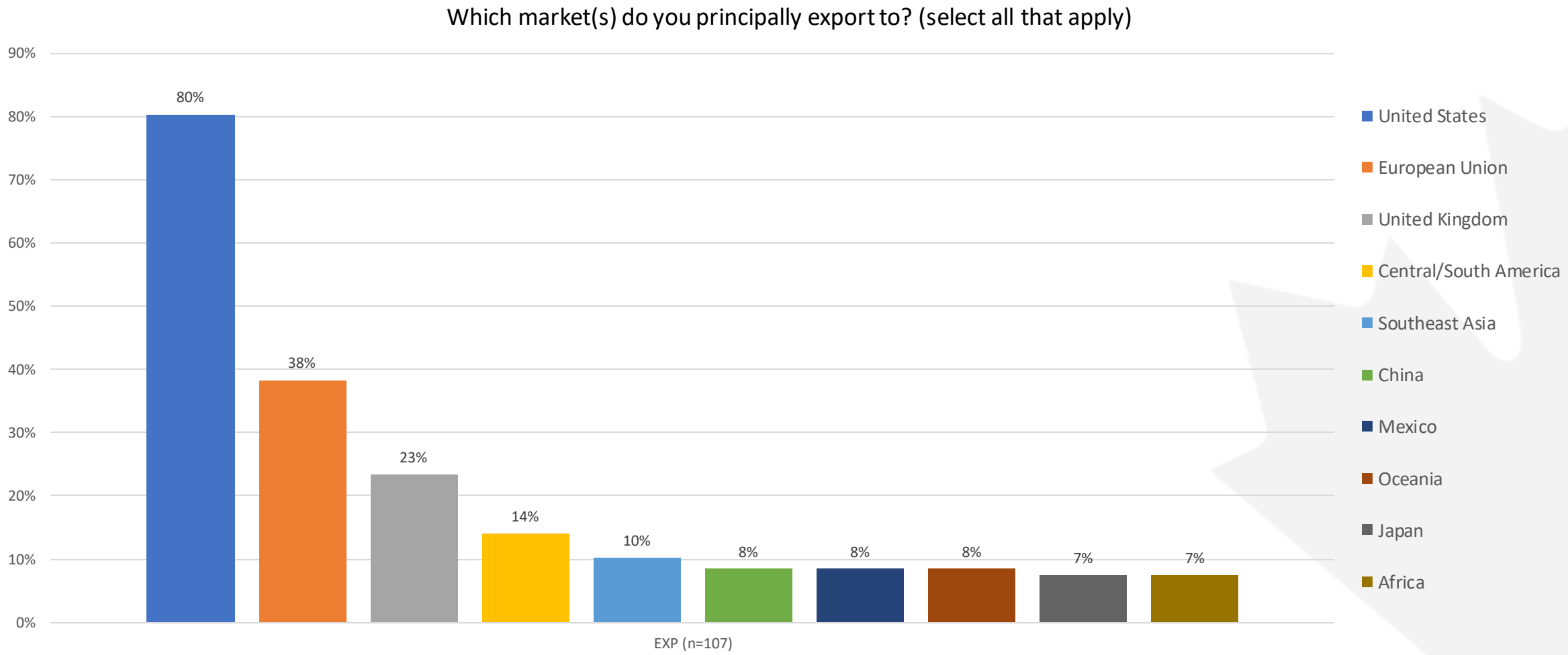
Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Share of Exports] 67% of the Canadian cleantech firms that do export make at least half of their sales abroad



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Export Destinations] The US is the main destination for 80% of the cleantech firms that export

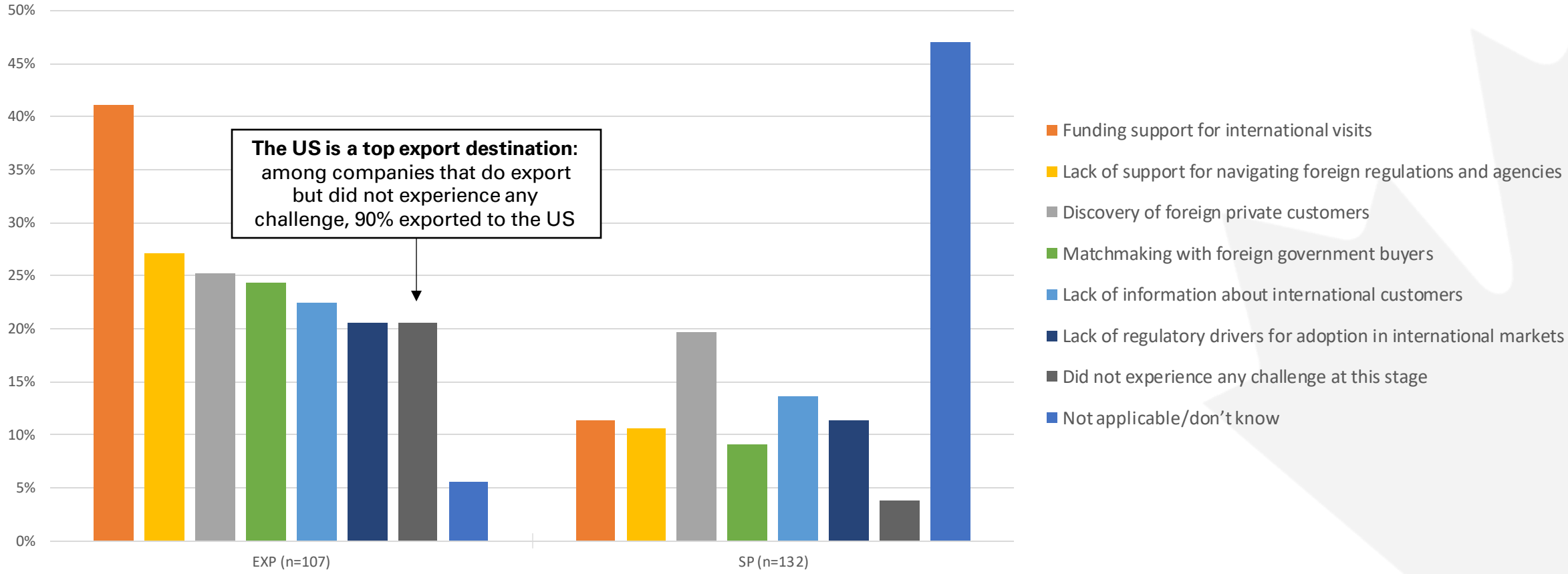


Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Export Issues] The greatest challenge for exporting firms is funding international visits (41%)

What are your major struggles with exporting your products? (select all that apply)

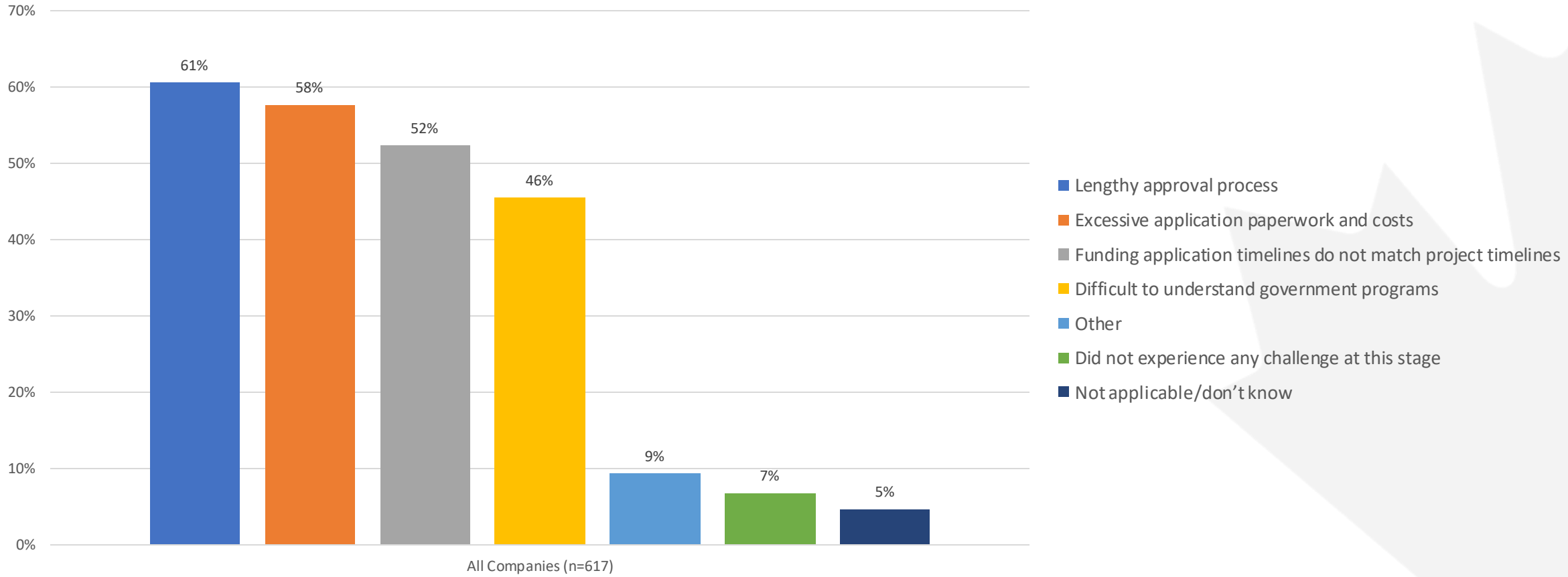
(top 8, by stage of development)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

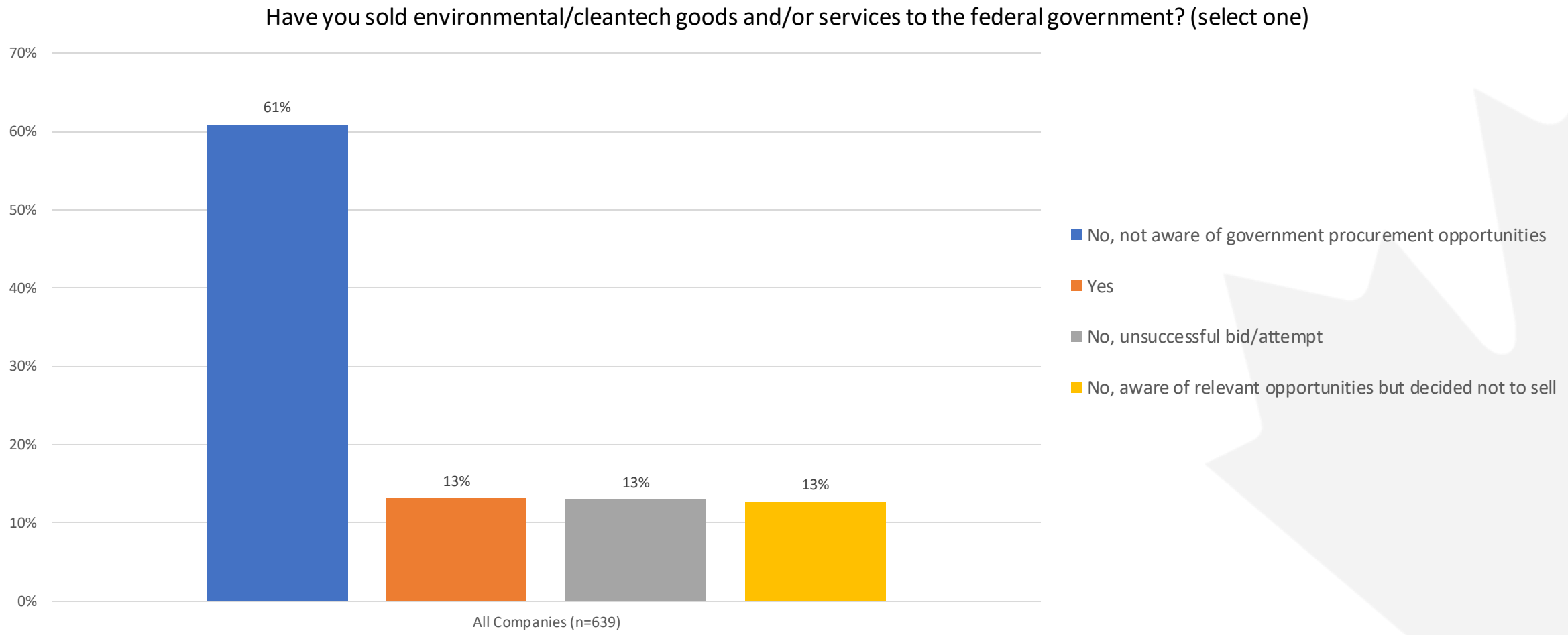
[Interacting with Government] When navigating federal government programs, respondents were impeded by lengthy approval process (61%) and excessive paperwork (58%)

What were the principal barriers you faced in accessing federal government funding or navigating federal government programs & agencies? (select all that apply)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

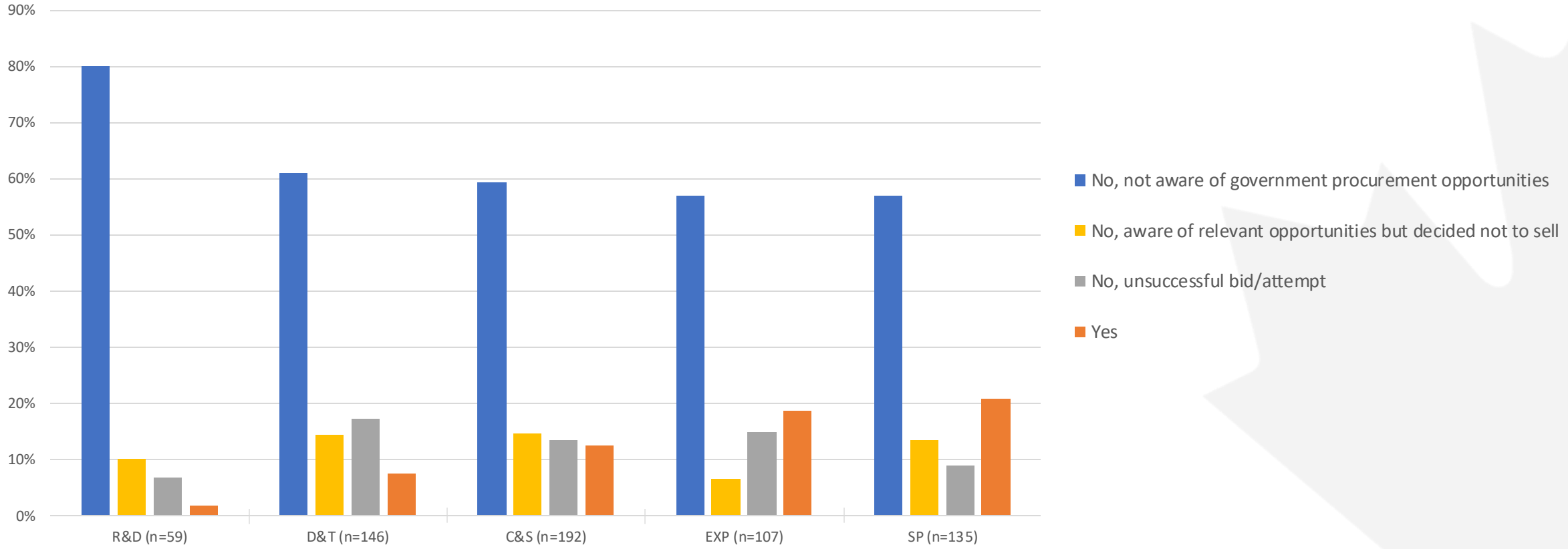
[Federal Procurement] The majority of respondents are not aware of government procurement opportunities (61%)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Federal Procurement] As firms move from R&D to commercialization & export, they sell products and services more frequently to the federal government

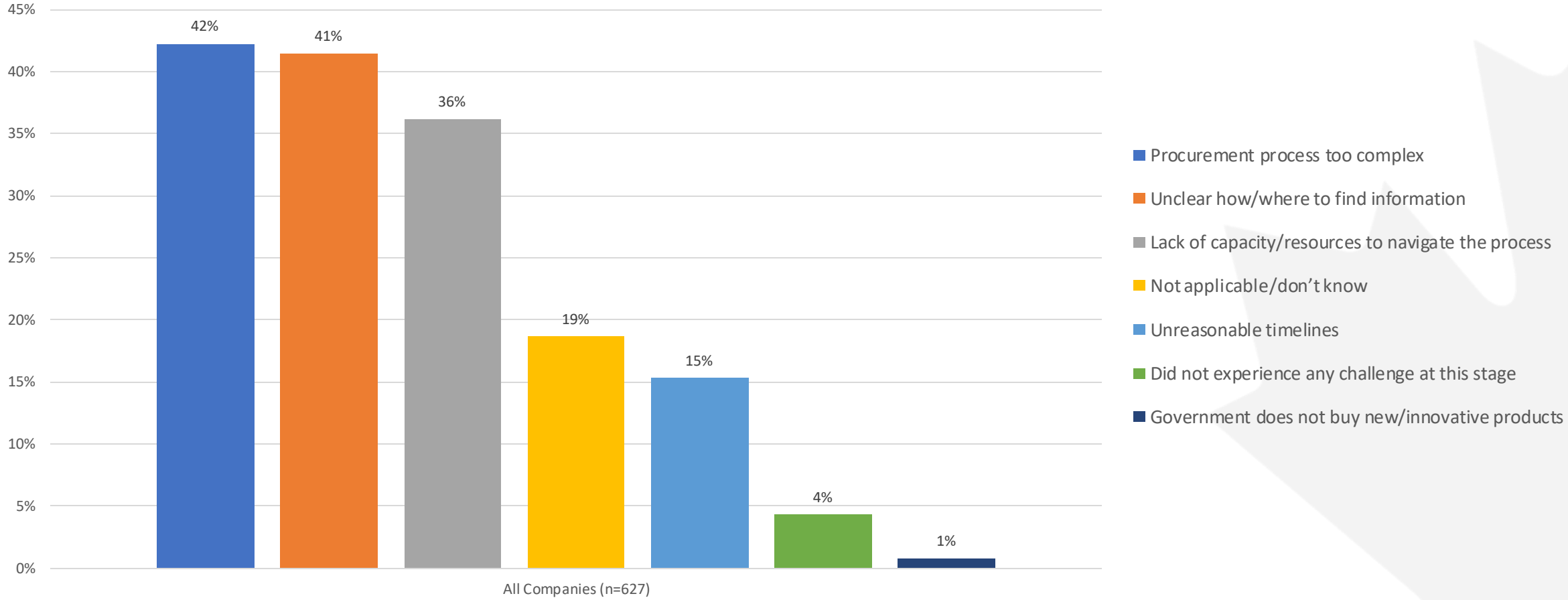
Have you sold environmental/cleantech goods and/or services to the federal government? (select one)
(by stage of development)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Issues with Federal Procurement] Complexity of the process (42%, 41%) and a lack of resources to navigate it (36%) dominate the responses for procurement barriers

What barriers have you faced or what issues might discourage you from selling to the federal government? (select all that apply)



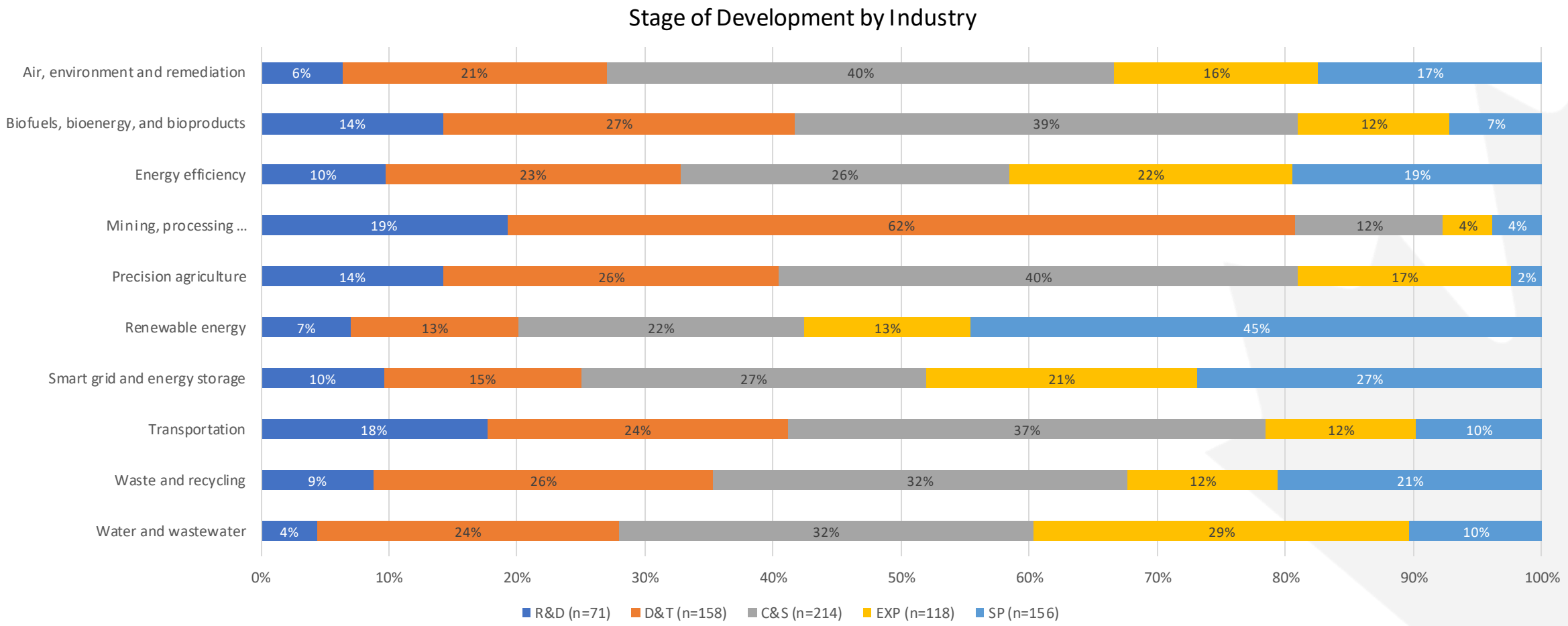
Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

Canada

Results

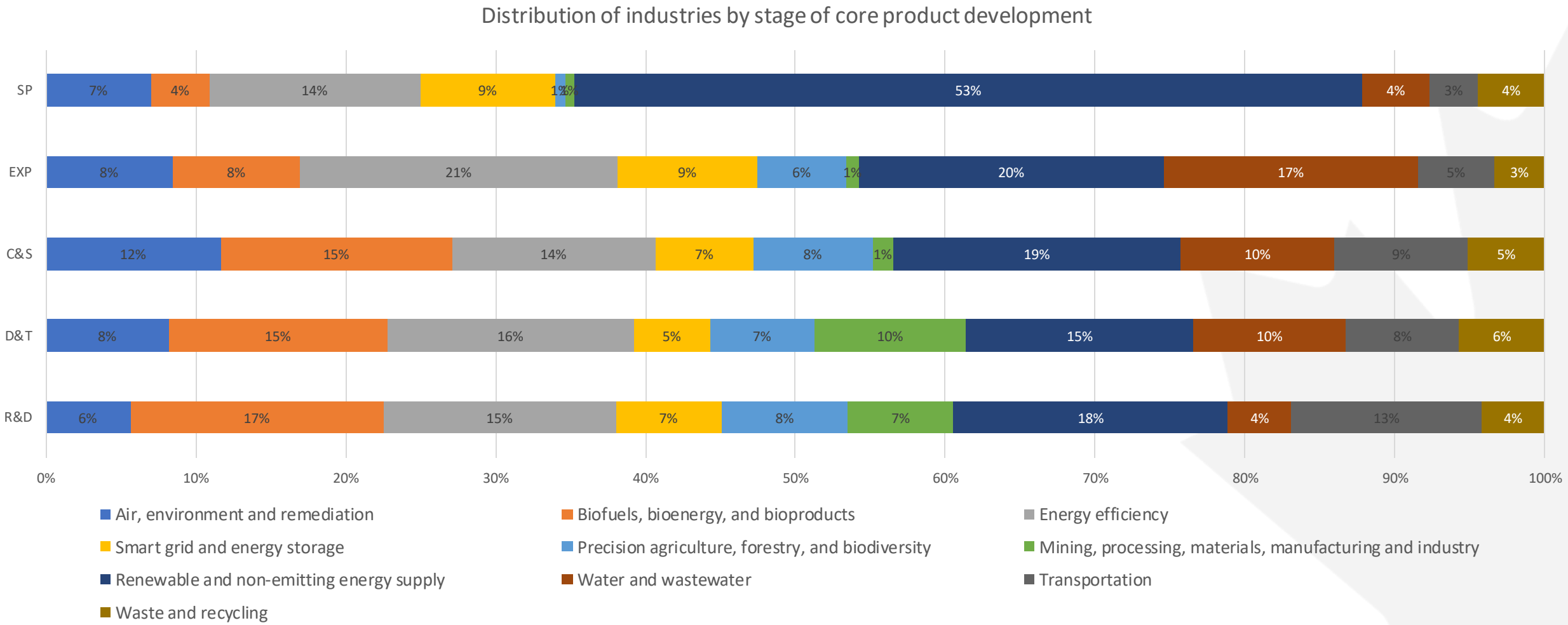
By cleantech industry

[Stage of development by industry] 62% of cleantech firms in Mining+ have their core product at the demonstration and technology testing stage



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

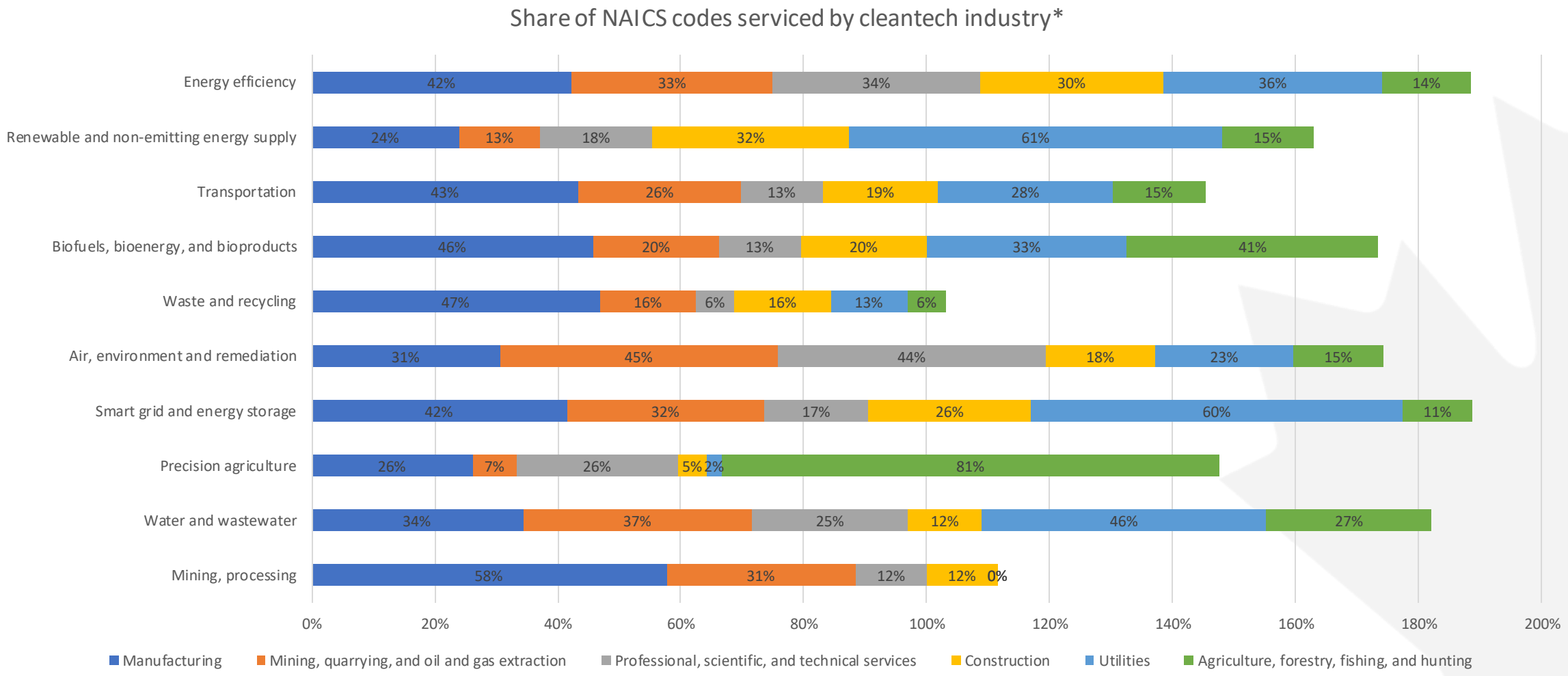
[Industry by stage of development] More than half of Service Providers are in the Renewable & Non-Emitting Energy Supply industry



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[NAICS serviced by cleantech industry]

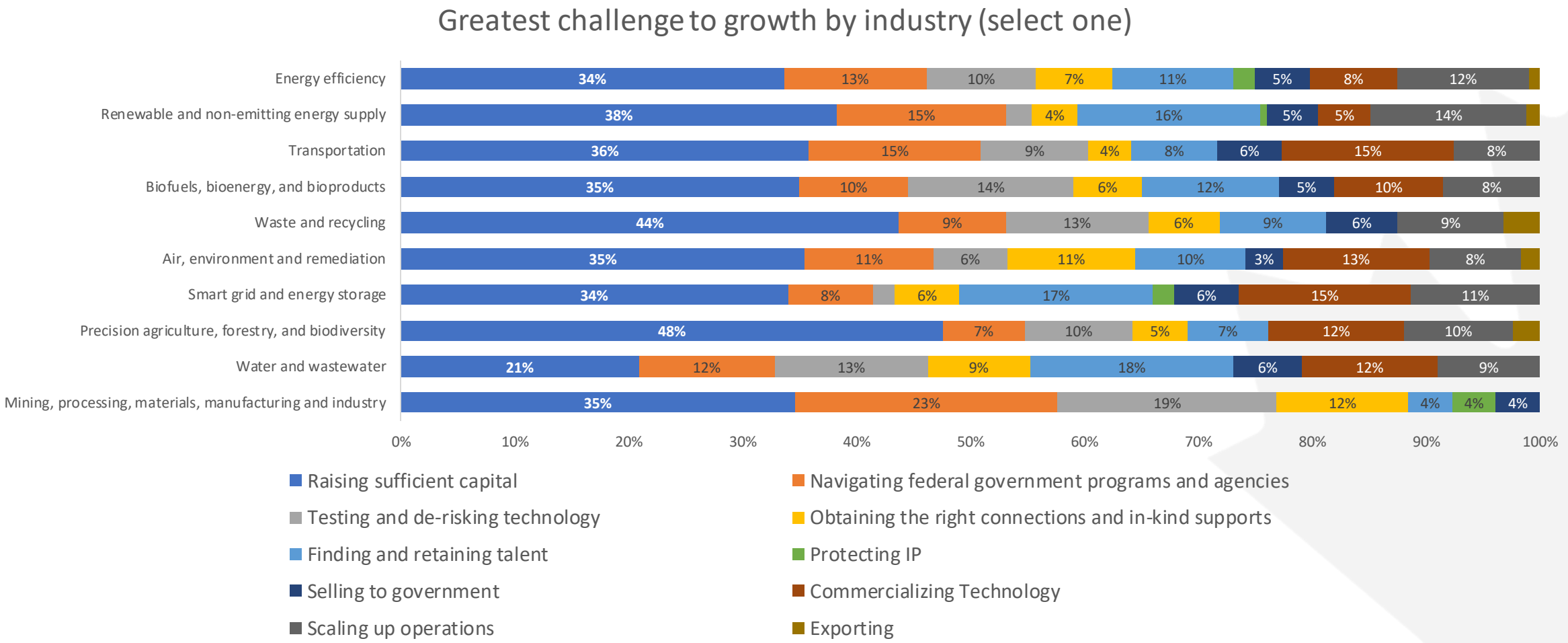
Canada



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

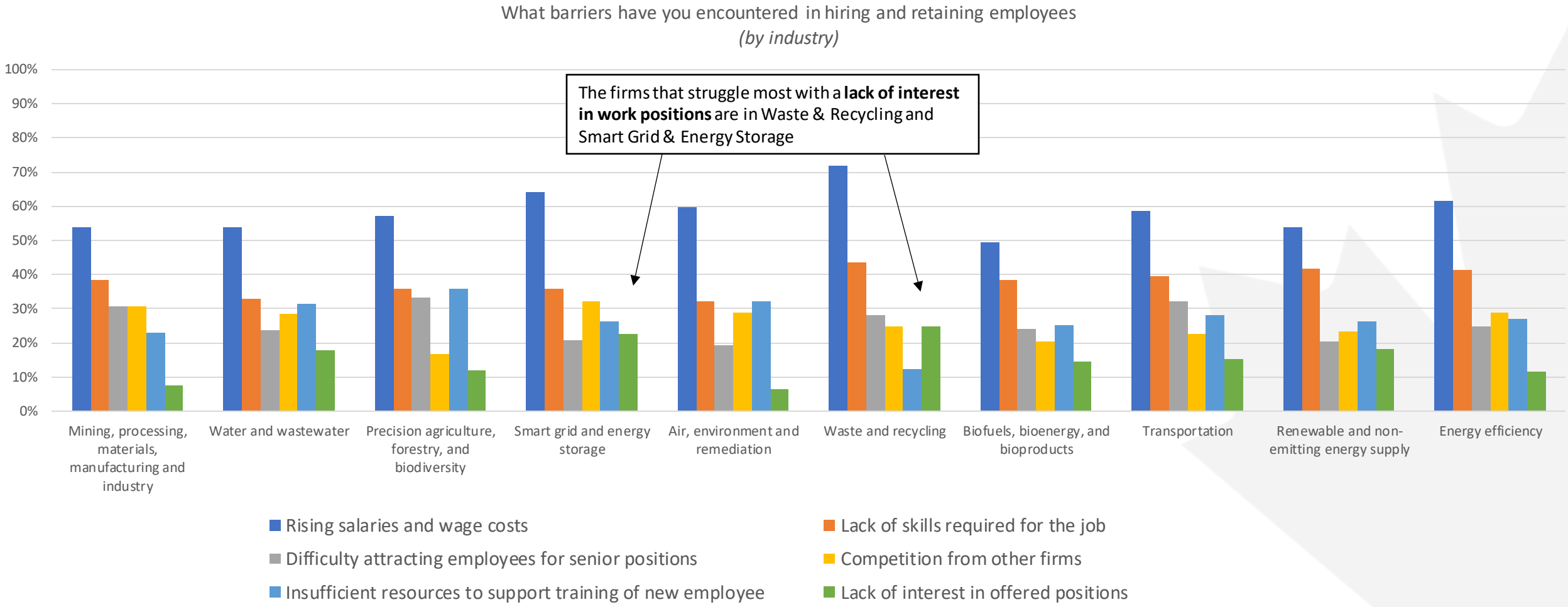
*Values may not add up to 100% as firms may service more than one industry

[Greatest Challenge] Raising capital is most challenging for Waste & Recycling and Precision Agriculture firms, and easiest for Water & Wastewater firms



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

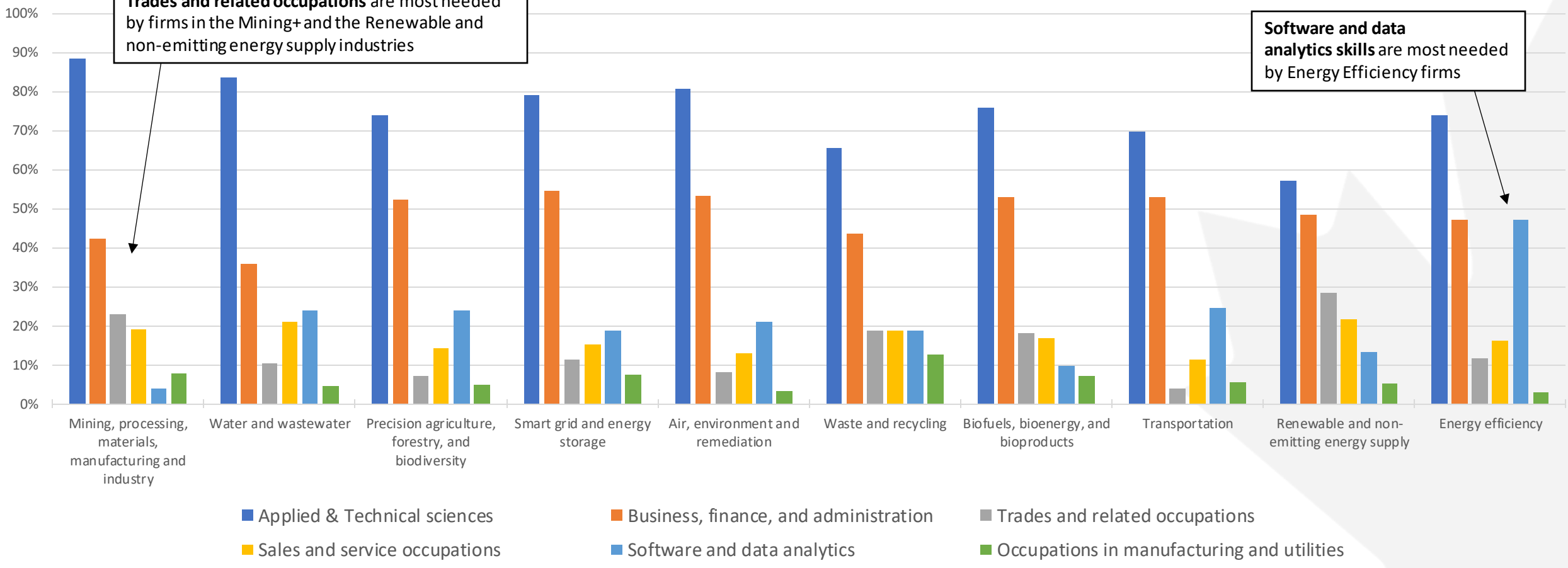
[Hiring] Between 32% and 42% of firms across all industries struggle to find the right skills on the market and retaining employees



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

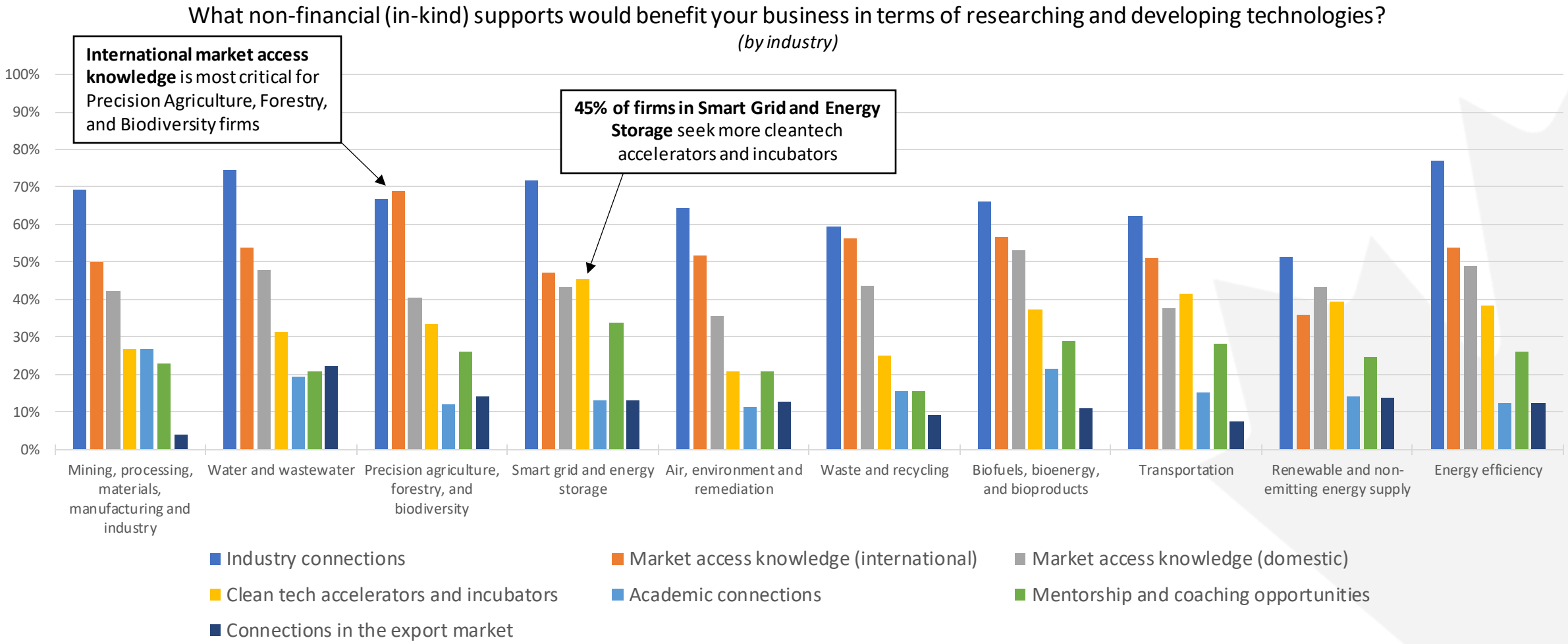
[Skills] In every industry, more than 50% of cleantech firms will need Applied & Technical Sciences professionals to grow

What occupations are you going to be looking for to scale your business?
(by industry)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

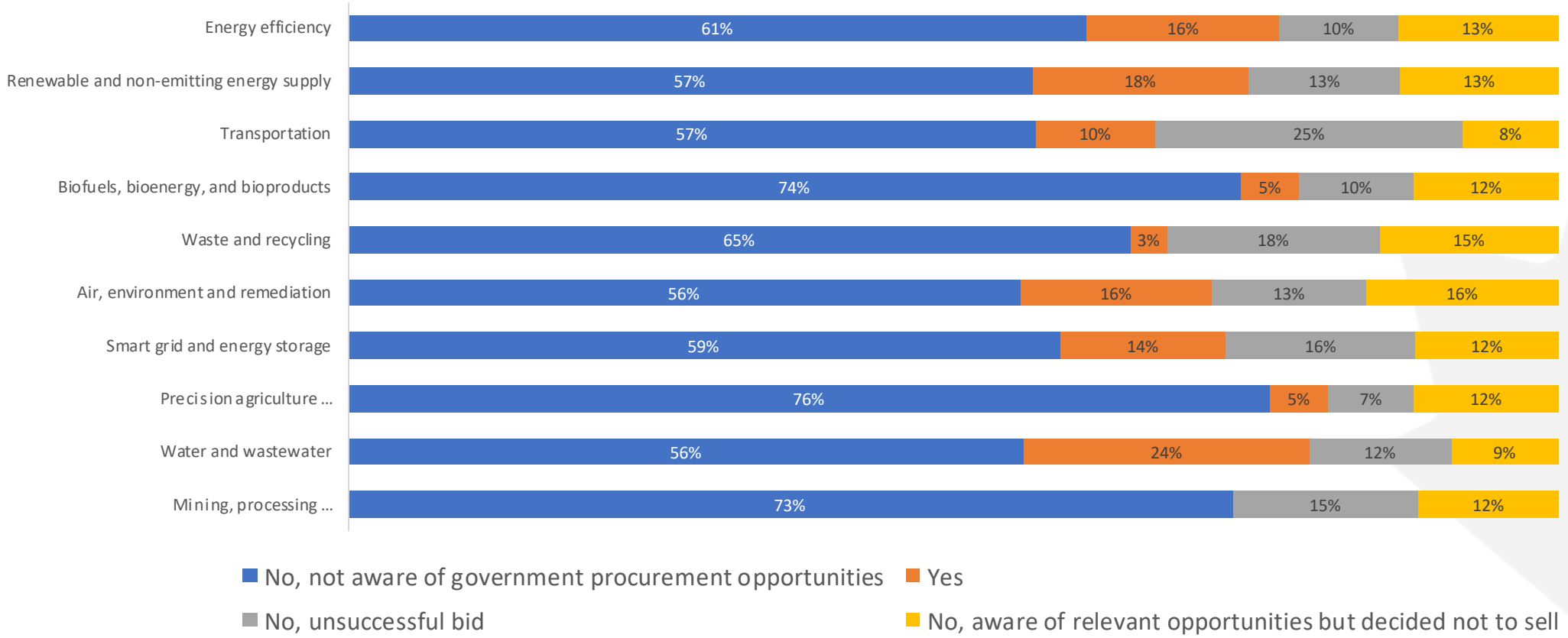
[Non-financial Supports] More than half of firms across all industries seek support making industry connections



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

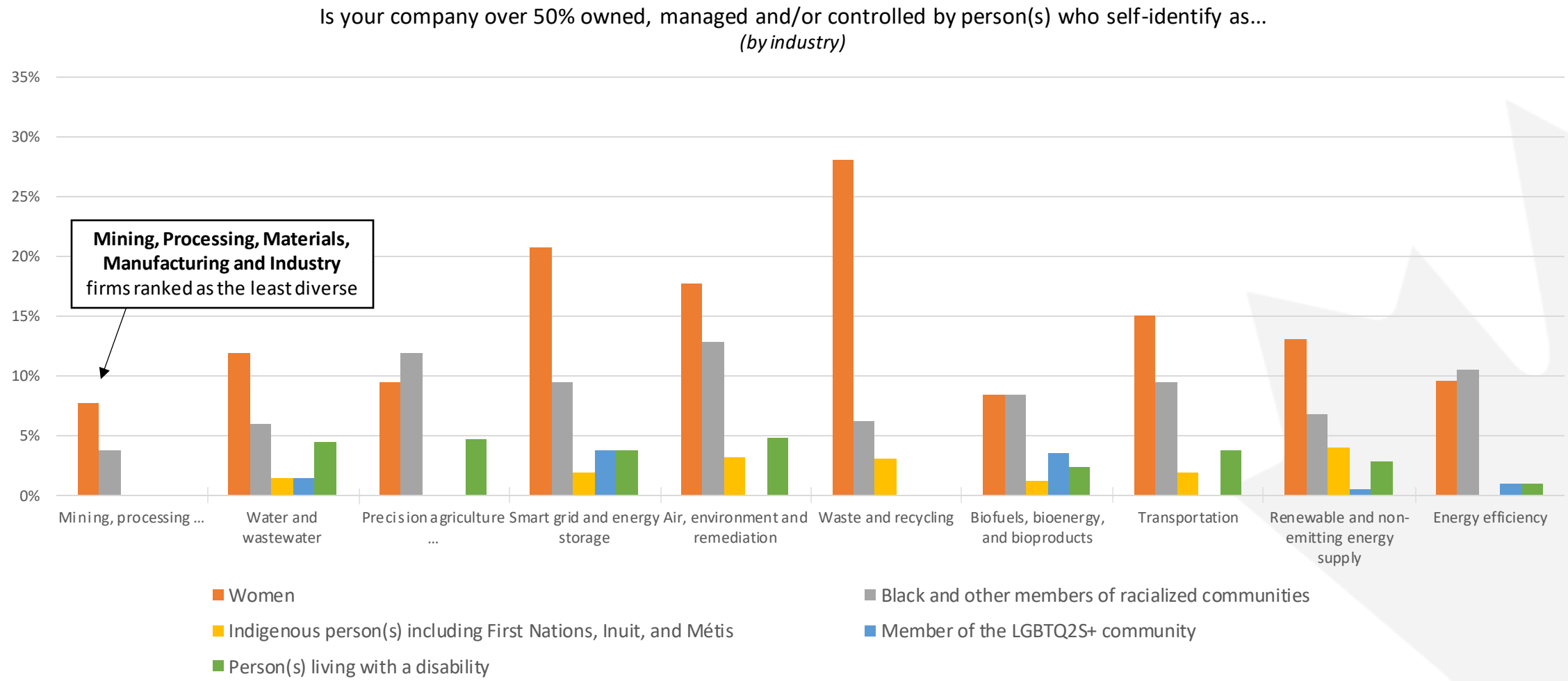
[Federal Procurement] Long-standing cleantech industries like Water and Wastewater (24%) have been most successful with selling to government

Has your company sold cleantech goods or services to the federal government?
(by industry)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[EDI] Waste and recycling, Smart grid and energy storage firms are the highest owned or managed by women (28% and 21% respectively)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

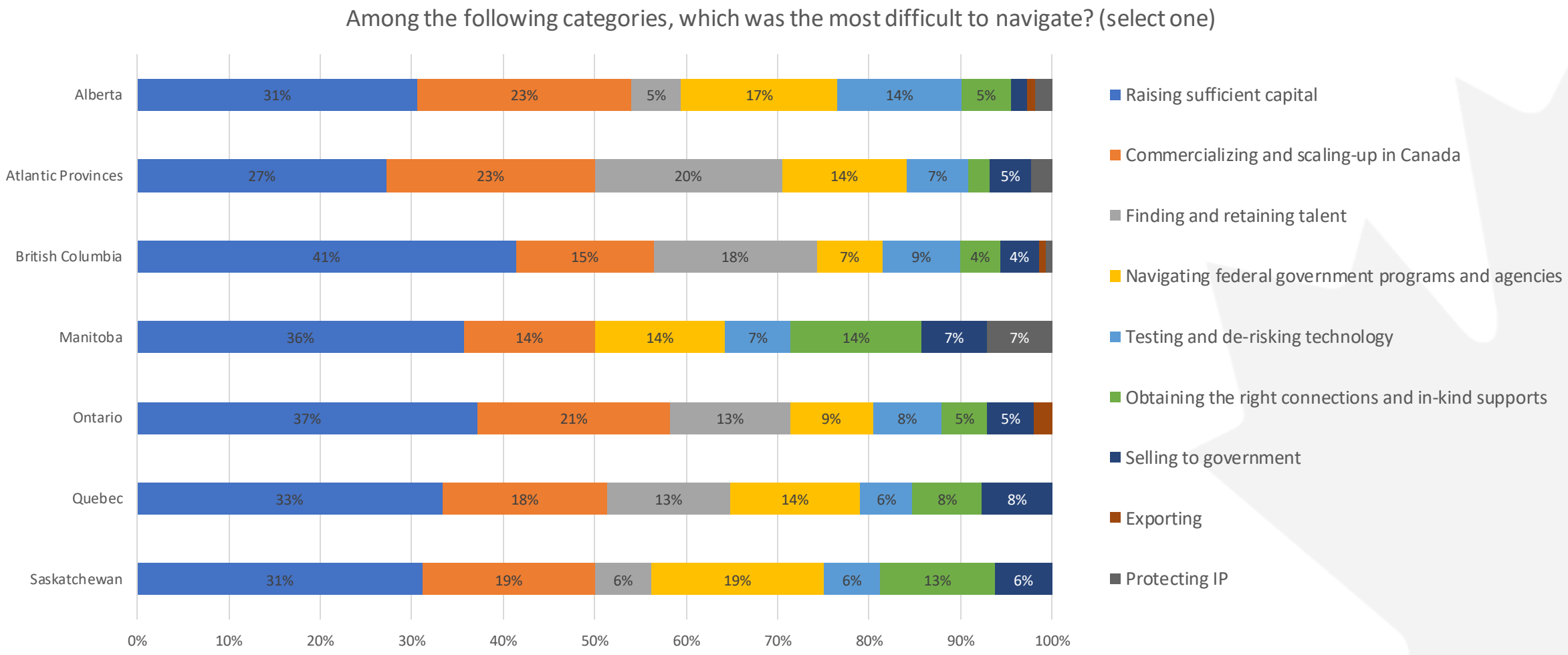
Canada

Results

By province and territory

[Greatest Challenge] Raising sufficient capital is again the most consistent challenge across provinces

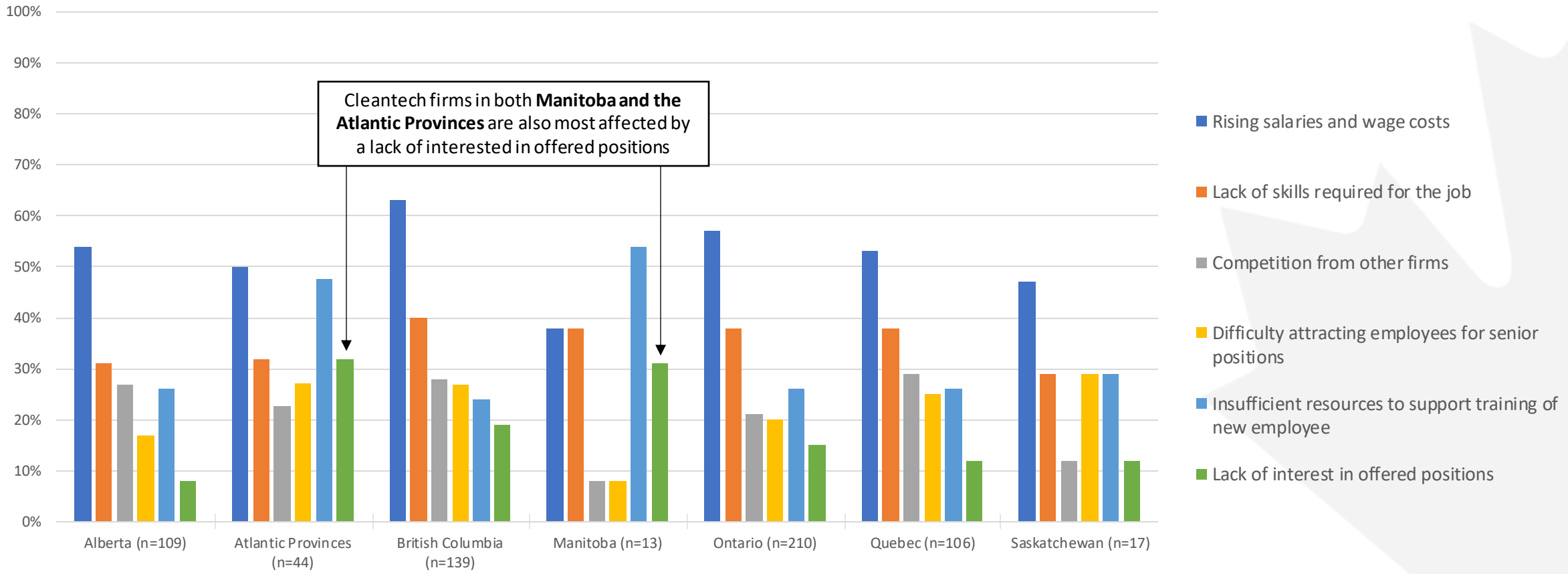
Canada



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Hiring Issues] Lack of resources to train new employees is most challenging for cleantech firms in Manitoba and Atlantic Canada

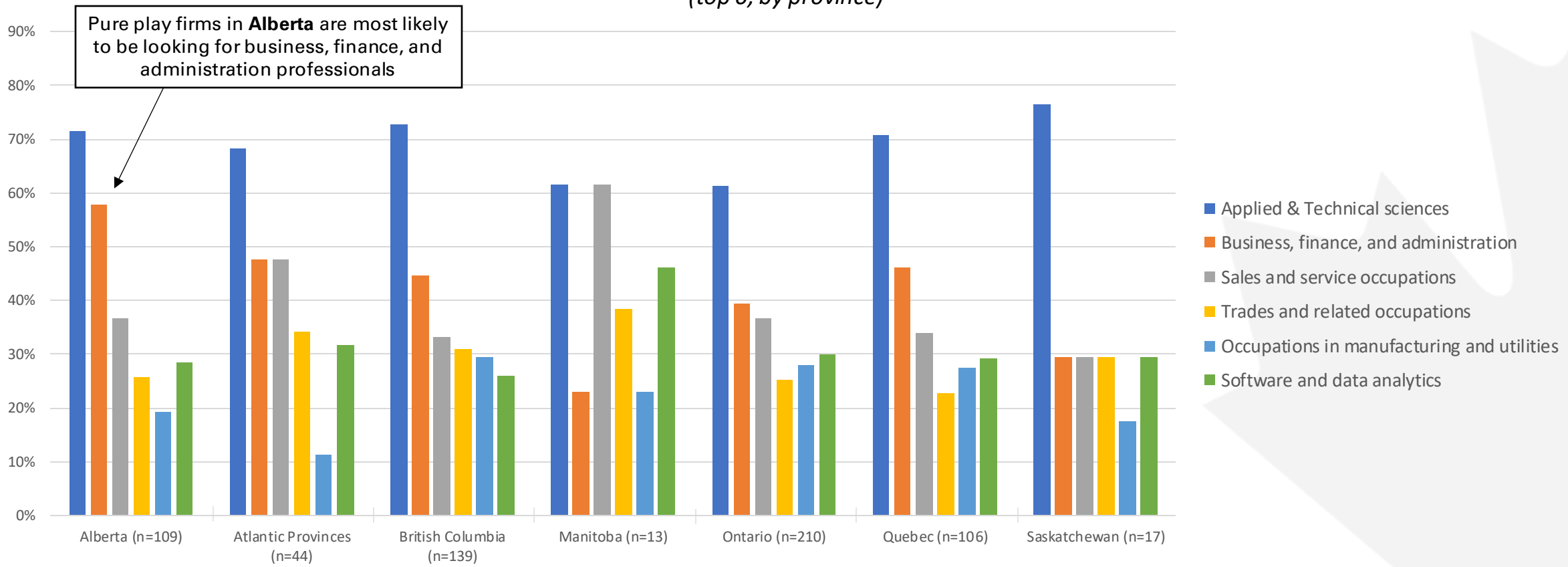
What barriers have you encountered in recruiting and retaining employees?
(top 6, by province)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Skills Needed] Applied & Technical sciences skills are the most needed across all provinces (69% average)

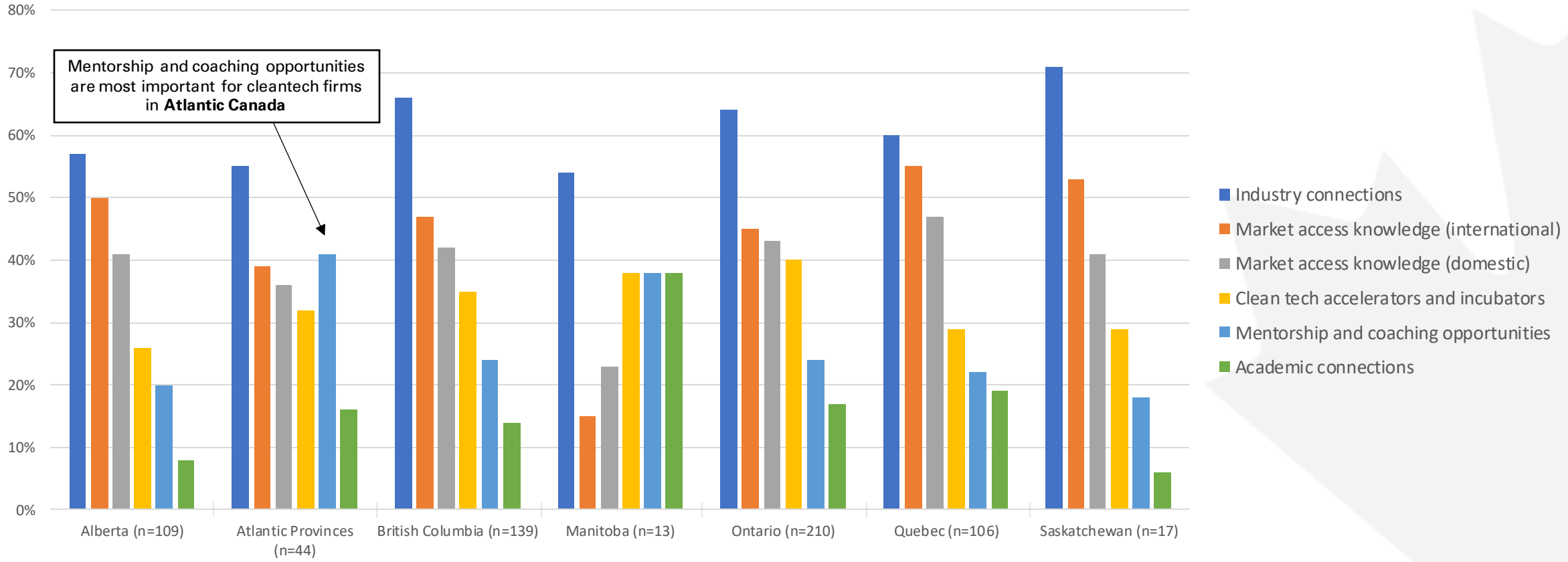
What occupations are you going to be looking for to scale your business?
(top 6, by province)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

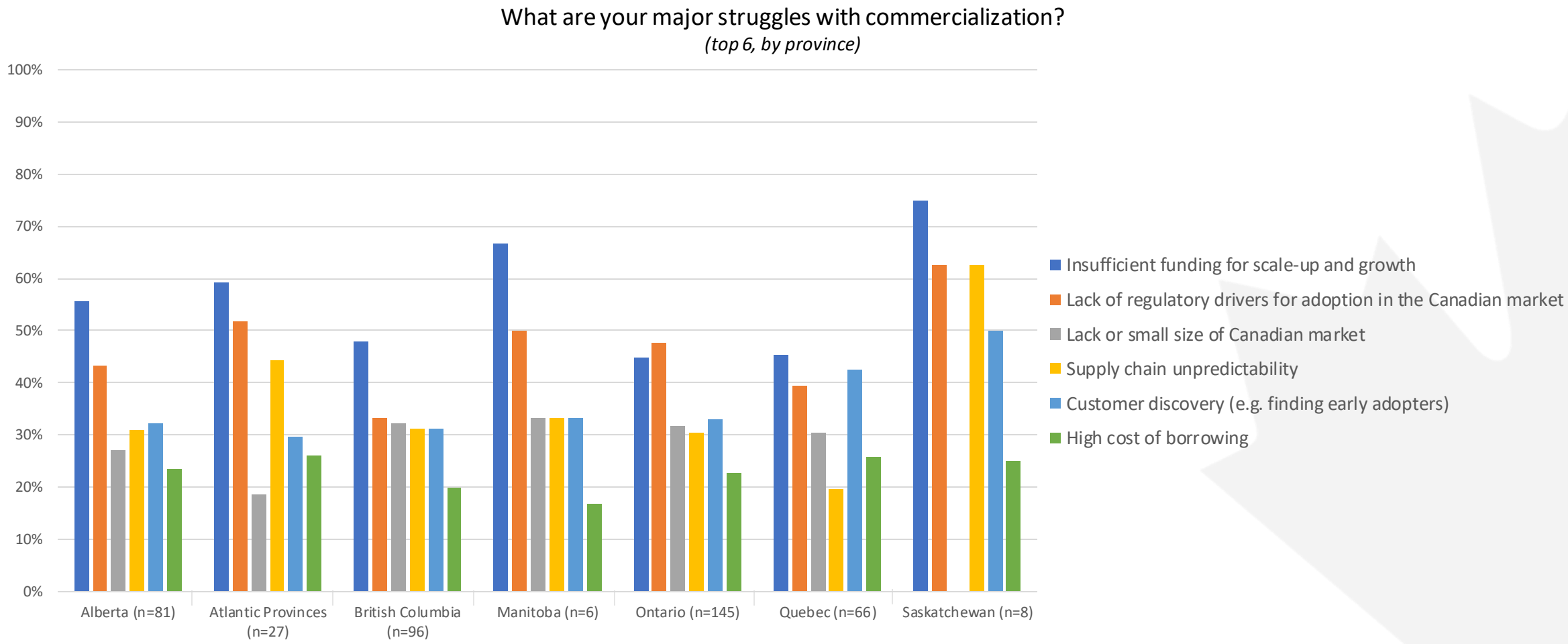
[Non-financial Supports] Industry connections are a consistent need across all provinces (61% average)

What non-financial (in-kind) supports would benefit your business in terms of researching and developing technologies?
(top 6, by province)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

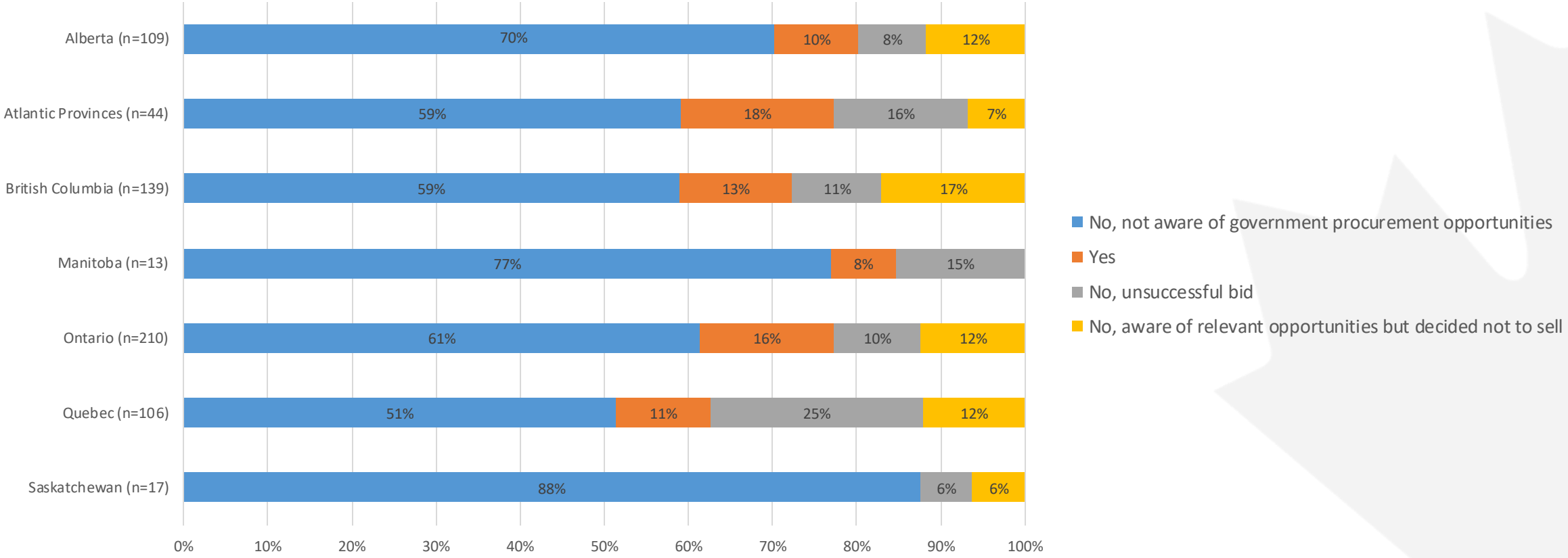
[Issues at Commercialization] The greatest challenge to commercialization for Ontario firms is the lack of regulatory drivers for the technology's adoption in the market



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[Federal Procurement] Cleantech companies in Quebec are most aware of federal government procurement opportunities (49%)

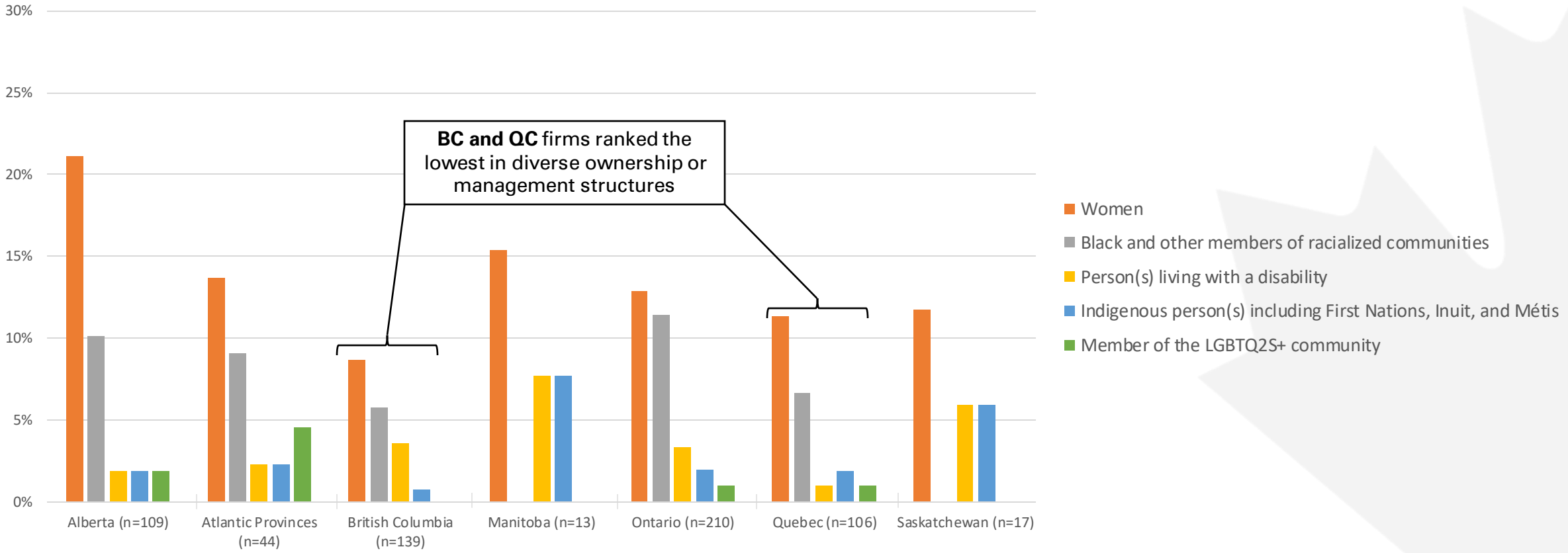
Have you sold environmental/cleantech goods and/or services to the federal government?
(by province)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

[EDI] 21% of Alberta-based pure play firms are primarily owned by women, compared to the provincial average of 13%

Is your company over 50% owned, managed and/or controlled by person(s) who self-identify as...
(by province)



Source: CTDS Industry Data Survey (September 20 – November 14, 2022)

Canada

Appendix

Sources

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