

Bolder Boulder: A City's Quest to meet Kyoto when Federal Policies Fail

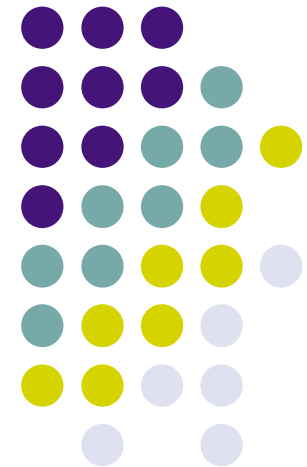
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What we'll talk about:

- Orient you to Boulder
- Development of Boulder's Climate Action Plan
- The Carbon Tax
- 2007 Implementation Plans
- What will the future hold?







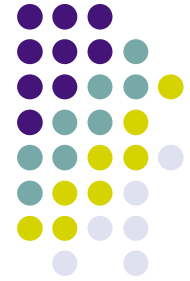
Boulder's Political Context



- Smart policy decisions over the decades have created a solid foundation from which to build
- Financial resources, community support, and political will to be an innovator and leader
- “Powerful” municipal image in Colorado

Boulder's Climate Action Plan:

How we got here



- May 2002: Boulder City Council adopted Kyoto Protocol goals for the city:
“Reduce community-wide greenhouse gas emissions to 7% below 1990 levels by 2012.”
- 2003: volunteer group developed framework for Climate Action Plan; City spent € 75,000 developing a detailed GHG inventory

Boulder's Climate Action Plan:

How we got here



- November 2004: City Council appropriated 200,000 Euros annually in 2005 and 2006 for GHG reduction programs and development of a Climate Action Plan (CAP), including long-term funding options.
- 2005: Council, staff, and key stakeholders developed overarching strategies for the CAP and explore funding options; staff began ramping up limited programs.

Boulder's Climate Action Plan:

How we got here

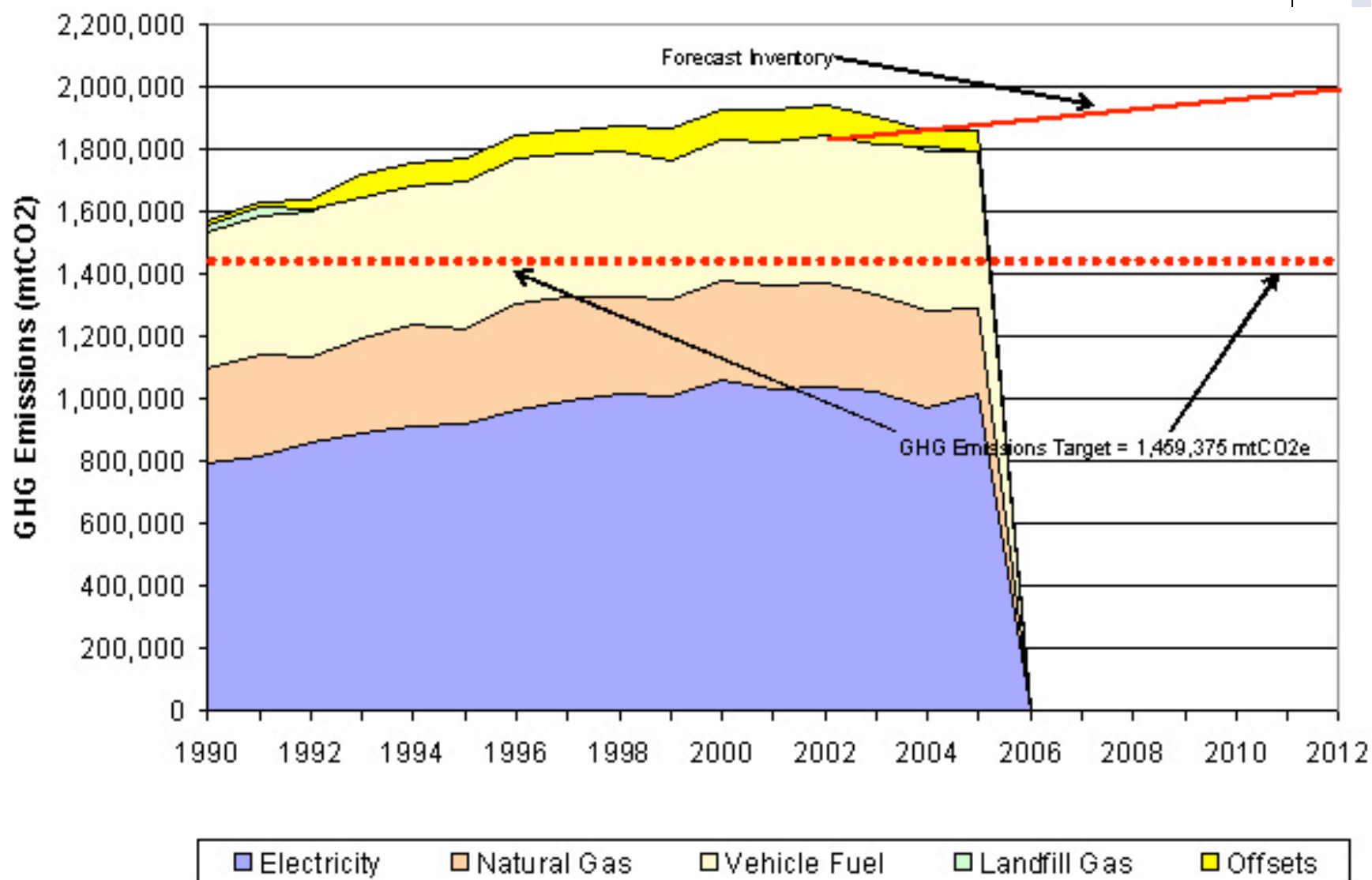


2006:

- Climate Action Plan Committee shepherded CAP toward completion; adopted by City council in June
- Council determined carbon tax is best revenue source for implementation, placed tax measure on November ballot
- Measure passed, 60.5% in favor, 39.5% opposed



Actual GHG emissions in Boulder 1990 through 2004 with “business as usual” forecast to 2012

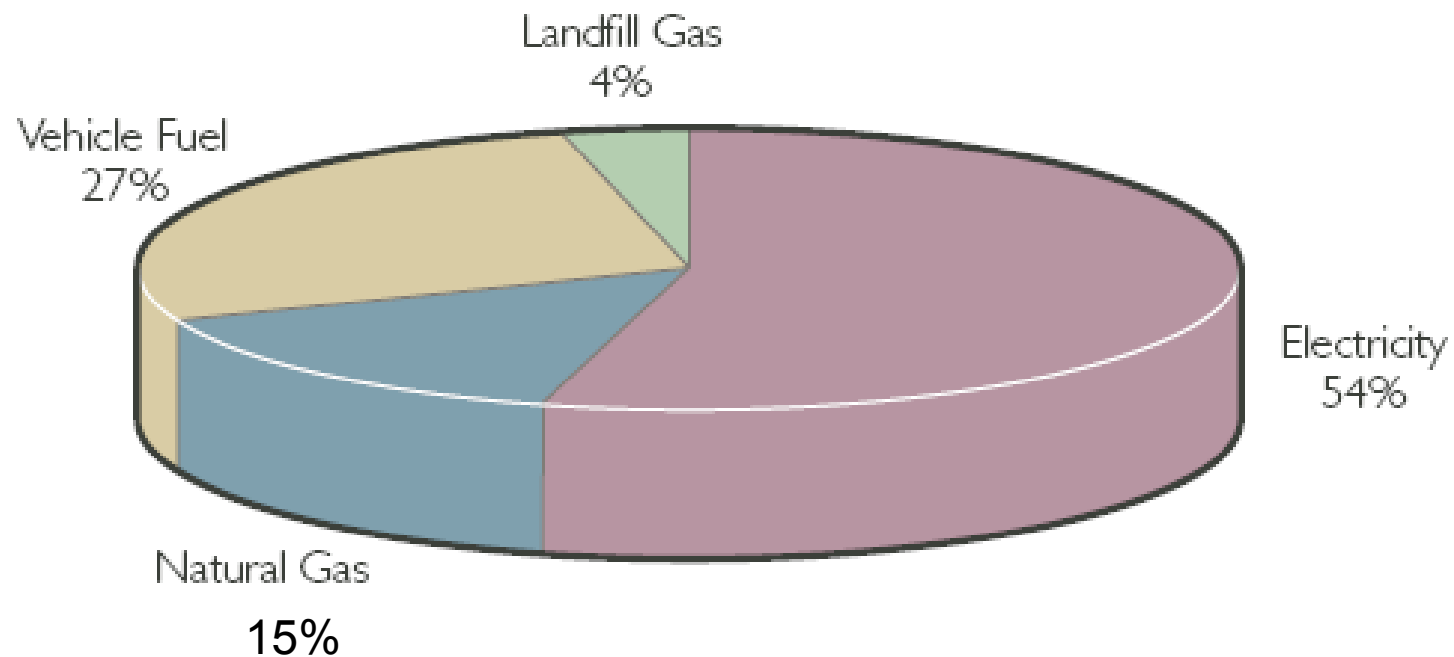


Boulder's Carbon Tax: Specifics



- Tax on electricity consumption

GHG INVENTORY BREAKDOWN BY ENERGY SOURCE



Boulder's Carbon Tax: Specifics



- Applies to all electricity customers in the city
- No tax charged for green power customers
- Rates set in direct proportion to expected program sector expenditures
- Rates can be re-set depending on program needs
- Rates can be increased by 20%
- Sunsets in 2012
- Will raise approximately €0.75 million per year

Boulder's Carbon Tax: Specifics



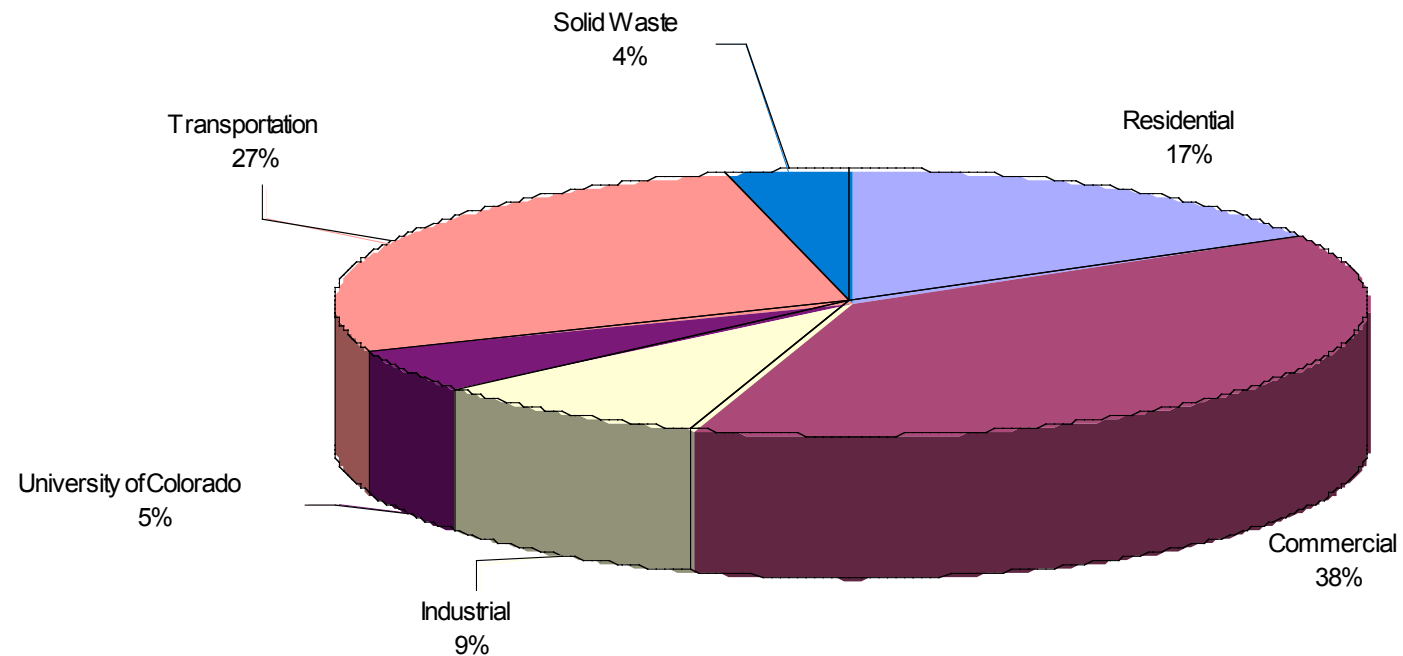
Sector Rates:

	Euros per kilowatt-hour
Residential	0.00165
Commercial	0.0003
Industrial	0.00015

2005 Emissions by Sector



GHG Inventory Breakdown by Sector



Residential Sector

Characteristics



- 17% of total GHG emissions
- Approximately 51,030 residential units, 45% single-family and 55% multi-family dwellings
- Roughly half of housing units are rental properties

Climate Action Plan Strategies



 **Increase energy efficiency**

 **Switch to renewable energy and vehicle fuels**

 **Reduce vehicle miles traveled**

Maximize voluntary emissions reductions through:

- Education, outreach and marketing
- Connecting residents and businesses with available rebates and tax credits
- Providing services not offered in the Boulder market

Energy Efficiency

Current Programs



Income – Qualified Weatherization

- 2007 Budget: € 30,000 for 20 homes
- Increased income guidelines to 78.5% of AMI (HUD + 10%) and opened to renters
- Measures include:
 - Insulation
 - Furnace replacement
 - Refrigerator replacement
 - Programmable thermostat
 - Duct sealing
 - CFLs
 - Considering evaporative cooling



Energy Efficiency

Current Programs



Residential Energy Audit Program



RESIDENTIAL
ENERGY
AUDIT
PROGRAM

- 2007 Budget: € 36,000
- 300 homes in the city of Boulder
- Homeowner pays € 75 of the audit cost

Energy Efficiency

Current Programs



Boulder Energy Brigade

- 2007 budget € 22,500
- 2006 pilot targeted 550 homes with kits, and conducted 63 1-hour audits
- Program highlights:
 - Deliver kits with low-cost, no-cost efficiency measures and educational literature





Energy Efficiency

Residential Programs to be developed in 2007



- Home Energy Makeover
- Refrigerator Round-up
- Insulation Buy-down
- Public Housing Retrofits
- Updated Lighting Program
- Integrate Green Building Programs – Training and Education

Vigorous building energy efficiency initiatives in Boulder



- Boulder Green Building Guild modeled after medieval European guilds
- Educational mission, produces Boulder Green Building Journal
- Copies at www.bgbg.org under News & Events, Journal & Publications

Achieving energy efficiency in housing

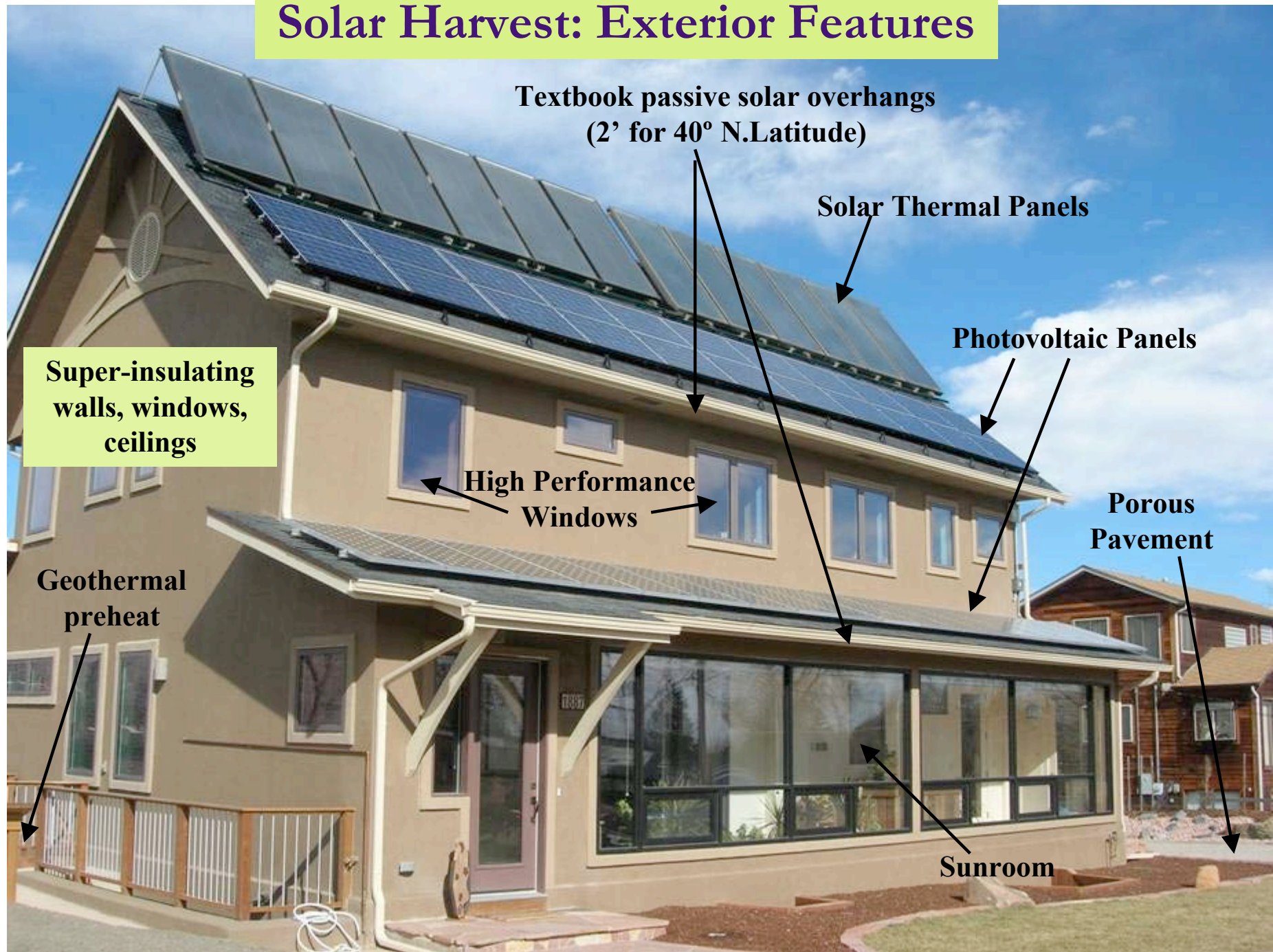


- Good design and good execution both critical.
- Build a thermos bottle, protect IAQ w/ smart ventilation.
- Excellent insulation, excellent air sealing.
- This includes ducts as well as the envelope; better radiant heating avoids fans and leaky ducts.
- Sun control summer and winter with overhangs and specularly-selective glazing; passive solar with insulated shutters, daylighting.
- Right size equipment; active solar DHW.
- Electric efficiency, lighting, appliances; evap cooling.
- Commission dwelling—pressure balance, controls, people.

Solar Harvest: *Boulder's First Net-Zero Energy Home*



Solar Harvest: Exterior Features



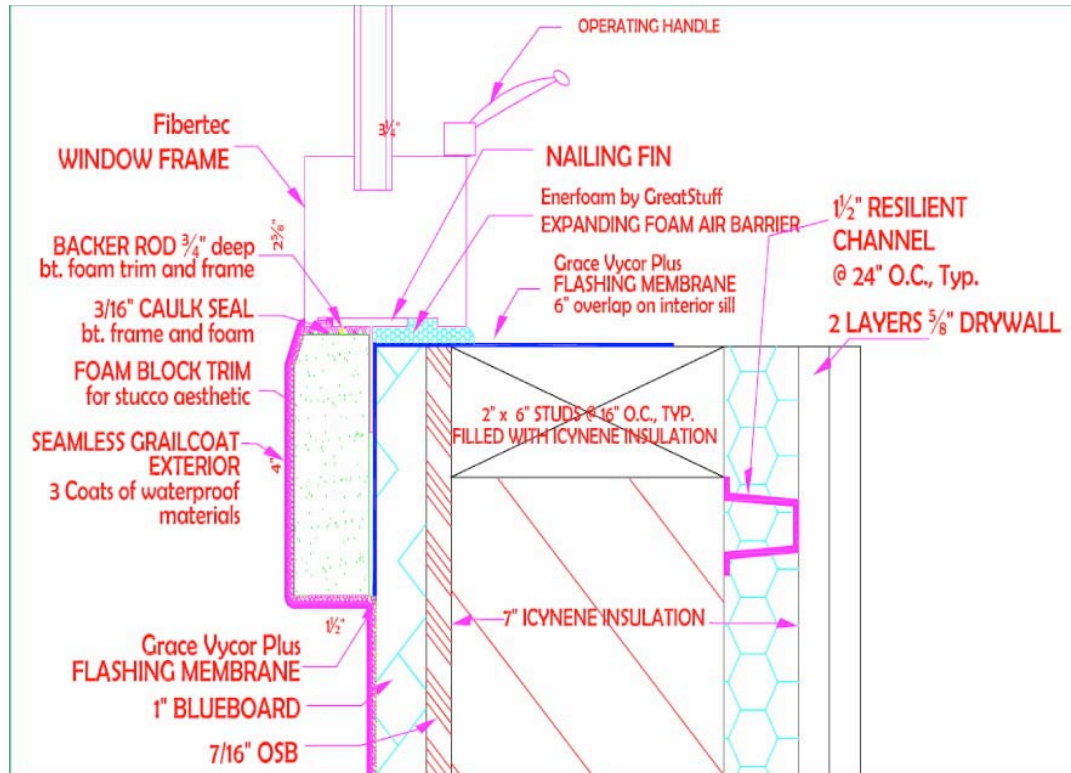
Interior Features & Building Techniques



- Tight Building Envelope
- Super Insulation
- Passive Solar Gain & Active Heat Distribution
- Thermal Mass: Double Drywall
- Solar Thermal Heating and Hot Water
- Geothermal Exchange
- PVs & Electricity Efficiency

Insulation and Grailcoat detail

Wall = R-6



Commercial Sector

Characteristics



Context:

- 1,600+ Commercial Buildings
- 30 million sq ft of space
- 38% of Boulder's emissions

Goals through 2012:

- 20% reduction in electricity use
- 5% reduction in natural gas consumption
- Reach 1/3 of commercial building stock

Commercial Sector

2007 Work Plan



Energy Efficiency

- Budget: € 96,000
- Goal: 500,000 kWh reductions *implemented*
- Strategies:
 - Establish Trade Ally network
 - Focused and robust training for property owners, managers, and contractors on building energy efficiency and Xcel Energy rebates

Commercial Sector

Xcel Energy



Commercial rebates and other programs

- Cooling efficiency
- Compressed Air efficiency
- Custom Efficiency
- Energy Design Assistance
- Energy Management System
- Lighting Efficiency
- Motor Efficiency
- Recommissioning



Industrial Sector

- Just 13 industrial customers in Boulder
- 9% of GHG emissions
- Focus will be on leveraging Xcel Energy programs
- Looking into industrial “self-direct” approach

Renewable Energy Programs



- Boulder Wind Challenge
- Solar promotion



Ideas:

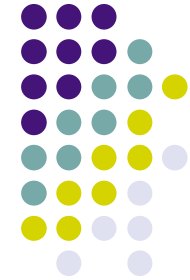
- Neighborhood renewable energy competitions
- Bulk purchases of solar equipment
- Collaborate with local RE suppliers and nonprofits to maximize visibility and promotion



Transportation

- 27% of total GHG emissions
- Goal: Reduce emissions by 40,000 tons by 2012
- Focus of CAP will be on promoting and increasing access to renewable fuels and promoting highly-efficiency and flex-fuel vehicles

Summary of Climate Action Plan



Actions	GHG emissions reduction by 2012	% of target	Lifetime energy cost savings (millions)	Private sector investment by 2012 (millions)	Public sector cost by 2012 (millions)	Public sector cost per ton
Energy Efficiency	76,000	22	€ 48	€ 26.7	€ 2.47	- € 347
Renewable Energy	204,000	58	-	€ 0.67	€ 1.05	€ 8.25
Transportation	40,000	11	not estimated	not estimated	€ 0.375	€ 0.75
Education and Outreach	30,000	9	not estimated	-	€ 0.9	€ 15
TOTAL	350,000	100	€ 48	€ 27.4	€ 4.88	€ 67

Next Steps



Climate Action Plan efforts:

- Program branding
- Awards programs
- CAP Symposium

Other policy efforts:

- Solar rebates and municipal solar installations
- Building energy codes
- Renewable Energy investments
- Municipalization of electric power company

Boulder's Carbon Tax:

What we've learned



- City council and city management leadership and commitment is critical.
- Involve residents in designing plan.
- Engage key community stakeholders—and listen to what they have to say.
- Keep the issue in front of the community.
- When the people lead, sooner or later the federal government will follow!

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