

Home Performance Stakeholder Council HVAC Sector Working Roadmap

JANUARY 2018

The Home Performance Stakeholder Council is working together with BC's home improvement industry sectors to develop and grow the home performance industry into a sustainable and profitable market segment.

Table of Contents

Executive Summary	4
1 Introduction.....	9
1.1 Background.....	9
1.2 Vision.....	9
1.3 Mission and Core Objectives.....	9
1.4 Organizational Structure.....	10
2 Roadmap Development Process	11
2.1 Roadmap Toolkit	12
3 Home Performance Industry Overview	13
3.1 Political Landscape.....	13
3.2 Industry Landscape.....	13
3.3 HVAC Sector Landscape.....	13
3.4 Home Performance Industry Vision	16
3.5 Summary of HVAC Sector Issues	17
4 Recommendations to Address the Issue of Capacity Building: Availability of Trained Trades, Workforce Development, and Professionalism	19
4.1 Current Situation.....	19
4.2 Barriers and Challenges.....	19
4.3 Goals for Sector	19
4.4 Recommendations for Achieving Goals.....	20
5 Recommendations to Address the Issue of Quality Workmanship: Industry Reputation, Standards of Practice, and Installation Quality.....	22
5.1 Current Situation.....	22
5.2 Barriers and Challenges.....	22
5.3 Goals for Sector	23
5.4 Recommendations for Achieving Goals.....	23
6 Recommendations to Address the Issue of Advocacy: Connectivity to and Engagement in Utility and Government Program & Policy Design	27
6.1 Current Situation.....	27
6.2 Barriers and Challenges.....	27
6.3 Goals for Sector	28
6.4 Recommendations for Achieving Goals.....	28
7 Recommendations to Address the Issue of Advocacy: Effectiveness and Enforcement of Codes, Regulations, and Bylaws	31
7.1 Current Situation.....	31
7.2 Barriers and Challenges.....	31
7.3 Goals for Sector	31
7.4 Recommendations for Achieving Goals.....	32
8 Recommendations to Address the Issue of Market Growth: Consumer Demand and Quality Awareness.....	36
8.1 Current Situation.....	36
8.2 Barriers and Challenges.....	36
8.3 Goals for Sector	37
8.4 Recommendations for Achieving Goals.....	38
9 Resources Available	40

10 Summary and Next Steps.....40

Executive Summary

The Home Performance Stakeholder Council aspires to assist industry stakeholders involved in residential renovation in delivering exceptional services and solutions, priced at affordable levels for consumers, to support the growth of a long-term, sustainable market for home performance related activities that significantly reduce energy use and carbon emissions in homes across the province while enhancing building durability, occupant comfort, and health.

To this end, the HPSC has established six Sector Councils (HVAC, Fenestration, Insulation, Renovation, Energy Advisors, and Utility and Government) composed of key industry players tasked with amalgamating and addressing the fragmented interests, opportunities, and challenges that exist in a home performance industry, which is evolving and growing.

The following *HVAC Sector Working Roadmap* documents the recommendations made by the HVAC Sector Council to address the issues and opportunities prioritized by the Sector Council. The recommendations are directed primarily at industry, by industry, but also include recommendations for Utilities and Government. The recommendations are directed at achieving the following goals in response to the issues identified in Table 1 below. The priority of each recommendation is indicated by the following key:

HIGH	MEDIUM	LOWER
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Recommendations are prioritized according to when their development must begin in order to meet the 2025 Vision. Some recommendations are dependent on the development of other recommendations and some will take several years to reach full implementation. High priority recommendations include those whose development needs to start in 2018, and those which can start right away as soon as resources are available.

Table 1: Summary of the Issues and Goals for the HVAC Sector Council’s Draft Home Performance Roadmap

ISSUE	INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
Capacity Building: Availability of Trained Trades, Workforce Development, and Professionalism	1. Gap analysis on HVAC training requirements.	Support	Support
	2. Develop a trade designation/certification that includes training and experience requirements.	Consult	Consult
	3. Develop a communication plan to promote residential trades careers to students in secondary schools, vocational schools, and technical institutions, and to the general public.	Support	Support
Quality Workmanship: Industry Reputation, Standards of Practice, and Installation Quality	Consult	1. Develop and implement an initiative to improve consumer knowledge of home performance.	
	2. Develop an HVAC contractor accreditation program.	Consult	Support
	3. Develop a contractor training program to fully support residential HVAC contractor accreditation.	Consult	Support
	Consult	4. Include contractor accreditation as a requirement for participation in home performance related programs.	
	5. Develop better standards for equipment and equipment installation.	Support	Consult
	Consult	Support	6. Make better – and more consistently enforce – codes, standards, and bylaws that apply to products and services in home performance.

Advocacy: Connectivity to and Engagement in Utility and Government Program & Policy Design	1. Strategic collaboration with Government and Utilities on program and policy design.	Consult	Consult
Advocacy: Effectiveness and Enforcement of Codes, Regulations, and Bylaws	1. Approach municipalities and regional districts to discuss what can be done to increase consistency and provide more simplicity in bylaws and regulations.	Support	Consult, Local Governments
	2. Work with local governments to ensure there is adequate industry input into codes, bylaws, and regulations using a systematic process that extends from when regulations are contemplated through to notification and training.	Support	Consult, Local Governments
	Consult	Support	3. Review bylaws with the aim of simplifying and streamlining approval.
	Consult	Support	4. Ensure adequate well-trained staff are available to review applications.
	Consult	Support	5. Ensure that those responsible for enforcing codes, regulations, and bylaws are properly trained to improve consistency in interpretation and provide greater certainty to contractors and consumers, while maintaining the flexibility to deal with hardship cases.
	Consult	Support	6. Jointly review options aimed at ensuring permits are taken out when required and inspections are carried out on a more frequent and systematic basis to ensure compliance with local regulations.

	Consult	Consult	7. Develop an outreach program for consumers who are considering renovations to educate them about the reasons for regulations, the importance of meeting them, and the consequences of not meeting them.
Market Growth: Consumer Demand and Quality Awareness	Consult	1. Develop and implement an initiative to improve consumer knowledge of home performance using the Home Energy Coach website and other tools.	
	Consult	2. Instill consumer confidence through labelling, branding, and customer care	
	Consult	3. Enhance consumer motivation by clearly showing benefits and reducing customer costs using incentives, tax credits, financing, utility rates, labelling, and marketing, lead generation, and sales.	
	Consult	4. Ensure inspections meet applicable codes and standards, and the project is completed as contracted – governments, industry associations, energy advisors, and other independent third parties, supported by utilities.	
	5. Develop potential warrantee solutions to provide consumers with confidence that their project will be done properly and provide recourse if problems arise.	Consult	Consult

This *HVAC Sector Working Roadmap* herein organizes recommendations by issue and presents the current situation, goals and recommendations along with the suggested lead(s).

This Roadmap has been developed by Home Performance Sector Council with input from the HVAC Sector Council and other industry representatives. The members of the HPSC HVAC Sector Council include:

- Garth White, Ark At Home
- Cam Kusluski, EMCO
- Dan Bradley, FortisBC
- Chuck Gandy, Gandy Installations
- Dave Hoare, Midtown Heating & Cooling
- Steve Savage, Nickel Heating
- Russ Roper, North Shore Plumbing & Heating
- Charles Frass, Superior Gas Install & Servicing

The information and recommendations within this Roadmap are intended to represent the input of the HPSC HVAC Sector Council and other industry representatives. However the information and recommendations within the Roadmap may not be representative of the views or opinions of the broader industry.

The primary purpose of the *HVAC Sector Working Roadmap* is to provide input into the broader, cross-sector *Home Performance Industry Roadmap*.

1 Introduction

1.1 Background

Home performance is a holistic approach to identifying and addressing energy efficiency, comfort, health, and safety related issues to make a home perform better.

It is estimated that nearly 500,000 single detached houses in BC may benefit from home performance upgrades. Row houses and townhouses present an additional opportunity. And whole home performance renovations in BC could represent a four-billion-dollar industry over the next 10 years.

The Home Performance Stakeholder Council (HPSC) is composed of key industry players tasked with amalgamating and addressing the fragmented interests, opportunities, and challenges that exist in the home performance industry, which is evolving and growing. *We gratefully acknowledge the financial support of BC Hydro, FortisBC, and the Province of British Columbia.*

1.2 Vision

The HPSC aspires to assist industry stakeholders in delivering exceptional services and solutions, priced at affordable levels for consumers, to support the growth of a long-term, sustainable market for home performance related activities that significantly reduce energy use and carbon emissions in homes across the province while enhancing building durability, occupant comfort, and health.

1.3 Mission and Core Objectives

The mission of the HPSC is to work together with BC's home improvement industry sectors to develop and grow the home performance industry into a sustainable and profitable market segment that delivers products and services to:

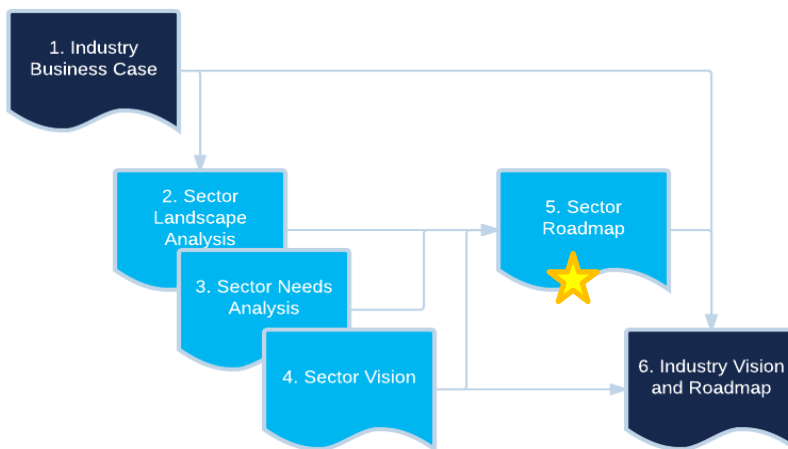
- Lower utility bills through reducing energy use
- Improve home comfort and building durability
- Reduce environmental impact
- Improve air quality, health, and safety

1.4 Organizational Structure



2 Roadmap Development Process

The Roadmap is a key step in organizing the industry to reach their vision.



The Roadmap aims to:

- bridge the gap between the Needs Analysis and Industry Vision,
- take into consideration the issues and priorities of other sectors operating in the home performance industry and identify areas for potential synergies,
- and provide a specific set of actionable recommendations for the public and private sectors.

2.1 Roadmap Toolkit

Recommended solutions to the issues identified draw from a common “toolkit,” which includes:

Information

Consultation and Collaboration

Education and Training

- Consumer
- Trades
- Business
- Real Estate Industry

Marketing and Lead Generation

- Home Labelling
- Branding

Standards

Codes and Regulations

- Product
- Installation

Legislation

Inspections and Quality Assurance

Accreditation

- Tradespeople
- Businesses

Capacity Building

Incentives

- Consumer
- Contractor
- Supply Chain

Tax Credits

- Federal
- Provincial
- Municipal

Financing

- Utility
- Bank (for Energy Efficiency)
- Municipality

Utility Rates

Consumer Advocacy

Warrantees

- Contractor
- Third Party

3 Home Performance Industry Overview

3.1 Political Landscape

Canada's Buildings Strategy has the following goals:

- Federal, provincial, and territorial governments will work to develop a model code for existing buildings by 2022, with the goal that provinces and territories adopt the code.
- Federal, provincial, and territorial governments will work together with the aim of requiring the labelling of building energy use by 2019.

The Ministry of Energy, Mines and Petroleum Resources has been given the mandate to make substantial progress on the following priority:

- Create a Roadmap for the future of BC energy that will drive innovation, expand energy efficiency and conservation programs, generate new energy responsibly and sustainably, and create good, lasting jobs across the province.

3.2 Industry Landscape

- Includes disparate industries with some key players interested in home performance.
- There are few coordinated home performance contractors in BC.
- Representatives from the HVAC, Renovator, Insulation, Energy Advisors, and Fenestration industries, as well as Utilities and Government, are interested in working together to develop and grow a home performance industry into a sustainable and profitable market segment.

3.3 HVAC Sector Landscape

The HVAC Sector is currently organized by Thermal Environmental Comfort Association (TECA). The Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), based out of Ontario, also has presence in the market.

There are no HVAC manufacturers that are local to BC. The following list summarizes the leading international HVAC manufacturers:

- Lennox (Armstrong/Allied/ADP/Ducane)
- Carrier (Bryant/Payne)
- American Standard (Trane/Ameristar)
- York (Luxaire/Fraser Johnson/Coleman)
- Goodman (Amana/Daikin)
- Rheem/Ruud

Additionally, there are a limited number of HVAC manufacturers in Canada, including:

- Dettson
- Napoleon
- Granby

A complete list of HVAC manufacturers providing products in Canada can be sourced through Natural Resources Canada (NRCan) online at: http://oee.nrcan.gc.ca/pml-lmp/index.cfm?action=app.search-recherche&appliance=FURNACES_G.

The HVAC supply chain is a complex network of agents, wholesalers, retailers, and contractors.

Agents: Directly connected to manufacturers. Market and sell equipment directly to wholesalers and contractors. No inventory carried. Example: Lennox (Dealer Network)

Wholesalers: Purchase equipment from manufacturers or agents. Market and sell equipment directly to contractors. Inventory carried. Example: Werner's Wholesale Group (Carrier/Bryant/Payne)

Retailers: Sell equipment and installation to consumers. Sell equipment and materials to contractors. Market and sell equipment directly to consumers. Inventory carried. Example: Home Depot (Trane)

Contractors: Various HVAC contractor models are present in BC. The volume of sales/installations and market coverage varies significantly amongst each group.

- Direct sales, supply, and installation. May be single trade or general contractor.
- Supply and install subcontractor.
- Install-only subcontractor.
- Maintenance/service by single trade

There are two comprehensive lists of HVAC contractors operating in the province of BC available online:

- TECA Members (https://www.teca.ca/Q1st_contractors.php)
- FortisBC Trade Ally Network (<https://www.fortisbc.com/FindAContractor/Pages/Trade-Ally-Network.aspx#>)

The support network for the HVAC industry includes associations, trade allies, and industry organizations, including:

- Thermal Environmental Comfort Association (TECA)
- Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI)
- Sheet Metal & Air Conditioning Contractors' National Association (SMACNA)
- Heating, Air Conditioning & Refrigeration Distributors International (HARDI)
- Air Conditioning Contractors of America (ACCA)
- North American Technician Excellence (NATE)
- ASHRAE (BC Chapter)
- Trade Ally Network (FortisBC)
- BC Housing
- Service Master

The industry operates under the following codes and standards:

Codes:

- BC Building Code (provincial)
- Vancouver Building Bylaw (municipal)
- Authorities having jurisdiction (municipal) – various, with Kelowna, North Vancouver, and Burnaby having heating permit/bylaw approaches

Standards:

- CSA for product safety and performance standards
- Energy Star for energy performance and efficiency standards
- ACCA Standard 5: “HVAC Quality Installation Specification” (US-based)
- ACCA Standard 9: “HVAC Quality Installation (QI) Verification Protocols” (US-based)
- Consortium for Energy Efficiency (CEE) “Specification of Energy Efficiency Installation & Maintenance Practices for Residential HVAC Systems” (US-based)
- National Renewable Energy Laboratory: “Topic 5.30 Forced Air” (US-based)
- SMACNA and ASHRAE standards, as referenced by the National Building Code

3.4 Home Performance Industry Vision

3.4.1 2025 Consumer Vision:

- **Valued Services:** Home performance contractors are a valued and major component of whole home multiple-measure projects.
- **Increased Volume:** Retrofits that value home performance are being carried out at a significantly greater rate, and are in steady demand, resulting in greater energy savings and GHG emission reductions.
- **Consumer Understanding:** Consumers understand the benefits of home performance retrofits, including more comfortable and durable homes with a higher resale value, and the importance of selecting a qualified contractor.
- **Consumer Resources:** There are viable resources and mechanisms for consumers to seek out industry advice if they have questions or concerns about their certified contractor or their home performance project.

3.4.2 2025 Industry Vision:

- **Accredited Professionals:** There are recognized, accredited professional home performance contractors available to advise consumers and guide them through the process of home improvements, often in combination with broader home performance projects.
- **Benefits Tools:** Home performance contractors have the means to easily estimate customer benefits and include these benefits as part of their standard offerings of products and services.
- **Industry Organization:** A contractor-led industry organization represents accredited contractors by ensuring ongoing, coordinated two-way communication of issues and ideas to utilities and governments, providing coordinated communication to consumers about the industry, its members, and its benefits, and working to ensure sufficient capacity and geographic coverage within the province so consumers have reasonable access to its members.
- **Home Performance Education:** Building science, product knowledge, and related business training and support are required and available on an ongoing basis for home performance contractors and their employees.

3.4.3 2025 Utility And Government Vision:

- **Utility and Government Support:** Utilities and Government promote professional home performance upgrades within renovation projects by providing credibility to potential benefits and encouraging consumers by giving them information and examples of success.
- **Regional and Community Goals and Targets:** Cities, regional districts, and municipalities play a key role at the regional and community level in encouraging residents to participate in home performance upgrades by setting local goals and targets around GHG emission reductions and energy savings, along with specific local programs help spur consumers to act.

- Home Labelling System: A well-known and well-understood home labelling system for energy efficiency is supported by government, utilities, mortgage lenders, the real estate industry, and purchasers.

3.5 Summary of HVAC Sector Issues

The following five issues were identified by the HVAC Sector Council as priorities in working towards the vision of a home performance industry in BC:

- Capacity Building: Availability of Trained Trades, Workforce Development, and Professionalism
- Quality Workmanship: Industry Reputation, Standards of Practice, and Installation Quality
- Advocacy: Connectivity to and Engagement in Utility and Government Program & Policy Design
- Advocacy: Effectiveness and Enforcement of Codes, Regulations, and Bylaws
- Market Growth: Consumer Demand and Quality Awareness

While the recommended actions in this Roadmap are specific to the HVAC Sector being discussed, each of the other Sector Councils identified their priority issues. The HPSC recognizes the many synergies between the sectors' issues, as shown in Table 2 below.

Table 2: Roadmap Issues Across the HPSC Industry Sectors

Issue	U&G	HVAC	EA	Reno.	Insul.	Fen.
Quality Workmanship: Industry Reputation, Standards of Practice, and Installation Quality	✓	✓	✓	✓	✓	✓
Market Growth: Consumer Demand and Quality Awareness	✓	✓	✓	✓	✓	✓
Capacity Building: Availability of Trained Trades, Workforce Development, and Professionalism	✓	✓	✓	✓	✓	✓
Advocacy: Connectivity to and Engagement in Utility and Government Program & Policy Design	✓	✓	✓	✓	✓	✓
Advocacy: Effectiveness and Enforcement of Codes, Regulations, and Bylaws	✓	✗	✗	✓	✗	✓
Advocacy: Longevity and Consistency of Utility and Government Programs	✓	✗	✓	✗	✓	✗
Advocacy: Industry Representation for Contractors	✓	✗	✓	✗	✓	✗
Capacity Building: Changing Landscape and Demands on Industry	✗	✗	✓	✗	✗	✗
Market Growth: Limited Ability to Connect Consumers with Quality Contractors	✓	✗	✓	✗	✗	✗

4 Recommendations to Address the Issue of Capacity Building: Availability of Trained Trades, Workforce Development, and Professionalism

4.1 Current Situation

- Trained technicians/tradespeople are often not available to add capacity and meet schedules at peak demand times. Overall, the level of training in many cases is not at the level needed.
- Quality people who see a career in residential HVAC are hard to find.
- The rise of demographic groups not traditionally involved in trades work in BC is a changing dynamic within the industry, and the ability to reach, communicate, train, and certify this growing segment requires planning and strategy.
- Employers may be reluctant to invest in training as there is little value ascribed to professional credentials, and some are concerned that well-trained employees may leave and join competitors or start their own businesses.

4.2 Barriers and Challenges

- Developing an HVAC designation has been explored through TECA before but it has never materialized. That said, some type of HVAC designation or certification is needed for trained tradespeople, both to encourage them to take essential training for their career development and so contractors can identify them when hiring. This currently exists for some tradespeople, such as electricians, gas fitters, and refrigeration mechanics.
- Limited access and demand for HVAC training in retrofits and home performance renovation needs to be addressed. Trade-specific training needs to be available on an ongoing basis so that new people can enter the HVAC trade and get the needed training and trade designation as quickly as possible. Ongoing training is also needed to ensure tradespeople can keep current on new practices and products.
- HVAC is not viewed strongly enough as a potential long-term career path for those entering the trades. Residential HVAC trades need to be promoted as attractive career choices in secondary schools, vocational schools, and technical institutions. People need to realize that well-trained tradespeople in the home HVAC industry can have well-paid careers, ones that are not substantially subject to “off-shoring,” automation, or robotics. They can also contribute to reducing energy use and GHG emissions.
- Contractors within the industry need to be supportive of employees who wish to take training to improve their skills.
- Funding is needed to determine trade-specific training needs, develop the required training, and ensure the training is available.

4.3 Goals for Sector

- Gap analysis on HVAC training requirements (retrofitting priority).
- Develop a trade designation/certification for HVAC with a focus on retrofitting and home performance.

- Develop a plan to promote residential HVAC trades careers.

4.4 Recommendations for Achieving Goals

The following table outlines the HPSC’s recommendations for the HVAC Sector best achieving these goals:

INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
<p>1. Gap analysis on HVAC training requirements.</p> <ul style="list-style-type: none"> • Determine training requirements for each trade and conduct a gap analysis. Determine additional training needed and who/how/when it should be provided. • Where practical, consider how training of multiple trades can be coordinated. Engage existing training providers and consider how delivery can be done regionally, especially where “hands-on” training is required. • Consider how new products and processes can be included on an ongoing basis. • Collaboration and consultation of the HVAC Sector Council with the TECA, HRAI, and BC Safety Authority and active participation of HVAC manufacturers, suppliers, and installers in the HVAC Sector Council. • HPSC participation in TECA/HRAI events and communications. <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Support</p>	<p>Support</p>

<p>2. Develop a trade designation/certification that includes training and experience requirements for HVAC, and that incorporates home performance (house-as-a-system and building science).</p> <ul style="list-style-type: none"> • Include a plan for implementation, considering the existing situation and the need for intake to allow the industry to scale up. <p>Resources include:</p> <ul style="list-style-type: none"> • HVAC Sector Council • Heating Associations • BCIT Trades & Apprenticeship / Technician • Red Seal Program • Ontario has a residential A/C qualification requirement that could be evaluated for model potential and perhaps the provincial government could lead this <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Consult</p>	<p>Consult</p>
<p>3. Develop a communication plan to raise awareness and promote residential trades careers to students in secondary schools, vocational schools, and technical institutions, and to the general public.</p> <ul style="list-style-type: none"> • Emphasize the value of the trades designation and complete special outreach to demographics that are under-represented in the trades. <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Support</p>	<p>Support</p>

5 Recommendations to Address the Issue of Quality Workmanship: Industry Reputation, Standards of Practice, and Installation Quality

5.1 Current Situation

- Need to differentiate professional residential HVAC contractors from low-quality, low-cost companies whose work and behaviour reflect poorly on the entire industry and makes the sale of quality projects and installations difficult.
- There needs to be some method of differentiating those who do this work professionally, following standards for equipment selection and installation, from those who do not and contribute to substandard results that damage the reputation of the industry. Contractor selection should be based on value, not price.
- Currently there is a lack of standards, and lack of enforcement of those standards that do exist. This leads to an “unlevel playing field” where quality contractors who meet the existing standards must compete with others who do not.
- Sometimes energy improvement processes and technologies are not well researched, which can lead to future problems. There may be conflicting theories and “factual data” between suppliers and presenters of home energy solutions.

5.2 Barriers and Challenges

- Education of consumers on the importance of installation quality remains a challenge with respect to:
 - What is entailed in a quality job?
 - What process should you go through in selecting and working with a professional contractor?
 - What types of issues can be expected to arise and how they can be dealt with?
 - What can go wrong if you choose the wrong contractor?
 - How can you recognize a professional contractor?
- Scaling the contractor education to improve quality and the business value associated with improved workmanship is a challenge.
- Generating agreement on a systematic inspection process targeting contractors whose projects have a history of problems.
- More effort needs to be put towards ensuring that permits are actually taken out when required, by local governments
- More effort needs to be put towards informing homeowners regarding regulations and the importance of following them, by local governments and the provincial government.
- Utility and Government programs need to have more focus on ensuring quality installations.
- More “fact-based” information needs to be supplied to contractors regarding new equipment, technologies, and installation practices.
- The industry needs better standards for equipment and installations, and enforcement of these standards.

5.3 Goals for Sector

- Develop and implement an initiative to improve consumer knowledge of home performance.
- Develop better standards for HVAC equipment and equipment installation.
- Develop an HVAC contractor accreditation program that supports HVAC retrofitting and home performance.
- Develop a contractor training program to fully support residential HVAC contractor/trades accreditation in HVAC retrofitting and home performance.
- Include contractor accreditation as a requirement for participation in home performance related programs.

5.4 Recommendations for Achieving Goals

The following table outlines the HPSC's recommendations for the HVAC Sector best achieving these goals:

INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
Consult	<p>1. Develop and implement an initiative to improve consumer knowledge of home performance. This should include:</p> <ul style="list-style-type: none"> • the process that should be followed in selecting a HVAC contractor • the differences between a high-value, quality project and a minimum-cost project • how they can recognize a professional contractor • when and why permits are required • the risks involved in hiring a contractor who cuts corners <p>Development should leverage:</p> <ul style="list-style-type: none"> • BC Hydro, FortisBC, Province of BC, and municipalities with community energy programs • TECA and HRAI • Home Energy Coach website <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	

<p>2. Develop an HVAC contractor accreditation program.</p> <ul style="list-style-type: none"> • Work with Government and Utilities to develop an accreditation program to allow consumers to easily find qualified residential HVAC contractors, and to differentiate them from non-professionals in the business. The accreditation program should have requirements around: <ul style="list-style-type: none"> - Training - Experience - Business licence - WorkSafe BC registration - Recognizing and dealing with hazardous materials - Insurance - Business processes - Warrantees - Business ethics <p>Development should leverage:</p> <ul style="list-style-type: none"> • HVAC Sector Council • TECA and HRAI • BC Hydro, FortisBC, Province of BC - Program Registered Contractor initiative - Trade Ally Networks <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Consult</p>	<p>Support</p>
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<p>3. Develop a contractor training program to fully support residential HVAC contractor accreditation.</p> <ul style="list-style-type: none"> • The contractor training program for HVAC contractor accreditation should include a phased-in approach that will allow contractors who meet critical requirements but are not fully qualified to register and get full accreditation over time. It must also include an agreement with participating contractors that provides for the loss of accreditation for poor performance. • Development, including design, should be led by contractors and industry associations with support from Government and Utilities. Operation of the program should be by an independent third party. <p>Development should leverage:</p> <ul style="list-style-type: none"> • HVAC Sector Council • TECA and HRAI • BC Hydro, FortisBC, Province of BC <ul style="list-style-type: none"> o Program Registered Contractor initiative o Trade Ally Networks <p>INITIATIVE LEADERSHIP: Industry Associations</p>	Consult	Support
Consult	<p>4. Include contractor accreditation as a requirement for participation in home performance related programs.</p> <ul style="list-style-type: none"> • Utilities and Government should include contractor accreditation as a requirement for participation in home performance related programs. • This will help to ensure consumers get the quality work they expect and that energy savings, GHG emissions reductions, and other homeowner benefits are actually achieved. • It will also reduce potential issues and liability around equipment performance, improper handling of hazardous materials, indoor air quality, and moisture problems. This may include a phased-in approach as a system of accreditation is developed. <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	

<p>5. Develop better standards for equipment and equipment installation.</p> <ul style="list-style-type: none"> • Improved standards for HVAC equipment and equipment installation should be developed. This needs to be focused on fact-based information, with caution to avoid mistakes around equipment and installation practices that have caused problems in the past. <p>Development should leverage:</p> <ul style="list-style-type: none"> • TECA and HRAI • BC Hydro, FortisBC, Province of BC <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Support</p>	<p>Consult</p>
<p>Consult</p>	<p>Support</p>	<p>6. Make better – and more consistently enforce – codes, standards and bylaws that apply to products and services in home performance.</p> <ul style="list-style-type: none"> • This includes a process to ensure permits are taken out when needed, as well as more and systematic inspections, with the frequency of inspections determined, to a degree, by past experience with the contractor. <p>INITIATIVE LEADERSHIP: Government, Consult Local Government</p>

6 Recommendations to Address the Issue of Advocacy: Connectivity to and Engagement in Utility and Government Program & Policy Design

6.1 Current Situation

- There needs to be better connectivity and integration of industry input into Government and Utility objectives.
- While program impacts have generally been positive, they haven't necessarily worked as well as they might have, and have had some unintended consequences.
- Programs that start, stop, and change frequently can negatively affect the industry as it struggles to meet significant variations in demand for its services.
- Government and Utility programs need better industry involvement at design, mobilization, and management stages, including industry involvement in technical/product criteria, installation standards, specifications, and quality assurance.
- There is no structured and systematic approach to engaging and actually using industry input on utility program design, rate design, and government policies around fuel choice and taxation. Industry is not being effectively kept up to date on developments and changes.

6.2 Barriers and Challenges

- The existing approach to Utility and Government collaboration with industry on program and policy design remains a challenging environment:
 - When developing programs, policies, rate designs, and taxation regimes, utilities and governments need to employ a systematic approach to getting industry input on a continuous basis in a coordinated fashion.
 - Industry should be viewed as a partner in these developments and given time and opportunity to be involved and provide input with vested interest.
 - Potential unintended consequences should be evaluated with industry.
 - Technical criteria, installation standards, program life, program consistency, and quality assurance need to be discussed with industry prior to making final program or policy decisions.
 - Industry needs to be informed of plans at an early design stage, before details are worked out, and given ample time to prepare input and subsequently be kept informed of progress and allowed further input as the design moves ahead into program mobilization and management.
 - Industry input should be valued and incorporated where needed. When input is not fully utilized, communication should be provided on decision-making.
 - Once an initiative is implemented, industry must be kept informed of progress and changes on an ongoing basis

- Mobilizing the residential HVAC industry to actively participate and fully engage with Utilities and Government in program and policy design remains a barrier:
 - The industry must take an active role in assisting with program and policy design and set up a simple and reliable mechanism for utilities and governments to get industry input and to facilitate ongoing collaboration, rather than ad hoc discussions.
 - The industry must work to ensure that all industry members have the opportunity to provide their input.
 - The industry must recognize that a modest investment of time to provide input on programs and policies will provide long-term value in improving program and policy design and implementation.

6.3 Goals for Sector

- Strategic collaboration with Government and Utilities on program and policy design.

6.4 Recommendations for Achieving Goals

The following table outlines the HPSC's recommendations for the HVAC Sector best achieving this goal:

INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
<p>1. Strategic collaboration with Government and Utilities on program and policy design.</p> <ul style="list-style-type: none"> • Take an active role in assisting with program and policy design and set up a simple and reliable mechanism for Utilities and Government to get industry input and to facilitate ongoing collaboration. • Expansion of HVAC industry contribution base and commitment to take active role in supporting government and utilities. <p>Development should leverage:</p> <ul style="list-style-type: none"> • Information • Consultation and collaboration <ul style="list-style-type: none"> - Meetings/workshops - Webinars - Websites – perhaps one home performance website with links from the websites of all industry partners, including individual contractors - Surveys (online and in-person) - Email communications and knowledge sharing with industry database - Dialogue/interviews: contractors, suppliers, manufacturers, utilities, governments • Education and training <ul style="list-style-type: none"> - Program materials/policy papers - Online training: utilities, government, industry associations, manufacturers, and suppliers - Webinars: utilities, government, industry associations - In-person training: utilities, government, industry associations - Emails to industry database - Using industry associations as communication channels - Newsletters specifically for the industry • HPSC Sector Council • TECA and HRAI • BC Hydro, FortisBC, and Province of BC 	Consult	Consult

INITIATIVE LEADERSHIP: Industry Associations		
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7 Recommendations to Address the Issue of Advocacy: Effectiveness and Enforcement of Codes, Regulations, and Bylaws

7.1 Current Situation

- The time and cost of compliance with regulations results in some contractors not complying in order to minimize costs and move projects ahead. Contractors who fully comply face delays and added costs that are avoided by others.
- Consumers typically have little understanding of the applicable regulations and what is required to comply. They are often surprised at the time and cost of compliance.
- Regulations are in constant flux and change regularly. Even professional contractors have difficulty keeping up and sometimes come across to their clients as uninformed. While regulations are needed to ensure quality and comprehensive work to protect the consumer, they must be effectively communicated, consistently applied, and enforced to avoid driving work to the underground economy, to the detriment of consumers, the industry, and society as a whole.
- The interpretation of regulations varies across jurisdictions and sometimes even within jurisdictions, leading to uncertainty, delays, and added costs.
- Contractors are not consulted enough when new codes, regulations, policies, and bylaws are developed. There are sometimes unintended consequences to regulation.

7.2 Barriers and Challenges

- Inconsistency among bylaws in different jurisdictions.
- Inconsistency in the interpretation of codes and bylaws both within a jurisdiction and between jurisdictions, while maintaining the flexibility to allow for legitimate relaxations due to hardship situations in which 100% compliance becomes unreasonably expensive.
- A well-understood consultation process between industry and government is needed when new regulations are developed, with the aim of ensuring simplicity of regulations and avoiding unintended consequences and costs.
- A systematic process of notification and training is needed to ensure contractors are aware of changes and understand them.
- Existing gaps in compliance and verification are not easily addressed. More effort needs to be put towards ensuring that permits are actually taken out when required.
- More inspections are needed to ensure compliance with requirements.
- More effort should be made towards informing homeowners about regulations and the importance of following them.
- The cost and time needed for compliance is a barrier to widespread adoption. Requirements need to be as simple as possible while remaining effective.
- Application and approval processes need to be as streamlined as possible, and sufficient well-trained staff need to be in place to avoid delays.

7.3 Goals for Sector

- Approach municipalities and regional districts to discuss what can be done to increase consistency and provide more simplicity in bylaws and regulations.
- Collaborate with local governments to facilitate industry input into codes, bylaws, and regulations using a systematic process that extends from when regulations are contemplated through to notification and training.
- Review bylaws with the aim of simplifying and streamlining approval.
- Work with municipalities on professional development specific to HVAC to ensure adequate well-trained staff are available to review applications.
- Jointly review options aimed at ensuring permits are taken out when required and inspections are carried out on a more frequent and systematic basis to ensure compliance with local regulations.
- Develop an outreach program for consumers who are considering renovations to educate them about the reasons for regulations, the importance of meeting them, and the consequences of not meeting them.

7.4 Recommendations for Achieving Goals

The following table outlines the HPSC's recommendations for the HVAC Sector best achieving these goals:

INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
<p>1. Approach municipalities and regional districts to discuss what can be done to increase consistency and provide more simplicity in bylaws and regulations.</p> <ul style="list-style-type: none"> • Contractors/industry associations should approach municipalities and regional districts to discuss what can be done to increase consistency and provide more simplicity in bylaws and regulations. • Municipalities can save time and resources by jointly dealing with issues with other municipalities and developing common solutions to issues. They will also need to spend less time in discussions with contractors around misunderstandings and disputes. • Contractors can save time and resources by having a common set of rules that they need to follow, and can develop business processes to achieve this more effectively and efficiently. <p>Initiative should leverage:</p>	<p>Support</p>	<p>Consult, Local Governments</p>

<ul style="list-style-type: none"> • HPSC Sector Council • TECA and HRAI • Municipal governments • Union of British Columbia Municipalities <p>INITIATIVE LEADERSHIP: Industry Associations</p>		
<p>2. Work with local governments to ensure there is adequate industry input into codes, bylaws, and regulations using a systematic process that extends from when regulations are contemplated through to notification and training.</p> <ul style="list-style-type: none"> • Contractors/industry associations should work with local governments to ensure there is adequate industry input into codes, bylaws, and regulations. This should be a systematic process that is followed as changes to regulations are contemplated. A systematic process of notification and training is also needed to ensure all HVAC contractors are aware of changes and understand them. <p>Initiative should leverage:</p> <ul style="list-style-type: none"> • HPSC Sector Council • TECA and HRAI • Municipal Governments • Union of British Columbia Municipalities <p>INITIATIVE LEADERSHIP: Industry Associations</p>	<p>Support</p>	<p>Consult, Local Governments</p>

Consult	Support	<p>3. Review bylaws with the aim of simplifying and streamlining approval.</p> <ul style="list-style-type: none"> • Local governments should review their bylaws with the aim of simplifying as far as possible and streamlining approval processes to prevent long delays in providing project approvals. • They also need to ensure adequate well-trained staff are available to review applications within a reasonable time. Simplified bylaws may be easier to enforce but must still provide flexibility when needed. <p>INITIATIVE LEADERSHIP: Local Governments, Consult UBCM</p>
Consult	Support	<p>4. Ensure adequate well-trained staff are available to review applications.</p> <ul style="list-style-type: none"> • Additional training for HVAC may be required for those responsible for enforcing codes, regulation, and bylaws to improve consistency in interpretation and provide greater certainty to contractors and consumers, while maintaining the flexibility to deal with hardship cases. <p>INITIATIVE LEADERSHIP: Local Governments, Consult UBCM</p>
Consult	Support	<p>5. Ensure that those responsible for enforcing codes, regulations, and bylaws are properly trained to improve consistency in interpretation and provide greater certainty to contractors and consumers, while maintaining the flexibility to deal with hardship cases.</p>

Consult	Support	<p>6. Jointly review options aimed at ensuring permits are taken out when required and inspections are carried out on a more frequent and systematic basis to ensure compliance with local regulations.</p> <ul style="list-style-type: none"> Options considered should include new or increased fines for both homeowners and contractors who fail to take out permits when required, and determining inspection frequency, at least in part, by a contractor's past performance. Resources need to be considered to avoid any delays in inspections. <p>INITIATIVE LEADERSHIP: Local Governments, Consult UBCM</p>
Consult	Consult	<p>7. Develop an outreach program for consumers who are considering renovations to educate them about the reasons for regulations, the importance of meeting them, and the consequences of not meeting them.</p> <ul style="list-style-type: none"> Local governments should consider developing outreach programs to consumers who are considering renovations to educate them about the reasons for regulations, the importance of meeting them, and the consequences of not meeting them. This will allow consumers to have more meaningful conversations with potential contractors and avoid being taken advantage of. <p>Initiative should leverage:</p> <ul style="list-style-type: none"> Province of BC (BC Building Standards and Safety Branch) and local governments Union of British Columbia Municipalities <p>INITIATIVE LEADERSHIP: Government</p>

8 Recommendations to Address the Issue of Market Growth: Consumer Demand and Quality Awareness

8.1 Current Situation

- Consumers don't understand what is required for a quality job and don't appreciate the value in improving home performance. Consumers often make their decisions around cosmetic or functional upgrades, with little thought to energy efficiency, envelope upgrades, equipment upgrades, or building science issues. Educating them regarding efficiency options, performance improvements, the need to comply with regulations, potential for hazardous materials, and basic building science at this point is extremely challenging.
- Too often consumers select a contractor based on low cost rather than value and quality. Consumers face conflicts between their wants, needs, and available budget. Many do not understand that cost-effective home performance upgrades can actually improve affordability due to lower operating costs.
- TV programs often set unrealistic cost expectations leading consumers to choose a lowest cost proposal. People don't want to pay more for quality plumbing, duct work, etc., because it cannot be seen and the sense is that if water comes out of the tap and the furnace turns on without causing a flood or a fire, everything must be fine... why pay more?
- The existence of multiple home performance programs in the marketplace can be confusing to consumers.

8.2 Barriers and Challenges

- Addressing the existing challenge of consumer knowledge and awareness of home performance solutions and the importance of quality installations:
 - What is home performance?
 - What is entailed in a quality job?
 - What process should I go through with a potential contractor?
 - What types of issues can be expected to arise and how they can be dealt with?
 - What can go wrong if I choose the wrong contractor?
 - What assistance may be available from utilities and governments?
 - What do I need to know about how my home works?
- Addressing the consumer confidence gap in HVAC and home performance product and service providers:
 - How can I find/recognize a quality contractor?
 - What should I expect from a quality contractor?
 - Are there enough qualified people available to complete my project on schedule?
 - What do utilities and governments recommend be included in my renovation?
 - How will contractors deal with potential hazardous materials and air quality to make my home safer and healthier?
 - What strategies can my contractor and I use to minimize nasty surprises later in the project?

- Addressing the various “wants versus needs” of consumer motivations when investing in HVAC and home performance product/services:
 - How will home performance work benefit me and my family in terms of improved air quality, reduced moisture problems, durability of our home, and resale value?
 - Who can help me determine the potential benefits?
 - How will home performance work save me money, and how much?
 - Are there programs available to help me?
 - What warranties are available?
 - Why should I act now?

8.3 Goals for Sector

- Develop and implement an initiative to improve consumer knowledge of home performance using the Home Energy Coach website and other tools.
- Instill consumer confidence through labelling, branding, and customer care.
- Develop potential warranty solutions to provide consumers with confidence that their project will be done properly, and provide recourse if problems arise.
- Enhance consumer motivation by clearly showing the benefits of home performance enhancement and reducing customer costs using incentives, tax credits, financing, utility rates, and labelling, as well as marketing, lead generation, and sales.
- Ensure inspections meet applicable codes and standards, and projects are undertaken and completed as contracted.
- Collaborate with Government and Utilities on the design of demand side management (DSM) programs that are more consistent in structure and requirements and provide stable market signals for contractors and consumers.

8.4 Recommendations for Achieving Goals

The following table outlines the HPSC's recommendations for the HVAC Sector best achieving these goals:

INDUSTRY ASSOCIATIONS	UTILITIES	GOVERNMENT
Consult	<p>1. Develop and implement an initiative to improve consumer knowledge of home performance using the Home Energy Coach website and other tools.</p> <ul style="list-style-type: none"> • Support consumer education initiatives that are designed to improve consumer knowledge and demand for HVAC products/services and home performance solutions. This can be carried out through: <ul style="list-style-type: none"> - Website – perhaps one home performance website with links from the websites of all industry partners, including individual contractors – utilities, government, Home Energy Coach, contractors, industry associations, HPSC - Advertising – utilities, government, industry organizations - Home shows and community events – utilities, government, industry organizations - Literature – utilities, government, industry organizations, individual contractors - Bill stuffers – utilities - Program materials – utilities, government, industry organizations - Dialogue – contractors, energy advisors (EAs), utilities, industry organizations, real estate agents (once trained) - Regulation – governments (e.g. City of Vancouver requires renovations over \$5,000 to have an energy audit and get an EnerGuide rating) <p>Initiative should leverage:</p> <ul style="list-style-type: none"> • HPSC Sector Council • TECA and HRAI • BC Hydro, FortisBC, and Province of BC <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	
Consult	<p>2. Instill consumer confidence through labelling, branding, and customer care.</p> <ul style="list-style-type: none"> • Support initiatives designed to improve consumer confidence in value of HVAC products/services and home performance solutions. This can be carried out through: <ul style="list-style-type: none"> - Labelling and branding, which need to be either fully integrated or clearly complementary. They need to be supported by all industry partners so consumers get a consistent message and develop confidence in the label and brand – utilities, governments, industry organizations, contractors, HPSC, EAs. - Consumer advocacy: Create a plan for consumers to upgrade their homes over time, to the most effective level of efficiency and in a logical order – energy advisors, other NGOs, websites (how to). Lead consumers through the contracting process as an independent advisor and advocate – energy advisors, other NGOs. Help consumers through the decision-making process – energy advisors, HPSC, utility and government websites. Help consumers discover any programs that may help them and lead them through the paperwork – energy advisors, other NGOs, HPSC website, Home Energy 	

	<p>Coach website, utility websites, government websites.</p> <p>Initiative should leverage:</p> <ul style="list-style-type: none"> • HPSC Sector Council • TECA and HRAI • BC Hydro, FortisBC, and Province of BC <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	
Consult	<p>3. Enhance consumer motivation by clearly showing benefits and reducing customer costs using incentives, tax credits, financing, utility rates, labelling, and marketing, lead generation, and sales.</p> <ul style="list-style-type: none"> • Stimulate increased consumer demand by developing comprehensive suite of tools that enhance consumer motivation for home performance solutions. <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	
Consult	<p>4. Ensure inspections meet applicable codes and standards, and the project is completed as contracted – governments, industry associations, energy advisors, and other independent third parties, supported by utilities.</p> <ul style="list-style-type: none"> • Inspections to ensure contractor work meets applicable codes and standards, and the project is completed as contracted. Utility inspections will be limited to those required to ensure program compliance. <p>Initiative should leverage:</p> <ul style="list-style-type: none"> • HPSC Sector Council • TECA and HRAI • BC Hydro, FortisBC, and Province of BC • BC Safety Authority for HVAC equipment • Building Officials Association of BC <p>INITIATIVE LEADERSHIP: Shared (Utilities and Government)</p>	
<p>5. Develop potential warrantee solutions to provide consumers with confidence that their project will be done properly, and provide recourse if problems arise – contractors, third party, possibly through BC Housing in the long term.</p> <p>INITIATIVE LEADERSHIP: Industry Associations</p>	Consult	Consult

9 Resources Available

Financial and in-kind resources may come from several sources. Utilities and Government contribute time and funding. Government contributions may come from federal (NRCan), provincial (MEMPR, Ministry of Housing, Building Standards Branch), and local levels of government. These potential sources have not yet been fully explored but consideration is underway.

Contractors, industry associations, manufacturers, suppliers, and distributors contribute their time and possibly funding where appropriate.

10 Summary and Next Steps

Resources need to be put in place and a plan developed to move the priority initiatives ahead in 2018.

The plan would cover 2018 to 2025 and specify timing, dependencies, and resources for each initiative. It should also include a dashboard, or online tracking tool, so everyone can see progress measured against the plan.

The implementation of many of the Roadmap recommendations needs to begin in 2018. This process should focus on recommendations that have a long development cycle (e.g. the development of an accreditation program), and those that are clearly needed and don't require other recommendations to be completed first (e.g. the development of trades training). It is important that the industry starts to see real benefits from this work in 2018.