

## CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Greg Metz

Date: 1/4/2020

Email address: Greg.Metz@State.MN.US

Model Code:

ANSI/ASHRAE/IES Standard 90.1-2019

Telephone number: 651-284-5884

Modify Section 6.1.1.3.6 Alterations to Existing Buildings- Rooftop HVACR

Firm/Association affiliation, if any: DLI/CCLD

Code or rule section to be changed: MR 1323

Intended for Technical Advisory Group ("TAG"): 1323 Minnesota Energy Code

### General Information

**Yes**    **No**

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| A. Is the proposed change unique to the State of Minnesota?                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| B. Is the proposed change required due to climatic conditions of Minnesota?            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| C. Will the proposed change encourage more uniform enforcement?                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| D. Will the proposed change remedy a problem?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| E. Does the proposal delete a current Minnesota Rule, chapter amendment?               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| F. Would this proposed change be appropriate through the ICC code development process? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Proposed Language

1. The proposed code change is meant to:

- change language contained the model code book? If so, list section(s).
- change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).
- delete language contained in the model code book? If so, list section(s).
- delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).
- add new language that is not found in the model code book or in Minnesota Rule.  
**6.1.1.3.1.6 Rooftop HVACR**

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.  
No.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and words proposed to be deleted. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Add 6.1.1.3.6 Rooftop HVACR as follows:

**6.1.1.3.1.6 Rooftop HVACR**

New and replacement rooftop equipment shall be provided with new insulated curbs in accordance with Section 5.5.3.1 of sufficient height to allow roof replacement with insulation thickness to comply with Tables 5.5-6 and 5.5-7.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.  
No

**Need and Reason**

1. Why is the proposed code change needed?

Minnesota currently has an exception that allows sub-standard insulation when mechanical equipment curbs or other drainage components do not allow full depth of roof insulation at roof replacement. This section will prevent the perpetuation of non-compliance when rooftop mechanical equipment is not replaced at the same time that roof replacement occurs.

2. Why is the proposed code change a reasonable solution?

The intent of the Conservation Code for Existing Buildings is to move buildings toward compliance as alterations occur. Since curbs are directly related to the rooftop mechanical equipment and would not be installed otherwise, it is right to require their replacement with compliant work when the overall equipment is being replaced so that a future roof replacement can also be done in a compliant manner.

3. What other considerations should the TAG consider? None.

**Cost/Benefit Analysis**

1. Will the proposed code change increase or decrease costs? Please explain.

Potential increase in cost for new insulated mechanical curbs and roof patching where curbs are replaced.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain.  
The increased costs are easily offset by the future energy savings of a fully compliant roof replacement.

3. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain. No.

4. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed \$25,000 for any one small business or small city? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

No.

## **Regulatory Analysis**

1. What parties or segments of industry are affected by this proposed code change?  
Architects, Engineers, Construction Contractors, Building Officials and Inspectors.
2. What are the probable costs to the agency and to any other State agencies of implementing and enforcing of the proposed rule? Is there an anticipated effect on state revenues?  
  
There should be no additional costs to state agencies.
3. Are there less costly intrusive methods for achieving the purpose of the proposed rule?  
No.
4. Can you think of other means or methods to achieve the purpose of the proposed code change? If so, please explain what they are and why your proposed change is the preferred method or means to achieve the desired result.  
No.
5. What are the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?  
  
Potential incremental cost of providing new insulated curbs and cost of installation flashing them into the existing roof system.
6. What are the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?  
  
Continued significant energy loss at the building roof in perpetuity because it is rare when mechanical equipment is replaced at the same time that roofing is replaced.
7. Are you aware of any federal regulation or federal requirement related to this proposed code change? If so, please list the federal regulation or requirement and your assessment of any differences between the proposed rule and the federal regulation or requirement.  
  
No.
8. Please include an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

N/A

## CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

*Author/requestor:* John G. Smith, P.E.

*Date:* February 1, 2021

*Email address:* jsmith@michaudcooley.com

*Model Code:*

ANSI/ASHRAE/IES Standard 90.1-2019

*Telephone number:* 612 -867-3145

*Code or Rule Section:* 6.1.1.5 Prohibition of  
Once-Through Water Use

*Firm/Association affiliation, if any:*

*Code or rule section to be changed:* MR 1323

*Intended for Technical Advisory Group ("TAG"):* Commercial Energy Code

### General Information

**Yes    No**

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| A. Is the proposed change unique to the State of Minnesota?                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| B. Is the proposed change required due to climatic conditions of Minnesota?            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| C. Will the proposed change encourage more uniform enforcement?                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| D. Will the proposed change remedy a problem?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| E. Does the proposal delete a current Minnesota Rule, chapter amendment?               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| F. Would this proposed change be appropriate through the ICC code development process? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Proposed Language

1. The proposed code change is meant to:

change language contained the model code book? If so, list section(s).  
Add: **6.1.1.5 Prohibition of Once-Through Water Use**

change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

delete language contained in the model code book? If so, list section(s).

delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.  
No.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and words proposed to be deleted. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Delete Minnesota Rule 1313.C401Section C401.4 in its entirety.

Add ANSI/ASHRAE/IEC Standard 90.1, Section 6.1.1.5 to read as follows:

**6.1.1.5 Prohibition of once-through water use permits.**

Once-through water use permits are prohibited in accordance with Minnesota Statutes, section 103G.271, subdivision 5.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.  
No

**Need and Reason**

1. Why is the proposed code change needed?

To ensure continued compliance with the ban on once-through water use permits and to clarify the scope of the prohibition for more uniform enforcement.

2. Why is the proposed code change a reasonable solution?

It inserts the current rule language into the body of the model code where it is more likely to be found and followed. It clarifies exactly where the prohibition applies.

3. What other considerations should the TAG consider? None

**Cost/Benefit Analysis**

1. Will the proposed code change increase or decrease costs? Please explain.

No cost change. The modification carries forward an existing requirement.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain.  
N/A

3. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain. No.

4. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed \$25,000 for any one small business or small city? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

No.

**Regulatory Analysis**

1. What parties or segments of industry are affected by this proposed code change?

Architects, Engineers, Construction Contractors, Building Officials and Inspectors.

2. What are the probable costs to the agency and to any other State agencies of implementing and enforcing of the proposed rule? Is there an anticipated effect on state revenues?

There should be no additional costs to state agencies.

3. Are there less costly intrusive methods for achieving the purpose of the proposed rule?  
No.
4. Can you think of other means or methods to achieve the purpose of the proposed code change? If so, please explain what they are and why your proposed change is the preferred method or means to achieve the desired result.  
No.
5. What are the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?

None

6. What are the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?

The requirement could be missed and designs could be completed which would not be allowed.

7. Are you aware of any federal regulation or federal requirement related to this proposed code change? If so, please list the federal regulation or requirement and your assessment of any differences between the proposed rule and the federal regulation or requirement.

No.

8. Please include an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

N/A

## CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

*Author/requestor:* John G. Smith, P.E.

*Date:* February 13, 2021

*Email address:* jsmith@michaudcooley.com

*Model Code:*

ANSI/ASHRAE/IES Standard 90.1-2019

*Telephone number:* 612 -867-3145

*Code or Rule Section:* 6.4.2 Calculations

*Firm/Association affiliation, if any:*

*Code or rule section to be changed:* MR 1323

*Intended for Technical Advisory Group ("TAG"):* Commercial Energy Code

### General Information

**Yes    No**

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| A. Is the proposed change unique to the State of Minnesota?                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| B. Is the proposed change required due to climatic conditions of Minnesota?            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
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| D. Will the proposed change remedy a problem?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
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| F. Would this proposed change be appropriate through the ICC code development process? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Proposed Language

1. The proposed code change is meant to:

change language contained the model code book? If so, list section(s).

change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

delete language contained in the model code book? If so, list section(s).

delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.  
No.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and words proposed to be deleted. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Add the following new subsection:

**6.4.2.1.1 Climatic Data Design Conditions**

Climatic data design conditions to be used for the calculation of heating and cooling loads shall be determined by either of the following methods:

Method 1: Use weather conditions identified in Table C6.4.1. Where the building city location is not listed, use the listed city that is the nearest.

Method 2: Use weather data published as a part of ASHRAE Standard 169-2020 for the nearest city. This data is available at [www.ASHRAE-meteo.info](http://www.ASHRAE-meteo.info). Design temperatures shall be rounded to the nearest whole number. Winter design conditions shall be the mean extreme annual temperature. Summer conditions shall be the 1% annual cooling design conditions.

| <b>Table C6.4.1<br/>CLIMATIC DATA DESIGN CONDITIONS</b> |                                |  |
|---|--------------------------------|--|
| <b>City</b>   | <b>Winter<br/>Design db °F</b> | <b>Summer<br/>db °F/coincident wb °F</b> |
| Aitkin  | -24                            | 82/72                                    |
| Albert Lea  | -15                            | 85/72                                    |
| Alexandria AP   | -21                            | 86/70                                    |
| Bemidji AP  | -24                            | 84/68                                    |
| Cloquet   | -20                            | 82/68                                    |
| Crookston   | -27                            | 84/70                                    |
| Duluth AP   | -20                            | 81/67                                    |
| Ely   | -29                            | 82/68                                    |
| Eveleth   | -26                            | 82/68                                    |
| Faribault   | -16                            | 86/73                                    |
| Fergus Falls  | -21                            | 86/71                                    |
| Grand Rapids  | -23                            | 81/67                                    |
| Hibbing   | -19                            | 82/68                                    |
| International Falls AP                                  | -28                            | 83/67                                    |
| Litchfield  | -18                            | 85/71                                    |
| Little Falls  | -20                            | 86/71                                    |
| Mankato   | -15                            | 86/72                                    |
| Mpls/St. Paul AP  | -15                            | 88/72                                    |
| Montivedeo  | -17                            | 86/72                                    |
| Mora  | -21                            | 84/70                                    |
| Morris  | -21                            | 84/72                                    |
| New Ulm   | -15                            | 87/73                                    |
| Owatonna  | -16                            | 86/73                                    |
| Pequot Lakes  | -23                            | 84/68                                    |
| Pipestone   | -15                            | 85/73                                    |



|                   |     |       |
|-------------------|-----|-------|
| Redwood Falls     | -17 | 89/73 |
| Rochester AP      | -17 | 85/72 |
| Roseau            | -29 | 82/70 |
| St. Cloud AP      | -20 | 86/71 |
| Thief River Falls | -25 | 82/68 |
| Tofte             | -14 | 75/61 |
| Warroad           | -29 | 83/67 |
| Wheaton           | -20 | 84/71 |
| Willmar           | -20 | 85/71 |
| Winona            | -13 | 88/74 |
| Worthington       | -14 | 84/71 |

### **Need and Reason**

1. Why is the proposed code change needed?

The above table is currently in the 2020 Energy Code and was in the version previous to the current code. ASHRAE 90.1 includes no information of what design conditions to use, and the reference to Standard 183 similarly does not. It is important to have the outdoor design conditions for uniformity in design and to help assure that HVAC systems will perform as expected. Using Method 2 identified above provides very similar results as using the table, however, the data for many more cities is available at the ASHRAE site. Method 2 clearly identifies which weather data conditions to use for the heating and cooling conditions as the data includes many different statistical data points.

2. Why is the proposed code change a reasonable solution?

Maintains design conditions which have been used for many years in Minnesota. Provides a standard method of determining the design conditions.

3. What other considerations should the TAG consider? None

### **Cost/Benefit Analysis**

1. Will the proposed code change increase or decrease costs? Please explain.

No cost change. The modification carries forward an existing requirement.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain.

N/A

3. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain. No.

4. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed \$25,000 for any one small business or small city? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

No.

## **Regulatory Analysis**

1. What parties or segments of industry are affected by this proposed code change?  
Architects, Engineers, Construction Contractors, Building Officials, Owners and Inspectors.
2. What are the probable costs to the agency and to any other State agencies of implementing and enforcing of the proposed rule? Is there an anticipated effect on state revenues?

There should be no additional costs to state agencies.

3. Are there less costly intrusive methods for achieving the purpose of the proposed rule?  
No.
4. Can you think of other means or methods to achieve the purpose of the proposed code change? If so, please explain what they are and why your proposed change is the preferred method or means to achieve the desired result.  
No.
5. What are the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?

None

6. What are the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

There would be no uniformity of how heating and cooling loads are calculated.

7. Are you aware of any federal regulation or federal requirement related to this proposed code change? If so, please list the federal regulation or requirement and your assessment of any differences between the proposed rule and the federal regulation or requirement.

No.

8. Please include an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

N/A

MINNESOTA WEATHER DATA

|                        | ASHRAE 1981 |        |                           |       |       | 2020 Minnesota Energy Code |           | 2017 ASHRAE Climatic Data |       |        |              |                           |           |      |
|------------------------|-------------|--------|---------------------------|-------|-------|----------------------------|-----------|---------------------------|-------|--------|--------------|---------------------------|-----------|------|
|                        | Winter      |        | Summer                    |       |       | Winter                     | Summer    | Winter                    |       | Summer |              |                           |           |      |
|                        | Design db   | 97.50% | Design db w/coincident wb | 1%    | 2.50% | 5%                         | Design db | db w/coinc wb             | 99.6% | 99.0%  | Extreme Mean | Design db w/coincident wb | 0.4%      | 1.0% |
| Aitkin                 |             |        |                           |       |       | -24                        | 82/72     | -20.0                     | -14.8 | -28.1  | 85.9/74.8    | 82.4/72.1                 | 81/70.4   |      |
| Albert Lea             | -17         | -12    | 90/74                     | 87/72 | 84/71 | -15                        | 85/72     | -11.8                     | -7.7  | -18.5  | 89.6/73.9    | 86.1/72.2                 | 83.5/70.9 |      |
| Alexandria AP          | -22         | -16    | 91/72                     | 88/72 | 85/70 | -21                        | 86/70     | -18.0                     | -12.8 | -23.1  | 87/9/72      | 84.7/70                   | 82/68.5   |      |
| Bemidji AP             | -31         | -26    | 88/69                     | 85/69 | 81/67 | -24                        | 84/68     | -22.5                     | -17.2 | -30.3  | 86.4/70      | 82.4/67.3                 | 80.7/65.9 |      |
| Brainerd               | -20         | -16    | 90/73                     | 87/71 | 84/69 |                            |           | -18.6                     | -12.9 | -27.4  | 88.3/72.3    | 84.8/69.3                 | 82.2/68.1 |      |
| Cloquet                |             |        |                           |       |       | -20                        | 82/68     | -18.0                     | -12.7 | -24.4  | 84.2/70.8    | 81.6/68.2                 | 79.1/66.2 |      |
| Crookston              |             |        |                           |       |       | -27                        | 84/70     | -24.1                     | -18.1 | -28.2  | 87.8/72.7    | 83.9/70.1                 | 81.5/68   |      |
| Duluth AP              | -21         | -16    | 85/70                     | 82/68 | 79/66 | -20                        | 81/67     | -17.2                     | -12.0 | -23.4  | 84.2/69.7    | 81.1/67.1                 | 78.2/65.3 |      |
| Ely                    |             |        |                           |       |       | -29                        | 82/68     | -26.6                     | -20.0 | -33.9  | 84.3/69.2    | 81.6/67.4                 | 79.1/65.2 |      |
| Eveleth                |             |        |                           |       |       | -26                        | 82/68     | -22.4                     | -17.1 | -30.7  | 85.8/69.4    | 82/66.9                   | 80.5/65.7 |      |
| Faribault              | -17         | -12    | 91/74                     | 88/72 | 85/71 | -16                        | 86/73     | -13.7                     | -8.4  | -20.6  | 90.1/74.3    | 87.6/72.7                 | 83.9/70.7 |      |
| Fergus Falls           | -21         | -17    | 91/72                     | 88/72 | 85/70 | -21                        | 86/71     | -18.2                     | -15.0 | -26.0  | 88.5/72.5    | 84.5/70.2                 | 82.1/68.6 |      |
| Grand Marais           |             |        |                           |       |       |                            |           | -12.8                     | -7.5  | -18.5  | 76.8/61.9    | 73.1/61.7                 | 70.1/60.4 |      |
| Grand Rapids           |             |        |                           |       |       | -23                        | 81/67     | -19.5                     | -15.0 | -24.6  | 84.2/69.8    | 81.6/67.4                 | 79.2/65.4 |      |
| Hibbing                |             |        |                           |       |       | -19                        | 82/68     | -23.6                     | -17.6 | -31.4  | 85.5/70.1    | 82.3/67.8                 | 79.7/65.8 |      |
| International Falls AP | -29         | -25    | 85/68                     | 83/68 | 80/66 | -28                        | 83/67     | -26.1                     | -20.5 | -34.6  | 85.4/69.8    | 82.3/67.4                 | 79.5/65.8 |      |
| Litchfield             |             |        |                           |       |       | -18                        | 85/71     | -15.0                     | -9.1  | -19.9  | 89.6/73.6    | 85.8/72                   | 82.3/69.4 |      |
| Little Falls           |             |        |                           |       |       | -20                        | 86/71     | -18.2                     | -12.8 | -26.3  | 90/72.9      | 85.9/69.9                 | 82.1/67.5 |      |
| Mankato                | -17         | -12    | 91/72                     | 88/72 | 85/70 | -15                        | 86/72     | -12.3                     | -8.2  | -15.9  | 89.8/73.7    | 86.3/71.9                 | 83.5/70.6 |      |
| Mpls/St. Paul AP       | -16         | -12    | 92/75                     | 89/73 | 86/71 | -15                        | 88/72     | -10.6                     | -5.8  | -16.7  | 90.8/73.3    | 87.8/72                   | 84.9/70.2 |      |
| Montivedeo             |             |        |                           |       |       | -17                        | 86/72     | -14.8                     | -9.0  | -19.1  | 90.2/73.4    | 87.7/72.8                 | 84/70.3   |      |
| Mora                   |             |        |                           |       |       | -21                        | 84/70     | -18.0                     | -11.8 | -23.9  | 80.8/70.1    | 85.5/70.3                 | 81.5/67.8 |      |
| Morris                 |             |        |                           |       |       | -21                        | 84/72     | -17.8                     | -12.9 | -22.6  | 89.6/74.1    | 85.6/72                   | 82.3/70.1 |      |
| New Ulm                |             |        |                           |       |       | -15                        | 87/73     | -14.0                     | -8.6  | -18.6  | 90.2/74.2    | 87.6/73                   | 83.9/70/9 |      |
| Owatonna               |             |        |                           |       |       | -16                        | 86/73     | -14.5                     | -8.6  | -19.1  | 89.9/74.2    | 86.4/72.3                 | 83.7/71   |      |
| Pequot Lakes           |             |        |                           |       |       | -23                        | 84/68     | -23.4                     | -17.2 | -30.5  | 88.9/69.8    | 85.4/68.3                 | 81.8/66.2 |      |
| Pipestone              |             |        |                           |       |       | -15                        | 85/73     | -12.3                     | -8.2  | -18.7  | 89.6/73.7    | 86.2/72.7                 | 83.6/71   |      |
| Redwood Falls          |             |        |                           |       |       | -17                        | 89/73     | -13.4                     | -8.7  | -18.8  | 91.3/74.2    | 88.4/72.6                 | 85.6/70.8 |      |
| Rochester AP           | -17         | -12    | 90/74                     | 87/72 | 84/71 | -17                        | 85/72     | -12.4                     | -7.6  | -18.7  | 87.7/73.3    | 84.7/71.7                 | 82.2/70.3 |      |
| Roseau                 |             |        |                           |       |       | -29                        | 82/70     | -25.5                     | -19.5 | -31.1  | 87.6/74.6    | 83.6/71.5                 | 81.2/69.6 |      |
| St. Cloud AP           | -15         | -11    | 91/74                     | 88/72 | 85/70 | -20                        | 86/71     | -16.8                     | -11.3 | -24.2  | 89.4/72.5    | 86.3/70.7                 | 83.4/68.7 |      |
| Silver Bay             |             |        |                           |       |       |                            |           | -19.5                     | -14.7 | -28.3  | 84.1/68.1    | 81.5/65.7                 | 79/64.1   |      |
| Thief River Falls      |             |        |                           |       |       | -25                        | 82/68     | -22.2                     | -17.5 | -27.3  | 85.8/70.9    | 82.2/68.4                 | 80.8/67.1 |      |
| Tofte                  |             |        |                           |       |       | -14                        | 75/61     |                           |       |        |              |                           |           |      |
| Virginia               | -25         | -21    | 85/69                     | 83/68 | 80/66 |                            |           | -22.4                     | -17.1 | -30.7  | 85.8/69.4    | 82/66.9                   | 80.5/65.7 |      |
| Warrond                |             |        |                           |       |       | -29                        | 83/67     | -24.3                     | -18.4 | -32.1  | 84.3/71.2    | 81.7/69.7                 | 79.3/67.2 |      |
| Wheaton                |             |        |                           |       |       | -20                        | 84/71     | -17.4                     | -11.3 | -22.6  | 89.8/72.9    | 86.1/71.6                 | 82.5/69.3 |      |
| Willmar                | -15         | -11    | 91/74                     | 88/72 | 85/71 | -20                        | 85/71     | -17.4                     | -11.3 | -21.7  | 89.7/73.2    | 86/71.8                   | 82.5/69.9 |      |
| Winona                 | -14         | -10    | 91/75                     | 88/73 | 85/72 | -13                        | 88/74     | -8.9                      | -4.3  | -17.7  | 90.8/73.2    | 88.4/72.6                 | 84.2/70.4 |      |
| Worthington            |             |        |                           |       |       | -14                        | 84/71     | -11.2                     | -7.6  | -15.8  | 88.4/72.3    | 85.6/70.9                 | 82.3/69   |      |

ASHRAE 1981: Winter: Months of December, January, and February  
 Summer: Months of June, July and August

Latest ASHRAE weather based on 8760 hours of the year

**Table C6.4.1  
CLIMATIC DATA DESIGN CONDITIONS**

| <b>City</b>            | <b>Winter<br/>Design db °F</b> | <b>Summer<br/>db °F/coinc wb °F</b> |
|------------------------|--------------------------------|-------------------------------------|
| Aitkin                 | -24                            | 82/72                               |
| Albert Lea             | -15                            | 85/72                               |
| Alexandria AP          | -21                            | 86/70                               |
| Bemidji AP             | -24                            | 84/68                               |
| Cloquet                | -20                            | 82/68                               |
| Crookston              | -27                            | 84/70                               |
| Duluth AP              | -20                            | 81/67                               |
| Ely                    | -29                            | 82/68                               |
| Eveleth                | -26                            | 82/68                               |
| Faribault              | -16                            | 86/73                               |
| Fergus Falls           | -21                            | 86/71                               |
| Grand Rapids           | -23                            | 81/67                               |
| Hibbing                | -19                            | 82/68                               |
| International Falls AP | -28                            | 83/67                               |
| Litchfield             | -18                            | 85/71                               |
| Little Falls           | -20                            | 86/71                               |
| Mankato                | -15                            | 86/72                               |
| Mpls/St. Paul AP       | -15                            | 88/72                               |
| Montivedeo             | -17                            | 86/72                               |
| Mora                   | -21                            | 84/70                               |
| Morris                 | -21                            | 84/72                               |
| New Ulm                | -15                            | 87/73                               |
| Owatonna               | -16                            | 86/73                               |
| Pequot Lakes           | -23                            | 84/68                               |
| Pipestone              | -15                            | 85/73                               |
| Redwood Falls          | -17                            | 89/73                               |
| Rochester AP           | -17                            | 85/72                               |
| Roseau                 | -29                            | 82/70                               |
| St. Cloud AP           | -20                            | 86/71                               |
| Thief River Falls      | -25                            | 82/68                               |
| Tofte                  | -14                            | 75/61                               |
| Warroad                | -29                            | 83/67                               |
| Wheaton                | -20                            | 84/71                               |
| Willmar                | -20                            | 85/71                               |
| Winona                 | -13                            | 88/74                               |
| Worthington            | -14                            | 84/71                               |

## CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

*Author/requestor:* Diana Burk

*Date:* 2/10/2021

*Email address:* diana@newbuildings.org

*Model Code:*

ANSI/ASHRAE/IES Standard 90.1-2019

*Telephone number:* 404-290-5442

*Code or Rule Section:* 6.5.3.7

*Firm/Association affiliation, if any:* New Buildings Institute

*Code or rule section to be changed:* 6.5.3.7, 6.5.3.8

*Intended for Technical Advisory Group ("TAG"):* Commercial Energy Code TAG MR 1323

### General Information

**Yes    No**

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| A. Is the proposed change unique to the State of Minnesota?                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| B. Is the proposed change required due to climatic conditions of Minnesota?            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| C. Will the proposed change encourage more uniform enforcement?                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| D. Will the proposed change remedy a problem?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| E. Does the proposal delete a current Minnesota Rule, chapter amendment?               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| F. Would this proposed change be appropriate through the ICC code development process? | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

### Proposed Language

1. The proposed code change is meant to:

change language contained the model code book? If so, list section(s).

change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

delete language contained in the model code book? If so, list section(s).

delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

X add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.  
No.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and words proposed to be deleted. Include the entire code (sub) section or rule subpart that contains your proposed changes.

**Add new Section 6.5.3.7 as shown (I-P units).**

**6.5.3.7 Low Power Fans.** Fans that are not covered by Section 6.5.3.6 and having a *fan nameplate electrical input power* of less than 180 W or having a *motor nameplate horsepower* less than 1/12 hp shall meet the fan efficacy requirements of Table 6.5.3.7 at one or more rating points.

**Exceptions to 6.5.3.7:**

1. Fans in *space-conditioning equipment*.
2. Intermittently operating dryer exhaust duct power ventilators, domestic range hoods, and domestic range booster fans.
3. Fans in *radon mitigation systems*.
4. Fans not covered within the scope of the test methods referenced in Table 6.5.3.7.5. Ceiling fans regulated under 10 CFR 430 Appendix U.

**Modify Section 6.5.3.8 as shown (I-P).**

**6.5.3.78 Ventilation Design.** The required minimum *outdoor air* rate is the larger of the minimum *outdoor air* rate or the minimum exhaust air rate required by Standard 62.1, Standard 62.2, Standard 170, or applicable codes or accreditation standards. *Outdoor air ventilation systems* shall comply with one of the following:

- a. Design minimum *system outdoor air* provided shall not exceed 135% of the required minimum *outdoor air* rate.
- b. Dampers, *ductwork*, and *controls* shall be provided that allow the *system* to supply no more than the required minimum *outdoor air* rate with a single *set-point* adjustment.
- c. The *system* includes exhaust air *energy* recovery complying with Section 6.5.6.1.

**Table 6.5.3.7 Minimum Fan Efficacy for Low-Power Fans**

| <u>System Type</u>   | <u>Minimum Fan Efficacy<sup>a,b</sup>, cfm/W</u> | <u>Test Method and Rating Conditions</u> |
|--|--|--|
| HRV <sup>c</sup> , ERV <sup>d</sup> , or other system with exhaust air energy recovery | 1.2  | CAN/CSA 439-18                           |
| Transfer fans; in-line <sup>e</sup> supply or exhaust fan                              | 3.8  | ASHRAE Standard 51                       |
| Other exhaust fan, <90 cfm   | 2.8  |  |
| Other exhaust fan, >90 cfm and <200 cfm  | 3.5  |  |
| Other exhaust fan, >200 cfm  | 4.0  |  |

a. Fan efficacy is the volumetric fan airflow rate divided by total fan motor electrical input power at a specified static pressure difference.

b. Fans shall be tested in accordance with the referenced test method. Fan efficacy shall be reported in the product listing or shall be derived from the fan motor electrical input power and airflow values reported in the product listing or on the label. Fan efficacy for fully ducted HRV or ERV, balanced, and in-line fans shall be determined at a static pressure difference not less than 0.2 in. of water for each airstream. Fan efficacy for other ducted fan systems shall be determined at a static pressure difference not less than 0.1 in. of water.

c. A heat recovery ventilator (HRV) is a mechanically powered ventilating device with separate intake and exhaust airstreams and a heat exchanger to transfer a portion of the sensible energy, heat, from one airstream to the other.

d. An energy recovery ventilator (ERV) is a mechanically powered ventilating device with separate intake and exhaust airstreams and a heat exchanger to transfer a portion of the total energy, heat and moisture, from one airstream to the other.

e. An in-line fan is an exhaust or supply fan installed with ductwork on both the fan inlet and outlet.

**Table 6.5.3.7 Minimum Fan Efficacy for Low-Power Fans**

| <u>System Type</u>   | <u>Minimum Fan Efficacy a, b, cfm/W (L/s/W)</u> | <u>Test Method and Rating Conditions</u> |
|--|---|--|
| HRV <sup>c</sup> , ERV <sup>d</sup> , or other system with exhaust air energy recovery | .57   | CAN/CSA 439-18                           |
| Transfer fans; in-line <sup>e</sup> supply or exhaust fan                              | 1.8   | ASHRAE Standard 51                       |
| Other exhaust fan, <42.5 L/s   | 1.3   |  |
| Other exhaust fan, >42.5 L/s and <94.4 L/s   | 1.7   |  |
| Other exhaust fan, >94.4 L/s   | 1.9   |  |

a. Fan efficacy is the volumetric fan airflow rate divided by total fan motor electrical input power at a specified static pressure difference.

b. Fans shall be tested in accordance with the referenced test method. Fan efficacy shall be reported in the product listing or shall be derived from the fan motor electrical input power and airflow values reported in the product listing or on the label. Fan efficacy for fully ducted HRV or ERV, balanced, and in-line fans shall be determined at a static pressure difference not less than 50 Pa for each airstream. Fan efficacy for other ducted fan systems shall be determined at a static pressure difference not less than 25 Pa.

c. A heat recovery ventilator (HRV) is a mechanically powered ventilating device with separate intake and exhaust airstreams and a heat exchanger to transfer a portion of the sensible energy, heat, from one airstream to the other.  
d. An energy recovery ventilator (ERV) is a mechanically powered ventilating device with separate intake and exhaust airstreams and a heat exchanger to transfer a portion of the total energy, heat and moisture, from one airstream to the other.  
e. An in-line fan is an exhaust or supply fan installed with ductwork on both the fan inlet and outlet.

**Renumber section 6.5.3.8:**

**6.5.3.89 Occupied-Standby Controls**

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

No.

**Need and Reason**

1. Why is the proposed code change needed?

This code proposal change is based on ASHRAE addendum a to Standard 90.1-2019.<sup>1</sup> Standard 90.1 is developed under ANSI-approved consensus procedures, and is under continuous maintenance. ASHRAE publishes changes to Standard 90.1 as individual addenda to the preceding Standard, and then bundles them together to form the next published edition. Because addenda are typically not recognized as part of Minnesota's energy code, it is important to incorporate the most crucial addenda to the Minnesota commercial energy code during the adoption process. This addenda establishes minimum fan efficacy requirements for low-power ventilation fans. It also establishes Standard 62.2 as the reference for determining the minimum ventilation rates for non transient dwelling units.

Efficacy requirements for low-power ventilation fans were introduced in the 2012 IECC for whole-house ventilation in low-rise residential buildings. Both mid-rise residential and small commercial buildings often use small ventilation fans which has left a loophole in the code for common energy loads. These fans are often used for point-of-source contaminant exhaust and ventilation in multifamily buildings making them a common and potentially significant energy load. A large number of products on the market can meet these requirements and in fact, the requirement is far below the market average efficiency for bath fans and close to the market average for in-line fans.

2. Why is the proposed code change a reasonable solution?

Exhaust fan efficacies were introduced in the code in 2012 IECC for whole-house ventilation in low-rise residential buildings, but have never been included in the commercial provisions of the IECC. Mid-rise residential occupancies and small commercial buildings often utilize the same small ventilation fans leaving a loophole for a common energy load. These fans are used for point-of-source contaminant exhaust and are frequently utilized as part of a ventilation strategy in multifamily buildings. These fans are also smaller than the threshold for fan size (1/12 HP) that is attached to the other commercial fan requirements. This makes them a common load, and a potentially significant load in multifamily buildings, that is completely unregulated in commercial buildings.

This proposal adopts the table approach already utilized for these fans in the residential section of the code. However, it updates the efficiency requirements. The current residential IECC fan efficacies are from an older version of Energy Star (Version 2.0), so these have been updated to align the latest

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<sup>1</sup> *ANSI/ASHRAE/IES Addendum a to ANSI/ASHRAE/IES Standards 90.1-2019*, ASHRAE Standards Committee, 7 Oct. 2020, [https://www.ashrae.org/file%20library/technical%20resources/standards%20and%20guidelines/standards%20addenda/90\\_1\\_2019\\_a\\_20201030.pdf](https://www.ashrae.org/file%20library/technical%20resources/standards%20and%20guidelines/standards%20addenda/90_1_2019_a_20201030.pdf)

Energy Star requirement Version 4.0. These fan efficacy values are very conservative based on what is currently on the market.

It sets the efficiency requirement at a level that can reasonably be met by a large number of products available on the market. According to the HVI database of fans, the average efficiency of bath fans is around 7 CFM/W, and the average efficiency of in-line fans is 3.1. This proposal, therefore, places the requirement far below the market average efficiency for bath fans and close to the market average for in-line fans, making this a reasonable requirement.

3. What other considerations should the TAG consider?

### **Cost/Benefit Analysis**

1. Will the proposed code change increase or decrease costs? Please explain.

According to a similar amendment (CE140-19) to the 2018 IECC, increasing fan efficacy could increase the cost of construction. The amendment states: "Cost for the kinds of fans covered by this requirement are not driven solely by efficacy. Cost is also a function of flow rate, finishes, design and noise and whether they include other features like lights, sensors, or heaters. In some cases, fans that meet this requirement can be obtained for less other fans that do not. Nevertheless, a comparison of the low-cost exhaust fans shows that this proposal can result in no incremental first costs or short simple paybacks where incremental costs are incurred."

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain.

If a cost is incurred, it will be offset by energy savings.

3. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

No.

4. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed \$25,000 for any one small business or small city? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

No.

### **Regulatory Analysis**

1. What parties or segments of industry are affected by this proposed code change?  
Architects, Engineers, Construction Contractors, Building Officials and Inspectors.

All segments of the industry will be affected by this code change. Architects and engineers will have to specify fans that meet this code requirement. Construction contractors will have to install that fan and building officials and inspectors will have to ensure the fans meet the requirement in code.

2. What are the probable costs to the agency and to any other State agencies of implementing and enforcing of the proposed rule? Is there an anticipated effect on state revenues?

There should be no additional costs to state agencies.

None.

3. Are there less costly intrusive methods for achieving the purpose of the proposed rule?



No.

4. Can you think of other means or methods to achieve the purpose of the proposed code change? If so, please explain what they are and why your proposed change is the preferred method or means to achieve the desired result.

No.

5. What are the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?

As stated above, the incremental costs associated with this change are either negligible or very small resulting in very short payback periods. Building owners and individuals paying utility bills will be the parties who are most affected by this code requirement.

6. What are the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

Not adopting this code requirement would result in increased utility bills for individuals living in mid-rise multifamily housing and small commercial business owners.

7. Are you aware of any federal regulation or federal requirement related to this proposed code change? If so, please list the federal regulation or requirement and your assessment of any differences between the proposed rule and the federal regulation or requirement.

No.

8. Please include an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

There is no additional cumulative effect of the rule when accounting for other federal and state regulations.

\*\*\*Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can be considered by the TAG.

## CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

*Author/requestor:* Diana Burk

*Date:* 2/10/2021

*Email address:* diana@newbuildings.org

*Model Code:*

ANSI/ASHRAE/IES Standard 90.1-2019

*Telephone number:* 404-290-5442

*Code or Rule Section:* 6.5.6.1.2

*Firm/Association affiliation, if any:* New Buildings Institute

*Code or rule section to be changed:* 6.5.6.1.2

*Intended for Technical Advisory Group ("TAG"):* Commercial Energy Code TAG MR 1323

### General Information

**Yes   No**

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| A. Is the proposed change unique to the State of Minnesota?                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| B. Is the proposed change required due to climatic conditions of Minnesota?            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| C. Will the proposed change encourage more uniform enforcement?                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| D. Will the proposed change remedy a problem?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| E. Does the proposal delete a current Minnesota Rule, chapter amendment?               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| F. Would this proposed change be appropriate through the ICC code development process? | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

### Proposed Language

1. The proposed code change is meant to:

change language contained the model code book? If so, list section(s).

change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

delete language contained in the model code book? If so, list section(s).

delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

X add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.  
No.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and words proposed to be deleted. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Modify Section 6.5.6.1.2 as follows:

#### **6.5.6.1.2 Spaces Other than Nontransient Dwelling Units**

Each fan *system* serving spaces other than *nontransient dwelling units* shall have an *energy recovery system* where the design supply fan airflow rate exceeds the value listed in Tables 6.5.6.1.2-1 and 6.5.6.1.2-2, based on the climate zone and percentage of *outdoor air* at design airflow conditions. Table 6.5.6.1.2-1 shall be used for all *ventilation systems* that operate less than 8000 hours per year, and Table 6.5.6.1.2-2 shall be used for all *ventilation systems* that operate 8000 or more hours per year.

For spaces other than *nontransient dwelling units*, *energy recovery systems* shall result in an *enthalpy recovery ratio* of at least 50%. The *energy recovery system* shall provide the required *enthalpy recovery ratio* at both heating and cooling *design conditions*, unless one mode is not required for the climate zone by the exceptions below. Provision shall be made to bypass or *control* the *energy recovery system* to permit *air economizer* operation as required by Section 6.5.1.1.

##### **Exceptions to 6.5.6.1.2**

1. Laboratory *systems* meeting Section 6.5.7.3.
2. *Systems* serving *spaces* that are not cooled and that are heated to less than 60°F.
3. Heating energy recovery where more than 60% of the *outdoor air* heating *energy* is provided from *site-recovered energy* or *site-solar energy* in Climate Zones 5 through 8.
4. *Enthalpy recovery ratio* requirements at heating design condition in Climate Zones 0, 1, and 2.
5. *Enthalpy recovery ratio* requirements at cooling design condition in Climate Zones 3C, 4C, 5B, 5C, 6B, 7, and 8.
6. ~~Where the sum of the airflow rates exhausted and relieved within 20 ft of each other is less than 75% of the design outdoor airflow rate, excluding exhaust air that is~~
  - a. ~~used for another *energy recovery system*,~~
6. Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design outdoor air flow rate.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

No.

### **Need and Reason**

1. Why is the proposed code change needed?

ERVs are a very effective way to increase the energy efficiency of a building. According to recent energy modeling of multifamily buildings in Climate Zone 6, NBI found that the energy savings for installing an ERV in a 10-story multifamily building achieved 10.7% energy savings and for a 20-story multifamily building achieved 10.1% energy savings. Unfortunately, it is common in multifamily buildings to have multiple central exhaust fans in close proximity (less than 20ft) to each other making them exempt under exception 6 in section 6.5.6.1.2. By modifying that exception to be like the related exception in IECC 2021, Minnesota could close this loophole by limiting the application of the exception for when the largest source of air exhausted at a single location is less than 75% of the designed outdoor air flow rate.

2. Why is the proposed code change a reasonable solution?

This amendment would result in the installation of ERVs in most multifamily buildings, an important tool to reducing energy use in multifamily buildings by requiring an appliance that recovers heat from air exhausted from the building.

3. What other considerations should the TAG consider?

None.

### **Cost/Benefit Analysis**

1. Will the proposed code change increase or decrease costs? Please explain.

This proposed code change will increase costs by requiring ERVs for buildings using exception 6 by having multiple central exhaust fans in close proximity (less than 20ft) to each other.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain.

The increased cost of installing ERVs in these buildings will be offset by a significant reduction in the buildings utility bill.

3. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

No.

4. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed \$25,000 for any one small business or small city? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

No.

### **Regulatory Analysis**

1. What parties or segments of industry are affected by this proposed code change?  
Architects, Engineers, Construction Contractors, Building Officials and Inspectors.

All parties will be affected by this proposed code change. Architects and Engineers will have to specify ERVs for more buildings. Construction Contractors will have to install these ERVs and building officials and inspectors will ensure they are installed.

2. What are the probable costs to the agency and to any other State agencies of implementing and enforcing of the proposed rule? Is there an anticipated effect on state revenues?

There should be no additional costs to state agencies.

None.

3. Are there less costly intrusive methods for achieving the purpose of the proposed rule?

No.

4. Can you think of other means or methods to achieve the purpose of the proposed code change? If so, please explain what they are and why your proposed change is the preferred method or means to achieve the desired result.

No.

5. What are the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals?

The probable costs of complying with this requirement by requiring ERVs in more situations would be born by the building owner.

6. What are the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

The costs of not adopting the proposed rule would be born by those paying the utility bills in the building.

7. Are you aware of any federal regulation or federal requirement related to this proposed code change? If so, please list the federal regulation or requirement and your assessment of any differences between the proposed rule and the federal regulation or requirement.

No.

8. Please include an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

There is no cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

\*\*\*Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.