



Governor's
Energy Office

**Colorado's
New Energy Economy**

**Tom Plant, Director
Governor's Energy Office
November 15, 2007**



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The Southwest

the throbbing red splotch

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.



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Governor Ritter's Executive Order

Leading by Example

- Increase energy efficiency of state government facilities 20%
- Reduce water use of state departments 10% by 2012
- Reduce paper use of state departments 20% by 2012
- Reduce consumption of petroleum in state fleet 25% by 2012
- Require use of Bio-Diesel and E-85 in State Fleet vehicles
- Increase fuel efficiency of state vehicles
- Require energy management plan for all departments



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Leading by Example

- 5,600 state buildings
- 63 million square feet
- 517 leased spaces
- \$154 million annual utility budget
- UBILS utility management system



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2007 Legislative Session





2007 Legislative Session

Doubled the Renewable Portfolio Standard

- From 10% to 20% by 2020
- Included the Rural Electric Coops and Municipal Utilities (10% by 2020)



2007 Legislative Session

TRANSMISSION

- SB 100
- HB 1150
- SB 91





2007 Legislative Session

SB 100

Energy Resource Zones

- Established a requirement for IOUs to identify energy resource zones
- authorizing current cost recovery by utilities for building transmission to the resource zones.





2007 Legislative Session

HB 1150

Create Energy Transmission Authority

- Attract investment in transmission and clean energy technologies
- Address emerging renewable energy export market





2007 Legislative Session

SB 91:

Renewable Energy Development Mapping

- 16 member Task Force
- Map renewable generation areas
- Transmission capability

*A report to the legislature and Governor will be filed
before December 31, 2007.*





2007 Legislative Session

Energy Efficiency

- Directs the Colorado Public Utilities Commission to require jurisdictional **electric** utilities and **gas** local distribution companies to develop and substantially expand energy efficiency programs.



2007 Legislative Session

- **K-12 Building Efficiency Upgrades**
 - \$500k /year for 3 years
 - Leveraging over \$80M in upgrades
 - Performance contracting
- **Increase Building Standards**
 - Adopt 2003 IECC Standard
 - Increase energy efficiency for new construction
- **High Performance Buildings (LEED)**
 - Require new state buildings to meet LEED Gold standard



2007 Legislative Session

Clean Energy Fund Legislation ~\$7-10 M/year

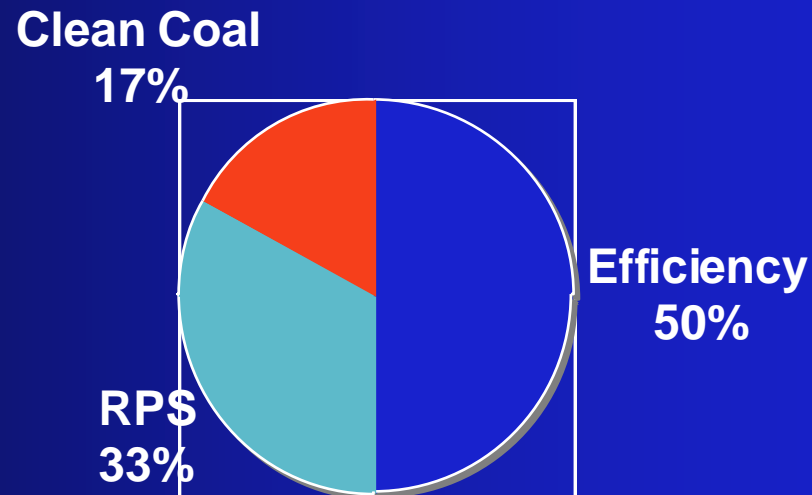
- Help bring technology to the marketplace
- Attract clean tech investment
- Increase energy efficiency and renewable energy across the state



- **Reduce overall GHG emissions by 20% by 2020**
- **Establish clean car standard**
- **20% reduction in CO₂ emissions from the utility sector by 2020**



- **20% reduction in CO₂ emissions from the utility sector by 2020**





- **50% of utility sector CO2 reductions will be from efficiency**

As modeled	MMTCO2
2005 (48,353 GWh)	44.53
2020 BAU (69,008 GWh)	63.56
20% below 2005	35.63
Savings needed in 2020	27.94
50% of 2020 goal (Energy Efficiency only)	13.97



- **50% of utility sector CO2 reductions will be from efficiency**

- 41% - Expanded Utility DSM Programs

- 25% - Lighting efficiency improvements

- 16% - Updating and improving building codes

- 15% - Industrial energy efficiency improvements

- 3% - State Government, Leading by Example



Vestas

- **Vestas opens its first North American manufacturing facility in Windsor, Colorado:**
 - 75 acre site
 - 200,000 square foot factory
 - 35 white-collar jobs
 - 455 blue-collar jobs
 - \$60 million investment by Vestas
 - Will start production in early 2008





AVA Solar

DENVER BUSINESS JOURNAL

AVA Solar Inc., a spin-off from Colorado State University, is planning to build a manufacturing plant that will use new technology to manufacture cheaper solar panels.

The new factory, expected to employ as many as 500 people...





Ascent Solar



Forbes
.com

“OSLO (Thomson Financial) - Norsk Hydro ASA said it is to invest an additional 62 mln nkr in US-based solar energy group Ascent Solar, a producer of super-thin, flexible solar-cell modules.

Earlier this year Hydro invested 56 mln nkr in the Colorado-based company, meaning the Norwegian group's total investment now stands at 118 mln nkr.”



Projects in 2007



Groundbreaking at 400 MW FPL Wind Farm, Spring 2007

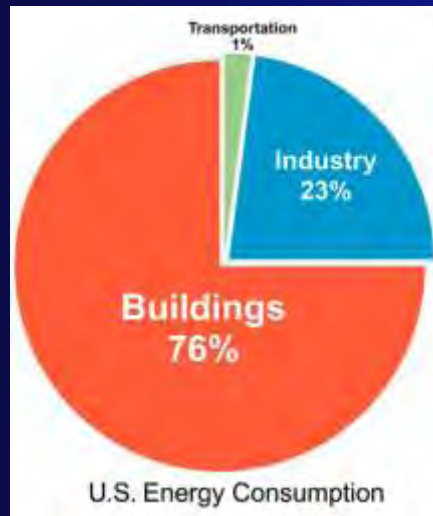
Groundbreaking at 8 MW SunEdison PV Plant,
Alamosa, Spring 2007



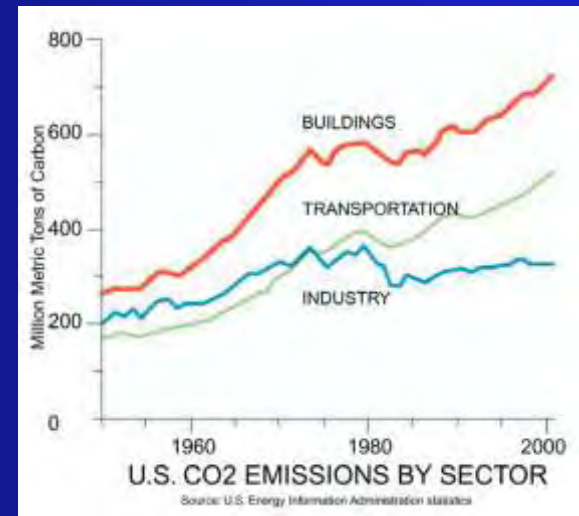


The Governor's Energy Office

has two directors dedicated to achieving improvements in buildings - **commercial** and **residential**



76% of all power plant generated electricity is used just to operate buildings.



Buildings Account For Half Of All Greenhouse Gas Emissions



By 2030 the US will have re-built almost half of its built environment

~Prof Arthur C Nelson

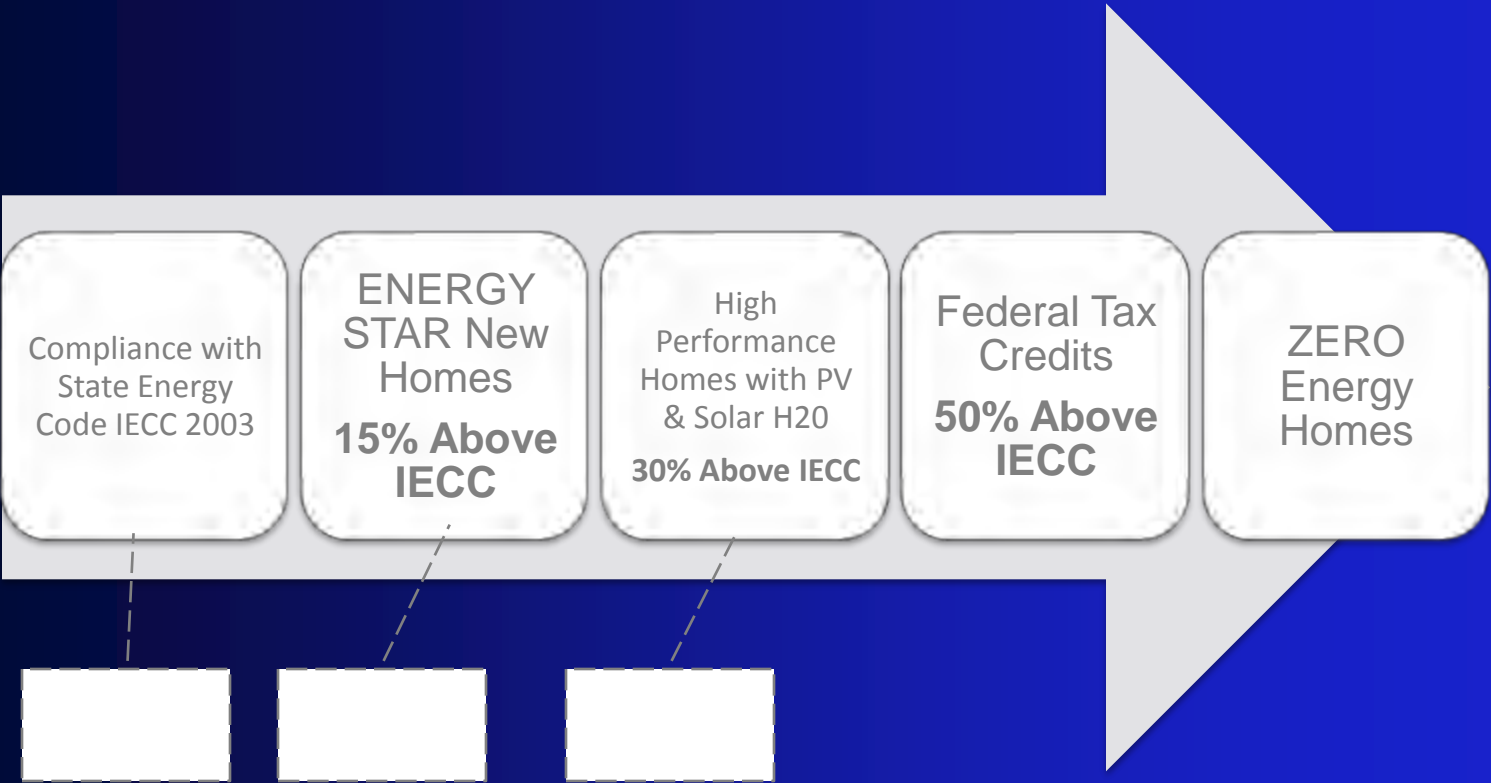
- In 2030, about half of the buildings in which Americans live, work, and shop will have been built after 2000.
- Commercial and industrial sectors will have the most new space with over 60 percent of the space in 2030 less than 30 years old.





Residential Buildings Program

New Construction





Residential Buildings Program

Existing Homes

Basic Home Efficiency

- Speaker Series: Town Hall Talks on EE & RE (2008 program)
- Point-Of-Sale Retrofit Pilot (2008 pilot)

Single Measure Installation

- Insulate Colorado: Homeowner Rebates (2008 program)

Whole House Retrofits

- Home Performance with ENERGY STAR (2008 support)

PV/Solar Installation

- Energy Efficiency with PV (2008 pilot TBD)



Residential Buildings Program

Codes Training (HB 1146)

Step 1

- Baseline Study
 - Document current code status for all building jurisdictions
 - Cross reference codes status research by actual regional permit data
 - Survey of preferred training mediums (CD, classroom, field, etc.)

Step 2

- RFP for Training Development and Delivery
 - Competitive national solicitation for development of IECC 2003 training
 - Training contractor works in partnership with GEO office and Field Reps

Step 3

- Actual Training Delivery
 - Statewide training sessions delivered January to June 2008
 - Contractor submits monthly reports, training attendance lists, etc.



Commercial Buildings Program

New Buildings/Major Renovations

- High Performance Design – LEED Gold target
- LEED Design Assistance grants for state/local government and K-12 schools

Existing Buildings

- Performance Contracting for state/local government buildings and K-12 schools
- State buildings utility bills management system

Renewable Energy

- Grants for renewable distributed generation projects in new and existing commercial buildings.
- Renewable Energy Secure Schools





Commercial Buildings Program

- New buildings represent the **greatest opportunity** to leverage energy efficiency, incorporate renewables, and reduce environmental degradation.
- **Senate Bill 51** requires all new construction projects receiving 25% or more in capital construction funding from the state to strive to achieve a LEED Gold certification.
- **The GEO will provide grant funding** and technical assistance to help new K-12 schools and state buildings incorporate the principles of high performance design in their project through the LEED process.





Cost & Benefits of LEED in Colorado

- The cost premium of building a LEED-NC version 2.1 certified building compared to conventional construction ranges between 1 and 6 percent.
- LEED-NC project modeled energy savings shows that the net present value of the predicted energy savings alone outweighs the cost premium in 7 of 9 of the projects with reported data.





Utility Program

- Intervening at the PUC on behalf of Governor's Office
 - Promoting utility policies to advance renewables and energy efficiency
 - Partnerships with utilities throughout the state
 - Collecting energy usage information for statewide energy resource and transmission plan





Biofuels

- Liquid fuels for transportations derived from agricultural wastes and crops

Local Fuels

- Woody Biomass
- Anaerobic Digester Projects
- Landfill
- Waste Water





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changing the way we think about energy.

Thank you

Tom Plant

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