Policy Briefing

New Policy for New Weather
A Sustainable Energy Utility

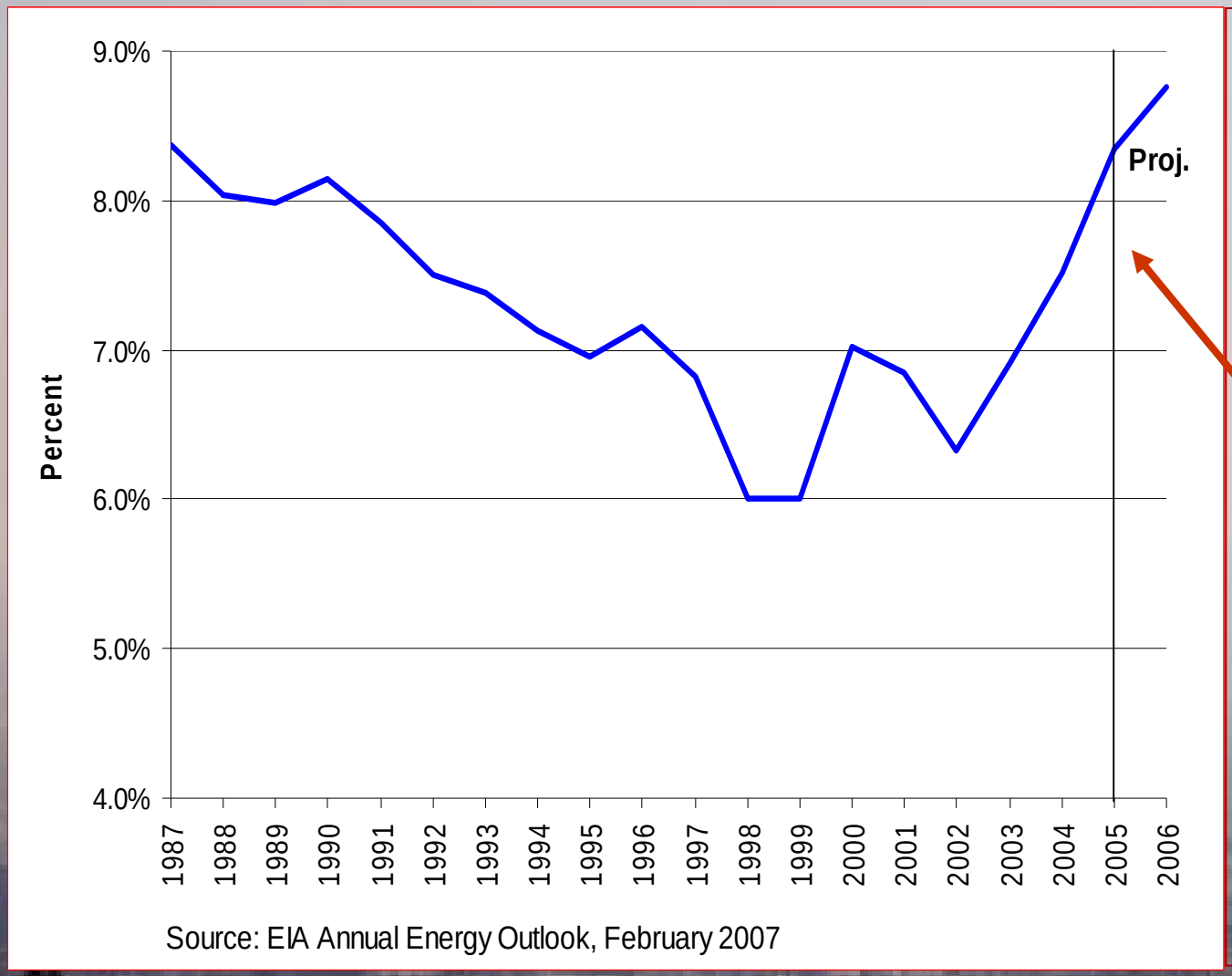
Center for American Progress,
DC Dept. of the Environment,
DC Councilmember Mary Cheh,
ACEEE, Maryland PIRG, DC Environmental Network,
Cool Capital Challenge, & Institute for Market Transformation

John Byrne
Center for Energy and Environmental Policy
University of Delaware

Trenton Allen
Citigroup Global Markets

October 12, 2007

Energy Expenditures as % of US GDP

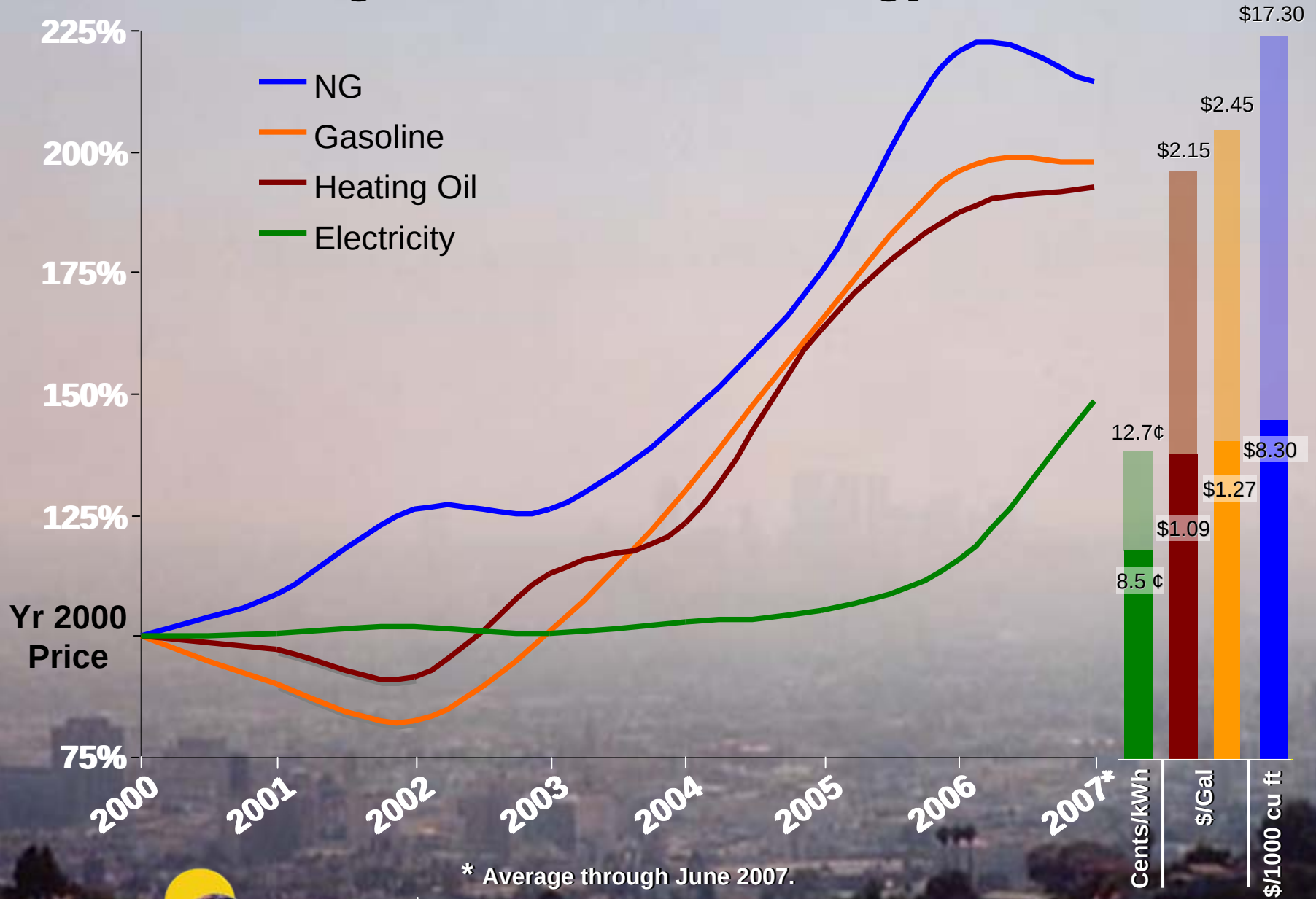


Source: EIA Annual Energy Outlook, February 2007

8.8% of GDP (est.) in 2006

Highest since 1987 [6.2% in 2002]

Climbing Conventional Energy Prices



* Average through June 2007.

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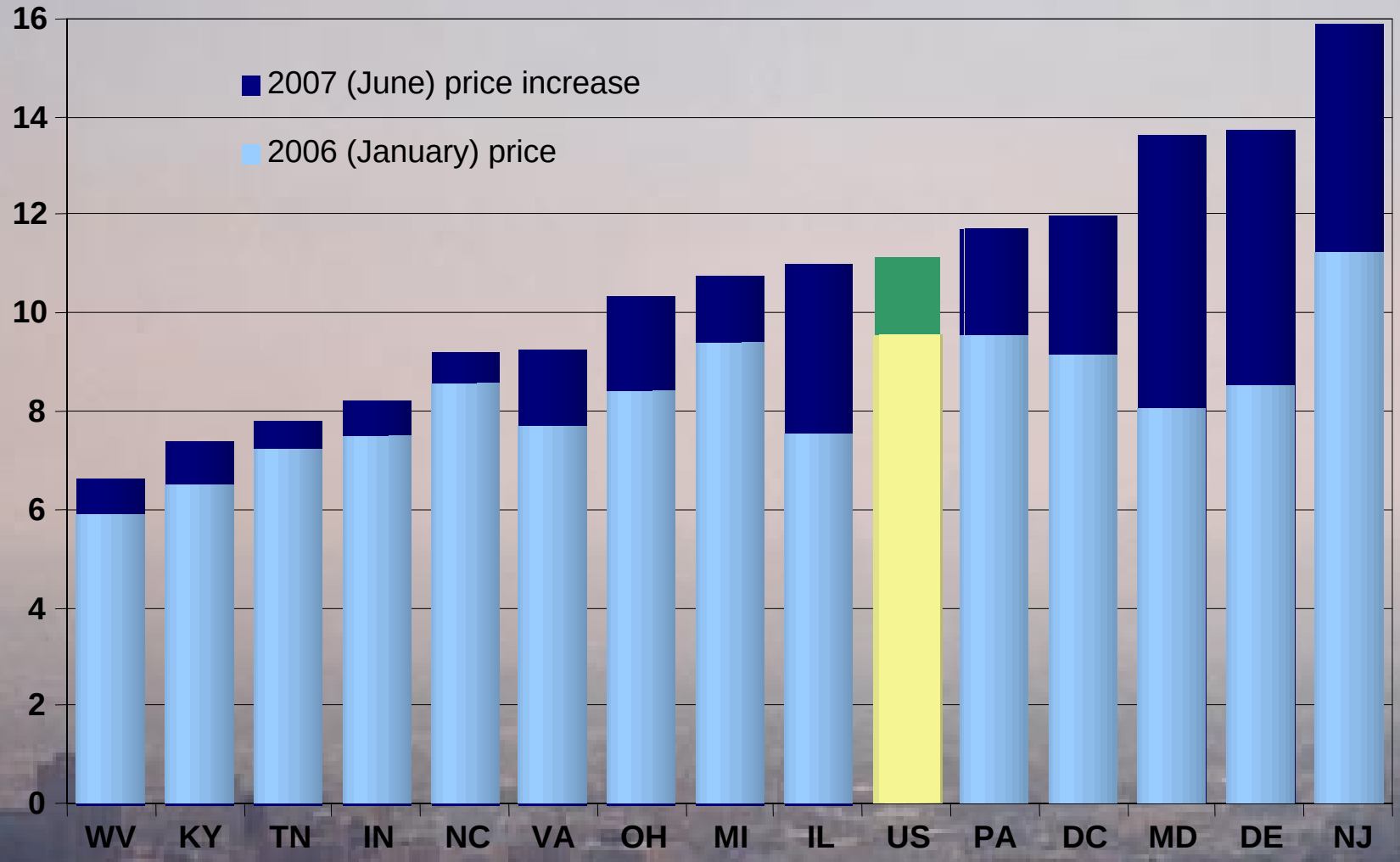
PJM Region
Residential Electricity Prices: Jan 2006 - July 2007



Source: EIA 2007. Average Price by State by Provider (EIA-861)

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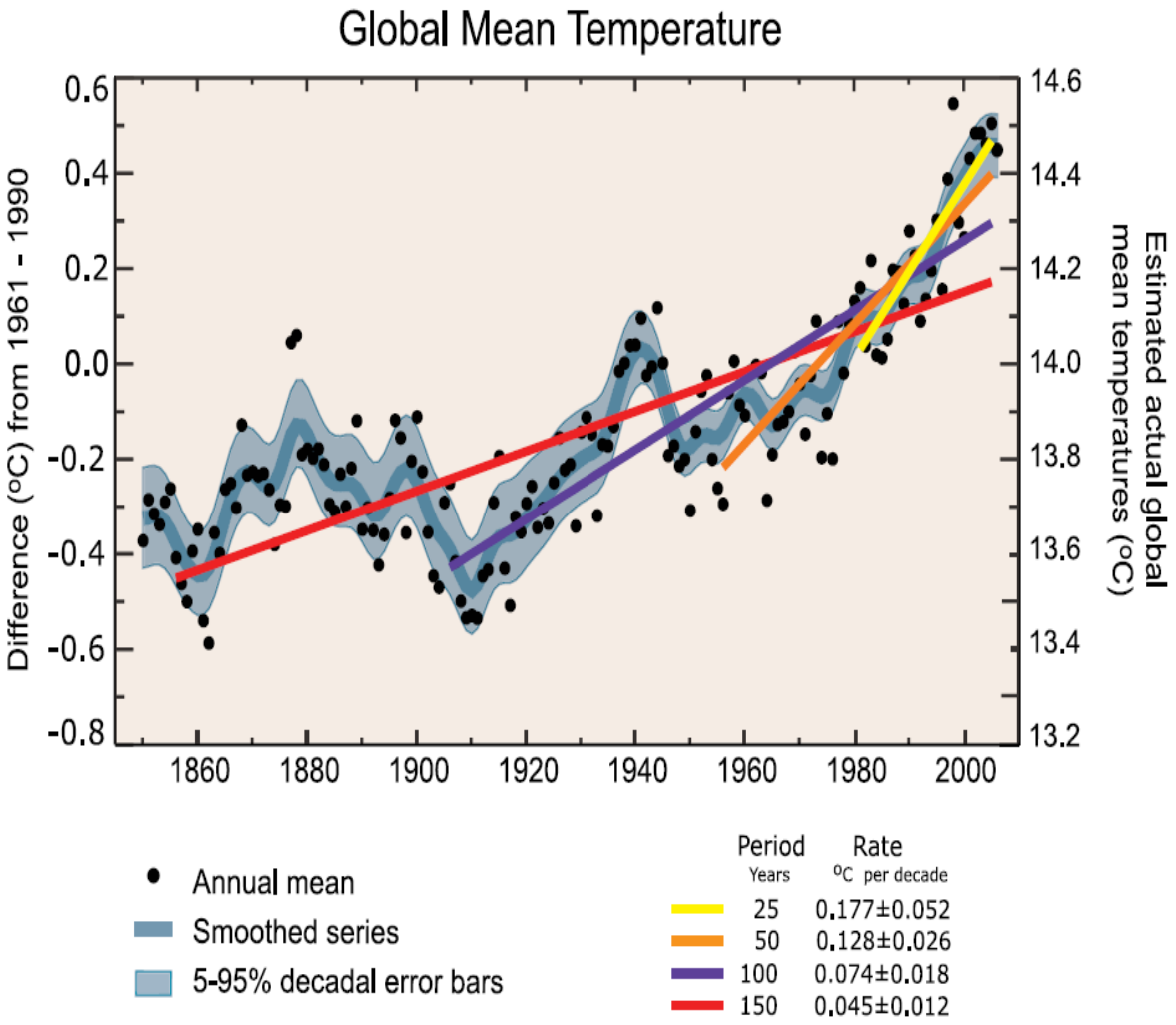
Global Warming



- According to the 2007 IPCC report, mean global surface temperature has increased by 0.74°C over the last 100 years (1906-2005)
- 11 of the warmest years on record occurred during the past 12 yrs

Source: IPCC

Needed GHG Emissions Reductions to Stabilize Atmospheric Concentrations at Current Levels

Carbon dioxide	> 60%
Methane	8 - 20%
Nitrous oxide	70 - 80%
CFC 11	70 - 75%
CFC 12	75 - 85%
HCFC 22	40 - 50%

Source: IPCC Second & Third Assessment Reports

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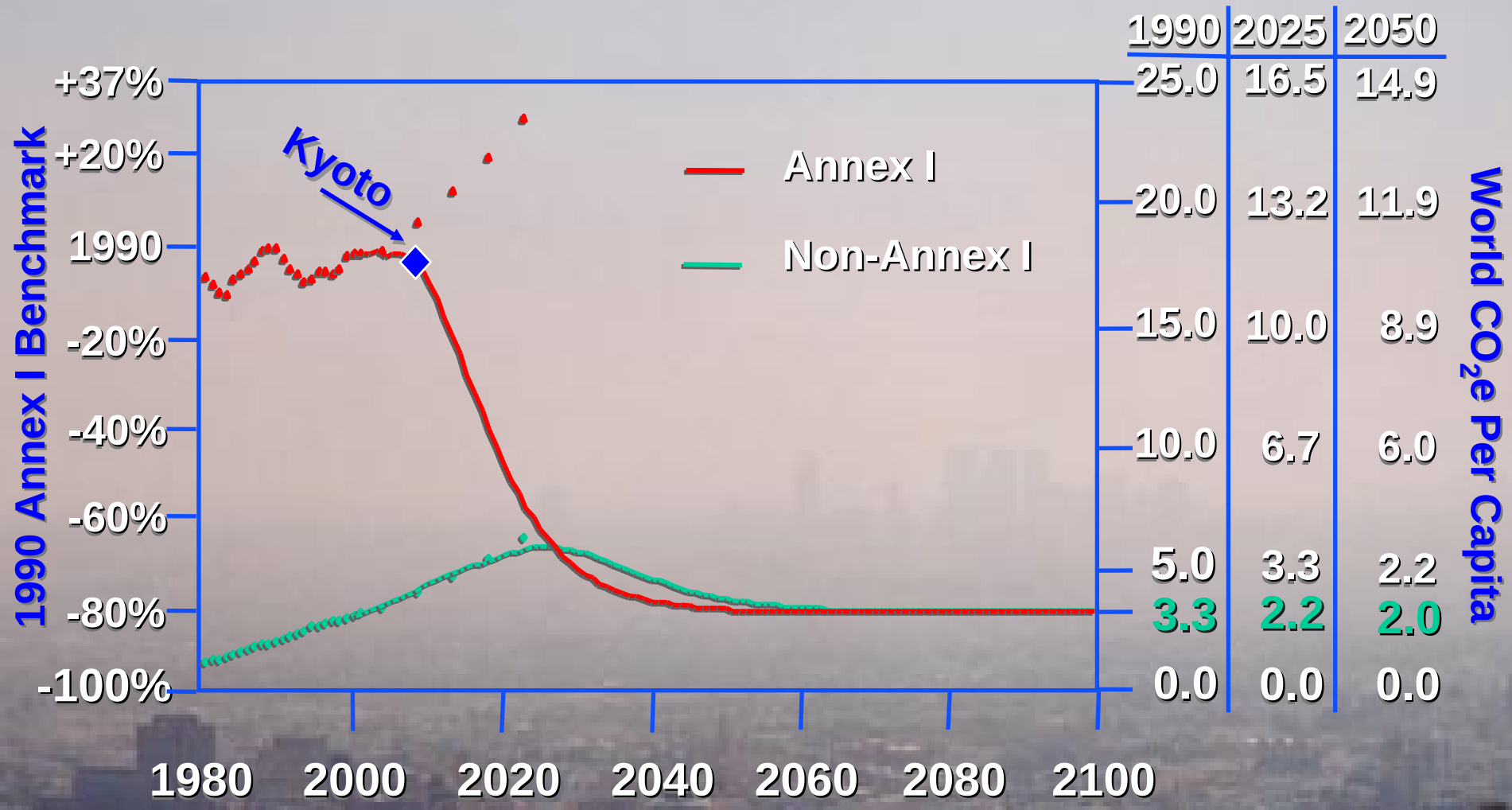
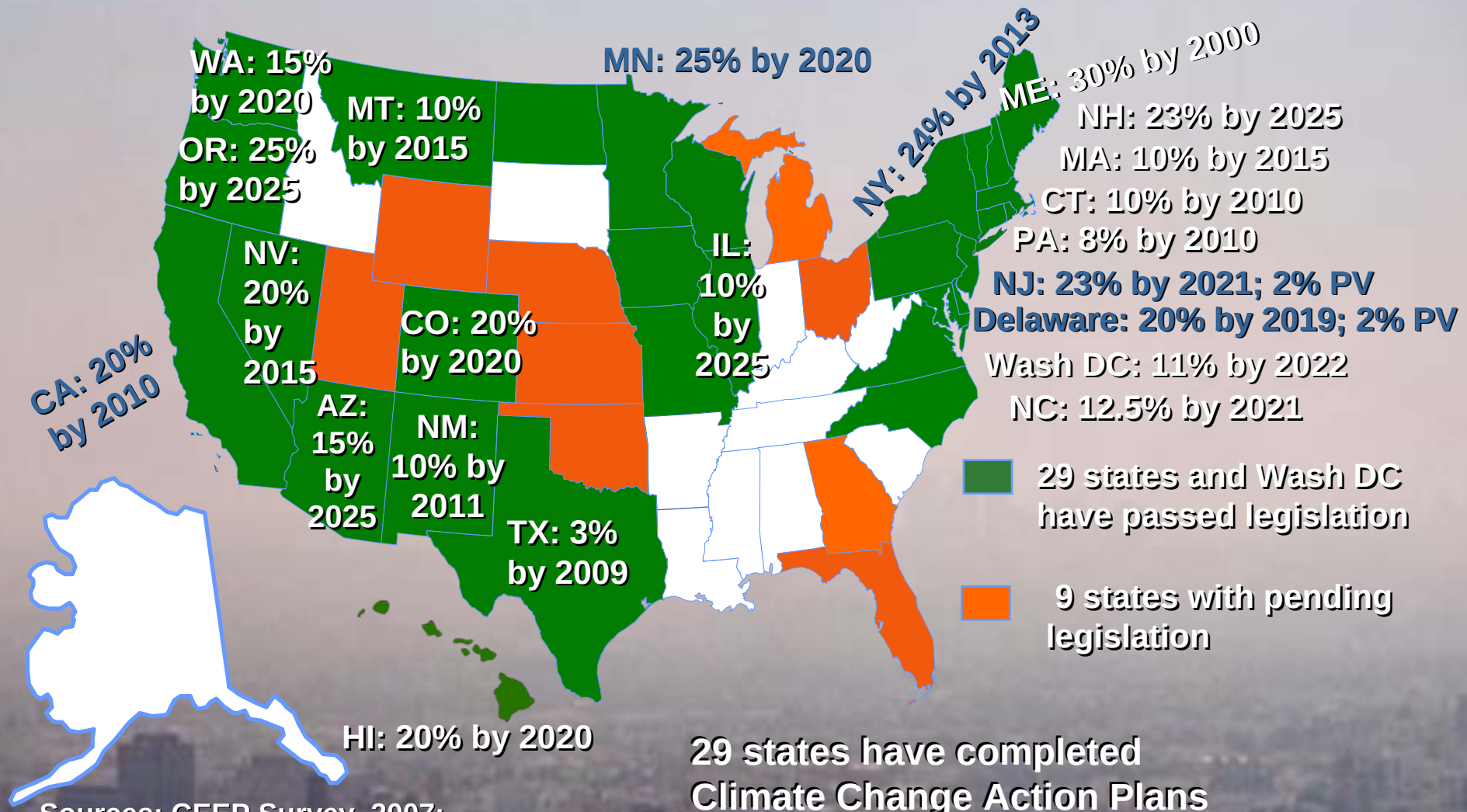
World GHG Emissions Reduction Scenario

60% Reduction from World 1990 Levels by 2050



Source: Based on John Byrne et al (2004)"Reclaiming the atmospheric commons: Beyond Kyoto." In V.I. Grover (ed.), *Climate Change: Perspectives Five Years After Kyoto.* Chapter 21. Plymouth, UK: Science Publishers, Inc.

State Renewable Portfolio Standards in the U.S.



Sources: CEEP Survey, 2007; DSIRE, 2007; UCS, 2007

29 states have completed Climate Change Action Plans
http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsStateActionPlans.html

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Chicago

Population: 2.8 million

- **Chicago Green Energy Partnership**
  - 20% of City energy via renewables by 2010
  - $800 million City-Utility Fund created
- **Green Roofs – Green Buildings**
  - 3 million sq. ft. of Green Roofs installed
  - All City buildings must meet LEED* Silver rating

  * USGBC: Leadership in Energy and Environmental Design
- **Historic Bungalows Initiative**
  - Rebates to install solar, geothermal and energy efficiency technologies in City's 80,000 bungalow homes

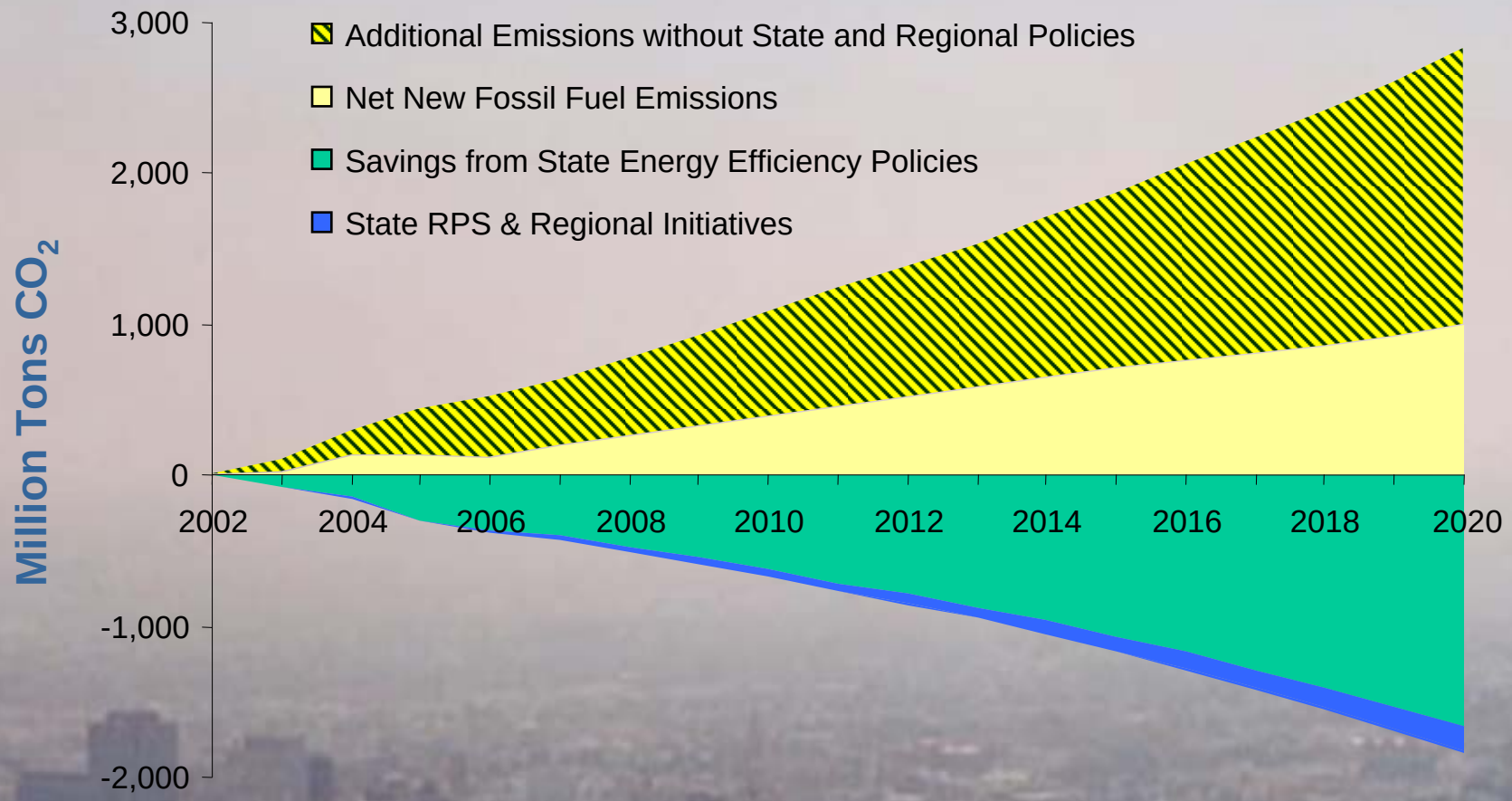
Note: In 1995, the City experienced a heat wave with high temperatures for the month of July in the range of 100-106 °F, resulting in 521 heat-related deaths. E. Klinenberg, *Heat Wave: A Social Autopsy of Disaster in Chicago* (2002)

San Francisco

Population: 777,000

- **CLIMATE ACTION PLAN**
  - 20% reduction from 1990 GHG emissions level by 2012
- **GREEN ENERGY BOND**
  - $100 million bond for citizen investments in energy efficiency and renewables projects
- **EMERGING RENEWABLES PROGRAM**
  - Program covers 50% of a residential PV installation

Estimated CO_2 Impacts of State & Local Policies & Programs



J. Byrne, K. Hughes, W. Rickerson and L. Kurdgelashvili (2007) "American policy conflict in the greenhouse: Divergent trends in federal, regional, state, and local green energy and climate change policy, " *Energy Policy*

SEU Task Force Members

Senator Harris B. McDowell III, Chair

Dr. John Byrne, Co-Chair

Charlie Smisson, State Energy Coordinator

3 State Senators (in addition to Senator McDowell)

4 State Representatives

Delaware's Public Advocate

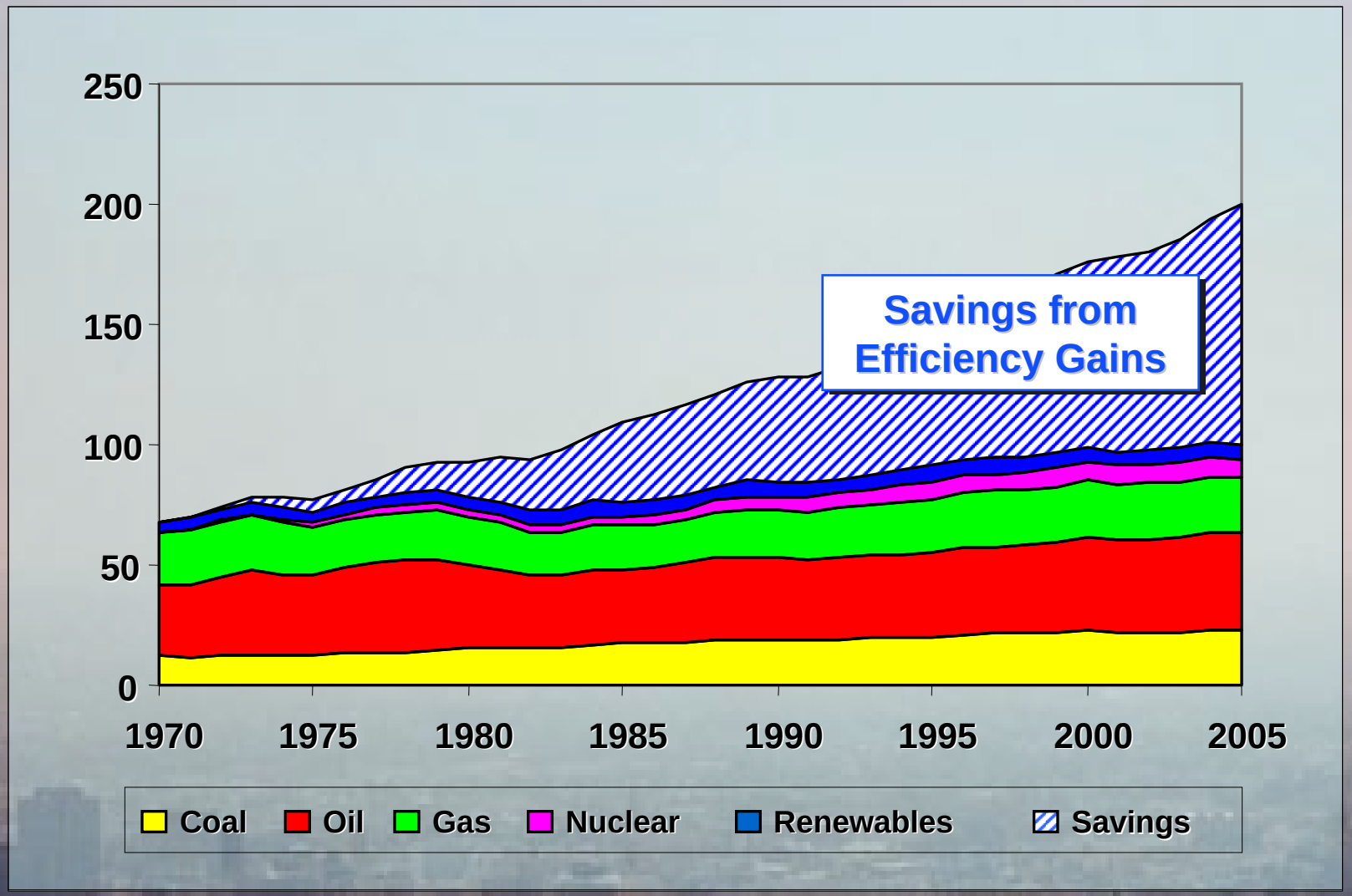
Executive Director, Peoples Settlement Association
(the oldest African- American community organization in DE)

Energy Policy Specialist, Delaware Nature Society

Legislative Analyst, Delaware State Senate Office

10 CEEP Researchers

U.S. Energy Supply by Source (Quadrillion Btu)



Note: Data from U.S. EIA, *Annual Energy Outlook* (2007)

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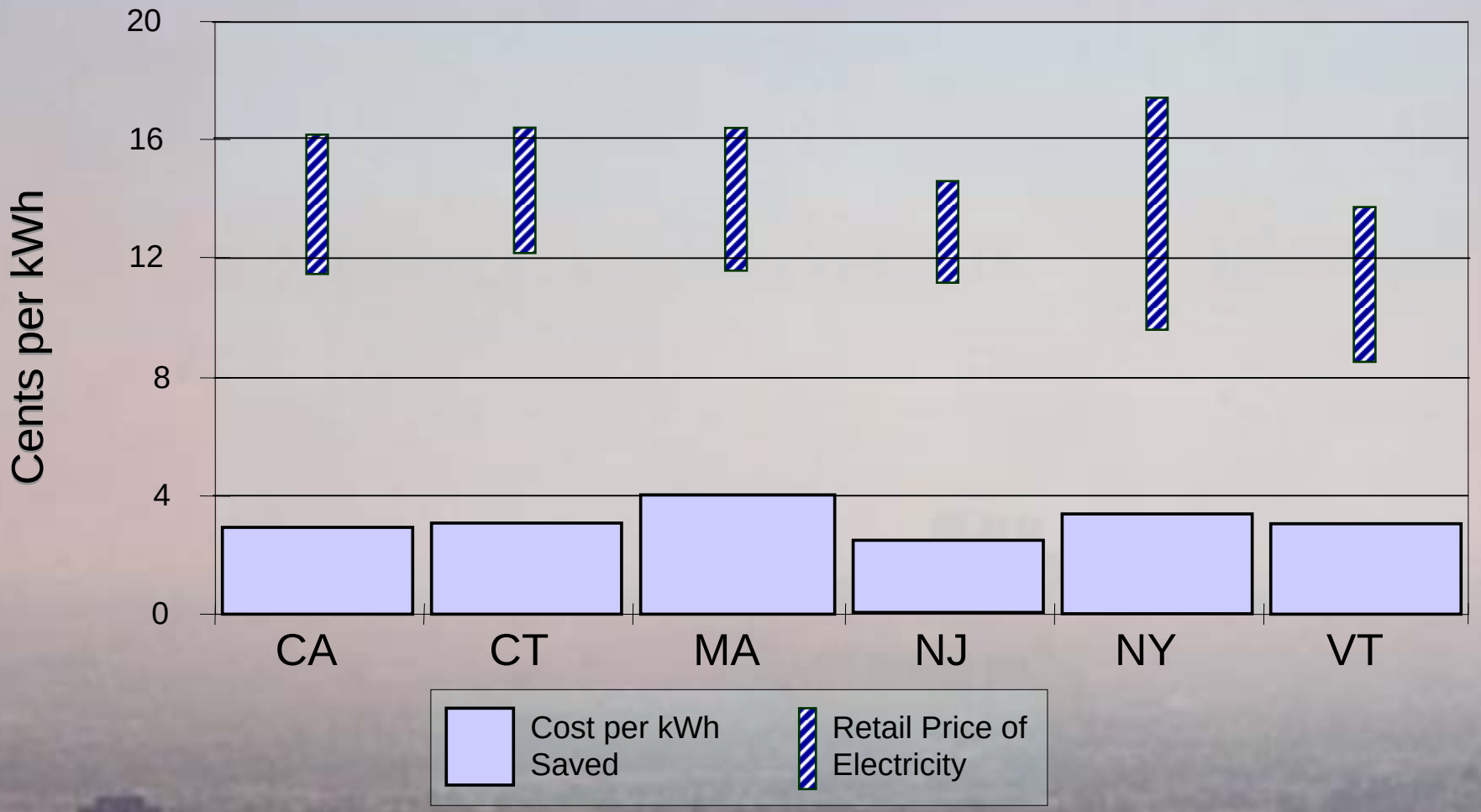
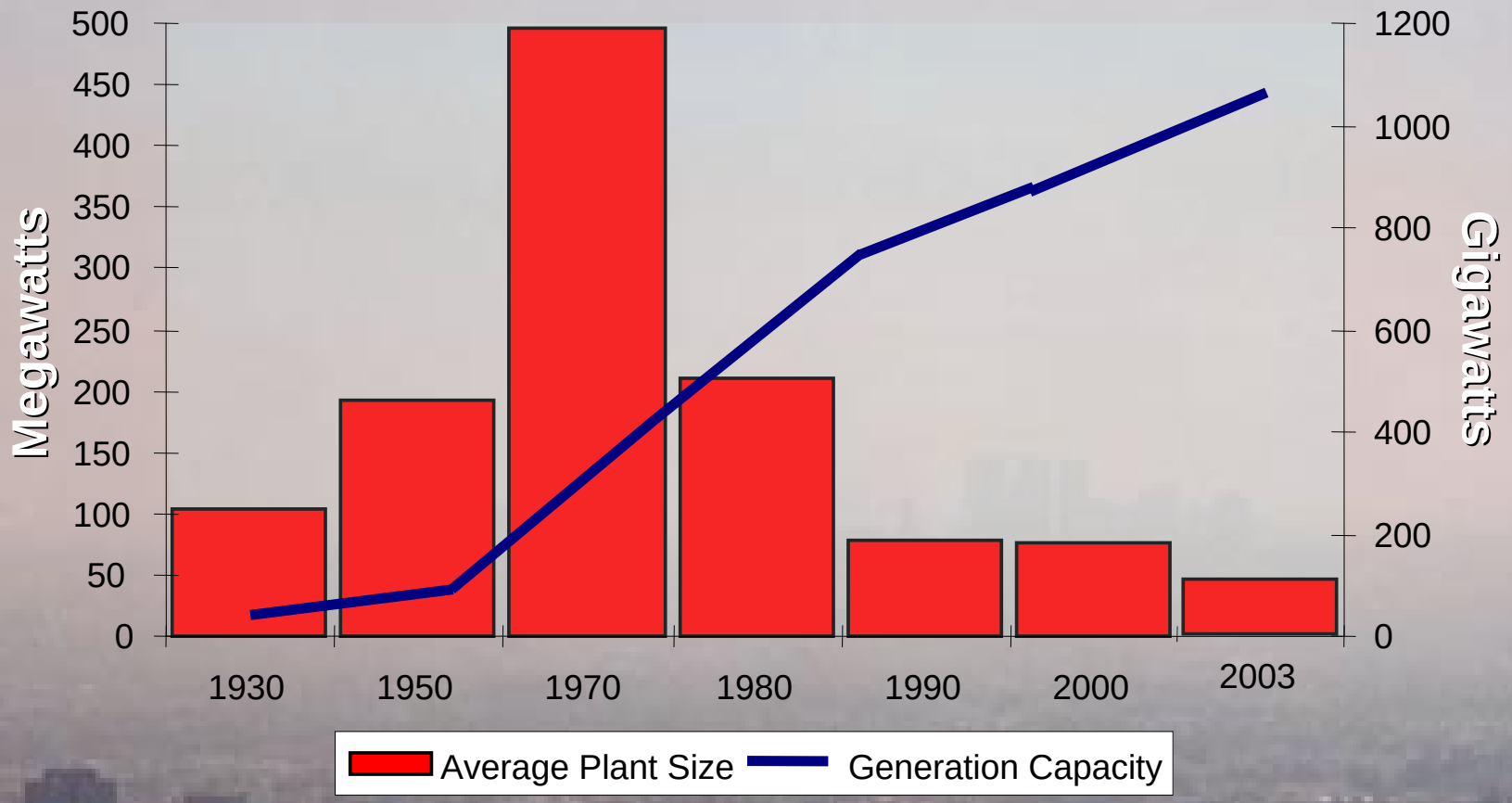
U.S. Cost per kWh Saved versus kWh Supplied



Source: Delaware Sustainable Energy Utility Task Force (2007)
http://www.seu-de.org/docs/Section_F.pdf http://www.seu-de.org/docs/Section_H.pdf and http://www.seu-de.org/docs/App_A.pdf

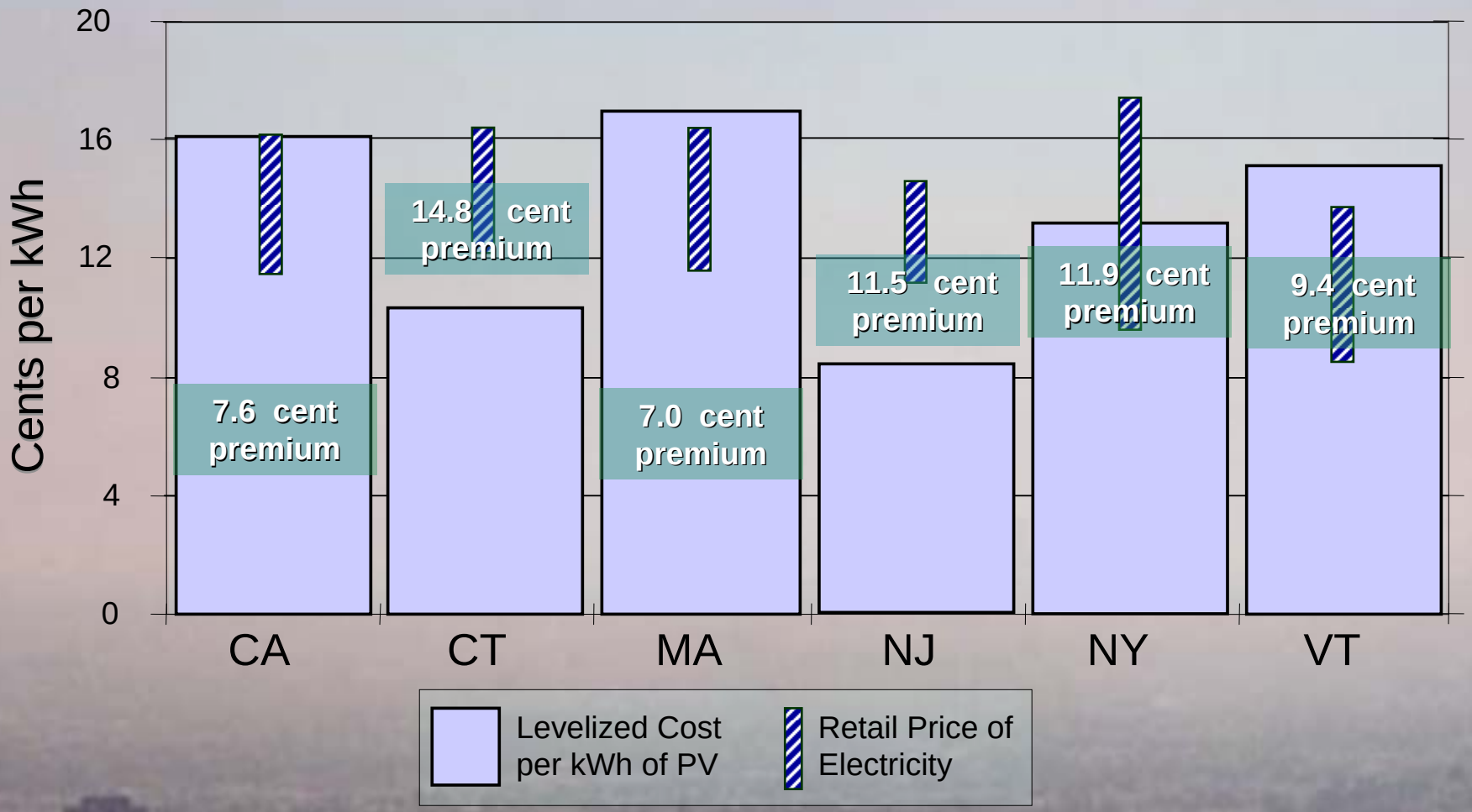
U.S. Power Plant Capacity



Sources: T. R. Casten (1995) *The Energy Daily* (September 7), Hirsh. 1999: 274; and *EIA Electric Power Annual* (1981, 1990, 2000, 2003)

Center for Energy and Environmental Policy

U.S. Cost per kWh Saved versus kWh Supplied



Source: Delaware Sustainable Energy Utility Task Force (2007)
http://www.seu-de.org/docs/Section_F.pdf http://www.seu-de.org/docs/Section_H.pdf and http://www.seu-de.org/docs/App_A.pdf

Center for Energy and Environmental Policy

White Roof Coating Program
Energy Coordinating Agency (Philadelphia)

Approximately 440,000 row homes in Philadelphia, about nine in ten have black tar roofs

White roofs never get hotter than ~ 95° F

Black roofs can be hotter than 115° F

Solar Electric & Hot Water Systems
Energy Coordinating Agency (Philadelphia)

Energy Affordability

Center for Energy and Environmental Policy

New Direction – A Sustainable Energy Utility

By 2015

- Delaware residents and businesses cut conventional energy use by 30%: ALL FUELS, ALL SECTORS
  - Utilize Market Transformation Rebate Programs: pay the incremental cost difference between standard and high-efficiency models
  - Double the Weatherization Program: support novel strategies such as 'white roofs' & partner with utilities and fuel companies to reduce arrears accounts
  - Create a Green Buildings Initiative: reward green renovations of existing buildings and provide incentives for new construction that contributes to Low/No Emissions Buildings
  - Adopt a Sustainable Transport Plan: promote High MPG, Low Carbon Vehicles; reward Employee Commute Planning; incent Carsharing

By 2019

- 20% of electricity serving the State to come from Renewable Energy
  - Upgrade the Renewable Portfolio Standard (RPS) to 20% by 2019
  - Include a Solar Carveout of 2% by 2019 with High-Value Solar RECs
  - Encourage a Renewable Energy Credits (RECs) Market, providing a revenue stream to customer-sited renewables

Both Goals = 25-30% reduction in Delaware's carbon footprint

New Direction – A Sustainable Energy Utility

DE Sustainable Energy Utility
(Competitively Selected Nonprofit Corporation)

SEU
Administered by the Delaware Energy Office

SEU Oversight Board

Target Markets

- Electricity End-Uses
- Natural Gas End-Uses
- Clean Vehicles
- Green Buildings
- Affordable Energy Services
  - Solar Lifeline

Implementation Contractors

- Energy Service Companies (ESCOs)
- Local Government
- Community Service Organizations
- Utilities, Others

Fuels:	End Users:	End Uses:	Functions:
- Electricity	- Low-income	- Appliances	- Education & Outreach
- Gas	- Residential	- Lighting	- Incentive programs
- Fuel Oil	- Commercial/Industrial	- Heating & Cooling	
- Propane	- Agricultural	- Industrial Processes	
- Gasoline, diesel	- Transportation	- Vehicles	

New Direction – A Sustainable Energy Utility

Funding an SEU

- **Green Energy Fund (GEF)**

  Support Rebates for energy efficiency, customer-sited renewables, & affordable energy services from a Public Benefit Charge on all conventional fuel use ($0.0003 /kWh equivalent)

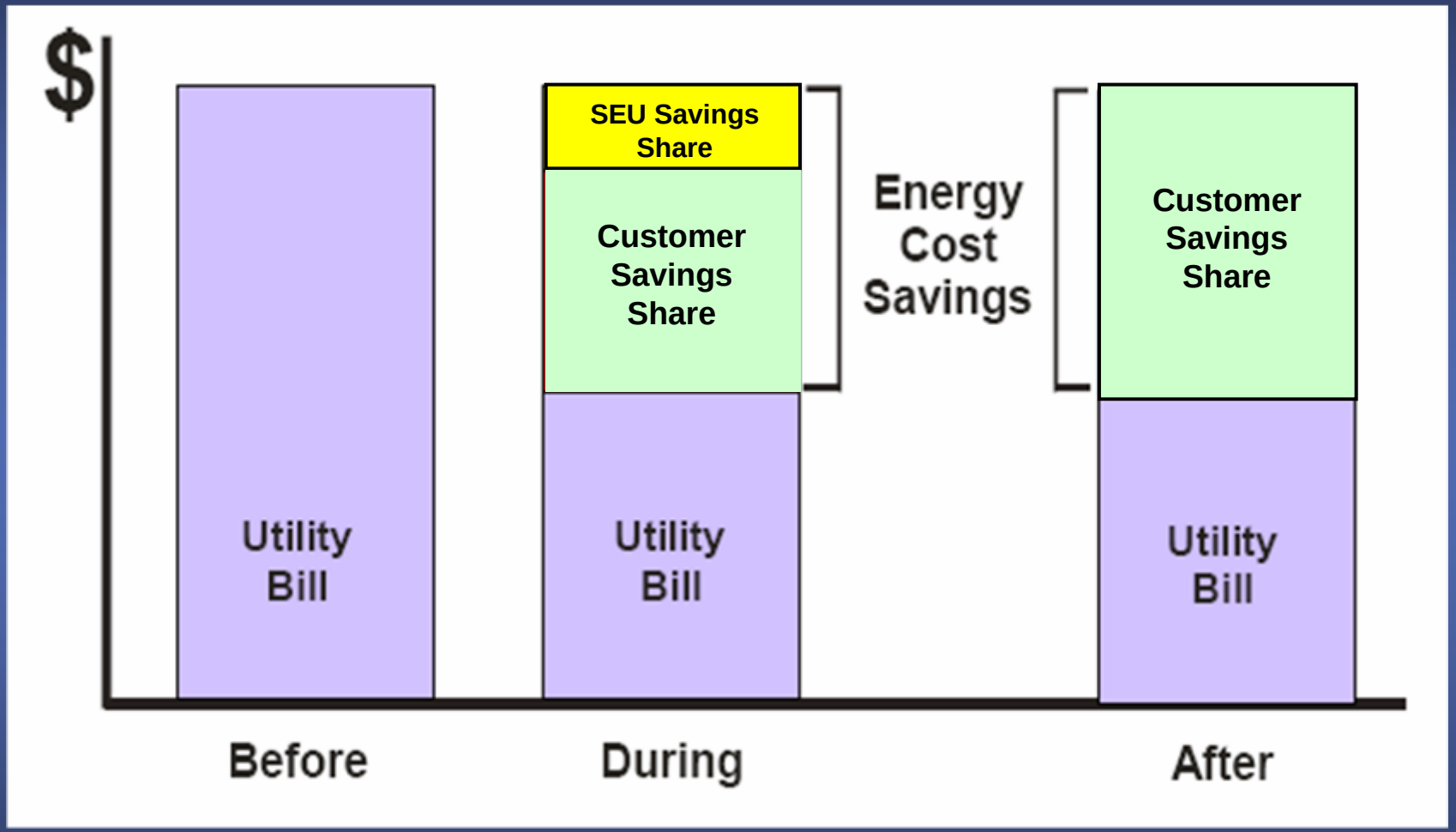
- **Sustainable Energy Bond**

  Authorize $30 million in Sustainable Energy Bonds that creates jobs, lowers energy bills and improve the environment

- **Reinvest through Shared Savings and RECs**

  In return for assumption of initial capital cost of Sustainable Energy investments, sign agreements with participants to share savings (e.g., 33% for 5 years) and REC revenues (e.g., 25% for 8 years)

Performance Contracting



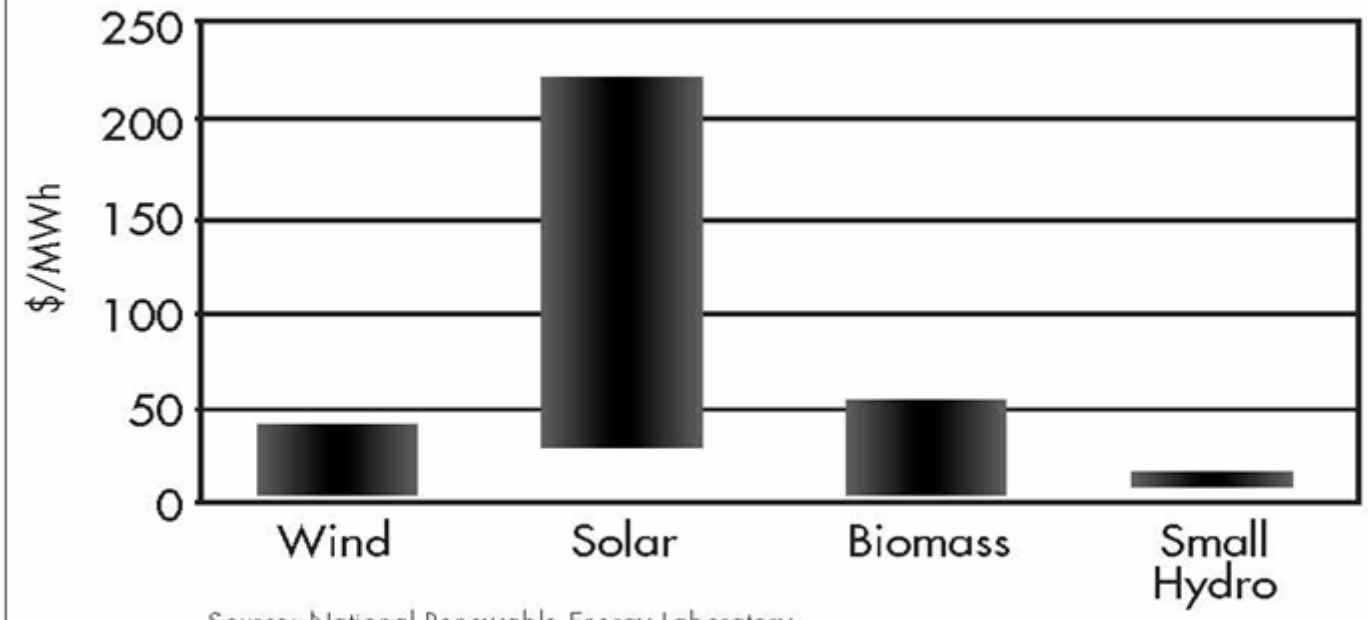
Source: King, 2003

Renewable Energy Credits (RECs) Markets for Sustainable Energy

Figure 1

Wholesale Voluntary REC Prices, By Resource Type

REC prices vary widely in voluntary markets.



Source: National Renewable Energy Laboratory

SEU Cash Flow Detail

(not including Sustainable Energy Bond)

	Expenditures					Revenues	Balance
Year	SEU Contract	SEU Program Costs (Rebates, Incentives, EM&V, etc.)	SEU / DEO Education & Marketing	Bonus Fund	Expenditure Totals	SEU Revenues: 0.25RECs + 0.33SS (yrs 1-5) + GEF Revenues	Annual Cash Balance
2008	-$800,000	-$5,953,981	-$300,000	-$100,000	-$7,153,981	$3,140,411	-$4,013,569
2009	-$816,000	-$8,823,059	-$300,000	-$175,000	-$10,114,059	$7,630,898	-$2,483,161
2010	-$832,320	-$10,520,922	-$300,000	-$192,962	-$11,846,205	$12,864,141	$1,017,936
2011	-$848,966	-$17,429,788	-$261,447	-$288,291	-$18,828,492	$19,219,402	$390,910
2012	-$865,946	-$21,628,684	-$432,574	-$392,609	-$23,319,812	$26,173,902	$2,854,090
2013	-$909,243	-$32,364,351	-$647,287	-$664,624	-$34,585,505	$33,231,192	-$1,354,313
2014	-$954,705	-$38,569,611	-$771,392	-$759,003	-$41,054,712	$37,950,155	-$3,104,557
2015	-$1,002,440	-$42,212,500	-$844,250	-$841,412	-$44,900,602	$42,070,590	-$2,830,012
Sub-totals	-$7,029,621	-$177,502,896	-$3,856,950	-$3,413,900	-$191,803,367	$182,280,690	-$9,522,677
2016	-$1,052,562	-$41,052,588	-$821,052	-$937,295	-$43,863,498	$46,864,759	$3,001,262
2017	-$1,105,191	-$44,887,443	-$897,749	-$1,020,003	-$47,910,386	$51,000,162	$3,089,776
2018	-$1,160,450	-$45,173,259	-$903,465	-$1,068,534	-$48,305,708	$53,426,697	$5,120,989
2019	-$1,218,473	-$42,744,016	-$854,880	-$1,123,466	-$45,940,835	$56,173,305	$10,232,470
Totals	-$11,566,296	-$351,360,203	-$7,334,096	-$7,563,199	-$377,823,794	$389,745,614	$11,921,820

SEU Prospectus

Year	Net SEU Revenues (before Debt Service)	SEU Bond Debt Service							Net SEU Revenue (after Debt Service & Bond Retirement)	SEU Bottom Line
	Balance of SEU Costs and Revenues	Tax Exempt Bond Floats	Annual Interest Cost for Bond 1 (Yield = 5.20%)	Annual Interest Cost for Bond 2 (Yield = 5.0%)	Annual Interest Cost for Bond 3 (Yield = 4.90%)	Annual Interest Cost for Bond 4 (Yield = 4.90%)	Bond Management	Debt Totals	SEU Balance + Bond Interest Cost + Bond Principal	Cumulative Cash Flow
2008	-$4,013,569	Bond 1: 5 yr Maturity Yield = 5.20% $7,700,000	-$400,400				-154000	-$554,400	$3,132,031	$3,132,031
2009	-$2,483,161		-$400,400					-$400,400	-$2,883,561	$248,469
2010	$1,017,936	Bond 2: Yield = 5.00% $0	-$400,400	$0			$0	-$400,400	$617,536	$866,006
2011	$390,910	Bond 3: Yield = 4.90% $0	-$400,400	$0	$0		$0	-$400,400	-$9,490	$856,515
2012	$2,854,090	Bond 4: 8 yr Maturity Yield = 4.90% $15,300,000	-$400,400	$0	$0	-$749,700	-$306,000	-$1,456,100	$8,997,990	$9,854,505
2013	-$1,354,313			$0	$0	-$749,700		-$749,700	-$2,104,013	$7,750,492
2014	-$3,104,557			$0	$0	-$749,700		-$749,700	-$3,854,257	$3,896,235
2015	-$2,830,012			$0	$0	-$749,700		-$749,700	-$3,579,712	$316,523
Sub-totals	-$9,522,677		-$2,002,000	$0	$0	-$2,998,800	-460000	-$5,460,800	$316,523	
2016	$3,001,262			$0	$0	-$749,700		-$749,700	$2,251,562	$2,568,084
2017	$3,089,776			$0	$0	-$749,700		-$749,700	$2,340,076	$4,908,161
2018	$5,120,989			$0	$0	-$749,700		-$749,700	$4,371,289	$9,279,450
2019	$10,232,470			$0	$0	-$749,700		-$749,700	-$5,817,230	$3,462,220
Totals	$11,921,820		-$2,002,000	$0	$0	-$5,997,600	-460000	-$8,459,600	$3,462,220	

All Bond Interest
-$7,999,600

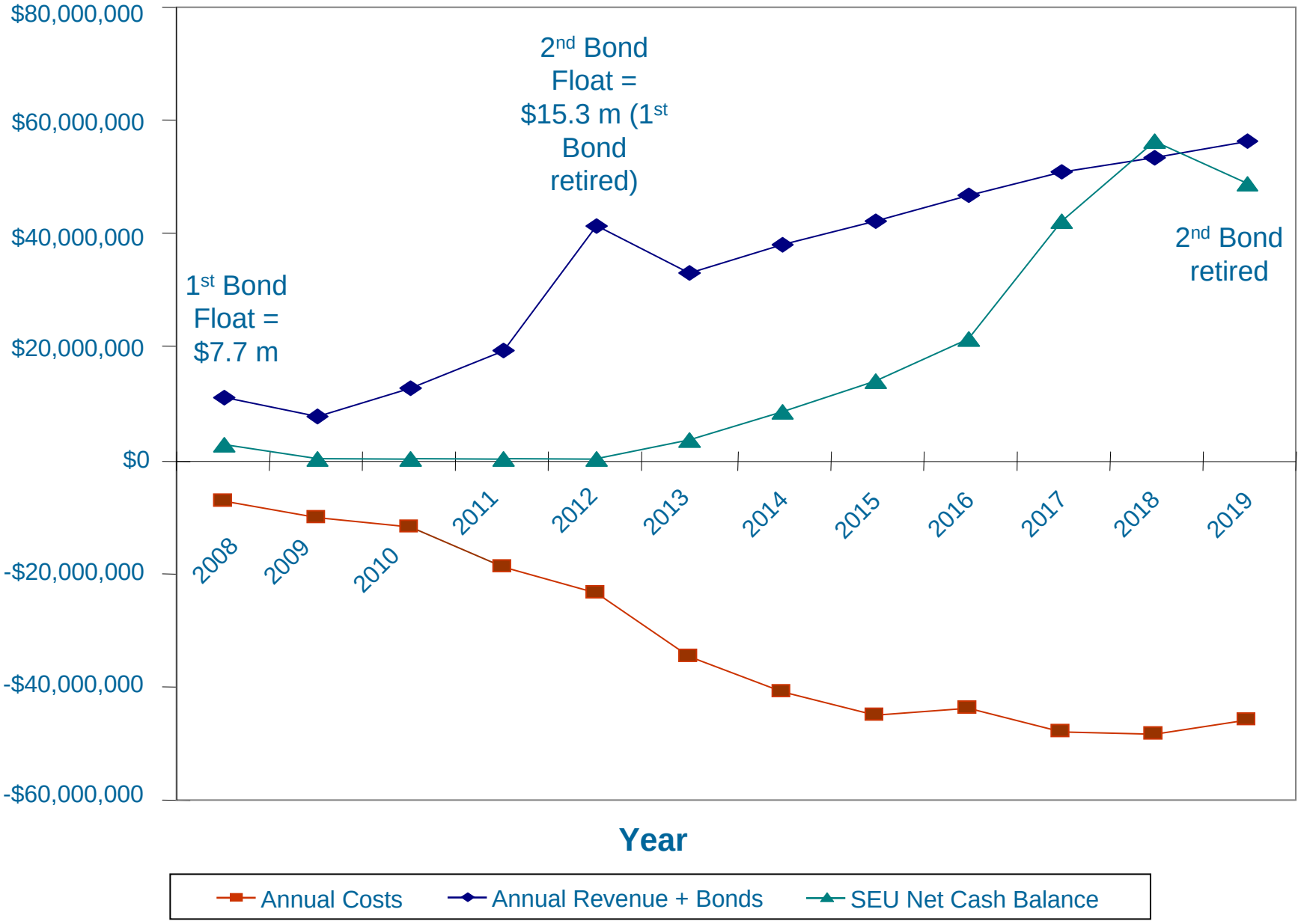
Total Bond Float
$23,000,000

* Revenue Assumptions

$25 million in Sustainable Energy Special Purpose Revenue Bonds are authorized.
GEF mill rate is doubled.
REC revenues are based on declining price schedule.

Prepared for the Delaware Sustainable Energy Utility Task Force by the Center for Energy & Environmental Policy, University of Delaware.

SEU Annual Costs, Revenues & Cash Balance



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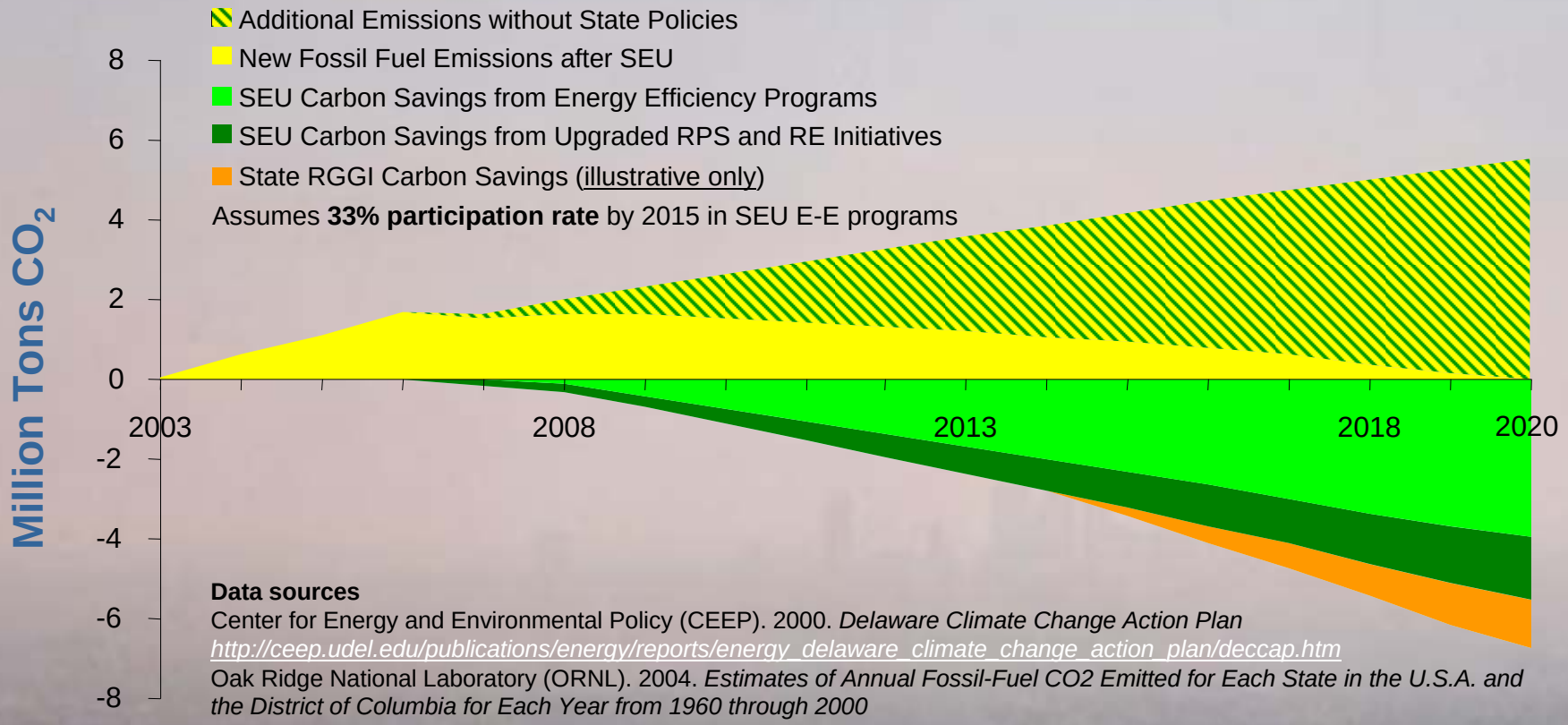
Policy Agenda

- **Renewable Portfolio Standard (RPS)**
  - Upgrade to proven 'best practice': 20% by 2019
  - Add 2% Solar Carveout
- **Green Energy Fund (GEF)**
  - Double GEF mill rate to support renewables & energy efficiency
  - Cost to the average residential customer = ~ 18 cents per month
- **Net Metering Standards**
  - Enable commercial & industrial customers to generate up to 2 MW
  - Enable residential customers to generate up to 25 kW
  - Net meter customer generation at full retail rates (including generation and T&D)
- **Authorize a Sustainable Energy Bond**
  - Authorize the State to initially invest $30 million in a Sustainable Energy Future
- **Create the Delaware Sustainable Energy Utility**
  - An incentive-based institution that utilizes performance contracting
  - Offers one-stop, comprehensive sustainable energy services to all
  - Super Majority 3/4th Vote Required:
    - **Senate (Democrat Party majority): 19-1**
    - **House (Republican Party majority): Unanimous vote in favor**

Delaware Sustainable Energy Utility

Our Best Environmental Policy



Data sources

Center for Energy and Environmental Policy (CEEP). 2000. *Delaware Climate Change Action Plan* http://ceep.udel.edu/publications/energy/reports/energy_delaware_climate_change_action_plan/deccap.htm

Oak Ridge National Laboratory (ORNL). 2004. *Estimates of Annual Fossil-Fuel CO2 Emitted for Each State in the U.S.A. and the District of Columbia for Each Year from 1960 through 2000* http://cdiac.esd.ornl.gov/trends/emis_mon/stateemis/data/datacsv.html

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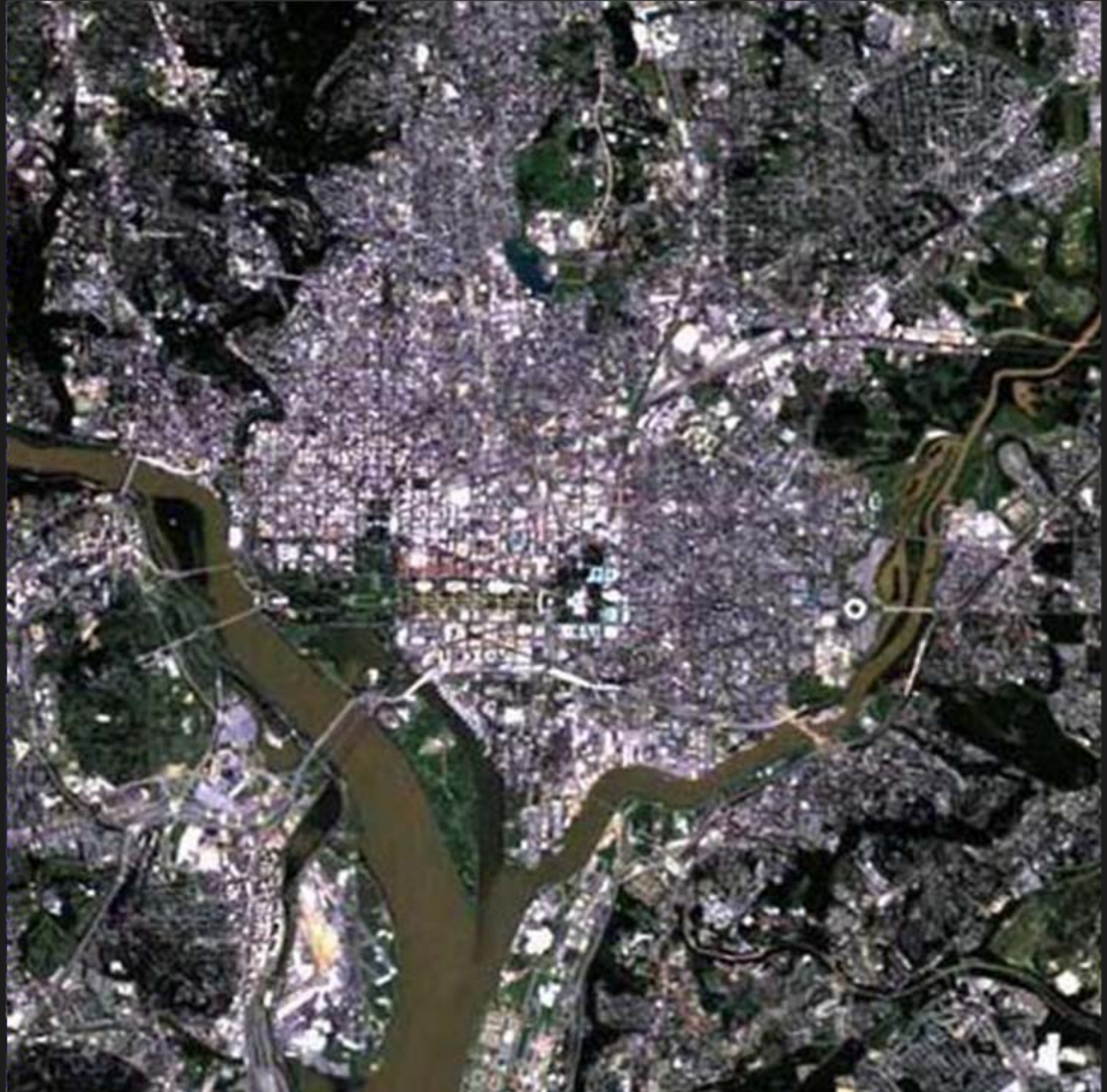
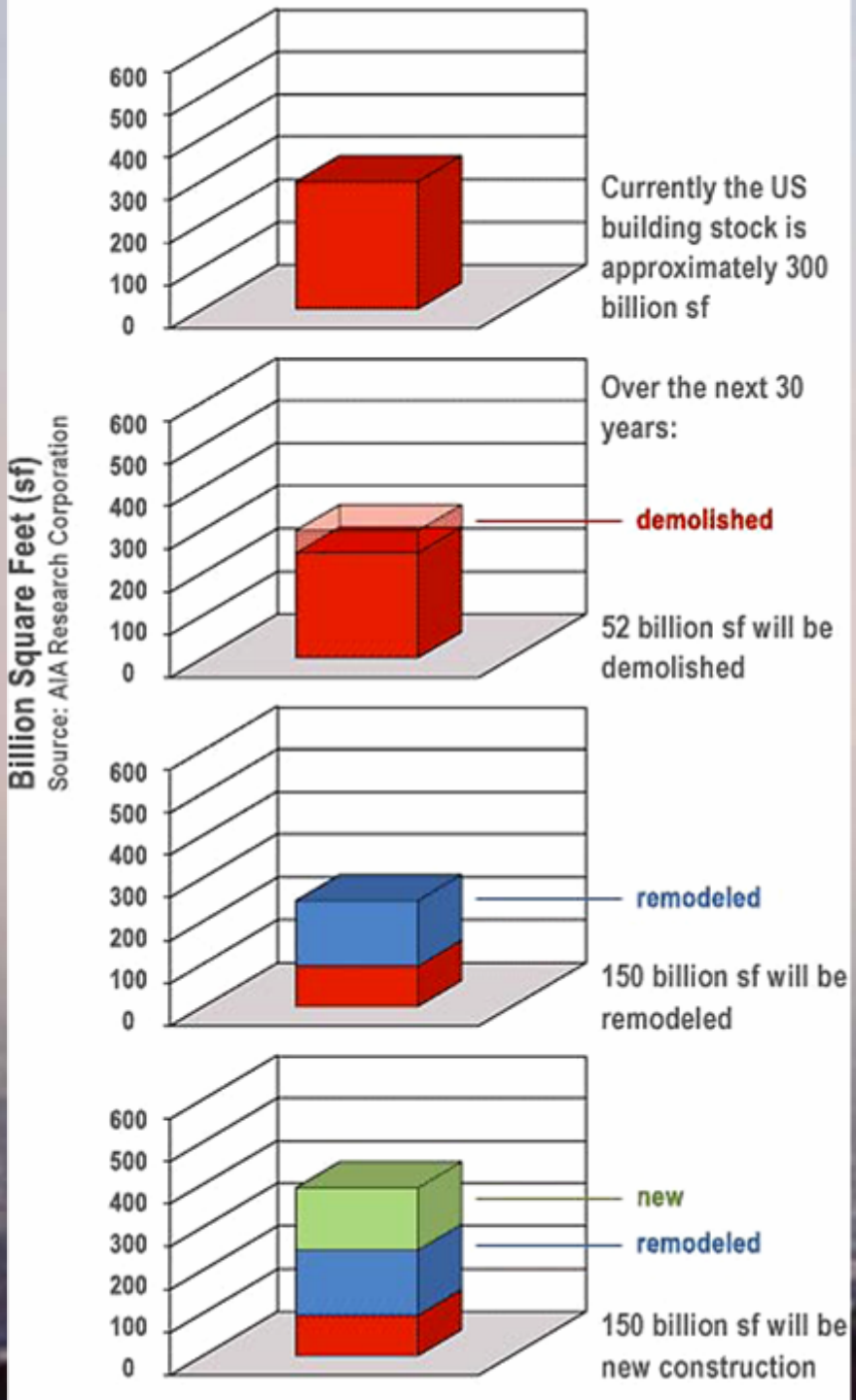
Estimates prepared for the Sustainable Energy Utility Task Force by the Center for Energy & Environmental Policy, University of Delaware.



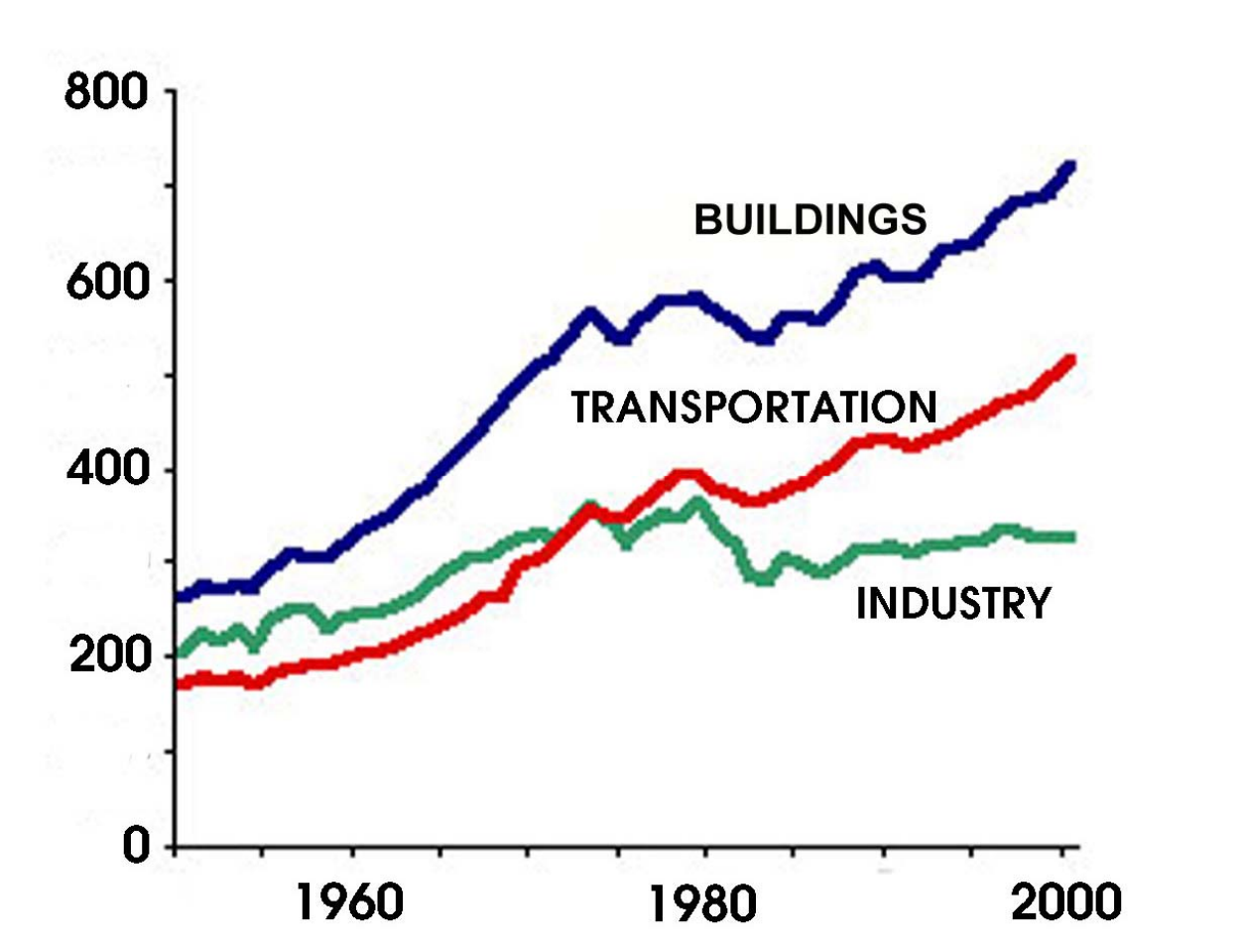


Conclusion: the U.S. will build or rebuild the same number of buildings now in place IN JUST THE NEXT 30 YEARS!

Slide courtesy of Edward Mazria, Mazria Odems Dzurec, Architects & Don Aitken, UCS & ISES

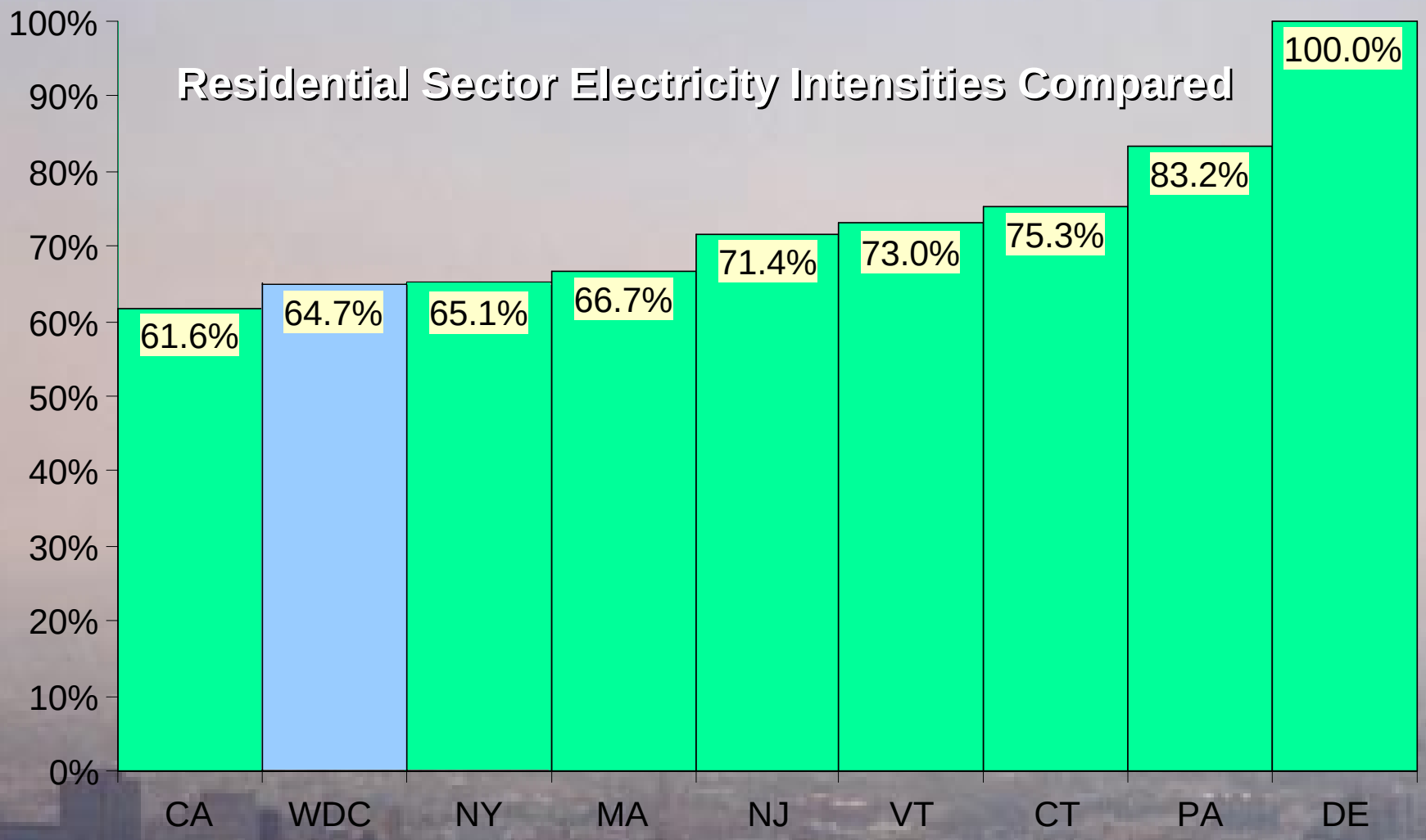
U.S. CO_2 Emissions by Sector
(Million Metric Tons of Carbon)

Slide courtesy of Jesse Hensen, AIA, and Amy Hoagberg, CEM, Kyocera Solar



Source: Ed Mazria of Mazria Odems Dzurec

Asset & Challenge: The District's Buildings Sector

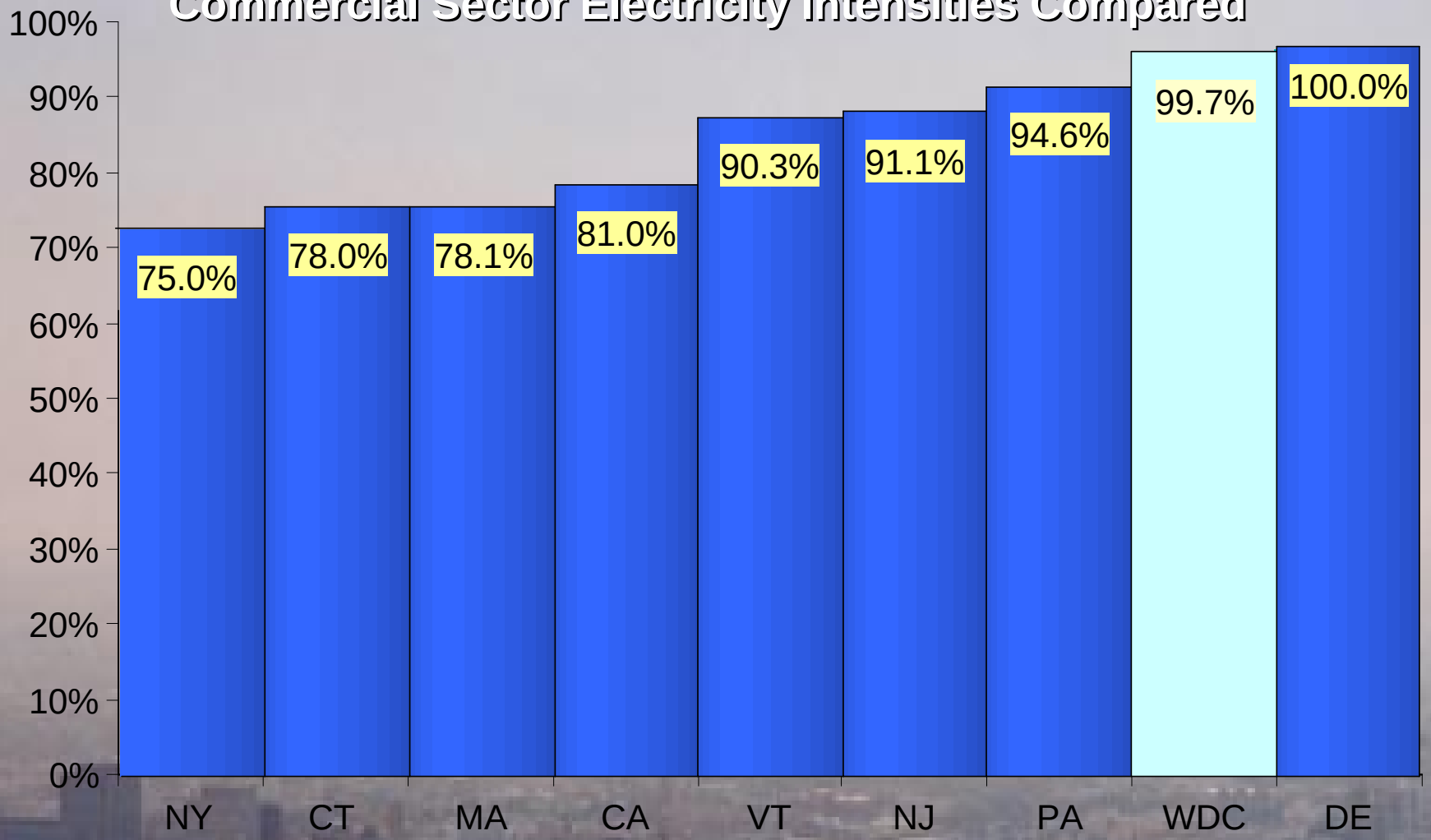


Source: *Sustainable Energy Utility Design: Options for the District of Columbia (2007). Prepared for the DDOE. (Under review.)*

Center for Energy and Environmental Policy

Asset & Challenge: The District's Buildings Sector

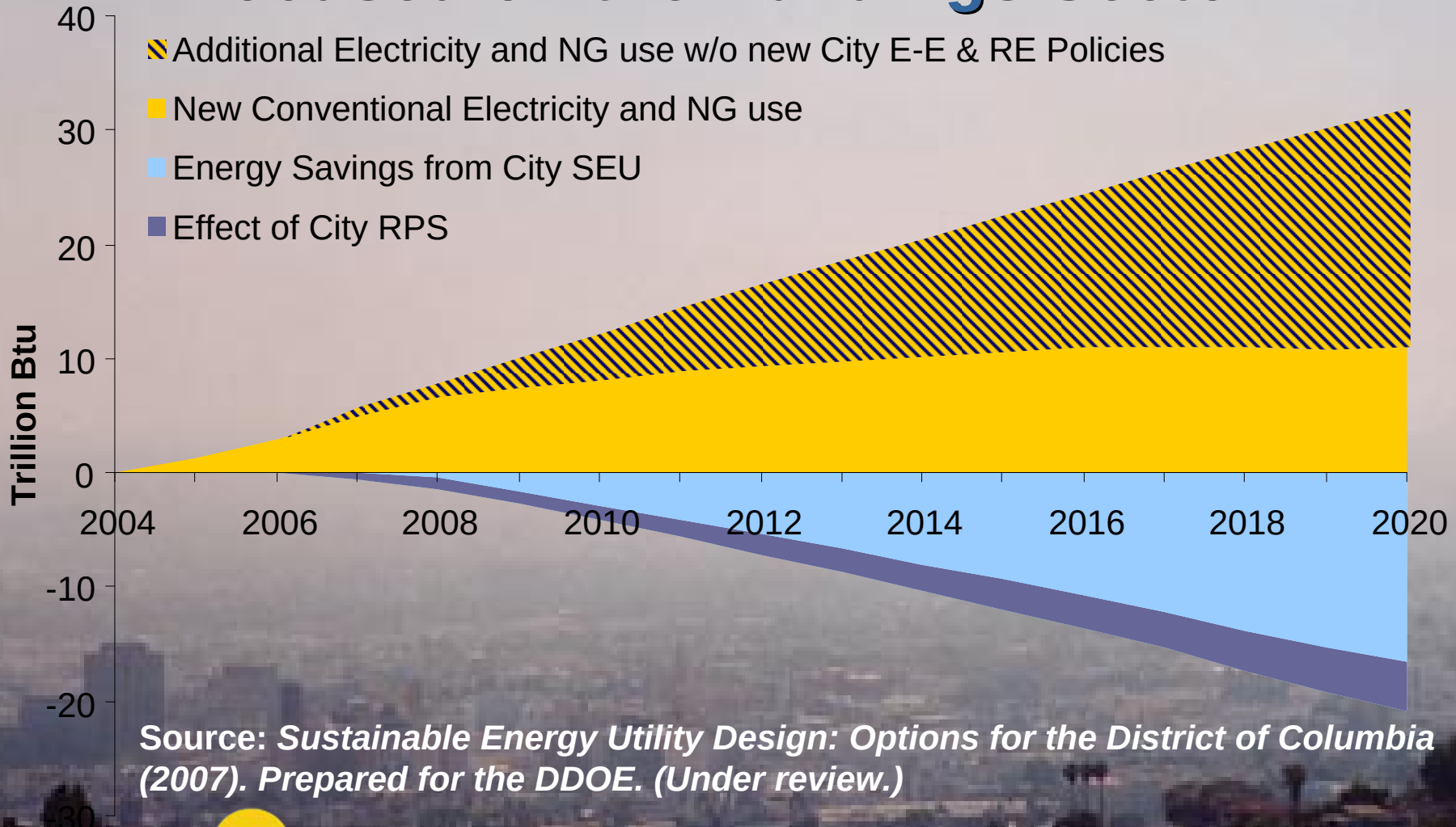
Commercial Sector Electricity Intensities Compared



Source: *Sustainable Energy Utility Design: Options for the District of Columbia (2007). Prepared for the DDOE. (Under review.)*

Center for Energy and Environmental Policy

Potential Energy Impacts of a DC Sustainable Energy Utility Focused on the Buildings Sector



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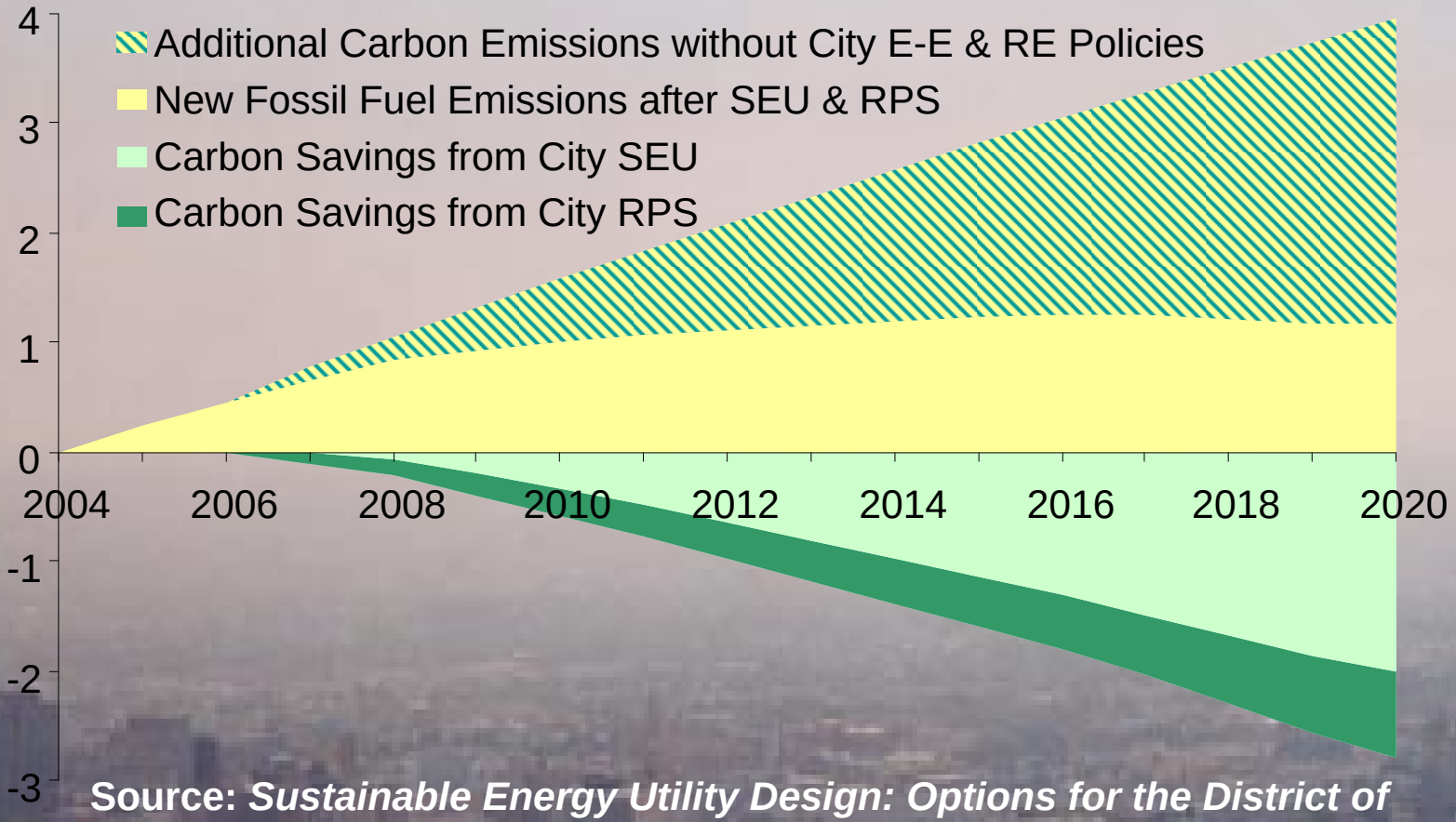
Center for Energy and Environmental Policy

Potential Carbon Impacts of a DC Sustainable Energy Utility Focused on the Buildings Sector



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Sustainable Energy Utility

Website: http://www.seu-de.org/

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