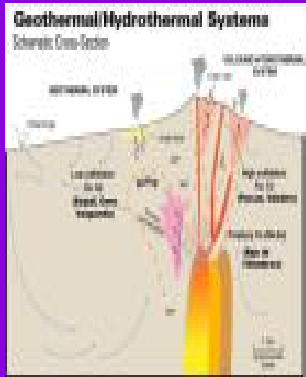


Cheaper, Cleaner, Cooler Ways to Meet our Needs for New Energy



Tom "Smitty" Smith Director
Public Citizen's Texas Office
512-477-1155 Smitty@citizen.org



Five Crises or Opportunities

1. Air pollution
2. Global Warming
3. Increasing Energy Bills
4. Reserve Margin
5. ERCOT Including all Available of Resources

Next steps

Implementing HB 3693

Preparing for the Next Session



HB 3693 – a big step forward

- **Expands energy efficiency goals to 15% of growth in demand by 2008 and 20% by December 31, 2009**
 - Requires the utilities to study whether 30% of demand growth is achievable by 2011, and whether 2050% is achievable by 2016
 - Creates an energy efficiency cost recovery factor, and incentive to reward utilities for exceeding the minimum goals
- **Municipally owned utilities above 500,000 MWh should administer energy savings incentive programs**
- **Electric Cooperatives shall consider implementing energy efficiency programs to reduce annual growth in demand**
- **Requires state funded entities to set a goal of reducing energy use by 5% per year for 6 years**
- **PUC and ERCOT are required to account for impacts of projected energy savings and demand impacts from:**
 - standard offers,
 - market transformation,
 - combined heat and power,
 - demand response,
 - solar incentives,
 - programs in public buildings, etcUpdate the building energy code and develop a HERS based rating system for existing homes
- **Net metering must be provided by the utility**



Ozone/Pollution

- Ozone is damaging to lung tissue
 - Asthma attacks will increase
 - Induces respiratory inflammation
 - Reduces existing lung function
- Ozone forms in temperatures over 90°F
- Houston is often the smog capital of the U.S.
- 9-12 additional counties may violate the newly proposed lower ozone standard



Today, In Texas & Nationally, Power Plants Are The Largest Source Of Industrial Air Pollution

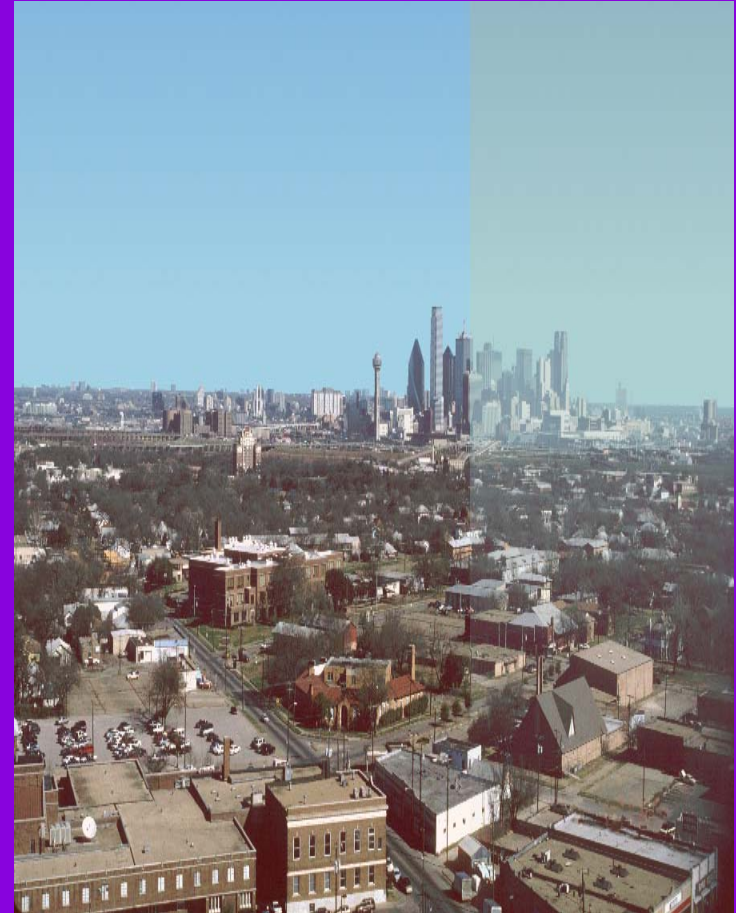
In Texas power plants emit more pollution than the chemical and refining industries combined!

Powering the average home every month produces

- 1,686 lbs of CO₂ (global warming)
- 3.9 lbs of SO₂ (acid rain)
- 2.16 lbs of NO_x (smog)

In 2004 power plants emitted

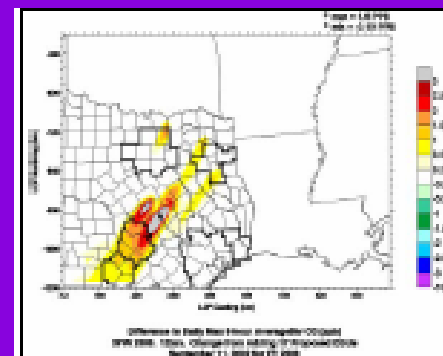
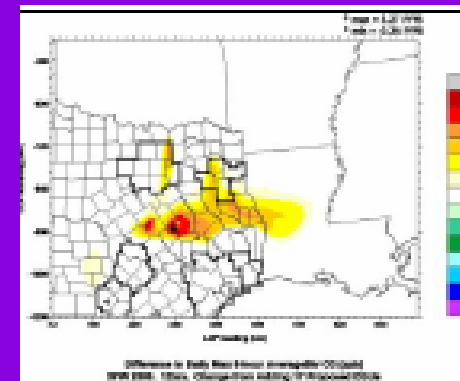
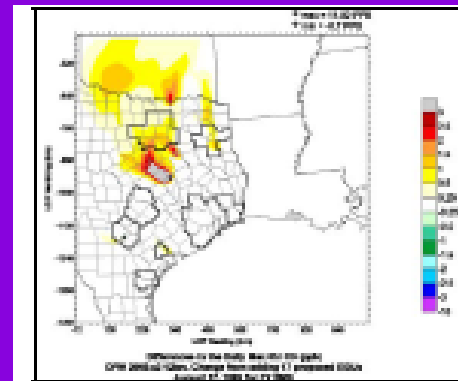
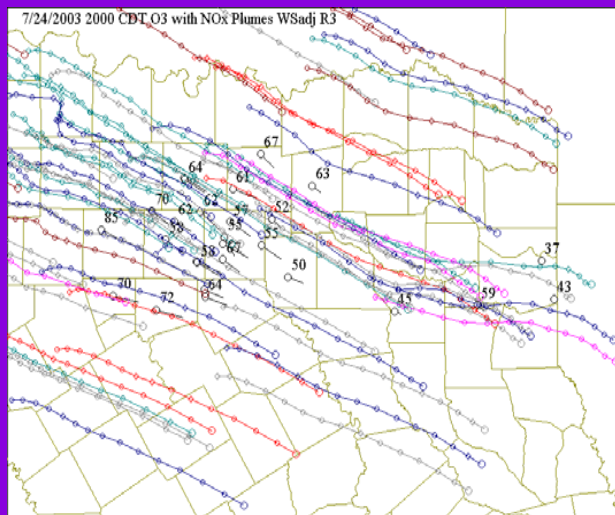
- 252 million tons CO₂
- 524,372 tons of SO₂
- 184,483 tons of NO_x



Power Plants Emissions Effect Air Quality Across Texas

Existing plants
Affect DFW, Longview,
Austin, San Antonio

9 new coal plants:
5 of which are permitted- 4 still in the process



Health Impacts from Existing Power Plants are Costly To D/FW Health and Economy

Estimated Health Impacts in the DFW area alone:

290	early deaths
476	heart attacks
10,263	asthma attacks
288	hospitalizations
547	E/R visits - asthma

Estimates based on emissions from existing power plants in Texas. Modeling done by Abt and Associates who do modeling for EPA Based on peer reviewed process for modeling health impact. Reported in Dirty Air /Dirty Power by the Clean Air Task Force June 2004

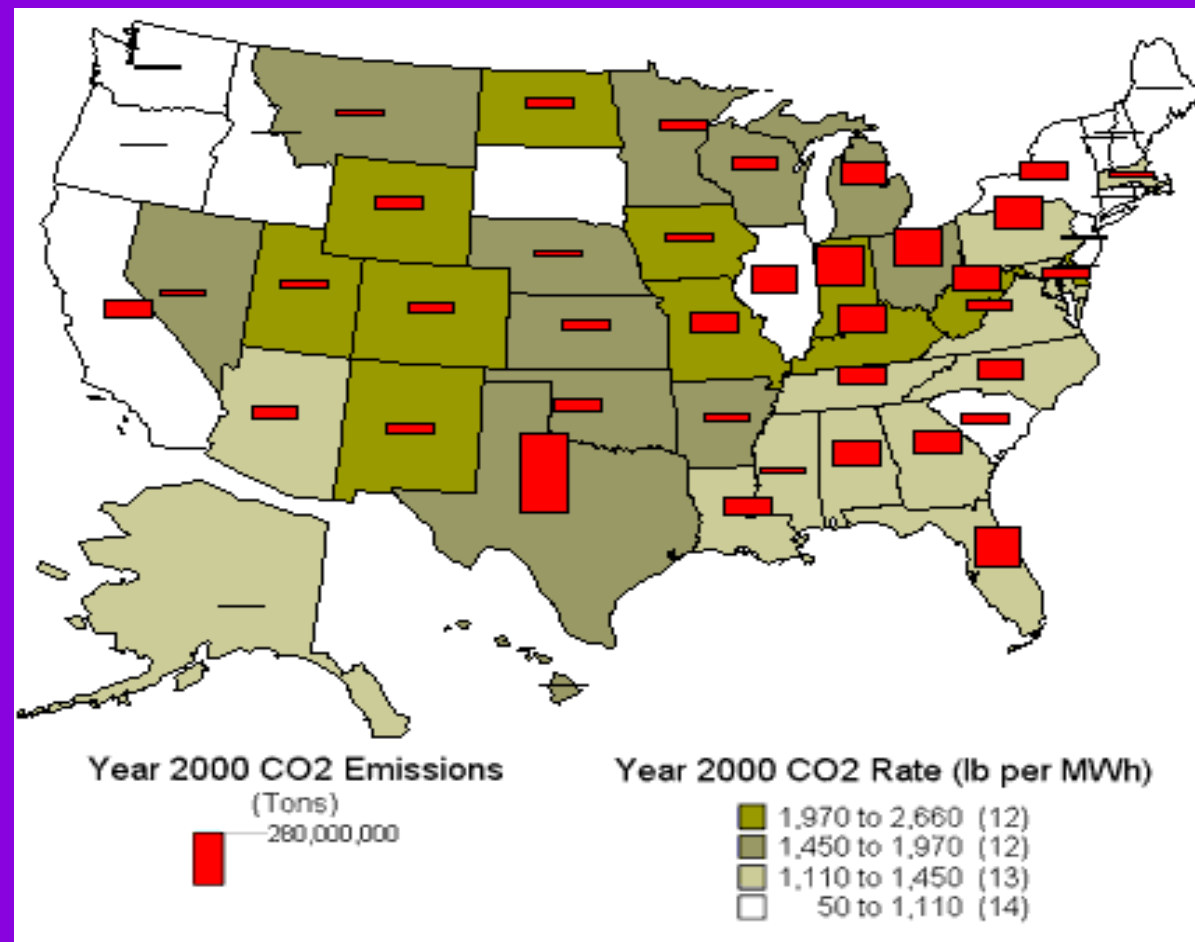
At just one Dallas Hospital:

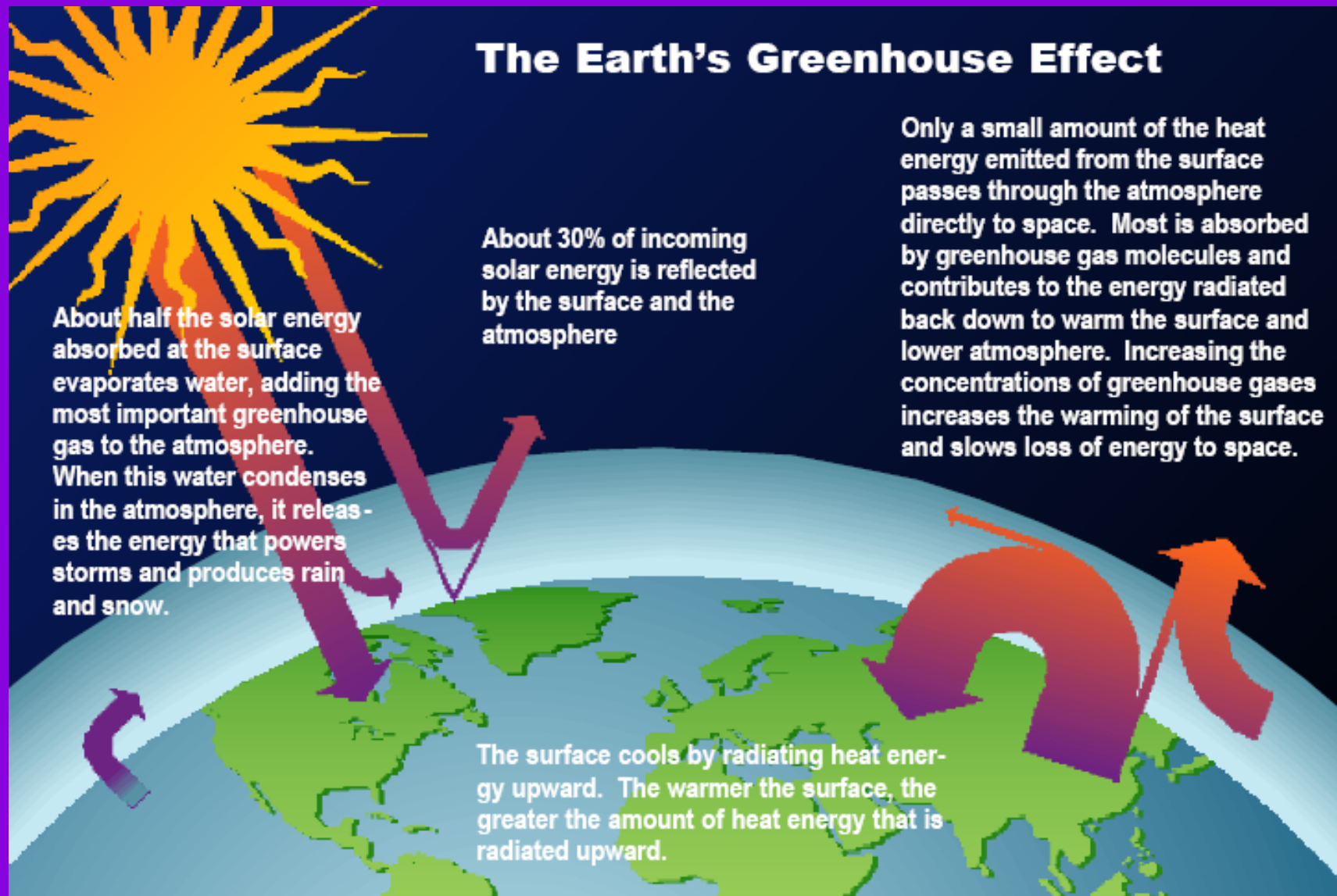
The Children's Medical Center reported annual expenditure of \$825 million on respiratory care....

“Asthma and related respiratory conditions were the primary diagnoses for 1,398 children who required hospitalization at Children's and 5,346 visits to the emergency center”.

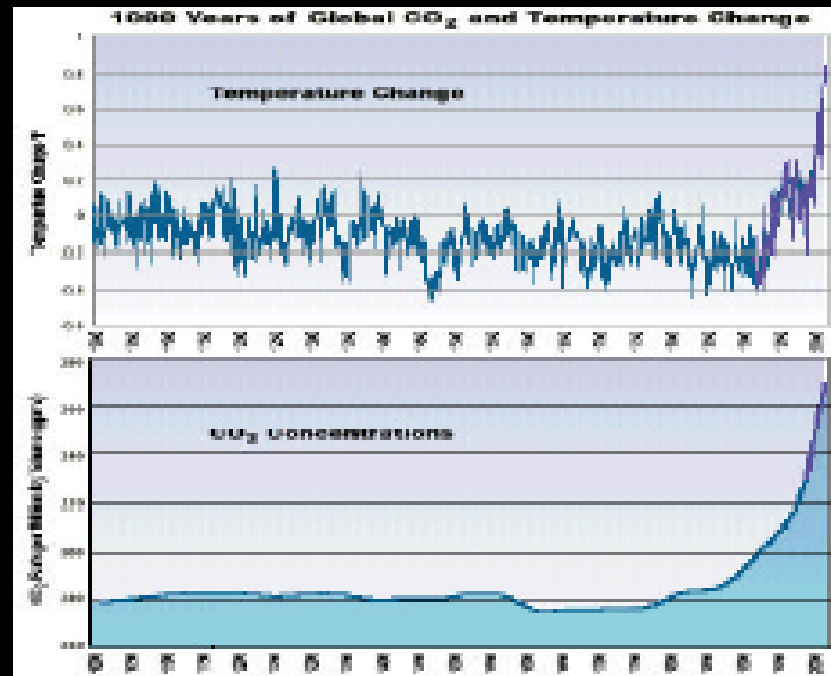


Texas Emits more Global Warming Gasses from Electric Generation than Other States





Historical and Observed CO_2 /Temperature Linkage

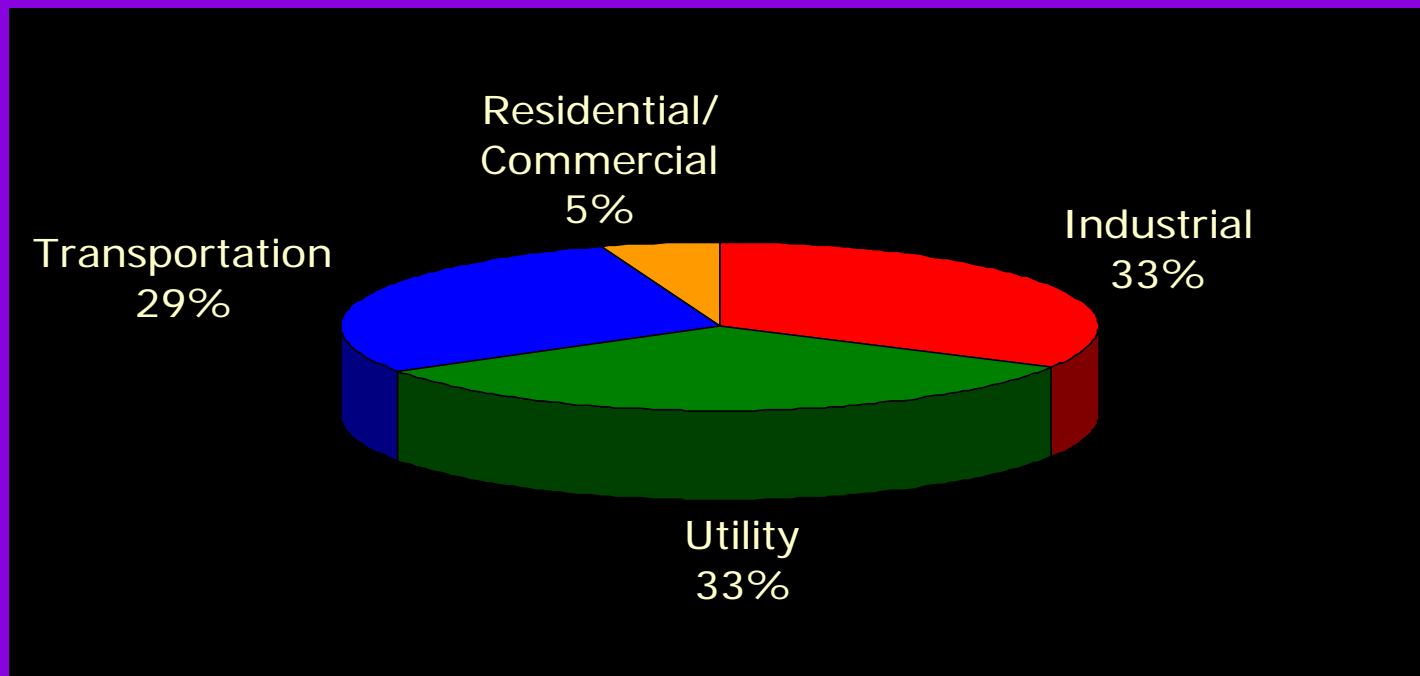


Source: US National Assessment, US Global Change Program, 2001.

Public
Citizen

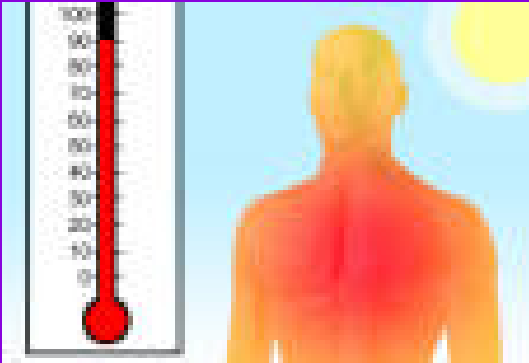


Where do Greenhouse gas emissions come from in Texas?



Source: *Greenhouse Gases: A Report to the Commission*. Texas Natural Resource Conservation Commission 2002.



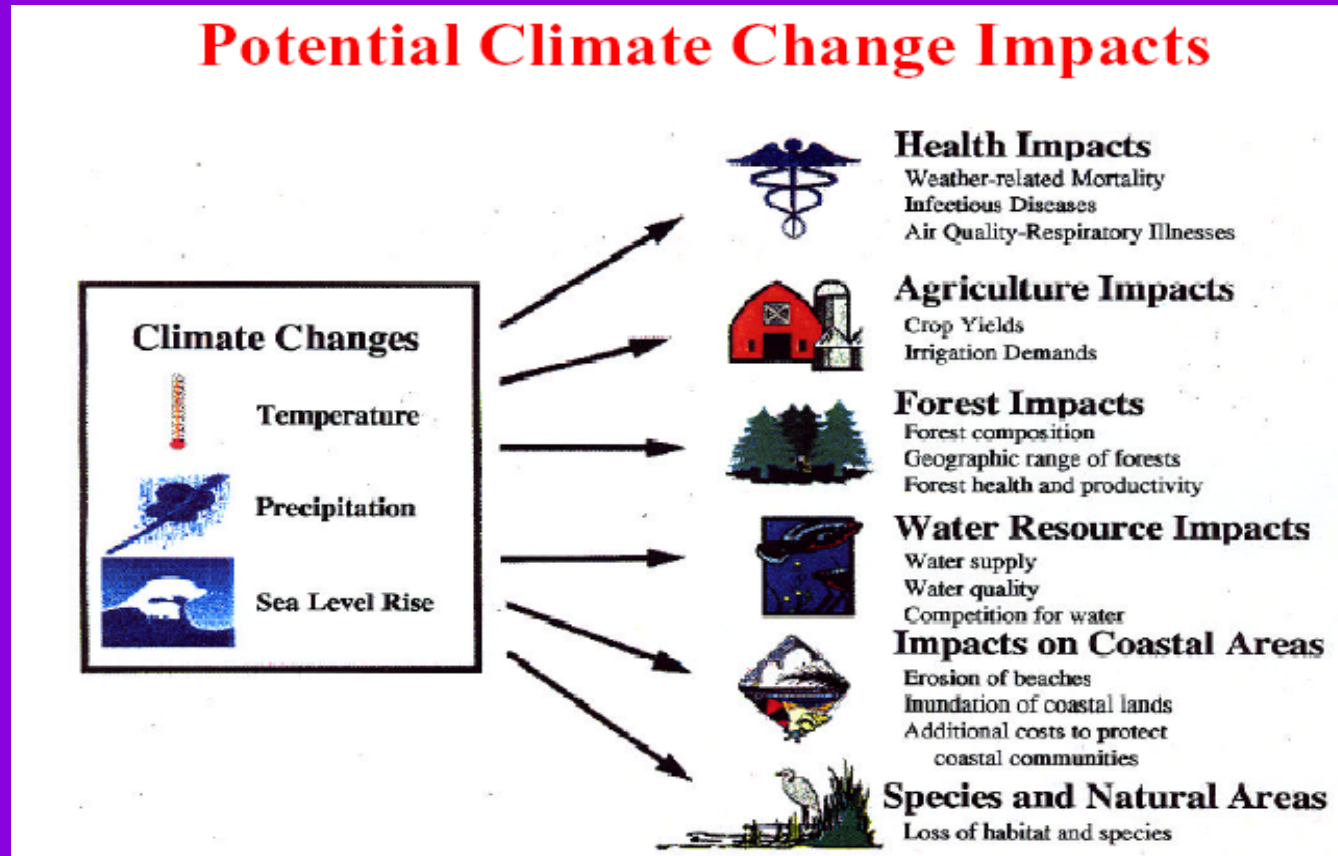


Future Warming

- Scientists predict an increase in temperature from 2.7-11°F over the next century.
- Texas' July heat index is expected to rise by 25 degrees over this century.
- **The EPA has found that Dallas' heat-related deaths could triple by 2050.**
- The United Nations weather agency predicts that large cities will suffer twice as many deaths from heat waves by 2020.
- Surface temperatures will likely increase
- Land will heat more than the ocean
- Less water for cooling
- Hotter winters
- Nighttime temperatures will warm more than daytime temperatures
- More hot days and heat waves, fewer cold waves
- In East Texas, we can expect an average temperature increase of 5-10°F by 2100.



What's at Stake in Texas?

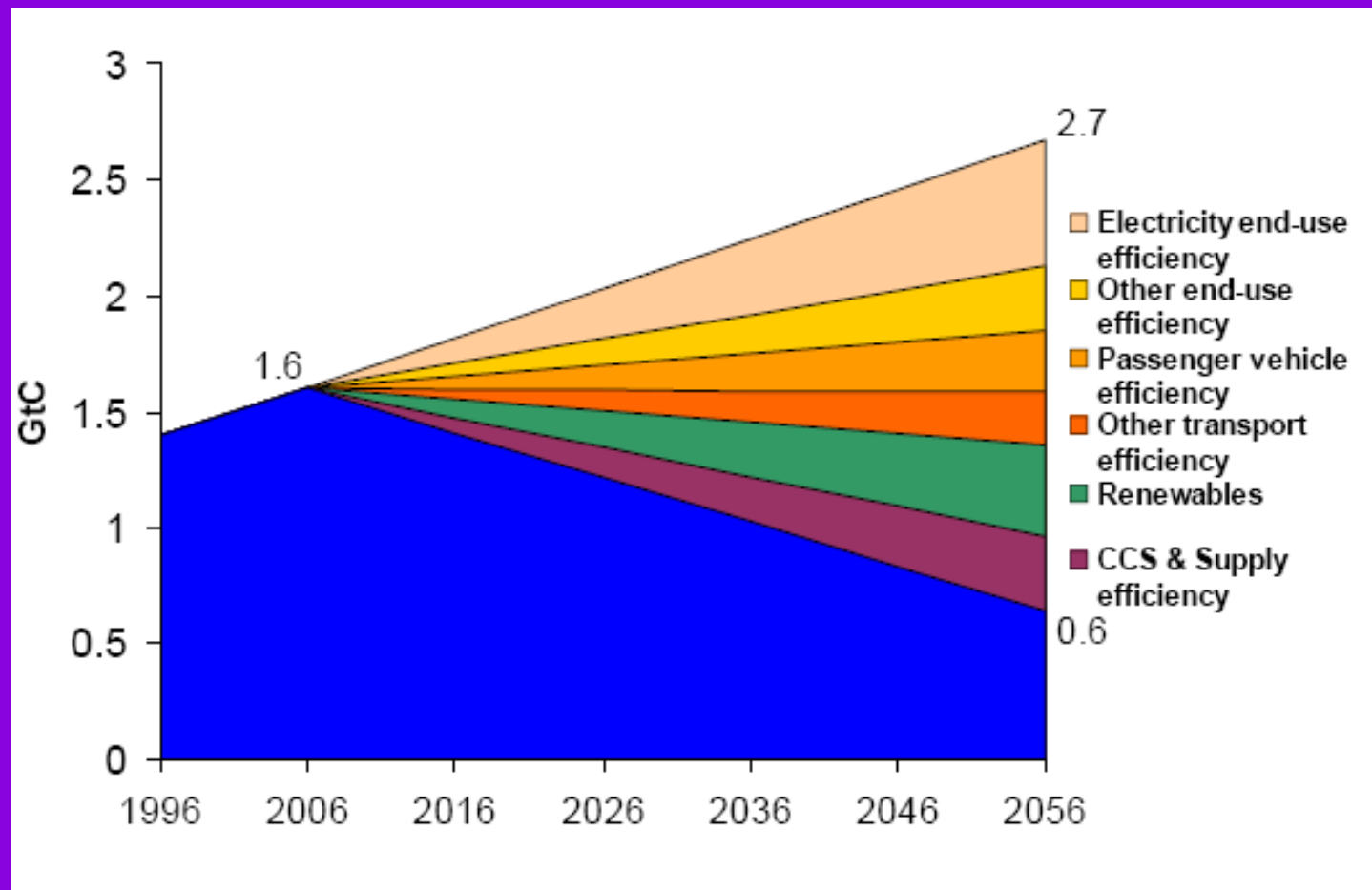


Solutions To Global Warming And Power Plant Pollution

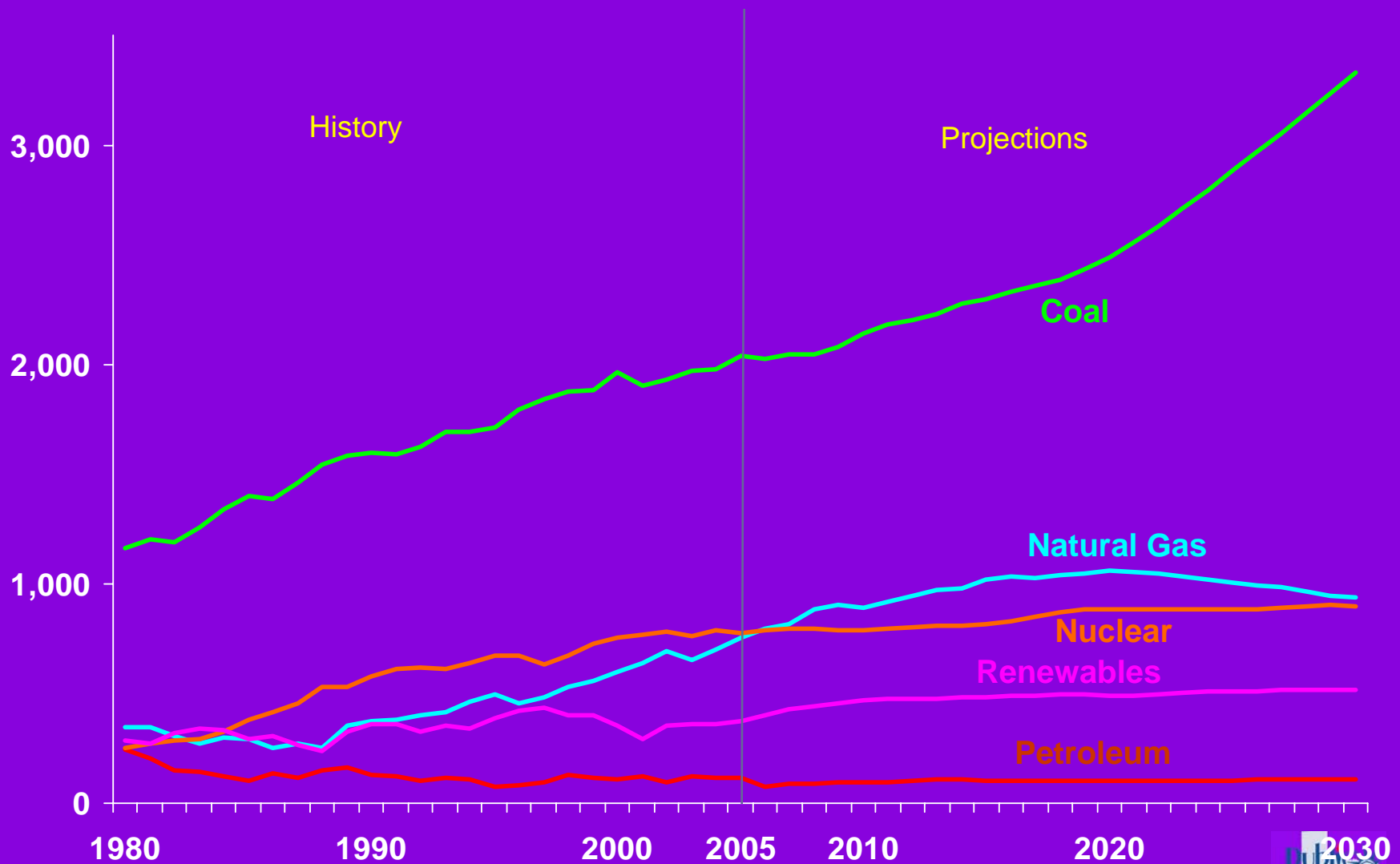
- Energy Efficiency HB 3693 – retrofits
- Energy Management
- Building Codes, Green Buildings and Net Zero buildings
 - 2030 goal of US Conference of Mayors,
- Renewable Energy
 - Wind, solar thermal, geothermal, solar electric
- CHP



7 Ways to Reduce CO₂

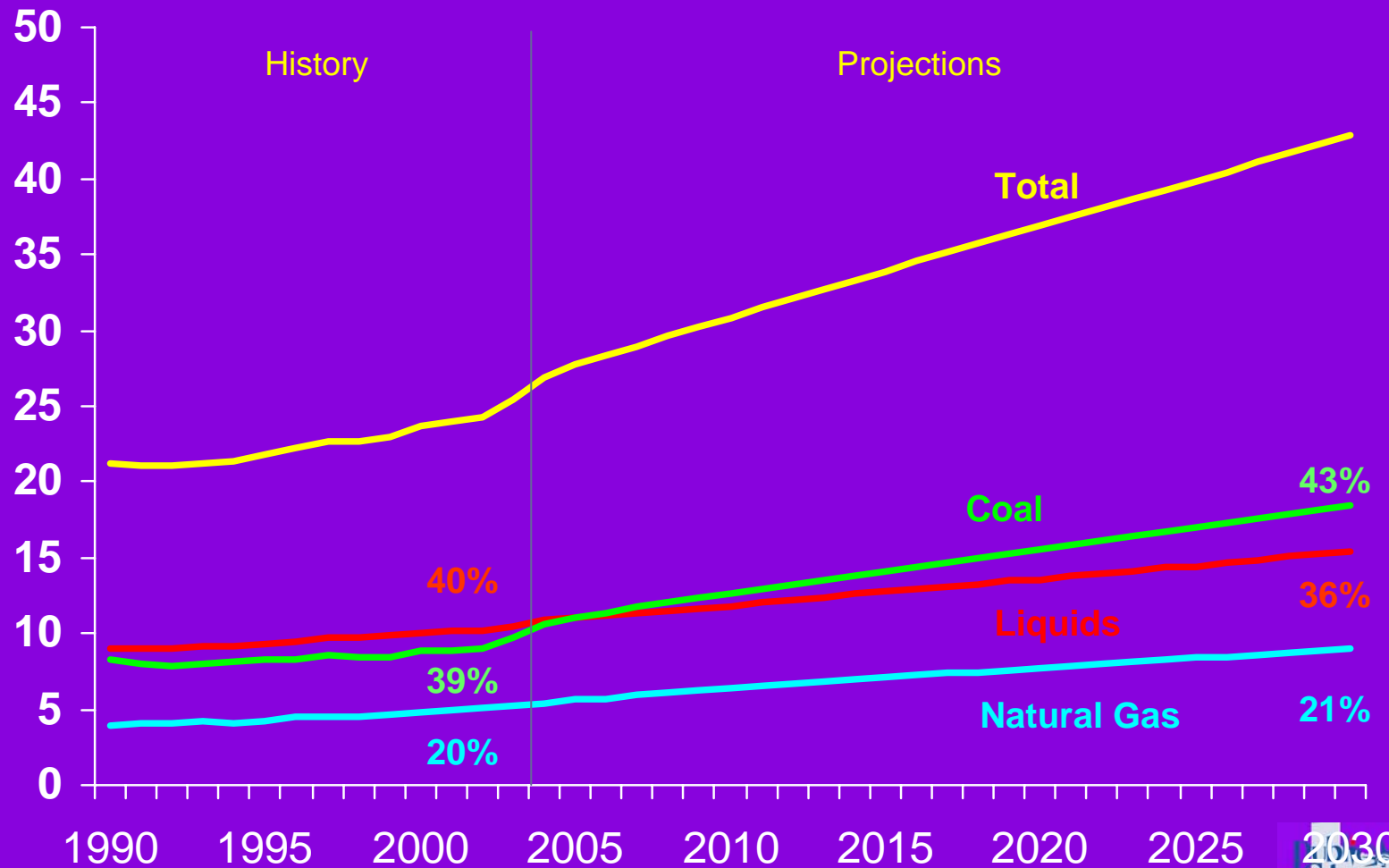


U.S. Electricity Generation by Fuel, 1980-2030 (billion kilowatthours)



Annual Energy Outlook 2007

World Energy-Related Carbon Dioxide Emissions, 1990-2030 (billion metric tons)



International Energy Outlook 2007

29 Other State's Are Taking Action to Reduce Global Warming

New England Governor's Plan

- Reduce emission levels to at least the 1990 levels by 2010
- Reduce emission levels 10% below 1990 levels by 2020.
- Try for sustainability ~80% current levels by 2050



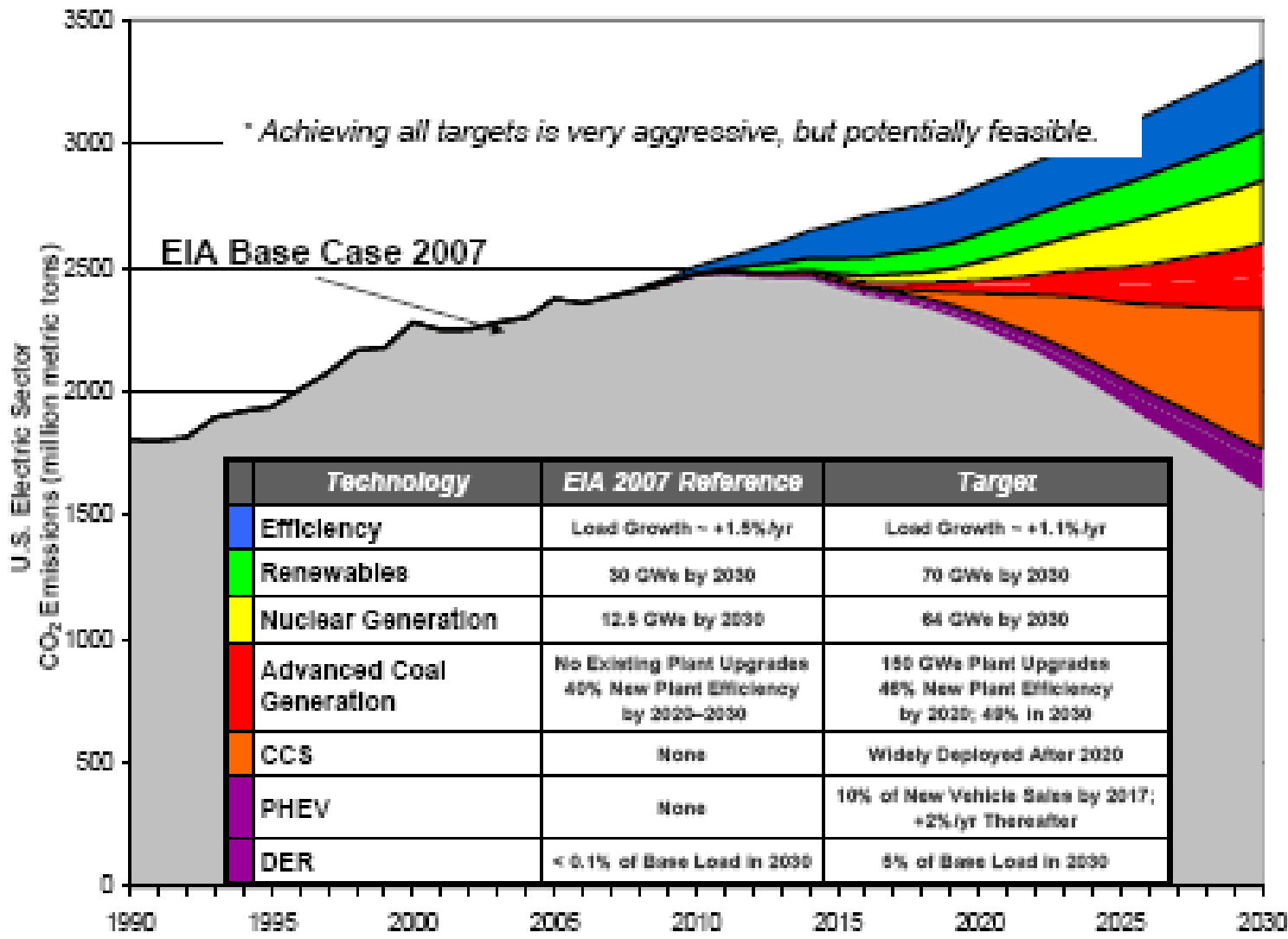
Governor Pataki of New York

- Reduce state agency electricity usage through energy efficiency improvements (35% below 1990 levels by 2010).
- Commit to purchasing renewable energy for state buildings (10% by 2005, 20% by 2010).
- Increase alternative use in state fleet vehicles (At least 50% of new vehicle purchases will operate on alternative fuel by 2005, 100% by 2010).

Other states are requiring GHG reduction at power plants



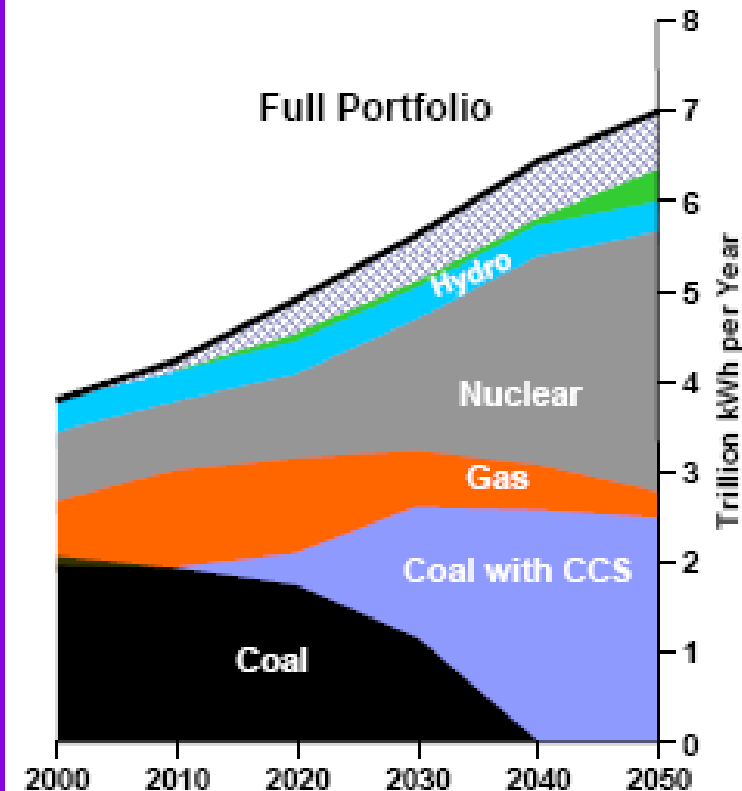
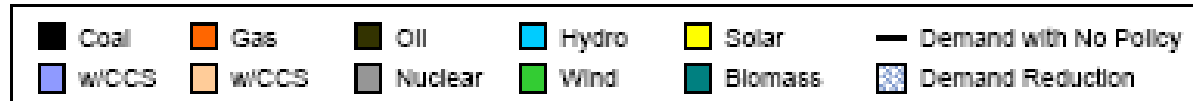
CO₂ Reductions ... Technical Potential*



From Presentation by Commissioner Barry Smitheman
 At the GULF COAST POWER ASSOCIATION FALL 2007 CONFERENCE & EXHIBITION
 OCTOBER 3 & 4, 2007
 THEORY IS CLEAN; LIFE IS MESSY CONTINUING DEVELOPMENTS IN THE ERCOT MARKET.



U.S. Electric Generation - Full Portfolio



The vast majority of electricity supply is CO₂-free

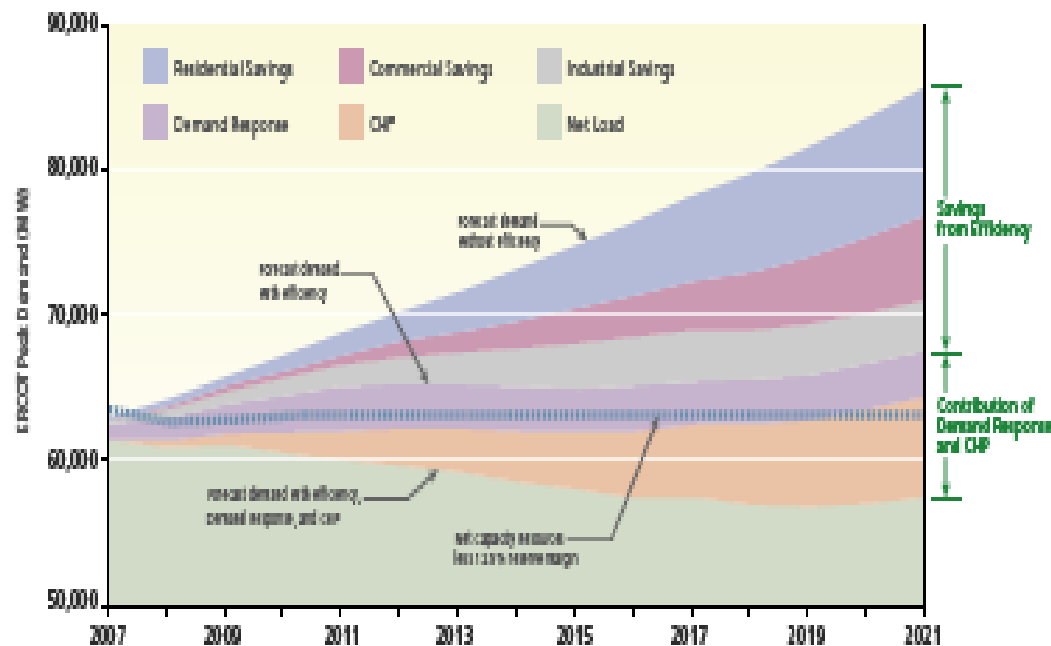
Gas and non-captured coal are the only supply options paying a CO₂ cost

From Presentation by Commissioner Barry Smitherman
 At the GULF COAST POWER ASSOCIATION FALL 2007 CONFERENCE & EXHIBITION
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 THEORY IS CLEAN; LIFE IS MESSY CONTINUING DEVELOPMENTS IN THE ERCOT MARKET.



Recent study by Optimal Energy found:

Figure ES-1: Effect of Demand-Side Resources on ERCOT Forecast and Reserve Margin



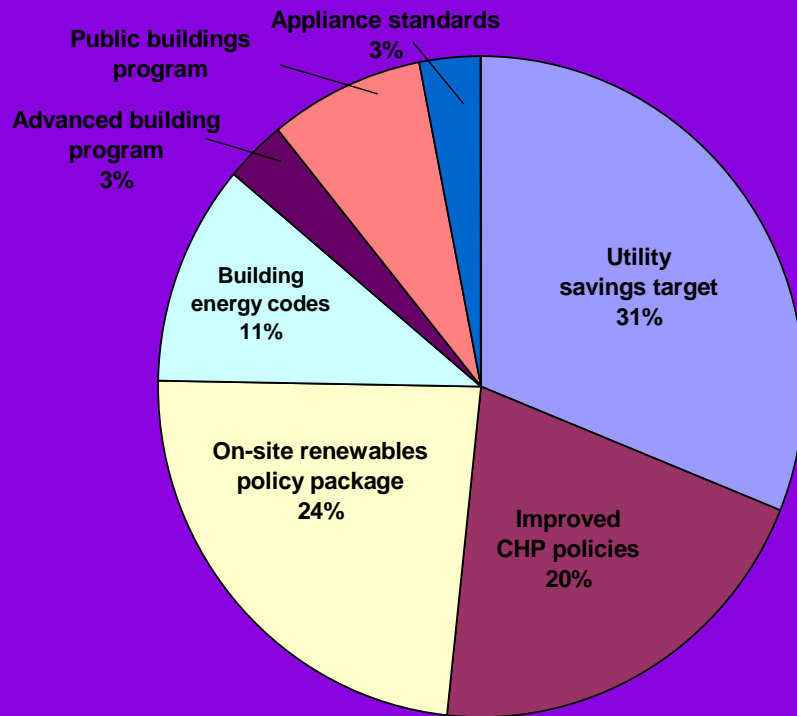
ERCOT requires a reserve margin of 12.5%, which means that the available generation capacity should be equal to or greater than the actual peak energy load plus 12.5%. The dashed line represents ERCOT's estimated available capacity after allowing for the 12.5% reserve margin. The colored bands show the energy forecast and the effects of efficiency in the three major consuming sectors (residential, commercial, and industrial) and of Demand Response and CHP.

- Energy Efficiency could save 80% of the growth in demand
- Each dollar in energy savings initiatives would generate \$4.40 in savings
- Save energy at a cost of less than 2 cents per kilowatt-hour vs. 5¢ for coal

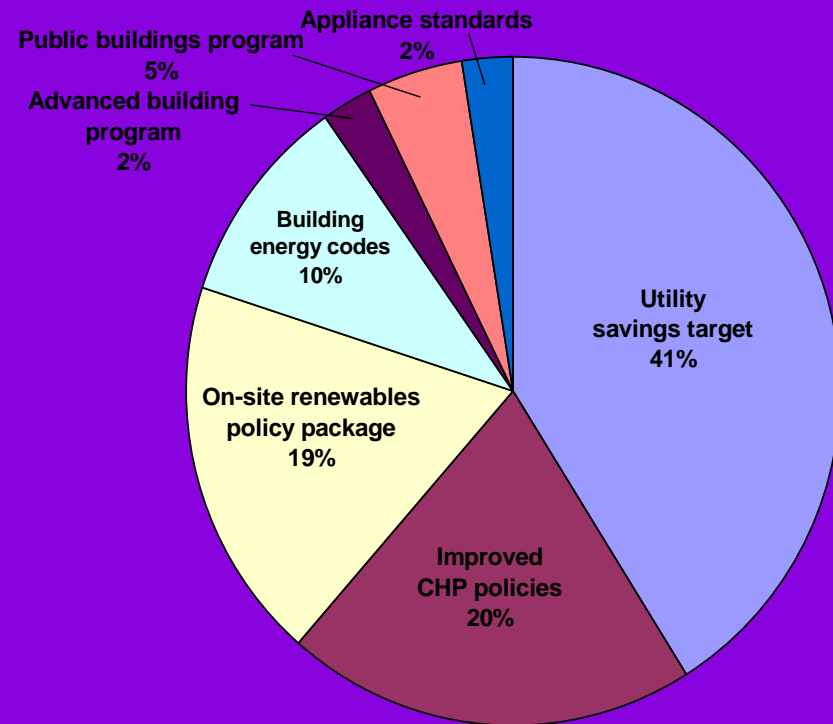


Efficiency Renewables and CHP could save 76%-101% of the growth in demand in Texas

Dallas/Ft. Worth



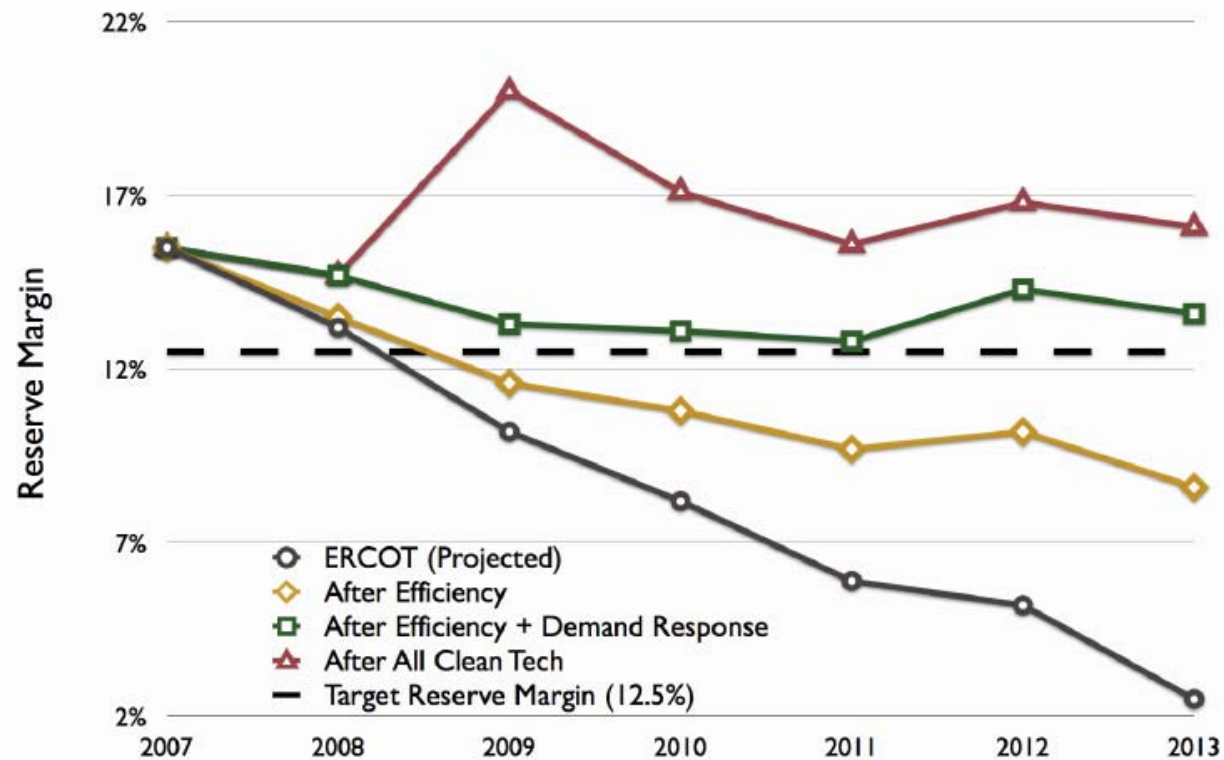
Houston



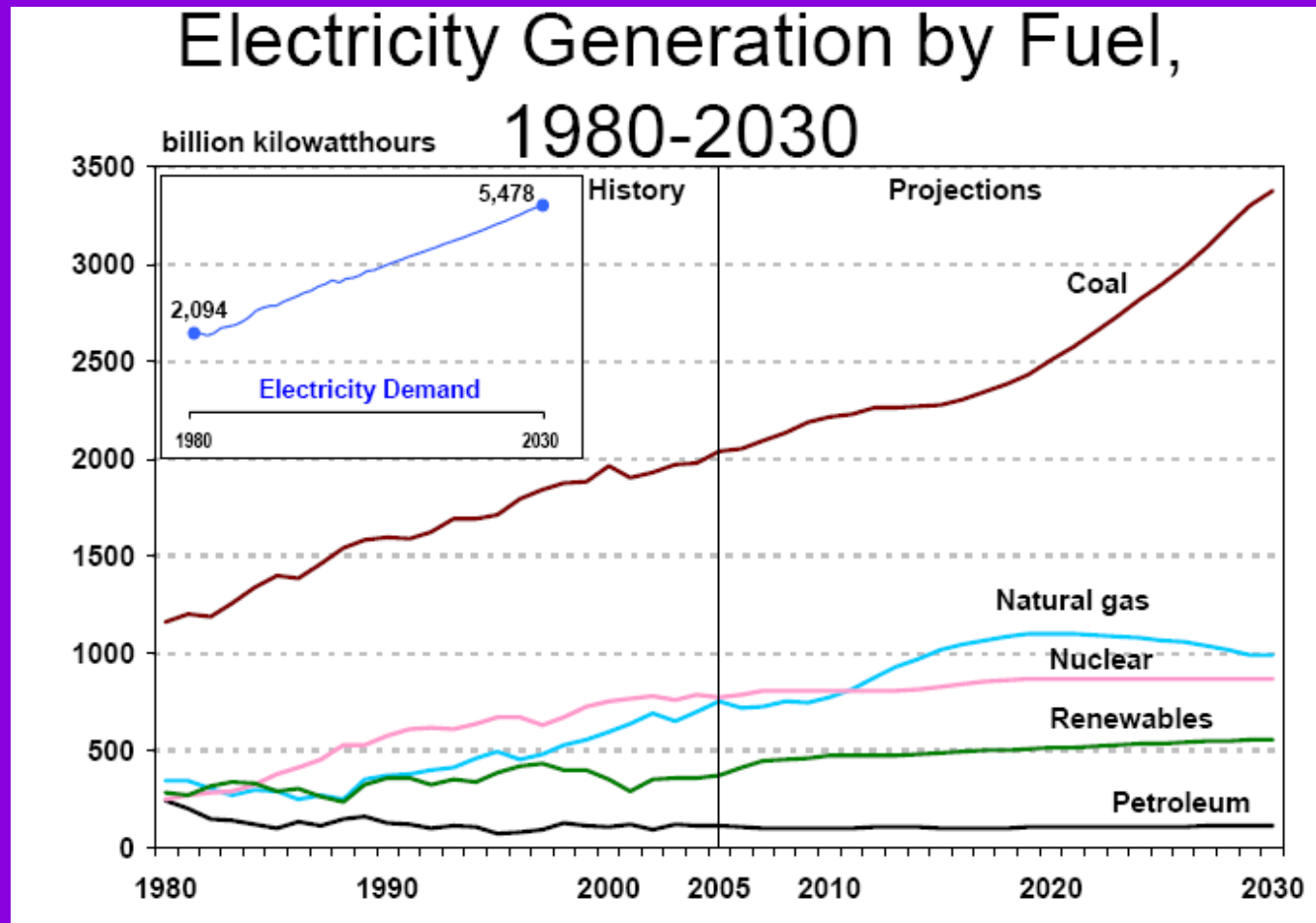
An Alternate Path-

developed by Environmental Defense and others

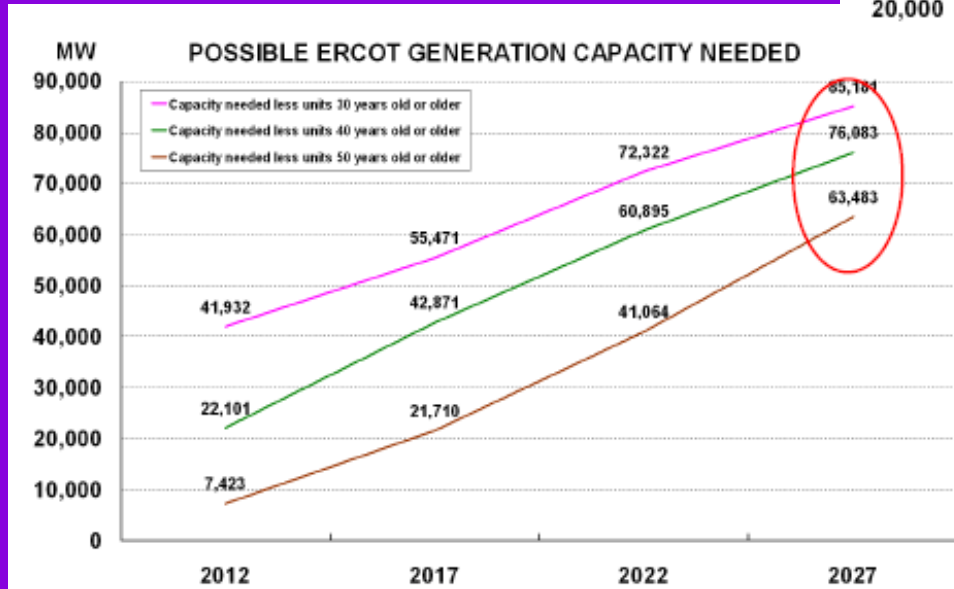
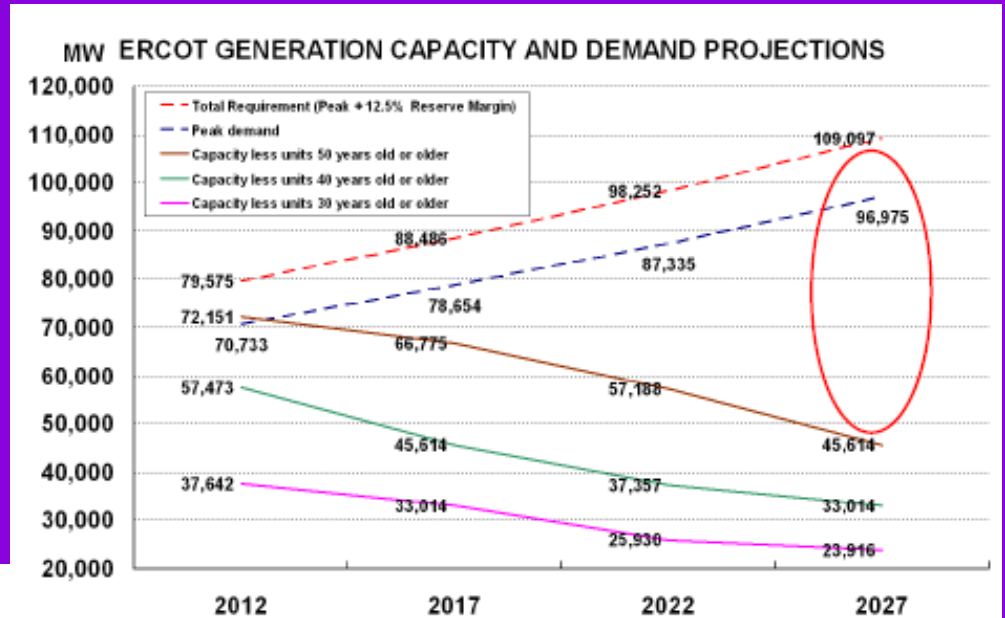
Reserve Margin - Crisis Averted



Commissioner Smitherman's View Of The Future Doesn't Include Energy Efficiency Or Demand Management



Ercot demand forecast 2007-12



From Presentation by Commissioner Barry Smitherman
 At the GULF COAST POWER ASSOCIATION FALL 2007 CONFERENCE
 & EXHIBITION
 OCTOBER 3 & 4, 2007
 THEORY IS CLEAN; LIFE IS MESSY CONTINUING
 DEVELOPMENTS IN THE ERCOT MARKET.



ERCOT's Forecast Doesn't Include Efficiency

2007 Report on the Capacity, Demand, and Reserves in the ERCOT Region

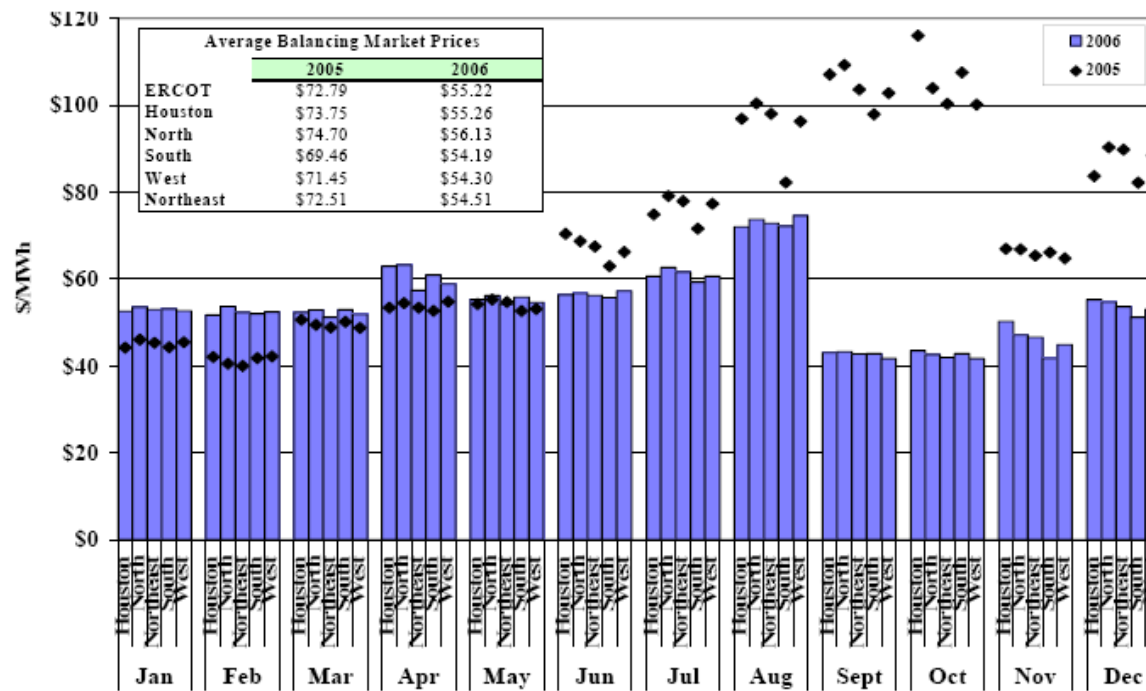
Summer Summary

	2007	2008	2009	2010	2011	2012
Load Forecast:						
Total Summer Peak Demand, MW	63,794	65,135	66,508	67,955	69,466	70,733
less LAARs Serving as Responsive Reserve, MW	1,125	1,125	1,125	1,125	1,125	1,125
less LAARs Serving as Non-Spinning Reserve, MW	0	0	0	0	0	0
less BULs, MW	0	0	0	0	0	0
Firm Load Forecast, MW	62,669	64,010	65,383	66,830	68,341	69,608
Resources:						
Installed Capacity, MW	61,424	61,424	61,424	61,424	61,424	61,424
Capacity from Private Networks, MW	6,513	6,217	6,217	6,217	6,217	6,217
Effective Load-Carrying Capability (ELCC) of Wind Generation, MW	298	298	298	298	298	298
RMR Units under Contract, MW	169	169	169	169	0	0
Operational Generation, MW	68,404	68,108	68,108	68,108	67,939	67,939
50% of Non-Synchronous Ties, MW	553	553	553	553	553	553
Switchable Units, MW	2,848	2,848	2,848	2,848	2,848	2,848
Available Mothballed Generation, MW	165	510	419	594	568	522
Planned Units (not wind) with Signed IA and Air Permit, MW	0	590	590	590	1,300	2,100
ELCC of Planned Wind Units with Signed IA, MW	0	171	174	174	174	174
Total Resources, MW	71,970	72,740	72,652	72,827	73,372	74,136
less Switchable Units Unavailable to ERCOT, MW	158	317	317	0	0	0
less Retiring Units, MW	0	375	375	433	433	433
Resources, MW	71,812	72,048	71,960	72,394	72,939	73,703
Reserve Margin (Resources - Firm Load Forecast)/Firm Load Forecast	14.6%	12.6%	10.1%	8.3%	6.7%	5.9%
Other Potential Resources:						
Mothballed Capacity, MW	553	9,153	14,459	15,911	17,664	17,717
50% of Non-Synchronous Ties, MW	0	5,197	5,288	5,113	5,318	5,354
Planned Units in Full Interconnection Study Phase, MW	553	553	553	553	553	553
Planned Units in Full Interconnection Study Phase, MW	0	3,404	8,618	10,245	11,293	11,810

Page 1



Balancing Energy Market Prices 2005 & 2006



Wall Street Journal

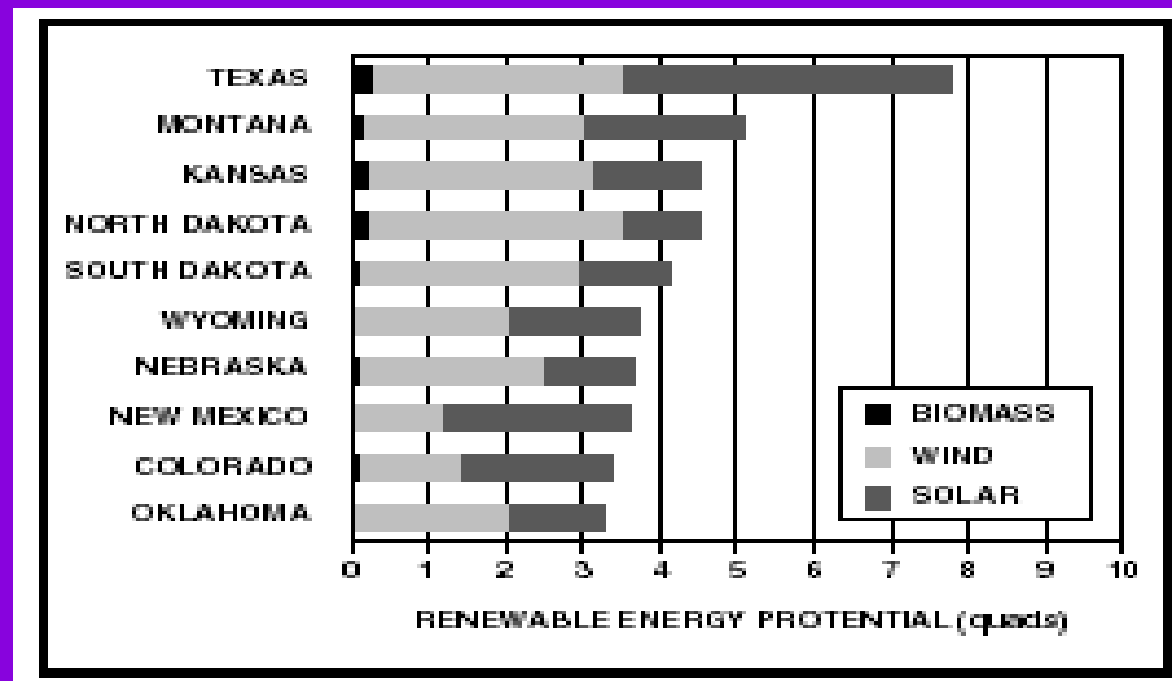
Improving the (Profit) Environment at TXU

- Those who underestimate buyout kings like Henry Kravis may do so at their peril....Now comes word that one of the group's earliest chess moves — **its agreement to shelve TXU's plans to build coal-fired power plants — may be doubly rewarding for them.** Not only did it get them the buy-in from some environmental groups, but now it appears that the move may help them *boost their returns.* ..., **keeping the coal plants out of circulation will help boost electricity rates for TXU's other plants in the state.**
- *The state's grid operator says excess generating capacity of 14.6% this summer could fall to 5.9% by the summer of 2012 — well below the 12.5% that is considered the “safety margin.”*



Cooler Power:

Texas Leads the Nation in Renewable Energy Potential



Source: Texas State Energy Conservation Office.



Texas Has Been VERY Successful Promoting Wind



**Over 3352 MW
Built since 1999**

5076 MW by 2008

**States goal is
5880- by 2015!**



The Texas RPS has Developed Wind- but it Has Failed to Develop Solar and Other Clean Generating Resources

We need to set 1% aside for solar and farm based renewable energy



Why?

- **No solar or small renewable set aside**
- **Insurance requirements**
- **Buy back rates aren't clear**

Solar is cost effective in remote and low voltage applications

Solar is heavily used by the oil and gas and communications industries---but has not been widely used for bulk power

Waste gasses from concentrated animal feeding operations can power generators

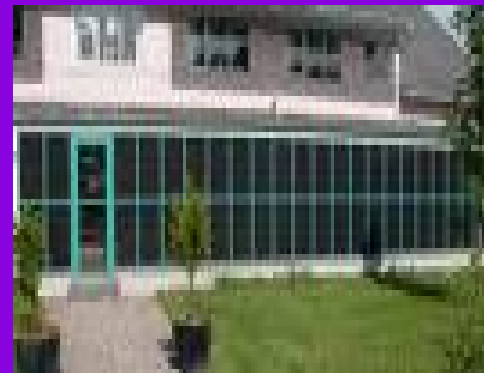
Biogasses from crop wastes can power generators, too



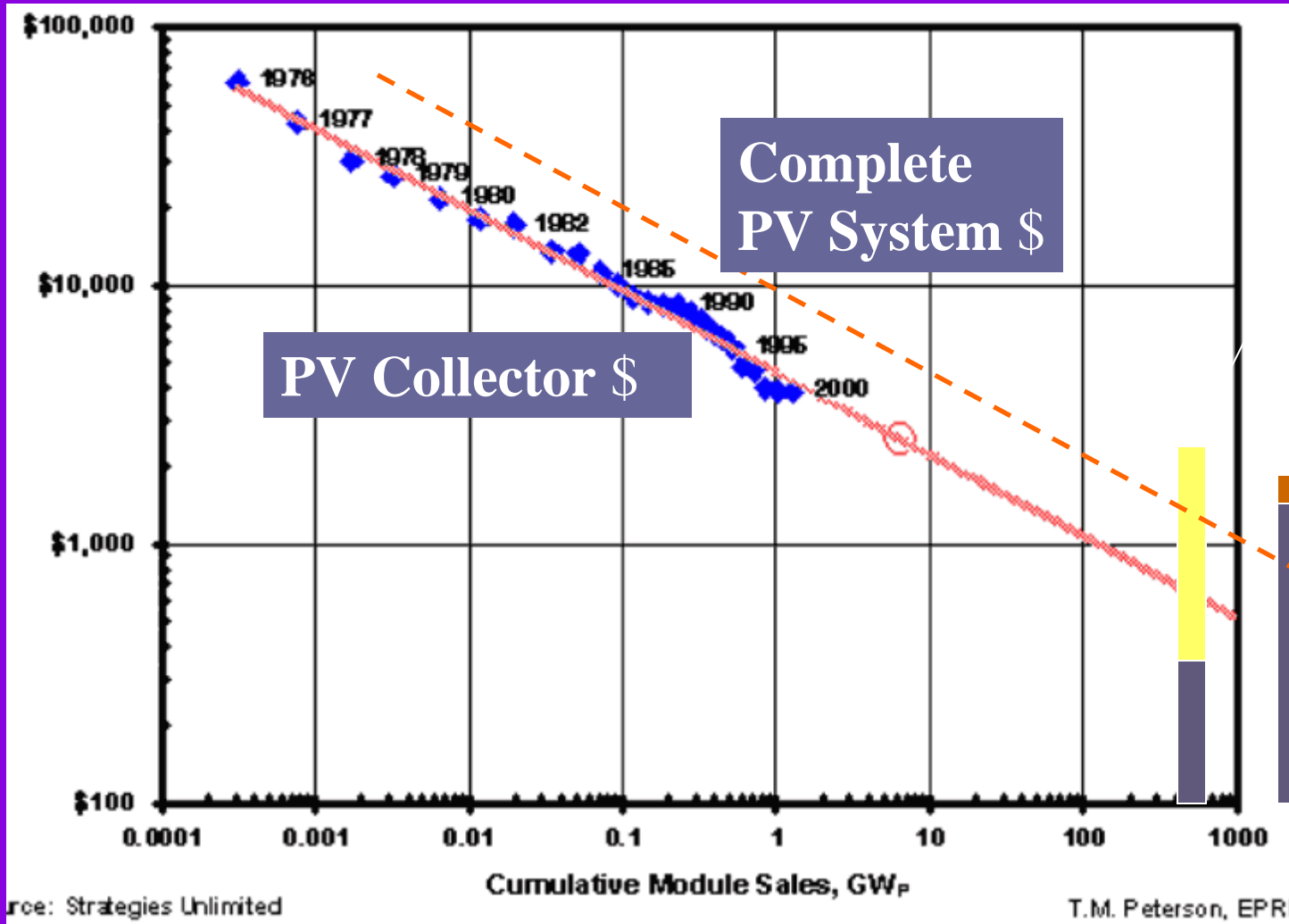
Texas Leads the Nation in Solar Potential



Thin Film Solar will be Critical to Developing Net Zero Energy Homes



If Sales Volume Increases PV Will Cost Less than Coal & Gas



Natural Gas
high fuel \$
low plant \$

Coal
low fuel \$
high plant \$



Geothermal Energy Potential

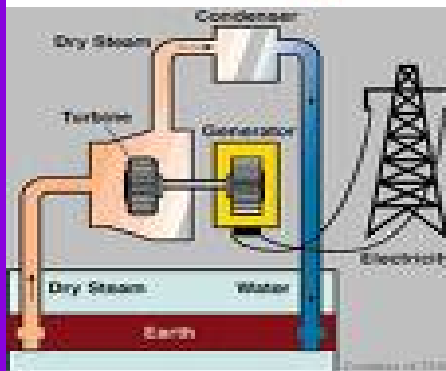
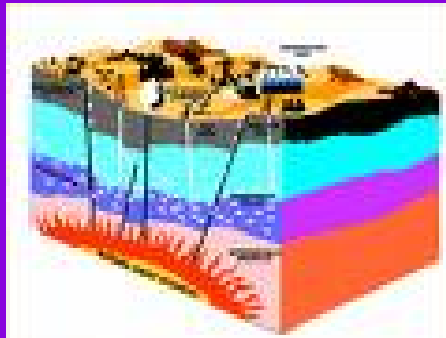
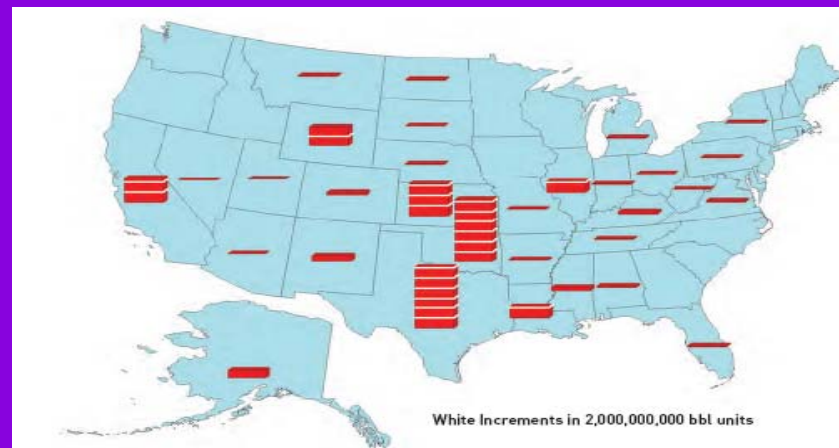


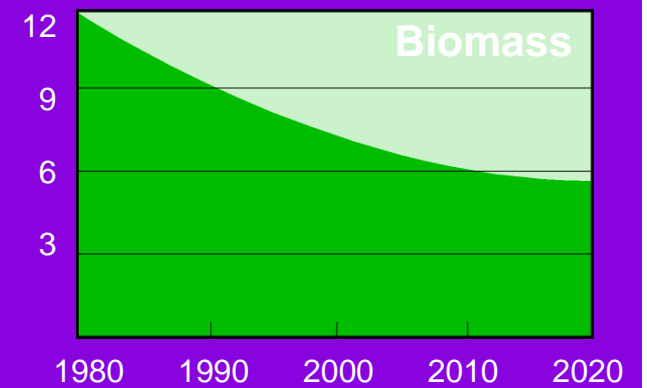
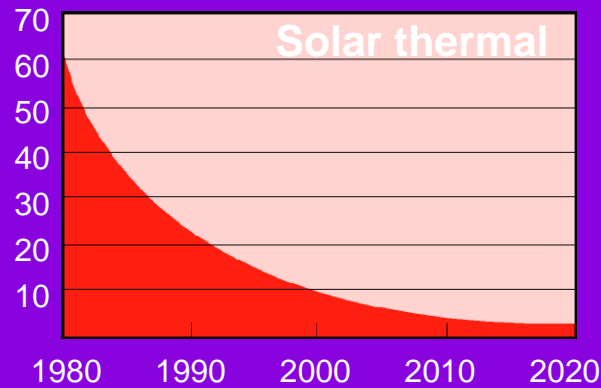
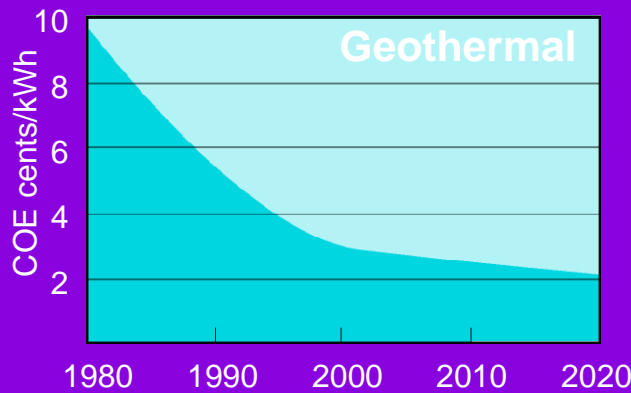
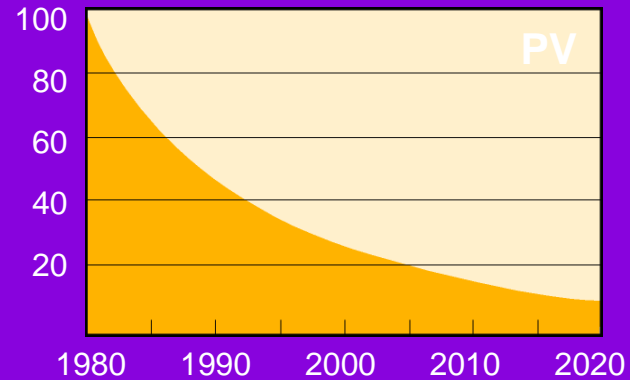
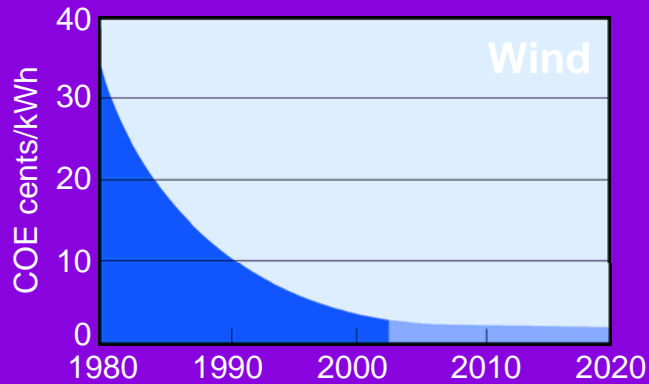
Table 2.3 Equivalent geothermal power from coproduced hot water associated with existing hydrocarbon production in selected states (a complete listing is given in Appendix A.2.2).

State	Total Water Produced Annually, in 1,000 kbbbl	Total Water Production Rate, kGPM	Equivalent Power, MW @ 100°C	Equivalent Power, MW @ 140°C	Equivalent Power, MW @ 180°C
Alabama	203,223	18	18	47	88
Arkansas	258,095	23	23	59	112
California	5,080,065	459	462	1,169	2,205
Florida	160,412	15	15	37	70
Louisiana	2,136,573	193	194	492	928
Mississippi	592,518	54	54	136	257
Oklahoma	12,423,264	1,124	1,129	2,860	5,393
Texas	12,097,990	1,094	1,099	2,785	5,252
TOTALS	32,952,141	2,980	2,994	7,585	14,305



Renewable Energy Cost Trends:

R&D and Market Growth Lower Costs



Source: NREL Energy Analysis Office
 Updated: June 2002

Levelized cents/kWh in constant \$2000



Our Challenge after HB 3693 : How To Estimate And Integrate The Potential Savings Into The Current And Future Demand Forecasts

Potential savings

- PUC programs
- Political subdivisions
- Demand management
- Rate design
- CHP
- On- site renewable
- Solar hot water
- Appliances
- Geothermal

Players:

- PUC
- ERCOT
- Political Subdivisions
 - City Councils and codes
- Builders
- Homebuyers
- Congress
- Legislature
- EPA
- Coops and Munis



Our Opportunities

- Developing comprehensive regional studies that fully characterize all potential ways we could save or manage energy thru 2025
- Examine the regional variations in current and projected temperatures, air pollution, commercial partners and culture
- Create new ways to reach and teach Texans and trades people about efficiency opportunities



Next Steps

- Getting public entities to do as much efficiency as possible
- Documenting the savings
- Developing building retrofits
- Developing plan for the next session



It's far better to act and be a little wrong than to fail to act and have been catastrophically wrong!

“The Time to act is now. Acknowledging the reality of a well documented problem is critical: taking swift and decisive action to solve it is the mark of leadership.”

Dallas Morning News— on July 11, 2005

“From Talk to Action”



The End

