



# British Columbia Stewardship Plan for Thermostats Revised 5 Year Plan: 2015-2020



**Submitted by:**

Heating, Refrigeration and Air Conditioning  
Institute of Canada (HRAI)

With the support of the Canadian Institute of  
Plumbing and Heating (CIPH)

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# 1. Introduction

## 1.1 Overview

In accordance with the British Columbia Recycling Regulation (Reg. 449/2004), the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), with the support of the Canadian Institute of Plumbing and Heating (CIPH), is submitting this Stewardship Plan on behalf of manufacturers and distributors responsible for selling thermostats into British Columbia.

The ultimate goal of this Plan is to continue to deliver a high-quality program that satisfies the obligations of the thermostat manufacturers under the British Columbia Recycling Regulation, and which is also a part of a harmonized national program. This version of the Plan covers a five-year period from July 1, 2015 to June 30, 2020, and as such sets five-year targets for accessibility and collection. This plan builds from the work that was done in the original plan period of July 1, 2010 to June 30, 2015, and makes amendments to ensure that program performance shows continuous improvement. As per the Recycling Regulation guidelines, the collection program for thermostats will be ongoing, the Plan will be reviewed after five years of operations, and any necessary amendments will be made at that time. Between five year plan revisions, Switch the 'Stat will remain committed to achieving the targets set out in this Plan and demonstrating continual improvement.

## 1.2 Program Participants

HRAI, with the support of CIPH, has taken the lead in developing this Plan on behalf of manufacturers and distributors responsible for selling thermostats into British Columbia. [Appendix A](#) includes a list of the manufacturers and distributors that sell thermostats into British Columbia. [Appendix B](#) lists the thermostat manufacturers and distributors that have already signed onto this Plan.

HRAI and CIPH contacted the manufacturers and distributors listed in [Appendix A](#) to notify them about this Plan and, as a result, the list in [Appendix B](#) continually evolved over the first five years of the program. Currently, 21 manufacturers have signed on to this program, representing 100% of the thermostat brands collected by the program as of 2013. The list of participating manufacturers and distributors is also posted on the program website ([www.switchthestat.ca](http://www.switchthestat.ca)), and is updated regularly as new manufacturers agree to support the program.

As the agency appointed by the manufacturers and distributors listed in [Appendix B](#) to fulfill their legal obligation to develop and deliver a collection and recycling program for thermostats in British Columbia, HRAI has contracted Summerhill Impact to provide overall program management and delivery.

### 1.3 Program Products

This Plan covers all thermostat types, which are defined as “products that sense and control room temperature through communication with heating, ventilation and air conditioning equipment from all sectors (residential and commercial), including:

- Electromechanical thermostats, which contain internal mercury switches (mercury in a sealed glass bulb) or snap switches to control the flow of electrical current; and,
- Electronic thermostats, which use sensors instead of switches to detect temperature levels and electronically control the flow of electrical current."

The designed lifespan of an electromechanical thermostat is 20–30 years. However, in reality, many thermostats are replaced more frequently than that — on average every 7–10 years — as a result of renovations and/or replacing furnaces and other HVAC equipment. This long potential lifespan, coupled with the significant variability in the replacement rate presents a challenge in anticipating how many thermostats will become available for collection in a given year. This means that targets must be based around collection totals rather than a recovery rate. Details will be provided below in the section describing [Collection Targets](#).

## 2. Product Stewardship Plan

### 2.1 Plan Development

In 2006, Clean Air Foundation (now Summerhill Impact) developed and operated a pilot program to collect mercury-containing thermostats. This program, Switch the ‘Stat, became a permanent, ongoing initiative of Clean Air Foundation in 2007. Then in early 2009, Summerhill Impact, HRAI, CIPH and a number of thermostat manufacturers and distributors partnered to use the existing Switch the ‘Stat program model and infrastructure as the basis for the Stewardship Plan for thermostats to meet the obligations of the British Columbia Recycling Regulation.

Since 2010, Summerhill Impact has been delivering Switch the ‘Stat on behalf of HRAI, CIPH and the thermostat manufacturers and distributors under an approved stewardship plan in BC; SI has also been delivering under an approved plan in MB since 2011, and operating across the rest of Canada on a voluntary basis. Switch the ‘Stat now reaches over 1,400 contractors and wholesalers across Canada, including 329 in BC, with SI providing education and outreach for both the participating home and/or business owners and contractors/wholesalers, as well as free collection containers and shipping for all thermostats collected.

### 2.2 Collection Infrastructure

The Plan will continue to use the following three channels to collect end-of-life thermostats in British Columbia:

1. Contractors and wholesalers who will remove and collect thermostats during the course of their operations, and act as drop-off locations for general public.
2. Send-back kits for members of the public in remote regions of the province, or who have mobility challenges.
3. Regional districts and municipal collection points where the public can drop-off their old thermostats.

#### Contractor/Wholesaler Channel

This channel will be used as the primary collection channel for the Plan. It is estimated that 85 to 90% of thermostats sold into British Columbia are sold and installed via the contractor/wholesaler channel and, as such, we expect to see a similar proportion of thermostats collected and returned through this channel. This assumption has been proven through British Columbia’s collection results over the last five years, which demonstrate that only 15% of thermostats are recovered from other sources.

SI and HRAI will continue to identify and engage HVAC contractors and wholesalers via letters, emails, advertising in industry publications, and participation in industry meetings and tradeshows. Contractors and wholesalers can register for Switch the ‘Stat either via the program

website ([www.switchthestat.ca](http://www.switchthestat.ca)) or by calling SI directly. Upon registration, SI sends the following materials to a new contractor/wholesaler participant:

- a collection container (United Nations approved for shipping mercury);
- an introductory letter;
- program instructions;
- information brochures to leave behind with their customers; and,
- a pre-paid courier waybill.

Contractors then remove old thermostats from homes or businesses and replace them with new thermostats, and place old thermostats intact in the provided collection containers. Once the collection container is full, the participant can use their pre-paid waybill to return the collection container to the recycling facility. Participants will also be asked to send back any pail that is half-full or more during the collection sweeps, which take place biannually in May and September.

The program will continue to ensure that the courier and recycling companies used by the program have the appropriate certificates of approval to transport and receive all types of thermostats, including those containing mercury. Once at the recycling facility, the thermostats will be counted, documented, and dismantled, and the number of thermostats collected by each contractor will be reported back to SI on a monthly basis, along with a breakdown of the total quantities of mercury-containing and electronic thermostats, the total number of mercury vessels (each thermostat can have between 1-4), and the total weight of plastics and metals from each participant. The mercury vessels will be removed and stored temporarily before being shipped to a retort facility at least once a year, and the metal and plastic components of the thermostats will be sent to appropriate secondary recycling facilities.

For do-it-yourselfers or smaller contractor businesses (who do not collect a sufficient volume of thermostats to want to have their own pail), the program promotes the contractors and wholesalers who participate in the program as year-round drop-off locations. The Switch the 'Stat website ([switchthestat.ca](http://switchthestat.ca)) has a map with search-by-postal code functionality that will allow the user to locate a participating contractor/wholesaler in their area.

### **Send-back Channel**

This channel will continue to be used as a secondary collection channel for the Plan, after being tested as a pilot project in Years one through five. Though collection results through this channel have been low in British Columbia over the past five years (accounting for less than 1% of overall collection results), this channel is important in terms of offering fair and equitable access to thermostat recycling for northern, coastal and remote residents of British Columbia. This channel is provided as an option for British Columbia residents living in remote areas who do not have access to Switch the 'Stat drop-off locations. The Switch the 'Stat website currently lists a phone number and an online request option where the public can request a small shipping

container (suitable for up to approximately 4 thermostats) with a pre-paid courier waybill to ship their old thermostat directly to the recycling facility.

### **Regional District/Municipal Collection**

This channel will continue to be used as a secondary collection channel for the Plan, after being tested as a pilot project in Years one through five, and being found to result in 15% of overall collection results. Regional District and Municipal collection provides a way for the general public to easily access the program, as these are locations that members of the public are likely already familiar with, and which often support collection of other stewarded materials as well.

## **2.3 Pollution Prevention Hierarchy**

### **Reduce/Redesign**

The main environmental concern with thermostats is the mercury contained in many of the older models. While mercury-containing thermostats have been in use for more than 50 years, they are no longer produced by the major manufacturers. Honeywell stopped selling mercury-containing thermostats in Canada in 2006 and Emerson/White Rodgers stopped in Spring 2007. As well, the government of Canada is working on a risk management strategy that will ban the sale, manufacture and import of all mercury-containing products (excluding lamps and dental amalgam) into Canada. This ban will guarantee that mercury-containing thermostats are an obsolete material.

### **Reuse**

Switch the 'Stat does not encourage the reuse of old thermostats collected through this program for a number of reasons. First, many of the old thermostats contain mercury and this program will ensure that the mercury is properly managed and recycled once in our collection channels. Second, for the non-mercury-containing thermostats, the risk in reusing them is that they will not meet the technical/safety specifications of new HVAC systems.

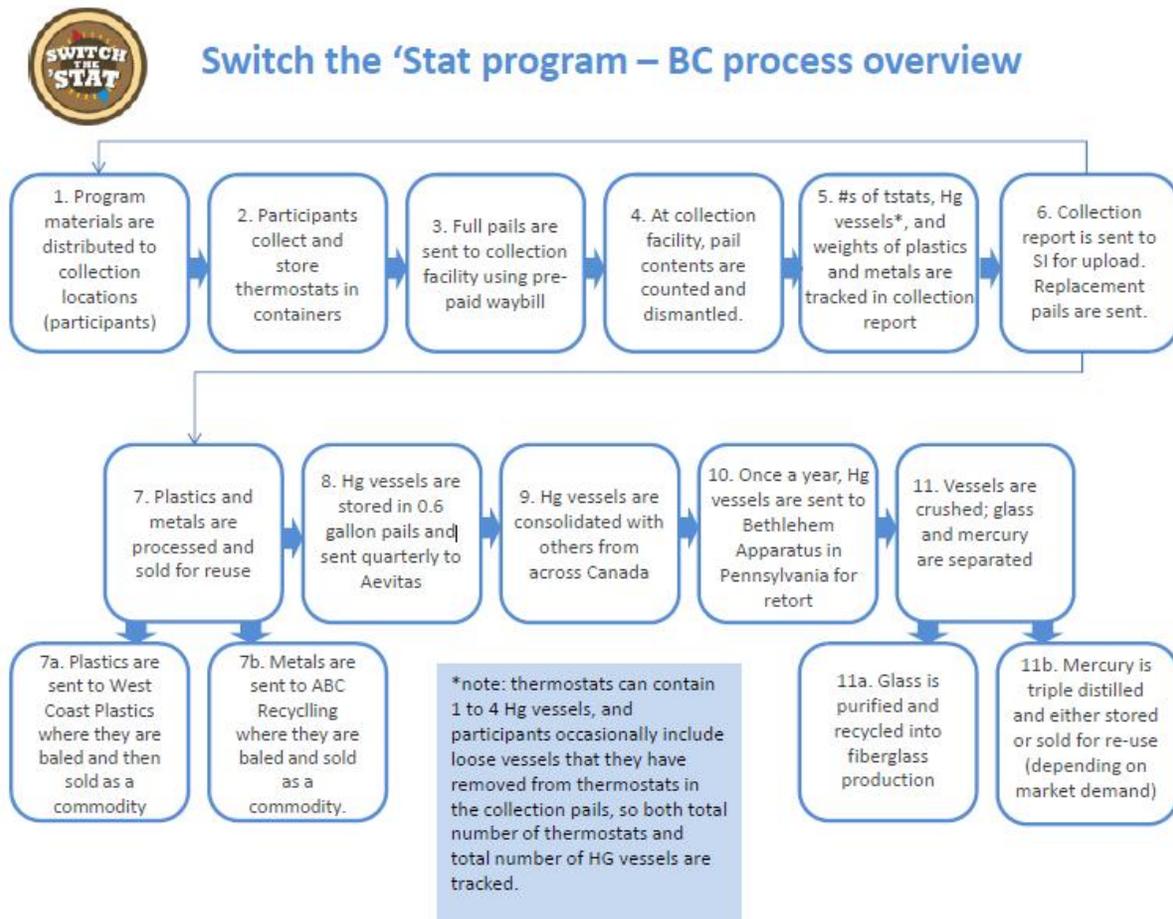
### **Recycle**

The following steps will continue to be taken to manage the materials recovered through the program:

- Once at the recycler, the thermostats are counted, documented and dismantled, and the components are separated for appropriate recycling.
- The glass vials that contain the mercury are removed from the thermostat and stored temporarily before being sent to a retort facility. Once at the retort facility, the glass vials are crushed and the glass and mercury are separated. The mercury is triple distilled to remove any impurities and then either sold as a commodity (depending on market demand) or put into long-term storage. The glass is crushed, distilled and sent for recycling in fiberglass applications.

- The metal and plastic components from the thermostats are separated and sent for recycling. Both the metals and plastics will be sent from the primary recycling facility to secondary recyclers where the material is consolidated with material from various other sources and baled, then sold as a commodity.

The process is described in the following flow chart:



Both the Collection Infrastructure and the adherence to the Pollution Prevention Hierarchy, as well as the Program Performance (as described in the following section) were subject to an Independent Reasonable Assurance audit by Price Waterhouse Coopers, in accordance with the International Standard on Assurance Engagements 3000 (IAS 3000) procedures. PWC found that in their unqualified opinion, the Switch the 'Stat program presents fairly with respect to all audit criteria. The details of these criteria and the details of the audit can be found in the 2013 Annual Report, located online on the "[Program Results](#)" page of the Switch the 'Stat website.

# 3. Program Performance

## 3.1 Program Accessibility

### Contractor/Wholesaler Channel

In the previous approved Plan (2010-2015), it was estimated that there were approximately 400-450 businesses that could eventually act as collection points for thermostats, and further research (to be summarized in the section “Collection Location Targets” below) since 2010 has proven this estimate to be accurate. By reaching out to the existing HRAI and CIPH contractor/wholesaler memberships, as well as the memberships of several other contractor associations, and by advertising in industry trade publications and attending industry meetings, the program has reached 329 participants, 280 of which are contractors and wholesalers. These participants, as well as those from the channels described in the following sections, have been plotted on the Coverage Map below. These contractors provide on-site collection for thermostats that they remove from homes and businesses.

The program has also worked to engage wholesaler branches as drop-off points for thermostats, because all small contractor businesses will visit at least one wholesaler branch on a regular basis to purchase supplies. Some contractors with a public-facing office location will also opt to be drop-off locations. Research conducted by the program team has also shown that many smaller contractor businesses prefer to visit drop-off locations rather than registering for the program, therefore it will not be possible to register 100% of the potential businesses. However, these businesses will still have access to the program through the drop-off locations. This finding will be reflected in the registration targets outlined below. However, some independent contractors find it more convenient register for the program and receive their own pail to use in the field. The program offers the flexibility to meet the needs of a variety of different businesses.

### Send-Back Channel

This channel was run as a pilot in the original 5 year plan, to provide access to the Switch the ‘Stat program rural and remote areas of the province. While the collection results from this channel have been quite low (under 1%), it ultimately proved to be a valuable and cost-effective way to make the program accessible to those residents of BC who are outside the areas currently serviced by existing participants and drop-off locations. This revised plan intends to continue to offer this channel.

## Regional District/Municipal Channel

In order to ensure that the Program is as accessible as possible to the residents of BC, collection is also available through Regional District and Municipal collection channels. This channel provides convenient access to the program for members of the public who are “do-it-yourselfers” and prefer not to use a contractor for a thermostat replacement, as well as being a method of disposal that many residents are already familiar with.

This channel was run as a pilot in Year one of the previous Plan, and was determined to be a valuable method of collection, accounting for approximately 15% of returned thermostats. Therefore, efforts have been made to engage with as many Regional Districts and Municipalities as possible to increase the availability of this channel. Whenever possible, Switch the ‘Stat makes collection available at the same locations as other BC EPR programs, in order to improve the convenience to the public.

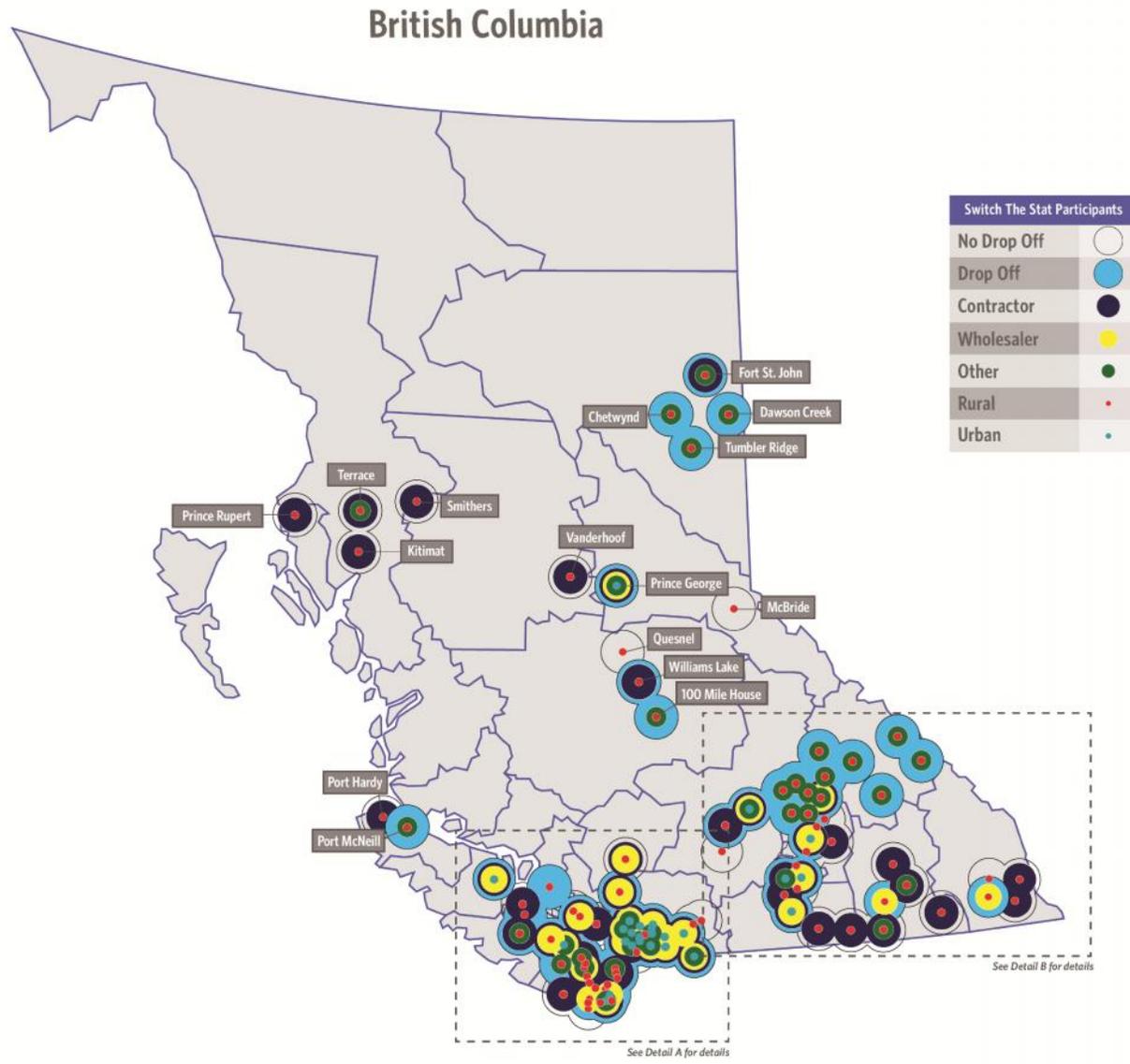
## Collection Location Targets

Program delivery over the previous plan period has focused heavily on recruiting new collection locations, particularly in 2012 and 2013 to address the challenges in meeting these targets in the previous years. As demonstrated by the Coverage Map below, the program has excellent coverage in the Southern part of the province, and representation in all Regional Districts except:

- Central Coast
- Stikine
- Northern Rockies

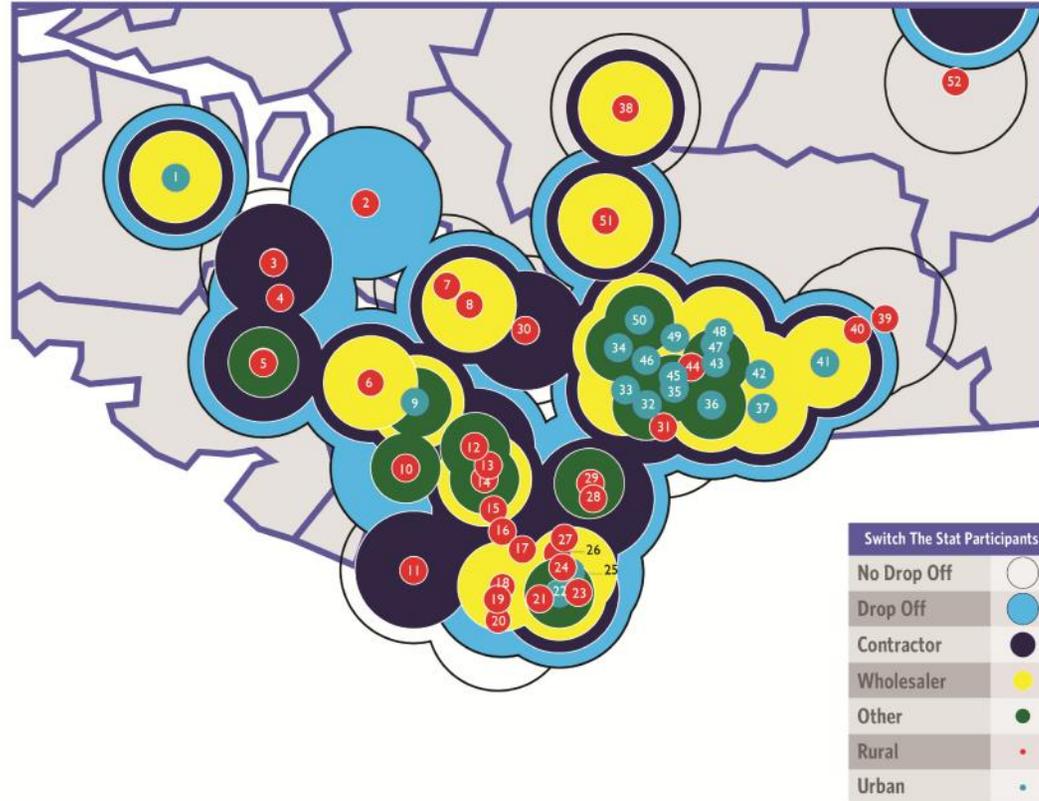
SI will continue to contact contractors and wholesalers, as well as at Municipal and Regional District locations, in the Stikine and Northern Rockies Regions with the intention of having collection locations in each regional district of the province. However, conversations with representatives from the Central Coast Regional District have indicated that heating types prevalent in the Central Coast have never used thermostats, and thus no collection will be necessary in this District. The communities serviced by Switch the ‘Stat collection locations account for approximately 77% of the total population of BC, with coverage in the rest of province available through the send-back channel.

Switch the 'Stat Coverage Map  
(as of July 2014)



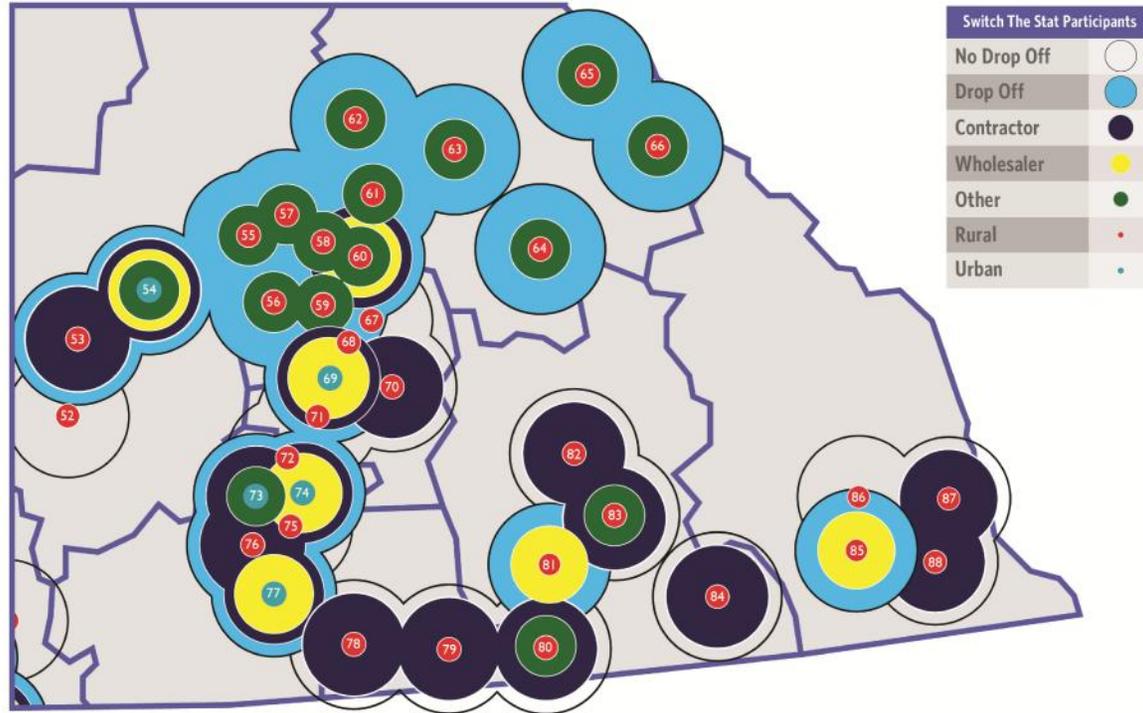
## Detail A - Southwest

- |                     |                        |
|---------------------|------------------------|
| 1. Campbell River   | 27. Sidney             |
| 2. Powell River     | 28. Salt Spring Island |
| 3. Lazo             | 29. Galiano Island     |
| 4. Lake Courtenay   | 30. Gibsons            |
| 5. Port Alberni     | 31. White Rock         |
| 6. Parksville       | 32. Delta              |
| 7. Sechelt          | 33. Richmond           |
| 8. Wilson Creek     | 34. Vancouver          |
| 9. Nanaimo          | 35. Surrey             |
| 10. Lake Cowichan   | 36. Langley            |
| 11. Sooke           | 37. Abbotsford         |
| 12. Ladysmith       | 38. Whistler           |
| 13. North Cowichan  | 39. Hope               |
| 14. Duncan          | 40. Kent               |
| 15. Shawnigan Lake  | 41. Chilliwack         |
| 16. Mill Bay        | 42. Mission            |
| 17. North Saanich   | 43. Maple Ridge        |
| 18. Langford        | 44. Pitt Meadows       |
| 19. Colwood         | 45. New Westminster    |
| 20. Metchosin       | 46. Burnaby            |
| 21. Esquimalt       | 47. Port Coquitlam     |
| 22. Victoria        | 48. Coquitlam          |
| 23. Oak Bay         | 49. Port Moody         |
| 24. Central Saanich | 50. North Vancouver    |
| 25. Saanich         | 51. Squamish           |
| 26. Saanichton      | 52. Merritt            |



## Detail B - Southeast

- |                       |                 |
|-----------------------|-----------------|
| 52. Merritt           | 78. Rock Creek  |
| 53. Logan Lake        | 79. Grand Forks |
| 54. Kamloops          | 80. Trail       |
| 55. Tappen            | 81. Castlegar   |
| 56. Falkland          | 82. Slocan City |
| 57. Scotch Creek      | 83. Nelson      |
| 58. Sicamous Landfill | 84. Creston     |
| 59. Glenemma          | 85. Cranbrook   |
| 60. Salmon Arm        | 86. Kimberley   |
| 61. Malakwa           | 87. Sparwood    |
| 62. Seymour Arm       | 88. Fernie      |
| 63. Revelstoke        |                 |
| 64. Trout Lake        |                 |
| 65. Golden            |                 |
| 66. Parson            |                 |
| 67. Armstrong         |                 |
| 68. Spallumcheen      |                 |
| 69. Vernon            |                 |
| 70. Lumby             |                 |
| 71. Coldstream        |                 |
| 72. Lake Country      |                 |
| 73. West Kelona       |                 |
| 74. Kelowna           |                 |
| 75. Peachland         |                 |
| 76. Summerland        |                 |
| 77. Penticton         |                 |



In order to ensure that all avenues for engaging potential collection locations have been explored and that outreach attempts are cost-effective and reach the target audience (based on above channels), ongoing research has been conducted throughout the term of the original Plan. Additional research has been conducted to support the development of revised targets for the 2015-2020 Plan; this research is as follows:

- Analysis of potential collection locations (via registration membership lists, and chapter outreach);
- Analysis of registration/participation trends;
- Annual participant survey;
- Non-participant survey (focused on un-registered TECA members); and,
- In-depth interviews with HRAI members.

As demonstrated in the table below, the program has continued to grow steadily from Year 1 through 4, positioning the program well to meet targets in Year 5. At this point, the program has conducted extensive outreach to contractor associations (including HRAI, CIPH, Mechanical Service Contractors of Canada, TECA, etc.) as well as reaching out to wholesalers to register all of their BC branches. The extensive research that was conducted in the preparation of this revised Plan, as well as research that has been conducted throughout the term of the original Plan indicates that many small contractor businesses prefer to visit drop-off locations rather than registering for the program themselves. Therefore while the original assumption as to the number of contractors and wholesalers who could potentially participate was accurate, the program has likely reached a saturation point as to the number that would actually register for the program.

The table below shows performance towards the targets for the number of collection points from the original Plan:

Program Year	Target Number of Collection Locations	Pro-rated Target for Calendar Year (for annual report)		Actual Collection Points (by calendar year)	Percentage Increase
Year 1 (July 1, 2010 – June 30, 2011)	200	2010	100	96	n/a
Year 2 (July 1, 2011 – June 30, 2012)	240	2011	220	109	14%
Year 3 (July 1, 2012 – June 30, 2013)	288	2012	264	199	83%
Year 4 (July 1, 2013 – June 30, 2014)	346	2013	317	319	60%
Year 5 (July 1, 2014 – June 30, 2015)	415	2014	381	328*	3%

\*Total Collection Locations as of October 1, 2014

Whereas the original Plan aimed for 20% growth year over year, the targets presented in this revised Plan for 2015-2020 aim for more modest growth of 5% in 2015 and 2016, and then reaching a plateau in 2017, after which point recruitment efforts will be focused on ensuring that coverage remains consistent and any collection locations that opt out of the program (for example, businesses that close down) are replaced. Growth in 2015 and 2016 will be targeted to areas that are currently under-serviced by the program. This revised strategy will allow the program to target resources to focused outreach in areas where recruitment has been more difficult, and to drive more resources towards increasing collection results. These targets are as follows:

Year	Target Number of Collection Locations	Percent Increase from Previous Year
2015*	400	5%
2016	420	5%
2017	420	0%
2018	420	0%
2019	420	0%
2020	420	0%

\*although part of 2015 is included in the original Plan (which extends to June 30, 2015) the calendar year results for 2015 are included in this plan for clarity and continuity

One additional change to the Collection Location targets is that, as per discussions with the BC Ministry of the Environment, they will be re-aligned to the calendar year rather than the program year, in order to facilitate reporting.

### 3.2 Consumer Awareness

As described above, the Switch the ‘Stat program is primarily focused on the HVAC and Plumbing industry, rather than the general public. However, 15% of all thermostats collected have come from Regional and Municipal channels, therefore there is a need for some public awareness of the program.

In November, 2013 a joint Consumer Awareness Benchmarking Study was conducted on behalf of the members of the Stewardship Agencies of British Columbia (SABC). Among those surveyed, awareness of the program was 24%. Only 21% of participants reported ever having had thermostats that needed disposal, and of those that had used the program, both convenience and trust were rated well, at 72% and 88% respectively. While the overall awareness level is lower than that reported for the larger, consumer-facing programs, it is an appropriate level for an industry-focused program like Switch the ‘Stat. The Program will continue to engage in targeted and cost-effective consumer outreach initiatives and will participate in future consumer awareness studies with SABC to monitor awareness levels. One key joint initiative is the development of a consumer-facing brand for SABC members; the name BC Recycles has been adopted, a logo has been created, and a consumer-facing website is in development. This

website will integrate the RCBC Recyclepedia, and function as a hub of consumer-facing information about the various BC EPR programs.

For Switch the ‘Stat, the messaging that is used for consumer awareness outreach focuses on why old thermostats need to be recycled (in particular because of the risks associated with the mercury found in many older thermostats), who funds the program (and the fact that it is completely free to participate), disposal options (contractor channel, drop-off locations, send-back), and program contact information for more information. This information is communicated through the following resources and channels:

- Program website —presents a comprehensive overview of the program, with regular updates and an up-to-date list of disposal locations (i.e., participating contractors and wholesalers, drop-off locations and send-back options).
- Printed brochures — consumer friendly brochures are made available at Regional District/Municipal collection locations (sent out upon registration, or available upon request).
- BC Stewards/BC Recycles — information about the program currently appears on the BC Stewards website (<http://bcstewards.com/>), and will appear on the new BC Recycles site when it goes live.
- Advertising via the Recycling Council of British Columbia’s Recyclepedia and hotline — information about what is collected through the program and locations of drop-off locations are made available through these RCBC services.
- Regional District/Municipal waste reduction/recycling calendars — Switch the ‘Stat ads will be purchased in Regional District and Municipal waste reduction or community recycling calendars as appropriate to increase consumer awareness of the program.

In addition, manufacturers currently provide information on the packaging of new thermostats sold into North America to inform the customer that their old thermostat may contain mercury, along with a website ([www.thermostat-recycle.org](http://www.thermostat-recycle.org)) and a toll-free phone number so that customers can find out where and how to properly dispose of it in the United States. This Plan will continue to utilize this existing US infrastructure which includes a link to the Switch the ‘Stat program website on the US website (<http://www.thermostat-recycle.org/resources/faqs>).

**Appendix D** provides examples of the existing Switch the ‘Stat program resources that are focused on Consumer Awareness.

The following metrics will be used as benchmarks to measure the effectiveness of the communications tools listed above:

- BC Recycles website — information will be posted on the new BC recycles website when it goes live (scheduled for 2015).
- Advertising via the Recycling Council of British Columbia’s website and hotline — information about the Switch the ‘Stat program will be supplied to RCBC on an ongoing basis for use on their website and hotline.
- Advertising in waste reduction/community calendars for regional districts — key regions will be targeted based on coverage needs.

### 3.3 Industry Awareness

Because Switch the 'Stat is industry focused, rather than consumer-facing, awareness efforts will primarily target contractors/wholesalers rather than consumers. To supplement the consumer facing initiatives described above, industry-facing materials are also available. The messaging for these materials is similar to the consumer-facing information, in that it focuses on why old thermostats need to be recycled (in particular because of the risks associated with the mercury found in many older thermostats) and who funds the program, but include more of an emphasis on the fact that it is completely free to participate and describing the ways that contractors or wholesalers can join the program (registering as a participant or a drop-off location, or the option for smaller businesses to visit drop-off locations). Materials also describe what participants receive when they register, and emphasize how easy it is to participate. This information is communicated through the following resources and channels:

- Program website —presents a comprehensive overview of the program, with regular updates and an up-to-date list of disposal locations, as well as simple way to register for the program
- Printed brochures — to be distributed by contractors/wholesalers at locations that sell new thermostats
- Printed posters — to be displayed at participating drop-off locations to advertise to customers that the program is available at that location
- “Proud Participant” stickers — to be displayed at participating drop-off locations to advertise to customers that the program is available at that location, or affixed to trucks that are out in the field to increase program visibility
- Industry communications via newsletters and industry publications to inform the contractors/wholesalers about the program and how to register and participate
- Wholesalers, distributors and manufacturers will promote the program to contractors and the general public via their websites, newsletters, signage, etc.
- Wholesalers and distributors provide on-site promotion and education for the small, one-person contractors via signage and printed information (posters, brochures and stickers), as well as allowing the contractors to use their collection containers if they want to (instead of acquiring their own collection pail)
- This Plan will continue to link to other initiatives and programs that HRAI is part of, such as the Refrigerant Management Canada (RMC) program and outreach to the Building Owners and Managers Association (BOMA) and Green Building Council to target the IC&I sector

Appendix E provides examples of the existing Switch the 'Stat program resources that are focused on Industry Awareness.

The following metrics will be used as benchmarks to measure the effectiveness of the communications tools listed above:

- Program website — the program website will be updated monthly with collection results and new program participants and drop-off locations.
- Printed brochures — a minimum of 500 brochures will be printed and distributed on an annual basis.
- Printed posters — posters will be distributed to all new drop-off locations to be displayed on site.

- Industry-facing advertising — a minimum of 5 ads per year will target industry (for example, through industry associations, trade publications, e-blasts, etc)

### 3.4 Collection Targets

In developing the targets for the original plan, there was limited information available specific to the British Columbia context, therefore the targets were based on research conducted in Ontario, and adjusted on a per capita basis for BC. The original per capita targets were also adjusted upward, to ensure the program set ambitious collection targets in its first years. Based on the actual collection results in ON, the targets were appropriate for that context; however, the actual collection results in BC for years 1–4 have suggested that these targets were not appropriate for this province. The table below provides the original five-year collection targets, and the actual collection results to date:

Year	Estimated Number of Mercury-Containing Thermostats Available for Collection	Number of Thermostats to be Collected	% Capture	Actual Collection Results
Year 1 (July 2010–June 2011)	13,500	3,375	25%	1,755
Year 2 (July 2011–June 2012)	13,500	5,400	40%	2,505
Year 3 (July 2012–June 2013)	13,500	7,425	55%	2,841
Year 4 (July 2013–June 2014)	13,500	8,775	65%	3,918
Year 5 (July 2014–June 2015)	13,500	10,125	75%	572*

\*collection results as of October 1, 2014

In light of these findings, additional research has been conducted to support the development of revised Collection targets for the 2015-2020 Plan. The goals of the research were to seek more accurate sources of data, and consult with industry members to validate findings; this research is as follows:

- Analysis of central air conditioner (CAC) and furnace sales for 2009-2013 for BC and ON;
- Analysis of thermostat sales for 2009-2013 for BC, ON, and Canada;
- Annual participant survey (10% response rate in BC);
- Non-participant survey (focused on un-registered TECA members) (13% response rate); and,
- In-depth interviews with HRAI members (11 interviews).

This research has determined that simply adjusting the ON targets to account for the population of BC did not result in accurate targets, for the following reasons:

- The original modeling was overly aggressive and used an inflated ratio for the per capita calculation, and assumed that the BC targets would be approximately 60% of the ON targets
- An analysis of the CAC and furnace sales (which were the foundation for the original ON targets) shows that sales into BC are only approximately 16% of those in ON
- An analysis of the available thermostat sales data (which was not available in the development of the original ON or BC plans) shows that sales into the BC market are approximately 12% of those into ON
- Anecdotal evidence from surveys suggests that many older homes would have had electric heat that did not use mercury-containing thermostats

Based on this evidence, the total available thermostats available for collection and the collection targets must both be adjusted. Based on the available thermostat sales data, there are approximately 25,858 thermostats sold into the BC market each year. To determine the retrofit market, the CAC and furnace sales were analyzed. The research conducted for the original plan development indicated that, according to industry sources, a reasonable assumption regarding the incidence of thermostat replacement is that half of the replacements occur when both the CAC and furnace are replaced, and the other half occurs when only one of the two (either the CAC or the furnace) are replaced. The retrofit market for central air conditioners was determined to be 35% of sales, and for furnaces it represents 53% of sales; to estimate the percentage of thermostats going to retrofits rather than new builds, an average of 44% will be used. Therefore, an average of approximately 11,378 thermostat replacements are occurring each year BC.

The next step is to determine the fraction of these that would be likely to contain mercury. The surveys that were conducted in preparation for the writing of this plan asked contractors what percentage of the programmable thermostats they installed were replacing mercury thermostats. Responses varied so widely that no conclusions could be drawn from these responses. However, Statistics Canada's Households and the Environment Survey (2011) provides an alternate, and perhaps more statistically significant source of information. According to this survey, 92.5% of households had a thermostat, and of those, 53.4% were programmable and 43.5% were non-programmable. Therefore, approximately 4,949 of the thermostats that are coming out of service each year are non-programmable.

The non-programmable thermostat segment is made up of electronic and mechanical categories. While mercury thermostats are part of the mechanical category, not all mechanical thermostats do contain mercury. Because of this, it is difficult to estimate the fraction of non-programmable thermostats that are likely to contain mercury. This is compounded by the fact that manufacturers' transition to all non-mercury thermostats took place over a long period of time, and mercury thermostat sales decreased significantly as more accurate, more efficient all-electronic models became available. The most recent information available to determine the

number of mechanical versus electronic thermostats that make up this non-programmable segment is from 2003, when mercury-containing thermostats were still being sold, and covers the entire North American market. This info is presented in the table below:

Type of Thermostat	Units Sold	Percent of Total Sales
Mechanical	5,180,000	36%
Electronic	9,100,000	64%
Total	14,280,000	

Source: Information provided by Product Stewardship Institute, using Frost & Sullivan 2003 data.

The results of this research have not been reflected in the collection results in BC, where electronic thermostats have accounted for only 5% of all collection, or in the other jurisdictions in which the program operates, where electronic thermostats have accounted also accounted for 5% of total collection. Part of the discrepancy between the Frost & Sullivan numbers and the actual program results can be accounted for by market changes, but part could also be related to lack of awareness that electronic thermostats should also be recycled. However, it is also important to recognize that because mercury-containing thermostats are no longer being manufactured and sold into Canada, the number of these thermostats available for collection will decline as the program matures, and the number of other mechanical and electronic thermostats will increase.

Therefore, in order to set realistic new Collection Targets, the Plan will assume that approximately 80% of thermostats coming out of service each year will be mercury-containing, for a of 3,950 available annually. As with the previous plan, the targets will be based on a percent capture basis, emphasizing modest program growth. As with the collection location targets, the collection targets will also be re-aligned to the calendar year rather than the program year in order to facilitate reporting. The targets for 2015-2020 are outlined in the table below:

Year	Estimated Number of Mercury-Containing Thermostats Available for Collection	Number of Thermostats to be Collected	% Capture
2015	3,950	3,160	80%
2016	3,950	3,357	85%
2017	3,950	3,555	90%
2018	3,950	3,752	95%
2019	3,950	3,950	100%
2020	3,950	3,950	100%

As mercury-containing thermostats are much more damaging to the environment and human health if they are not properly disposed of, targets focus on capture of available mercury-containing thermostats. Other thermostats will also be collected, and those collection totals will be included in all reporting, but collection numbers to date have not been sufficient to necessitate setting collection targets. Further, the program will continue to monitor the ratio of mercury-containing versus electronic thermostats that are collected each year to determine how long there will still be mercury-containing thermostats available for collection.

### **Monitoring**

The quantities collected and diverted as a result of the Plan will be monitored via monthly reporting from the recycler to SI and will include the number of thermostats collected from specific contractors, wholesalers, and regional/municipal channels.

### **Remedial Actions**

If the collection targets are not met, the Plan will focus on scaling-up both consumer and industry awareness initiatives, as well as increasing communication to all collection locations. This communication will emphasize the importance of properly recycling mercury-containing thermostats, as well as education about collection of non-mercury-containing thermostats.

## **4. Program Administration**

### **4.1 Program Financing**

The Plan will continue to be managed and funded by the manufacturers and distributors that sell and/or import thermostats into British Columbia. The manufacturers and distributors pay per unit fees based on return share of the thermostats collected.

### **4.2 Steward Compliance**

SI and HRAI will actively identify and recruit manufacturers and distributors that sell and/or import thermostats into British Columbia who are not participating in the Plan. Techniques to identify these companies will include audits of collected materials and information received from the industry associations and member companies.

Once a company is identified, SI and HRAI will issue communications (letter, email or phone call) to advise the steward of their regulatory obligation to participate in a stewardship program. If the company does not comply, SI and HRAI will issue a letter to the British Columbia Ministry of the Environment advising of the circumstances and requesting investigation and appropriate enforcement.

### **4.3 Dispute Resolution**

SI will contract with all suppliers and service providers by the use of formal contracts and agreements. Any disputes arising will be resolved using appropriate legal procedures.

### **4.4 Cooperation with Other Thermostat Collection Programs**

HRAI is committed to working with any other agencies that operate approved stewardship programs for thermostat collection in British Columbia to ensure the programs operate cooperatively and as effectively as possible.

## 5. Stakeholder Consultation

This section will be completed after the public consultation process has been completed.

# Appendices

## Appendix A: List of Manufacturers and Distributors Responsible for Selling Thermostats into British Columbia

- Bard Manufacturing Corporation
- Carrier Canada Ltd.
- Chromalox
- Climate Master, Inc.
- Emerson Electric Corporation/White-Rodgers
- Empire Comfort Systems
- General Electric Corporation
- Honeywell Corporation
- ITT Corporation
- Invensys Controls
- Johnson Controls Inc.
- Johnson Controls-UPS Division (York)
- Lennox International Inc.
- Lux Products
- McQuay International
- NORDYNE/Nordyne Corporation
- Rheem Manufacturing Company
- Schneider Electric
- Sears Holdings
- Trane Commercial Systems
- TPI Corporation

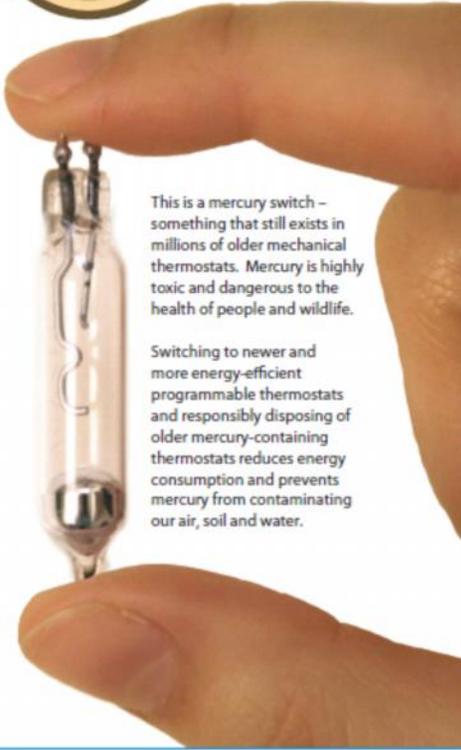
## **Appendix B: List of Thermostats Manufacturers and Distributors Signed-on to Participate in the Stewardship Plan**

### **Registered Thermostat Manufacturers and Distributors:**

- Bard Manufacturing Company Inc.
- Carrier Canada Ltd.
- Climatemaster Inc.
- Emerson/White Rodgers
- Empire Comfort Systems Inc.
- Honeywell
- International Comfort Products
- ITT Corporation
- Johnson Controls
- Lennox International Inc.
- Lux Products Corporation
- McQuay International
- Nordyne
- PSG Controls Inc.
- Schneider Electric
- Sears Canada Inc.
- Tekmar Control Systems Ltd.
- TPI Corporation
- Thomas & Betts Ltd.
- Uponor Ltd.
- Waterfurnace International, Inc.

# Appendix C: Consumer-facing Outreach Materials

## Consumer-facing Brochure





### MAKE THE RIGHT SWITCH!

This is a mercury switch – something that still exists in millions of older mechanical thermostats. Mercury is highly toxic and dangerous to the health of people and wildlife.

Switching to newer and more energy-efficient programmable thermostats and responsibly disposing of older mercury-containing thermostats reduces energy consumption and prevents mercury from contaminating our air, soil and water.

### Now the choice is yours!

If you dispose of your old thermostat with your household waste, you are sending mercury to landfill.



Old mechanical thermostats have one to four switches, each containing approximately 2.5 grams of mercury.



Mercury is a potent neurotoxin. It only takes one gram of mercury to contaminate an eight-hectare lake to the point where the fish are not edible for a full year.

If you participate in **Switch the 'Stat**, you'll conserve energy, save money, and prevent mercury releases to the environment.




**Step 1:** With the help of your participating **Switch the 'Stat** contractor, switch to a newer, more energy-efficient programmable thermostat.



**Step 2:** Responsibly dispose of your old mercury-containing thermostat through your local **Switch the 'Stat** contractor. A recycling facility will dismantle the thermostat, recycle the parts, and prevent the mercury from contaminating air, soil and water.

For more information, visit [www.switchthestat.ca](http://www.switchthestat.ca), e-mail [switchthestat@summerhillgroup.ca](mailto:switchthestat@summerhillgroup.ca) or call 416-922-2448.

The Switch the 'Stat program is administered by HRAI

Supported by:



Canadian Partnership of Heating & Cooling

Delivered by:



FSC logo here



## Appendix D: Industry-facing Outreach Materials

### Industry-facing Brochure

Front:

**SWITCH THE 'STAT**

**EASY. SAFE. FREE.**  
THERMOSTAT RECYCLING

Recycling with Switch the 'Stat is safer for you and the environment.

We recycle all components of a thermostat: plastic, metal, electronics, and mercury (which is particularly hazardous).

**DO YOUR PART AND JOIN THE MORE THAN 1,300 CONTRACTORS ALREADY PARTICIPATING IN THE PROGRAM!**

Back:

**SWITCH THE 'STAT**

Mercury is a potent neurotoxin. It only takes one gram of mercury to contaminate an eight hectare lake (about the size of 1.5 Olympic sized swimming pools) to the point where the fish are inedible for an entire year. Each thermostat contains 2.5-10 grams of mercury!

Let us take care of them for you in three easy steps:

- 1. SIGN UP**
- 2. DROP 'STATS IN THE SAFETY PAIL**
- 3. SEND THE PAIL BACK**  
(AND WE WILL SEND YOU A FREE REPLACEMENT PAIL)

**FOR MORE INFORMATION**  
(416) 922-2448 ext. 232  
switchthestat.ca

Administered by:



Supported by:



Delivered by:



Drop-off Poster

The poster features a yellow background with a dark grey horizontal band. On the left, a circular logo contains the text 'SWITCH THE STAT' with a sunburst graphic. To the right of the logo, the text 'EASY. SAFE. FREE. THERMOSTAT RECYCLING' is displayed in white. Below this, a blue banner with a white arrow shape contains the text 'DROP OFF LOCATION'. The background of the lower half shows a close-up of a thermostat dial. A red starburst graphic contains the text '1,300+ CONTRACTORS ALREADY PARTICIPATING ACROSS CANADA' with a small yellow maple leaf icon. At the bottom, a dark red banner contains contact information.

**SWITCH THE STAT**

**EASY. SAFE. FREE.**  
THERMOSTAT RECYCLING

**DROP OFF**  
LOCATION

- BRING US YOUR FULLY-INTACT THERMOSTATS FOR SAFE RECYCLING
- WE RECYCLE ALL COMPONENTS, INCLUDING HAZARDOUS MERCURY
- SHOW YOUR CUSTOMERS YOU ARE DOING YOUR PART TO PROTECT THE ENVIRONMENT!

**1,300+ CONTRACTORS**  
ALREADY PARTICIPATING  
ACROSS CANADA

**FOR MORE INFORMATION**  
(416) 922-2448 ext. 232  
[switchthestat.ca](http://switchthestat.ca)

Administered by:



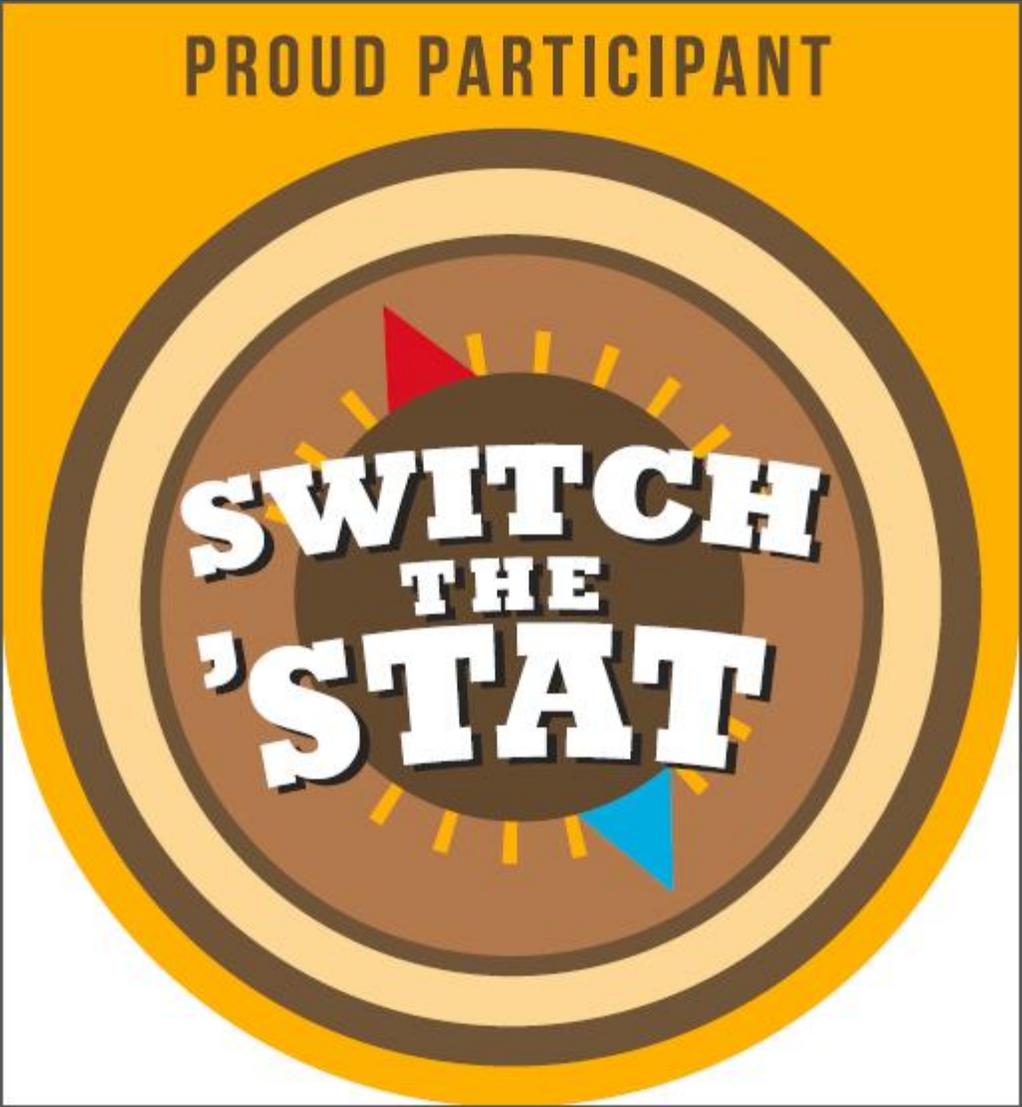
Supported by:



Delivered by:



Proud Participant Sticker



## Appendix E: Summary of Program Performance Measures

Measures	Targets/Goal				
	2015	2016	2017	2018	2019
<b>Collection Location Targets (participation)</b>	400	420	420	420	420
<b>Collection Targets</b>	3,160	3,357	3,555	3,752	3,950
<b>Consumer Awareness</b>	<ul style="list-style-type: none"> <li>• Maintain or increase consumer awareness levels from 2013 SABC benchmarking survey (24%)</li> <li>• BC Recycles website — information will be posted on the new BC recycles website when it goes live (scheduled for 2015).</li> <li>• Advertising via the Recycling Council of British Columbia’s website and hotline — information about the Switch the ‘Stat program will be supplied to RCBC on an ongoing basis for use on their website and hotline.</li> <li>• Advertising in waste reduction/community calendars for regional districts — key regions will be targeted based on coverage needs.</li> </ul>				
<b>Industry Awareness</b>	<ul style="list-style-type: none"> <li>• Program website — the program website will be updated monthly with collection results and new program participants and drop-off locations.</li> <li>• Printed brochures — a minimum of 500 brochures will be printed and distributed on an annual basis.</li> <li>• Printed posters — posters will be distributed to all new drop-off locations to be displayed on site.</li> <li>• Industry-facing advertising — a minimum of 5 ads per year will target industry (for example, through industry associations, trade publications, e-blasts, etc)</li> </ul>				