Designing Home Retrofit Policy for the People Who Do the Work

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A discussion paper on home performance business models for net-zero emissions and good jobs

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About Efficiency Canada

Efficiency Canada is the national voice for an energy-efficient economy. Our mission is to create a sustainable environment and better life for all Canadians by making our country a global leader in energy efficiency policy, technology, and jobs. Efficiency Canada is housed at Carleton University's Sustainable Energy Research Centre, which is located on the traditional unceded territories of the Algonquin nation.

The views expressed, as well as any errors or omissions, are the authors' sole responsibility.

Executive summary

Meeting Canada's 2050 greenhouse gas emission goals will require significant efforts to scale decarbonization in existing homes.

The home improvement sector, including companies and workers involved in installing heat pumps, upgrading insulation, and air sealing homes, plays a crucial role. However, few policy initiatives are focused on their perspective. Instead, policy attention is directed toward customer incentives and regulatory measures.

It is important to think about home decarbonization policy from a contractor perspective — without businesses driving the change, we don't see how the scale of high-quality retrofits required to meet Canada's net-zero goals can be achieved.

The goal of this paper is to initiate a discussion on practical, applicable policies that support these key players in their decarbonization work. We explore how policies can align business practices in the sector with net-zero pathways while creating good jobs for workers.

First, we explore challenges and missed opportunities in the home-improvement sector. Prevailing business models driven by short-term planning and reactive approaches fail to capture significant value for both contractors and homeowners. This also poses a climate problem, as energy and carbon-intensive technologies may be locked in for another generation. Addressing these dynamics presents an economic opportunity with potential productivity-enhancing changes, creating new entry points for economic activity, and securing middle-class prosperity through better, more stable jobs.

Next, we outline the concept of "home performance", an approach that treats homes as complex integrated systems. Sequential retrofit strategies with upgrades planned over years to coincide with the end of equipment or material lifetimes could capture more value for all stakeholders. Business models centered around this concept would offer integrative services that value long-term and proactive planning. We introduce a framework to conceptualize existing and emerging home performance business models along a spectrum of value propositions for both contractors and homeowners.

Using this framework, we discuss the value proposition of home performance business models for all stakeholders. For homeowners, this approach enables them to undertake improvements sequentially, fitting them within their budget and available resources

while maximizing the benefits of energy retrofit upgrades. For Canada, this could mean every home improvement project is better aligned with net-zero pathways and good jobs goals. For contractors, consultative home performance business models could mean higher revenues per customer, spreading demand across seasons, fewer call-backs, and creating rewarding and long-term customer relationships.

Additionally, we discuss how changing business models can help the sector address emerging challenges such as the evolving nature of homeownership, the growing complexity of home heating and cooling systems, the steep learning curve of new digital technologies for business operations, consolidation and buy-outs of small businesses, and issues related to talent acquisition, retention, and productivity.

While the advantages of shifting to a home performance-based approach are clear, they may not occur simultaneously. Transforming business models often involves substantial upfront expenses and risks, including retraining employees and altering sales, marketing, and operating practices. Overcoming these barriers calls for concerted (often external) support to make the transition feasible and attractive for businesses. While less common in the blue-collar home improvement sector, business support policies are common in other industries such as agriculture, manufacturing and software.

We discuss how public policies can assist in this transformation by supporting businesses directly through tailored services delivered by intermediary organizations, ensuring businesses find the right people, resources, and assurances to succeed. Change is thus encouraged through interaction and the creation of policy networks, distinct from regulations or subsidization focused on fixing market failures. Public policy can also reshape market environments to increase opportunities for businesses following a specific model.

We provide examples of policies from other jurisdictions that are helping transform business models toward home performance. We conclude by presenting the idea of a "good job green industrial policy," underscoring the importance of considering the people who actually do the work and why Canada's industrial, energy efficiency and climate policies need to support businesses that will reduce domestic emissions and provide good jobs. We hope this discussion paper inspires new thinking and have provided discussion questions to guide the reader's thoughts.

Sommaire

S'il souhaite atteindre ses objectifs en matière d'émissions de gaz à effet de serre d'ici 2050, le Canada devra déployer des efforts considérables pour procéder à la décarbonisation à grande échelle des maisons existantes.

Le secteur de l'amélioration de l'habitat, dont font partie les entreprises et les travailleurs qui installent des thermopompes, améliorent l'isolation et étanchéisent les maisons, joue un rôle crucial dans l'atteinte de ces objectifs. Toutefois, peu de politiques tiennent compte de leur manière de voir les choses. La plupart d'entre elles sont plutôt axées sur les incitatifs et les mesures de réglementation à l'intention des consommateurs.

Il est important d'aborder les politiques de décarbonisation de l'habitat du point de vue des entrepreneurs: en l'absence d'entreprises à l'origine du changement, nous ne voyons pas comment il sera possible d'effectuer des travaux de modernisation de haute qualité d'une ampleur nécessaire à l'atteinte des objectifs du Canada en matière de carboneutralité.

Le but de ce document est d'entamer une discussion sur les politiques pratiques et applicables qui soutiennent ces acteurs clés dans leurs efforts de décarbonisation. Pour ce faire, nous nous penchons sur la façon dont les politiques peuvent contribuer à l'harmonisation des pratiques commerciales du secteur avec les voies vers la carboneutralité tout en veillant à la création de bons emplois pour les travailleurs.

Nous commençons par aborder les défis et les occasions manquées du secteur de l'amélioration de l'habitat. Les modèles commerciaux dominants, qui reposent sur une planification à court terme et des approches réactives, ne parviennent pas à créer une valeur considérable pour les entrepreneurs et les propriétaires. Cette situation constitue un problème climatique, car la prochaine génération pourrait être aux prises avec les technologies énergétiques et à forte intensité de carbone actuelles. Le fait de traiter de ces dynamiques entraîne des possibilités économiques ainsi que des changements susceptibles d'améliorer la productivité, car le tout permet de créer de nouvelles sources d'activité économique et d'assurer la prospérité de la classe moyenne grâce à des emplois meilleurs et plus stables.

Ensuite, nous décrivons le concept de « performance de l'habitat », une approche qui considère les maisons comme des systèmes complexes intégrés. La mise sur pied de

stratégies de modernisation séquentielles assorties de mises à jour prévues au cours des prochaines années pour les faire coïncider avec la fin de la durée de vie de l'équipement ou du matériel pourrait créer plus de valeur pour l'ensemble des intervenants. Les modèles commerciaux axés sur ce concept pourraient offrir des services intégrés qui prônent la planification proactive et à long terme. Nous mettons en place un cadre pour conceptualiser les modèles commerciaux existants et émergents en matière de performance de l'habitat ainsi qu'une gamme de propositions de valeur à l'intention des entrepreneurs et des propriétaires.

À l'aide de ce cadre, nous discutons de la proposition de valeur des modèles commerciaux de performance de l'habitat pour l'ensemble des intervenants. Cette approche permet à ces derniers d'apporter des améliorations séquentielles en tenant compte de leur budget et des ressources disponibles, tout en maximisant les avantages de la modernisation énergétique. Elle pourrait garantir une meilleure harmonisation de chaque projet d'amélioration de l'habitat avec les voies vers la carboneutralité et les objectifs en matière de bons emplois pour le Canada. Pour les entrepreneurs, l'adoption de modèles commerciaux consultatifs de performance de l'habitat pourrait se traduire par une augmentation des revenus générés par client, une répartition de la demande sur plusieurs saisons, une diminution du nombre de rappels et l'établissement de relations gratifiantes et à long terme avec les clients.

En outre, nous examinons comment l'évolution des modèles commerciaux peut aider le secteur à relever les nouveaux défis tels que la nature évolutive de l'accession à la propriété, la complexité croissante des systèmes de chauffage et de climatisation, la courbe d'apprentissage abrupte des nouvelles technologies numériques utilisées dans les activités commerciales, la fusion et les rachats de petites entreprises ainsi que les questions liées à l'acquisition, au maintien en poste et à la productivité des talents.

Les avantages de l'adoption d'une approche fondée sur la performance de l'habitat sont peut-être évidents, mais ils pourraient ne pas se produire simultanément. La transformation des modèles commerciaux entraîne souvent des dépenses initiales et des risques considérables, notamment la formation des employés et la modification des pratiques commerciales, de marketing et d'exploitation. Pour surmonter ces obstacles, il faut offrir un soutien concerté (souvent externe) afin de rendre la transition réalisable et attrayante pour les entreprises. Bien qu'elles soient moins courantes dans le secteur de l'amélioration de l'habitat par les cols bleus, les politiques de soutien aux

entreprises sont en vigueur dans d'autres secteurs tels que l'agriculture, la fabrication et les logiciels.

Nous discutons de la façon dont les politiques publiques peuvent contribuer à cette transformation en soutenant directement les entreprises par le biais de services adaptés fournis par des organismes intermédiaires, le tout en veillant à ce que les entreprises trouvent les personnes, les ressources et les garanties nécessaires à leur réussite. On encourage donc un changement par les interactions et la création de réseaux politiques qui se distinguent des réglementations ou des subventions visant à corriger les défaillances du marché. La politique publique peut également refaçonner les environnements commerciaux afin d'accroître les débouchés pour les entreprises suivant un modèle précis.

Nous offrons des exemples de politiques en vigueur dans d'autres administrations qui aident à orienter les modèles commerciaux vers la performance de l'habitat. Nous concluons en proposant une « politique industrielle verte pour de bons emplois », en soulignant l'importance de tenir compte des personnes qui font réellement le travail et des raisons pour lesquelles les politiques industrielles, climatiques et écoénergétiques du Canada doivent soutenir les entreprises qui réduiront les émissions à l'échelle nationale et créeront de bons emplois. Nous espérons que cet article suscitera chez le lecteur des idées nouvelles et des questions qui l'aideront à guider sa réflexion.

Introduction

Meeting Canada's 2050 greenhouse gas emission goals requires significant efforts to decarbonize existing homes. While much of the technology needed to achieve this goal already exists — and the benefits are broadly understood — market uptake of technologies like heat pumps and efficiency measures such as insulation and air sealing has been slow.[1]

The dominant policy paradigm to encourage broader adoption of energy and GHG saving retrofits has been to provide incremental financial incentives to homeowners or to regulate the worst performing products at the point of sale. Along these lines, federal initiatives such as the Greener Homes program and Green Municipal Fund provide incentives, grants and financing to help homeowners improve energy efficiency and transition their homes off fossil heat. Federal regulations require household appliances and heating and cooling equipment to meet certain prescribed minimum energy efficiency performance standards.

These policies have resulted in some improvement. A recent progress report on the impact of the Greener Homes program shows that the annual retrofit rate has increased to just under one per cent of the low-rise building stock in 2022. Yet, at this rate, it would still take over a century to retrofit all buildings. Only 6.3 per cent of these retrofits achieved 50 per cent savings or more, with fewer homes undertaking building envelope improvements.[2]

A key part of the puzzle involves the people who actually do the work of decarbonizing homes by installing heat pumps, upgrading insulation, air sealing homes, etc. Few policy initiatives are focused on their perspective.

The people and businesses in the home renovation sector face a volatile environment with seasonal boom-busts and crisis management of “no heat” service emergencies. Decarbonization policy and new technologies add complexity and demands. Yet, these businesses have fewer resources due to factors like an aging workforce and competition based on narrow up-front price considerations.

The problems of the HVAC and home renovation companies will become climate policy problems. If heat pumps are not properly sized, installed, monitored, well integrated, and

[1] Government of Canada, “Canada’s 2030 Emissions Reduction Plan - Chapter 2.”

[2] Millyard, “Retrofitting Canada’s Homes: Progress Report #1.”

performance tested (i.e. commissioned), consumers may lose confidence in the technology. A failure to follow sound building science principles can lead to unhealthy buildings with problems such as mould or poor indoor environmental quality. Most importantly, we will not significantly scale net-zero emission performance retrofits unless customers and businesses become enthusiastic participants and can capture more value and life improvements.

This paper aims to start a discussion on designing home energy efficiency and decarbonization policy for the people and businesses that do the work. We discuss the critical role of changing business models and what policy can do to facilitate productive business model changes that meet societal goals for net-zero emissions and good jobs.

The paper will first discuss the current business environment and sectoral dynamics. We introduce the role of business models and what net-zero emission-aligned home performance business models could look like. We then consider the role of policy in facilitating business model change, discussing direct business supports and shaping market environments that enable new business model success and growth. The paper ends with discussion questions on exploring the right energy efficiency "policy mix" from the perspective of those people and businesses doing the work.

Why focus on business models?

The residential retrofit industry has many stakeholders with overlapping interests and values. Homeowners as consumers have certain needs and expectations of the products and services they purchase. Businesses and business owners seek to turn a profit by competing to meet those consumer needs. Workers seek to earn a livelihood and advance in careers they find meaningful and rewarding. Societal interests lie in ensuring the industry is aligned with net-zero goals and provides good jobs. A business model is a representation of how a firm can create, deliver and capture value for these networks of stakeholders.[3]

In doing so, business models provide an insight into understanding the industry from the perspective of stakeholders. By visualizing the flow of value and resources between networked stakeholders, business models help us better understand the internal operational logic of the industry. Conceptual tools such as value proposition, core

[3] Osterwalder, *The Business Model Ontology - a Proposition in a Design Science Approach.*

competencies, market differentiation, revenue streams, etc., allow us to make observations, such as why the industry targets certain opportunities and leaves others out or why some stakeholders are able to realize some of their goals while others miss out.

By mapping out the terrain of an industry in terms of value captured for stakeholders, we can also anticipate the trajectories through which a sector might evolve in response to market conditions or comment on why they can become stuck or locked into practices that are undesirable from the perspective of different stakeholders.[4]

Most importantly, business models as a reflection of market realities offer an entry point into developing policy responses from the perspective of the everyday lives of the people and businesses that do the work. This helps us develop a mix of policies and business supports that are practical and applicable to the daily lives of businesses and workers in the sector while exploring how these business practices can be better aligned with net-zero pathways and good jobs for workers.

The home improvement sector now: challenges and (missed) opportunities?

Homes can be sanctuaries of comfort, health, and safety. Homes provide reliable heating and cooling, maintain good indoor environmental quality, and offer protection during extreme events such as power outages. However, realizing those services may often require major improvements such as opening walls, re-cladding exteriors, upgrading roofing, or replacing heating systems.

Such home improvement projects can be an entry point for decarbonizing homes by incorporating advanced envelope or heating system upgrades into renovation plans. Yet, surprisingly, such decarbonizing opportunities are rarely seized in practice. Why are these opportunities overlooked?

This section discusses business model dynamics that might contribute to why these opportunities are overlooked. We explore how the prevailing business models' *reactive* approach to home improvements could be hindering the widespread adoption of decarbonization initiatives. We examine the promise of a more proactive business

[4] Barnes and Hansen, "16 - Governing Energy Communities."

model — home performance — for decarbonizing Canadian homes while providing good jobs for the workforce.

Canadians care about their homes and invest in them

Home improvement is a big business in Canada. Nearly one in two Canadians plan home improvements of some sort every year, and Canadians invest $77B in improving their homes every year.[5]

The majority of investments in home improvement are **lifestyle renovations,** such as redesigning a kitchen for a modern aesthetic. These services are provided by specialized home renovation contractors, remodelers, design+build firms, and general contractors.

Canadians invest another $26B in routine **maintenance and repair**, such as replacing roof shingles, repairing eavestroughs, or maintaining outdoor landscaping, to ensure their homes remain in good condition. These services are provided by general contractors or specialized home service providers.

Maintaining desired indoor temperatures is also a priority for Canadians. Nearly 360,000 furnaces and air conditioners are upgraded, replaced or installed every year in Canada, with spending on home air conditioning and heating equipment totalling $1.2B in 2022.[6] **Retrofit projects** may also include upgrading insulation, performing air sealing and adding new siding, although the size of this industry in the context of residential services is not well documented.

Why current business models create challenges for decarbonization and good jobs

In principle, such home improvement projects present an opportunity for decarbonizing homes: insulation upgrades when walls are opened up or when exterior re-cladding and roofing upgrades are performed; and upgrading to low-carbon and efficient heat pumps when heating systems are replaced.

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[5] RE/MAX Canada, “Canadian Real Estate Trends”; Statistics Canada, “Investment in Building Construction.”

[6] Statistics Canada, “Air Conditioning.”

In practice, however, these opportunities are seldom taken advantage of. Homeowners prioritize lifestyle renovations — such as adding basement in-law suites or kitchen renovations — without considering improving energy efficiency or reducing household emissions. Similarly, heating and cooling systems in homes are often replaced with newer equivalent systems rather than switching to highly efficient and low-carbon systems like heat pumps, as evidenced by their low uptake rate.[7]

In a typical scenario, homeowners and home improvement firms are confined to a transaction-based business model characterized by **short-term planning**, a **reactive approach** to the immediate desires of homeowners, and the provision of services that are specific to **one-time homeowner needs** and contractor's core competency.

Challenges for decarbonization

Homeowners, driven by lifestyle changes, aesthetic preferences or emergency needs, seek specific home improvement services within the confines of their budget, time and resources. Contractors in a competitive market promptly offer quotes and services, aiming to deliver the most value within the scope of their expertise and specialization. Often, they do not fully consider the pricing or marketing of building envelope improvements beyond the minimum required by building codes.

These improvements, usually aesthetic in nature, come with well-known cost recovery benchmarks and improved home value.[8] However, the benefits of less visible upgrades, such as insulation enhancements, while documented by some research, are less widely recognized. Consequently, homeowners are less likely to undertake these improvements as part of broader home renovation projects.[9]

Businesses providing residential heating, ventilation, and air conditioning (HVAC) services find themselves in a volatile market environment. A significant portion of the

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[7] Heat pump use in homes increased from four per cent in 2019 to seven per cent in 2023. See: https://www150.statcan.gc.ca/n1/daily-quotidien/231030/dq231030b-eng.htm and Statistics Canada. Table 38-10-0286-01 Primary heating systems and type of energy
DOI: https://doi.org/10.25318/3810028601-eng.

[8] Many lifestyle blogs and realty organizations publish surveys and national benchmarks for cost and value of home renovations. See https://blog.remax.ca/best-home-renovations-biggest-roi/ and https://www.investopedia.com/articles/mortgages-real-estate/08/add-value-to-real-estate.asp and https://www.royallepage.ca/en/realestate/news/kitchen-renovation-has-greatest-potential-to-boost-a-propertys-sale-price/ for example.

[9] Yun et al., "National Association of Realtors Research Group: Remodeling Impact Report."

business involves response to emergency replacement needs. An estimated 85 per cent of replacements happen when equipment abruptly breaks down at end of life.[10] Without forward planning, there is little opportunity to improve building envelopes, duct systems etc., to complement decarbonized heating or to engage in some customer education about a different heating system.

Challenges for good jobs

The absence of strategic planning for heating system improvements results in a business cycle for contractors that is heavily influenced by seasonal variations, leading to operational challenges. Contractors typically see a surge in customer inquiries and service requests at the height of summer heat or the depths of the chill of winter, just when heating and cooling systems are pushed to their limits and more prone to fail. This pattern leads to contractors facing extended lulls in work, interrupted by short spells of intense demand.[11] This cyclical "feast and famine" pattern undermines business continuity and burdens resource allocation, workload, staffing and customer relations during peak times.

In an environment dominated by short-term decision-making under the duress of equipment failure, contractors often vie for business based on cost and rapid service, focusing on moving existing stock from their inventory.[12] Opportunities to educate customers about the health and comfort benefits of building envelope improvements or the advantages of tailored and efficient heat pumps are scarce. The common practice of offering a "free quote" for equipment typically minimizes the importance of informed consultation and design advice.

The focus on immediate HVAC solutions also keeps companies that could be collaborating on comprehensive decarbonization projects apart. Instead of devising a long-term, integrated strategy for a decarbonized and efficient home system that combines the building envelope, ventilation, and temperature control, homeowners are opting for quick replacements. Window and insulation specialists often work in silos, separate from HVAC professionals, leading to disjointed retrofits that are managed in an ad hoc manner by the homeowner.

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[10] Adams, “Emergency! Most HVAC Replacements Are Emergencies, Don’t Miss a Key Opportunity!”; Open Technologies, “Stuck: Why Home Electrification Is Lagging in British Columbia and What Must Be Done to Break the Deadlock on Residential Carbon Retrofits.”

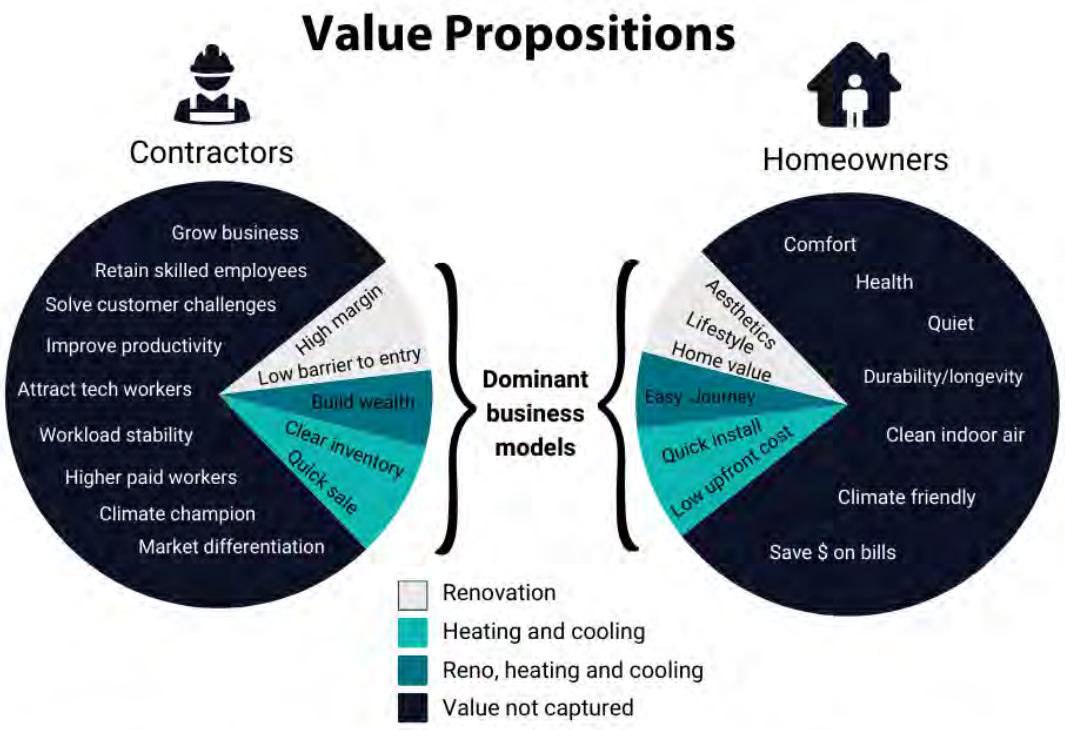
[11] Thomas, “So You Want to Be a Home Performance Contractor...”.

[12] HRAI, “Overcoming Implementation Barriers to HVAC Contractor-Led Building Retrofits.”

What happens in the home renovation sector matters

Current business models are a climate and economic policy problem

The current situation where lifestyle renovations are prioritized over basic home services related to comfort and health means significant value fails to be captured for both contractor businesses and clients (homeowners and occupants). Figure 1 shows the limited slice of the value "pie" emphasized by the current market environment and what is left out. Clients could be experiencing much lower bills, protection against climate impacts, and improved health and comfort.



Existing business models in home improvement services industry in Canada only unlock a small piece of the value proposition pie for both homeowners and contractors

Figure 1. Home improvement value propositions for contractors and homeowners

The lack of value capture for contractor businesses is both a climate and economic policy problem. It is a climate policy problem because current business models for home energy upgrades are geared towards locking in conventional — and sometimes energy and carbon-intensive — technologies for another generation.

This is also an economic problem as businesses miss out on potential productivity-enhancing changes. Capturing more value for businesses could mean better job satisfaction to attract and retain workers through stable and meaningful employment. The lack of value capture also reduces the ability to pay appropriate mid-range wages, which are important for an economy seeking to provide good jobs. A domestic service industry like home improvement is more likely to be a source of middle-class employment in the future than traditional sectors like manufacturing due to factors like automation.[13]

The structural characteristics and dynamics described above are a set of challenges for contractor businesses and customers engaged in private market transactions. Governments play a limited role in ensuring customer protection, trades certification etc. but take no strategic interest in business behaviours and sector dynamics. This is the dominant policy approach right now.

We argue that what happens in the home renovation sector matters for some of Canada's most pressing societal challenges, such as climate change and the provision of good middle-class jobs in the future.

Why it matters for climate change

Canada has ambitious climate targets that it must meet in a relatively short period of time. Decarbonizing residential buildings requires a major increase in the pace of retrofits and higher energy and GHG savings per home. This is unlikely to occur without businesses who do the retrofit work (or could do it) adopting business strategies that accelerate the achievement of climate change goals. This includes increasing the speed and depth of decarbonizing home improvements and ensuring technologies like heat pumps meet customer needs and do not result in "defaming" and losing consumer confidence.

[13] Rodrik, "An Industrial Policy for Good Jobs."

Why it matters for good jobs

The business models adopted in the home renovation sector also matter because this sector is capable of providing good, middle-class jobs in the future.

Policymakers have previously looked to manufacturing sectors to supply their populations with rewarding, middle-class wage jobs. However, manufacturing has been declining as an overall share of employment in Canada and internationally (Rodrik 2022). Modern manufacturing requires increased skill and capital intensity and faces increased international competition. While manufacturing will remain a strategic sector to earn export revenue, promote innovation, and create secure supply chains, it might not play its 20th-century role as the prime supplier of good middle-class jobs.

The bulk of good mid-wage jobs are likely to be supplied by domestic service industries where ongoing interactions with customers are part of the process and less susceptible to automation. Home renovations is a sector that could supply good middle-class jobs that also help meet net-zero emissions. However, for these positions to offer good wages, stable employment, job security and opportunities for advancement, the businesses must be sufficiently productive, and the market must maintain a level of consistency to ensure the longevity, stability and reliability of these roles.

Therefore, how businesses adapt to the aforementioned dynamics and their ability to transition away from current low-value business settings is a matter of public interest and should be considered a focal point for public policy.

Are home performance business models a better way?

What is a home performance business model?

Above, we described a dominant business model focused on quick installation of (mostly fossil fuel-based) HVAC equipment at low up-front cost or home renovations focused on aesthetic upgrades instead of changes to a home's unseen yet fundamental services, like comfort and health.

Home performance is a term used in building science to emphasize how all aspects of a home work together as a comprehensive system, where performance considers the

seen and unseen factors like affordability, comfort, health, durability and energy efficiency.

Business models centered around this concept would offer integrative services to make the home work better as a system. These services would be delivered in a more turn-key and streamlined way for customers purchasing a desired end-state that can be achieved through changes to insulation, air sealing, ducting, HVAC systems, ventilation, filtration, on-site generation and storage, etc. Business profit would be focused on offering a service to solve these problems, with the value of good consultation, education, and design of a project recognized and compensated.

The relationship between customer and business is more likely to be long-term and consultative. This could be because the contractor could be paid for realized energy efficiency and affordability improvements or due to ongoing monitoring of indoor environmental quality. Both parties might also be involved in implementing sequential retrofit strategies, with upgrades planned over years to coincide with the end of equipment or material lifetimes.

A shift to home performance business models may be necessary

Managing prevailing dynamics: seizing additional value

Compared to prevailing business models in the sector, a home performance approach offers a viable pathway for scaling residential decarbonization by creating and capturing additional value for all stakeholders.

- For homeowners, a home performance approach enables them to undertake improvements sequentially, fitting them within their budget and available resources. By treating a house as a complex interconnected system, a home performance approach maximizes the co-benefits of measures being installed and helps fix existing issues while avoiding creating new ones. Better home performance enhances comfort by regulating temperature, humidity, and air quality. This has ancillary health benefits as well, especially for individuals who

suffer from respiratory illnesses, allergies, or long-term illnesses.[14] Taken together, home performance can help homeowners unlock more value from their homes by helping them achieve better comfort, improved convenience, ease of decision-making and reduced climate impacts.

- For contractors, this means a steady workflow and a more predictable revenue stream throughout the year as homeowners plan and execute their home improvement upgrades in stages. Homeowners are also likely to return to the same contractor for successive phases of the work, ensuring repeat business and long-term customer relationships. With projects spread out over time, contractors can better plan their resources and workforce — avoiding the strain of overwork during peak seasons and underutilization during off-peak periods. Contractors can also differentiate themselves in a competitive marketplace through an expanded portfolio of services such as insulation, air-sealing, planned system replacement, education, and project management.

If implemented well, home performance business models could offer better jobs, higher revenue per customer, spreading demand from peak to slower seasons, fewer call-backs, and creating rewarding and long-term relationships with customers focused on delivering value by providing consultation and value-added services to solve homeowner problems.

Navigating emerging dynamics: more complexity, fewer resources

Above, we have described the dominant market environment in the home renovation sector, which has existed for a long time. Yet, there are new dynamics that home renovation businesses are facing, adding more complexity while taking away traditional resources. Below are a list of factors home renovation businesses increasingly need to consider.

Changing nature of homeownership

The dynamics of homeownership in Canada are undergoing significant changes with implications for the home improvement industry. The declining homeownership rate

[14] Willand, Ridley, and Maller, "Towards Explaining the Health Impacts of Residential Energy Efficiency Interventions – A Realist Review. Part 1"; Wilson et al., "Home Rx: The Health Benefits of Home Performance - A Review of the Current Evidence."

and changing patterns of migration,[15] suggest that not every home is a forever home. This transience impacts homeowners' investment horizons, often leading to a preference for quick, cheap, one-time energy installations done piecemeal rather than a long-term whole-home approach. This makes it more difficult for businesses to market the value of less tangible benefits such as durability, longevity and improved health.

Furthermore, the shift in new housing towards condos and apartments presents opportunities for scaling decarbonization and retrofits but comes coupled with increased complexity. To manage these new dynamics, businesses need to improve core competencies, such as building science knowledge of more complex building archetypes and non-technical skills, such as complex project management.

Complex technology requirements and new opportunities

Manufacturers have improved heat pumps and furnaces for better energy efficiency, performance, and safety defaults. Yet, achieving this performance in people's homes requires a more complex planning and installation process. First, a heat pump works best when "right-sized" for the home's heating needs (in Canada), which requires a process to properly estimate heating load (through modelling and/or monitoring of thermostat and weather data), which is difficult to do under emergency replacement conditions. Ideally, sizing considerations would consider the benefit of building envelope improvements (air sealing, insulation, windows) to reduce heating and cooling loads, and in very energy inefficient homes, these improvements are needed for lower capacity / higher airflow heat pumps instead of a fossil fuel furnace or boiler.

The advanced tools manufacturers use in HVAC systems require careful attention to installation instructions. Yet, these instructions are often vague, and installers do not have a process to methodically follow them. A 2018 US Department of Energy survey of studies found that 29 to 78 per cent of systems can have too little refrigerant (undercharged), and four to-50 per cent of systems can have too much (overcharged), while low airflow is a problem 50 per cent of the time.[16] The implications of these installation "faults" are lower energy performance, higher operating and maintenance costs, and lower indoor air quality and comfort. For a business, it can mean more

[15] See discussion on Canadian homeowners mobility and new construction starts at: https://www.theglobeandmail.com/investing/personal-finance/household-finances/article-do-canadian-home-owners-really-move-every-seven-years/.

[16] US Department of Energy, "Residential HVAC Installation Practices: A Review of Research Findings."

customer complaints, unproductive service calls, and warranty claims due to the reduced lifetime of the equipment.

Various tools to help businesses adapt to new equipment characteristics, such as software, monitoring sensors, and workflows, are already available or can be designed with existing technology, yet learning them and adopting them into business practices takes time and resources. HVAC and home performance is becoming a more technologically sophisticated process, yet is not viewed as a high-tech sector.

Sensor cost reductions and “internet of things” platforms also create new opportunities to demonstrate value. For instance, monitoring indoor air quality can alert contractors and customers of potential problems in a home that need to be resolved. Remote monitoring of HVAC systems can prevent the need for in-person service calls while providing a tailored and thorough answer to customer concerns. Uncovering this value and providing these new services requires companies to build data management and analytics systems.

Digital technology barriers

The increasing adoption of digital technologies in the home improvement industry, including CRM, monitoring platforms, dispatching software and invoicing services, is revolutionizing business practices in the sector. However, this transition represents a steep learning curve for many (particularly small) enterprises and can leave them uncompetitive. The cost of technological solutions and the resources required to train and maintain them can be cost-prohibitive for most small enterprises. Business support can provide low-cost and easy-to-use alternatives to proprietary software solutions for small to medium enterprises.

Consolidation, buy-outs and private equity

Private equity firms are increasingly attracted to buying and consolidating companies in the HVAC sector. The industry is attractive to investors due to its fragmented nature, consistent seasonal cash flow, essential service offerings, and steady profit margins. Business owners are often motivated to sell as they near retirement age and have not undertaken adequate succession planning.

The impact of private equity involvement is uncertain. On one hand, centralization may enable spreading out the fixed costs of modernization, increasing profit margins for owners who may re-invest in workforce development, training and employee welfare.

Larger companies may also be more likely to lead to unionization of their workforce, particularly if they are undertaking a mix of commercial and residential HVAC projects.[17]

Yet, private equity could also exacerbate the short-term and commodified nature of existing business models. Some investors will push businesses towards certain short-term returns from quick, high-margin installs of traditional equipment rather than paying the up-front costs associated with learning how to market, install, and educate about decarbonized home solutions. Standardization of products and services could crowd out customized solutions for customers. The search for short-term profitability could prioritize up-selling equipment rather than providing regular maintenance and servicing, which stabilizes business operations and customer retention.

For HVAC business owners and workers, consolidation could accelerate the cannibalization of small businesses that may struggle to compete with large companies in attracting and retaining skilled workers, possibly leading to the disappearance of small, family-owned enterprises in Canada. This trend could impact the traditional pathway to middle-class wealth creation for Canadians who choose not to pursue post-secondary education. Pathways to ownership may be out of reach for workers in the sector, who will miss out on the chance to become small business owners and leaders in their communities.

Talent acquisition, retention and productivity

The three dynamics discussed above add complexity to customer relationships, technology, and the business environment. These more complex dynamics occur when resources are scarce. A wave of older generation technicians is expected to retire soon. This is not only a problem for finding people to do the work but also for having these people train and mentor new professionals before they retire.

Attracting new people to careers in the trades is also a potential challenge, and "success" in Canadian society is often viewed as a white-collar professional job rather than a blue-collar one.

The business environment can make retaining skilled workers or attracting new talent difficult. As noted, a seasonal boom-bust dynamic can cause underemployment or layoffs during shoulder seasons. In peak seasons, the heavy workload can lead to employee burnout and decreased job satisfaction, negatively affecting productivity.

[17] HVACSchool.org, "Weighing the Benefits of Commercial Vs Residential HVAC Work."

Businesses must have the productivity and stable income to pay competitive salaries. Increasing value capture and improving the productivity of operations in small home renovation and HVAC businesses could help pay these higher wages. Yet, they require a shift in the low-value business environment described above.

What a sector with home performance business models looks like

Canada currently has a nascent and emerging home performance sector that can be understood as a subset of the home improvement sector that caters to homeowners specifically seeking a whole-home approach to energy upgrades, either explicitly due to personal preferences or being compelled to do so by government programs that provide progressive incentives for sequential upgrades (e.g., Greener Homes program).

The number of home performance firms in Canada is not well known and can be hard to track.[18] However, their business models — what services they offer for sequential home energy upgrades and how they generate value for homeowners — fall within a continuum, articulated conceptually in Figure 2 below. Going from left to right, each business model archetype offers additional services and takes on progressively increasing responsibility for delivering value and outcomes to homeowners.[19]

[18] 'Home performance' is not a registered certification or trade in Canada, which makes the size of the sector complicated to track. We will further explore this question in the next stage of research.

[19] Home performance business models identified across Canada currently serve a niche market of homeowners, primarily driven by those taking advantage of energy efficiency grants and loans.

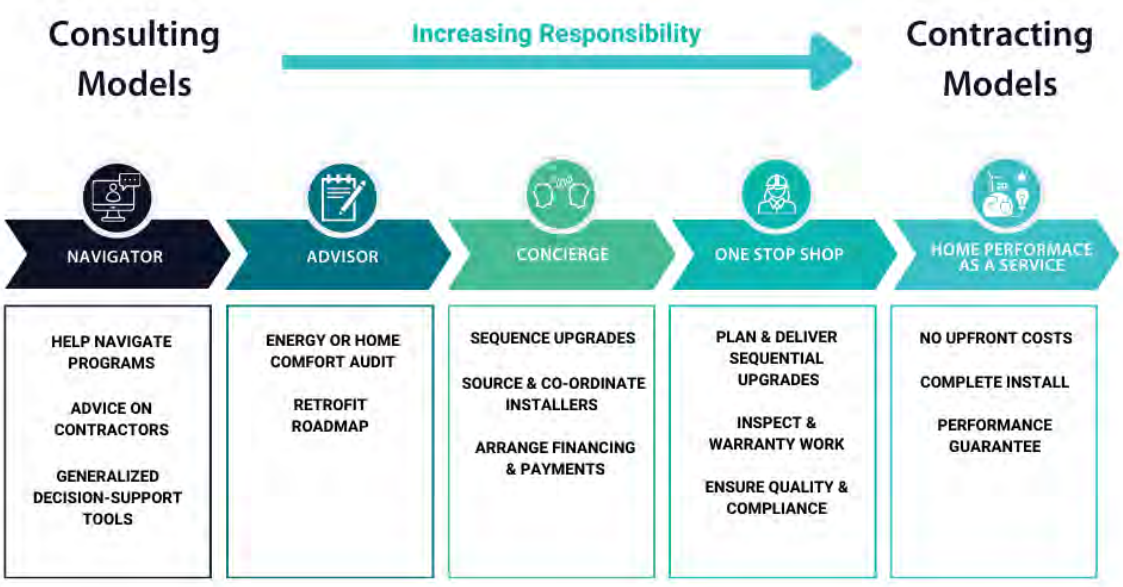


Figure 2. Continuum of home performance business model archetypes

For illustration purposes, home performance businesses in the Navigator archetype offer readily accessible recommendations for energy retrofits, often on a web-based platform. Businesses in the Advisory archetype provide advice on the right way to sequence retrofit projects but hold no responsibility for the work itself. The Concierge archetype may go a step further and provide guidance throughout the entire retrofit journey, recommend preferred advisors and/or assist with soliciting quotes from contractors and securing financing. Further along the continuum, a home performance business in the One Stop Shop archetype might design, install and warranty insulation, air sealing, and HVAC retrofits in a single contract – with tradespersons in-house or through sub-contracting. Home Performance as a Service (HPaaS) offers all the services of the One Stop Shop through a monthly payment that delivers energy savings with no upfront cost.

It is important to view these archetypes as existing in a spectrum with fuzzy boundaries between them. Many variations of home performance business models are possible

along the continuum. Each archetype is simply a snapshot of a business model that provides value to homeowners and contractors, with ancillary benefits to other stakeholders such as utilities, Canadian society, and public policy goals of decarbonization.

While business supports may catalyze the emergence of new home performance businesses, we expect their services offered and value captured to also fall within the continuum articulated by our conceptual framework in Figure 2. New home performance business can be arrived at by different means: emerging firms are incubated or introduced into this sector; existing home performance contractors move along the continuum by bringing new services in-house; existing home improvement contractors such as renovators, HVAC contractors and insulators building a reciprocal referral network or transition into offering home performance services.

Appendix 1 describes existing home improvement businesses in Canada and explores some idealized pathways through which they may transition into performing whole-home retrofits.

A shift to a home performance business model needs additional support

As highlighted above, home performance presents a different business model with the potential to help Canada meet net-zero emissions while increasing value for both businesses and homeowners. There is potential to create new companies following these business models or to shift existing sectors, such as HVAC and insulators, into these models.

Although the advantages of shifting the home improvement sector to a home performance business model may seem clear, the transition to these new business models is not occurring spontaneously. There are several reasons for this inertia:

- **Fixed costs**: Shifting to a new business model often involves substantial upfront expenses. Companies may need to invest in new equipment, staff training, or technology upgrades, which can be costly and may not yield immediate returns.
- **Market uncertainties**: Transitioning to a new way of doing business comes with risks. The uncertainty of market acceptance — whether customers will value and pay for the new offerings — and regulatory risks, such as changes in

environmental legislation or building codes, could affect the viability of new business models.

- **Reconfigurations required**: Adapting to a home performance business model isn't just about purchasing new equipment or services; it's about reconfiguring the entire operational structure. This could involve retraining employees, altering sales and marketing strategies, and changing the company's organizational structure.
- **Proliferation challenges**: For new business models to become widespread, they must be adopted by more than a few companies and must be spread across the industry. This requires coordination and support from industry associations, government policies, and often incentives and support to encourage businesses to take the leap.

In summary, while new business models have the potential to contribute to net-zero emissions and create good jobs, the path to realizing this potential is strewn with financial, operational, and market-related hurdles. Overcoming these barriers requires a concerted effort and, often, external support to make the transition feasible and attractive for businesses.

How to change business models

There are two main ways public policy can promote business model changes. First, policymakers can support businesses directly in making changes to strategies, internal routines, technologies, operations, etc. Second, governments can reshape market environments to increase business opportunities following a certain model to succeed.

The next section discusses the first method by discussing business support policies in other sectors, including the home renovation sector. The following section will discuss the role of policy mixes in reshaping market environments.

Direct business support policies

Business support policies are any set of policies “aiming at assisting enterprises or entrepreneurs in developing their businesses successfully and in responding effectively to the challenges of their business, social and physical environment.” [20]

[20] Bellini, “Business Support Policies.”

They are justified if the enhanced performance or transformation of a certain business sector or segment of the economy provides benefits to businesses and society. The benefits of a certain business model or improved business efficiency can extend beyond the company implementing them, such as contributing to economic growth, workforce development and societal well-being. Advanced knowledge of technologies or productivity-enhancing practices can have a public or mixed goods character, whereby businesses are unlikely to use these goods on their own due to low individual returns, yet high societal returns. Finally, some businesses might not be using a more profitable and productive business model due to a lack of awareness or entrenched habits, with public policy encouraging a reshaping of expectations and expanded recognition of opportunities.[21]

Business support policies are typically delivered as highly tailored services to individual business clients by intermediary organizations. The aim is to bring about change through business interactions with "street level" civil servants who consider their client needs and can offer services such as information exchange on market dynamics or new technologies and practices; developing new business plans and partnerships; benchmarking business operations and assessing capability gaps; assistance in adopting new technologies and change management within companies; executive coaching; as well as market reshaping activities such as coordinating demand.

Change is thus encouraged via interaction and the creation of policy networks, which are distinct from policies focused on fixing market failures through regulations or subsidization. This policy aims to "get the relationships right" by ensuring businesses can find the right people, resources, and assurances to succeed. Left to themselves, individual businesses "do not know what and whom they do not know (or can trust)."[22] This network-building approach means that public sector involvement often helps existing business consulting services access clients through trusted referrals instead of crowding out private sector business support services.

Business support policies in other sectors

Early business support policies include the US Agricultural Cooperative Extension Service, started in 1914, and Canada's start of agricultural instruction in 1913 through

[21] Termed "field augmentation". See Jones, "Government, Business, and Entrepreneurship in Economic Development."

[22] Brandt, Schrank, and Whitford, "Brokerage and Boots on the Ground."

the Agricultural Instruction Act.[23] In the 1980s extension services were extended to manufacturing as the move from mass production to "flexible specialization" required networked organization and common services for smaller suppliers.[24] What was often termed "Technology advisory services" or industrial extension was later focused on small and medium-sized enterprises that were viewed as job creators that required help adopting productivity-enhancing technologies.[25] With the rise of the digital economy, business support services were also provided under the monikers of "incubators" and "accelerators" to support software companies.[26]

In Canada, the Industrial Research Assistance Program within the National Research Council is a business support intermediary that has existed since 1947. It has 250 field staff and 130 offices across Canada — often co-located within organizations like universities and colleges, technology institutions, and local associations — that are part of local technology systems. In February 2023, the government announced this program would be integrated into a new Canadian Innovation Corporation. Numerous studies have used IRAP as a positive example of industrial policy and technology assistance.[27] Another relevant example is the Mars Discovery District, which supports start-up companies through services such as advisors, talent attraction, investor relationship building, and market intelligence.

Business support policies are an integral component of "industrial policy," which aims to achieve societal goals by helping businesses in particular sectors grow and succeed. These policies have traditionally focused on agriculture, manufacturing, and high-tech sectors to meet policy goals such as national sovereignty, international competitiveness, technological development, and job creation. However, given the role domestic service sectors will need to play in creating stable middle-class jobs and the

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[23] Keesing, "A Study of Provincial Agricultural Extension Services in Canada."

[24] Piore and Sabel, *The Second Industrial Divide*.

[25] Shapira, Youtie, and Kay, "Building Capabilities for Innovation in SMEs"; Kolodny et al., "Design and Policy Choices for Technology Extension Organizations"; Shapira and Youtie, "The Impact of Technology and Innovation Advisory Services"; Shapira et al., "Institutions for Technology Diffusion."

[26] Doloreux and Turkina, "Intermediaries in Regional Innovation Systems"; Robbins and Crelinsten, "Accelerating Growth: Canadian Funding Policy for Innovation Intermediaries."

[27] Kolodny et al., "Design and Policy Choices for Technology Extension Organizations"; Lipsey and Carlaw, *A Structuralist Assessment of Technology Policies*; Breznitz and Samford, "Innovation Agency Case Study."

societal challenge of decarbonization, it might be time to direct this aspect of industrial policy toward encouraging home performance business models.

Current business support for home improvement sector

As noted above, tailored and specific business support policies have existed for sectors like manufacturing and software. They are less common in the blue-collar sector of home improvement.

In a trades and training-dominated field, practical skills training takes precedence, and business operations can be a secondary priority. Workers and business owners in this industry typically focus on obtaining trade certifications as their principal objective, with significant emphasis on mastering the technical skills of professions such as heating, refrigeration, and air conditioning mechanics, carpentry, plumbing, electrical work, and insulation. Cultivation of business and administrative skills may take a background.

As a result, a company, which may start as a single tradesperson, could expand to a larger team without a strategic plan for scaling up its business operations. This oversight is compounded by the demanding nature of the market, which leaves little room for these professionals to acquire the complex business skills necessary for growth and efficiency. The development of business strategies, financial acumen, marketing, and customer relations management are crucial competencies that enable a company to thrive beyond the benchwork. Yet, these are often undervalued in training programs within the blue-collar sector. This leaves a gap in capabilities necessary for a company's growth, adaptation and transformation in a competitive market.

Recognizing this, some third parties provide tailored management consulting services for contractors. An example is Vancouver-based Breakthrough Academy, which has business coaches providing support for finance, organizational structure, recruitment, and marketing.[28] The Blue Seal program is a certification available in four provinces to recognize business knowledge gained by tradespersons through approved business programs and courses accessed at local colleges and training institutes. Some sector-specific business experts provide advice through trade magazines and offer consultation services.[29] The Heating Refrigeration and Air Conditioning Institute and the Professional Home Builders Institute of Canada both offer online courses on business

[28] Breakthrough Academy, "Systems, Coaching & Community for Contractors."

[29] Coleman, "Getting out of Our Own Way in Business."

fundamentals, people and financial management.[30] Third-party software providers like Service Titan and Field Edge offer contractors business courses and paid coaching services.[31]

Industry associations sponsor conferences, networking, information sessions, and webinars to help their members keep pace with industry trends and evolutions. For example, the Heating, Refrigeration, and Air Conditioning Institute of Canada (HRAI) organized a Heat Pump Symposium in April 2023, expected to become a biannual event.[32]

Finally, there are generic programs and offerings to businesses. For instance, Industry Canada has a business benefits finder, and the Business Development Bank of Canada offers both financing and business advice, while Canada's Digital Adoption Program offers grants and advice.[33] Major cities across Canada often have street-level small business service offices that support local economic development through access to advisors, grants, and classes.[34]

In addition to such business support, there are select opportunities for home renovation contractors to advance their training and competency in building science. Examples include the Canadian Home Building Association (CHBA) Net Zero Renovators program (refer to Table 1), Blue House Energy, the Canadian Institute for Energy Training (CIET), Building Knowledge Canada and several colleges across Canada offer courses and/or micro-credentials in building science.

Thus, a home renovation business seeking support, training, and knowledge has options. However, none of the business support services in the current landscape appear ready to support business model change, especially towards home performance or decarbonization-promoting directions. This gap exists for at least three reasons:

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[30] HRAI, "HRAI MMBA"; phbi, "Phbi Business Courses."

[31] ServiceTitan, "Free Webinars for the Trades"; FIeldEdge, "FieldEdge: Academy."

[32] HRAI, "Heat Pump Symposium."

[33] Government of Canada, "Business Benefits Finder – Canada.ca | Outil de Recherche Des Programmes de Soutien Aux Entreprises – Canada.Ca"; BDC, "Consulting Services for Canadian Businesses"; Government of Canada, "Canada Digital Adoption Program."

[34] Small Business Centres Ontario, "Empowering Entrepreneurs to Launch, Build and Thrive!"; CBDC, "CBDC: Business Financing, Support and Advice."; Yukonstruct, "A Shared Space for Northern Changemakers, Innovators, and Makers."

- First, industry associations could find it difficult to support business models that might disrupt one segment of their membership with a new business model, or to promote changes that could end up creating somewhat different business identities, such as an HVAC company re-constituting itself as a home performance business, enthusiastically supporting fossil fuel phase out.
- Second, services to boost management and productivity of existing businesses are highly valuable and needed, yet are focused on improvements within existing business model structures. Services focused on business model change would help guide a company through potential mergers or partnerships, articulation of a new value proposition, linking technology adopted to introducing customers to the benefits of decarbonization and home performance, and targeting new profit streams. Optimization of existing business operations are complementary to business model change, but not the same objective.
- Finally, many of the generic business services offered are unlikely to have the sector-specific knowledge required to provide tailored support for navigating challenges or for imparting knowledge of the state of the art technologies and practices required to develop a new business model and succeed. In addition, the services provided are on a menu of standardized supports. The business client is expected to identify their specific needs and get general support for business planning, grants, research etc. While a key function of a high-quality business support advisor involves helping a company discover "what and whom they do not know" or who they could build trust with. Thus, an ongoing relationship of co-discovery is more important than the transactional provision of a specific service.[35]

We note that Canada's home improvement sector has likely indirectly benefited from business support policies. For instance, Communitech is a technology business incubator that has supported software companies offering project management software for construction and a marketplace for heavy construction equipment.[36] These software companies likely had access to fuller spectrum and more tailored support than those offered to the home performance businesses that might adopt their innovations.

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[35] Brandt, Schrank, and Whitford, "Brokerage and Boots on the Ground."

[36] Crowley, "Bridgit Raises CDN$24M Series B Round"; Crowley, "DOZR Raises CDN$27.5M in Series B Round."

In the next section, we review examples of policies and support mechanisms from other jurisdictions (and select positive Canadian examples) that are specifically designed to facilitate business model innovation and transformation.

Home performance business supports - promising examples

We conducted a review of existing initiatives and found promising examples that point toward business supports more focused on changing business models towards home performance. Table 1 highlights examples of initiatives that are reshaping the customer-contractor relationships so contractors can make their value visible, services highly tailored to contractor needs and specific communities, and working from traditional trades boundaries towards home performance.

Policy name (Reference)	Description	Jurisdiction
Renov'UP Retrofit Accelerator[37]	Funding and advisory support to generate disruptive solutions for energy renovation in buildings. "New Business Models" were one of the themes encouraged.	France
Energy Systems Catapult Business Model Innovation Program[38]	Supports zero carbon companies with a unique mix of energy, engineering and commercial experts who can help identify, design, and validate new business models. Businesses can access Home Truths, a consumer panel of thousands of homeowners, and a Living Lab of smart homes to test value propositions.	United Kingdom
Collaborative Business Model Development[39]	The business model canvas was introduced as a tool to co-develop novel One Stop Shop business models by encouraging individual actors to collaborate during workshops facilitated by local change agents. This process was repeated in five countries, generating twenty-four new joint ventures.	Europe
Elevate Contractor Accelerator[40]	Elevate is a non-profit that works closely with local utilities, municipalities, trade organizations, and technical experts to offer business accelerators for contractors. They provide low-interest loans paired with financial coaching to help contractors build their credit history, grow their financial expertise, and prepare for financial growth and stability in the energy efficiency or clean energy sector.	United States
HVAC 2.0	Sales process, sizing software and community of practice for HVAC contractors to adopt a consultative business model for residential HVAC.	North America

[37] Renov'UP France, "Accelerator program to develop innovative energy retrofit solutions."

[38] Catapult, "Catapult Energy Systems: People Lab."

[39] Mlecnik, Straub, and Haavik, "Collaborative Business Model Development for Home Energy Renovations."

[40] Elevate, "Elevate - Contractor and Workforce Development."

National Comfort Institute (NCI)	NCI certifies and supports HVAC professionals to differentiate their companies through performance, quality and value.	United States
Building Performance Institute (BPI)	BPI trains and certifies home performance professionals including insulators/building envelope professionals, building analysts and heat pump installers. They provide visibility through a contractor listing and lookup tool.	United States
Pearl Certifications for Contractors	Pearl certifies HVAC professionals, builders and real estate agents. The Green Door app stores information about the home's energy use, retrofit recommendations, upgrades and links to certified contractors.	United States
Home Performance Stakeholder Council[41]	The only organization in Canada with an explicit aim to support and develop home performance contractors. Members have access to online training, networking, marketing information and an industry liaison for in person advice and encouragement. Five Sector Councils (one for each of trade) also provide input to utilities and government on policy.	British Columbia
CHBA Net Zero Renovator Program[42]	Whole house retrofit training, certification, networking and marketing resources. The Net Zero Renovator's Bootcamp equips renovators with an online building science course, two day in-person workshop, integrated design process knowledge and an optional sales training course. Renovators who have successfully completed the bootcamp are then eligible to lead one of 100-150 deep energy retrofit pilot renovations, with advice from a Net Zero Energy Advisor, to gain hands-on experience.	Canada
One Stop Shop Incentives[43]	Larger incentives offered to homeowners utilizing a registered One Stop Shop and achieving a minimum 30 per cent reduction in energy use. Window rebates reserved for this program. Prospective One Stop Shops are guided through an approval process that helps them clearly define their growth and marketing strategy to achieve a target number of whole home retrofits over a two year period.	Ireland

[41] HPSC, "HPSC Working Roadmap."

[42] CHBA, "CHBA Net Zero Renovations."

[43] SEAI, "One Stop Shop Registered Providers."

HOMES Rebate Program[44]	A tiered, performance-based incentive for whole home retrofits that model or measure energy reductions greater than 20 per cent. Incentives can also be claimed by aggregators, not only by homeowners, which may hold promise for the emergence of new business models.[45]	United States
KfW Development Bank's low-interest financing[46]	Low-interest loans of up to $150,000 for homeowners to complete energy efficient renovations. The energy savings achieved dictates the percentage of loan forgiveness (grant). The full construction works are eligible for the loan and additional funds can be used for construction supervision by an energy advisor, potentially encouraging new business models.	Germany

Table 1. Promising examples of supports for business model change in the home improvement/performance sector

[44] Offutt, Martin C. "The Inflation Reduction Act: Financial Incentives for Residential Energy Efficiency and Electrification Projects." *Congressional Research Service: IN FOCUS* IF12258 (August 2, 2023).

[45] Frank, "Aggregators."

[46] KfW Bank, "Existing Properties: Energy-Efficient Refurbishment."

Policy mixes for re-shaping market environments

We are attempting to draw distinctions between business optimization versus business model change, and business model changes related to home performance. These are not easy distinctions to make. The most important aspects probably relate to the ability to provide tailored, ongoing support with clear goals in mind that meet societal goals and help businesses succeed. While the initiatives noted above are promising, many of them are still short-term projects or programs. If business model change is seen as a necessary policy pillar for home decarbonization, business support should come from an enduring institution rather than a short-term project.

Given that good business supports are tailored and adaptive to client needs, below we aim to elucidate what home performance business supports could look like by presenting an example of possible client experience. After this we outline some characteristics of good business support policy design and how they might be implemented in the home performance sector.

A possible client experience

A possible business client for business support policies would be an owner of an HVAC company that employs about 30 people. The company is installing more heat pumps, yet often concerned that customers should also be improving its building envelopes to avoid bad experiences and call-backs. The owner might have a growing interest in building science and indoor air quality, yet finds it difficult to market this knowledge to serve customers.

At an industry association conference the business owner heard about a new home performance business support initiative. An advisor is located at a local community college where they recruit new workers and go for training.

The owner had an initial meeting with a business model advisor to discuss goals and needs. The advisor had some useful resources on hand immediately, including a description of the latest relevant software tools and more sophisticated airflow-pressure estimates of heat pumps on ductwork developed by Natural Resources Canada. The advisor also noted that the community college had a drop-in lab, where their employees could get hands-on experience using technologies like blower doors, thermal imaging, static pressure measurement, etc.

The advisor listened to the HVAC business owner's story and asked some questions about business operations. The advisor suggested some local business management consultants who could help improve the productivity of back-office operations. The aim was to improve productivity under the existing business model to free up some time for new business model experimentation.

The first experiment the business conducted with the help of the advisor involved using software to commission HVAC systems during the shoulder seasons with accurate digital measuring tools of refrigeration charge, static pressure, etc., and marketing this as an added service and quality guarantee to customers. The software itself and extra time was paid for by a local utility working with university researchers aiming to accurately measure and claim energy savings from high quality HVAC installations.

The advisor's team was also working on developing a local business specialized in air sealing. They set up a meeting with the HVAC company to build trust and explore potential sub-contracting and partnerships.

The business owner knew he could call the advisor quickly and set up regular meetings to get the latest market intelligence, trends, research and tools.

The advisor notified the business owner that they are working on developing strategies to make the value of home performance contractor businesses more visible, learning from international examples such as the Building Performance Institute. They also worked with CMHC and local utilities to provide back-end financing for "efficiency as a service" business models, where a business could replace any up-front costs with regular payments. The business would be expected to take on the risk and responsibility for energy and GHG saving performance, but the new policy would remove any credit risk to the business and offer zero-to-low-interest rates. In anticipation of these new policies and market changes, the HVAC business owner intensified discussions with the air sealing and larger building envelope specialists to consider merging into a larger home performance company.

A private equity firm offered to buy the HVAC business. The owner worked with the advisor to collect information on the private equity firm's reputation and investment priorities and they concluded they would direct the business towards high-volume, low-price strategy. Instead of accepting the buy-out, the business owner worked to merge with others into a new business. The owner would maintain a stake in the business after retirement and identified some key employees that could take on future leadership

roles. The new business would work with public and private investors interested in supporting high-value home performance businesses.

The story above shows how the advisor frequently plays an intermediary role as matchmaker between different companies, researchers, utilities, and policies. The services involve some codified or menu-like information exchange, but the core relationship is tailored and based on the client's goals and risk appetite, as well as the resources available in the local market.

The advisor is not simply providing business advice. They are actively reshaping the market and policy environment by working to fill an air-sealing business gap in the local market and developing new policies that further incent the evolution of home performance business models. Rather than a menu of services, a good business support policy should provide relationships that help home performance business models succeed.

Characteristics of policies for reshaping markets for home performance

The literature on business support services across sectors identified some key characteristics these institutions should have to be effective to clients, while also meeting public purpose objectives and avoiding political opposition. Below are some key characteristics and how they might relate to home performance business models.

Implemented by “street level” civil servants

Advisors and other implementers of business support policies should not be distant bureaucrats administering routine grant procedures. They should be embedded within existing industry networks and places of work. Organizations like IRAP have decentralized structure, often embedded within existing organizations. For home performance this could be community colleges, training institutes, or even online communities. A decentralized structure would facilitate partnering with existing initiatives like BC’s Home Performance Stakeholder Council rather than duplicating efforts.

Staff implementers should be knowledgeable and trusted. Different staff members could have enough general knowledge to interact with business clients, while also specializing in particular areas to form a larger knowledge network. To find trusted and knowledgeable individuals, the organization could recruit near-retirement professionals or enable secondments from existing business and research networks. To be useful,

the organization must not only have staff members trusted by business leaders, but also have people who can navigate policy systems to propose new initiatives.

Crowding in business through networks

Public sector-sponsored business support services can create concerns about crowding out or competing with private business consultants. Experience shows that well-designed business support policies crowd in business for private entrepreneurs seeking to support businesses by acting as a matchmaker. Street level civil servants discussed above play a valuable role by referring clients to services available, and selecting out bad matches.

Similarly, good business support implementers can strengthen local industry associations because it is in their interest to increase information flow and local networks. However, being independent from associations ensures business support policies remain focused on the societal mission of decarbonization rather than answering to membership concerns or navigating internal conflicts.

Market driving

Business support policies can be either market driven or market driving. The former are responsive to business client problem definitions and are likely to be focused on improving productivity and innovation within existing business models.

A market driving mission is needed to encourage home performance as a new business model. Advisors are therefore more likely to need to pick up on weak signals about what the business could do and encourage the business to enter new frontiers. As Bellini 2008 states “the question that the firm raises is often not the questions that need to be answered.” This is more likely to be the case with a business model change objective.

The business support policy implementers will also play a role in actively reshaping market structures, such as identifying gaps in local markets where new businesses need to be created, the potential for business mergers, and what new policies or programs can highlight the value of home performance services.

A market driving mission is also likely to require prioritizing a smaller number of business clients who are committed to making a change rather than seeking to offer general services to a broader number of businesses.

Systemic evaluation

The system-building nature of business model change also means that results are likely to be difficult to evaluate under standard evaluation protocols. Tailored services make it difficult to have control groups for statistical analysis with clearly distinguished treatments.

The companies selected for support are likely those already committed to doing something different. This complicates the evaluation of "additional" public benefit, clearly delineating between policy and private business. In reality, both civil servants and businesses interact and co-develop. Thus, evaluation will need to consider system-level changes rather than incremental verifiable changes.

Home performance, however, entails a much better measurement of impact. Creating data that can then be valued in the market is likely to be a promising change strategy, such as monitoring of real energy savings and indoor air quality. Utilities and policymakers could value home performance with access to data on the impact of things like better heat pump installation and air sealing techniques. Creating more data to demonstrate the value of home performance is likely to be a key objective, but many actors will be involved in this and business support policy implementers are likely to act as coordinator.

Developing the right policy mix for home performance businesses

Direct business support is one way to change business models. Yet, the success of new business models is also determined by the larger market environment they encounter. Some of the examples stated above demonstrate the role business support policy implementers can play in reshaping market environments by championing new initiatives with utilities, research institutes, and other market players, as well as developing new policies.

However, we also need to consider the wider policy mix implemented by governments and its impact on discouraging or encouraging the success of home performance business models. We use the term "policy mix" because it is not one or two policies that influence a business environment but the interaction of several policies.

The next stage of our research project aims to consider a wider policy mix from the perspective of those doing the building retrofit work and aiming to build successful home performance businesses. Some of these policies might universally benefit all types of contractor businesses. Others may specifically support home performance companies and potentially disrupt traditional home improvement businesses. We will conduct this research in interaction with businesses themselves in a way that mimics what business support organizations might consistently do. Examples of wider policies we wish to co-explore alongside relevant businesses include:

- Incentives: How would performance requirements for government rebates and loans influence contractors' ability to sell home performance services? Are requirements to use “certified contractors” supported by home performance contractors? What are the implications to contractors of shifting from homeowner incentives to upstream incentives provided to the contractor or distributor?
- Homeowner financing: What is the role of government-supported finance in supporting business model components like “efficiency as a service”?
- Consumer awareness and education: Would mandatory building labels improve value recognition of home performance services? What role might the real estate, appraisal and mortgage industry play in educating homeowners on the value of home performance?
- Access to data: Is access to data a barrier for home performance professionals? Can public policy facilitate better access to standardized home energy use data, indoor air quality measurements, real-time system monitoring or retrofit needs and timing?
- Customer aggregation: How are public energy concierge services influencing sales for home performance contractors? What is the role for neighborhood based retrofit initiatives as a component of a planned retrofit agenda, or provision of utility services such as geo-targeted energy efficiency as a “non-wire alternative”?
- Performance standards and certifications: How would the use of regulatory powers to make certain products like heat pumps or smart water heaters the market norm impact home performance contractors?

- Workforce development: What is the role for business supports to help home performance companies attract and retain talent, and to influence training and education systems to meet home performance business needs?
- Coaching and mentorship: What types of supports might HVAC and renovations contractors need to change their business models? Would access to a coach or mentor with experience in home performance business be useful? Software solutions to streamline business operations? What about networking opportunities with complementary trades or a community of practice?
- Modernization: Are there administrative or regulatory barriers to businesses promoting home performance approaches? What might modernizing these processes (e.g. building permit process) involve?

Our project aims to not only consider a mix of policies but also to demonstrate a policy process of co-developing ideal policy mixes using insights from policy experts and businesses interested in adopting home performance models. An ongoing policy process of monitoring and co-designing policy options would occur between a growing number of companies following home performance business models and public sector organizations playing a business support function.

Conclusion: a good job green industrial policy

Energy efficiency and home retrofit policies have tended to neglect those people and businesses responsible for doing the work. Attention is drawn towards customer incentives and/or regulatory instruments.

Yet, neglect of the contractor's business experience can lead to fantastic failures. For example, the UK Green Homes Grant Scheme was a short-term six-month initiative, experiencing payment and voucher delays and then an abrupt closure. This short time frame did not give installer businesses time to train or plan, and the payment delays and abrupt closure led to layoffs and loss of customer confidence.[47]

Thinking about home decarbonization policy from a contractor perspective is important because we cannot see increasing the scale of high-quality retrofits required without businesses themselves driving change.

[47] UK House of Commons and Committee of Public Accounts, “Green Homes Grant Voucher Scheme: Twenty-Seventh Report of Session 2021–22.”

This discussion paper outlined the volatile market structure and challenging dynamics that currently act as barriers to decarbonization-friendly residential retrofit business models. We also outlined the promise of increasing both business and customer value by focusing on home performance over aesthetic changes or emergency replacements of existing equipment. We then discussed different business models and the role of public policy strategies in promoting business model change through direct business support and shaping market environments through a policy mix.

Business support policies are common in sectors such as manufacturing and software. It is recognized that more innovation, production, and business activity involves working directly with the businesses responsible. The business support systems for HVAC and renovation companies or potential home performance companies are generic and inadequate for the task of business model change. We presented a picture of what business support policies for home performance could look like.

Next, we hope to discuss these ideas further and explore the wider “policy mix” needed in Canada to help home performance businesses championing the net-zero emission transition succeed.

This discussion paper and subsequent participatory research intend to illustrate a “good jobs green industrial policy”. Canadian climate and economic policy have discussed industrial policy, but it is thus far focused on attracting foreign direct investment into areas like electric vehicle manufacturing or speculative sectors like hydrogen. Yet, these initiatives do not directly reduce emissions in Canada, especially in the near term when earlier GHG reductions are better for the climate. Traditional manufacturing sectors might also not provide the bulk of middle-class jobs in the future.

There is both an economic and a climate policy imperative to consider the benefits of industrial policy approaches in non-traditional sectors like home renovation. This sector requires a business model change to reduce emissions in Canada while producing domestic benefits of healthier and climate-resilient homes and providing rewarding middle-class jobs in the green economy.

We hope this discussion paper inspires new thinking. Energy efficiency and climate policy need to consider the people who actually do the work, and Canada’s industrial policy needs to consider those businesses that will reduce domestic emissions and provide good jobs.

Discussion questions

1) As a contractor, what are the main challenges and emerging new dynamics you and your business face today? Did we summarize your experiences?

2) How do existing business models in the home renovation sector impact efforts towards achieving net-zero emissions and generating quality jobs? Did we capture the dynamics?

3) What types of support and resources are necessary for businesses in the home improvement sector to transition to 'Home Performance' business models? Are there examples we should have included?

4) What types of policies or programs either act as barriers to developing home performance businesses, create unintended consequences, or are just annoying? Are there any policies we should exclude based on your experiences?

5) Can you draw parallels between the support needed for the home improvement sector and those provided in other sectors? Are there any examples that stand out as preferable or as something we should avoid? Are there any others we should have included in our list?

6) What are some successful examples from other jurisdictions where business model shifts towards home performance have been implemented, and what can we learn from them? Are there any important examples we've overlooked?

7) What emerging tools and resources are most encouraging and useful for your business? Do these tools help align your business with net-zero goals and/or improve job satisfaction?

8) What is the ideal market environment for the success of a home performance business? The market environment can relate to the demand side (nature of customers and energy efficiency incentive programs), supply side (training, equipment, software), and regulatory policies.
    a) What policies could help create this ideal market environment?

b) Would these policies make home performance businesses more competitive than traditional ones or help all businesses?

9) What role do homeowners play in transitioning to home performance business models, and how can their participation and support be encouraged?

10) What role should industry associations and civil society play in transitioning to home performance business models, and how can their participation and support be encouraged?

11) What role does the federal government play in supporting the transition to home performance business models? What are the roles of provinces and municipalities? What are some examples of roles they should *not* play?

12) What are some research questions we should have asked?

13) Who are the key players in the home performance' sector, and who should we be talking to?

If you'd like to share your thoughts on these questions, please reach out to Abhi at abhilash.kantamneni@efficiencycanada.org or Carol at carol.maas@efficiencycanada.org.

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Appendix 1

Home improvement to home performance: idealized pathways

The following types of home improvement projects and the contractors leading them - renovators, HVAC contractors and insulators — present an ideal pathway to higher performing homes. A description of these contractors today, and an exploration of how they might transition to home performance services tomorrow, is outlined in the tables below.[48]

Renovators, remodelers, general contractors, design + build firms

What	Lifestyle enhancing home improvement projects. Coordinate tradespersons, permits, materials acquisition and selection, installation. Warranty all works to meet building code standards.
How many in Canada	71,000 residential construction businesses. Nearly every community in Canada has a renovation company.
Size	Majority (96 per cent) are SME's with revenue less than $5 million.
Pathway to home performance	Already on site when energy efficiency upgrades such as insulation, air sealing, energy efficient windows and doors are a marginal additional cost.
Transferable skills	● Project management skills, relationships with multiple trades. ● Familiar with air sealing, insulation, electrical upgrades. ● Comfortable with warranting the full scope of a project. ● New home builders may already use blower door tests.

[48] "How many in Canada" and "Size" of business for each contractor type was sourced from: ISED Canada, "Financial Performance Data - Industries and Business."

HVAC and plumbing

What	Retrofit home improvement projects installing heating, cooling, hot water, ventilation and indoor air quality equipment. Repair, maintenance and annual service contracts.
How many in Canada	18,000 HVAC and plumbing businesses. Nearly every community in Canada has a HVAC service company.
Size	The majority (94 per cent) are SME's with revenue less than $5 million.
Pathway to home performance	First line of support for homeowners looking to upgrade their home energy systems, usually when the system reaches end of life. Only trade that is in homes multiple times per year.
Transferable skills	● Knowledge of energy, humidity, ventilation system sizing and installation. ● Familiar with safety standards for water, oil, gas and electricity. ● Networked with manufacturers/distributors to source parts and get assistance. ● Work with sub-trades: electrical and plumbing.

Drywall and insulators

What	Insulators bring the building envelope up to code, improve energy efficiency and resolve comfort concerns like temperature extremes, drafts and noise. Can remedy mould issues. Drywall installers also install batt insulation as part of their scope.
How many in Canada	9,000 drywall and insulation businesses exist in Canada.
Size	The majority (97 per cent) are SME's with revenue less than $5 million.
Pathway to home performance	Drywallers are hired when walls are open, an ideal time to add insulation. Insulators are typically engaged when home performance is desired, homeowner or general contractor may therefore be open to additional home performance work.
Transferable skills	● Knowledge of building envelope sealing, thermal resistance of different material, thermal imaging, home performance indicators like RSI, ACH. ● Some already do energy auditing and blower door tests. ● Have existing relationships with renovators, waterproofers, roofers.

Home improvement job characteristics

Industry / job	Provinces w compulsory cert.[49]	Years as residential apprentice	Optional Red Seal	Number of wage earners	% working part-year < 49 weeks[50]	Range of wages[51]	Median income	Full-time median income
Canadian average					40%		$42,800	$63,600
Trades helpers and labourers		0		212, 975	62%		$32,000	$50,000
Roofers and shinglers	1	4	✓	21,680	67%	$19/28/41	$33,200	$49,600
Plasterers, drywall installers and finishers, and lathers	1	3	✓	26,455	59%	$20/30/41	$35,200	$47,200
Insulators	1	0[52] - 3.5	✓	8,825	57%	$21/36/43	$48,400	$60,800
Carpenters	1	4	✓	155,690	55%	$19/30/41	$40,400	$52,400
Glaziers	1	4	✓	8,130	47%		$45,600	$54,400
Sheet metal worker				18,990	47%		$53,600	$66,000
Plumbers	7	4	✓	50,615	40%	$18/31/43	$52,400	$63,600
Heating, refrigeration and air conditioning mechanics	7	2 yrs[53]	✓	29,605	38%	$18/31/46	$59,600	$72,500
Gas fitters	7	0-3 yrs[54]	✓	6,620	34%	$19/34/47	$56,400	$71,000
Home inspectors	2			3000[55]	N/A			
Energy advisors	All			1400[56]	N/A			$89,681[57]
Total tradespeople in 2021				544,000				

Notes: The numbers include jobs in the residential, industrial, and commercial sectors, as well as in both new and existing buildings. Part year is working fewer than 49 weeks. Sourced primarily from: Statistics Canada. "Employment Income Statistics by Occupation Unit Group, Visible

[49] Most trades have voluntary certification options in each province.

[50] 2021 involved COVID related layoffs, however 2016 national average was also 40% (Statistics Canada 2018a).

[51] Government of Canada, "Labour Market Information - Explore the Market - Job Bank."

[52] 3 day polyurethane spray foam course and written exam required to become a certified installer. CAN/ULC S705.2 Certification.

[53] 313D residential refrigeration mechanic.

[54] Work on systems less than 400,000 BTUH, Gas fitter class B or 2nd Class.

[55] Best available estimate from private correspondence with industry expert.

[56] Gaede et al., "2022 Canadian Energy Efficiency Scorecard: Provinces and Territories."

[57] Indeed, "Energy Advisor Salary in Canada."

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