



Conservation Applied Research  
& Development (CARD) Program  
FINAL REPORT

# Energy Code Compliance in Minnesota 2012/2013

## Baseline for ARRA Compliance

**Prepared for:** Minnesota Department of Commerce, Division of Energy Resources  
**Prepared by:** Minnesota Department of Labor & Industry, Construction, Codes and Licensing Division



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## **Abstract:**

**Project Goal:** Assess and record energy code compliance of buildings currently under construction, following the U.S. Department of Energy (DOE) processes, in compliance with the American Recovery and Reinvestment Act of 2009 (ARRA), and identify procedural changes in code enforcement and training needed to improve compliance rates.

From May of 2012 through June of 2013, the Minnesota Department of Labor and Industry, Construction Codes and Licensing Division (CCLD), conducted an assessment of Energy Code compliance in accordance with the federal American Recovery and Reinvestment Act (ARRA) under contract with the Minnesota Department of Commerce, Division of Energy Resources. The objective of the contract was to assist the state in assessing the baseline for ARRA required compliance of new and renovated Residential and Commercial buildings, and to identify code enforcement procedural changes and/or training needs that would improve compliance rates.

This compliance study utilized the 2009 International Energy Conservation Code (IECC) for assessing residential building compliance, and the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 90.1-2007 for assessing commercial building compliance. The results of this study indicate that code compliance for commercial buildings in Minnesota is already over 90%, meeting the ARRA standard for all three building categories assessed. However, residential buildings were only about 75% compliant on average, falling short of the ARRA standard. This lack of compliance for residential buildings is largely due to the differences between the current Minnesota energy code and the ARRA Standard.

Three areas for improving the energy efficiency of Minnesota buildings were identified including providing adequate documentation related to proper heating and cooling equipment sizing, HVAC commissioning, and updating the Minnesota energy code to include enforced standards that meet the ARRA standards. Additional education on building energy codes for building officials, design professionals, contractors and other groups is also recommended.

## **Background:**

The American Recovery and Reinvestment Act of 2009 (ARRA) ([Pub.L. 111-5](#)) set forth the requirements stated below for issuing State Energy Program formula grants. Minnesota received \$54,172,000 in State Energy Program formula ARRA funds, which were instrumental in supporting the Minnesota energy economy as we moved out of the recession. Additionally, the significance of this funding has left a lasting impact through effective training and placement of dislocated workers, money, and energy saved with more efficient homes, expanded business within the renewable energy supply chains, and increased clean energy production (Department of Commerce, 2012).

The ARRA energy program requirement, which all 50 states accepted, stipulates that the State, or the applicable units of local government that have authority to adopt building codes, will implement the following:

- (A) A residential building energy code (or codes) that meets or exceeds the most recent International Energy Conservation Code, or achieves equivalent or greater energy savings.
- (B) A commercial building energy code (or codes) throughout the State that meets or exceeds the ANSI/ASHRAE/IESNA Standard 90.1-2007, or achieves equivalent or greater energy savings.
- (C) A plan to achieve 90 percent compliance with the above energy codes within eight years. This plan will include active training and enforcement programs and annual measurement of the rate of compliance.

A governor's assurance letter (Appendix D) was submitted by Governor Tim Pawlenty to the DOE as a requirement for receiving the funds. This project is intended to partially fulfill the requirements for an annual measurement of the rate of compliance.

Following passage of ARRA, the DOE determined that the residential building energy code that meets the ARRA standard is the 2009 International Energy Conservation Code (IECC). The Minnesota Department of Labor and Industry intends, during 2014, to adopt the 2012 IECC and the ASHRAE Standard 90.1-2010 which, being more stringent than the 2009 IECC required by ARRA, will set the stage toward Minnesota's fulfilling the AARA energy program requirement.

## **DOE Tools:**

The DOE's Building Energy Codes Program (BECP) developed guidelines and tools for measuring and expressing compliance with the ARRA energy program requirement, which are summarized in the report *Measuring State Energy Code Compliance* (Pacific Northwest National Laboratory, 2010). In 2010, the BECP funded eight pilot studies

(unpublished) in nine states to aid all states in their compliance efforts and to provide insight into the effectiveness of these tools and suggestions for their improvement.

To determine compliance with ARRA criteria, the BECP guidelines call for surveys of statistically valid samples for each of four different building populations: residential and commercial, both new and renovations. For most states, the BECP recommends a minimum sample size of 44 buildings in each population. A BECP online tool called the State Sample Generator (DOE, 2010) is based on algorithms developed by Pacific Northwest National Labs (PNNL) and generates a valid random sample of buildings in each county and population distributed across the state and, for commercial new construction only, includes distribution by building size strata.

BECP designed separate checklists for residential and commercial buildings to be completed during plan review as well as during on-site inspections at various construction stages. Another BECP online tool developed by PNNL, the Score + Store™ tool (DOE, 2010) is an application for use by states to collect, store, and evaluate their compliance information and to calculate their overall compliance rate. Data from the checklists is entered into a Score + Store™ database.

One element of the BECP guideline was for building code enforcement authorities to conduct self-assessments of energy code enforcement within their jurisdictions. The stated intent of a self-assessment is to support local code officials assessing the baseline energy code compliance of new and renovated residential and commercial buildings and to identify code enforcement procedural changes and/or training needs that could improve compliance rates. The results of two Minnesota entities, which conducted self-assessments between November 2011 and March 2012, are provided in Appendix A.

To make a determination as to whether ARRA criteria have been met, the BECP guidelines recommend that each state conduct a formal assessment using a third-party entity to evaluate a statistically valid sample of buildings. The Measuring State Energy Code Compliance document recommends procedures for performing this third-party evaluation. The current project is Minnesota's first effort to conduct such an assessment; the survey was completed by CCLD, which is Minnesota's state building code office. As CCLD is only one step removed from the local building code jurisdictions, it would more accurately be termed a "second-party." However, the BECP definition of "second-party" is as follows: "A second-party evaluation would be performed by the entity responsible for validating compliance, such as state or local government, through their direct oversight of those designing and constructing buildings". Therefore, because CCLD is not the entity responsible for validating code compliance for locally approved building projects, its participation should suffice as a formal third-party assessment.

## **Methodology:**

This study required that “using the BECP State Sample Generator Tool, CCLD will generate a sample of jurisdictions for the project.” This tool generates a sample number for both commercial and residential buildings that will need to be reviewed and studied. The selection of these projects is based on data relating to the number of permits issued in counties across Minnesota over the past few years. Minnesota has a statewide building code in effect; however, enforcement is not statewide at the current time. Therefore, the data from the sampler program was only able to use the permit data as reported by jurisdictions with an enforcement program in effect to generate the number of buildings required for study in each county. Building officials put CCLD staff in contact with builders that worked in both code enforcement and non-enforcement areas of the State in an attempt to broaden the scope. The sample generator tool only identified building numbers by counties. CCLD contacted the local jurisdictions within each county to identify specific buildings that qualified for the project. This was done by discussing the overall project and what was needed with code officials within each relevant county. Minnesota was experiencing a generally slower time in the construction industry, therefore there was a limited sample of buildings available to choose from that were still in the construction process. The department does believe that through perseverance, communication, and positive commitment of both the local and state authorities, the sample set of buildings represents an accurate cross section of construction in Minnesota.

Checklists developed by DOE in conjunction with their “Score + Store™” software were used as the means to evaluate the compliance of structures that were inspected in this study. The resulting data were entered into the national “Score + Store™” software for all buildings involved in the compliance study. The compliance averages used in the report were tabulated utilizing this software program. CCLD subcontracted with the mechanical engineering firm *engineering design initiative* for evaluation of more complex mechanical systems which included complex control systems.

## **Results**

The sample sizes for buildings studied for this report were:

- 54 New residential
- 20 Residential additions
- 19 Residential renovations
- 30 New commercial
- 30 Commercial additions
- 12 Commercial renovations

Only two buildings were found in non-enforcement areas and one project did not proceed for financial reasons. As a result, only one building in a non-enforcement area of the state was assessed for this project and that building was a residential that did not affect the statistical sample. All of the remaining buildings are located in code enforcement areas of Minnesota.

Of the commercial projects studied, two projects, due to state funding, were required to comply with the Minnesota Sustainable Building Guidelines (MSBG)<sup>1</sup>. These projects met the ARRA standard 100%, but were not a large enough factor to skew the statistical sample and so are included in the overall results.

The resulting averages at the time of final inspection for each building category are broken down into three permit categories—new, addition, or renovation—for both residential and commercial buildings.

The weighted average for residential building compliance with the provisions of the 2009 IECC was 76.8% overall (Table 1). Average compliance rates for specific residential categories were highest for new construction at 80.2%, followed by renovations at 72.7%, and finally additions at 71.6%.

**Table 1. Compliance Rates for Assessed Building Categories**

<b>Building Permit Category</b>	<b>Average % Compliance</b>	<b>Sample Size</b>
Residential New Construction:	80.2%	54
Residential Additions:	71.6%	20
Residential Renovations:	72.7%	19
<b>Weighted Residential Average:</b>	<b>76.8%</b>	<b>Total: 93</b>
Commercial New Construction:	90.1%	30
Commercial Additions:	93.2%	30
Residential Renovations:	92.6%	12
<b>Weighted Commercial Average:</b>	<b>91.8%</b>	<b>Total: 72</b>

The weighted average for commercial building compliance with the provisions of the ASHRAE Standard 90.1-2007 was 91.8% overall (Table 1). Averages for specific commercial categories were highest for additions at 93.2%, followed by renovations at 92.6%, and finally new construction at 90.1%

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<sup>1</sup> In Minnesota, all new building which receive funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding after January 1, 2009 are required to meet MSBG guidelines, which include that they exceed the state energy code by at least 30%. Further information on MSBG can be retrieved from the [MSBG website](#).

Store + Score™ summary sheets for each of the six building permit categories assessed are attached as Appendix C.

CCLD tracking sheets listing all the inspected projects and compliance ratings at certain stages for both commercial and residential, are included in Appendix B with observations listed below by building type and permit category:

**Results pertaining to all building categories:**

1. For both commercial and residential buildings, it was found that the initial documents submitted to the building departments for permit application were lacking complete heat loss and gain calculations. This appears in every category.
2. For all building types there was also the frequent absence of calculations for HVAC equipment sizing and thus proper duct sizing.

**Results pertaining to new residential buildings:**

1. A high compliance rate was seen for dampers installed on air intakes and exhausts.
1. Wall insulation was consistently installed in accordance with manufacturer's instructions.
2. Programmable (set-back) type thermostats were installed on forced air systems.
3. Low compliance was seen for attic access panels that do not meet the R-value required for the rest of the attic.
4. The R-values of the basement and ceiling insulations were consistently less than that required by review standard.
5. The items that most commonly missing during inspections included proper information for U-factors required on exterior doors.
6. Heating and cooling calculations to assure proper sizing of the equipment are not being submitted.
7. Furnaces in all new and one remodeled homes in this sample where the efficiency could be determined were 90 percent and above high efficiency condensing units.
8. Mechanical cooling in homes in this sample where the efficiency could be determined: 45 were minimum efficiency (13 SEER) and seven (13.5 percent) were higher efficiency (six at 16 SEER and one at 14 SEER).



### **Results pertaining to additions to residential buildings:**

1. For additions to residential buildings, the percentage rate of compliance is lower than for new construction.
2. Low compliance was seen for attic access panels that do not meet the R-values required for the rest of the attic.
3. High compliance rates were seen for labeled windows that meet the requirements of the review standard.
4. Low rates of compliance were seen for the R-value of the ceiling insulation.
5. Information was not commonly provided for the proper sizing of the Mechanical equipment.

### **Results pertaining renovations of residential buildings:**

1. Requirements with the highest compliance percentage in renovations are related to the sealing of the building envelope and its components, including recessed light fixtures.
2. Low compliance was found for completeness of submittal documents.
3. A very low compliance rate was found in renovations for the required posting of a building energy certificate.

### **Results pertaining to all three categories of commercial buildings:**

1. High compliance was observed to the review standard for temperature controls for service water heating systems.
2. High compliance was observed for use of energy efficient exit signs.
3. High compliance was seen for integration of lighting controls.
4. The lowest percentage of compliance was the submittal of complete sets of plans and specs at the time of permit application.
5. An item typically not seen was a complete set of operating and maintenance manuals for the building owner.
6. Acceptance testing is currently required to be provided to the owner and the building official has to ask for them to get a copy. As such they were not available for the projects studied.

These observations are summarized in Table 2 below:

**Table 2. Summary of Observations**

RESULTS		RESIDENTIAL			COMMERCIAL		
		New	Add	Renov.	New	Add	Renov.
% Compliant Overall		80.2%	71.6%	72.7%	90.1%	93.2%	92.6%
<b>LOW COMPLIANCE</b>	Submitted documents lacking needed information	X	X	X	X	X	X
	Submitted documents lacked U-value information on exterior doors	X					
	Submitted documents lacked needed information on heating and cooling calculations to assure proper sizing of HVAC equipment	X	X				
	Attic access panels that do not meet R-value required for rest of attic	X	X				
	R-values of ceiling insulation less than required	X	X				
	R-values of basement insulation less than required	X					
	Required posting of building energy certificate			X			
	Submittal of specs and plans at time of permit application				X	X	X
	Lacked complete set of O&M manuals for building				X	X	X
<b>HIGH COMPLIANCE</b>	Dampers installed on air intakes and exhausts	X					
	Wall insulation installed in accord with manufacturer's instructions	X					
	Programmable set-back thermostats installed on forced air systems	X					
	Labeled windows that meet requirements		X				
	Sealing building envelope & components, including recessed lights			X			
	Temperature controls on service hot water heaters	n/a	n/a	n/a	X	X	X
	Use of energy efficient exit signs	n/a	n/a	n/a	X	X	X
	Integration of lighting controls	n/a	n/a	n/a	X	X	X

## **Discussion of Results:**

For all building types it was observed that insufficient documentation is being provided with permit applications to demonstrate energy code compliance. While this lack of documentation is in itself non-compliant, for the most part the insufficient documentation did not appear to be a deterrent to completed projects being built in accordance with energy code requirements.

The other observation for all building types was the frequent absence of calculations for equipment sizing. This is a code violation and could have negative impacts on energy performance. Even a high efficiency piece of equipment that is not run within its design parameters will not perform to the efficiency levels it was designed for. An undersized unit runs too long and an oversized unit, which is usually the case, cycles too frequently. The fact that we see high efficiency equipment is tempered by the need to know that it is properly sized.

### **Residential:**

Certain elements of Minnesota's current energy code in place since June 2009 are less stringent than the ARRA standard, particularly insulation requirements for walls, ceilings and foundation walls. As a result, the study frequently found these elements, while up-to current Minnesota code, failed to meet the ARRA baseline criteria. Existing Minnesota code and ARRA standard require manufactures to label exterior door U-factors before shipping. However, during this study labeling requirements were not met.

Elements that were found to almost always meet the ARRA standards included air intake and exhaust dampers, programmable thermostats, and window U-factors. Most windows sold in Minnesota today are labeled and are more efficient than the Minnesota energy code requires, with U- factor approximately 0.29 on average.

Lack of compliance was seen for attic access panels. They do not meet the R-values required for the rest of the attic. They are typically insulated with a piece of R-38 batt insulation glued to the top of the panel.

State Building Code requires that all elements of additions comply with the same requirements as for new structures. It is common that additions have more homeowner involvement and most homeowners have little understanding of the code requirements. Never-the-less this study found that residential additions, for the most part, were in compliance with existing Minnesota code requirements but were somewhat lower in meeting the ARRA standards.

For residential renovation, the highest compliance was seen in sealing of the building envelope and its components, including recessed light fixtures. Lowest compliance was

seen with submittal of complete documents and posting of the required building energy certificate. In the case of renovations, sometimes submittal documents are incomplete because once the walls and/or ceilings are opened up the scope of work expands due to the discovery of additional, necessary repairs.

### **Commercial:**

Consistency was seen in items that complied, did not comply, or items that we were not able to observe across all commercial buildings including new buildings, additions, and renovations.

The items in all three categories that provided the highest compliance percentage to the ARRA standard were temperature controls on the service water heating systems, exit signage, and lighting control. Exit signage now utilizes LED technology to provide exit signs with a power factor of one-half of a watt per face, which is much lower than the 5 watts per face as allowed by the code. Building designers are incorporating lighting engineers into the building process for the building's design.

The lowest compliance was seen for complete construction documents. This should include plans and specs for all aspects of the building, including all of the buildings mechanical systems. The items that are most frequently not included are the fenestration products and their testing for U-factors, Solar Heat Gain Coefficients (SHGC's), and air leakage.

It was not observed if owners received operating and maintenance manuals for their building. It is also not clear that owners had received acceptance testing reports for the operation of the overall systems. Delivery of these items to the owner is not currently required by the building code or monitored by the building official. Acceptance testing and commissioning are critical to ensure that the overall efficiencies designed in to the system are in place for building operation.

### **Conclusions and Recommendation:**

In summary, a statistically valid sample of Minnesota Commercial buildings that were studied did meet the ARRA standard. However, the statistically valid sample of Minnesota residential buildings that were studied fell short of meeting the ARRA standard. The shortfall in residential buildings was largely due to the differences between the current Minnesota energy code and the ARRA Standard.

For improving energy efficiency of new, added to, or remodeled Minnesota buildings, emphasis must be given to the three areas most frequently found to be lacking energy code compliance:

- adequate documentation provided with the permit application, related to proper heating and cooling equipment sizing,
- HVAC commissioning, and
- Updating the Minnesota energy code to include enforced standards that meet the ARRA standards.

The new energy codes being adopted in 2014 will put more emphasis on what is included in commissioning and acceptance testing and enforcement by the building official as part of the construction process.

Both permit applicants and building officials appear to be well informed in certain elements of the energy code, but lacking in others areas. It is the authors' opinion that the following training will improve energy code compliance:

- Provide education to building officials. It is critical to further educate building officials on the energy codes and the required submittals.
- Provide education for design professionals. It is important to educate design professionals on the codes and on the submittals required so that energy requirements are clearly evident early in the process.
- Provide education for contractors. It is important to continue to educate contractors on the code and what submittals are needed in conjunction with permits.
- Provide education, for both residential and commercial segments of the industry, emphasizing energy code requirements for the correct sizing of mechanical equipment.

Furthermore, the current rules adoption of the 2012 IECC and the ASHRAE 90.1-2010 is critical to updating the state energy code in order to meet the new standards required in conjunction with ARRA.

Building officials that do not enforce the adopted energy code will be subject to administrative penalties and loss of their certification.

## **References:**

Minnesota Department of Commerce, December, 2012. "SEP ARRA Final Report – Minnesota." Minnesota Department of Commerce, 857<sup>th</sup> Place East, Suite 500, St. Paul, MN 55101-2198. The [SEP ARRA Final Report](#) is available on line.

Pacific Northwest National Laboratory, March 2010. "Measuring State Energy Code Compliance", Prepared for the U.S. Department of Energy under Contract DE-AC05-76RL01830. Pacific Northwest National Laboratory, Richland, Washington, 99352. A copy of the [Measuring State Energy Code Compliance](#) document is available on line.

U.S. Department of Energy (DOE), 2010. State Sample Generator tool. Retrieved from the [Sample Generator web page](#) on DOE's website.

U.S. Department of Energy (DOE), 2010. Score + Store™ tool. Retrieved from the [Store + Score™ web page](#) on DOE's website.

## **APPENDIX A – Two Minnesota ARRA Self-Assessments**

In late 2011, the Minnesota Department of Commerce provided grants to Scott County and the City of Woodbury to conduct energy code self-assessments in accordance with the BECP guidelines. The grant agreements specified self-assessments must have been applied for permits not before June 1, 2009, the most recent (and current) Minnesota energy code.

Of course, the baseline energy code used for comparison in these assessments was the ARRA requirement of the 2009 IECC for residential buildings and the ASHRAE Standard 90.1-2007 for commercial buildings. This contrasts with the Minnesota energy code that became effective on June 1, 2009 and was based on the 2004 IECC for residential buildings and the ASHRAE Standard 90.1-2004 for commercial buildings.

The objective of the self-assessment grants was to help local code officials assess the baseline energy code compliance of new and renovated residential and commercial buildings and to identify code enforcement procedural changes and/or training needs that could improve compliance rates. In addition, data collected through these grants will be made available to the U.S. Department of Energy (DOE) as part of a national evaluation of energy codes compliance. This grant program seeks geographic diversity among the participating jurisdictions.

Both used the BCAP generated checklists and recorded results with the Score and Store tool. Because the 2009 IECC is not the current energy code in Minnesota, it was expected that surveyed buildings would fall somewhat short of the 90% compliance rate set by the ARRA energy program requirement and put forth in the governor's assurance letter.

### **Scott County self-assessment**

The Scott County Building Official's office enforces the building code (including the energy code) in 11 townships in the county. The Building Official office conducted plan reviews of every new home under their jurisdiction for which a permit had been applied for between June 1, 2009 and March, 2012. ARRA criteria plan reviews were done for 105 new residential buildings. Out of this same set of buildings, 40 on-site ARRA criteria compliance surveys were also performed.

Since nearly all homes had been constructed and occupied long before the site visits, the BCAP checklists were filled out using data from the plan reviews assuming the buildings were constructed as planned. The validity of this assumption was confirmed by observations of the building elements visible during the site visits as well as

## **APPENDIX A – Two Minnesota ARRA Self-Assessments**

experience of inspectors having examined all of these homes while they were under construction.

The checklist data were entered into a Score and Store database. The county used a portion of its grant funds to purchase a blower door and obtain training for two of their building inspectors. Blower door tests were performed on 15 of the homes that received on-site compliance surveys. The county intends to include a blower door test as part of future residential final inspections.

The Scott County survey Score and Store report gave an 84.4% overall average compliance rate when evaluated against the 2009 IECC. The compliance rate ranged from 72.7 percent to 100 percent. The blower door tests averaged 2.1 air exchanges per hour (ACH) (Figure A-1). This result is substantially tighter than 2009 IECC optional requirement of 7.0 ACH, and even well below the 2012 IECC requirement for residential buildings of 3.0 ACH.

Items with the highest compliance rate were:

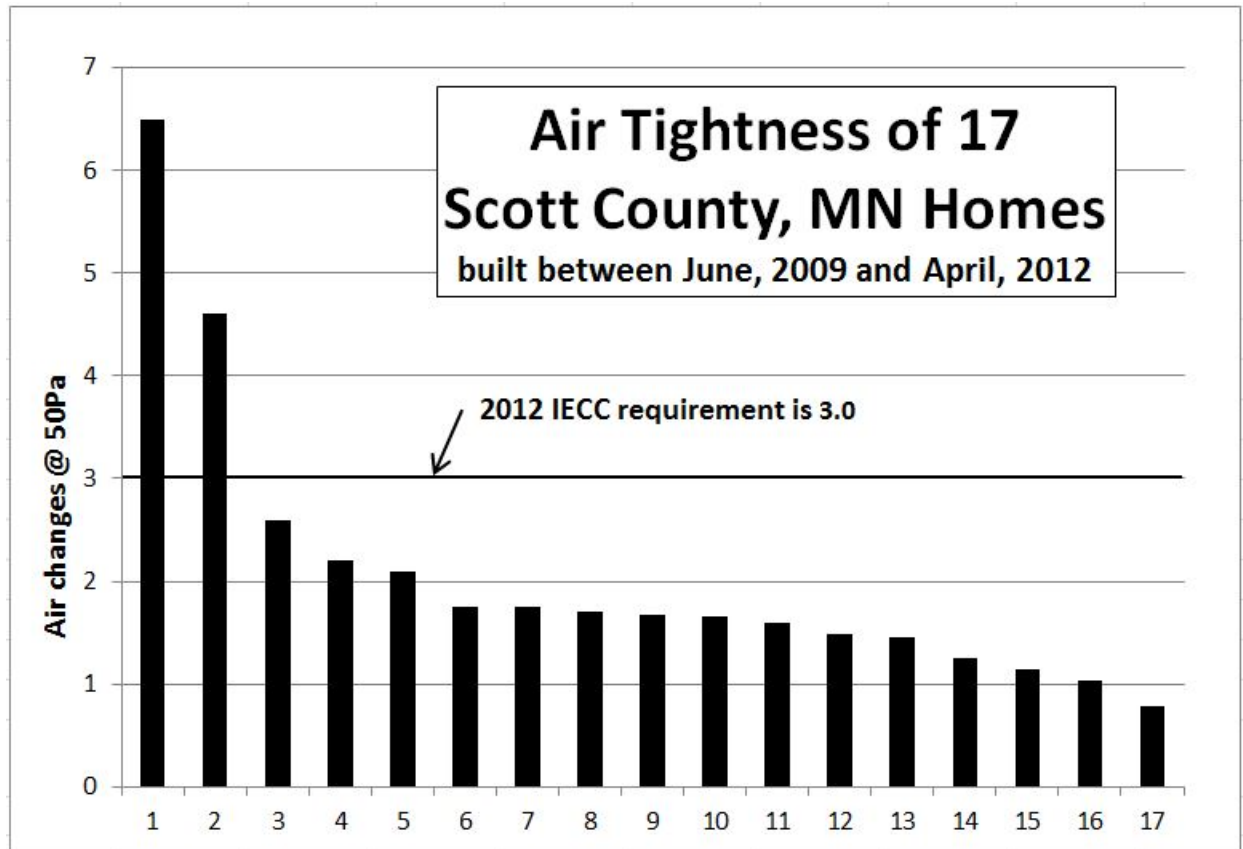
- Programmable thermostats installed on forced air furnaces.
- Construction drawings and documentation sufficiently demonstrates energy code compliance for the building envelope.
- Ceiling insulation installed per manufacturer's instructions.

Items with the lowest compliance rate (against the 2009 IECC) were:

- Attic access hatch and door insulation
- Conditioned basement wall insulation R-value.
- Wall insulation R-value.



## APPENDIX A – Two Minnesota ARRA Self-Assessments



**Figure A-1**

The county also conducted commercial building plan reviews for five new and one remodeled buildings. No on-site reviews could be performed for these buildings, so the BCAP checklists were filled out using data from the plan reviews assuming the buildings were constructed as planned. The Score and Store results give a 9.3 percent average compliance rate for the five new buildings and a 67.4 percent compliance rate for the remodeled building. These compliance rates were against the ASHRAE 90.1-2007, while the Minnesota energy code in place when these projects had applied for permits was based on the ASHRAE 90.1-2004.

### **City of Woodbury self-assessment**

Plan reviews and site inspections were done for sixteen single family homes in various stages of construction within four Twin Cities' metropolitan area jurisdictions. The checklist provided by the Building Energy Codes Program (BECP) was used to record compliance with the 2009 IECC. Data were entered into a Score and Store database.

The City of Woodbury survey Score and Store report gave a 53.6 percent overall average compliance rate when evaluated against the 2009 IECC. The compliance rate ranged from 18.5 percent to 64.6 percent.

## **APPENDIX A – Two Minnesota ARRA Self-Assessments**

Items with the highest compliance rate were:

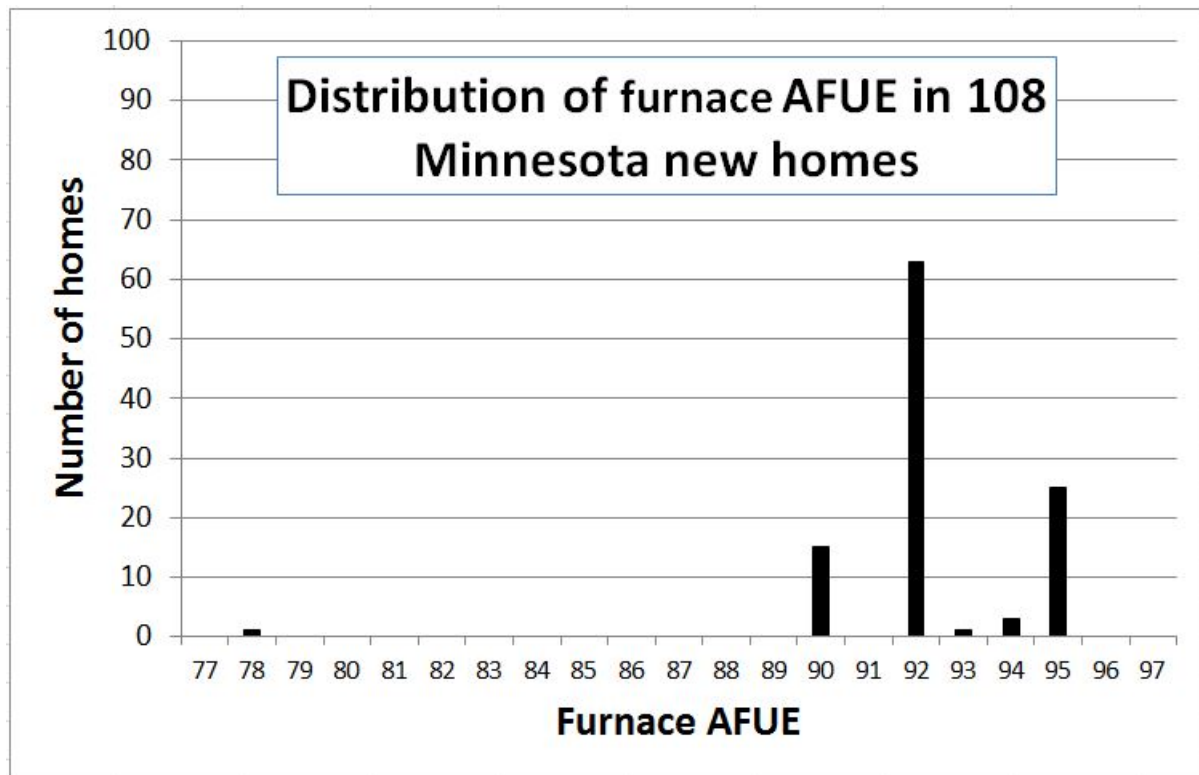
- Slab edge insulation installed per manufacturer's instructions.
- Ceiling insulation installed per manufacturer's instructions.
- All joints and seams of air ducts, air handlers, filter boxes, and building cavities used as return ducts are sealed.

Items with the lowest compliance rate (against the 2009 IECC) were:

- Duct tightness via post-construction maximum leakage.
- Slab edge insulation R-value.
- Fenestration labeled as meeting AAMA/WDMA/CSA 101/I.S.2/A440.

### **Furnace efficiencies for self-assessment reviewed homes**

In addition to the ARRA criteria compliance, the Department of Commerce required in the grant agreements with both the City of Woodbury and Scott County that heating and cooling system type and efficiencies be recorded. Figure A-2 shows the rated furnace efficiencies of the 108 homes of the sample in which furnaces were installed.



**Figure A-2**

**APPENDIX B – Compliance Tracking Sheets**

**Compliance Tracking Sheet for Residential Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
Andover Res-1	Andover	Anoka	6	MN	69.0%	82.9%	60.8%	92.1%, 13 SEER, Eff. H2O
Austin Res - 1	Austin	Mower	6	MN	44.1%	54.4%	65.3%	92.1%, 13 SEER, Eff. H2O
Austin Rem-1	Austin	Mower	6	MN	21.4%	73.3%	60.9%	92.1%, 13 SEER, Eff. H2O
Baxter Res – 1	Baxter	Crow Wing	7	MN	88.5%	82.0%	79.8%	92.1%, 13 SEER, Eff. H2O
Champ Res - 1	Champlin	Hennepin	6	MN	46.2%	66.7%	62.5%	92.1%, 13 SEER, High Eff. H2O
Chaska Rem - 1	Chaska	Carver	6	MN	0.0%	45.0%	66.7%	92.1%, 13 SEER, High Eff. H2O
Chaska Res – 1	Chaska	Carver	6	MN	50.0%	73.8%	68.0%	92.1%, 13 SEER, High Eff. H2O
Det. Lakes Res-1	Detroit Lakes	Becker	7	MN	76.9%	80.0%	84.3%	92.1 % Furnace 7.7 HSPF on Heat Pumps High Eff. H2O Heater
Duluth Rem - 1	Duluth	St. Louis	7	MN	85.7%	95.7%	Final PR= 95.7%	92.1%, 13 SEER, Eff. H2O

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<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
Duluth Res- 1	Duluth	St. Louis	7	MN	13.0%	73.4%	70.7%	92.1%, N/A, Eff. H2O
Duluth Res- 2	Duluth	St. Louis	7	MN	50.0%	85.0%	65.8%	95%, 13 SEER, Elec. H2O
E. B. Rem -1	East Bethel	Anoka	6	MN	0.0%	46.5%	50.0%	N/A
E. B. Rem -2	East Bethel	Anoka	6	MN	21.4%	73.8%	72.3%	N/A
E.B. Rem -3	East Bethel	Anoka	6	MN	0.0%	N/O	58.3%	N/A
F. L. Res-1	Forest lake	Washington	6	MN	55.0%	71.2%	70.7%	92.1%,13 SEER, N/O
F. L. Res-2	Forest lake	Washington	6	MN	42.9%	78.9%	78.6%	Not completed
F. L. Res-3	Forest lake	Washington	6	MN	50.0%	71.9%	63.5%	92.1%, 13 SEER, High Eff. H2O
F. L.Rem-1	Forest lake	Washington	6	MN	21.4%	76.9%	82.4%	N/A
Grand Rap. Res-1	Grand Rapids	Itasca	7	MN	0.0%	58.3%	59.1%	Elect Boiler No AC

**APPENDIX B – Compliance Tracking Sheets**

**Compliance Tracking Sheet for Residential Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
Grand Rap Rem-1	Grand Rapids	Itasca	7	MN	23.1%	70.2%	68.6%	N/A (Existing)
H. L. Res-1	Ham Lake	Anoka	6	MN	13.5%	37.5%	50.0%	90%, 13 SEER, N/O
H. L. Res-2	Ham Lake	Anoka	6	MN	57.1%	63.2%	54.9%	90%, 13 SEER, N/O
Inver Gr. Hts. Res -1	Inver Grove Heights	Dakota	6	MN	65.7%	74.6%	74.2%	92.1%, 13 SEER, High Eff. H2O
Inver Gr. Hts. Res -2	Inver Grove Heights	Dakota	6	MN	69.0%	63.5%	67.9%	92.1%, 13 SEER, Eff. H2O
Inver Gr. Hts. Rem-1	Inver Grove Heights	Dakota	6	MN	35.3%	82.2%	84.3%	N/A
Inver Gr. Hts. Rem-2	Inver Grove Heights	Dakota	6	MN	60.9%	PR= 83.3%	84.6	N/A
M.G. Res-1	Maple Grove	Hennepin	6	MN	69.0%	86.7%	77.9%	92.1%, 13 SEER, N/O
M.G. Res-2	Maple Grove	Hennepin	6	MN	54.1%	78.9%	68.8%	92.1%, 13 SEER, N/O

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<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
M.G. Res-3	Maple Grove	Hennepin	6	MN	45.5%	67.7%	71.6%	92%, 13,SEER, N/O
M.V. Res-1	Mounds view	Ramsey	6	MN	48.3%	51.2%	67.4%	92.1%, 13 SEER, Elec, N/O
Mank Res-1	Mankato	Blue earth	6	MN	85.0%	50.9%	51.2%	90% +, 16 SEER, N/O
Mank Res-2	Mankato	Blue earth	6	MN	74.3%	84.2%	75.9%	90% +, 14 SEER, N/O
Mank Res-3	Mankato	Blue earth	6	MN	76.9%	71.0%	77.8%	92.1% +, 13 SEER, N/O
Mank Rem-1	North Mankato	Blue earth	6	MN	0.0%	52.0%	43.3%	N/A
Medina Res-1	Medina	Hennepin	6	MN	50.0%	44.7%	44.7%	N/A
Medina Rem-1	Medina	Hennepin	6	MN	47.8%	Project Completed	Without	Inspections
Moorhead Res-1	Moorhead	Clay	7	MN	25.0%	75.7%	78.9%	92%, 13 SEER, N/O
Moorhead Res-2	Moorhead	Clay	7	MN	25.0%	88.2%	83.3%	95%, 13 SEER, N/O
Moorhead Res-3	Moorhead	Clay	7	MN	45.0%	70.7%	61.3%	92.1%, No A/C, Elect. H2O

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**Compliance Tracking Sheet for Residential Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
N.B. Rem-1	New Brighton	Ramsey	6	MN	40.0%	60.5%	69.6%	N/A
Now Res-1	Nowthen	Anoka	6	MN	28.1%	51.7%	45.6%	95%, 13 SEER, N/O
Pine Res-1	Pine City	Pine	7	MN	51.7	73.0%	76.3%	92.1%, 13 SEER, High Eff. H2O
Pine Res-2	Pine City	Pine	7	MN	51.7	73.0%	76.3%	92.1%, 13 SEER, High Eff. H2O
Pine Res-3	Pine City	Pine	7	MN	51.7	73.0%	76.3%	92.1%, 13 SEER, High Eff. H2O
Ply Res-1	Plymouth	Hennepin	6	MN	65.4%	77.6%	77.6%	2-90% Furnaces, 13 SEER, High Eff. H2O
Ply Res-2	Plymouth	Hennepin	6	MN	62.5%	72.6%	69.5%	92.1%, 13 SEER, N/O
Ply Res-3	Plymouth	Hennepin	6	MN	73.9%	66.7%	69.8%	92.1%, 13 SEER, High Eff. H2O
Ply Rem-1	Plymouth	Hennepin	6	MN	0.0%	73.7%	66.7%	N/A

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<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
Ply Rem-2	Plymouth	Hennepin	6	MN	54.5%	N/A	N/A	N/O
Pope Res-1	Glenwood *	Pope	6	MN	0.0%	64.6%	65.1%	92.1%, 13 SEER, High Eff. H2O
Pr Lake Res-1	Prior Lake	Scott	6	MN	25.0%	67.2%	69.9%	92.1%, 13 SEER, High Eff. H2O
Pr Lake Res-2	Prior Lake	Scott	6	MN	62.5%	71.0%	63.6%	96%, 16 SEER, 50 Gal H2O
Pr Lake Res-3	Prior Lake	Scott	6	MN	25.0%	67.2%	63.6%	96%, 16 SEER, 50 Gal H2O
Roch Res-2	Rochester	Olmstead	6	MN	60.9%	93.8%	93.0%	92.1%, 13 SEER, N/O
Roch Rem-1	Rochester	Olmstead	6	MN	33.3%	82.4%	80.5%	N/A
S.F. Res-1	St... Francis	Anoka	6	MN	31.4%	47.9%	66.0%	90%, 13 SEER, N/O
S.F. Rem -1	St Francis	Anoka	6	MN	0.0%	PR 0.0%	Removed From Program	Not Started Due to illness
Savage Rem-1	Savage	Scott	6	MN	100.0%	71.7%	62.8%	N/A



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Savage Rem-2	Savage	Scott	6	MN	50.0%	No Insp	Could Not	Gain access
Savage Rem-3	Savage	Scott	6	MN	0.0%		62.5%	N/A
Savage Rem-4	Savage	Scott	6	MN	0.0%	76.9%	68.6%	N/A
Shako Res-1	Shakopee	Scott	6	MN	23.1%	PR= 77.0%	85.4%	92.1%, 13SEER, High Eff. H2O
Shako Res-2	Shakopee	Scott	6	MN	47.8%	64.6%	62.3%	92.1%, 13 SEER, N/O
Shako Res-3	Shakopee	Scott	6	MN	39.1	63.5%	54.9%	92.1%, 13 SEER, N/O
Shako Res-4	Shakopee	Scott	6	MN	62.5%	74.6%	68.1%	92.1%, 13 SEER, N/O
Sherb Cty Res-1	Zimmerman	Sherburne	6	MN	0.0%	69.6%	72.2%	92.1%, 13 SEER, High Eff. H2O
Sherb Cty Res-2	Zimmerman	Sherburne	6	MN	27.3%	78.4%	70.7%	High Eff. Ground Source System
Sherb Cty Res-3	Zimmerman	Sherburne	6	MN	31.6%	51.5%	73.6%	92.1%, 13 SEER, High Eff. H2O

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**Compliance Tracking Sheet for Residential Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u> (Furnace, AC & Water Heater)
Sherb Cty Rem-1	Princeton	Sherburne	6	MN	0.0%	64.1%	71.7%	N/A
Sherb Cty Rem-2	St Cloud	Sherburne	6	MN	0.0%	74.4%	69.8%	N/A
Sherb Cty Rem-3	Big Lake	Sherburne	6	MN	20.0%	71.4%	71.1%	N/A
St L. P. Res-1	St Louis Park	Hennepin	6	MN	60.9%	N/O	65.4%	92.1%, 13 SEER, N/O
St L. P. Res-2	St Louis Park	Hennepin	6	MN	80.0%	76.6%	79.5%	92.1%, 13 SEER, High Eff. H2O
St L. P. Rem-1	St Louis Park	Hennepin	6	MN	0.0%	64.3%	57.3%	N/A
Still Res-1	Stillwater	Washington	6	MN	73.9%	79.7%	72.7%	96%, 16 SEER, 50 Gal H2O
Still Rem-1	Stillwater	Washington	6	MN	50.0%	63.9%	72.1%	N/A
Wdby Res-1	Woodbury	Washington	6	MN	71.1%	74.1%	57.5%	96%, 16 SEER, 50 Gal H2O
Wdby Res-2	Woodbury	Washington	6	MN	17.2%	81.8%	72.2%	96%, 16 SEER, 50 Gal H2O
Wdby Rem-1	Woodbury	Washington	6	MN	0.0%	Un Available	69.6	N/A

## APPENDIX B – Compliance Tracking Sheets

### **Compliance Tracking Sheet for Residential Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Final Inspection Compliance %</u>	<u>Efficiency of Appliances</u>  (Furnace, AC & Water Heater)
Wdby Rem-2	Woodbury	Washington	6	MN	0.0%	Un Available	95.7 %	92.1%, 13 SEER, High Eff. H2O
Wdby Rem-3	Woodbury	Washington	6	MN	27.3%	Un Available	67.1%	N/A
Wright Cty Res-1	Annandale	Wright	6	MN	62.1%	67.7%	63.1%	92.1%, 13 SEER, N/O
Wright Cty Rem-1	Annandale	Wright	6	MN	42.9%	69.4%	70.0%	N/A

Notes on Tracking Sheet for Residential Buildings and Inspections:

- Buildings with a \* noted in the table next to the name of the City are buildings built in jurisdictions with no code enforcement.
- Job code with “Res” indicates new construction and additions, and with “Rem” indicates remodeled.

**APPENDIX B – Compliance Tracking Sheets**

**Compliance Tracking Sheet for Commercial Buildings and Inspections**

<u>Job Code #</u>	<u>City</u>	<u>County</u>	<u>Climate Zone</u>	<u>State</u>	<u>Plan Review Compliance %</u>	<u>Insulation Inspection Compliance %</u>	<u>Notes</u>
Alex New-1	Alexandria	Douglas	7	MN	44.0%	86.4%	Jobs Still in progress
Alex New-2	Alexandria	Douglas	7	MN	22.7%	83.7%	
Alex Rem-1	Alexandria	Douglas	7	MN	94.2%	94.9%	
Alex Rem-2	Alexandria	Douglas	7	MN	N/O	96.4%	Mechanical only
Alex Rem-3	Alexandria	Douglas	7	MN	N/O	98.9%	Mechanical Only
Anoka Cty Rem-1	Andover	Anoka	6	MN	95.4%	95.1%	
Apple Valley New-1	Apple Valley	Dakota	6	MN	100%	95.2%	
Baxter Rem-1	Baxter	Crow wing	7	MN	66.7%	94.0%	
Bemidji Rem-1	Bemidji	Beltrami	7	MN	31.8%	82.9%	Job still in progress
Bemidji Rem-2	Bemidji	Beltrami	7	MN	N/O	87.5%	

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Bemidji Rem-3	Bemidji	Beltrami	7	MN	N/O	91.4	Mechanical Only
Blaine New-1	Blaine	Anoka	6	MN	0.0%	79.3%	
Blaine Rem-1	Blaine	Anoka	6	MN	0.0%	52.9%	
Center City New-1	Center City	Chisago	6	MN	N/O	87.5%	Mechanical Only
Cloquet Rem-1	Cloquet	Carlton	7	MN	78.6%	90.4%	
Coon Rapids New-1	Coon Rapids	Anoka	6	MN	32.0%	78.6%	
Coon Rapids Rem-1	Coon Rapids	Anoka	6	MN	0.0%	0.0%	Project abandoned
Crook New-1	Crookston	Polk	7	MN	8.7%	75.5%	
Crook Rem-1	Crookston	Polk	7	MN	20.0%	79.0%	
Duluth New-1	Duluth	St Louis	7	MN	29.4%	100.0%	

## APPENDIX B – Compliance Tracking Sheets

### Compliance Tracking Sheet for Commercial Buildings and Inspections

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Duluth New-2	Duluth	St Louis	7	MN	14.3%	88.0%	
Duluth New-3	Duluth	St. Louis	7	MN	39.1%	26.7%	
Duluth New-4	Duluth	St Louis	7	MN	15.4%	91.1%	
Duluth New-5	Duluth	St Louis	7	MN	12.5%	84.8%	
Duluth Rem-1	Duluth	St Louis	7	MN	11.8%	92.7%	
Duluth Rem-2	Duluth	St Louis	7	MN	72.7%	81.9%	
Duluth Rem-3/4	Duluth	St Louis	7	MN	20.7%	91.7%	Job still in progress
Elk River New-1	Elk River	Sherburne	6	MN	25.0%	78.5%	
Elk River Rem-1	Elk River	Sherburne	6	MN	29.6%	92.9%	
Elk River Rem-2	Elk River	Sherburne	6	MN	N/O	90.0%	Mechanical Only
Golden Valley Rem-1	Golden Valley	Hennepin	6	MN	92.0%	92.0%	

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Grand Rap New-1	Grand Rapids	Itasca	7	MN	32.4%	72.2%	Job still in progress
Grand Rap Rem-1	Grand Rapids	Itasca	7	MN	35.7%	79.1%	
Houst Cty New-1	Caledonia	Houston	6	MN	N/O	90.1%	Mechanical Only
Hubbard Cty Rem-1	Park Rapids	Hubbard	7	MN	N/O	97.6%	Mechanical only
Hutchinson Rem-1	Hutchinson	McLeod	6	MN	0.0%	87.5%	
Lester Pr Rem-1	Lester Prairie	McLeod	6	MN	N/O	95.1%	Mechanical Only
Little Falls Rem-1	Little Falls	Morrison	7	MN	N/O	95.8%	Mechanical Only
Little Falls Rem-2	Little Falls	Morrison	7	MN	N/O	96.0%	Mechanical Only
Maple Gr New-1	Maple Grove	Hennepin	6	MN	86.4%	93.6%	
Maple Gr Rem-1	Maple Grove	Hennepin	6	MN	96.2%	100.0%	

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Maple Gr Rem-2	Maple Grove	Hennepin	6	MN	71.0%	85.7%	
Maple Gr Rem-3	Maple Grove	Hennepin	6	MN	90.0%	N/O	Project not started
Maple Gr Rem-4	Maple Grove	Hennepin	6	MN	35.3%	65.4%	
Maple Gr Rem-5	Maple Grove	Hennepin	6	MN	50.0%	87.1%	
Milaca Rem-1	Milaca	Mille Lacs	7	MN	100.0%	96.0%	
Milaca Rem-2	Milaca	Mille Lacs	7	MN	94.6%	93.8%	
Minnetonka Rem-1	Minnetonka	Hennepin	6	MN	N/O	93.5%	Mechanical Only
Mont New-1	Monticello	Wright	6	MN	17.6%	90.6%	
Mora New-1	Mora	Kanabec	7	MN	98.9%	99.3%	
Mpls New-1	Minneapolis	Hennepin	6	MN	86.4%	N/O	Job just starting Struct.



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Mpls Rem-1	Minneapolis	Hennepin	6	MN	N/O	88.1%	Mechanical Only
No Mank New-1	North Mankato	Blue Earth	6	MN	N/O	92.4%	Mechanical Only
No Mank Rem-1	North Mankato	Blue Earth	6	MN	N/O	995.8%	Mechanical Only
Owatonna Rem-1	Owatonna	Steele	6	MN	50.0%	50.0%	
Owatonna Rem-2	Owatonna	Steel	6	MN	12.5%	20.8%	
Roch New-1	Rochester	Olmstead	6	MN	28.3%	67.9%	
Roch New-2	Rochester	Olmstead	6	MN	0.0%	90.4%	
Roch New-1	Rochester	Olmstead	6	MN	0.0%	90.4%	
Roch New-1	Rochester	Olmstead	6	MN	0.0%	90.4%	
Roch Rem-1	Rochester	Olmstead	6	MN	66.7%	84.7%	
Roseville New-1	Roseville	Hennepin	6	MN	100.0%	98.5%	
Shakopee New-1	Shakopee	Scott	6	MN	100.0%	98.2%	

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St Cloud Rem-1	St Cloud	Sherburne	6	MN	N/O	90.9%	Mechanical Only
Still New-1	Stillwater	Washington	6	MN	90.6%	81.7%	
Still New-2	Stillwater	Washington	6	MN	17.6%	90.6%	
Still Rem-1	Stillwater	Washington	6	MN	0.0%	100.0%	
Walker Rem-1	Walker	Cass	7	MN	N/O	95.7%	Mechanical Only
Willmar Rem-1	Willmar	Kandiyohi	6	MN	90.9%	94.1%	
Willmar Rem-2	Willmar	Kandiyohi	6	MN	100.0%	100.00%	
Willmar Rem-3	Willmar	Kandiyohi	6	MN	88.2%	91.2%	
Winona Rem-1	Winona	Winona	6	MN	N/O	92.9%	
Woodbury Rem-1	Woodbury	Washington	6	MN	0.0%	58.8%	
Worthington Rem-1	Worthington	Nobles	6	MN	53.3%	68.9%	

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Worthington Rem-2	Worthington	Nobles	6	MN	N/O	95.6%	Mechanical Only

Notes on Tracking Sheet for Commercial Buildings and Inspections:

- All Buildings were built in Jurisdictions with Code enforcement
- Buildings with a \* noted after the Name of the Jurisdiction, are also addressed in the Minnesota B-# building Requirements.
- Job code with “New” indicates new construction and additions, and with “Rem” indicates remodeled.



# 90.1% Overall Compliance

Compliance evaluated against: 90.1-2007

## Checklist Metrics

### Code Requirements with Highest Compliance Rate (Top 3)

[7.4.4.1] Temperature controls installed on service water heating systems (&lt;math>t \le 120^{\circ}\text{F}</math> to maximum temperature for intended use).

**EL6** - [9.4.3] Exit signs do not exceed 5 watts per face.

**FI11** - [7.4.4.3] Public lavatory faucet water temperature not greater than 110 °F.

### Code Requirements with Lowest Compliance Rate (Top 3)

**PR2** - [4.2.2, 6.4.2] Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and delineate and document where exceptions to the standard are claimed.

**PR4** - [4.2.2] Plans, specifications, and/or calculations provide all information with which compliance can be determined for the lighting and electrical systems and equipment and delineate and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.

**PR3** - [4.2.2, 7.4.1] Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and delineate and document where exceptions to the standard are claimed.

### Code Requirements Most Frequently Not Observed (Top 3)

**FR1** - [5.4.3.2] Factory-built fenestration and doors are labeled as meeting air leakage requirements.

**FR12** - [5.8.2.1, 5.8.2.4] Fenestration products rated in accordance with NFRC.

**FR13** - [5.8.2.2] Fenestration products are certified as to performance labels or certificates provided.



## 93.2% Overall Compliance

Compliance evaluated against: 90.1-2007

### Checklist Metrics

#### Code Requirements with Highest Compliance Rate (Top 3)

**EL6** - [9.4.3] Exit signs do not exceed 5 watts per face.

**EL2** - [9.4.1.2] Independent lighting control installed per approved lighting plans and all manual control readily accessible and visible to occupants.

**EL4** - [9.4.1.4] Verify separate lighting control devices for specific uses installed per approved lighting plans.

#### Code Requirements with Lowest Compliance Rate (Top 3)

**FO3** - [5.5.3.5] Slab edge insulation R-value.

**ME24** - [6.5.3.2.3] Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.

**ME6** - [6.4.3.9] Demand control ventilation provided for spaces  $>500 \text{ ft}^2$  and  $>40 \text{ people}/1000 \text{ ft}^2$  occupant density and served by systems with air side economizer, auto modulating outside air damper control or design airflow  $>3,000 \text{ cfm}$ .

#### Code Requirements Most Frequently Not Observed (Top 3)

**FR14** - [5.8.2.3, 5.5.3.6] U-factor of opaque doors associated with the building thermal envelope meets requirements.

**FR1** - [5.4.3.2] Factory-built fenestration and doors are labeled as meeting air leakage requirements.

**FR10** - [5.5.4.4.1] Vertical fenestration SHGC value.



# 92.6% Overall Compliance

Compliance evaluated against: 90.1-2007

## Checklist Metrics

### Code Requirements with Highest Compliance Rate (Top 3)

**3) ME9** - [6.4.4.1.3] HVAC piping insulation thickness.

**PR1** - [4.2.2] Plans and/or specifications provide all information with which compliance can be determined for the building envelope and delineate and document where exceptions to the standard are claimed. Performance compliance approach submitted for buildings with vertical fenestration area >40% or skylight area >5%.

**FI2** - [6.4.3.1.1] Heating and cooling to each zone is controlled by a thermostat control.

### Code Requirements with Lowest Compliance Rate (Top 3)

**PR2** - [4.2.2, 6.4.2] Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and delineate and document where exceptions to the standard are claimed.

**PR4** - [4.2.2] Plans, specifications, and/or calculations provide all information with which compliance can be determined for the lighting and electrical systems and equipment and delineate and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.

**PR1** - [4.2.2] Plans and/or specifications provide all information with which compliance can be determined for the building envelope and delineate and document where exceptions to the standard are claimed. Performance compliance approach submitted for buildings with vertical fenestration area >40% or skylight area >5%.

### Code Requirements Most Frequently Not Observed (Top 3)

**FI17** - [8.7.2] Furnished O&M manual for electrical power systems and equipment.

**FI16** - [8.7.1] Furnished as-built drawings for electric power systems.

**FI7** - [6.7.2.1] Furnish HVAC "as-built" drawings submitted within 90 days of system acceptance.



## **80.2% Overall Compliance**

Compliance evaluated against: **2009 IECC, 2012 IECC**

### **Checklist Metrics**

#### **Code Requirements with Highest Compliance Rate (Top 3)**

**FR19** - [403.5] Automatic or gravity dampers are installed on all outdoor air intakes and exhausts.

**IN4** - [303.2] Wall insulation installed per manufacturer's instructions.

**FI9** - [403.1.1] Programmable thermostats installed on forced air furnaces.

#### **Code Requirements with Lowest Compliance Rate (Top 3)**

**FI3** - [402.2.3] Attic access hatch and door insulation  $\geq$ R-value of the adjacent assembly.

**FO4** - [402.1.1] Conditioned basement wall insulation R-value. Where internal insulation is used, verification may need to occur during Insulation Inspection. Not required in warm-humid locations in Climate Zone 3.

**FI1** - [402.1.1 402.2.1 402.2.2] Ceiling insulation R-value.

#### **Code Requirements Most Frequently Not Observed (Top 3)**

**FR1** - [402.1.1, 402.3.4] Door U-factor.

**FI5** - [403.6] Heating and cooling equipment type and capacity as per plans.

**FO2** - [303.2, 402.2.8] Slab edge insulation installed per manufacturer's instructions.



# 71.6% Overall Compliance

Compliance evaluated against: 2009 IECC, 2012 IECC

## Checklist Metrics

### Code Requirements with Highest Compliance Rate (Top 3)

**FR20** - [402.4.4] Fenestration that is not site built is listed and labeled as meeting AAMA/WDMA/CSA 101/I.S.2/A440 or has infiltration rates per NFRC 400 that do not exceed code limits.

**FR4** - [303.1.3] U-factors of fenestration products are determined in accordance with the NFRC test procedure or taken from the default table.

**FI2** - [303.1.1.1, 303.2] Ceiling insulation installed per manufacturer's instructions. Blown insulation marked every 300ft<sup>2</sup>.

### Code Requirements with Lowest Compliance Rate (Top 3)

**PR1** - [103.2] Construction drawings and documentation sufficiently demonstrates energy code compliance for the building envelope.

**FI1** - [402.1.1 402.2.1 402.2.2] Ceiling insulation R-value.

**FI3** - [402.2.3] Attic access hatch and door insulation  $\geq$ R-value of the adjacent assembly.

### Code Requirements Most Frequently Not Observed (Top 3)

**FI1** - [402.1.1 402.2.1 402.2.2] Ceiling insulation R-value.

**FI18** - [303.3] Manufacturer manuals for mechanical and water heating equipment have been provided.

**FI2** - [303.1.1.1, 303.2] Ceiling insulation installed per manufacturer's instructions. Blown insulation marked every 300 ft<sup>2</sup>.





# Score + Store

## 72.7% Overall Compliance

Compliance evaluated against: 2009 IECC

### Checklist Metrics

#### Code Requirements with Highest Compliance Rate (Top 3)

**FR16** - [402.4.5] IC-rated recessed lighting fixtures sealed at housing/interior finish and labeled to indicate  $\leq 2.0$  cfm leakage at 75 Pa.

**FI6** - [404.1] 50% of lamps in permanent fixtures are high efficacy lamps.

**FR13** - [403.2.2] All joints and seams of air ducts, air handlers, filter boxes, and building cavities used as return ducts are sealed.

#### Code Requirements with Lowest Compliance Rate (Top 3)

**PR1** - [103.2] Construction drawings and documentation sufficiently demonstrates energy code compliance for the building envelope.

**PR3** - [103.2, 403.7] Construction drawings and documentation sufficiently demonstrates energy code compliance for lighting and mechanical systems. Systems serving multiple dwelling units must demonstrate compliance with the commercial code.

**FI7** - [401.3] Compliance certificate posted.

#### Code Requirements Most Frequently Not Observed (Top 3)

**FI7** - [401.3] Compliance certificate posted.

**FR1** - [402.1.1, 402.3.4] Door U-factor.

**FR20** - [402.4.4] Fenestration that is not site built is listed and labeled as meeting AAMA/WDMA/CSA 101/I.S.2/A440 or has infiltration rates per NFRC 400 that do not exceed code limits.

EXC-2009-005879



# STATE OF MINNESOTA

Office of Governor Tim Pawlenty

130 State Capitol ♦ 75 Rev. Dr. Martin Luther King, Jr. Boulevard ♦ Saint Paul, MN 55155

March 23, 2009

Mr. Steven Chu, Secretary  
United States Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585

RE: State Energy Program Assurance

Dear Secretary Chu,

Please find enclosed Minnesota's signed "Governor's Assurance Certification" as required by the guidance set forth by USDOE in Funding Opportunity Announcement (FOA) DE-FOA-0000052 for State Energy Program Formula Grants.

This signed document is a condition of receiving our State's share of the \$3.1 billion funding for the State Energy Program (SEP) under the American Recovery and Renewal Act of 2009. I am providing the assurances set forth in the enclosed "Attachment 3" document provided by your office.

We are prioritizing our energy investments to take advantage of existing programs and expand programs where appropriate. Our State is committed to a robust improvement in energy efficiency and renewable energy, as well as a balanced State energy policy. I want to assure you that, within the limits of my authority, we will move forward in these critical areas.

We look forward to immediate distribution of the federal SEP funds to permit my State to make progress in energy efficiency and renewable energy.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "T. Pawlenty".

Tim Pawlenty  
Governor

By email

Voice: (651)296-3391 or (800)657-3717

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# APPENDIX D – ARRA Governor's Assurance Letter

## ATTACHMENT 3 -- GOVERNOR'S ASSURANCE

By signing below, the State Governor is providing their written notification that they will comply with and obtain the following assurances in accordance with Section 410 of the Recovery Act.

- (1) The applicable State regulatory authority will seek to implement, in appropriate proceedings for each electric and gas utility, under its rate-making authority a general policy that ensures that utility financial incentives are aligned with helping their customers use energy more efficiently and that provide timely cost recovery and a timely earnings opportunity for utilities associated with cost-effective measurable and verifiable efficiency savings, in a way that sustains or enhances utility customers' incentives to use energy more efficiently.
- (2) The State, or the applicable units of local government that have authority to adopt building codes, will implement the following:
  - (A) A residential building energy code (or codes) that meets or exceeds the most recent International Energy Conservation Code, or achieves equivalent or greater energy savings.
  - (B) A commercial building energy code (or codes) throughout the State that meets or exceeds the ANSI/ASHRAE/IESNA Standard 90.1-2007, or achieves equivalent or greater energy savings.
  - (C) A plan to achieve 90 percent compliance with the above energy codes within eight years. This plan will include active training and enforcement programs and annual measurement of the rate of compliance.
- (3) The State will to the extent practicable prioritize the grants toward funding energy efficiency and renewable energy programs, including—
  - (A) the expansion of existing energy efficiency programs approved by the State or the appropriate regulatory authority, including energy efficiency retrofits of buildings and industrial facilities, that are funded by the State or through rates under the oversight of the applicable regulatory authority, to the extent applicable;
  - (B) the expansion of existing programs, approved by the State or the appropriate regulatory authority, to support renewable energy projects and deployment activities, including programs operated by entities which have the authority and capability to manage and distribute grants, loans, performance incentives, and other forms of financial assistance; and
  - (C) cooperation and joint activities between States to advance more efficient and effective use of this funding to support the priorities described in this section.

  
\_\_\_\_\_  
Minnesota Governor Tim Pawlenty 4

March 23, 2009  
\_\_\_\_\_  
Date