

# HEAT PUMP PROGRAM - AIR SOURCE

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Program Guide



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## Program Guide

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This publication is subject to change.  
Please visit [efficiencyMB.ca/heatpump](http://efficiencyMB.ca/heatpump) for the most current information.

# PROGRAM OVERVIEW

Efficiency Manitoba's Heat Pump Program provides financial rebates to customers who replace an existing heating system with an air source heat pump (ASHP).

## Financial Rebates

Customers must have their project approved by Efficiency Manitoba prior to purchasing and installing an ASHP system.

**Customers who have started a system installation without written approval from Efficiency Manitoba won't be eligible for financial rebates.**

## System Installation Rebate

The rebate for installing an ASHP is calculated as being the lesser of:

1. Per square foot of floor area heated by an ASHP system:

	ASHP	ccASHP*
<b>Ductless</b>	\$0.65/sq.ft.	\$1.00/sq.ft.
<b>Centrally Ducted</b>	\$1.30/sq.ft.	\$1.65/sq.ft.

OR

2. Per MBH (1,000 BTU/hour) of installed ASHP space heating capacity:

	ASHP	ccASHP
<b>Ductless</b>	\$20/MBH	\$30/MBH
<b>Centrally Ducted</b>	\$40/MBH	\$50/MBH

OR

3. Per MBH (1,000 BTU/hour) of the building/home's eligible base transmission and infiltration heating load:

	ASHP	ccASHP
<b>Ductless</b>	\$20/MBH	\$30/MBH
<b>Centrally Ducted</b>	\$40/MBH	\$50/MBH

\*cold climate Air Source Heat Pump

## Program Eligibility

Existing homes and buildings are eligible for rebates if they're currently served through a Manitoba Hydro electric rate class and aren't currently being heated by a heat pump system.

New construction projects aren't eligible for Heat Pump Program rebates; however, they may be eligible for energy efficiency rebates through the New Buildings Program ([efficiencyMB.ca/newbuildings](http://efficiencyMB.ca/newbuildings)) or New Homes Program ([efficiencyMB.ca/newhomes](http://efficiencyMB.ca/newhomes)).

Homes that are currently heated with natural gas, propane, fuel oil, or coal may be eligible for rebates.

Commercial buildings currently heated by natural gas may be eligible for rebates.



# HOW TO FIND AN AIR SOURCE HEAT PUMP INDUSTRY PROFESSIONAL

## Find an Air Source Heat Pump Contractor/Installer

Your contractor/installer must be an Efficiency Manitoba (EM) registered ASHP supplier. View the **EM registered supplier list** to find an ASHP contractor/installer in your area. If the ASHP contractor/installer you would like to work with is not registered with EM they can participate; however they must first join our **supplier network**.

We recommend getting at least three quotes and checking references before making your choice. Be sure to compare the proposed heat pump setup of each installer; pay attention to the heat pump capacity compared to the square footage of your home. Your installer should perform a heat loss calculation to ensure the system is the correct size for your home.



# INSTALLER & DESIGNER PROJECT REQUIREMENTS

## Installer Requirements

- The installer must employ a refrigeration mechanic licensed in Manitoba.
- The installer must be an EM registered ASHP supplier.

## Building Code Compliance

- All building renovation projects including heating system replacements that are required to comply with the Manitoba Building Code (MBC) must be designed and constructed to do so.

## Professional Designer Requirement – Part 3 Buildings

- Professional designers (architects and structural, mechanical and electrical engineers) are required on most building renovation and heating system retrofit projects. For Part 3 buildings, an engineer-sealed drawing of the building mechanical system must be provided upon request. Exemption from this requirement can only be granted by the local authority having jurisdiction.
- If the local authority having jurisdiction has exempted your project of the professional designer requirement, a copy of official documentation from the authority to prove this must be submitted along with your Heat Pump Program application. The documentation from the code authority having jurisdiction must indicate the reason for the exemption.
- Some common reasons that a building project may be exempt from the professional designer requirement may include (but are not limited to):
  - The National Farm Building Code of Canada applies
  - The building is not an Assembly occupancy
  - The building area doesn't exceed 6,450 square feet
  - The building height doesn't exceed three storeys

- The alteration to the existing building systems is judged by the authority having jurisdiction to not significantly effect the integrity of any one of the following:
  - Fire safety systems
  - Fire compartments and fire separations
  - Structural systems
  - Environmental separation systems including building envelope
  - Heating, ventilation, and air conditioning systems
  - Usable floor area through the addition of a mezzanine, in-fill, or similar element
- The professional designers shall be responsible for:
  - Preparing signed and sealed plans of the construction work
  - Reviewing building construction or alteration to determine conformity with the design
  - Reviewing all shop drawings and related documents to determine conformity with the design
  - Reviewing the workmanship, materials, and material tests during the construction process

The above interpretation is an approximate summarization of the MBC. For a detailed description, refer to the MBC Division C amendments to Section 2.2.2.3 through 2.2.7.4 (1) of The National Building Code of Canada (2010).

**Note:** If the building is not covered under Part 3 of the Manitoba Building Code, be sure to contact the local authority having jurisdiction to ensure adherence to the applicable code.



# REBATE APPLICATION PROCESS

These steps outline how to qualify and apply for financial rebates for ASHP projects:

## Step 1: Review the Program Eligibility Criteria

The customer reviews the program eligibility criteria and the terms and conditions. These can be found in this program guide and at [efficiencyMB.ca/heatpump](http://efficiencyMB.ca/heatpump).

## Step 2: Apply for the Rebate

The customer’s contractor submits the following to Efficiency Manitoba:

- The completed Heat Pump Program application
- A copy of the detailed building heat loss calculation, including a breakdown of the unoccupied base transmission and infiltration loads
- A copy of the specifications for the equipment being installed

Once the customer submits the signed application, Efficiency Manitoba reviews the application for eligibility and to calculate the conditional rebate.

Heat Pump Program applications and documents can be submitted by an EM registered contractor/installer online at [efficiencyMB.ca/ashpapply](http://efficiencyMB.ca/ashpapply).

## Step 3: Have the Heat Pump Installed

After written approval is received by email, the customer can purchase and begin installation of their heat pump system.

### Permits:

The customer’s contractor is responsible for acquiring all relevant permits and licences before starting the installation.

These may include (but are not limited to):

- Electrical permit (Certificate of Electrical Approval)
- Occupancy Certificate (if required)

Valid copies of required permits must be provided to Efficiency Manitoba before the rebate is paid.



## Step 4: Finish the Project & Submit Completion Documents

Once the heat pump system is installed, the customer and/or installer/engineer performs an inspection and completes the Completion Declaration. This declaration certifies that all the heat pump equipment has been installed and is fully operational. Following the customer inspection, submit the following to Efficiency Manitoba:

1. Installer/vendor Completion Declaration;
2. Customer Completion Declaration (customer to complete);
3. Copies of paid project invoices showing equipment pricing, make, and model number (excluding labour, financing charges, delivery fees, taxes, and warranty fees).
4. Copy of approved electrical permit;
5. Copy of Occupancy Certificate (if requested);
6. Valid copies of any other required permits; and
7. Photos of installed equipment (if requested).

All documentation requested above must be completed in full and sent to Efficiency Manitoba before final approval can be issued.

## Step 5: Receive Your Rebate

After Efficiency Manitoba receives the documentation requested in step 4, an Efficiency Manitoba representative may perform a site visit to confirm the make and model of the equipment installed.

The conditional rebate may be increased or decreased if the actual system, installed equipment, or building design have changed. The final rebate amount will then be calculated and approved. The rebate is then processed and sent to the payee specified by the customer.



# HEAT PUMP TERMS & CONDITIONS

## Program Eligibility Criteria

- The program applicant must currently be served through a Manitoba Hydro electric rate class.
- The Program applies only to renovation and retrofit projects where the heat pump is replacing another type of heating system. The sole exception is new construction farm buildings which must meet specified building envelope criteria to be eligible for rebates.
- Rebates are not available for projects in progress or already completed.
- Only one application per building will be accepted.
- Buildings must be heated for the entire heating season (September to May) and use the installed heat pump system as the primary heating source.
- The building must be occupied 12 months per year. Seasonal buildings are not eligible.
- An ASHP must be sized to provide between 70% to 105% of the base building transmission and infiltration heating loads. Additional installed system capacity won't be applied when calculating the rebate.
- Products, equipment, and their applications and installations must be new and meet or exceed energy efficiency regulatory requirements in Manitoba.
- Customers applying for financial assistance from any federal, provincial, Manitoba Hydro, or other program must disclose this information to Efficiency Manitoba at the time of application. The maximum payable from all funding sources cannot exceed the total equipment cost for the project.
- Efficiency Manitoba must be notified in writing of any changes to the building design or ownership that affect the original application before any energy-efficient equipment is installed in order for the changes to be eligible for rebates.
- All rebates are limited to not more than the equipment cost paid for by the customer, including taxes.
- Efficiency Manitoba's decisions relating to equipment or customer eligibility, energy savings potential of the proposed projects, rebate amounts, or other related issues will be final and binding on all parties.

## Equipment Specifications

- Equipment must be listed on the Natural Resources Canada (NRCAN) ASHP and ccASHP eligible product list.
- Indoor and outdoor units must be part of an AHRI matched system.
- COP  $\geq$  1.8 at -15°C (5°F) (at maximum capacity operation).
- Heating capacity maintenance percentage must be  $\geq$  70% (Heating capacity at -15°C (5°F)/Heating capacity at 8.3°C (47°F)).
- Compressor must be of variable capacity with three or more distinct operating speeds, or continuously variable speed.
- Performance rating certified to CSA Standard CAN/CSA-C656-05 with a minimum HSPF of 10.

In order to qualify for a rebate, this entire application must be approved in writing by email from an authorized Efficiency Manitoba Heat Pump Program representative before any portion of the system is purchased or installed.





## Disclaimer

Talk to a qualified contractor to determine if an air source heat pump is right for you.

An ASHP typically has a higher upfront cost than a conventional heating and air conditioning system. Annual operating costs depend on a number of factors, including but not limited to weather, electricity rates, operational behavior of occupants, and system maintenance. An ASHP can help lower operating costs when compared to traditional electric heating.

Correct sizing of an ASHP is important to the efficiency and performance of the system. Some centrally ducted ASHPs may require larger ducts to be installed to allow for proper air flow and system design.

An ASHP becomes less efficient with colder outdoor temperatures. Supplementary heat is required when the outdoor temperature drops below approximately  $-8^{\circ}\text{C}$  for conventional ASHPs and below approximately  $-25^{\circ}\text{C}$  for cold climate air source heat pumps (ccASHPs). When temperatures drop below freezing, ASHPs may periodically need to defrost their outdoor coils, further reducing their efficiency. Consult your ASHP owner's manual for more information.



# APPENDIX 1 – AIR SOURCE HEAT PUMP PROJECT REQUIREMENTS

**For Review by Mechanical Engineer, Architect, or System Designer**

## 1.0 Project Eligibility

Heat pump systems sized to provide from 70% to 105% of the base building transmission and infiltration heating loads only, will be eligible for an installation rebate. Eligible heating systems must be designed to operate a minimum of 1,500 full load hours in one heating season (September to May).

Efficiency Manitoba reserves the right to reject applications for installations which are deemed to be a significant risk of not producing predictable, sustainable savings or which would not meet Efficiency Manitoba's energy efficiency objectives.

Please review the detailed Heat Pump Program eligibility criteria.

## 2.0 New Construction Project Eligibility

### 2.1 New Construction projects

New construction projects may be eligible for a rebate through the New Buildings Program or New Homes Program. For more information about new construction rebates, visit: [efficiencyMB.ca/newhomes](http://efficiencyMB.ca/newhomes); or [efficiencyMB.ca/newbuildings](http://efficiencyMB.ca/newbuildings)

New farm buildings, which are exempt from the Manitoba Building Code, may be eligible for rebates if they are designed to meet or exceed Efficiency Manitoba's building envelope requirements.

### 2.2 New additions to existing buildings

An addition to an existing building receiving additional heating/cooling equipment must go through the New Buildings Program or New Homes Program. An addition to an

existing building, where existing heating/cooling infrastructure is being upgraded to heat pumps and expanded to meet the heating/cooling requirements of the new and existing buildings, may be eligible for financial rebates through the Heat Pumps Program for the existing portion of the building only.

## 3.0 Heating Loads Eligible for Rebates

The Heat Pump Program rebates are calculated based on the eligible design heating load, or equipment heating capacity (whichever is less), but are limited to the per square foot of floor area heated amount as identified in the system installation section of this program guide. The section below outlines which loads are eligible for rebates.

### 3.1 Envelope unoccupied base heating loads

Heat pump systems sized to provide up to 100% of the base building unoccupied transmission and infiltration heating loads will be eligible for a rebate. The maximum infiltration allowance is 0.3 air changes per hour.

### 3.2 Continuous ventilation base heating loads

Ventilation air heating with air-to-air heat recovery is considered by the program as base case. Continuous ventilation base loads incremental to the loads that the heat recovery system can service will be considered on an individual basis.

### 3.3 Non-continuous or intermittent ventilation and infiltration heating loads

Non-continuous and intermittent heating loads (mechanical or passive ventilation and door openings) aren't eligible for rebate.



## 4.0 Heating & Cooling Load Calculations

### 4.1 Manual or spreadsheet methods

Manual or spreadsheet (Excel or equal) methods in accordance with methods found in the ASHRAE Handbooks, HRAI Digest (technical manuals), or CSA F280 for residential and small commercial buildings are acceptable.

### 4.2 Software methods

Commercially-available building energy modelling software or heat load calculation software which use ASHRAE or HRAI methods are acceptable.

### 4.3 Technical review

Results of the heating load calculations obtained through manual, spreadsheet, or software methods will be reviewed by Efficiency Manitoba technical staff to ensure they're acceptable, realistic, and meet program requirements. Copies of model or spreadsheet files must be provided for review upon request.

## 5.0 Required Supporting Documentation

A summary report showing the heat loads broken down into the major categories of conduction (transmission), infiltration (air leakage), and ventilation (if applicable) for each major component of the building envelope including windows, above grade walls, below grade walls, roof, and floors is required. A complete copy of the detailed heat loss calculation report must be provided on request.

## 6.0 Heat Pump Coefficient of Performance (COP)

Savings claims should be based on detailed engineering calculations and estimates of the system's COP at design conditions and over several heating seasons. The seasonal heating COP is defined as the total output energy over a heating season divided by the total input energy over a heating season at average operating conditions that could be expected over an expected 20-year operating life. The CSA C13256 standard for rating heat pump equipment performance only requires inclusion of the portion of the fan and pump power required to overcome internal resistance. The additional fan and pump power and energy required to overcome all external pressure drops must therefore be added to the system loads. Performance ratings also don't account for cycling losses and imperfect field operating conditions and maintenance practices. Not all equipment is independently tested and certified.

Efficiency Manitoba has found the most important factors affecting the long term performance of the heat pump system is the proper design, installation, and maintenance of the systems. The location of the ASHP needs to be carefully considered to ensure that proper drainage and protection from the elements are available. These factors are generally unknown, so conservative performance estimates are justified.


Due to the many factors that affect the actual system efficiency, Efficiency Manitoba expects that the average long term design condition COP's and seasonal COP's for ASHP systems installed and operating in Manitoba fall between 1.2 (for an ASHP) and 1.5 (for a ccASHP), depending on the defrost cycle and auxiliary heating energy consumed by the system. Performance claims exceeding this range won't be endorsed by Efficiency Manitoba.



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