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# Planning for sustainable jobs 101

A how-to guide for groups leading and supporting green labour and skills transitions



**PLACE Centre**  
Smart Prosperity Institute



**Future Skills Centre**

**Centre des Compétences futures**

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The PLACE Centre, which stands for Propelling Locally Accelerated Clean Economies, focuses on the complex challenges limiting clean economic growth in Canadian communities. Our core approach is “place-based,” meaning the PLACE team works with all levels of government, industry, and civil society organizations to ensure regions across Canada have the solutions needed to overcome the challenges they face in advancing clean economic growth. With this approach, the PLACE team can create practical, place-based recommendations where everyone involved can collaborate and work towards making progress in solving these problems. That way, every region and community across the country can be included in, and benefit from, Canada’s growing clean economy.

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Smart Prosperity Institute is a national research network and policy think tank based at the University of Ottawa. We deliver world-class research and work with public and private partners to advance practical policies and market solutions for a stronger, cleaner economy.

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## About the Future Skills Centre

The Future Skills Centre (FSC) is a forward-thinking centre for research and collaboration dedicated to driving innovation in skills development so that everyone in Canada can be prepared for the future of work. We partner with policymakers, researchers, practitioners, employers and labour, and post-secondary institutions to solve pressing labour market challenges and ensure that everyone can benefit from relevant lifelong learning opportunities. We are founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and are funded by the Government of Canada’s Future Skills Program.

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# Abbreviations

<b>BC</b>	British Columbia
<b>CGE</b>	Computable general equilibrium
<b>ESDC</b>	Employment and Social Development Canada
<b>EU</b>	European Union
<b>ICD</b>	Institute for Career Development
<b>IOTs</b>	Input-output tables
<b>IT</b>	Information technology
<b>LFS</b>	Labour Force Survey
<b>LMIC</b>	Labour Market Information Council
<b>MATES</b>	Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy
<b>O*NET</b>	Occupational Information Network
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>PBP</b>	Plant-based protein
<b>SPI</b>	Smart Prosperity Institute
<b>ZEV</b>	Zero-emission vehicles

# Table of contents

- Executive Summary** ..... 1
- Introduction** .....3
  - Report overview .....4
  - What makes sustainable jobs and skills planning different from other jobs and skills initiatives? .....4
  - What else has worked for green skills and labour planning efforts in the past? .....6
  - Which models have promise but have yet to be implemented? .....8
  - What elements need to be involved in all labour and skills planning efforts? .....9
- Step-by-step breakdown of conducting skills and labour planning efforts** ..... 10
  - Step 1: Identify a scope ..... 10
  - Step 2: Identify what success looks like for the initiative ..... 12
  - Step 3: Identify labour needs for the cluster ..... 13
  - Step 4: Identify skills needs ..... 16
  - Step 5: How should stakeholders be engaged? ..... 17
  - Step 6: Identify and implement post-research activities..... 19
- Conclusion** .....20
- Endnotes** ..... 21

## List of Figures

- Figure 1:** Overview of the process for conducting sustainable jobs planning ..... 1
- Figure 2:** Overview of the process for conducting sustainable jobs planning .....9





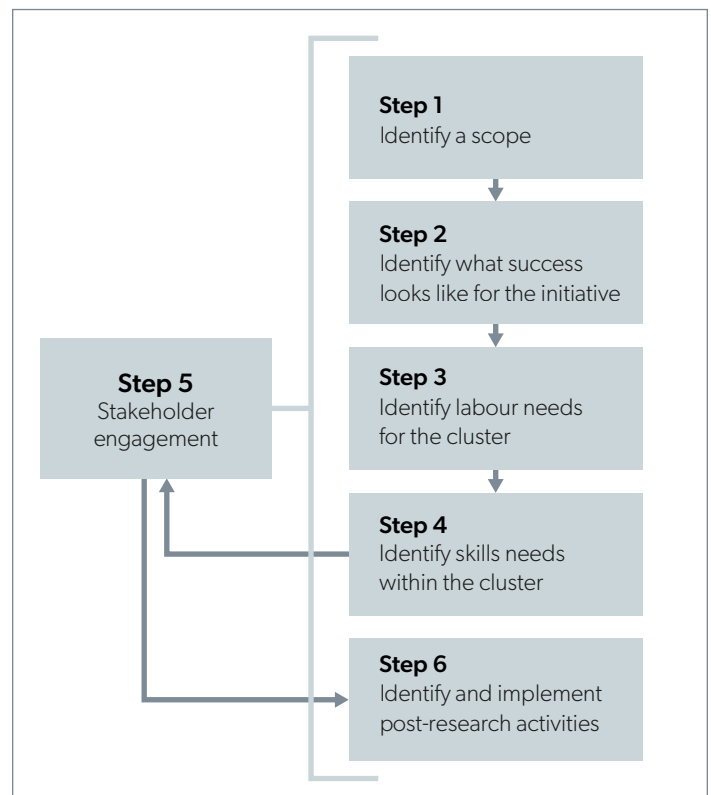
# Executive Summary

There is growing recognition across stakeholder groups that a skilled workforce is integral to designing, building, and advancing Canada’s national ambition to meet climate targets and pursue a lower-emissions economy. Regions and sectors are looking to help workers find meaningful employment in a clean economy or through providing support for skills development and assisting workers’ transitions to new economic opportunities.

Jobs and skills development for sustainable jobs needs to address issues of scale and uncertainty. We recommend dealing with these two challenges by focusing on a specific region or sector and drawing in local participants to find solutions. There are examples of success stories on skills training for sustainable jobs from around the world, as well as models to develop a skills ecosystem that hold promise but are yet to be implemented. A regional and/or sectoral approach that requires collaboration between multiple stakeholders is most prevalent across these success stories. The Maritime Alliance for fostering The European Blue Economy through a Marine Technology Skilling Strategy (MATES) program in the European Union (EU) used a similar strategy to Smart Prosperity Institute (SPI)’s recently completed work<sup>1</sup> to assess European maritime industries’ skills needs, applying those lessons to 11 different pilot programs to align current and future training with industry needs and improve long-term career resilience within the industry. The Great Recession’s detrimental effects on the manufacturing sector in the United States saw labour unions and the federal government collaborate to successfully deliver the Green Jobs Education project to retrain older manufacturing workers to be better equipped for the future labour market. In Indonesia, a partnership between leading automotive manufacturer Astra and Indonesian vocational and post-secondary schools to train students in line with employer requirements has been successful, with more than three-quarters of its graduates finding employment.

Despite these success stories, there is little guidance on how groups leading the green skills transition in Canada should undertake this work. This report aims to fill that gap. Based on a comprehensive literature review and ongoing research at SPI, developing a local or sectoral sustainable jobs plan comprises six steps.

**Figure 1: Overview of the process for conducting sustainable jobs planning**



**First**, groups must identify a scope of their particular sustainable opportunity using at least four measures: industry, jobs, geography, and temporality (i.e., amount of time to achieve outcomes). We recommend a scoping approach that considers the entire supply chain affected by a given clean growth opportunity; this supply chain is identified by looking at rates of trade between different industries and sectors. Across the supply chain, occupations where policymakers can design programs relevant to the most impacted individuals should be selected. Geographical scope plays a critical role in identifying opportunities and may be influenced by data availability or the type of clean growth opportunity considered. The chosen project time horizon should allow sufficient skills to be taught and retained.

**Second**, it is important to have a clear vision of what success in skills development looks like. Some examples may include transitioning workers from one industry to another or upskilling workers to adapt to new, cleaner technologies. In determining what success looks like, it is important to utilize a balanced approach that incorporates both upskilling workers as well as reskilling workers to transition between industries and sectors and promotes greater equity, diversity, and inclusion. Well-established metrics combined with overarching goals and ways to monitor processes should support these efforts to identify when an initiative has been successful.

**Third**, assess specific labour needs relevant to the sustainable jobs opportunity. Many of the challenges with identifying labour needs for green clusters are similar to the challenges of identifying “sustainable jobs” in the first place. Labour needs assessments must be tied to a particular industry with a specific set of occupations and for a particular geographic area. Assessing the number of jobs this opportunity may create helps to inform what gap may exist between current labour supply and future labour demand, as well as whether job creation will require attracting more workers, retraining existing ones, or managing transitions out of a sector. There are many different applicable methodologies for modelling such an assessment, including Statistics Canada’s Labour Force Survey (LFS), input-output tables (IOTs), labour supply-demand models, and computable general equilibrium (CGE). However, modelling alone cannot provide concrete answers to the question of what kinds of occupations will experience growth in the green transition; the process must also include stakeholder engagement and local insights. Another critical component of the discussion is around labour supply. Sectoral issues like the availability of training programs and public awareness of opportunities, plus overarching environmental factors, including immigration, housing affordability, access to transportation, and existing supports for workers, can influence the labour supply and are important to include during this research step.

**Fourth**, identify skills needs based on the mix of methodologies available. Approaches to capture changes in skills and knowledge requirements include quantitative measures, taxonomies, and qualitative measures, such as interviews, surveys, and workshops with industry leaders and experts. Each approach has advantages and disadvantages, so using multiple methods

that complement each other is common. Foresight exercises are important to include in the approach to determine how stakeholders perceive the future growth of a specific opportunity. Otherwise, survey results may be unintentionally biased by stakeholders’ perspectives around future growth and researchers will not know to consider these biases in interpreting their results. SPI’s project, *Closing Canada’s green skills gap: Identifying Canada’s green skilled workforce needs to reach our national 2030 climate target*,<sup>2</sup> used a combination of methods, including a foresight exercise, a survey, skills needs modelling using an existing skills and knowledge taxonomy, and interviews and workshops with stakeholders. Although this approach has proven useful in supporting planning efforts and designing sustainable transition programs, policies, and initiatives, other approaches may be more effective in certain circumstances or locations, and future research may lead to improved approaches.

**Fifth**, focus on stakeholder engagement through every step of the process. Stakeholders can provide relevant information on the local labour market, can expand the reach of a particular project, and are often the parties responsible for actioning the funding and ensuring the outcomes of any initiative. For our work, we approached stakeholder engagement and identified the key actors in a region’s or sector’s skills development system by developing a skills ecosystem framework for the cluster. An initiative can roughly categorize stakeholders into these non-exhaustive groups: learners/workers, educational institutions and training providers, employers and unions, policymakers and governments, and coordinating bodies (such as industry associations and employment agencies). Each type of stakeholder is responsible for different aspects of skills development, and it is important to engage with a broad set of stakeholders across all categories to gain a comprehensive understanding of a region’s or sector’s skills development system. Engagement can take various forms, individually (such as stakeholder interviews) or in group discussions (such as workshops, roundtables, or surveys). Combining different methods over an extended time can help capture more prominent viewpoints, trends, and data, as well as more specific insights.

**Finally**, identify and implement critical action points once the research is completed. This can include enlisting stakeholders as reviewers for the research reports and presenting findings at conferences, trade shows, and regional workshops. Another priority should be ensuring that previously engaged stakeholders, such as workshop participants, receive research outputs to help distribute the findings to their networks. Monitoring and evaluation plans should be developed to evaluate the success of implementation efforts.

Canada’s path forward on climate action requires putting sectors and communities in charge of their futures. This guide puts forward a process that communities can follow to prepare their workforces for the implementation of sustainable jobs—but it is ultimately up to communities and sectors to set the direction for where they want to go.



# Introduction

Meeting Canada’s climate targets will require investment, public policy, corporate leadership, and ambitious grassroots action. However, without a skilled workforce to design, build, and advance our national ambitions, there will be almost no climate progress. Careers involved in advancing climate action are growing rapidly, with jobs not historically considered “green” now installing heat pumps and building energy-efficient homes. These are high-paying, stable employment opportunities that can be captured in almost every community in Canada. From growing and manufacturing plant proteins in Portage la Prairie, Manitoba, to supporting advanced wood manufacturing in Golden, British Columbia (BC), to assembling batteries for electric vehicles in St. Thomas, Ontario, the coming decade offers strong prospects for workers looking to create careers helping to drive down national emissions.

Yet workers seeking to fill such job openings face challenges. A lack of educational programs for these emerging fields and uncoordinated employment service support are just two examples of barriers that arise due to the uncertainty, ambiguity, and poor planning currently seen in sustainable jobs planning initiatives. Much of the focus on improving sustainable jobs planning has been directed towards the principles that should govern efforts to support workers or the creation of lists for taxonomies detailing which jobs are “green” versus not. While these debates are important, they do not make it easier for workers to fill jobs. Additionally, they draw focus away from where it should be: the occupations available for, and skills needed from, workers. In the vast majority of sustainable jobs training efforts, the primary parties responsible for supporting workers are regional stakeholders like post-secondary institutions, local workforce planning boards,

employers, unions, and employment service providers. To these groups, what matters most is the practical steps they need to take to develop policies, programs, and practices that help fill open roles and support workers looking for jobs near where they live. Given their frontline role in implementing any sustainable jobs plans, more planning is needed to help these local groups understand what steps they need to take to support training and employment.

With this reality in mind, our research at Smart Prosperity Institute (SPI) has highlighted that sustainable jobs planning should not be thought of as one monolithic national challenge but rather as a series of distinctly local ones faced by each region and sector. For example, sustainable jobs training efforts in the automotive sector will need leadership from groups such as Workforce Windsor-Essex to succeed. Similarly, making mass timber in Northern BC will heavily depend on the efforts of post-secondary institutions in Mackenzie, Prince George, and Quesnel. Efforts to support regional stakeholders should be directed towards helping regional skills ecosystems (a term used to refer to a group of stakeholders responsible for training and education efforts in a particular region or sector) address the challenges brought about by uncertainty. In the process of addressing Canada’s climate goals, policies and markets will have uncertain effects on technology uptake and action, and training needs to be developed before these impacts can be fully predicted or understood (or the risk arises that there will not be enough workers to bring about these changes in the first place). This uncertainty can be particularly difficult for local stakeholders to navigate as they may not have the resources or expertise to credibly claim how to respond to global trends.



Navigating these challenges will require balancing urgency with pragmatism. Canada must act swiftly enough to meet its climate targets. However, creating funding for programs that train workers based solely on market or policy trends of the day risks creating a worst-case scenario: a workforce who has invested time and money into receiving training that led to no improvement in employment prospects. A balance is needed to ensure efforts can advance in the face of uncertainty, that they are occurring at the pace required to meet climate targets, and that steps taken are thoughtful and practical enough to avoid workers bearing the costs of overly impulsive decision-making. Tackling this challenge is no easy task, and will involve convening a wide range of stakeholders across the ecosystem to determine the scope of the opportunity, work together collaboratively, understand what information needs to be obtained, and how to leverage local knowledge to empower those who will need to act.



## Report overview

This report is written for policymakers, stakeholders, and other groups responsible for leading, supporting, or administering green labour and skills planning efforts. These efforts may be called sustainable transitions, local workforce planning efforts, just transitions, or clean economy workforce initiatives, amongst many others. Although terms may differ, the core challenge remains the same: help workers find roles in the growing clean economy and ensure regions have the proper supports in place to assist workers making career changes. This guide is meant as a reference for stakeholders tasked with generating insights that can be implemented by groups responsible for administering training. This reference guide is based on SPI and the Future Skills Centre's methodological approaches and research on supporting sustainable jobs and skills planning in regions across the country. It includes examples of successful initiatives, relevant methodologies, and lessons learned from previous research. It offers insight into questions such as "how to identify which jobs are 'green' versus not?" and "how to think about stakeholder engagement in skills planning exercises?" This guide also walks through what developing a green labour and skills planning exercise should consider. This guide does not presume to detail the only way these initiatives could or should be led and recognizes that different circumstances and future research may see alternative approaches emerge that are more effective or relevant within a particular region. However, this approach has proven useful in supporting planning efforts within multiple Canadian sectors and should be considered by any stakeholder designing programs, policies, or approaches to support a sustainable transition.

## What makes sustainable jobs and skills planning different from other jobs and skills initiatives?

Before beginning to walk through a detailed approach to sustainable jobs planning, it is helpful to understand what distinguishes this exercise from others. New organizations, facilities, and changing market conditions have been driving changes in the workforce and skills needs for years. What makes climate action as a trend any different than these others?

For the most part, it is not different. Skills needs changing as a result of climate action are not overly unique or distinct from skills needs shifting as a result of any other trend. Many of the challenges that need to be overcome are not explicitly sustainability-focused. Instead, they relate to more general issues such as policy coordination, identifying skills needs in the face of uncertainty, and the need to work with local groups to lead training efforts. These challenges are also faced when designing skills training efforts for jobs unrelated to sustainability efforts. As an example, automation and digitization will also require efforts to be led by local workforce planning groups, see skills needs differ by region and sector, and require consideration of equipping new graduates with needed skills and upskilling the current workforce.





The overlap between training for sustainable jobs and training for other non-green occupations simplifies the nature of planning for sustainable jobs and skills. Instead of creating entirely novel ways to plan or organize, governments can opt to look at other regions or sectors that have navigated skills change exercises in the past and identify lessons learned or successful models that can be adopted in their region. Many of the tools required to execute these ambitions successfully are already in place today (such as Canada's immigration system and strong networks of post-secondary institutions).

However, despite the many commonalities, a few factors still make sustainable jobs planning distinct from other efforts. These typically have less to do with the design of training programs or identification of alternative economic opportunities and more so with the broader conditions surrounding these efforts. The first challenge is one of scale. If sustainable jobs planning efforts are developed to help Canada meet its climate targets, then emissions will need to decline in every major region and sector across the country that currently has an emissions footprint (which is every single one). The challenge of supporting training for energy efficiency retrofits or installing heat pumps, as just two examples, in virtually every community in Canada is not a small one, especially given the fact that many of these activities will need to take place in a relatively short time frame. Within each region, training programs will also need to be led by different stakeholders. A union-led training program might make sense in one region, while programs developed by post-secondary institutions will make more sense in another, and employment service providers might need to be deeply engaged in a third region. Coordinating much of this planning in a six-year time frame (the amount of time left for Canada to meet its 2030 climate target) will be difficult, as will extending the training process beyond 2030.

The second challenge is the multiple, intersecting levels of uncertainty present in sustainable job planning efforts. Future-focused training and education efforts will always need to reckon with

uncertainty and a wide range of exercises and analytical methods can be used to navigate this challenge. However, the dual uncertainty in both markets and public policy drives much of the uncertainty surrounding sustainable jobs. With most climate or clean technology solutions, questions exist around the speed of adoption (i.e., uptake rates) and the final market size. These questions make skills training efforts difficult since understanding which technology will be adopted (and the scale at which a given solution will be adopted) is key to designing training for those seeking careers designing, installing, or maintaining that technology. Public policy attempts to remedy this uncertainty by providing a clear signal and direction for such planning processes, but this faces another challenge of being constantly called into question. Skills planning efforts need at least a two to five-year time horizon to design and implement new programs, and questions around whether a given set of policies will be in place following an election at any level of government make this time horizon very difficult to plan towards.<sup>3</sup> These two challenges also intersect. A given technological solution might seem more likely to be adopted because incentives exist to support its adoption, thereby reducing market uncertainty. However, this will only last if the policy remains in place. These factors make any local skills training effort more challenging to plan, especially if the outlook looks far enough out into the future so that assumptions need to be made about the future state of the market or technologies used.

We recommend dealing with these two challenges by focusing on a specific region or sector and drawing in local participants to convene around them. A national planning effort would be too vast and complex to undertake in the time frames needed to meet climate targets. Instead, local stakeholders who already understand their regional context, have relationships with local skills training, education, and employment service providers, and have been developing their own programs for years should be empowered to lead these efforts. This way, each region can opt for the path forward that makes the most sense for them given their local challenges, context, and stakeholder groups.

## What else has worked for green skills and labour planning efforts in the past?

Many green skills and labour planning efforts have been tried worldwide in recent decades. This report drew inspiration from some of these successful examples when creating its model. For many previous initiatives, there is a tendency for efforts to be led by training, vocational, and educational institutions. In other cases, unions or community organizations take the helm. As such, the overarching theme among these examples is to collaborate between two or more stakeholders for the betterment of the sector and their workforce at various stages of their careers.

### Example 1

#### **MATES (Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy)**

##### ***Energy and manufacturing sectors, European Union (EU)***

MATES is a multi-country EU initiative launched to develop a skills strategy for the shipbuilding and offshore renewable energy industries.<sup>4</sup> MATES ran from January 2018 to January 2022 and was carried out by a 17-partner consortium in eight member countries. It was overseen by the European Community Action Scheme for the Mobility of University Students (ERASMUS), the EU's program to support skills training and education. This initiative aimed to study and understand industry trends, identify skills shortages, and develop pilot projects, all of which touch on relevant themes for Canadian policymakers. Ultimately, the research led to the running of 11 pilot programs, consisting of training courses, virtual reality simulations,<sup>5</sup> practical sessions, and seminars that were reportedly well received by both trainees and industry partners (employers).<sup>6</sup> For the research phase, the MATES project undertook the following: a literature review, a forecasting and foresight exercise to identify and track sector trajectories, five workshops across five countries in the EU to hear from employers and workers in the shipbuilding sector, sector skills shortage and value chain mapping using the European Skills, Competencies and Occupations (ESCO) framework, and identifying priority areas for intervention and the pilots.<sup>7</sup>

MATES' mixed method model of skills analysis, stakeholder relationship building, and having a local focus and feedback loop were all touted as positive.<sup>8</sup> However, stakeholders also identified challenges, including the lack of wrap-around supports (the holistic support of social service recipients through flexible, comprehensive, and person-oriented supports, like counselling and financial payments, amongst others) associated with the pilots.<sup>9</sup> This absence of wrap-around supports contributed to a belief that these were primarily short-term initiatives that would not address the structural barriers impeding successful skills training and development efforts.<sup>10</sup> As such, the pilots may not have the desired longer-term effect to drive change in these sectors. Additionally, the project was EU-wide, with 11 different pilot programs. This meant there were multiple languages to conduct work in, adding to the complexity of data collection and analysis, and stakeholders reported this made the development

of detailed, granular insights that could be transferred across pilots and programs difficult.<sup>11</sup> While SPI's skill and labour work applies an almost identical methodology, SPI's focus on a handful of sectors in one country allows for more concentrated efforts and deeper relationship building.

### Example 2

#### **Green Jobs Education project (adult learning), run by the Institute for Career Development**

##### ***Energy sector, United States***

The Green Jobs Education project was an adult learning program administered by the Institute for Career Development (ICD) and targeted regions in the United States with a strong manufacturing sector presence (Northwest Indiana, Northeastern Ohio, Southeastern Pennsylvania, and Western New York). The program was also targeted to areas with significant groups of United Steel Workers (USW) union members who were adversely impacted by the Great Recession of 2008-2009.<sup>12</sup> Funded by the 2010 State Energy Sector Partnership and Training Grants from the Department of Labor, the project aimed to provide education, training, and placement services for workers in the manufacturing sector and the energy efficiency and renewable energy industries.<sup>13</sup> The program largely entailed providing training under the direction of ICD local coordinators and, where possible, within ICD's learning centers. Different types of training were offered in each region, and those trainings opportunities led to industry-recognized credentials, with regional differences being seen due to regional training demand, future job opportunity projections, and trainer availability.<sup>14</sup> Training certifications were offered as courses, which included alternative energy technology (wind turbine) installation, building performance institute (BPI) certifications (such as energy auditors, energy professionals and air-sealing, heating, ventilation, and air conditioning (HVAC), and solar installation), and wastewater treatment. Some courses were offered in partnership with Purdue University and could be counted towards an associate's degree, to better set up workers for educational opportunities in the future.<sup>15</sup>

Over 1,000 people were trained, with incumbent or laid-off union members and any other laid-off or unemployed non-union members in the target areas being eligible for the program.<sup>16</sup> Two-thirds (67%) of participants were unemployed or dislocated workers, a third (33%) were incumbent union members, almost two-thirds (64%) had some college, and only a tenth (10%) had a college degree. Lastly, a quarter (25%) of participants were 55 years old and above, and almost half (42%) were non-white.<sup>17</sup> Overall, close to two-thirds (61%) of participants who started a program finished it. Program administrators cited retention as a problem, anecdotally attributing this challenge to the state of the economy at the time, as unemployed participants who found work before training finished saw finishing the program as unnecessary once they had secured other jobs.<sup>18</sup>

Perhaps due to the relative novelty of 'green skills training' at the time of the training (2010), another challenge organizers faced was finding publicly funded training partners, like colleges,



who were familiar with developing training programs for these occupations.<sup>19</sup> Furthermore, many providers' training resulted in certificates, not certifications. While the former is evidence that one has completed a course, the latter is more comprehensive, given by a credentialing body, and often gives those with them a better chance of obtaining jobs (especially in the specific occupations which were covered in the courses).<sup>20</sup> Another challenge to participants completing the training was participants' need for math skills refresher courses, which the ICD overcame by offering optional practice tests.<sup>21</sup> This arose in SPI's skills work in the zero-emissions vehicles (ZEVs) and battery manufacturing sector and should be considered in future project iterations. Unlike the other initiatives reviewed here, this training program did not involve a convening or roundtable round to understand skills needs or shortages. This may be because it was led by a union, an organization well positioned to understand workers' and sectors' skills needs.

### Example 3

#### **Astra International Partnership** *Automotive sector, Indonesia*

The Astra International Partnership is between Astra International, one of Southeast Asia's largest automotive groups, and Indonesian teaching, vocational, and education training institutes (TVETs). Through this partnership, which began in earnest in 2009, Astra sponsors a polytechnic (formerly the Federal Technic Academy, now the Astra Manufacturing Polytechnic) and six other vocational secondary schools to provide training for students wanting to work in the automotive sector.<sup>22</sup> Besides teaching the Indonesian Federal Ministry of Education and Culture's education curricula, there is minimal direct government involvement in the program. Courses in this program aim to teach a blend of 65% practical skills and 35% theory.<sup>23</sup> It takes three years full-time to complete, with graduates achieving a diploma level 3 as a junior engineer after a 6-to-9-month internship.<sup>24</sup> In addition to partnering with some post-secondary institutions, the program has five specializations across automotive manufacturing. While there is no specific program for green skills, the program instead incorporates the teaching of cleaner and climate-friendly manufacturing practices into individual modules within those specialisations.

The Astra partnership appears to be effective, with more than two-thirds (69%) of graduates considered work-ready upon graduation.<sup>25</sup> It also reports a graduate employment rate of 82% (70% within Astra International, 12% in other companies), while the remaining 18% continue their studies at higher levels or go into entrepreneurship.<sup>26</sup> However, there is a gender imbalance among participants, as 84% of students are male.<sup>27</sup> The program's equity focus is instead on geographic diversity, as program administrators try to make it easier for students with poorer schooling outside Java Island (where most Indonesians live, and the capital Jakarta is located) to get accepted. This is done primarily through admissions requirements using psychometric tests, which assess the student's cognitive ability and personality, instead of academic tests, with dormitories also

provided for non-Javanese students to live in. While SPI's work aligns with developing multi-stakeholder partnerships at the student training level, recommendations for advancing this work do not exclude the government to the extent this Astra partnership does. Although Canada stops short of renaming vocational and training colleges after sponsors, colleges have partnerships and agreements in place with local and other regional manufacturers (such as Centennial College's Bombardier Centre for training aviation technicians and St. Clair College's partnerships and agreements in place with LG-Stellantis ahead of the incoming battery plant). Lastly, the implicit nature of the green skills mentioned through the training could be seen as a way to normalize acceptance of green manufacturing principles by not drawing particular attention to them. This approach may prove effective if opposition to a changing sector were a barrier to greater enrollment in training and education programs. However, this has not been the case in Canada.





## Which models have promise but have yet to be implemented?

When developing our approach to sustainable jobs planning, we also drew upon academic examples of models that could guide planning efforts. Prospective models have been identified within the literature that outline other promising approaches to sustainable jobs planning. These have not yet been tried in practice but warrant examination as alternatives to our proposed approach. There are two models relevant for discussion that we will cover.

### Model 1

#### Pembina Institute and the Canadian Labour Congress

One framework is from the Pembina Institute and the Canadian Labour Congress and was developed in response to the proposed Sustainable Jobs Act, which is still in committee at the time of writing this report.<sup>28</sup> This framework is designed to work within the federal Sustainable Jobs Act, meaning it is national in scope and could be applied to any industry or sector.<sup>29</sup> However, the framework appears best suited for application in industries with a large degree of labour organization and unionization.<sup>30</sup> This framework is built to advance sustainable jobs planning in two steps. First, it examines the enabling factors that create the right environment for success. Second, it outlines a robust governance framework for bringing stakeholders together to steer policy and planning decisions. Using this approach, it subsequently recommends several changes to the proposed Sustainable Jobs Act to make it more effective and inclusive.<sup>31</sup> This approach looks at certain factors in depth, including adequate resources, aligning to net-zero goals, having a cohesive strategy and vision, social dialogue, regional cohesion, and worker buy-in. This framework is less of a direct framework to undertake workforce planning for skills and labour needs for the green transition and more of a general series of recommendations and changes to improve the existing Sustainable Jobs Act. Many of its recommendations focus on either federal legislative changes or asking the federal government to incorporate a broader and more inclusive perspective in the Sustainable Jobs Partnership Council and the Sustainable Jobs Secretariat (two groups that will be formed as a result of the act). However, this report is only the first in their series, and the authors promise that future publications in the series will include specific measures, policies, funding, and programs that will support workforce planning and economic development.<sup>32</sup> Future versions of this work may further develop a sustainable jobs planning model that can be applied to lead or direct training and education efforts.

### Model 2

#### Organization for Economic Co-operation and Development (OECD)

The other proposed framework comes from the OECD, and it is slightly broader in scope and less tied to a particular piece of legislation. This framework, titled “*Assessing and Anticipating Skills for the Green Transition*,” provides a comprehensive overview of potential strategies and methodologies needed to gather information on skills and labour needs for the green transition and turn that data into policy action.<sup>33</sup> This research, published in September 2023, is designed to work in concert with other OECD-led skills and labour research efforts.<sup>34</sup> This framework is intended to apply to multiple sectors and industries and has a wide range of methodologies available.

This framework consists of three steps:

1. a planning stage to map information needed on the specific skills and jobs as well as to incorporate common targets and definitions,
2. an implementation stage, which undertakes skills analysis with mixed research methods that involve stakeholders in the execution of the process, and
3. an applying and engagement stage that takes the major results and continuously engages stakeholders in the subsequent policy-making process.<sup>35</sup>

This framework is designed for national-level research and has methods that national bureaucracies can incorporate as they seek to study and prepare for the transition to a clean economy. Given this national scope and the model’s attempt to cover as many potential regions and industries as possible, this report provides a broad picture for beginning the process of assessing and preparing for workforce transitions on a country-wide level. However, this broader picture may be less applicable for a particular region, industry, or sector if they are looking for more of an actionable process with specific steps and methodologies. It may also be difficult to advance quickly, given the need for national coordination to advance these approaches. Finally, this framework relies on the availability of big data on a national level to identify trends, jobs, and trends that then feed into the workforce planning process, and that data may not be universally available.<sup>36</sup>

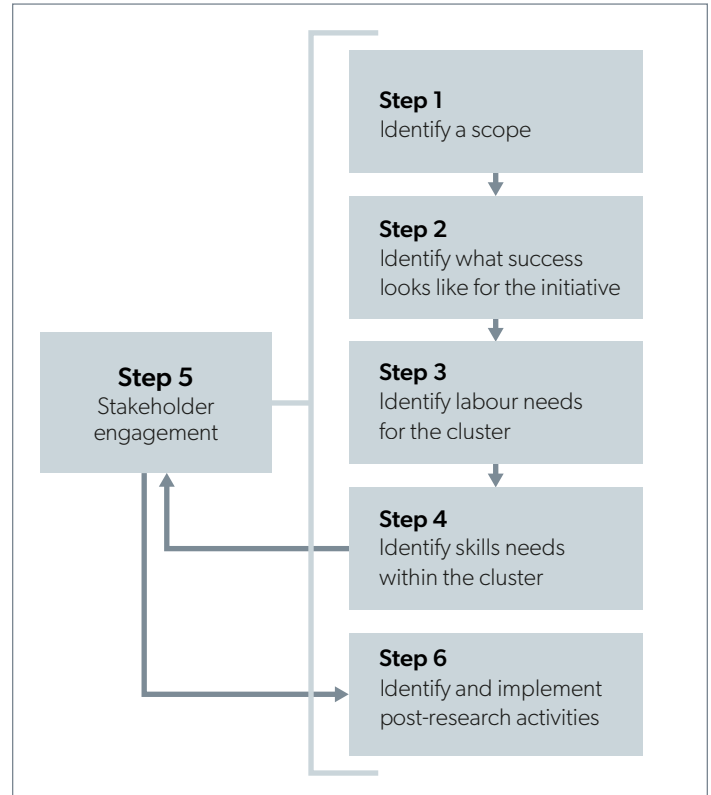
While both frameworks are useful for supporting sustainable jobs planning efforts, neither offers the needed insights to the regional stakeholders tasked with implementation. Despite this, they touch on relevant challenges for skills training and education efforts, namely the need to engage ecosystem stakeholders in the process, the challenge of identifying specific skills and competencies for training within each sector or industry, and the difficult process of turning more abstract data and analysis into real-world skills and training programs. These models should then be viewed as important contributions to the options available for policymakers to draw upon in addition to this model.

## What elements need to be involved in all labour and skills planning efforts?

Based on a comprehensive review of the literature and our ongoing skills and labour research, SPI has developed the following step-by-step approach to developing a local or sectoral sustainable jobs plan. Figure 2 below details each step of the process, which is expanded upon in the sections below. For more specific examples of how to use this process to explore sustainable skills and labour, you can read SPI's research project, *Closing Canada's green skills gap: Identifying Canada's green skilled workforce needs to reach our national 2030 climate target*, in partnership with the Future Skills Centre, on the [zero-emissions vehicles \(ZEV\)](#), [plant-based protein \(PBP\)](#) and [mass timber](#) clean economy clusters.



Figure 2: Overview of the process for conducting sustainable jobs planning







# Step-by-step breakdown of conducting skills and labour planning efforts

## Step 1: Identify a scope

When considering the scope of a sustainable jobs or skills planning exercise, the decision may seem evident to stakeholders. They might argue a scope should focus on the impacts of a set of policies, a specific industry, a given region, or a handful of communities that will be adversely impacted by the growth or decline of a particular opportunity. Yet, while these scopes are valid for use in these exercises, each requires more detail to be useful. For example, what geographic scope will be assigned if there is a desire to focus on skills needs in coal communities? At the time of publication, coal communities exist in Alberta, New Brunswick, Nova Scotia, and Saskatchewan, and the economic context differs between each region. Identifying the alternative employment opportunities available to current coal workers, since occupations need to be assessed for their skills transference potential, is difficult with a scope this large. They will look drastically different in Estevan, Saskatchewan, compared to Belledune, New Brunswick, as two examples. Finally, with a “coal communities” focus, which jobs should be considered when creating a plan for supporting workers? In some cases, the jobs that will be impacted could begin and end with workers directly employed within a plant. Meanwhile, other regions or sectors (including automotive assembly and forestry) have lengthy, multi-industry supply chains that will be affected by transitions in the end-use technologies they use and manufacture. Considering only one aspect of the supply chain will likely fail to capture the majority of a new technology’s impact on the workforce.

It is evident that identifying a scope is not as simple as noting “coal communities” or “the labour market impacts of a climate plan.” These are both valid starting points but require more detail to be useful as a scoping mechanism. Selecting a scope will require multiple variables that capture a more robust picture of labour market outcomes. In our work, we set a scope using four different measures: industry, jobs, geography, and temporal (i.e., amount of time). Within this work, an identified scope set using all four variables is referred to as a “cluster,” the term used in this guide.

## Industry

When determining which sectors or industries should be in scope, the impacts of change will always go beyond a single sector or even a handful of sectors. Consider the changing nature of automotive manufacturing. As the industry shifts towards manufacturing battery-powered ZEVs, more shifts are required than simply substituting gasoline or diesel-powered engines for battery-powered drive trains. Electric vehicles will have lighter iron and steel or aluminum frames to minimize weight, use fewer plastics, require three times as many semiconductors and twice as much copper, and have more electronic components.<sup>37</sup> These shifts will result in changes throughout the entire supply chain, impacting more than just sectors that fit under North American Industry Classification System (NAICS) categorizations for automotive and automotive parts manufacturing.



We recommend an approach that considers the entire supply chain affected by the growth of a given technological opportunity; the supply chain is identified by looking at rates of trade between different industries and sectors. Any new or emerging technology that is adopted by an industry will impact upstream and downstream activities across the supply chain. For instance, a technology like RFID (radio frequency identification) could improve food safety monitoring, real-time product tracking, and warehouse operations, thereby impacting the supply logistics and safe consumption of food.<sup>38</sup> Introducing this single technology implies new skills for occupations ranging from warehouse managers to food safety inspectors.

In our work, we have identified the effects of clean growth on Ontario's manufacturing sectors by examining ZEVs' impacts on skills needs within the region. We have also identified the impacts that changes in forestry practices, construction techniques, and wood manufacturing will have on a range of sectors by discussing how mass timber technologies will impact industries throughout BC. Stakeholders looking to develop their own plans may find it helpful to pick a "starting point" and build out their analysis from there.

## Jobs

Another particularly important task for scoping any sustainable jobs planning initiative is to understand the specific occupations that will be affected by this particular clean economy transition. This involves understanding the supply chain for the particular opportunity and what the key roles are in that chain. Without this understanding, key occupations may be overlooked and the focus will only be on very prominent "sustainable jobs" — to the detriment of the overall project. Selecting a list of occupations that will be in scope is not as simple as creating a list of which jobs are "green" or "non-green" to consider. Our previous report, [Ready for Green Jobs](#), details why this is the case:

"Our analysis shows that, in most sectors, much of the job growth will be in existing occupations. However, many of the activities completed in these occupations will change. Given this shift, workers will now have a wider range of activities they conduct as part of their occupation. For example, an electrician may install residential heat pumps in the morning and wire new homes at a construction site in the afternoon. This addition in tasks will require workers to be flexible and possess a wide range of skills to apply to both "green" and "non-green" projects (i.e., projects that offer improvements in environmental performance and those that do not)."<sup>39</sup>

As this passage points out, our research found that instead of creating a list of "green" jobs, a more useful framework for assessing sustainable jobs transitions is to focus on the specific tasks and activities that workers do in these roles that will be useful for meeting climate or environmental goals. This focus on what we think of as "task-based" approaches is still an emerging concept that may require more work to apply with all stakeholders. An alternative approach is to ignore the "green" versus "non-green" jobs debate and consider the occupations that make up the

largest concentrations of employment in each section of the supply chain identified in the previous section. By considering these occupations, policymakers can design programs that will be relevant for the majority of impacted individuals within a region. While this approach will not capture the full economic, environmental, and employment implications of a new technology or clean growth opportunity's impacts, it is typically sufficient to launch training and education efforts while allowing for further refinement from stakeholders as additional impacts arise.

## Geography

Geographical scope plays a critical role in identifying an overall scope for sustainable jobs planning initiatives, especially given that the distribution of economic impacts may vary dramatically depending on the particular technological opportunity considered. For instance, while mass timber production might impact a small number of forestry communities in BC, innovations in PBP processing and manufacturing could extend across several provinces, including Manitoba, Saskatchewan, and Alberta. Identifying a geographic scope can help stakeholders understand the impacts of a particular trend in a more concentrated and salient way, simplifying the efforts of acting upon insights. The nature of planning discussions for how PBP production will impact Manitoba in overall economic terms is different than discussing who should lead training for new facilities in Portage la Prairie.

A major factor that will influence decision-making around scope is data availability for a given region. Data can guide training decisions, improve the management of training systems, and identify impediments facing the workforce.<sup>40</sup> If there is no available data for the region, then planning efforts will need to be conducted either at a higher level, such as on a provincial scale, or the group conducting the sustainable jobs planning will need to find local data to provide relevant local insights. Local stakeholders, such as chambers of commerce, workforce planning and training boards, employment service providers, unions, and other groups, typically collect data on regional workforce trends and challenges. If they are willing to share this data, it can be leveraged to garner more local insights. Designing a stakeholder engagement process that ensures analysis is conducted in partnership with stakeholders, rather than in an extractive manner, is detailed in later sections but is a critical component of any project.

## Temporal

Time horizons are an important scoping mechanism for skills training efforts. Overall, stakeholders should consider planning towards a goal that is meant to be achieved by a specific year. For instance, BC plans to reduce greenhouse gas emissions by 40% by 2030 and reach net-zero emissions by 2050.<sup>41</sup> The relevant policies and targets associated with this vision could form the basis of labour planning efforts, provided they were sufficiently scoped based on the abovementioned criteria. Other temporal considerations concerning labour market planning are related to the speed and scale of anticipated transitions,

specifically looking at how many workers will need to be trained as compared to the size of the workforce. If the scope of the opportunity is such that 30,000 workers will need to be trained in a particular skill, it matters if that training needs to be undertaken in the next two years or the next six years. Another temporal consideration involves the length of training programs. Training programs should be designed to allow sufficient skills to be taught and retained while minimizing the time workers spend outside the labour force.

## Step 2: Identify what success looks like for the initiative

Success for a skills development initiative can be defined in various ways, and it is important to have a clear vision and be intentional about the initiative's specific objectives. Typical overarching goals for a skills development initiative might be helping workers upskill or reskill in a growing sector or helping workers find support as they transition to a new sector. Another common goal is to combine the previously mentioned goals into one objective: to assist workers as they transition from one industry into another one. An example of this would be wanting to attract workers to transition from an industry which is past its peak employment levels, such as oil and gas, into a clean growth opportunity of interest, like renewable energy.

Our research found that utilizing a balanced approach that incorporates both upskilling workers, as well as reskilling workers to transition between industries and sectors is required for any type of skills development initiative. These elements must be acknowledged as distinct and addressed independently. Stakeholders should not shy away from developing programs that address both sides of this challenge but should avoid conflating the two as one overarching objective in program design, as this can lead to tensions and risks creating pathways that are not desirable to workers experiencing economic changes.

These different goals have unique benefits and opportunities, as well as risks and drawbacks. For instance, initiatives that seek to transition workers from one sector or industry into another are at risk of equating the success of an initiative simply to how many workers successfully transitioned along the program planner's envisioned path. This may ignore the concerns and voices of workers who wish to pursue another path entirely. For example, not every worker leaving a job at a coal-fired power generation station wants to go into renewable energy installation. In fact, the sectors that displaced oil and gas workers in Alberta enter at the highest rates are manufacturing, followed by construction and software/information technology (IT).<sup>42</sup> Not all workforce training programs will directly focus on particular employment outcomes, but it is important when undertaking planning processes to be flexible regarding worker outcomes and to not be prescriptive about what career development or employment services are available or recommended to workers. Worker employment outcomes are driven by a complex mix of factors, including similar compensation levels, transferrable skill sets, regional availability of employment opportunities, and intangible

factors, such as values and beliefs about career mobility in these sectors. When setting goals for what success should look like for sustainable jobs planning, it is important to not be too prescriptive on the path that workers take in their career development and transitions.

Furthermore, while not all workers can be assumed to want to transition from one sector to another, the opposite also holds true: some workers are keen to transition if given the opportunity. Planning initiatives will need to connect workers with new opportunities and provide them with the knowledge, training, and capacity to succeed. In these cases, it is important to have a broader picture of the available clean growth opportunities for workers to transition into. Considering local opportunities is particularly important when working with individuals and communities that are more vulnerable to the impacts of economic shifts and ensuring that they can benefit equally from the opportunities is paramount. At-risk individuals and communities can include Indigenous communities, rural and remote communities that are dependent on limited local economic opportunities (such as natural resources).<sup>43</sup> For example, many small forestry communities across BC have been severely impacted by the downturn of the traditional forestry sector, with hundreds of jobs lost in 2023 alone. Local initiatives tend to focus heavily on supporting workers leaving the sector, and there is little to no overlap with discussions around emerging opportunities within forestry and wood manufacturing, such as mass timber.<sup>44</sup>

It is important to have a clear vision for a skills development initiative, especially since they typically operate in an environment of uncertainty. Stakeholders should consider setting both an overarching goal and outlining specific objectives for assessing progress towards that goal to ensure that the project can measure impact as the initiative progresses, and not just in retrospect. In general, progress in advancing training and education efforts should be determined and actioned relative to the scope set above so as not to overpromise outcomes or underestimate the scale of the problem. Determining the success of particular programs may be difficult, but it often can be estimated through measurable objectives, such as considering how many workers should be trained to support a broader transition, whether there are labour force participation objectives tied to socio-demographic factors that can support greater equity within the sector, or through a host of other established metrics that exist to identify success rates in training and education programming.

Regarding success metrics, it should be noted that many stakeholders who appear eager to support this exercise might, either purposefully or unintentionally, attempt to divert the attention away from a skills and labour-centric discussion toward other areas. This could occur by occupying time in planning sessions and sharing their views and ideological complaints about an emerging technology or the downturn of a traditional sector. They might also try to use these discussions to advance their priorities, limiting the utility of the skills planning exercise for the sector.

### Step 3: Identify labour needs for the cluster

Once the scope of the relevant sustainable jobs opportunity for the planning process has been identified and success measures have been set, stakeholders need to assess specific labour needs. This question is about defining the labour needs of a particular clean growth opportunity in specific enough terms that training programs can be created and appropriate metrics of success can be measured. While individual responses from stakeholders or anecdotal evidence from employers can help provide context and understanding for a specific opportunity, focused workforce planning needs data and modelling to accurately estimate labour needs. Many of the challenges with identifying labour needs for sustainable clusters are similar to the challenges of identifying “sustainable jobs” in the first place. Labour needs assessments need to be tied to a particular industry with a specific set of occupations and for a particular geographic area. Without first narrowing down the challenge, stakeholders will not be able to get enough specificity for eventual training programs to be effective interventions. For this, having a national (or even, in some cases, provincial) understanding of the workforce may not be a detailed enough picture to target recommended changes and programs. To ensure a more detailed picture, training programs will need to answer questions like how many jobs will be created specifically in a region or by an opportunity, what specific types of jobs will be created, will these be new occupations or exiting jobs, and what are the characteristics of the existing local workforce?

#### How many jobs will be created?

Assessing the number of jobs this opportunity may create is important to understand how large of a gap exists between current labour supply and future labour demand, and whether job creation will require attracting more workers, retraining existing ones, or managing transitions out of a sector. In some cases, labour and occupation needs can be estimated by, or compared to, relevant government or industry targets for the opportunity. For example, when looking at the PBP industry in Manitoba, the Government of Manitoba has a stated target for their Manitoba Protein Advantage Strategy of 1,550 new jobs by 2025 across all sectors.<sup>45</sup> Another method is to model estimates based on the number of jobs created through meeting emissions reduction targets. It is important to collect sufficient information to understand the labour needs for a cluster for a region and for specific occupations at a level that can be actioned. Knowing that agriculture as a whole has labour shortages is helpful, but not as useful as knowing the difference in potential labour needs for labourers, managers, vehicle operators, agronomists, supervisors, and other critical occupations.

Several methodologies can be used to ascertain these figures and estimates, but we must differentiate between current labour force composition and future job projections from investments or market shifts. The most readily available data for estimating the current labour force composition baseline is from Statistics Canada’s Labour Force Survey (LFS). This monthly survey of

employers provides employment estimates for occupations, industries, wages, union status, and even employer size, breaking it down by provincial or sectoral levels. For our research, we accessed LFS data using the Real-Time Remote Access tool and ascertained the level of provincial employment for the particular occupations we identified as part of the clean growth opportunity. For looking at future labour needs and job projections, other methodologies are available for researchers. Some of the more common ones include using economic modelling in the form of input-output tables (IOTs), labour supply-demand models, or computable general equilibrium (CGE) models that model labour demand.

IOTs are a more traditional option for estimating economic activity and labour needs. These models focus solely on the relationships between purchasers and consumers in an economy, often focusing on data from industry to industry.<sup>46</sup> The OECD provides public harmonized national IOTs for research use that can be applied to this context of examining labour force needs for clean economic opportunities.<sup>47</sup> While input-output models are universal and generally more accessible for most researchers, they can lack the accuracy provided by a CGE model and rely on assumptions around consumer behaviour changes, fixed price ratios, and specificity around demand shocks.<sup>48</sup> On the other hand, supply-demand models assess the current state of the labour force across different occupations and evaluate trends that will shift the availability and supply of labour for those particular jobs. A relevant Canadian example that uses supply-demand models is the Canadian Occupational Projection System (COPS) from Employment and Social Development Canada (ESDC).<sup>49</sup> This system utilizes a ten-year time horizon to estimate what occupations may have shortages in the future based on current employment, education, immigration, and job application data.<sup>50</sup> CGE models examine transactions across multiple sectors of the economy to provide a general model of the economy.<sup>51</sup> These models use Statistics Canada data for national accounts for sector activity, gross domestic product (GDP), trade of goods and services, and other transactions to provide a picture of the national economy to better understand the impact of shocks and changes on the labour supply.<sup>52</sup> In our work, we make frequent use of CGE models.<sup>53</sup> Incorporating behavioral changes and technological adoption in the model also increases the level of detail attached to the results.<sup>54</sup> Stakeholders should select whichever method is most applicable and accessible, given their circumstances.

#### Will these be new kinds of jobs or just new jobs in existing roles?

One of the more complex assessments of the labour planning process is to estimate the difference in what kinds of occupations will experience growth due to the green transition. Some individuals working in existing occupations will become part of the supply chain for a clean growth opportunity, such as managers on farms that produce dry peas for a PBP company or IT specialists in manufacturing facilities that make components for ZEVs. Other occupations, such as fuel cell engineers, solar energy technicians, or geothermal production managers, will be



new occupations created as a result of emerging clean technology opportunities.<sup>55</sup> How can policymakers determine which new occupations will be created and the proportion of new versus existing occupations for workforce growth? Modelling alone cannot provide concrete answers to this question. It must be combined with engagement with industry stakeholders and a full mapping of the value chain of the opportunity and how it will change with the green transition.<sup>56</sup> This is largely because models can only capture the data which is given to them in alignment with their assumptions, and much of what stakeholders understand and communicate is relevant to understanding sector trends but cannot be easily incorporated into modelling exercises.

As we cover in this report, even “new” sustainable jobs will consist of a suite of skills, knowledge, and activities that are not entirely novel. Skills like communication, time management, monitoring, and decision making will still be relevant for almost any position regardless of whether it is categorized as new.<sup>57</sup> It is important to remember that a green job, at its most basic, undertakes activities and tasks connected to the clean economy opportunity. Understanding what type of sustainable jobs will be created, and if they will be new jobs or existing jobs, can help to understand what kinds of skills and knowledge will be needed for the different types of jobs. A taxonomy focused on the worker’s activity or task, rather than just by job title or industry, can help narrow down what interventions or training will be needed to upskill or retrain workers.

### **What is the makeup and composition of the specific labour supply?**

When thinking about labour and clean economy opportunities, the primary focus is often on the demand for labour: how many jobs will a particular opportunity or investment create in a specific community? This is a critical component of the discussion but misses the other equally important side of the equation: labour supply. For any opportunity to be realized, there needs to be workers in the community capable of filling these roles. Not considering labour supply can create challenges.

Local businesses may become worried about poaching and may oppose significant capital investments by new companies into the region for fear of losing their workers. More severe regional labour market shortages may also be created or exacerbated, jeopardizing local businesses’ capacity to meet production or operational goals. These challenges could create further barriers to effective skills planning efforts, foster local opposition, and worsen local labour shortages.

To understand labour supply, organizations should start by examining the local context and situation of a particular opportunity. Relevant provincial departments, generally either labour or education ministries, will often have data on current supply gaps, either in graduation rates or enrollment numbers. They also track occupation levels for provincial occupations, which can help compare future needs to current employment rates. Measuring current levels can help understand where roadblocks to full employment may exist, such as a lack of training programs, persistent under-employment in a particular area or demographic group, or difficulty recognizing and earning credentials. This examination should also look at the specific sectoral employment situation for different demographic groups to identify whether it is below the optimal level and what groups of workers exist for a particular opportunity.

On a more systemic level, many factors can influence the labour supply, including immigration, education, housing affordability, access to transportation, and existing supports for workers. The availability and affordability of housing in a particular area can severely affect workers’ ability to take on new occupations. If workers cannot afford to live in a community where businesses key to the clean growth opportunity are located, then it will be harder for businesses to hire appropriate candidates.<sup>58</sup> A similar issue exists when looking at the public and private transportation options available to workers. Issues like whether reliable bus or train routes to their workplace exist, the quality of the highway and road systems, and whether alternatives to personal vehicles available in the community where the business is located exist can all affect the local labour supply.<sup>59</sup>



## Holistic worker support as a component of labour supply

Workers are not just inputs to the production processes, and the communities they live in impact their well-being outside of the workplace. The benefits and supports provided by the communities that workers live in, or the lack thereof, can influence whether a worker takes up or remains in a job. Workers with families may find it challenging to move to an area without sufficiently accessible and affordable childcare or eldercare.<sup>60</sup> While international workers, both temporary and permanent, are a component of addressing labour supply challenges, it cannot be the only solution to solve a labour shortage and must be combined with investments to make a particular region more attractive for workers to move to. Local access to healthcare is often inconsistent across Canada, and the availability of hospitals, family doctors, and specialty clinics is a relevant issue when considering labour supply.<sup>61</sup>

These issues are especially pertinent for immigrants, who are an increasingly important source of Canada's labour force and population growth, and also have historically landed in denser and more populated cities than those where SPI's clean growth clusters tended to be located (i.e., not Montreal, Toronto or Vancouver).<sup>62</sup> This is partly because these cities are more likely than SPI's cluster focus regions to have the kind—and volume—of physical and social infrastructure immigrants and their families need for their settlement. Some examples of the concerns SPI heard from stakeholders during its ZEV workshops included immigrant staff and incoming employers asking about the range, quality, and types of schools available for their children, the presence and level of involvement of settlement agencies, and the quality and types of transport available.

A final consideration for labour supply is the relative level of wages offered by occupations in the green opportunity compared to equivalently trained positions in nearby proximity of sector and geographic area. Understanding the opportunities available to workers can help to explain why workers for an occupation in a particular sector may be lacking if there are higher-paid alternatives nearby for individuals with similar qualifications.

For gathering information about these issues, much of the data around transportation, childcare, and healthcare are commonly found in provincial departments. However, municipalities also may have access to relevant information on local conditions but are unable to support extensive planning processes due to a lack of resources or capacity. Data on housing is more available from sources like the Canadian Mortgage and Housing Corporation (CMHC) or provincial realty bodies. Immigration data can be found from Immigration, Refugees and Citizenship Canada (IRCC) on a more aggregate level, but it is useful to supplement this information with data from local immigration support agencies. Lastly, as we will cover further in step five, stakeholders must be engaged at all levels and steps of the process to support and accompany these quantitative data sources with more qualitative data about the lived experiences of workers and businesses in the identified clean economy opportunity.



## Step 4: Identify skills needs

Once labour demand is understood, the next step is to identify the changing skills needs within the determined cluster(s). Identifying changes in skills needs (or new knowledge requirements) is the key to determining what needs to be taught or communicated in a new training or education program. This step aims to identify which skills will be increasingly in demand, and how skills needs will change, for workers within each occupation that is expected to be impacted by the decarbonization transition. The majority of methodologies available for capturing changes in skills and knowledge requirements rely on understanding employer needs and the rest of this section will review the utility of these methodologies.

### What approaches exist for identifying changes in skills and knowledge requirements?

There is a mix of available methodologies to identify skills needs, and training or education efforts may employ multiple tools to accomplish this task. These approaches include quantitative measures, taxonomies, and qualitative measures, such as interviews, surveys, and workshops with industry leaders and experts. It is important to note that each approach has advantages and disadvantages and that when using multiple methods alongside each other, methods are typically selected to compensate for another method's weaknesses to create a more comprehensive approach. For example, quantitative measures offer useful insights on a wide range of occupations regarding how existing skills and knowledge requirements may change in demand. However, they are often less helpful for identifying what new skills may be required. Similarly, surveys can be useful for generating insights from employers, but without the use of a foresight exercise, results of what skills will be in demand will be heavily biased by stakeholders' perspectives of the future growth of a given opportunity in ways that may not be apparent to researchers.

The Labour Market Information Council (LMIC) has identified three general methods for forecasting in-demand skills:

1. forecasting future employment numbers and mapping these occupations to skills,
2. using online job postings to forecast skills, and
3. using expert opinions to predict the trajectories of skills and which skills will be most in demand.<sup>63</sup>

The first approach, wherein future employment for occupations is mapped to skills, employs established forecasting methods and is widely used by industry associations, workforce development organizations, and governments.<sup>64</sup> Available datasets for employment level by occupation include the LFS and the Census of Population, both of which are credible sources for labour market information.<sup>65</sup> When determining the skills and knowledge profiles associated with each occupation within the supply chain, stakeholders can use databases that contain this information. The most commonly used framework in this analysis is the Occupational Information Network (O\*NET) skills

framework, which details 35 skills ranked by importance and complexity for over 923 standardized occupations. While it is an American framework, it is "cross-walked" (cross-walking denotes a process through which O\*NET occupation codes are matched with codes in other classification systems<sup>66</sup>) to the Canadian National Occupational Classification (NOC) system to allow for Canadian-specific analyses.<sup>67</sup> This approach works best when each occupation is treated as having a known, fixed set of skills and that the associated skills profile composition will not change over time. These frameworks, therefore, make for a great baseline understanding but are not well suited to identifying needs for entirely new skills and knowledge requirements.

The second and third methods identified by the LMIC in their 2021 report are not as commonly used by industry groups but remain important to understanding changing skills needs.<sup>68</sup> For the second, data on skills needs (which can be referred to as work requirement data) are gathered directly from online job postings. This is typically done through natural language processing algorithms, which help standardize the phrases into a predefined taxonomy.<sup>69</sup> While this approach shows promise, its novelty means that additional assessments on its use for skills forecasting are needed, and subsequent adjustments may be required.<sup>70</sup> There are also some potential downsides. Employers may not be aware (or completely forthcoming) of all the skills required to succeed in a given role, meaning this approach may not offer the complete picture of skills needed within a job. The third approach involves using expert opinions to develop skill trajectories for skills based on a taxonomy like O\*NET or ESDC's Skills and Competencies. This approach is the most commonly used across the OECD and can take the form of employer surveys, sector studies, interviews, and roundtables. These exercises are useful for surfacing practical challenges that modelling will miss, but they also do not offer the same depth or breadth of insight that can be achieved through quantitative methods or job board examination. They are best seen as a complement to these more detailed approaches.

The methodological steps used for SPI's project, *Closing Canada's green skills gap: Identifying Canada's green skilled workforce needs to reach our national 2030 climate target*,<sup>71</sup> included a foresight exercise, a survey, skills needs modelling using an existing skills and knowledge taxonomy, and interviews and workshops with stakeholders. This methodology was developed to combine detailed quantitative findings on changes in existing skills and identification of new skills stakeholders felt would be in demand as the sector grew in the coming decade. Although this approach has proven useful in supporting planning efforts and designing sustainable transition programs, policies, and initiatives, other approaches may be more effective in certain circumstances or locations, and future research may lead to improved approaches.

### Do workers need new skills or existing skills?

A significant challenge is that skills needed in the future might not currently exist. Assessing these new skills is difficult primarily because there is a lack of data on which future, non-existent



skills might soon be in demand. LMIC notes another challenge in identifying future skills needs is that many existing skills (or changes in skills that are in demand) are not typically directly monitored or evaluated.<sup>72</sup> This means that whether the scope is identifying a new skill or an entirely new occupation, it can take time for research to recognize a new type of work, start the data collection process, and determine a new skill description or occupation profile based on these changes (or update existing ones). This is the case even if trends indicate that individuals will soon be required to learn new skills and knowledge attributes. Innovations can cause new fields and occupations to be created, like when greater use of the internet became mainstream. Entire IT departments were set up, dedicated businesses established, and skilled professionals trained because of these widespread changes. Similarly, climate action and decarbonization are expected to result in shifts in skills and knowledge needs from workers as the adoption of clean technologies grows.<sup>73</sup> Therefore, to identify some of these new skills, SPI recommends using expert or stakeholder engagement methods that are designed to navigate some of these challenges.<sup>74</sup>

When conducting these skills identification exercises, it is important to note the distinction between possessing a skill and applying that skill. For example, visual artists and civil engineers have expert knowledge to accomplish their tasks, but in different domains, and each applies it differently to accomplish the tasks in their field. In another example, judgement and decision making can be an important skill for multiple occupations but are applied in different circumstances depending on the workplace's responsibilities. A manufacturing manager might use making to evaluate and decide whether their company should invest in new automation or robotics technologies. A financial planner could employ the same skills to assess an individual's accounts to make recommendations. Meanwhile, a farmer would use these skills to review data to make operational or planting decisions. These distinctions may not always be apparent to stakeholders within the sector, who may see a particular task as unique to their specific context. It will be up to researchers to interpret and delineate between the tasks completed and the skills required to complete those tasks to then determine what should be taught in training and education programs. should be taught in training and education programs.

## Step 5: How should stakeholders be engaged?

Engaging stakeholders should not be an afterthought or only arise in the form of a consultation on the outcomes of a modelling exercise to confirm findings. Instead, it is a crucial process that should be incorporated throughout all steps of an initiative (see [Box: how should engagement take place?](#) for a recommended breakdown of how to conduct engagement within each step). Stakeholder engagement is essential for informing training and education efforts for three primary reasons. First, stakeholders understand their local labour market context and have insights into what a model might not accurately reflect. Second, stakeholders can help expand a particular project's reach by gaining insights from and sharing findings with local

communities and workers, who may be harder for researchers to reach individually. Finally, stakeholders are often the parties responsible for actioning the findings and outcomes of any initiative. If the results of the initiative do not reflect their understanding, expertise, and experiences, they are far less likely to use any findings and recommendations when designing skills training initiatives, and they may even see the initiative as entirely irrelevant to their work.

## Which stakeholders need to be engaged?

A useful framework to approach stakeholder engagement and to identify the key actors in a region's or sector's skills development system is to develop a skills ecosystem framework for the cluster. Skills ecosystems are defined as regional and industry-specific networks in which workers' capabilities are developed and deployed for productive purposes.<sup>75</sup> The overarching goal of a skills ecosystem approach is to improve the alignment between training and industry needs, which can foster growth and innovation, increase the sustainability of the workforce, and reduce social inequities.<sup>76</sup> Under this approach, stakeholders can roughly be categorized into the following non-exhaustive list of groups: learners/workers, educational institutions and training providers, employers and unions, policymakers and governments, and coordinating bodies, such as industry associations and employment agencies. Each type of stakeholder is responsible for different aspects of skills development, and it is important to engage with a broad set of stakeholders across all categories to gain a comprehensive understanding of a region's or sector's skills development system:

- Training and educational institutions, such as universities and colleges, are responsible for delivering training to learners/workers. In addition, they train instructors, arrange work-integrated learning opportunities with employers, design and adapt curriculums with other stakeholders, and issue certifications and accreditations. They also provide crucial support to learners/workers, including financial aid, student housing, cultural and linguistic supports, and career awareness and guidance.<sup>77</sup>
- Employers and unions can fulfil a variety of functions in a skills ecosystem, including articulating demands for skills and training, providing work-integrated learning opportunities, and providing support to learners, such as flexible work arrangements. Employers also offer learners the opportunity to utilize their skills, which is a critical component of a healthy skill ecosystem.
- Policymakers and governments fulfil important functions, such as conducting labour market research, defining occupations and identifying specific skills, making capital investments, and providing operational funding for a variety of programs (including training initiatives). Policymakers also coordinate communication between actors within the skill ecosystem. Additionally, policymakers greatly influence some of the supports available for workers and industry alike.
- Learners/workers participate in learning opportunities, utilize relevant services and supports, and supply and utilize skills in the local labour market. A skills ecosystem is shaped

by a learners/worker's needs, interests, and abilities, as well as how an individual interacts with available services, supports, and infrastructure.<sup>78</sup>

- Coordinating bodies support the information flow and collaboration between the different stakeholders. Coordinating bodies include industry associations, employment agencies, immigration and (re)settlement services, labour market committees, and informal networks.<sup>79</sup>

## What engagement methods exist, and when should each be used?

Engagement can take various forms, including interviews and conversations with individuals, group discussions, and group consultations via surveys. Individual forms of engagement, such as stakeholder interviews, allow for a deep dive into the perspective of a single stakeholder. This approach is well suited for gathering expertise on a specific subject, having in-depth conversations about specific issues, and asking questions and clarifying uncertainties. Group discussions, such as workshops and roundtables, on the other hand, are ideal for collective brainstorming and ideation exercises. This allows stakeholders from varying backgrounds to exchange and build upon each other's perspectives, which can prompt discussions that are unlikely to occur in individual interviews. Group discussions can also be a useful forum for presenting initial findings from previous steps and gathering feedback from a large group. Group consultations, such as surveys, allow for collecting data, comments,

and feedback from a large group of stakeholders simultaneously. Stakeholders might also feel more comfortable sharing critical perspectives, especially when surveys are administered anonymously. By combining different individual and group-based approaches, it is possible to capture more prominent collective viewpoints, trends, and data, as well as more specific and detailed insights. The different types of data generated by each method of stakeholder engagement contribute important insights to the sustainable job planning process.

It is also important to recognize that even within different types of stakeholders, additional focus and care are needed to include and listen to stakeholders from equity-deserving populations. Women, people of colour, Indigenous peoples, recent immigrants, and persons with disabilities, as well as other equity-deserving groups, are all essential components of a workforce and exist within all other stakeholder groups. Without care and attention to include organizations which support and represent these groups, skills and training projects can accentuate existing biases and gaps in employment and training outcomes. A significant component of the initial skills framework and stakeholder ecosystem should include an equity, diversity, and inclusion lens for the demographic groups involved in a particular economic opportunity, such as if the sector has a large component of Indigenous workers or a higher percentage of temporary immigrants. Adding this lens can ensure that the resulting skills training and education programs do not replicate existing inequities and help to expand opportunities.

## How should engagement occur in each step of this process?

Stakeholder engagement should occur across all stages of an initiative. Each initiative is different and starts with varying levels of insights, and it might be necessary to adapt elements to better inform the work that is being conducted, but the following are recommended steps to be taken at each step:

- **Step 1: Identify a scope.** Individual interviews and conversations with subject matter experts should be conducted during the initial scoping phase. These allow for in-depth gathering of knowledge and the scoping of a particular initiative. This also allows for building initial relationships and partnerships, which can be invaluable at later stages.
- **Step 2: Identify what success looks like for an initiative.** Identical to step 1.
- **Step 3: Identifying labour needs for the cluster.** Larger group consultations, such as gathering data and input via a survey, become more important in this step. At the same time, individual interviews remain a useful tool to fill in missing gaps and to answer new questions that might arise from survey findings. These two methods should be advanced in parallel.
- **Step 4: Identifying changes in skills needs within the cluster.** Similar to Step 3, a blend of individual conversations with group engagement is useful at this stage. It is also at this stage where a larger workshop or roundtable to present initial findings and to gather feedback and further input from a larger group could be useful. Ideally, these are in-person and bring together stakeholders from a wide array of sectors for constructive conversations about the current and future state of skills training and education efforts within the cluster.
- **Step 6: Identify and implement post-research activities.** Once the research is completed, the focus is on knowledge mobilization efforts. This can include enlisting stakeholders as reviewers for the research reports and presenting findings at conferences, trade shows, and regional workshops. Another priority should be to ensure that previously engaged stakeholders, such as workshop participants, receive copies of the research as they can help implement the findings and share with their networks.

## Step 6: Identify and implement post-research activities

Once the research is completed, it is critical to implement the findings and make sure that any proposed actions are taken up and championed by stakeholders in the ecosystem. Studies show that passive dissemination of information is generally ineffective in bringing about change and that more proactive approaches are required.<sup>80</sup> At a local level, these proactive approaches could include using local opinion leaders to expand impact and knowledge mobilization, developing processes to build consensus for policy solutions, or to create interactive educational meetings. Additionally, roundtables could be convened following the publication of findings to identify what local leaders require to implement these approaches. If stakeholder engagement has been appropriately conducted throughout the process, stakeholders should feel engaged and represented in the findings, increasing the likelihood of being acted upon. Convening roundtables should also be accompanied by offers of financial support from relevant levels of government to help fund emerging pilots, as developing new training and curricula typically requires capital investment.

Another key point is that stakeholders, particularly regional groups, will already have mechanisms in place to update curricula through training and education providers, support workforce development efforts, and address the kinds of challenges that surfaced within research results. In the case of not wanting to duplicate existing skills planning initiatives, the following steps should involve working with the actors already engaged in workforce development to understand what is missing to allow them to act on these findings. This process may involve additional engagement and may require being led by a local champion capable of bringing together stakeholders and sustaining the required dialogue and collaboration to create local buy-in for the initiative.

Finally, monitoring and evaluation plans should be developed to evaluate the success of implementation efforts. A wide variety of information could be collected but should include identifying the costs or cost-effectiveness of interventions, the acceptability and adoption of new skills, and the financial sustainability of current approaches to skills implementation. More participatory approaches to monitoring and evaluation, like the EU's MATES program, that focus on stakeholder empowerment and social learning<sup>81</sup> can also help the ecosystem identify where they are now and where they would like to go.<sup>82</sup>







## Conclusion

Training a skilled workforce will be essential in Canada to grow the sustainable economy, reach emissions reductions targets, and ensure the creation of new job opportunities. In every region and sector across the country, workers will be needed to design, build, install, and maintain solutions that will reduce greenhouse gas emissions. These same solutions will also grow Canada's economy. As this report shows, the approaches needed to support these future workers are not abstract or mysterious. They involve putting local stakeholders in the driver's seat, conducting research to lend insight into the scale of the challenge, and fostering stakeholder collaboration to begin training efforts. If these steps are not taken, challenges such as uncoordinated policies, a lack of clarity around direction, and poor workforce planning could hold back climate progress in Canada.

At the conclusion of this research project, we are convinced that Canada's path forward on climate action requires putting sectors and communities in charge of their futures. Little about sustainable jobs planning is unique to the sustainability space, and the stakeholders we have engaged with in our work understand this. What they will require to advance these efforts is credible, evidence-based analysis to inform decision making, a common objective (such as a legislated climate target or set of policies to work towards), and a shared vision. This last challenge, in particular, will be key. As sectors move towards their goals, they will need to collectively identify and agree on what problems they are trying to solve and move together to address them. In this project, we witnessed how a common objective can bring together unlikely allies and solve problems in an incredibly short amount of time. We also saw examples where a lack of common purpose meant little progress was made, and workers bore the costs of this indecision and handwringing. This guide puts forward a process that communities can follow to get their workforces from uncertain to implementation-ready—but it is ultimately up to these communities and sectors to set the direction for where they want to go.

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