



2009 NATIONAL WEATHERIZATION TRAINING CONFERENCE

JULY 20-23, 2009 | **INDIANAPOLIS, INDIANA**



Generic Priority Lists for Colorado

Chris Fuller Governor's Energy Office
Colorado Weatherization Program



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Background

- Before ARRA funding Colorado averaged 4,000 homes a year
- In 04-05 Colorado was required to submit to DOE for approval of priority lists.



Why create Priority Lists

- 4,000 homes x 1.5 hrs / NEAT/MHEA = 6,000 hrs
- 6,000 hrs / 30 hrs of labor /unit = 200 units
- Found Errors with user inputs
 - Fuel type & cost
 - HDD (Weather Sta.)
 - Heating system efficiency
 - Job costing errors
 - You name it we found it





Steps in developing accurate Priority Lists

- Convened a workshop with agency technical staff
- Discussed each measure and tasks involved with the measure
 - Performed time studies for tasks
 - Analyzed costs for each measure
 - Some cost remained unique, some user inputs allowed
- Developed a spreadsheet with formulas to get sq. ft. cost



1 **GENERIC NEAT for a RANCH with Natural Gas (70% SSE furnace)**

2 **The prices below are additional costs that could be applied to the measure and still remain cost effective.**

Attics				Attics					
Existing	R-value 0	Existing	R-value 7	Existing	R-value 11	Existing	R-value 19		
The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed		
Insulate to R-38		Insulate to R-38		Insulate to R-38		Insulate to R-38			
1	\$2,300	1	\$200	1	\$150	1	\$25		
2	\$1,800	2	\$125	2	\$75	2	Not C.E.		
3	\$2,600	3	\$275	3	\$200	3	\$50		
4	\$1,800	4	\$325	4	\$140	4	\$0		
5	\$2,600	5	\$450	5	\$175	5	\$25		
6	\$2,100	6	\$350	6	\$125	6	\$0		
7	\$1,900	7	\$300	7	\$125	7	\$0		
89	\$1,900	89	\$300	89	\$125	89	\$0		
10	\$1,600	10	\$200	10	\$50	10	Not C.E.		

Walls		Perimeter		Floor		Storms			
Dense Pack Cellulose		R-19 FSK		R-19 Fiberglass batts		Interior Storm Windows			
The Regions below must attempt walls	If repair costs do not exceed	The Regions below shall foundation insul.	If repair costs do not exceed	The Regions below shall Insulate to R-19	If repair costs do not exceed	The Regions below should install storms	When the Cost Effective price per/sq. ft is met.		
1	\$600	1	\$300	1	\$200	1	\$4.50	1.8	
2	\$350	2	\$80	2	\$50	2	\$3.50	1.7	
3	\$700	3	\$325	3	\$400	3	\$4.50	2.0	
4	\$500	4	\$200	4	\$250	4	\$3.50	1.7	
5	\$650	5	\$325	5	\$300	5	\$5.00	1.8	
6	\$500	6	\$300	6	\$100	6	\$4.00	1.7	
7	\$500	7	\$200	7	\$125	7	\$4.00	1.7	
89	\$375	89	\$40	89	\$0	89	\$3.00	1.8	
10	\$300	10	\$150	10	\$75	10	\$3.50	1.7	

33 **Not C.E. means the measure is Not Cost Effective to install at the current price.**

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M9

A B C D E F G H I J K L M N O P

1 GENERIC NEAT for a RANCH with Propane Gas (70% SSE furnace)

2 The prices below are additional costs that could be applied to the measure and still remain cost effective.

Attics															
Existing		R-value 0		Existing		R-value 7		Existing		R-value 11		Existing		R-value 19	
The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed	The Regions below shall	If repair costs do not exceed
1	\$4,600	1	\$1,300	1	\$800	1	\$400	1	\$400	1	\$400	1	\$400	1	\$400
2	\$4,200	2	\$1,100	2	\$600	2	\$300	2	\$300	2	\$300	2	\$300	2	\$300
3	\$6,500	3	\$2,000	3	\$1,300	3	\$600	3	\$600	3	\$600	3	\$600	3	\$600
4	\$4,400	4	\$1,200	4	\$800	4	\$350	4	\$350	4	\$350	4	\$350	4	\$350
5	\$6,000	5	\$1,900	5	\$1,300	5	\$600	5	\$600	5	\$600	5	\$600	5	\$600
6	\$4,800	6	\$1,200	6	\$900	6	\$400	6	\$400	6	\$400	6	\$400	6	\$400
7	\$4,900	7	\$1,300	7	\$900	7	\$350	7	\$350	7	\$350	7	\$350	7	\$350
89	\$2,000	89	\$400	89	\$300	89	\$350	89	\$350	89	\$350	89	\$350	89	\$350
10	\$4,300	10	\$1,100	10	\$700	10	\$300	10	\$300	10	\$300	10	\$300	10	\$300

Walls		Perimeter		Floor		Storms	
Dense Pack Cellulose		R-19 FSK		R-19 Fiberglass batts		Interior Storm Windows	
The Regions below must attempt walls	If repair costs do not exceed	The Regions below shall install R-19 FSK	If repair costs do not exceed	The Regions below shall insulate to R-19	If repair costs do not exceed	The Regions below shall install storms	Cost Effective Price / Sq. Ft. SIR
1	\$1,400	1	\$800	1	\$1,100	1	\$7.50 1.7
2	\$1,400	2	\$600	2	\$900	2	\$6.50 1.7
3	\$2,300	3	\$1,200	3	\$1,700	3	\$10.00 1.7
4	\$1,500	4	\$800	4	\$1,250	4	\$7.00 1.7
5	\$2,300	5	\$1,200	5	\$1,600	5	\$10.00 1.7
6	\$1,600	6	\$900	6	\$1,100	6	\$7.50 1.7
7	\$1,600	7	\$900	7	\$1,150	7	\$7.50 1.7
89	\$1,400	89	\$600	89	\$1,150	89	\$8.00 1.7
10	\$1,400	10	\$800	10	\$1,100	10	\$7.50 1.7

1Gas70% 1Gas80% 1.5Gas70% 1.5Gas80% 1Pro70% 1Pro80% 1.5Pro70% 1.5Pro80%

Ready 100%

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R19

Region	Ceilings				Walls	Belly						Storms	
	Uninsulate	2" batt	4" batt	6" batt	with 1" or more free space	1" batt		2" batt		3" batt		Price per Sq.Ft.	SIR
1	\$2,000	\$400	\$300	\$0	\$300	Good	Poor	Good	Poor	Good	Poor	> 1.7	
						\$250	\$800	\$0	\$100	Not C.E.	\$50		
						Fair	V Poor	Fair	V Poor	Fair	V Poor	\$5.50	2.0
						\$400	\$1,000	\$75	\$200	Not C.E.	\$100		
2	\$1,800	\$400	\$100	Not C.E.	\$200	Good	Poor	Good	Poor	Good	Poor	\$5.00	1.7
						\$100	\$500	Not C.E.	\$175	Not C.E.	Not C.E.		
						Fair	V Poor	Fair	V Poor	Fair	V Poor		
						\$300	\$800	Not C.E.	\$300	Not C.E.	\$50		
3	\$2,700	\$1,000	\$800	\$300	\$500	Good	Poor	Good	Poor	Good	Poor	\$8.50	1.8
						\$750	\$1,400	\$200	\$700	Not C.E.	\$350		
						Fair	V Poor	Fair	V Poor	Fair	V Poor		
						\$1,000	\$1,700	\$400	\$900	\$100	\$450		
4	\$1,900	\$400	\$150	Not C.E.	\$400	Good	Poor	Good	Poor	Good	Poor	\$5.00	1.8
						\$300	\$800	\$0	\$300	Not C.E.	\$150		
						Fair	V Poor	Fair	V Poor	Fair	V Poor		
						\$500	\$1,000	\$150	\$500	Not C.E.	\$200		
5	\$2,700	\$900	\$400	\$100	\$600	Good	Poor	Good	Poor	Good	Poor	\$7.00	1.9
						\$500	\$1,000	\$100	\$500	Not C.E.	\$250		
						Fair	V Poor	Fair	V Poor	Fair	V Poor		
						\$750	\$1,500	\$200	\$750	\$60	\$450		

29 Not C.E. means the measure is Not Cost Effective to install.
 30 \$0 dollars means it is Cost Effective to install, but with no additional costs.
 31 Ceiling and belly cavities between 6" and 11" in depth are covered under this cost effective chart.
 32 Wall Cavities with less than 1" of free space are not feasible to insulate.
 33 Ceiling cavities with less than 3" of free space are not feasible to insulate.
 34 Storms are modeled using the Westland Distributing price for a #1893 self-storing storm. (Jan
 35 For Regions 3 it is Cost Effective to add to a 8" existing batt if feasible to install.

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Sort & Filter Find & Select

E20

	A	B	C	D	E
1	Priority List for San Luis Valley		7300+ HDD		
2					
3	Insulation Measures when the home has a 90% furnace on Natural Gas				
4					
5	SITE BUILT	Tier 3 DOE		Cost-Effective cut off is	
6					
7					
8	Attic	Add an R-30 when there is 6" or less of existing insulation		\$450	
9					
10	Attic	Add an R-38 only when there is 0" - 2" of existing insulation		\$1,750	
11					
12	Walls	Add Insulation only if the wall cavity is empty		\$1,200	
13					
14	Perimeter	<u>Uninsulated</u> foundation walls may receive R-11 or R-19 perimeter insulation		\$600	
15					
16	Floor	If the floor is being insulated wrap ducts and pipes below the insulation		\$1,150	
17					
18					
19					
20					
21					
22	Insulation Measures when the home has a 90% furnace on Natural Gas				
23					
24	MOBILE HOME	Tier 3 DOE		Cost-Effective cut off is	
25					
26					
27	Ceiling	A max. of R-19 may be added, when there is a 2" batt or less existing		\$550	
28					
29	Walls	If there is 2" of free space in the walls you may add more insulation		\$300	
30					
31	Belly	1.) Stuff and patch holes	Done	N/A	
32					
33	Perimeter	2.) Insulate Perimeter		\$350	
34					
35	Belly	3.) Insulate Belly		\$470	
36					
37	Appliance Replacement Chart				
38	Refrigerators	To replace the owner must be a willing participant and the appliance must use the min. kwh below			
39		15cu.ft replacement	18 cu.ft. replacement	22cu.ft replacement	
40	Freezers	more than 65kwh/mo	more than 70kwh/mo	more than 75kwh/mo	
41		9cu.ft. replacement	12cu.ft. replacement	16cu.ft.	
42		more than 50kwh/mo	more than 55kwh/mo	more than 60kwh/mo	



What has worked

- Reduced the time for auditors spent at the office/computer
- Increased time availability of auditors for other tasks
- Has contributed to increased production
- Has helped to improve the SIR statewide
- Assisted with delivery of measures to our clients in a more consistent and balanced manner statewide.



What hasn't worked

- The generic priority lists are not applicable to every home
- Occasionally the wrong GPL is still used or in the file
- Takes a lot of time and effort to create them
- As Weatherization Assistant becomes more technically involved, so does the software become more difficult to use
- Instead of dollar costs (\$) crews would prefer to see hours (time allowed) for each measure.