Spuckler, Amanda (DLI)

From: McCullough, Pat (CI-StPaul) <pat.mccullough@ci.stpaul.mn.us>
Sent: Wednesday, September 21, 2022 10:38 AM
To: RULES, DLI (DLI)
Subject: FW: Rulemaking Notice, Minnesota Rules, chapter 1323

ASHRAE 90.1
This document does not work for the real workers such as PM's, field installers, examiners. it is very unclear and difficult to understand what applies and doesn't.
Can we get something more basic with do's and don'ts can and cant's along the HVAC equipment efficiency's, BTU's, GPM's, gallons per flush and watts, volts, amps and lumens.
We need something tailored more towards our geographical area and needs and to promotes good, sound, energy efficient buildings.
This can be done with good thought and the use of former experiences and practice. that have proven to provided energy efficient buildings that are sustainable and maintains durability.

SAINT PAUL
MINNESOTA

Patrick McCullough
Senior Mechanical Inspector - Pipefitter
Department of Safety and Inspections
375 Jackson St. Suite 220
Saint Paul, MN 55101
P: 651-266-9015
pat.mccullough@ci.stpaul.mn.us

Spuckler, Amanda (DLI)

From: Reinsberg, Gary (CI-StPaul) <gary.reinsberg@ci.stpaul.mn.us>
Sent: Tuesday, September 20, 2022 11:09 AM
To: RULES, DLI (DLI)
Subject: 2019 ASHREA 90.1 MN rules 1323

Please do not adopt this or any other ASHREA document

ASHRAE 90.1 in my opinion is an engineering manual on what is required and how to design buildings and HVAC systems along with low water use fixtures and low electrical energy use.
This document is not for the actual users such as project estimators/managers, installers, inspectors and frankly it is so confusing and difficult to understand
of what applies and doesn't not to say all of the exceptions that may be used.
We need something more simplistic with dos and don'ts can and cants along the HVAC equipment efficiency's, BTU's, GPM's, gallons per flush and watts, volts, amps and lumens.
We need something tailored more towards our geographical area and needs and to promotes good, sound, energy efficient buildings homes and the integral appliances and fixtures for them.
I believe we can achieve this with good thought and the use of past experiences and practice that have proven to provided energy efficient buildings that are sustainable and maintains durability.

Thank you

Spuckler, Amanda (DLI)

From: Salute, Mario (CI-StPaul) <Mario.Salute@ci.stpaul.mn.us>
Sent: Wednesday, September 21, 2022 7:47 AM
To: RULES, DLI (DLI)
Subject: ASHRAE 90.1

To whom it may concern

I think that ASHRAE 90.1 is a document that is designed for engineers. It is not user friendly at all for anyone else in the design or installation process. It can be extremely confusing and lead to errors in design, installation and inspection of HVAC systems. I think that everyone would benefit from a change to something that is aimed more at the installer and inspector. This would lead to safer, less confusing installation and inspection. I believe this could be achieved by including people that have been working in the industry and are familiar with what changes need to be made to insure safety and proper design and installation.

Regards

SAINT PAUL
MINNESOTA

Mario Salute
Sheet Metal Inspector
Department of safety and inspections
375 Jackson Street Suite 220
Saint Paul, MN 55102
P: 651-266-9063
Email: mario.salute@ci.stpaul.mn.us

Spuckler, Amanda (DLI)

From: Scholl, Charles (CI-StPaul) <Charles.Scholl@ci.stpaul.mn.us>
Sent: Wednesday, September 21, 2022 8:38 AM
To: RULES, DLI (DLI)
Cc: Reinsberg, Gary (CI-StPaul)
Subject: ASHRAE 90.1

To whom it may concern,

I am writing to voice my opposition to:

The Minnesota Department of Labor and Industry intends to adopt permanent rules governing the adoption *ANSI/ASHRAE/IES Standard 90.1-2019 Energy Standard for Buildings Except Low-Rise Residential Buildings*, Minnesota Rules, chapter 1323.

This document is for engineers to design, it is not an installation document which is what it needs to be.

Minnesota Codes for installers and inspectors need to be user friendly documents, not engineering documents. In order for all parties to achieve the desired effect, there needs to be clear, concise and simple code documents for installers and inspectors to achieve the desired results. ASHRAE documents are engineering documents and, as such, are not user friendly, nor are they clear, concise and simple.

ASHRAE 154 is another document that replaced clear and concise code with engineering design formulas instead of installation code requirements that were also clear, concise and simple with little ambiguity.

In my opinion, putting ASHRAE documents into code makes it unduly difficult for installers and inspectors to ensure the minimum intent is achieved.

Please, please, please do not use ASHRAE.

Thank you.

Regards,

SAINT PAUL
MINNESOTA

Charles Scholl
Sheet Metal Inspector
Department of safety and inspections
375 Jackson Street Suite 220
Saint Paul, MN 55102
P: 651-266-9069
Email: charles.scholl@ci.stpaul.mn.us

DSI's Mission: "To preserve and improve the quality of life in Saint Paul by protecting and promoting public health and safety for all."

Spuckler, Amanda (DLI)

From: Wiskur, Chris (CI-StPaul) <Chris.Wiskur@ci.stpaul.mn.us>
Sent: Friday, September 23, 2022 6:40 AM
To: RULES, DLI (DLI)
Subject: ASHRAE 90.1

To whom it may concern,

My experience as a warm air/HVAC inspector and a sheet metal work with over 20 years as a sheet metal foreman, working with the ASHRAE 90.1 standards is very confusing.
I think that ASHRAE 90.1 has been designed as a document for engineers and is not user friendly for the intended user such as designers, installers and inspectors. I feel that the ASHRAE 90.1 standard should be removed from the body of the code. I feel that some of the charts and tables that are helpful to the installers and inspectors should stay.
Thank you,

SAINT PAUL
MINNESOTA

Chris Wiskur
Sheet Metal Inspector
Department of Safety and Inspections
375 Jackson Street, Suite 300
Saint Paul, MN 55101
P: 651-266-9062
chris.wiskur@ci.stpaul.mn.us

POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

3033 Wilson Blvd., Suite 700
Arlington, VA 22201
703.258.0093
www.polyiso.org

Sent via Electronic Mail

October 17, 2022

Amanda Spuckler
Department of Labor & Industry
443 Lafayette Road N.
St. Paul, MN 55155
dli.rules@state.mn.us

Re: Proposed Rules for the Adoption of ANSI/ASHRAE/IES Standard 90.1-2019, Energy Standard for Buildings Except Low-Rise Residential Buildings

Dear Amanda Spuckler,

The Polyisocyanurate Insulation Manufacturers Association (PIMA) thanks you for the opportunity to comment on Minnesota's review and adoption of the ASHRAE Standard 90.1-2019 as the State's next Commercial Energy Code (Minnesota Rules, chapter 1323). PIMA is concerned with the potential negative impacts to the State's goal of improving existing building energy efficiency created by the proposed amendments to section 5.1.3 of Standard 90.1-2019 under section 1323.0513, subparagraph 3 of the rule.

This proposed amendment would add an exception (Exception 9) to the insulation requirements for roof replacements where there are practical difficulties for compliance caused by existing rooftop features. While we understand the challenges associated with certain roof replacement projects, an overly broad exception overlooks the significant opportunity to improve building performance by adding insulation. As shown in the attached fact sheet, adding roof insulation can reduce whole building energy use by 6-11% in Climate Zone 6. PIMA believes a different approach would preserve both the opportunity for energy savings as well as the intent of the Exception 9.

As our alternative solution, we recommend that the State adopt ASHRAE's Addendum bi to Standard 90.1-2019, which addresses the issue with a different approach.[1] Earlier this year, a large group of experts representing manufacturers, contractors, and envelope consultants with extensive knowledge in building envelope construction and code compliance participated in the development of Addendum bi. PIMA believes this addendum achieves the same goals as the proposed Exception 9, but with the addition of reasonable checks and balances that include requiring documentation of the problematic rooftop features and a proposed design to mitigate deviation from the minimum insulation requirements.

We also believe that compliance in Minnesota would improve with the adoption of provisions that are part of a national model code and which will be enforced in other areas of the country. Although this addendum is new, it will be part of the ASHRAE Standard 90.1-2022, which will be available for adoption soon.

[1] See ASHRAE 90.1-2019 addenda at: https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda/addenda-to-standard-90-1-2019

Thank you for the opportunity to submit these comments. Please contact me should additional information be necessary (jkoscher@pima.org; (703) 224-2289).

Sincerely,

Justin Koscher
President

About PIMA: PIMA is the trade association for North American manufacturers of rigid polyiso foam insulation – a product that is used in most low-slope commercial roofs as well as in commercial and residential walls. Polyiso insulation products and the raw materials used to manufacture polyiso are produced in over 50 manufacturing facilities across North America.

Attachments:

1. ASHRAE 90.1-2019 Addendum bi
2. Roof Replacement Savings Fact Sheet (Climate Zone 6; Rochester, MN)

Attachment #1

ADDENDA

ANSI/ASHRAE/IES Addendum bi to
ANSI/ASHRAE/IES Standard 90.1-2019

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on July 29, 2022, and by the Illuminating Engineering Society on July 26, 2022.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (https://www.ashrae.org/continuous-maintenance).

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 180 Technology Parkway NW, Peachtree Corners, GA 30092. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

 ISSN 1041-2336

www.ansi.org

SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Addendum bi addresses existing building envelope requirements when performing a roof replacement by

- *providing a new definition for "roof replacement" that aligns with the definition and provisions of the 2021 IBC,*
- *clarifying the specific roof replacement requirements in a new Section 5.1.3.1, and*
- *requiring that, where areas of a roof have difficult conditions that may prohibit full, code-compliant levels of insulation from being achieved, roof replacement designs must be provided to the local authority having jurisdiction for review and approval.*

Currently, roof replacements are not specifically defined in the standard. They also are not specifically addressed as an alteration in Section 5.1.3 and are not one of the specific exclusions listed. Thus, replacement roofs must comply with the charging language of Section 5.1.3 as a general requirement for any alteration. This is the case for any alteration not specifically excepted in Section 5.1.3.

This has resulted in existing roofs with challenging flashing conditions to be unable to comply simply with the increased roof insulation levels. Addendum bi provides a pathway for those roofs.

Clarifying the specific requirements for roof replacement serves to minimize marketplace confusion and inconsistency in complying with the general requirements of the standard in Section 5.1.3, particularly regarding roof replacements for roofs with insulation entirely above deck. The inclusion of specific requirements also allows roof replacements to be performed without having to comply with the entirety of Section 5, as currently required by Section 5.1.3.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum bi to Standard 90.1-2019

Modify Section 3.2 as shown (I-P and SI). For more information, please see the reference section at the end of this document. (Note: This definition of "roof replacement" supersedes the one added by Addendum t to Standard 90.1-2019, which can be downloaded at https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda/addenda-to-standard-90-1-2019.)

~~***roof replacement:*** an alteration that includes the removal of all existing layers of the roof assembly materials down to the roof deck and installing a new roof assembly above the roof deck.~~

roof replacement: an *alteration* that includes the removal of all existing layers of the *roof* assembly materials down to the *roof* deck and installing a new *roof* assembly above the *roof* deck.

Modify Section 5.13 as shown (I-P and SI).

5.1.3 Envelope Alterations. *Alterations* to the *building envelope* shall comply with Section 5 for insulation, air leakage, and *fenestration* applicable to those specific portions of the *building* that are being altered.

Exception to 5.1.3: The following *alterations* need not comply with these requirements, provided such *alterations* will not increase the *energy* use of the *building*:

1. Installation of storm windows or glazing panels over existing glazing, provided the storm window or glazing panel contains a low-emissivity coating. However, a low-emissivity coating is not required where the existing glazing already has a low-emissivity coating. Installation is permitted to be either on the inside or outside of the existing glazing.
2. Replacement of glazing in existing sash and frame, provided the *U-factor* and *SHGC* will be equal to or lower than before the glass replacement.
3. *Alterations* to *roof, wall,* or *floor* cavities that are insulated to full depth with insulation having a minimum nominal value of R-3.0/in(0.02/mm).

4. *Alterations* to *walls* and *floors*, where the existing structure is without framing cavities and no new framing cavities are created.
5. *Roof recovering*.
6. *Roof replacements* ~~Removal and replacement of a *roof* membrane~~ where the~~re is~~ existing *roof* insulation is integral to or is located below the *roof* deck.
7. Replacement of existing *doors* that separate a *conditioned space* from the exterior shall not require the installation of a vestibule or revolving *door*, provided that an existing vestibule that separates a *conditioned space* from the exterior shall not be removed.
8. Replacement of existing fenestration, provided that the area of the replacement *fenestration* does not exceed 25% of the total *fenestration* area of an *existing building* and that the *U-factor* and *SHGC* will be equal to or lower than before the fenestration replacement.

5.1.3.1 Roof Replacement for Roofs with Insulation Entirely above Deck. *Roof replacement* for *roofs with insulation entirely above deck* shall comply with Section 5.5.3.1, shall not be required to comply with the requirements of Section 5.4.3, and shall not increase the *energy* use of the *building*. Where the insulation requirements in Section 5.5.3.1.1 cannot be met due to existing *roof* conditions, the *roof replacement* shall be constructed in accordance with approved *construction documents*, which shall include

a. a *roof* inspection report documenting existing *roof* conditions and
b. a *roof* design minimizing deviation from the requirements of Section 5.5.3.1.1.

Informative Note: The proposed *roof* design should be prepared by an approved entity capable of determining whether the design complies with the requirements of Section 5.1.3.1 to the extent practical.

[. . .]

5.5 Prescriptive Building Envelope Compliance Path

[. . .]

5.5.3.1 Roof Insulation

5.5.3.1.1 All *roofs* shall comply with the insulation values specified in Tables 5.5-0 through 5.5-8.

5.5.3.1.2 Roof Curbs. *Skylight* and other *roof* curbs shall be insulated to ~~the level of *roofs* with insulation entirely above deck or~~ not less than R-5.0(0.9)~~, whichever is less~~.

5.5.3.1.3 Joints in Roof Insulation. Joints in the insulation shall be installed in accordance with Section 5.8.1.10.

5.5.3.1.~~1~~4 Roof Solar Reflectance and Thermal Emittance

[. . .]

Exceptions to 5.5.3.1.~~1~~4:

[. . .]

Table 5.5.3.1.~~1~~4 Increased *Roof* Insulation Level

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

ASHRAE · 180 Technology Parkway NW · Peachtree Corners, GA 30092 · www.ashrae.org

About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards, and connect on LinkedIn, Facebook, Twitter, and YouTube.

Visit the ASHRAE Bookstore

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.

IMPORTANT NOTICES ABOUT THIS STANDARD

To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit www.ashrae.org/standards to download them free of charge.

Addenda, errata, and interpretations for ASHRAE Standards and Guidelines are no longer distributed with copies of the Standards and Guidelines. ASHRAE provides these addenda, errata, and interpretations only in electronic form to promote more sustainable use of resources.

7/22

Attachment #2

PIMA
POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

The Benefits of Energy Code-Compliant Roof Replacement

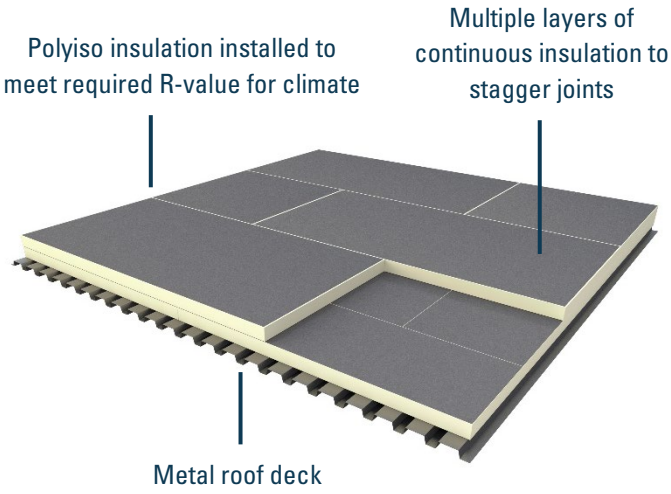
For U.S. Climate Zone 6 – Rochester, MN

Why is Proper Insulation Critical During Building Roof Replacement?

Insulation, whether in a public or commercial building, has a tremendous impact on the energy efficiency, resilience, cost savings, and the comfort of a space. While insulation can be an inconspicuous and sometimes overlooked building feature, it spans the entire surface area of a building's roof and helps to protect other features of building performance.

Roof insulation is particularly important for building performance as the roof comprises the largest single side of most buildings. Recognizing the importance of an energy-efficient building thermal envelope, modern energy codes have set minimum requirements for insulation installed entirely above the roof deck.

For low-sloped roofs with insulation entirely above deck, which is typical of public and commercial buildings, standards require that roof insulation be installed in in multiple layers with staggered joints to reduce air flow through gaps and require that it meets the prescribed minimum R-value requirement for the building's climate zone, space conditioning category, and roof construction type.

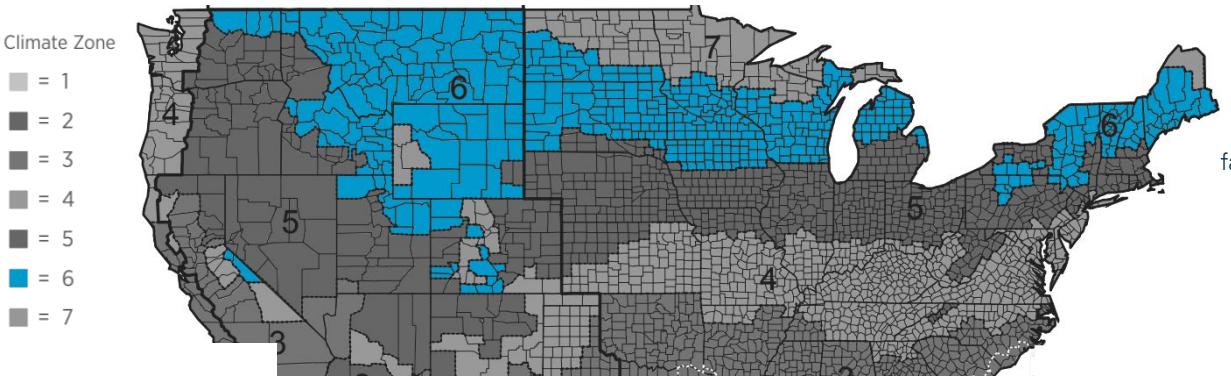


Above: A low-sloped roof assembly that is typical of commercial and public buildings. Diagram depicts multiple layers of polyiso insulation installed with staggered joints to reduce air flow through gaps.

Finding the Right Insulation for U.S. Climate Zone 6

When selecting the proper roof insulation for your building, it is critical to consider the climate zone for your location. Cities located in U.S. Climate Zone 6 are characterized as cold climates, which is defined as region with between 5,400 and 9,000 heating degree days on a 65 degrees Fahrenheit basis.

U.S. Climate Zone 6 - Cold Climates | Example City – Rochester, MN



Insulation for cities located in Climate Zone 6, such as Rochester, MN, must consider factors that regulate cold seasonal temperatures and prevent heat from escaping, which is caused by insufficient insulation and gaps that create air leaks.

PIMA
POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

The Benefits of Energy Code-Compliant Roof Replacement

For U.S. Climate Zone 6 – Rochester, MN

Potential Savings Estimates for Buildings in Climate Zone 6

During a roof replacement, installing additional roof insulation to meet the prescribed minimum R-value established by building energy standards for your region is estimated to yield cost savings and enhance overall performance for each of the building types modeled below. For buildings located in Climate Zone 6, current model energy codes require a minimum R-30 for roof insulation installed entirely above the deck.

Building Type	Annual Total Energy Savings	Cumulative Total Energy Cost Savings	Cumulative Energy Cost Savings per SF	Cumulative Total CO_2e per SF
Primary School	11%	$435,335	$5.88	102.50 lbs.
Retail Store	7%	$83,481	$3.34	58.83 lbs.
Strip Mall	6%	$94,758	$4.21	67.23 lbs.
Small Office	7%	$20,523	$3.73	42.88 lbs.

In cold climate zones where building energy expenditure is often dominated by heating processes, an inefficient thermal building envelope can waste gas and electricity, generating unnecessarily high utility bills.

The estimated payback of using code-compliant levels of insulation at the time of roof replacement can help companies and building owners realize a faster return on investment, while also locking in long-term energy savings at no additional operation and maintenance cost for the life of the investment – typically 30 to 40 years. The result is greater cost savings, improved building performance, and downstream emissions benefits, as well as decreased risk and likelihood of premature maintenance and repairs. When viewed as a long-term investment, code-compliant levels of roof insulation entirely above deck can help companies reach energy reduction goals while cutting costs and carbon emissions in the process. This analysis was prepared by ICF. For more information on insulation and to access the full report, visit www.polyiso.org.

About PIMA

For more than 30 years, the Polyisocyanurate Insulation Manufacturers Association (PIMA) has served as the voice of the rigid polyiso industry, proactively advocating for safe, cost-effective, sustainable, and energy-efficient construction. Organized in 1987, PIMA is an association of polyiso manufacturers and industry suppliers. Polyiso is one of North America's most widely-used and cost-effective insulation products.

October 17, 2022

Amanda Spuckler
Department of Labor and Industry
443 Lafayette Road N.
St. Paul, MN 55155

Re: Adoption of ASHRAE 90.1-2019 as Chapter 1323, MN Commercial Energy Code
Exhaust Energy Recovery Requirements

Dear Ms. Spuckler and DLI Representatives

I have reviewed Mr. Russ Landry's request to adopt the ASHRAE ERV Tables 6.5.6.1.2-1 and 6.5.6.1.2-2 as they were written in the ASHRAE 90.1-2019 in lieu of the proposed amended ERV requirements which were approved by the Energy Code TAG.

Mr. Landry is not accurate in his assessment of how the revised table was proposed. I am the person who wrote the SONAR to Section 6.5.6 Energy recovery, dated April 19, 2021. Before I presented this change request to the Energy Code TAG, I contacted Mr. Landry and informed him of what my own investigations had found when assessing the payback of Energy Recovery Ventilators, particularly for very low percentages of outdoor air (below 30%). Mr. Landry then requested assistance from Wildan to perform their own energy analysis, which I was well aware of and even reviewed the results. I shared my own findings and the energy analyses performed by myself and the energy modeler at my firm with Mr. Landry and Wildan.

At the TAG meeting, I presented my results and my recommendation for change. It is my recollection that Mr. Landry virtually attended that meeting. My recommendation was accepted by committee, and I still stand by my recommendation to revise the tables.

I have reached out to ASHRAE to discuss these tables with someone who was on the committee, but was unable to connect with anyone directly involved. Many office buildings operate less than 5,000 hours per year. What I have not been unable to understand in the ASHRAE tables is the difference in system size requiring ERV when operating at less than 20% outdoor air and when operating less than 8,000 hours per year versus operating 8,000 hours or greater.

Tables 6.5.6.1.2-1 and 6.5.6.1.2-2 below are the energy recovery tables as published in ANSI/ASHRAE/IES Standard 90.1-2019, which is proposed for the update to the current Minnesota Energy Code.

Exhaust Energy Recovery Tables as Presented in ANSI/ASHRAE/IES Standard 90.1-2019
Climate Zones which Apply to Minnesota: Zone 6A (Southern Regions) and Zone 7 (Northern Regions)

Table 6.5.6.1.2-1 Exhaust Air Energy Recovery Requirements for Ventilation Systems Operating Less Than 8000 Hours per Year

	% Outdoor Air at Full Design Airflow Rate							
Climate Zone	≥10% and <20%	≥20% and <30%	≥30% and <40%	≥40% and <50%	≥50% and <60%	≥60% and <70%	≥70% and <80%	≥80%
	Design Supply Airflow Rate, CFM							
6A (Southern)	≥26,000	≥16,000	≥5,500	≥4,500	≥3,500	≥2,000	≥1,000	≥120
7 (Northern)	≥ 4,500	≥4,000	≥2,500	≥1,000	≥140	≥120	≥100	≥80

Table 6.5.6.1.2-2 Exhaust Air Energy Recovery Requirements for Ventilation Systems Operating Greater Than or Equal to 8000 Hours per Year

	% Outdoor Air at Full Design Airflow Rate							
Climate Zone	≥10% and <20%	≥20% and <30%	≥30% and <40%	≥40% and <50%	≥50% and <60%	≥60% and <70%	≥70% and <80%	≥80%
	Design Supply Airflow Rate, CFM							
6A, 7	≥200	≥130	≥100	≥80	≥70	≥60	≥50	≥40

A few things to note about the above tables:

1. Typical office buildings operate about 4,000 hours per year. This means that Table 6.5.6.1.2-1 would apply.
2. For building with longer operating hours, if they operate 7,999 hours or less then Table 6.5.6.1.2-1 applies. Operating 1 more hour or greater requires Table 6.5.6.1.2-2 with substantial reduction in air system sizes requiring energy recovery. In my evaluation, I could find no logical reason for this significant reduction. I would like to see the costs justifications for this remarkable reduction.
3. A typical office building operates at about 10 – 15% minimum outdoor air which provides the required ventilation rates for building occupants, typical building exhaust such as toilet exhaust, and building pressurization to reduce infiltration. It would be difficult to duct the supplied outdoor air volume back to an energy recovery unit to exchange energy, especially air that is used for building pressurization which is lost through the building perimeter walls.
4. Typical office air handling systems with energy efficient air aide economizer cycles are bringing in more than 15% outdoor air for about 80% of the operating hours. This greatly reduces the potential available hours for energy recovery for low minimum outdoor air systems.
5. The potential air volume which can be used for energy recovery is the percentage of full design airflow rate times the supply airflow rate. For example, in Table 6.5.6.1.2-2, a 200 cfm airflow air handling unit requires energy recovery at about 10 – 20% outdoor air. If the system is bringing in 15% outdoor air, this represents a heat recovery system sized for 30 cfm – a very low number which would be difficult to accurately measure.

In the SONAR that I wrote in April of 2021, I proposed the following tables, which I presented at the TAG committee meeting and was approved. I could argue that higher percentages should not require ERV based on long paybacks, but feel the proposed changes are reasonable, and in the spirit of providing cost effective energy efficient systems.

Table 6.5.6.1.2-1and 2 Exhaust Air Energy Recovery Requirements
Proposed in SONAR to TAG

	% Outdoor Air at Full Design Airflow Rate							
Climate Zone	≥10% and <20%	≥20% and <30%	≥30% and <40%	≥40% and <50%	≥50% and <60%	≥60% and <70%	≥70% and <80%	≥80%
	Design Supply Airflow Rate, CFM							
6A (Southern)	NR	≥16,000	≥5,500	≥4,500	≥3,500	≥2,000	≥1,000	≥120
7 (Northern)	NR	≥4,000	≥2,500	≥1,000	≥140	≥120	≥100	≥80

NR - Not Required

In my checking with equipment suppliers, I learned that heat recovery systems cost about $5 - $6 per cfm, and installation adds about another $2 per cfm. These costs are fairly typical regardless of equipment size, and can actually be slightly higher for smaller systems – i.e. systems at the lower percentage of minimum outside air.

Most commercial air handling systems in Minnesota include what is called an “airside economizer cycle.” This cycle allows the use of cooler outdoor air temperatures to assist with the cooling of the building spaces. For the outdoor air temperatures of approximately 55°F to 72°F, the air handling system will introduce 100% outdoor air which is further conditioned as required to be delivered to the occupied spaces. Energy Recovery is not used for this temperature range. I would also note that below 55°F the percentage of outdoor air is reduced down to the “% Outdoor Air at Full Design Airflow Rate” with lower outdoor air temperatures used to obtain the desired mixed air conditions, typically 55° - 60°F. At -20°F outdoors, the mixed air temperature will be about 60°F. This condition will require minimal heating, if any, to obtain the desired supply air temperature. For the Minneapolis area, the air handling systems are bringing in greater than 20% outdoor air for over 80% of the annual hours, during which there would be no heat recovery. This does not provide many hours to take advantage of energy recovery.

I spent much time and recruited time from my company’s energy modeler in an attempt to identify when energy recovery systems are cost effective, particularly at lower percentages of minimum outdoor air. Many approaches to the energy models and analysis were tried. Those attempts failed to identify a reasonable payback for low percentage of outdoor air systems. The results are presented below. I would note that the numbers were run for an office building operating less at 3,952 hours per year and one operating continuously. I would agree that increasing the operating hours beyond the modeled 3,952 would reduce the payback period, but for low percentages of outdoor air the payback would remain very long.

Minnesota Energy Code																				
Review of Energy Recovery Requirements						30000	cfm													
Mar-21						HRV cost:	$5	per cfm (two reps stated $5-$6/cfm for 6000 cfm unit)												
						Gas costs:	$7.50	per MMBtuh												
30,000 cfm, 6:30/6:30 M-F, 8:30/4:30 S-S for 3,952 hrs/yr																				
Minneapolis																				
	Frac OA-->	**0.15**		**Frac OA-->**	**0.25**	**Frac OA-->**	**0.35**	**Frac OA-->**	**0.45**	**Frac OA-->**	**0.55**	**Frac OA-->**	**0.65**	**Frac OA-->**	**0.75**					
	EUI, kBtu/sf	**Total Cost**	-	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**					
No HR	51	$39,011		55	$40,306	62	$42,123	69	$44,276	76	$46,889	83	$49,323	91	$51,966					
HR	49	$38,909		49	$39,058	50	$39,471	52	$40,092	54	$41,356	56	$42,302	59	$43,419					
Difference	2	$102		6	$1,248	12	$2,562	17	$4,184	22	$5,533	27	$7,021	32	$8,547					
% Increase		Base			1124%		105%		63%		32%		27%		22%					
Multiplier to Base		Base			12		25		41		54		69		84					
OA CFM		4,500			7,500		10,500		13,500		16,500		19,500		22,500					
HRV Cost		$22,500			$37,500		$52,500		$67,500		$82,500		$97,500		$112,500					
Simple Payback		220.6			30.0		20.5		16.1		14.9		13.9		13.2					
Duluth																				
	Frac OA-->	**0.15**		**Frac OA-->**	**0.25**	**Frac OA-->**	**0.35**	**Frac OA-->**	**0.45**	**Frac OA-->**	**0.55**	**Frac OA-->**	**0.65**	**Frac OA-->**	**0.75**					
	EUI, kBtu/sf	**Total Cost**		**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**					
No HR	52	$39,066		58	$40,585	62	$42,719	74	$45,187	83	$48,330	92	$51,056	101	$54,069					
HR	50	$38,939		50	$39,014	51	$39,408	53	$40,047	56	$41,731	58	$42,668	61	$43,740					
Difference	2	$127		8	$1,571	11	$3,311	21	$5,140	27	$6,599	34	$8,388	40	$10,329					
% Increase		Base			1137%		111%		55%		28%		27%		23%					
Multiplier to Base		Base			12		26		40		52		66		81					
OA CFM		4,500			7,500		10,500		13,500		16,500		19,500		22,500					
HRV Cost		$22,500			$37,500		$52,500		$67,500		$82,500		$97,500		$112,500					
Simple Payback		177.2			23.9		15.9		13.1		12.5		11.6		10.9					
30,000 cfm, 24/7 operation, 8,760 hrs/yr																				
Minneapolis																				
	Frac OA-->	**0.15**		**Frac OA-->**	**0.25**	**Frac OA-->**	**0.35**	**Frac OA-->**	**0.45**	**Frac OA-->**	**0.55**	**Frac OA-->**	**0.65**	**Frac OA-->**	**0.75**			**Frac OA-->**	**1**	
	EUI, kBtu/sf	**Total Cost**		**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**			**EUI, kBtu/sf**	**Total Cost**	
No HR	77	$50,863		94	$55,431	114	$61,382	137	$68,234	159	$75,136	182	$82,653	204	$90,460			263	$111,217	
HR	67	$48,568		69	$49,098	73	$50,942	80	$53,433	87	$56,395	95	$59,856	103	$63,608			125	$74,772	
Difference	10	$2,295		25	$6,333	41	$10,440	57	$14,801	72	$18,741	87	$22,797	101	$26,852			138	$36,445	
% Increase		Base			176%		65%		42%		27%		22%		18%				36%	
Multiplier to Base		Base			3		5		6		8		10		12				16	
OA CFM		4,500			7,500		10,500		13,500		16,500		19,500		22,500				30,000	
HRV Cost		$22,500			$37,500		$52,500		$67,500		$82,500		$97,500		$112,500				$150,000	
Simple Payback		9.8			5.9		5.0		4.6		4.4		4.3		4.2				4.1	
Duluth																				
	Frac OA-->	**0.15**		**Frac OA-->**	**0.25**	**Frac OA-->**	**0.35**	**Frac OA-->**	**0.45**	**Frac OA-->**	**0.55**	**Frac OA-->**	**0.65**	**Frac OA-->**	**0.75**			**Frac OA-->**	**1**	
	EUI, kBtu/sf	**Total Cost**		**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**	**EUI, kBtu/sf**	**Total Cost**			**EUI, kBtu/sf**	**Total Cost**	
No HR	82	$51,160		104	$56,817	129	$64,065	69	$72,088	183	$80,066	211	$88,724	238	$97,680			308	$121,235	
HR	69	$48,333		71	$48,863	77	$50,983	52	$53,662	92	$56,826	101	$60,490	110	$64,425			135	$75,946	
Difference	13	$2,827		33	$7,954	52	$13,082	17	$18,426	91	$23,240	110	$28,234	128	$33,255			173	$45,289	
% Increase		Base			181%		64%		41%		26%		21%		18%				36%	
Multiplier to Base		Base			3		5		7		8		10		12				16	
OA CFM		4,500			7,500		10,500		13,500		16,500		19,500		22,500				30,000	
HRV Cost		$22,500			$37,500		$52,500		$67,500		$82,500		$97,500		$112,500				$150,000	
Simple Payback		8.0			4.7		4.0		3.7		3.5		3.5		3.4				3.3	

In reviewing Wildan's numbers, I am suspect of the paybacks they present for lower percentages (less than 30%) of outdoor air. There are many ways in which inputs can and will impact results. I was not privy to all of the inputs Wildan used for their model, but I can say that they resulted in much lower paybacks than the results of my multiple studies. The studies (Wildan's and those I was a part of) do not take into account equipment installation costs nor maintenance costs, both of which will increase paybacks.

Wildan's analysis was performed for two conditions: Equipment costs based on the estimated peak heating and cooling equipment requirements, and equipment costs based on reducing the heating and cooling equipment requirements based on using an energy recovery system. It is debatable if downsizing equipment capacity is an acceptable design approach, especially for winter conditions. I have seen energy recovery systems fail during extreme cold conditions with extensive systems damage being the result. Downsizing the equipment helps improve the payback but at added risk to the building. I would also note that the identified paybacks are simple paybacks which do not take into account maintenance costs nor finance costs. I suspect that if a life cycle cost analysis were performed, an 11 year simple payback would approach 20 years or greater, which is the life expectancy of the equipment. An 11 year simple payback is a long payback.

While ASHRAE is certainly a globally recognized organization, they are not infallible in their recommendations. A few years back I attended a seminar presented by an energy recovery equipment manufacturer. After the presentation, I asked the speaker how they could justify energy recovery on systems with less than 20% outdoor air. He told me that he argued this point with the ASHRAE committee but to no avail.

The proposed changes to the tables eliminates the requirement for energy recovery where there is little or no recovery possible. It also tries to minimize unnecessary cost burdens to a project where it may not make sense. A heat recovery system is an active system, meaning it requires continual maintenance. By being prudent of where the heat recovery is required, there are possibilities of taking the money not spent on heat recovery and using it for passive energy saving systems which do not require maintenance, such as high performance windows or increased insulation levels. It could also be used to provide higher performing mechanical systems. Keeping mechanical systems simple also helps to maintain those system efficiencies and discourage maintenance staff from disabling components due to what they feel is excessive maintenance. Too many times I have witnessed systems with energy saving features disabled.

Thank you in your consideration on this important topic. I have promoted energy efficient design thoughout my career, but also believe that those designs need to be no more complicated than necessary to accomplish the desired goals, and easy to maintain.

Yours truly,

John G. Smith, P.E.

Cc: Greg Metz - DLI

VIA ELECTRONIC MAIL

October 19, 2022

Amanda Spuckler
Department of Labor and Industry
443 Lafayette Road N.
Saint Paul, MN 55155
dli.rules@state.mn.us

RE: RECA Comments Supporting Proposed Adoption of *ASHRAE* Standard 90.1-2019 for Commercial Construction and Additional Recommendations

Dear Ms. Spuckler,

The Responsible Energy Codes Alliance[1] appreciates the opportunity to comment on Minnesota's proposed adoption of *ASHRAE* Standard 90.1-2019 for commercial construction as outlined in the State Register on September 19, 2022.[2] RECA has participated in previous energy code update processes, and we support the Department's efforts to improve efficiency and the overall quality of buildings in Minnesota. **RECA strongly supports Minnesota's proposed adoption of *ASHRAE* Standard 90.1-2019 and encourages the Department to take additional steps to improve commercial building efficiency.** The proposed updates will provide cost-effective, long-term energy savings and will help Minnesota achieve its climate and resiliency goals.

Improvements in *ASHRAE* Standard 90.1-2019

The improvements in *ASHRAE* Standard 90.1-2019 will save a significant amount of energy and help keep building occupants comfortable and safe. These improvements include:

- Substantially improved efficiency requirements for opaque envelope components and fenestration, helping to maintain occupant comfort and reduce energy use;
- More efficient mechanical efficiency requirements based on the latest federal standards and lighting systems and automated controls – all of which will contribute to better occupant comfort, health, and safety;
- An improved and expanded set of additional efficiency options that will allow design professionals more flexibility in achieving code compliance;

[1] RECA is a broad coalition of product and equipment manufacturers, trade associations, building science experts, environmental organizations and energy efficiency advocates that promote the adoption of the latest model energy codes in every state.

[2] Minnesota State Register, Vol. 47, No. 12 at 249 (Sep. 19, 2022).

- Improved requirements for commissioning, certificates, and other consumer protections; and
- Provisions that will improve resilience, protecting occupants from environmental and climate-related risks and helping protect the investment of building owners.

Energy and Cost Savings

Adopting *ASHRAE* Standard 90.1-2019 for commercial buildings will provide substantial energy and cost savings to Minnesota building owners and occupants. The U.S. Department of Energy analyzes and provides cost savings determinations for each new edition of *ASHRAE* Standard 90.1 for commercial construction. **According to the analysis of *ASHRAE* Standard 90.1-2019, U.S. DOE found that Minnesota building owners and occupants can expect to save (on average) $3.35-3.87 per square foot over the first 30 years of the building's useful life.**[3] In many cases, for a number of building types, these improvements are expected to result in immediate payback (meaning that construction costs will actually be reduced under the updated standard). And in other cases, the return on investment is well within the useful life of the building. The analysis compared the simple payback period for several types of commercial buildings: [4]

Table 6. Simple Payback for Minnesota (Years)

Climate Zone	Small Office	Large Office	Stand-Alone Retail	Primary School	Small Hotel	Mid-Rise Apartment	All Building Types
5A	Immediate	Immediate	Immediate	Immediate	9.8	Immediate	Immediate
6A	Immediate	Immediate	Immediate	Immediate	10.3	Immediate	Immediate
7	Immediate	Immediate	Immediate	Immediate	12.5	Immediate	Immediate
State Average	Immediate	Immediate	Immediate	Immediate	11.6	Immediate	Immediate

While these savings will benefit individual owners and occupants of buildings, U.S. DOE estimates that **the implementation of Standard 90.1-2019 statewide will save Minnesotans $663,200 in the first year and $279,600,000 over the next 30 years**. A complete copy of that analysis is attached to these comments.

Greenhouse Gas Emissions Reductions

The full adoption of the latest model energy code for commercial construction will also help Minnesota reduce its greenhouse gas emissions. In addition to reviewing the latest model codes for cost-effectiveness, U.S. DOE also analyzed the reductions in greenhouse gas

[3] *See* U.S. Dep't of Energy, *Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Minnesota*, at 1 (July 2021), available at https://www.energycodes.gov/sites/default/files/2021-07/Cost-effectiveness_of_*ASHRAE*_Standard_90-1-2019-Minnesota.pdf.

[4] *Id*. at 5.

emissions that would result from statewide adoption of these codes. A summary of DOE's findings is below:

Statewide CO2 Emissions Reductions from Adoption of *ASHRAE* Standard 90.1-2019[5]

CO2 Emissions Reduction (First Year)	CO2 Emissions Reduction (30 Years Cumulative)
7,081 Metric Tons	4,946,000 Metric Tons

Additional Recommendations to Further Improve the Commercial Energy Code

RECA supports the proposed rule to the extent that it reflects the improvements contained in *ASHRAE* Standard 90.1-2019, and we do not wish to delay the current process. However, we strongly encourage the Department to work toward eliminating weakening amendments and make other improvements going forward. Specifically:

1. **2021 *IECC* Alternative**. We urge the Department to allow compliance with the 2021 *IECC* as an acceptable alternative to *ASHRAE* Standard 90.1-2019. **An analysis recently published by U.S. DOE found that the 2021 *IECC* provides an additional 3.3% energy cost savings and 6.5% site energy savings, on average, as compared to ASHRAE Standard 90.1-2019.[6]** Most states adopt both the *IECC* and *ASHRAE* Standard 90.1 for commercial construction, and we believe there would be no downside to allowing compliance with the more stringent 2021 *IECC*. Given Minnesota's history of applying the *IECC* for commercial buildings, we believe it will be less disruptive for design professionals and commercial builders.
2. **Roof Replacement**. We oppose the additional exception #9, relating to roof replacement requirements proposed in Section 5.1.3. The model code already provides adequate exceptions and workarounds, and we see no need to add such a broad exception to the insulation requirements that apply to roof replacements. Roof replacement is one of the few opportunities to substantially improve the efficiency of the existing buildings in Minnesota, and any exceptions to these requirements should be narrowly written.

[5] *Id*. at 1.

[6] U.S. Dep't of Energy, *Energy and Energy Cost Savings Analysis of the 2021 IECC for Commercial Buildings*, at B.2 (Sep. 2022), available at https://www.energycodes.gov/sites/default/files/2022-09/2021_IECC_Commercial_Analysis_Final_2022_09_02.pdf.

Conclusion

RECA supports the hard work of the Department of Labor and Industry in seeing through the adoption of *ASHRAE* Standard 90.1-2019 for commercial buildings. Please contact me at (202) 339-6366 or eric@reca-codes.com if you have any questions or would like to discuss how RECA can be of assistance.

Sincerely,

Eric Lacey

RECA Chairman

RECA is a broad coalition of energy efficiency professionals, regional efficiency organizations, product and equipment manufacturers, trade associations, and environmental organizations with expertise in the development, adoption, and implementation of building energy codes nationwide. RECA is dedicated to improving the energy efficiency of homes throughout the U.S. through greater use of energy efficient practices and building products. It is administered by the Alliance to Save Energy, a non-profit coalition of business, government, environmental and consumer leaders that supports energy efficiency as a cost-effective energy resource under existing market conditions and advocates energy-efficiency policies that minimize costs to society and individual consumers. Below is a list of RECA Members that endorse these comments.

Air Barrier Association of America

Alliance to Save Energy

American Chemistry Council

American Council for an Energy-Efficient Economy

CertainTeed LLC

EPS Industry Alliance

Extruded Polystyrene Foam Association

Institute for Market Transformation

International Code Council

Johns Manville Corporation

Knauf Insulation

Midwest Energy Efficiency Alliance

National Fenestration Rating Council

Natural Resources Defense Council

North American Insulation Manufacturers Association

Owens Corning

Polyisocyanurate Insulation Manufacturers Association

Temporary Commissioner Nicole Blissenbach
Minnesota Department of Labor and Industry
443 Lafayette Road N.
St. Paul, MN 55155

Administrative Law Judge
State of Minnesota Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
St. Paul, MN 55164

Date: October 19, 2022

From: Fresh Energy

Re: Proposed Amendment of Rules Governing the Adoption of ANSI/ASHRAE/IES Standard 90.1-2019 Energy Standard for Buildings Except Low-Rise Residential Buildings, Minnesota Rules, Chapter 1323, Revisor's ID Number R-04696

Commissioner Blissenbach and Department Staff:

We submit these comments in response to the Department of Labor and Industry's (DLI) September 19, 2022 Dual Notice, whereby DLI noted its intent to adopt the Commercial Energy Code in ASHRAE 90.1-2019, with amendments. Our comments respond to the proposed rule language as well as the Statement of Need and Reasonableness (SONAR) prepared by DLI.

The proposed rules are both necessary and reasonable and Fresh Energy supports adoption of the proposed rules without a hearing. The proposed rules are necessary because of the benefits to public health, reduced greenhouse gas emissions, and improved energy security throughout the state that will result from their adoption. The proposed rules are reasonable because they are the result of a thorough stakeholder process, as described in the SONAR, that included staff from DLI and the Department of Commerce as well as stakeholders such as members of the Technical Advisory Group (TAG), including Fresh Energy, and members of the public. In addition, as evidenced by the thorough SONAR, the proposed rules have been considered and—as appropriate, amended—to fit the needs of Minnesotans.

Efficient Buildings are Healthier Buildings

Adopting ASHRAE 90.1-2019 as proposed will have important benefits to Minnesotans' health, comfort, and wellbeing. The improved energy efficiency and higher standards for ventilation will lead to healthier indoor air quality for all who spend time in commercial buildings.

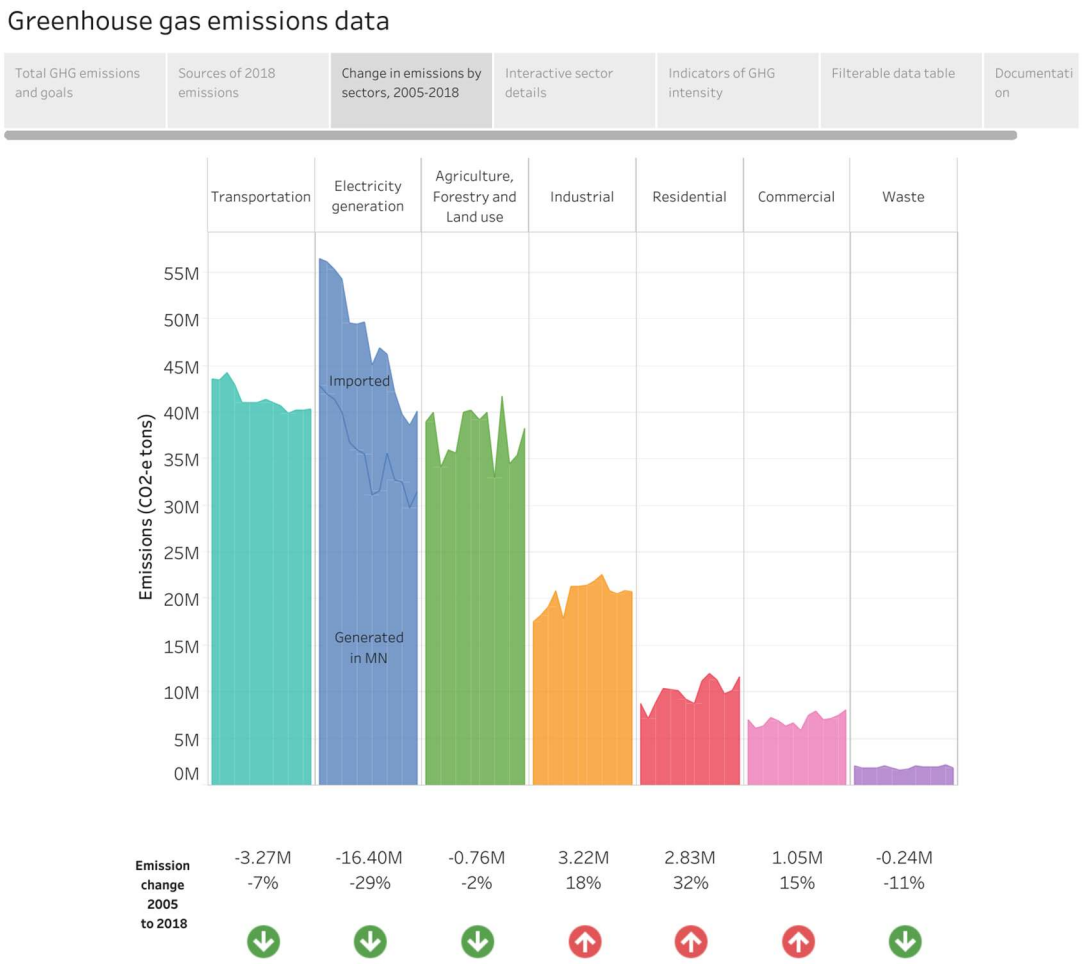
Adopting ASHRAE 90.1-2019 as proposed will lead to reduced fuel use through efficiency and improved air quality through better ventilation, both major factors in the health and wellbeing of families who work, shop, worship, and live in Minnesota buildings. For our public and individual health outcomes, and the comfort and wellbeing of everyone who spends their time in our buildings, we encourage the Department to update the Commercial Energy Code.

Energy Codes Are Critical to Meeting Climate Commitments

The adoption of ASHRAE 90.1-2019 as proposed is essential for the state of Minnesota and many of its cities to meet established energy and climate goals. The 2007 Next Generation Energy Act set statewide greenhouse gas emission reduction goals of at least 15% below 2005 levels by 2015, 30% by 2025, and 80% by 2050.[1] More recently, the state's Climate Action Framework noted that GHG emissions from commercial buildings have risen by 15 percent since 2005 and called for "[u]pdating building codes to ensure the highest possible efficiency and lowest possible emissions in new buildings."[2]

Currently, we are off track, with commercial buildings still **increasing** emissions.

[1] Minn. Stat. 216H.02 Subdivision 1, https://www.revisor.mn.gov/statutes/cite/216H.02
[2] Minnesota's Climate Action Framework at 49 – 53 (2022).



Source: Minnesota Pollution Control Agency[3]

Pacific Northwest National Laboratory (PNNL) estimates that adopting ASHRAE 90.1-2019 in Minnesota will reduce statewide CO2 emissions by 4.9 million metric tons over 30 years, "equivalent to the CO2 emissions of 1,076,000 cars driven for one year."[4]

To make progress toward our Next Generation Energy Act goals the Climate Action Framework and slow the disruptive impacts of climate change, we must continue to update our building codes with the minimum standards agreed upon in the model code. The increased efficiency will not only help to slow climate change, but will also increase the resilience of our buildings in the face of increasingly extreme weather patterns and volatile energy costs.

[3] https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data
[4] Pacific Northwest National Laboratory, "Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Minnesota," July 2021, https://www.energycodes.gov/sites/default/files/2021-07/Cost-effectiveness_of_ASHRAE_Standard_90-1-2019-Minnesota.pdf

Efficient Buildings Improve Energy Security

Minnesota imports 100 percent of its natural gas.[5] Gas is the top heating fuel in Minnesota, which means business owners, office tenants, residents, and everyone else who uses our buildings are affected by volatile, global markets for fossil fuels. Minnesotans faced rising heating bills in the winters of 20/21[6] and 21/22[7] and are facing the same increasingly-precedented high gas costs again this winter. The U.S. Energy Information Administration recently released its Winter Fuels Outlook, which predicted that household expenditures for heating will increase by 33 percent compared to last winter in the Midwest.[8] A similar increase could be expected by commercial customers due to the expected increase in wholesale natural gas prices compared to last winter. For example, spot prices at the U.S. benchmark Hendry Hub was up 54 percent compared to last winter.[9]

Adopting ASHRAE 90.1-2019 will not only save Minnesotans money and energy, it will continue to reduce our dependence on imported fuels and support the stability of our local economies.

Conclusion

There is sufficient evidence upon which the Department of Labor and Industry should move forward with updating the Commercial Energy Code.

Adoption of ASHRAE 90.1-2019 as proposed will reduce energy costs, protect public health, contribute to our climate goals, and help protect Minnesota businesses and consumers from unpredictable fluctuations in global fuel costs.

Sincerely,

Fresh Energy

---

[5] "Minnesota Energy Data Dashboard," Minnesota Department of Commerce, May 2022, https://mn.gov/commerce/policy-data-reports/energy-data-reports/energy-data.jsp

[6] "Heating bill price shock could be felt in Minnesota, too," Star-Tribune, February 2021, https://www.startribune.com/heating-bill-price-shock-could-be-felt-in-minnesota-too/600026236/

[7] "'I Literally Think I Gasped': Minnesotans Shocked At High Heating Bills," CBS Minnesota, February 2022, https://www.cbsnews.com/minnesota/news/i-literally-think-i-gasped-minnesotans-shocked-at-high-heating-bills/

[8] U.S. Energy Information Administration, Winter Fuels Outlook, October 2022, *available at* https://www.eia.gov/outlooks/steo/report/WinterFuels.php.

[9] *Id.*