Tom Plant
Director
Governor’s Energy Office
Colorado’s Climate Action Plan

✦ Establish Goals for the State
   ✴ 20% below 2005 Levels by 2020
   ✴ 80% below 2005 Levels by 2050
What does it look like?

Governor's Energy Office

Our challenge
50% of Climate Goals from Efficiency

- Lighting Efficiency: 25%
- Building Codes: 16%
- Industrial Efficiency: 15%
- State Government: 3%
- Utility DSM: 41%
Residential
- Insulation Rebates
- Contractor Training
- New Energy Codes
- Energy Star Homes
- Renewable Rebates
- Xcel DSM Programs

Commercial
- Performance Contracting
- K-12 Schools
Colorado Industrial Challenge Program

- Targeted at the state’s 100 largest energy users with recognition awards from the Governor.

- Commitment to implement all measures with a 5 year payback or less.

- The plan assumes energy savings will grow to 11.5% by 2020, leading to $2.2 \text{MMTCO}_2$ per year in 2020.

- Partners: SWEEP, CSU Industrial Assessment Center, Rocky Mtn. CHP Center. Spring, 2009 launch.

<table>
<thead>
<tr>
<th>Year</th>
<th># of Companies</th>
<th>% of CO Ind. Energy Use</th>
<th>% Energy Savings</th>
<th>Energy Savings (trillion Btu)</th>
<th>CO$_2$ Savings (metric tons/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>15</td>
<td>5</td>
<td>0.5</td>
<td>1.5</td>
<td>90,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>30</td>
<td>10</td>
<td>1.0</td>
<td>2.9</td>
<td>174,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>60</td>
<td>25</td>
<td>2.5</td>
<td>7.3</td>
<td>438,000</td>
</tr>
</tbody>
</table>
Green indicates LEED projects (Certified, Silver, and Gold)
Governor's Energy Office
K-12 Program:
Opportunity For Change
DIRECT SAVINGS
FOR AN AVERAGE
GREEN SCHOOL

$47,880
Annual Direct Energy Savings Per School

$95,760
Annual Total Direct Savings Per School
Governor's Energy Office

Eagle Place Townhomes, Lafayette
Governor’s Energy Office
Utilities Program

Jim Tarpey  Ron Binz  Matt Baker

- Electric Resource Plan
- Demand Side Management Docket
- Incentives Investigatory Docket
- Transmission Investigatory Docket
Xcel CAP DSM Targets vs. PUC Docket Order DSM
State Funding (HB06-1200/08-1387)

- Energy efficiency measures and education to low-income households
- Heating system and other appliance replacement
- Renewable energy measures
- Energy efficiency upgrades to new housing
- Eligibility criteria 80% AMI
- Serve as many low income households as possible; cost effective
GEO’s Objectives

✧ Engage the entire low-income housing sector in energy efficiency
✧ Investment-driven energy services (maximize savings/$ expended)
✧ Develop a full spectrum of services
3 Levels of Service (Tiers)

Tier 1 – Low Cost
  - CFLs, showerheads, energy ed, Tier 1 Audit

Tier 2 – State Weatherization
  - High efficiency appliances, Insulation, Air Sealing

Tier 3 – DOE Weatherization
  - High efficiency appliances, Insulation, Air Sealing
  - Health & Safety

✦ All services based on cost-effectiveness
✦ Level of service determined by energy use and need.
Energy $aving Partners (E$P) Program:

- State/LEAP partnerships
- State/Xcel partnerships (since 1993)
- State/Local partnerships (DOE requirement)
- Service Provider/Service Recipient partnership – expectations upon clients, landlords

➤ Regional Partnership Networks
U.S. Department of Energy = $6,558,012
HHS LIHEAP = $4,706,264
Xcel Energy = $2,500,000
Colorado HB 06-1200 = $6,000,000
TOTAL: $19,764,276

*Approx 25,000 households will receive some level of E$P service in 2008-09
Streamlined Outreach through Business Reply Card
Tier 1 Audit – Agency recruitment and training
Cost savings through bulk price agreements on materials
New utility partners
Program Overview

- Partnerships with Cities, Counties & Utilities
- Turnkey Rebate Program for Existing Home Attic & Exterior Wall Insulation, Air Sealing
  - 20% of Job Cost, Up to $300 (whichever is less)
- Matching Grants for Local Implementation
  - Dollar for Dollar Match (up to $25k)
- GEO Funding for Homeowner Rebates
  - Partners Can Be Used for Mktg, Admin, Rebates
Implementation Model

- Homes Insulated to IECC 2006 Levels
- No DIY, Must Use Eligible Contractor
- Homeowner Must Submit Invoice Copy with Rebate Form to City or County
- Measure and Verification Audit Program
- State Sponsored Marketing Campaign
**Implementation Model (continued)**

✿ *Recommended IECC 2006 R-Values Vary By County (see Rebate Form):*

<table>
<thead>
<tr>
<th>County</th>
<th>Ceiling Insulation</th>
<th>Wood Framed Wall Insulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Zone A</td>
<td>R-38</td>
<td>R-13</td>
</tr>
<tr>
<td>Climate Zone B</td>
<td>R-38</td>
<td>R-19*</td>
</tr>
<tr>
<td>Climate Zone C</td>
<td>R-49</td>
<td>R-19*</td>
</tr>
<tr>
<td>Climate Zone D</td>
<td>R-49</td>
<td>R-21*</td>
</tr>
</tbody>
</table>

* = Or insulation sufficient to fill the framing cavity, R-13 minimum for 2x4 wall cavity
Program Implementation (continued)

Homeowner Submits The Following

- Completed Homeowner Rebate Form
- Copy of the Insulation Contractor’s Itemized Invoice
- Copy of the Insulation Card
Description of Insulation Installed and Air Sealing Installed (Must Be Completed)

<table>
<thead>
<tr>
<th>Where Installed</th>
<th>Type of Insulation</th>
<th>Number of Inches Existing Prior to New Installation</th>
<th>Existing R-Value (see Worksheet below)</th>
<th>Number of Inches Installed</th>
<th>Square Feet of Area</th>
<th>Total R-Value Installed</th>
<th>Air Sealing Completed in Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior Walls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rebate Calculation:
A. Total Cost of Attic Insulation Work $________
B. Total Cost of Exterior Wall Insulation Work $________
C. Total Cost of Air Sealing Measures $________
D. Sum Cost (A) + (B) + (C) = $________
E. Multiply (D) x 0.20 = $________

Total REBATE Requested, enter $________ or value in (E), whichever is less: $________

By my signature, I am certifying that the information entered is accurate to the best of my knowledge. (Both Contractor and Homeowner signatures are required.)

Contractor ___________________________ Date ___________________________

Homeowner ___________________________ Date ___________________________

Optional Insulation Calculation Worksheet
Evaluating the R-Value of Insulation in Existing Homes (Includes effects of aging and settling)

<table>
<thead>
<tr>
<th>Insulation Type</th>
<th>R-Value Per Inch of Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiberglass Batt</td>
<td>3.1 to 4.3</td>
</tr>
<tr>
<td>Fiberglass Blown (attic)</td>
<td>2.2 to 4.3</td>
</tr>
<tr>
<td>Fiberglass Blown (wall)</td>
<td>3.7 to 4.3</td>
</tr>
<tr>
<td>Rock Wool Batt</td>
<td>2.1 to 4.0</td>
</tr>
<tr>
<td>Rock Wool Blown (attic)</td>
<td>2.1 to 4.0</td>
</tr>
<tr>
<td>Rock Wool Blown (wall)</td>
<td>3.1 to 4.0</td>
</tr>
<tr>
<td>Cellulose Blown (attic)</td>
<td>2.1</td>
</tr>
<tr>
<td>Cellulose Blown (wall)</td>
<td>2.7</td>
</tr>
<tr>
<td>Vermiculite</td>
<td>2.1</td>
</tr>
</tbody>
</table>

1. Use this formula to estimate the R-Value of your existing insulation:

\[
\left( \text{Thickness in inches} \times \frac{R-\text{Value per inch}}{\text{Estimated Total R-Value}} \right)
\]

2. Use this formula to estimate needed R-Value of Insulation:

\[
\left( \frac{\text{Recommended R-Value}}{- \text{Existing R-Value}} \right) = \text{R-Value Needed}
\]

3. Use this formula to estimate how many inches of insulation to add (to obtain recommended R-Value):

\[
\left( \frac{\text{R-Value Needed}}{- \text{R-Value per Inch}} \right) = \text{Estimated Inches Needed}
\]

2008 Insulate Colorado
"Supporting residential energy efficiency is a significant component of Colorado’s New Energy Economy. Insulation and air sealing can help homeowners save energy, save money and increase the comfort of their homes."

Bill Ritter, Jr.
Governor

2008 IECC Recommended R-Value
(recommended by county)

<table>
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<tr>
<th>Climate Zone</th>
<th>Ceiling Insulation</th>
<th>Wood Framed Wall Insulation</th>
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<tbody>
<tr>
<td>All Counties in IECC Climate Zone A</td>
<td>R-38</td>
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<td>R-49</td>
<td>R-19*</td>
</tr>
<tr>
<td>All Counties in IECC Climate Zone D</td>
<td>R-49</td>
<td>R-21*</td>
</tr>
</tbody>
</table>

* If insulation thickness to fill the cavity is less than 1.5 inches, use 1.5 inches.
GEO’s Implementation Model & Roll-out


- Published RFP to Secure Statewide Code Training Organization (Dec 2007), (ICC Selected)

- GEO Coordinated/Sponsored 30 FREE Training Sessions Across CO on both IECC 2003 & IECC 2006 (April 2008 to June 2008)
  - 850+ Participants Attended

- FREE Resources Available for Code Officials (code books, code summaries, work books, technical assistance)
Governor's Energy Office

HB 07-1146: Energy Codes
(GEO Sponsored IECC 2003 and 2006 Training)
Supporting (and funding) Advancements in the Energy Efficiency of CO’s Residential NC Sector is a Top Priority of Governor Ritter’s Plan for a New Energy Economy.

ENERGY STAR Provides A Common (Statewide) Platform For All 329 CO Jurisdictions & 56 Utilities to Build On.

ENERGY STAR Offers CO Homebuilders a Thoroughly Tested & Voluntary Construction Template to Follow, and a Proven Brand Name to Market Homes to Homebuyers.
Late 2007, GEO Convened A Meeting With CO Utilities, Cities and Counties to Discuss Their Interest in Supporting Area ENERGY STAR Builders.

*Response Was Overwhelmingly Positive*

In 2008, GEO Made 13 Matching Grants to 51 Cities, Counties & Utilities to Support ENERGY STAR

*$225,00+ in Funding to Provide:*

- HERS Rater Trainings
- Homebuilder Trainings
- Trades & Contractor Trainings
- Realtor Trainings
- Consumer Awareness Campaigns
Governor's Energy Office
CO ENERGY STAR New Homes
Governor's Energy Office
2009 CO ENERGY STAR NH Pgm.

✦ GEO Continuing Matching Grants For Regional Efforts:
  ✴ HERS Rater Trainings
  ✴ Homebuilder Trainings
  ✴ Trades & Contractor Trainings
  ✴ Realtor Trainings
  ✴ Consumer Awareness Campaigns

✦ GEO Launching Statewide Marketing Effort
  ✴ All Major Colorado Markets & Homebuyers Will Receive GEO Sponsored ENERGY STAR Messaging by Print, Radio, etc.

✦ GEO Partnering with Utilities to Offer ENERGY STAR New Home Incentives to Builders Statewide!
The Colorado New Construction Market Is Changing, ENERGY STAR Is Actually Growing Very Quickly Here …

- 2005 = 4.2% Market Penetration
- 2006 = 5.7% Market Penetration
- 2007 = 7.8% Market Penetration
- 2008 (YTD) = 14.5% Market Penetration

GEO and Partners Are Looking to Support All Builders Interested in Trying the ENERGY STAR Program.
The Colorado Carbon Fund provides high quality carbon offsets to consumers as a way to support new energy efficiency and renewable energy projects to reduce greenhouse gas emissions in our state.
changing the way we think about energy.

Tom Plant
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www.colorado.gov/energy