

Deeper Residential Energy Savings: What does it look like?

EEAC Consultants:

John Livermore

Glenn Reed

Richard Faesy

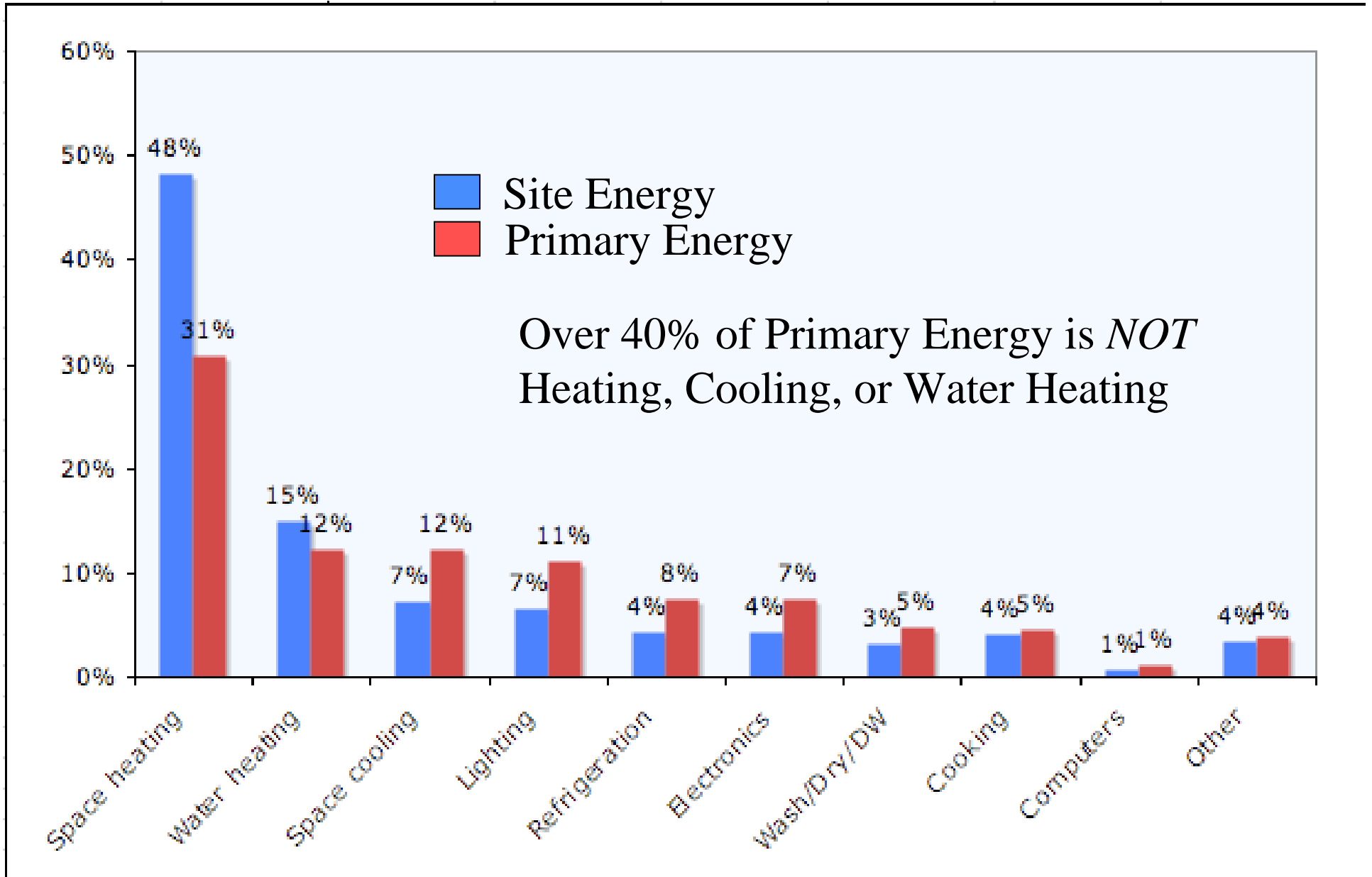
June 9, 2009

“... the majority of potential efficiency gains in Canada and the United States lies in renovating or retrofitting the existing building stock.”

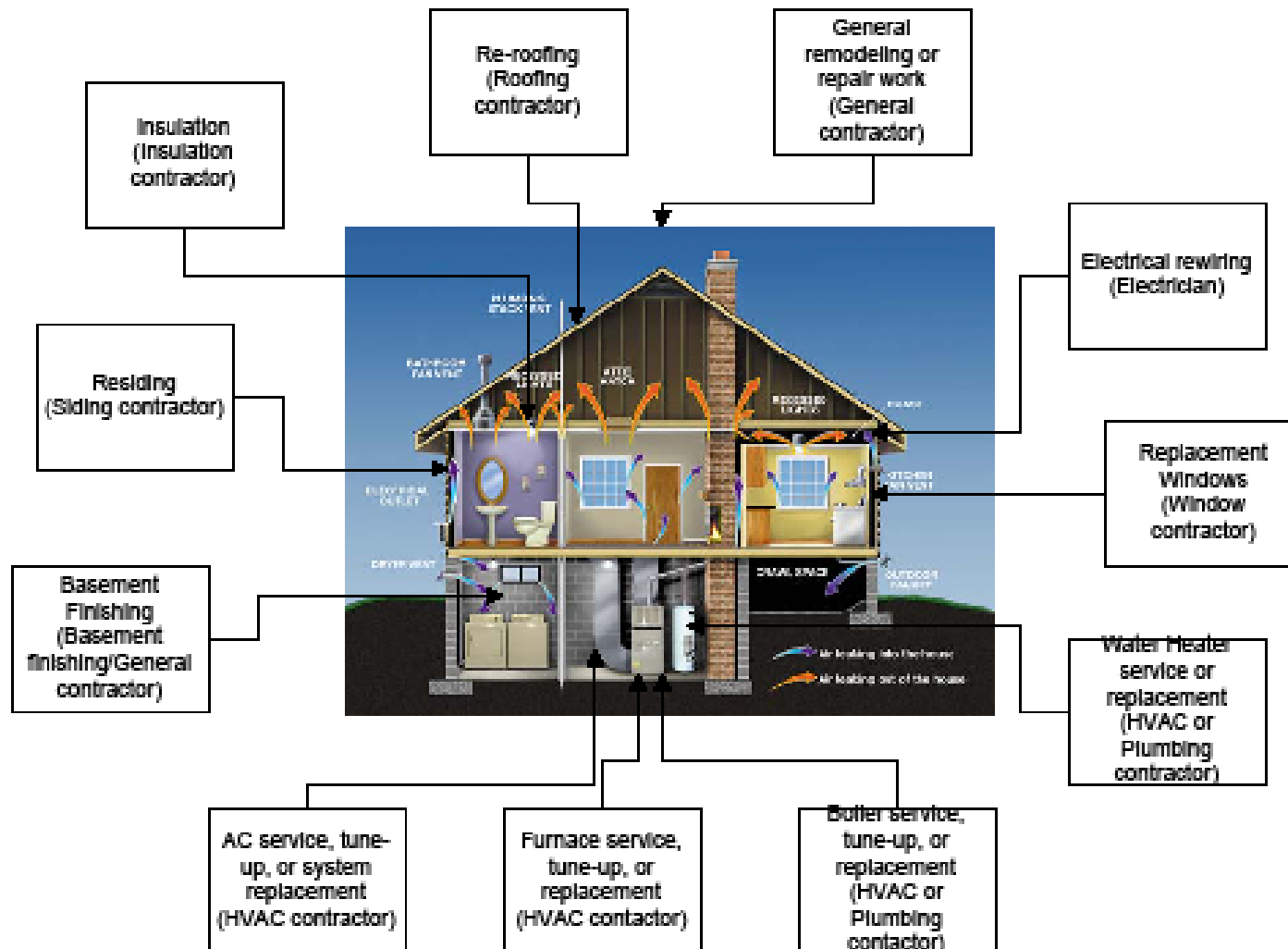
‘Green Building in North America: Opportunities and Challenges’

- Commission for Environmental Cooperation www.cec.org

US Residential Energy Use



Residential Contractor Entry Points



MassSAVE: Mining Opportunities

(Approx. range of % total energy savings)

Resulting Energy Savings HIGHLY dependent on home's baseline efficiency and, especially with electric measures, occupant behavior.

- Site visit w/CFL bulbs & DHW measures (2-5%)
- Plus air sealing & duct sealing (5-15%)
- Plus wall/attic/basement insulation (15-30%)
- Plus upgraded furnace/boiler & t-stat (25-40%)
- Plus upgraded appliances & AC (30-45%)
- Plus replacement windows (35-50%)
- Deep Energy Retrofit – All of the above plus additional shell treatments (50%+)

Mike Rogers' 1920s house in Burlington, VT



Before

- 1,320 sf
- Heat: 198 MMBTU/year
- 6,000 kWh/year



After

- 2,060 sf
- Heat: 85 MMBTU/year
- 3,000 kWh/year

60% heating energy reduction, with modest envelope improvements – cellulose + 1.5” foam, dbl low-e Ar windows, ~1,000 CFM50, furnace
50% electricity reduction – lighting, Energy Star appliances

Peter Yost's house in Brattleboro, VT





Before

- 2,430 sf
- Heat: 75 MMBTU/year
- DHW: 20 MMBTU/year
- Electric: 6,000 kWh/year
- Currently 1150 CFM50

After: projected

- 2,430 sf
- Heat: 24 MMBTU/year
- DHW: 6 MMBTU/year
- 2,500 kWh/year
- Projected 300 CFM50
- PV & Solar hot water
- Approaching Zero net energy

Deep Energy Retrofit pilot activity in 2009

Governor's Zero Net Energy Task Force calls for ramped-up Deep Energy Retrofit pilot in 2010 (250 homes).

- **NSTAR:** Completed Arlington project + up to 3 more projects.
- **NGRID:** 10 projects (3 to complete in 2009).
- **WMECO:** 5 projects
- **Cape Light Compact:** 1-3 projects

MassSAVE Financing Options

- Incentives up to 75% of costs w/\$2000 cap (currently examining raising cap).
- HEAT Loan up to \$15,000 w/term up to 7 years.
- Energy Pay & Save (EPS) pilot
- 30% Federal tax credit up to \$1,500

Discussing additional financing concepts to go deeper:

- **On property tax bill financing**
- **Mortgage write-down program**
- **Revolving loan fund**

Low Income: Mining Opportunities

(Approx. range of % total energy savings)

- Air & Duct sealing (5-15%)
- Heating system (10-20%)
- Insulate attic (15-25%)
- Insulate walls (25-35%)
- Install CFLs (27-37%)
- Insulate floor or foundation wall (32-42%)
- Insulate heating ducts/pipes (34-44%)
- Interior storm windows (38-48%)
- Deeper measures (50%+)

Addressing Barriers to Deeper Low-income Energy Savings

- ‘Boot Camp’ Training programs for low-income weatherization contractors
- Health & Safety issues
- Knob-and-Tube wiring

Efforts to learn more about Deeper energy savings

- PA evaluator screening of new measures, measure packages, and \$/MMBTU savings.
- DEEPER modeling project
- ACI's Thousand Home Challenge

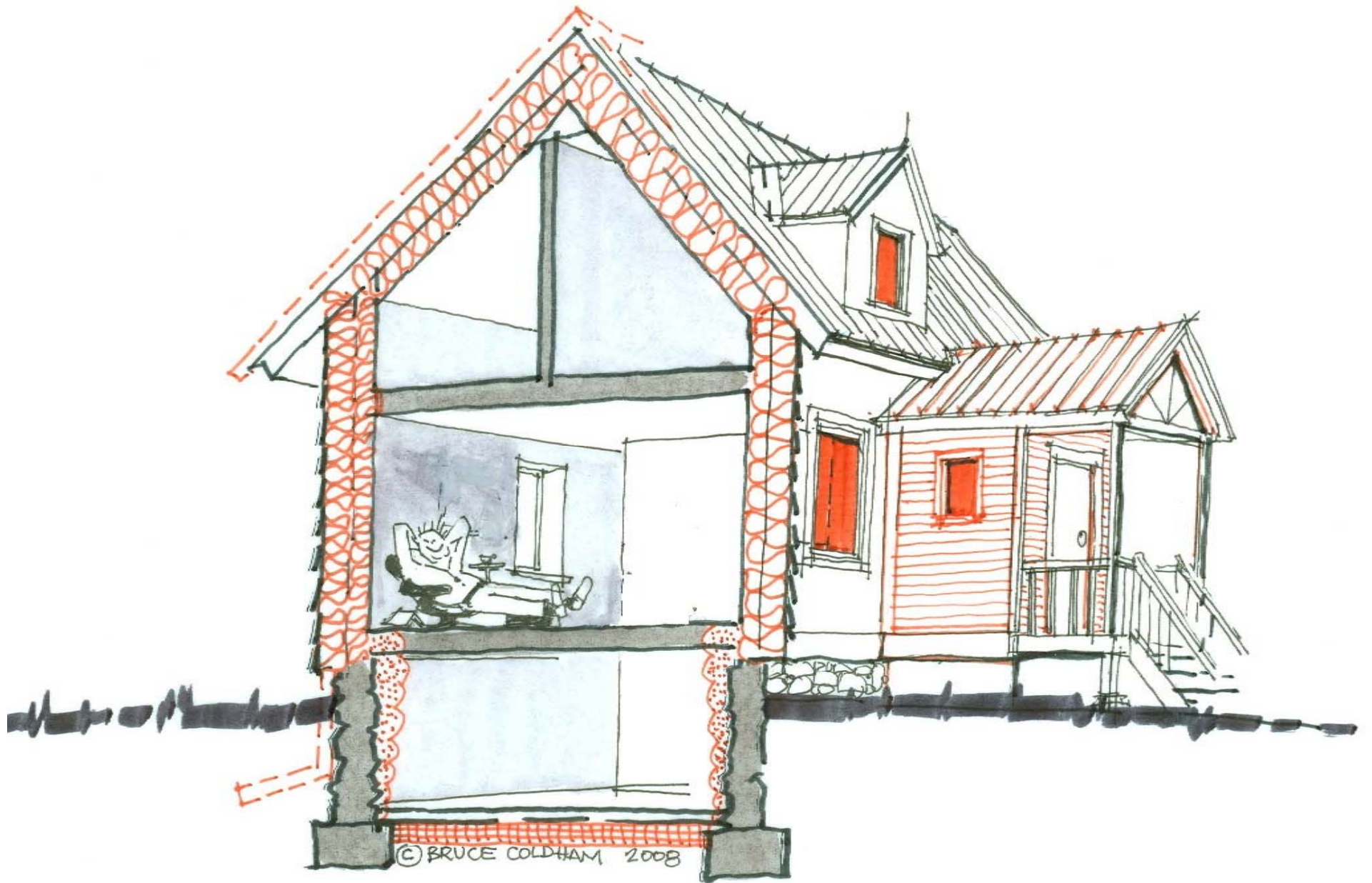
The Thousand Home Challenge is designed to:

- **Reduce** the energy consumption of existing homes by 70-90% (total use, not just space conditioning)
- **Develop** indicators of home energy performance
- **Exemplify** the performance-based systems design approach
- **Assemble** local / regional centers of excellence
- **Stimulate** collaboration, creative problem-solving, and innovative products and approaches

Residential New Construction

- Zero Energy Challenge
www.zechallenge.com
- Moving toward zero:
New tier of energy
performance – 60%
better than baseline
home
- Renewable-ready
construction





Residential Energy Pay & Save (EPS) pilot

- April 1 to December 31, 2009
- 50 customers statewide
- Up to \$500/customer for costs above rebate
- On monthly electric bill: “Other charges”