

Efficiency Maine

Residential Direct Install Initiative

Air Sealing Promotion

Results, Statistics and Findings

July 11th 2013



Residential Direct Install (RDI) "Air Sealing Promotion"



Original objectives:

- Eliminate barriers of entry into weatherization by larger segment of Maine households.
- Promote financing of larger scope weatherization projects by addressing key issues in Maine housing stock.
- Demonstrate immediate benefits of energy assessments in addressing "lowest hanging energy fruit" in homes.

Startup milestones:

- Launched in April 2012 with an incentive level of \$300 per unit with slow uptake. 170 units completed in 5 months.
- Incentive increased to \$600 per unit in September 2012 generated exponential growth of activity in auditing and weatherization. 1100 units completed by end of December 2012.

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Residential Direct Install (RDI) "Air Sealing Promotion"

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Phase 1: "Blower Door Driven Air Sealing"

The RDI Air Sealing Promotion has been advertised as a limited-time discount on air sealing and currently involves the following components and steps for participants:

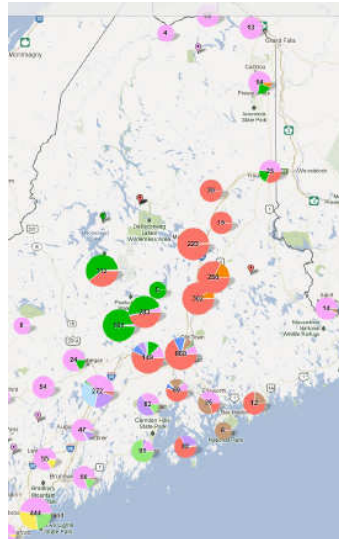
1. Home energy audit, including a blower door test, is performed by a Participating BPI certified Energy Auditor
2. At least six hours of air sealing and/or insulation work are completed by either the auditor or another registered vendor.
3. Contractor performs post project blower door test to measure the new air flow in the home and project energy savings.

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Distribution of projects has been statewide from York to Fort Kent.

70 participating contractor firms providing range of services and project scopes.

Significant activity in pockets near most active contractors.

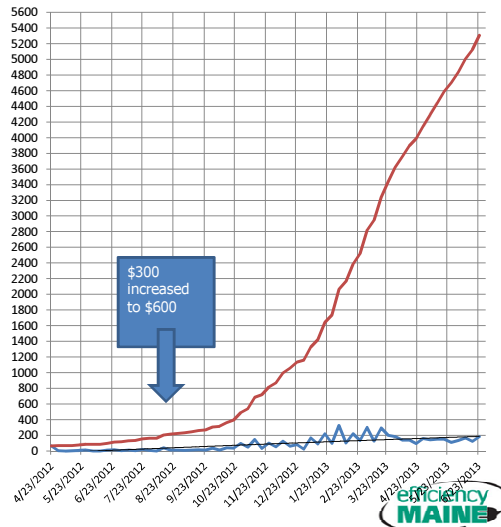
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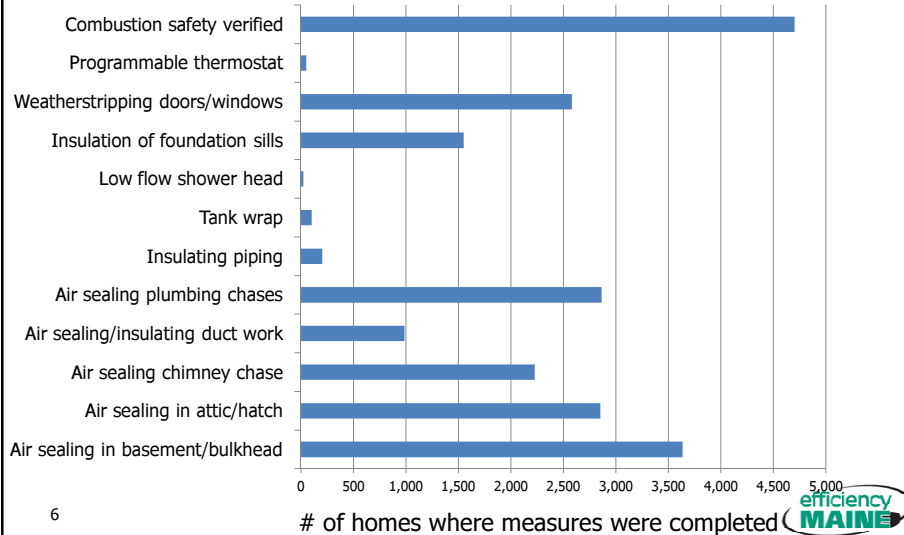
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As of	7/1/2013
Completions	5306
Average SqFT	1599
Average Year Built	1944
Average Occupancy	2.6
Ave PRE CFM50#	3263
Ave POST CFM50#	2752
Average Reduction CFM50	511
Percent air flow reduction	16%
Total job hours supported	58,535
Average Hours per project	11.0
Average total project cost	\$ 826



Air Sealing Promotion

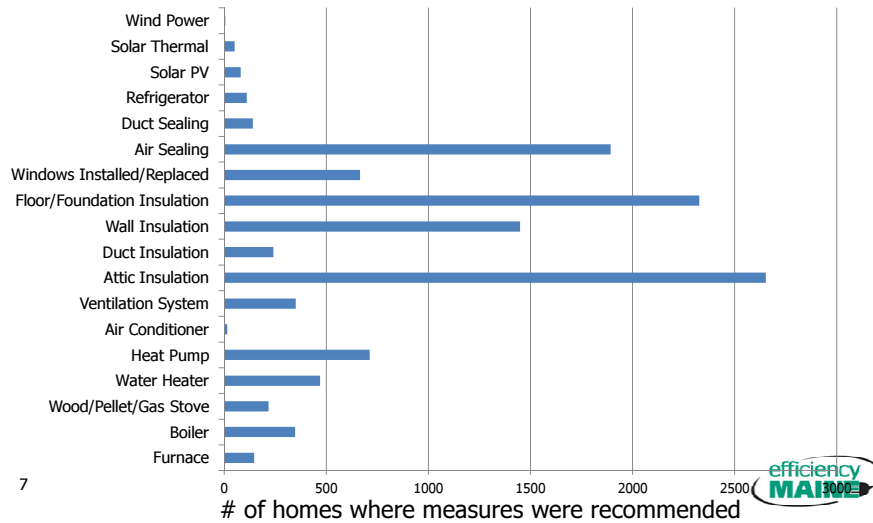
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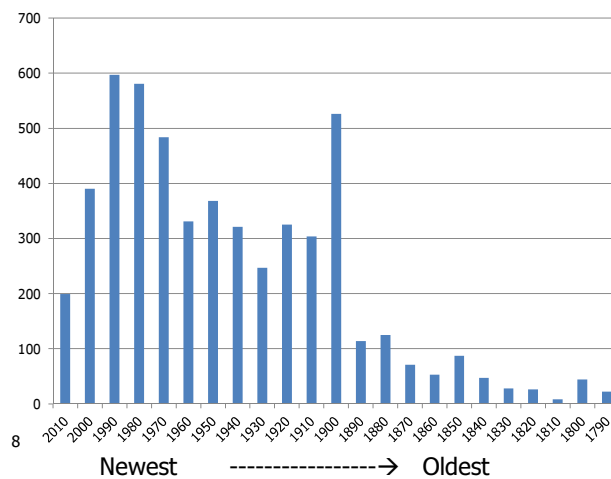
Recommended Improvement Measures and Upgrades



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Participating Home Decade of Construction



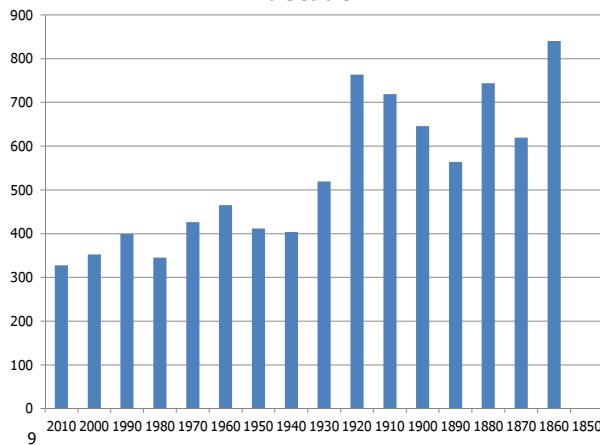
Maine has among
the oldest housing
stocks in the
country.

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Ave airflow reduction CFM50 by built decade



Greater savings can be found in short amount of time on oldest homes, but savings are significant even in newest part of housing stock.

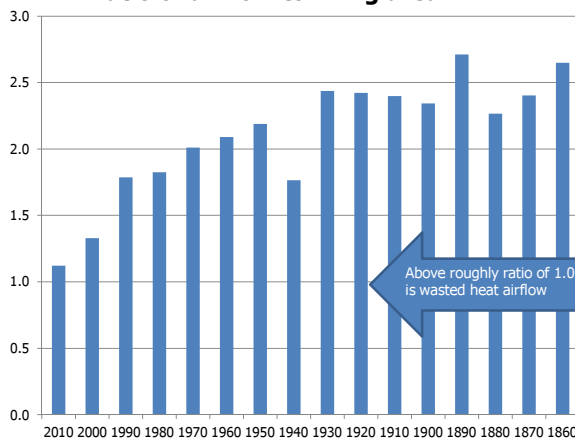


Decade Homes Built

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Ratio of airflow to living area



Air flow is required for good indoor air quality, but any more flow than is needed, is wasted heat in winter.

"Who left the window open?"

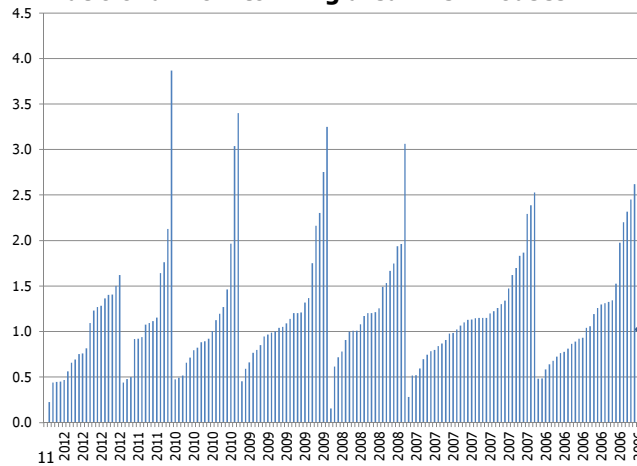


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ratio of airflow to living area - new houses



Even looking at the best and newest portion of the housing stock – huge amount of variation occurs in terms of tightness.

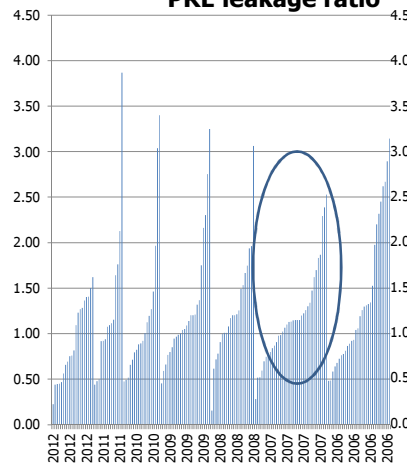
Above roughly 1.0 is wasted heat airflow

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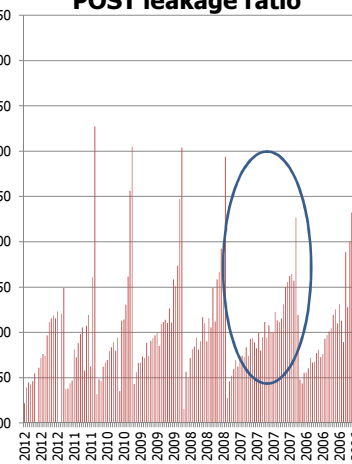
RDI impact on newest houses 2012 – 2006 built

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PRE leakage ratio



POST leakage ratio



12 Basic air sealing does not address all issues, but it makes a difference and creates an informed homeowner.

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Gross Impacts as Evaluated by Opinion Dynamics "Interim Impact Report"

Estimated average annual savings of 9.77 MMBTU per project.
(72 gallons of oil equivalent)

Analysis of the RDI Program found that the program is cost-effective for the Total Resource Cost test (TRC), the Program Administrator Cost Test (PACT), and the Participant Cost Test (PCT).

All tests show a positive net present value and a benefit-cost ratio that well exceeds 1.0. Estimated benefit-cost ratios for RDI are:

TRC = 2.64

PACT = 3.58

PCT = 6.66

What else have we learned?

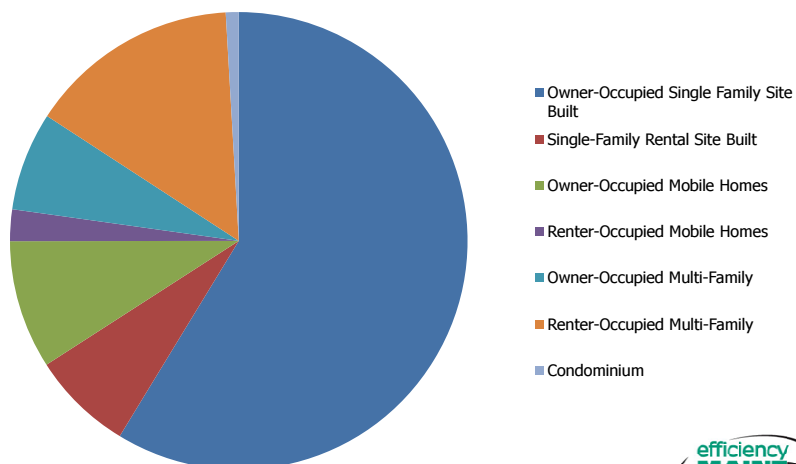


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Residential Direct Install (RDI) Building stock characteristics

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Building type (1 to 4 unit residential)

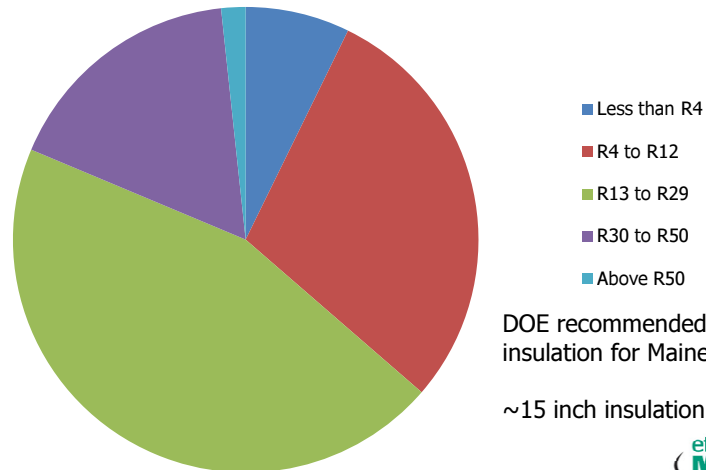


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Residential Direct Install (RDI) Building stock characteristics

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PRE average attic insulation R value



DOE recommended attic insulation for Maine is R49!!

~15 inch insulation depth

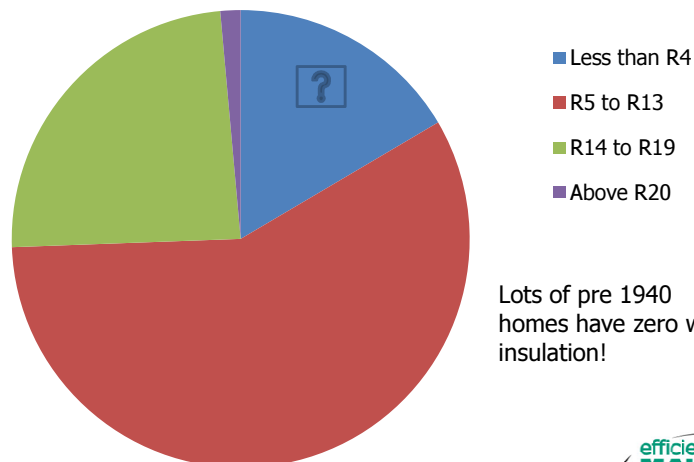


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Residential Direct Install (RDI) Building stock characteristics

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PRE average exterior wall insulation R value



Lots of pre 1940 homes have zero wall insulation!

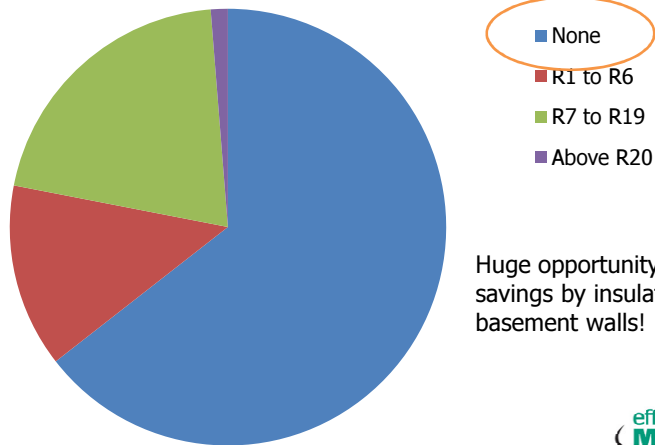


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Residential Direct Install (RDI) Building stock characteristics

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**PRE average basement wall or ceiling insulation
R value**



Huge opportunity for savings by insulating basement walls!

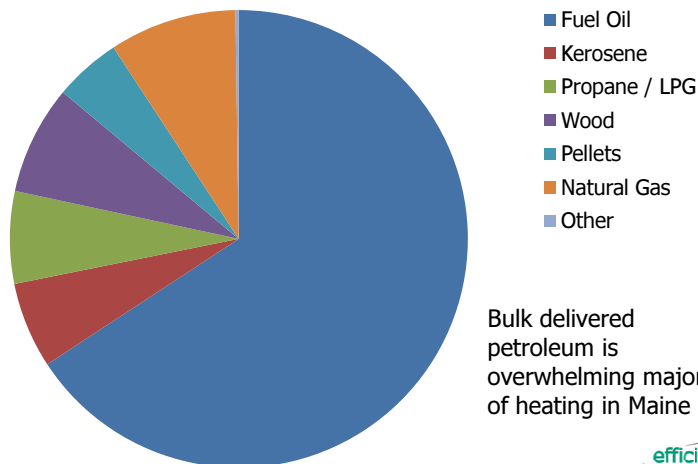


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Residential Direct Install (RDI) Building stock characteristics

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Primary Heating Fuel in participating homes



Bulk delivered petroleum is overwhelming majority of heating in Maine



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Residential Direct Install (RDI) Building stock characteristics

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Maine housing stock in summary:

- Older
- Leaky
- Poorly insulated
- Frequently damp
- Heating with most expensive fuels
- Average heating system is old and inefficient

Where we need to head:

- Air seal penetrations in basement, attic and living spaces
- Increase insulation levels in attics, walls and basements
- Upgrade to high efficiency heating systems with lower cost fuels
- Deal with bulk moisture issues everywhere

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One house at a time... A big problem but a finite one.

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"All of the above" strategy required
for maximum impact.

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