



GERRY CHASSE, PRESIDENT/COO

Transformation of Heating in Maine

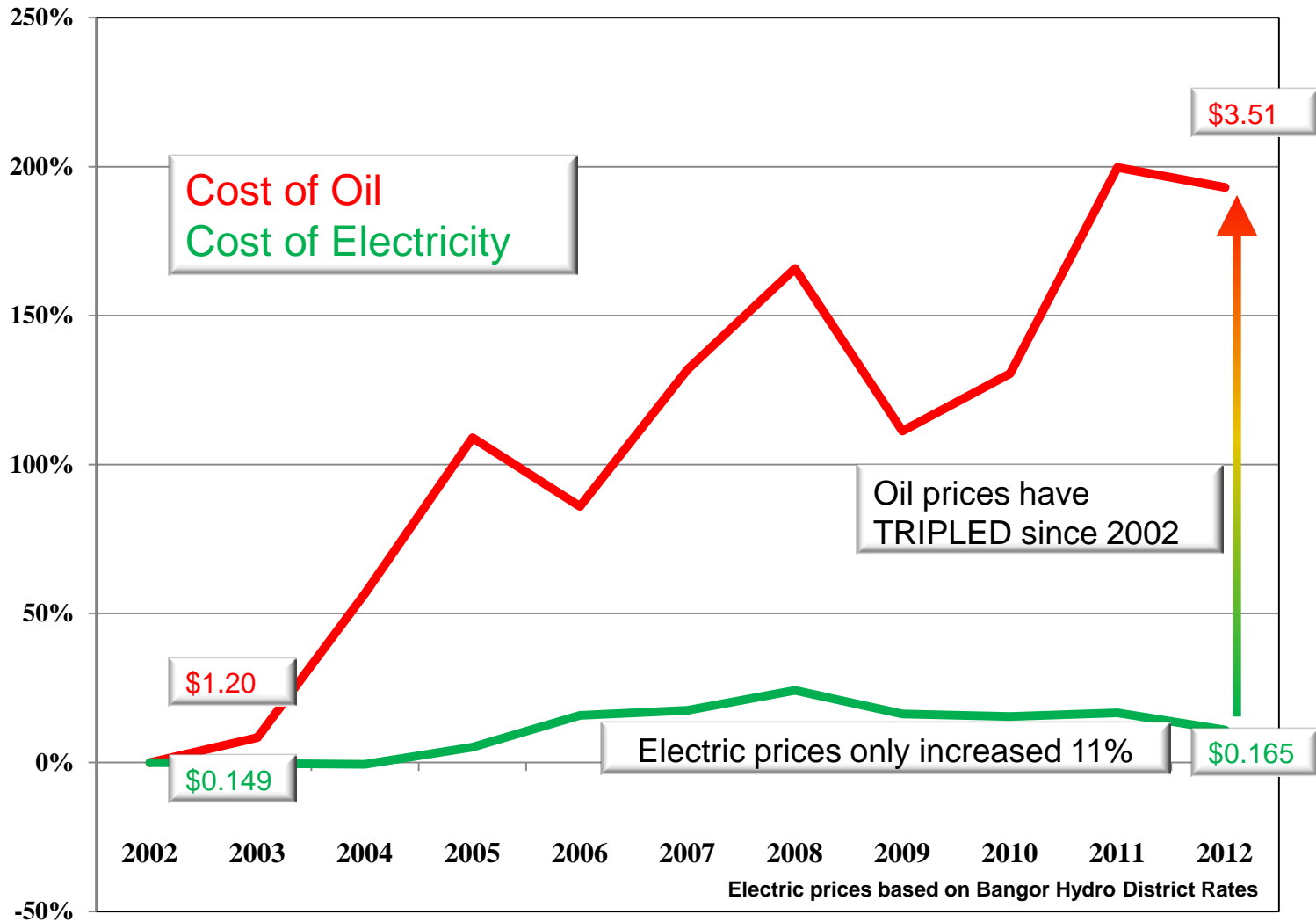
Heating the State of Maine... with Electricity???

Here are three reasons why...

OIL VS. ELECTRICITY

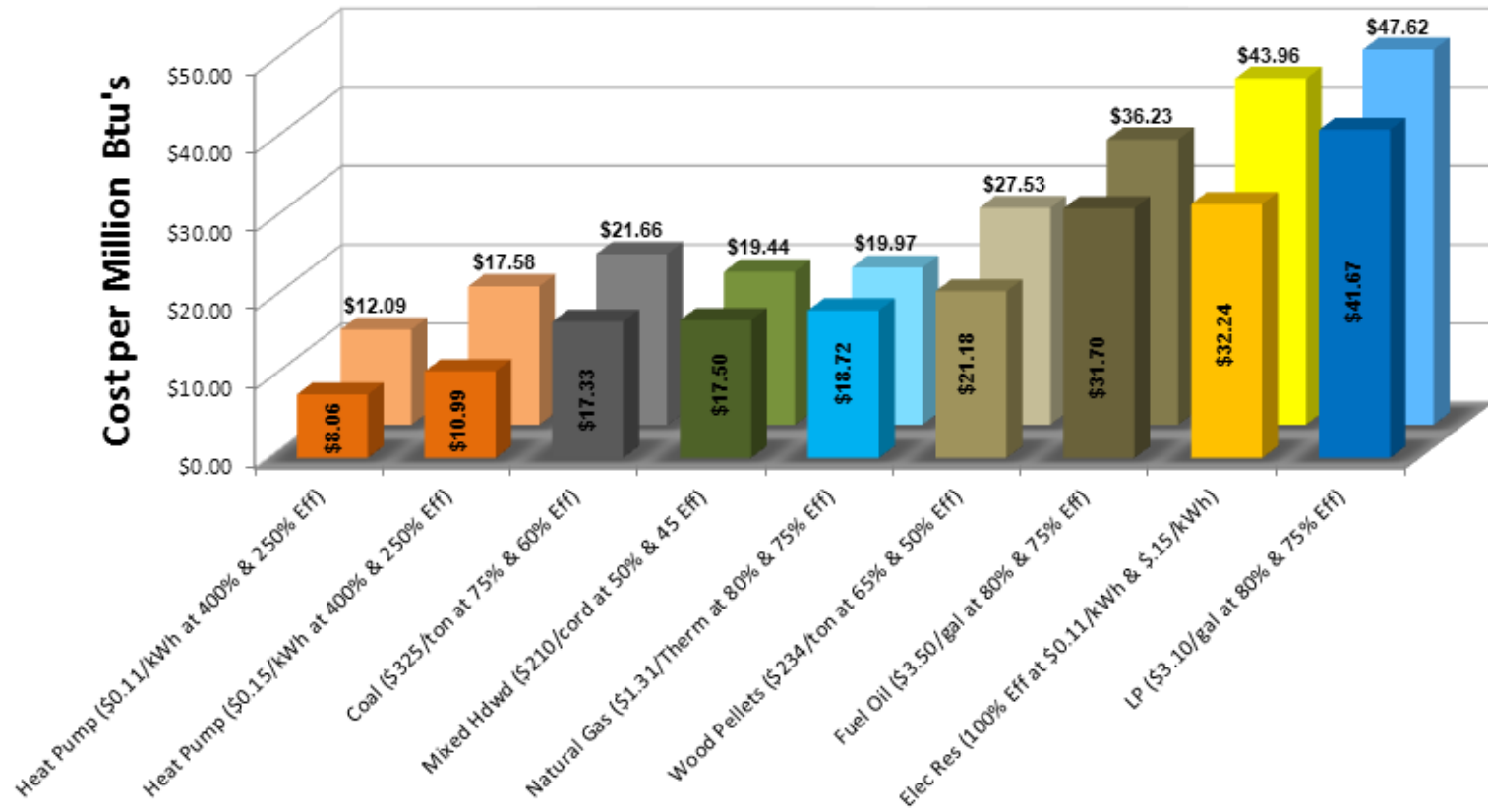
- 80% of our total energy use comes from oil
 - Transportation = 100%
 - Home Heating = 70%
 - Electricity = 5%
- Technology Advancement – Air Source Heat Pumps
- Natural Gas

10 Years of Oil vs. Electricity Prices



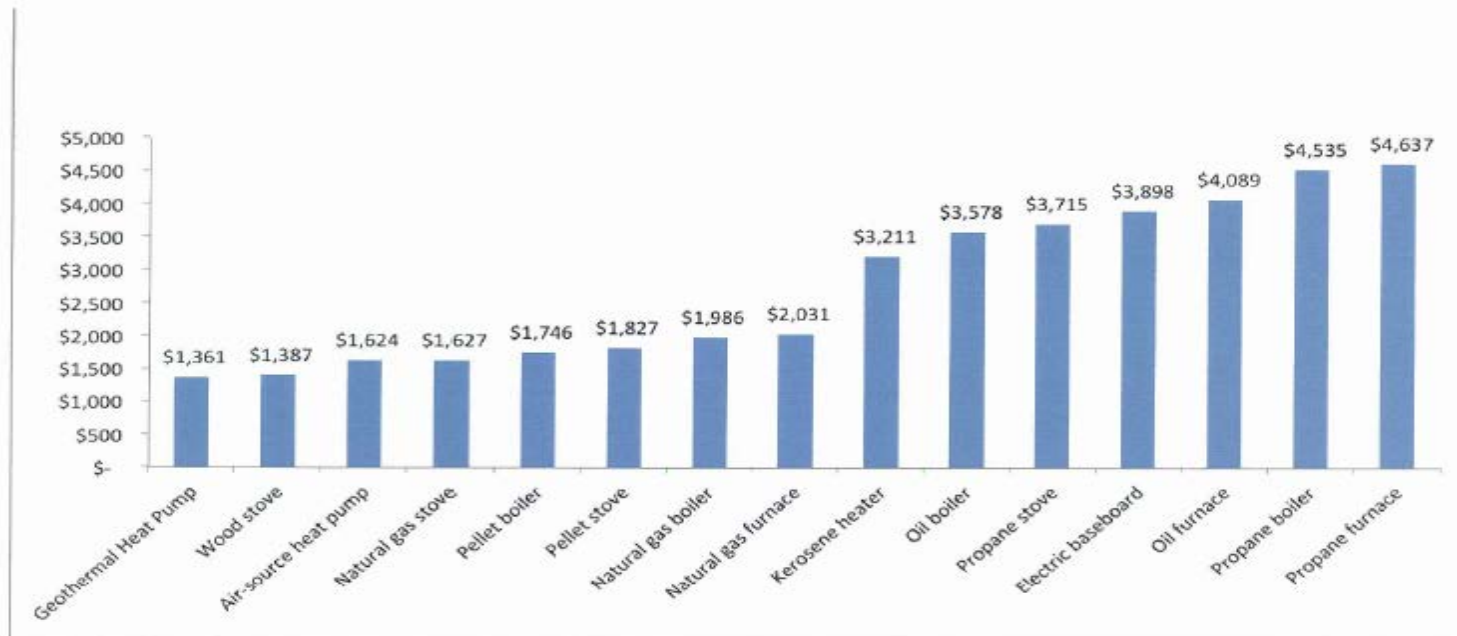
Why Use Electricity

Relative Cost of Various Heating Methods



The Alternatives

Annual Heating Cost (typical home)



Values from <http://www.efficiencymaine.com/pace/compare-heating-options> on 12/7/12

Factoids

- Heat Pumps vs. Oil
 - 1/3 operating cost
 - 1/3 energy usage
 - 20% of the carbon emissions
 - Low cost of entry (\$3,500 to displace 90% of oil usage)
 - Works well in cold climates
- 180 Million gallons per year of residential oil usage
- Natural gas serves 33,000 out of 800,000 customers in Maine today
- Mainers use more oil per capita for home heating than any other state
- Mainers use less electricity per capita than any other state

Opportunity

- Economic
 - \$675 Million total cost with oil
 - -\$400 Million/year savings
 - \$200 Million/year in electricity
 - \$75 Million/year in residual for heating and hot water
- Environmental – reduction of 1.3 Million metric tons of CO2 annually
- Energy – savings of 1.5 Trillion BTUs or 4.4 terawatt-hours (note: entire state electric load is approx. 12 terawatt-hours)
- T&D Investment – 2.2 terawatt-hours of sales for T&D companies
 - \$200 Million/year additional revenue (roughly half T&D and half supply)
 - \$50 Million/year of additional T&D costs (leaves \$50 Million/yr to reduce T&D costs)

Why today?

- Heat pump technology works
- The costs are very manageable – Opex and capex at 55% of the operational costs of oil
- Everyone has access to the infrastructure today



Vision

- Zero upfront capital costs to achieve 45% cost savings (available 2014)
- Hourly dynamic electric rates to incent behaviors and access additional cost savings (could be available today)
- Climate controls managing household heating efficiency through information and automatic decision making take into account:
 - Electricity prices
 - Oil prices
 - System demand
 - Heat pump efficiency
 - Intermittent supply/load matching
- Energy Storage