

Addressing the Climate Crisis: The Current Energy Policy Landscape of Oregon & the U.S.

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Today's Outline

The Climate Crisis:

- How bad is it?

Oregon's Energy & Climate Breakdown

- How are we doing?

Energy Policy in Oregon

- What tools are we using right now?
- What other options are out there?

National "Energy Policy"

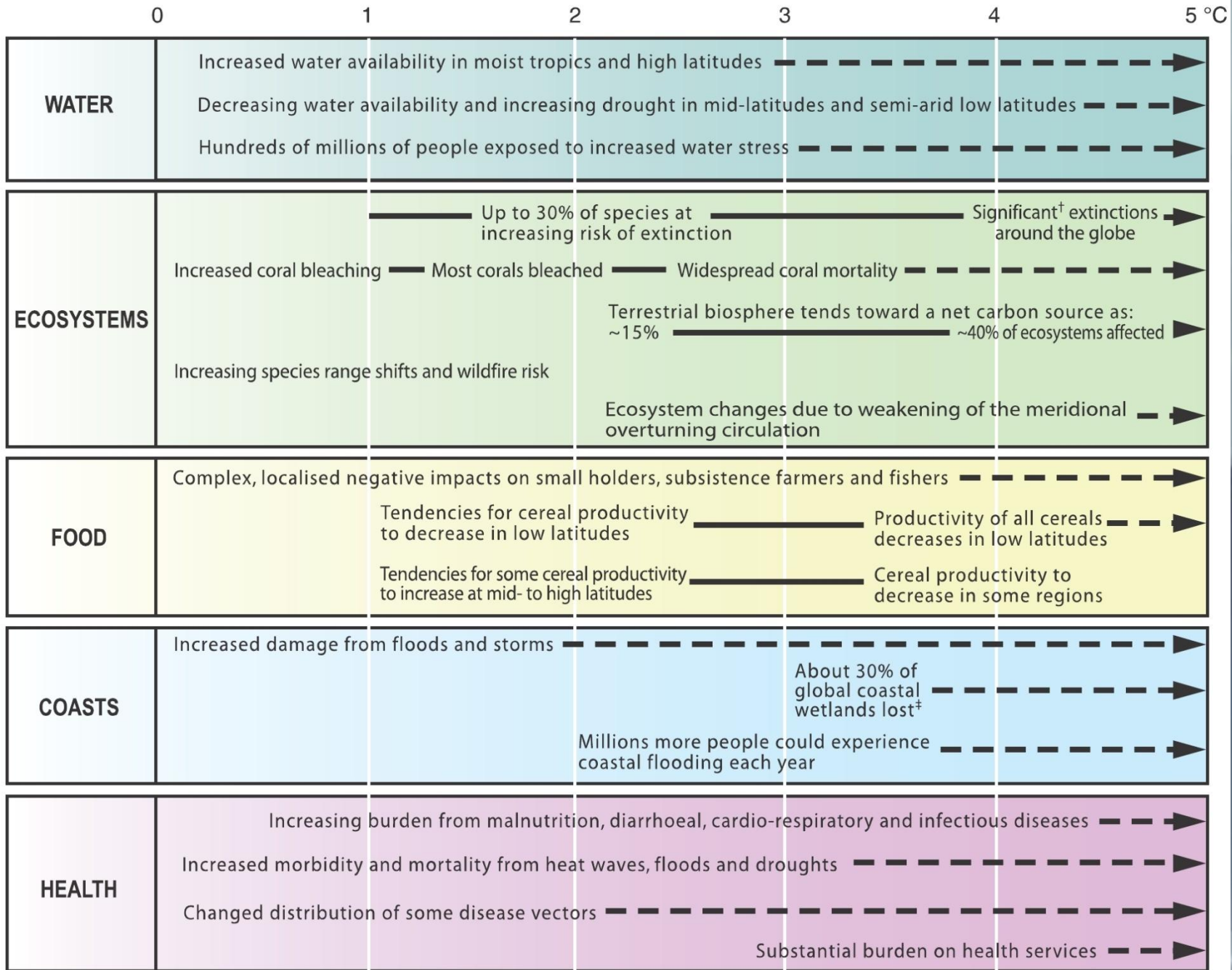
- Politics Over Substance



The Climate Crisis

How Bad Is It?





† Significant is defined here as more than 40%. ‡ Based on average rate of sea level rise of 4.2mm/year from 2000 to 2080.

A stunning year in climate science reveals that human civilization is on the precipice

The first anniversary of 'Climategate': The media blows the story of the century

November 15, 2010

- **40% decline in ocean phytoplankton**
- **Siberian methane stores destabilizing**
- **Global droughts, ocean acidification, sea level rise, species extinctions**

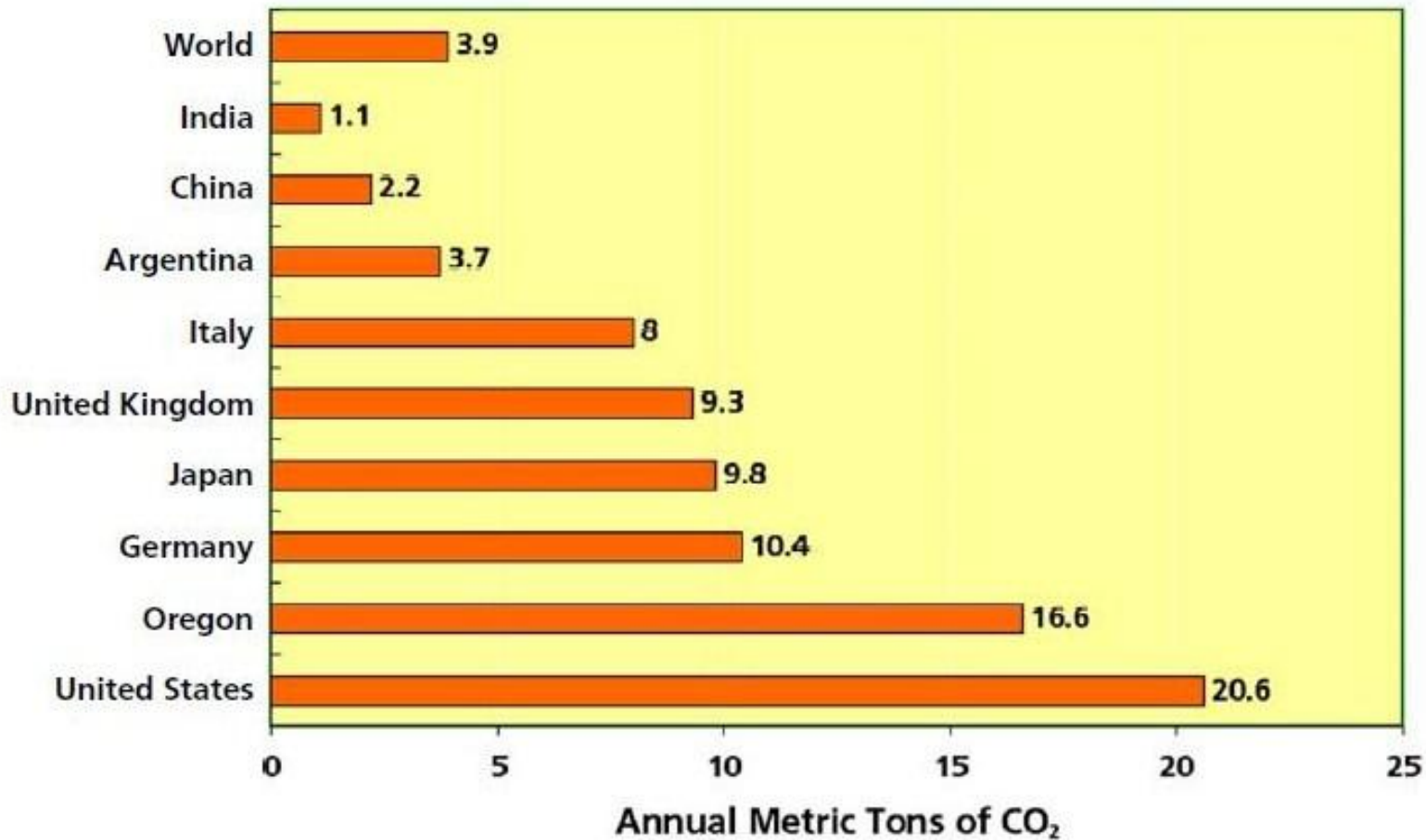
Oregon's Energy & Climate Breakdown

How Are We Doing?



International GHG Comparison

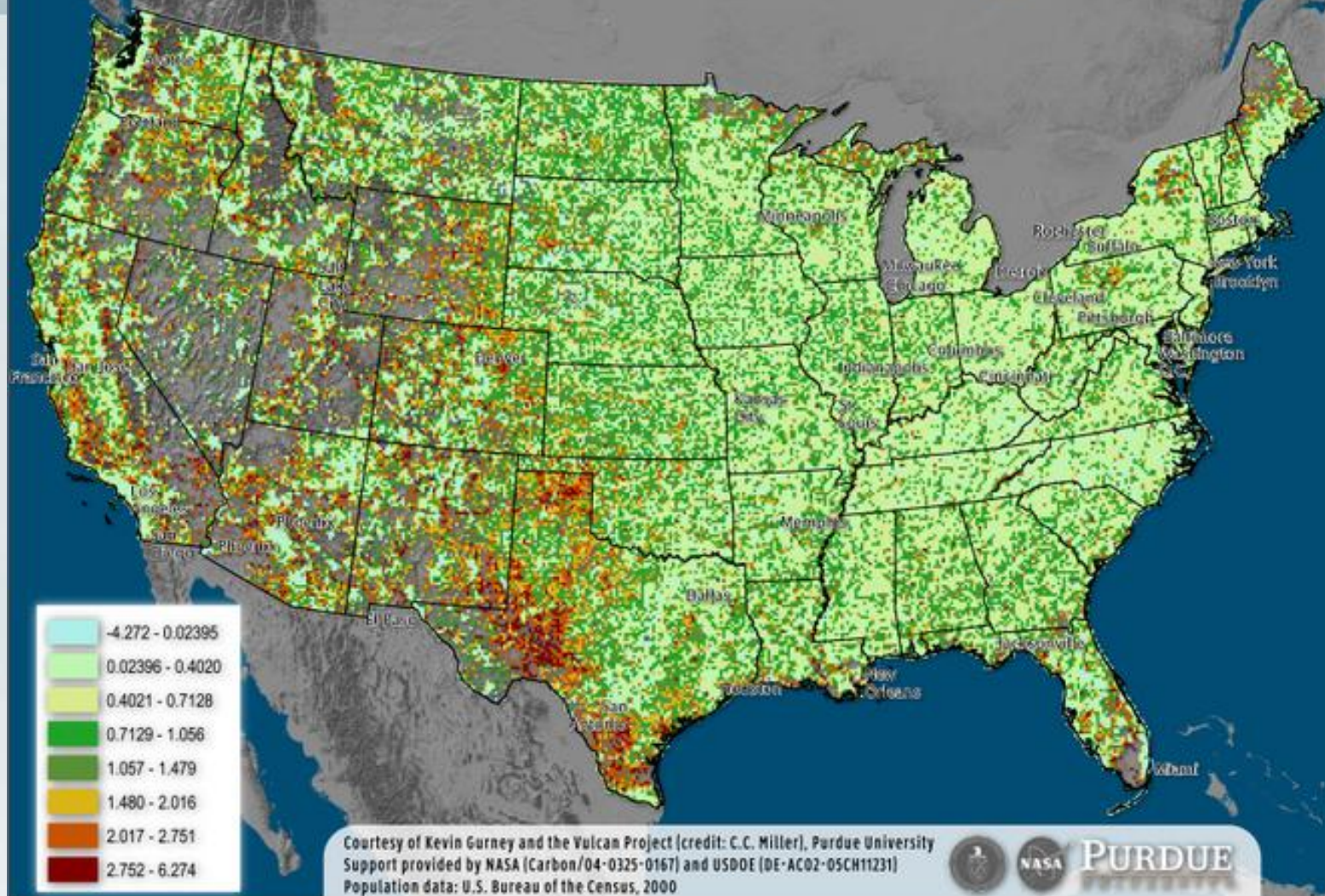
CO₂ Emissions Per Capita From Fossil Fuels



Sources: United Nations, U.S. Department of Energy, Oregon Department of Energy

Total Carbon Dioxide Emissions per Capita 2002

Units: log base 10 of tonnes of carbon/100 km²/year/person



NOTE: This map is a "quick" recalculation of the Vulcan 2002 fossil fuel CO₂ emissions inventory in order to achieve a per capita quantity. Please note the methods employed to produce this map and the intrinsic caveats. We are currently developing a more accurate assessment of per capita emissions for the Vulcan inventory. However, this map gives a reasonable approximation of per capita emissions and should serve to adequately inform discussions on that basis.

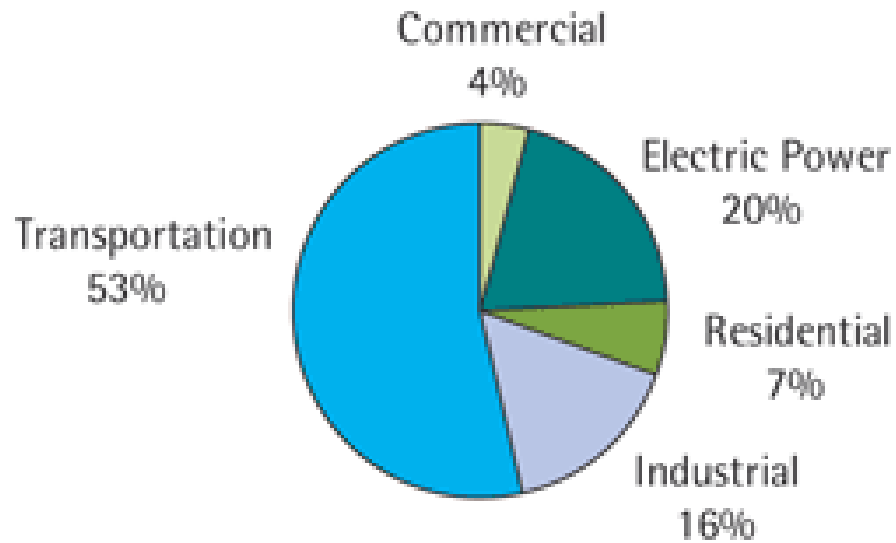
METHOD: Vulcan emissions in each 10 km x 10 km grid cell were divided by the total population of all U.S. Census Blocks (Decennial Census 2000) found within the cells' boundaries. For simplicity, only the centroids of Census blocks (not their polygons) were used to determine which blocks' populations were summed into any given grid cell. In the likely scenario in which many blocks lie within a single grid cell, the blocks' populations were summed into the cell before the per capita value was calculated. In the fewer cases where a Census block overlaps several grid cells, only the grid cell containing the block's centroid is given that block's population. Vulcan grid cells with no emissions or which overlaid areas with no population were omitted.

Oregon's Fossil Fuel CO2 Emissions



Source: U.S. Energy Information Administration

Oregon's Fossil Fuel CO₂ by Sector



CO₂ emissions from fossil fuels in Oregon

Total: 40.4 million metric tons

Source: 2003, Sightline Institute

Portland Regional CO2 by Sector

Metro Area Greenhouse Gas Emissions

31 Million Metric Tons Carbon Dioxide Equivalent (MMT CO2e)

Transportation

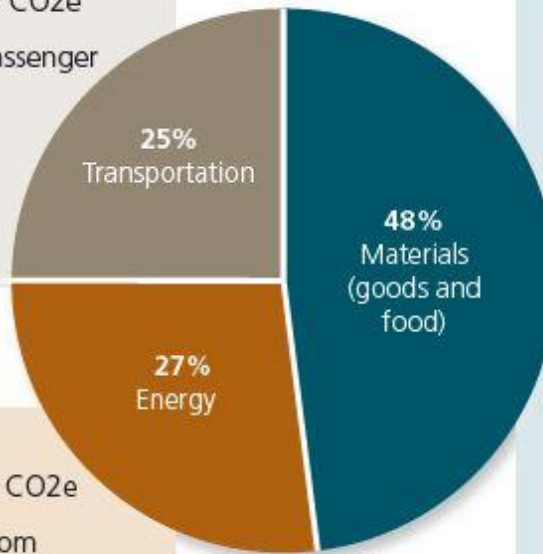
Estimated emissions: 7.8 MMT CO2e

- Vehicle miles traveled by passenger vehicles and light trucks
- Operation of public transportation system (TriMet)

Energy

Estimated emissions: 8.2 MMT CO2e

- Natural gas consumption from residents and businesses
- Fossil fuel consumption from utilities' imported electricity



Materials (goods and food)

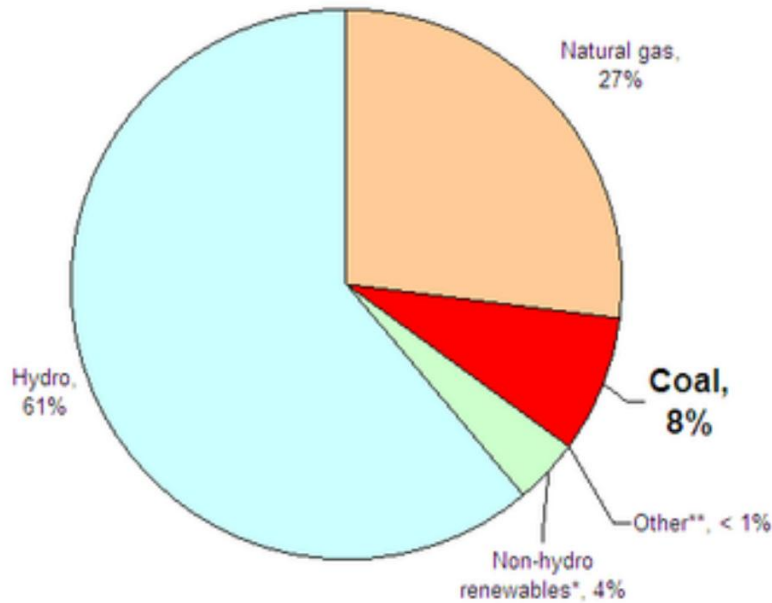
Emissions related to the production, manufacture and disposal of materials, goods and food

Estimated emissions 14.9 MMT CO2e

- Manufacture of products and food (from inside and outside the region) consumed by metro residents and businesses
- Freight movement of materials, goods and food (heavy truck, rail, air)
- Waste management and recycling system (collection, landfills)

Oregon's Electricity Generation (2007)

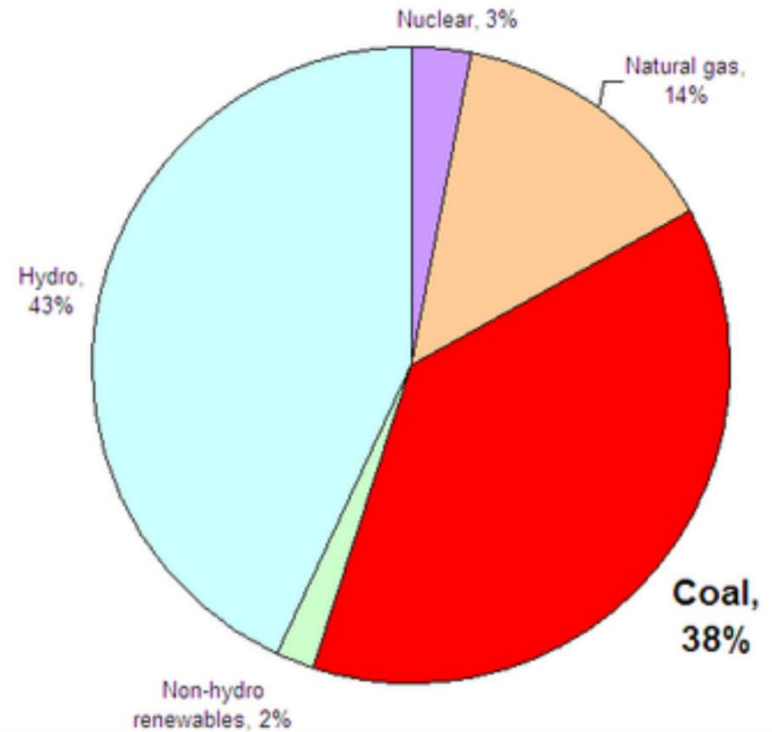
More than 1/3 of the the power generated in Oregon is fossil fuel-based -- and about 8% is coal, the more climate-damaging source.



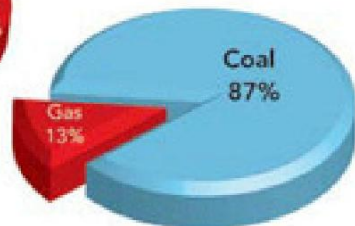
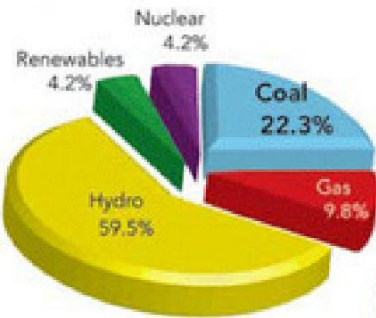
* Includes wind, solar, biomass, and geothermal energy.
 ** Includes petroleum.

Oregon's Electricity Consumption (2007)

38 percent of the electricity consumed in Oregon comes from coal-fired power plants.



Regional Generation Mix - MWhrs



Regional CO2 Emissions Mix

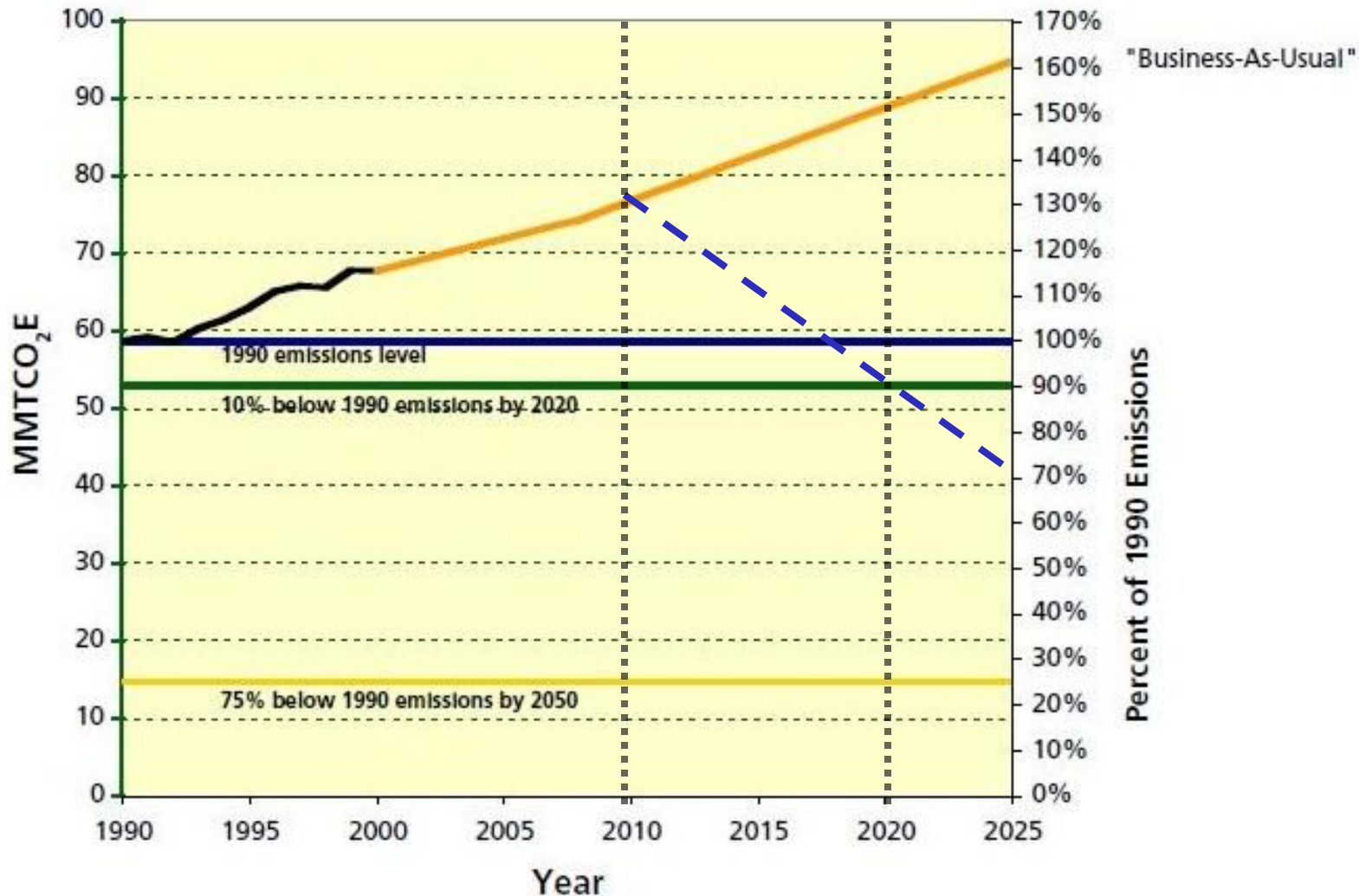
Source: Sightline Institute

Oregon's Climate Goals

The background of the slide features a blurred image of a wind farm. A large wind turbine is prominent on the right side, with its three blades extending outwards. In the distance, a line of smaller wind turbines stretches across the horizon under a clear sky.

- 1. Halt the growth of greenhouse gas (GHG) emissions by this year**
- 2. Reduce GHG emissions to 10% below 1990 levels by 2020**
- 3. Reduce GHG emissions to 75% below 1990 levels by 2050**

Oregon's Climate Goals (cont'd)



Source: Oregon Strategy for Greenhouse Gas Reductions, 2004

Energy Policy In Oregon

What Tools Are We Using Now?



Oregon Energy & Climate Policies



- 1) Renewable Portfolio Standard**
- 2) Business Energy Tax Credit (BETC)**
- 3) Western Climate Initiative**

Renewable Portfolio Standard (RPS)

A mandate requiring a certain amount of renewable energy generation



Renewable Portfolio Standard (RPS)



In Oregon:

- **Large Utilities: 25% of elec. load from *new renewable sources* by 2025**
- **Small Utilities: 5-10% by 2025**

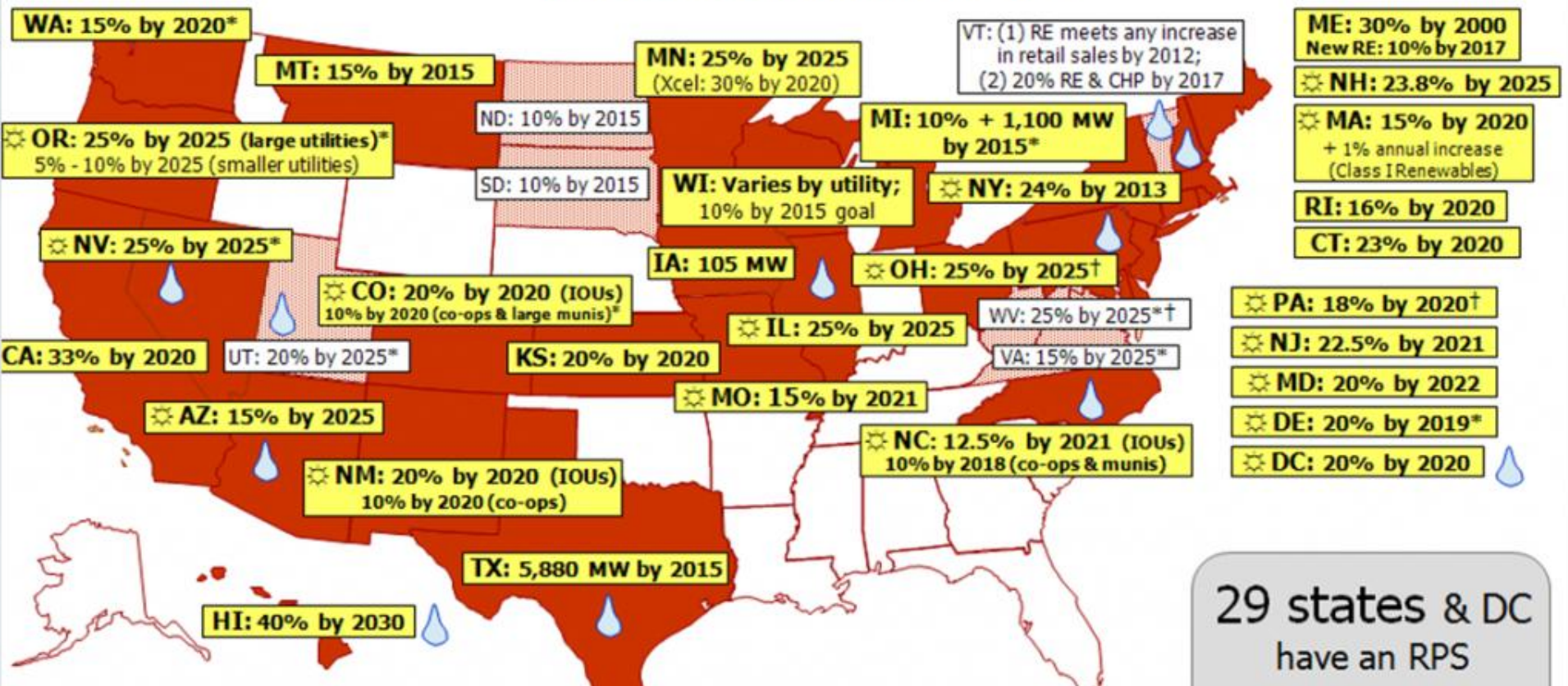
“Renewable” = no large hydro

“New” = no old renewables (pre-1995)

Note: can buy “Renewable Energy Credits” (RECs) from other states

Renewable Portfolio Standards

www.dsireusa.org / November 2009

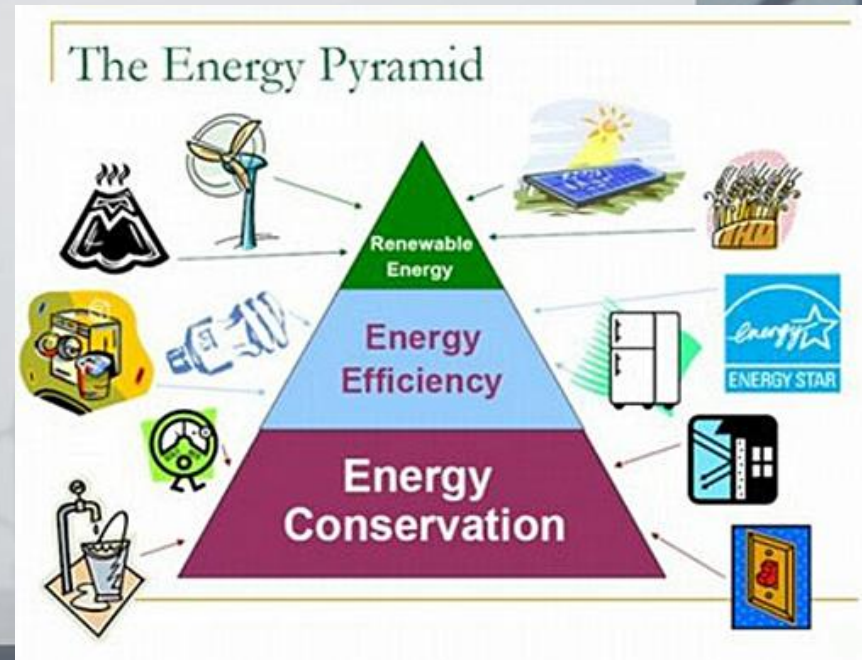


29 states & DC
 have an RPS
6 states have goals

- State renewable portfolio standard
- State renewable portfolio goal
- Solar water heating eligible
- Minimum solar or customer-sited requirement
- * Extra credit for solar or customer-sited renewables
- † Includes non-renewable alternative resources

Issues

- Don't include conservation and energy efficiency!
- Doesn't provide funding
- Doesn't account for legacy of renewable energy (new sources only)
- Should be regional



Business Energy Tax Credits (BETC)

- Subsidy for conservation, renewables, and “green” manufacturing projects



BETC (cont'd)

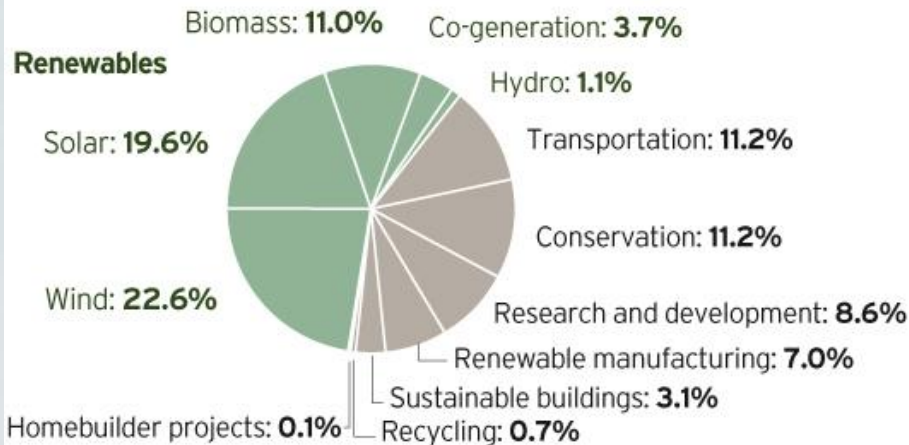
- Tax credits given for *investment* in energy projects
- Total tax credits:
 - ~\$150 million/year for renewables
 - ~\$100 million/year for manufacturing
 - Applicants compete for funds (paid out over time)
 - No limit for conservation
- Tax Credit Amount = 35-50% of project costs (only 2.5% for wind)
- “Pass-through option” = sell tax credits to someone else (e.g., Walmart)

Project precertification

The volume of projects precertified for the state's Business Energy Tax Credit increased 90 percent from 2008 to 2009. The potential tax credits these projects represent is about \$230 million in 2008 and \$500 million in 2009.

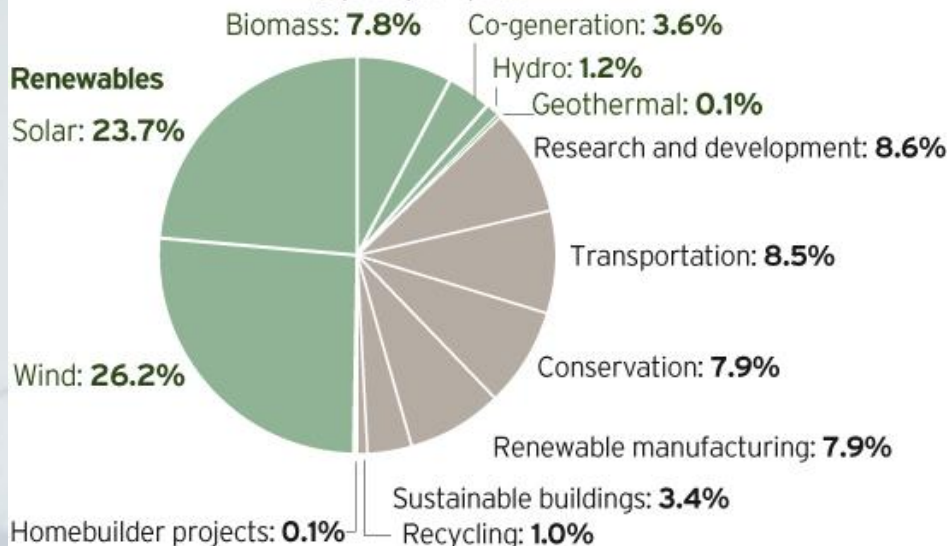
2008 project costs and percentage of total

\$572,002,443



2009 project costs and percentage of total

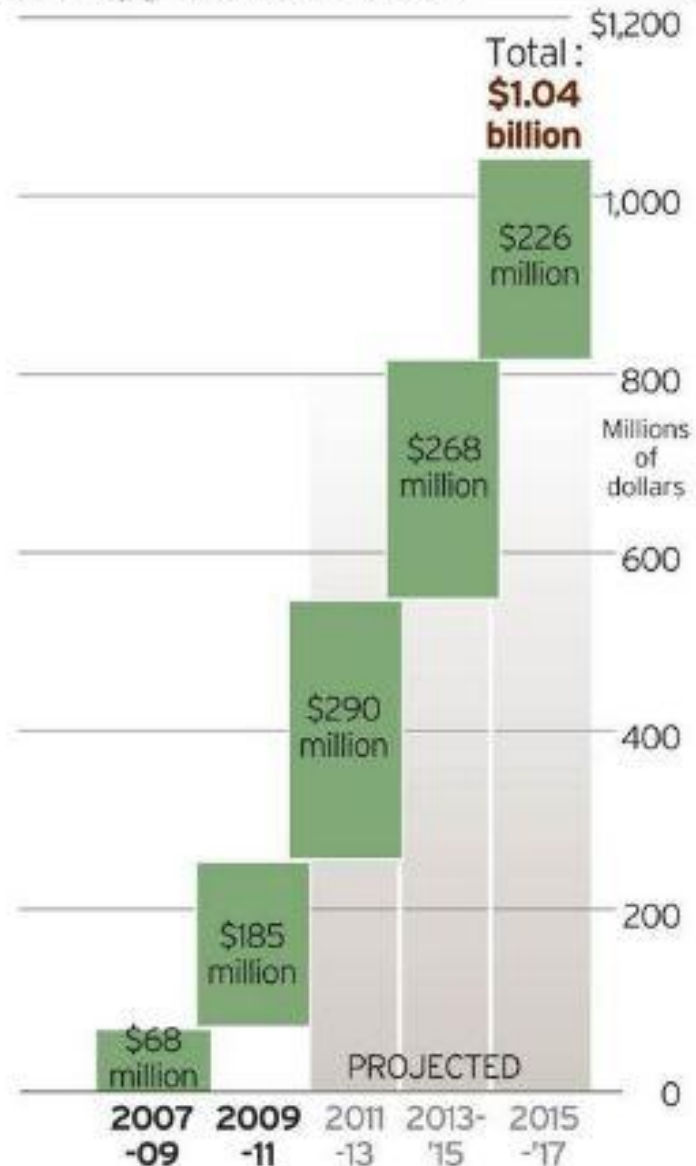
\$1,089,332,805



Source: Oregon Department of Energy

DAN AGUAYO/THE OREGONIAN

The cost of Oregon's energy tax credits

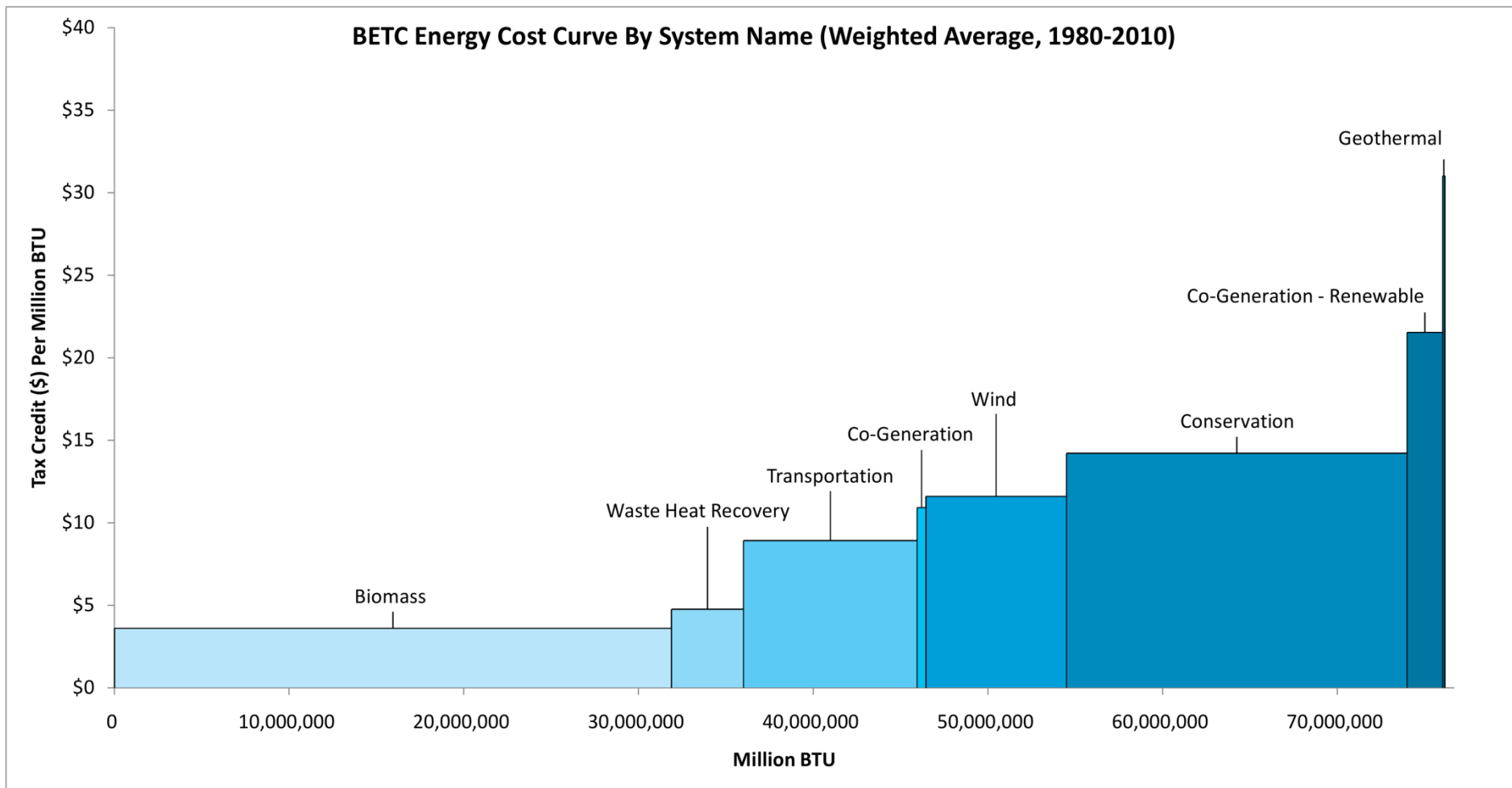


Source: Oregon Legislative Revenue Office

DAN AGUAYO/THE OREGONIAN

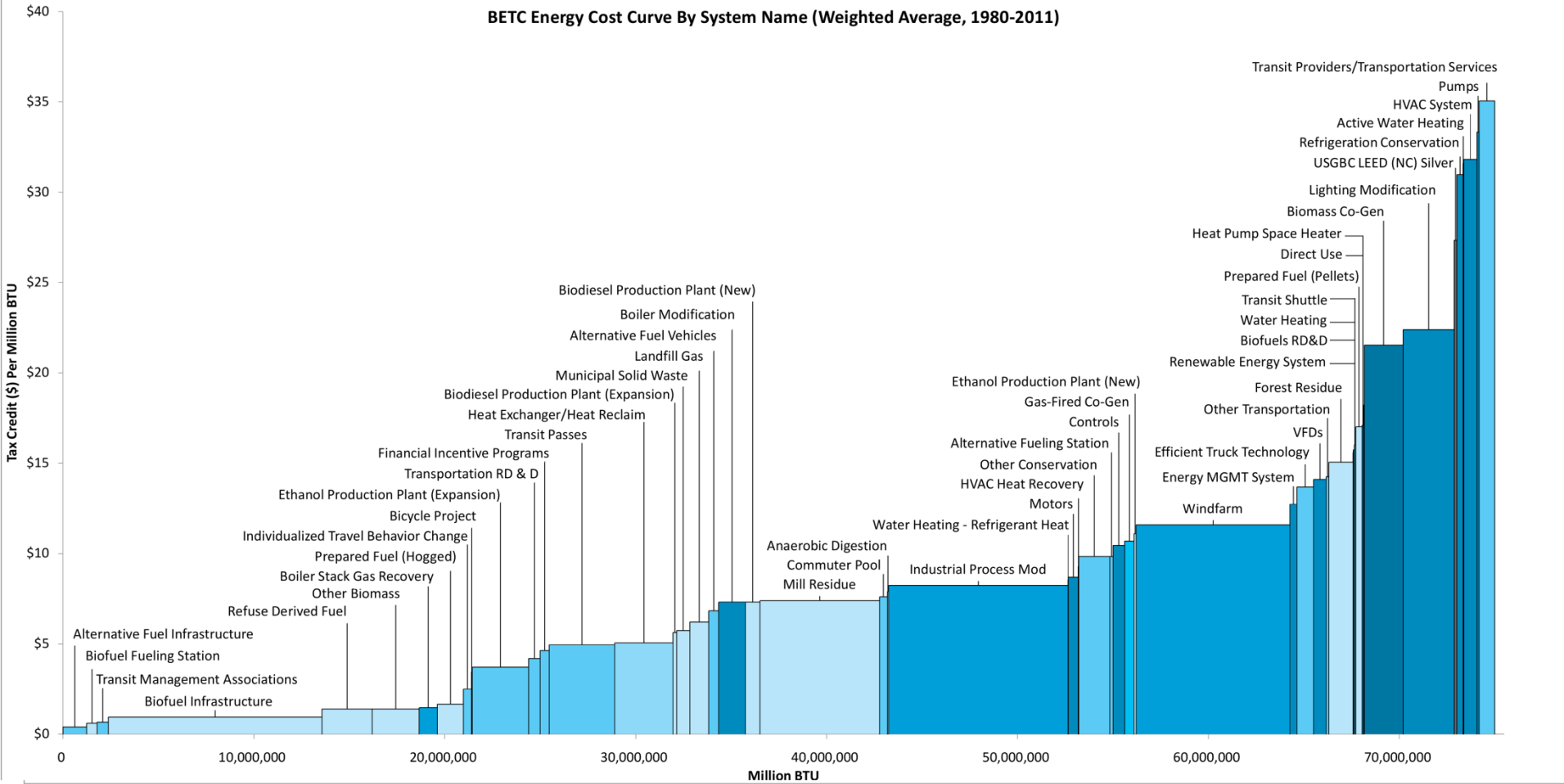
My Research

Investigate and evaluate BETC spending



My Research (cont'd)

BETC Energy Cost Curve By System Name (Weighted Average, 1980-2011)



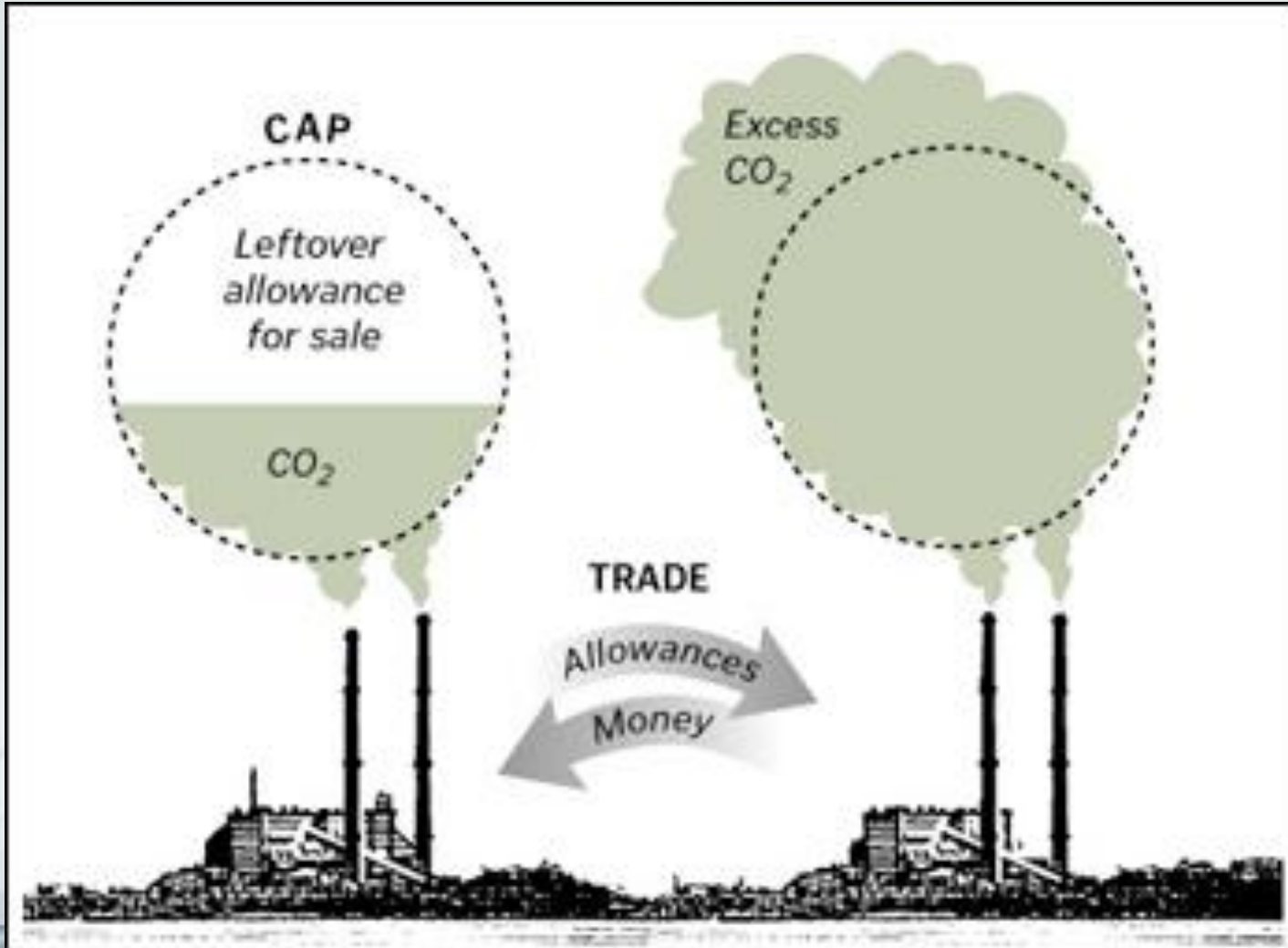
Issues

- **Significantly different outcomes per dollar spent**
- **Large amount of public dollars**
- **Energy remains cheap (less incentive for conservation)**



Western Climate Initiative (WCI)

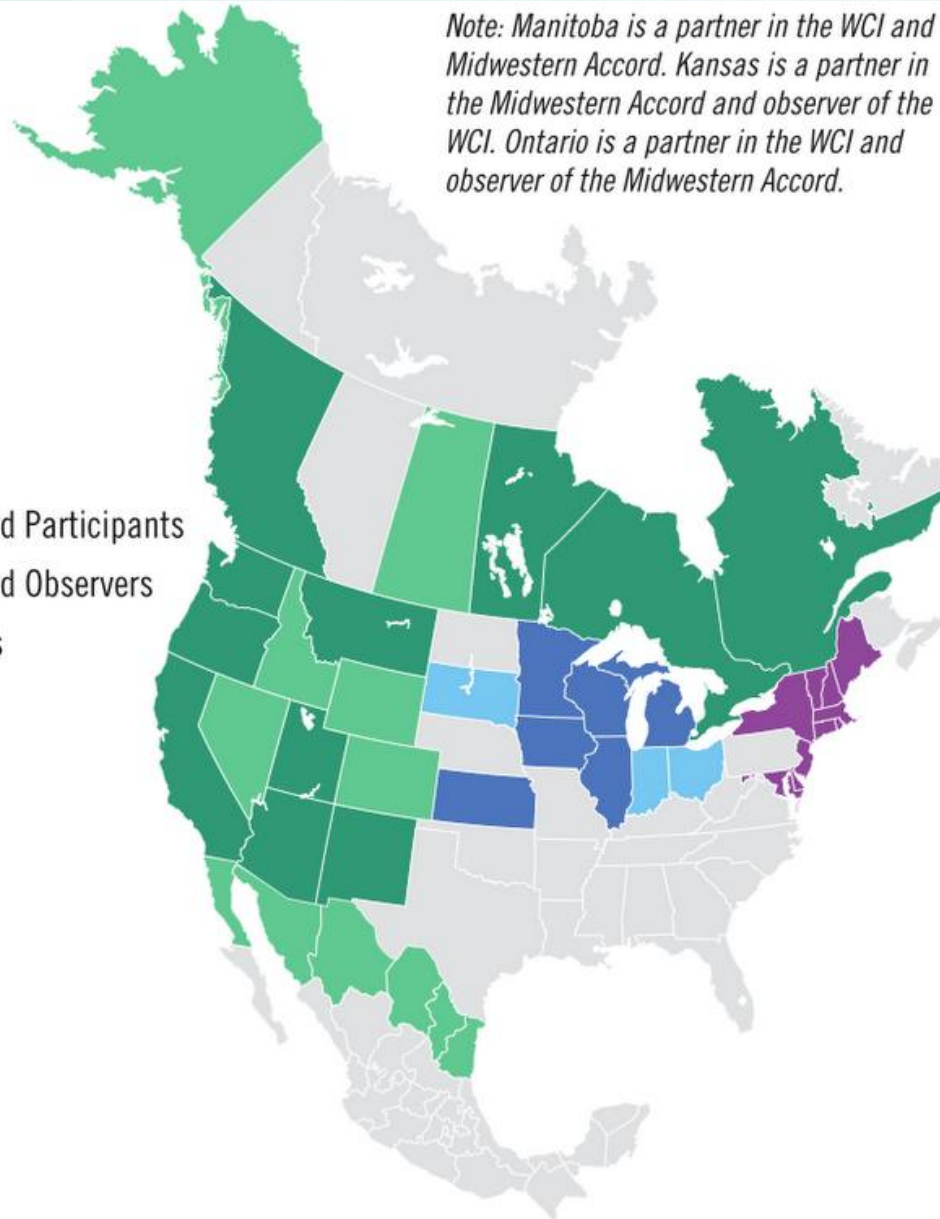
- Was going to be Oregon's entrance into cap-and-trade



Planned WCI Participants

Note: Manitoba is a partner in the WCI and Midwestern Accord. Kansas is a partner in the Midwestern Accord and observer of the WCI. Ontario is a partner in the WCI and observer of the Midwestern Accord.

- WCI Participants
- WCI Observers
- Midwestern Accord Participants
- Midwestern Accord Observers
- RGGI Participants



But Now...

- California is going it alone
- Begins in January 2012



Other Oregon Policies

- **Residential Energy Tax Credit (RETC)**
- **Energy Loan Program**
- **Pilot Feed-In Tariff Program**
- **Building Codes**
- **Ban on Coal-Fired Power Plants**

Energy Policy In Oregon

The background of the slide is a photograph of a wind farm. In the foreground, a road with a white guardrail runs horizontally. Beyond the road, a vast field of wind turbines is visible, extending towards the horizon. The sky is filled with soft, white clouds, and the overall lighting is diffused, suggesting an overcast day. The image has a slightly desaturated, blue-tinted appearance.

What Other Options Are Out There?

Other Policy Options



1) Feed-In Tariff

2) Production Tax Credit

Feed-In Tariff (FIT)

- A guaranteed premium price paid for any renewable energy produced



German PV

Peak power dependent FIT in ct/kWh

type		2004	2005	2006	2007	2008	2009	2010	Jul 2010	Okt 2010	2011
Rooftop mounted	up to 30 kW	57,4	54,53	51,80	49,21	46,75	43,01	39,14	34,05	33,03	28,74
	between 30 kW and 100 kW	54,6	51,87	49,28	46,82	44,48	40,91	37,23	32,39	31,42	27,34
	above 100 kW	54,0	51,30	48,74	46,30	43,99	39,58	35,23	30,65	29,73	25,87
	above 1000 kW	54,0	51,30	48,74	46,30	43,99	33,00	29,37	25,55	24,79	21,57
Ground mounted	contaminated grounds	45,7	43,4	40,6	37,96	35,49	31,94	28,43	26,16	25,37	22,07
	agricultural fields	45,7	43,4	40,6	37,96	35,49	31,94	28,43	-	-	-
	other	45,7	43,4	40,6	37,96	35,49	31,94	28,43	25,02	24,26	21,11

Development of the German PV market

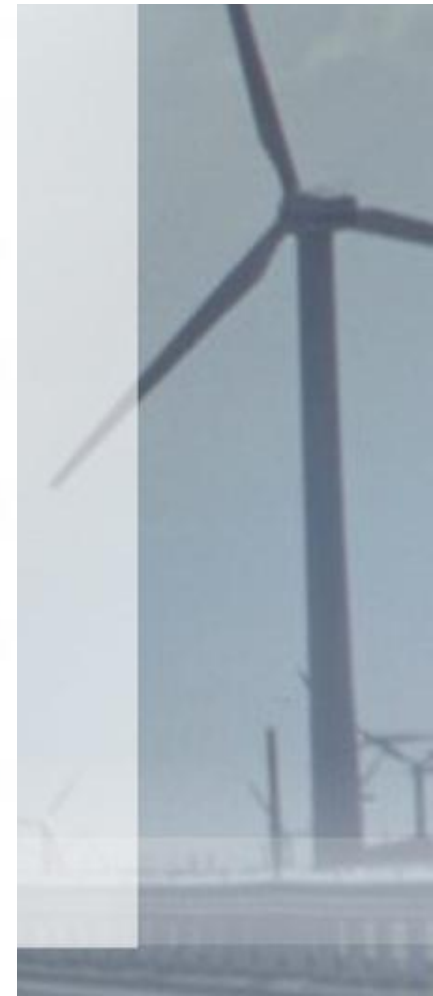
Market Data Photovoltaics in Germany 2008

Newly installed power	1,500 MWp
Total installed power	5,340 MWp
Solar electricity produced	4,300 GWh
No. of total systems installed	500,000
Turnover 2008	ca. € 6 bn
Employees	48,000

(Source: preliminary BSW-Solar data)

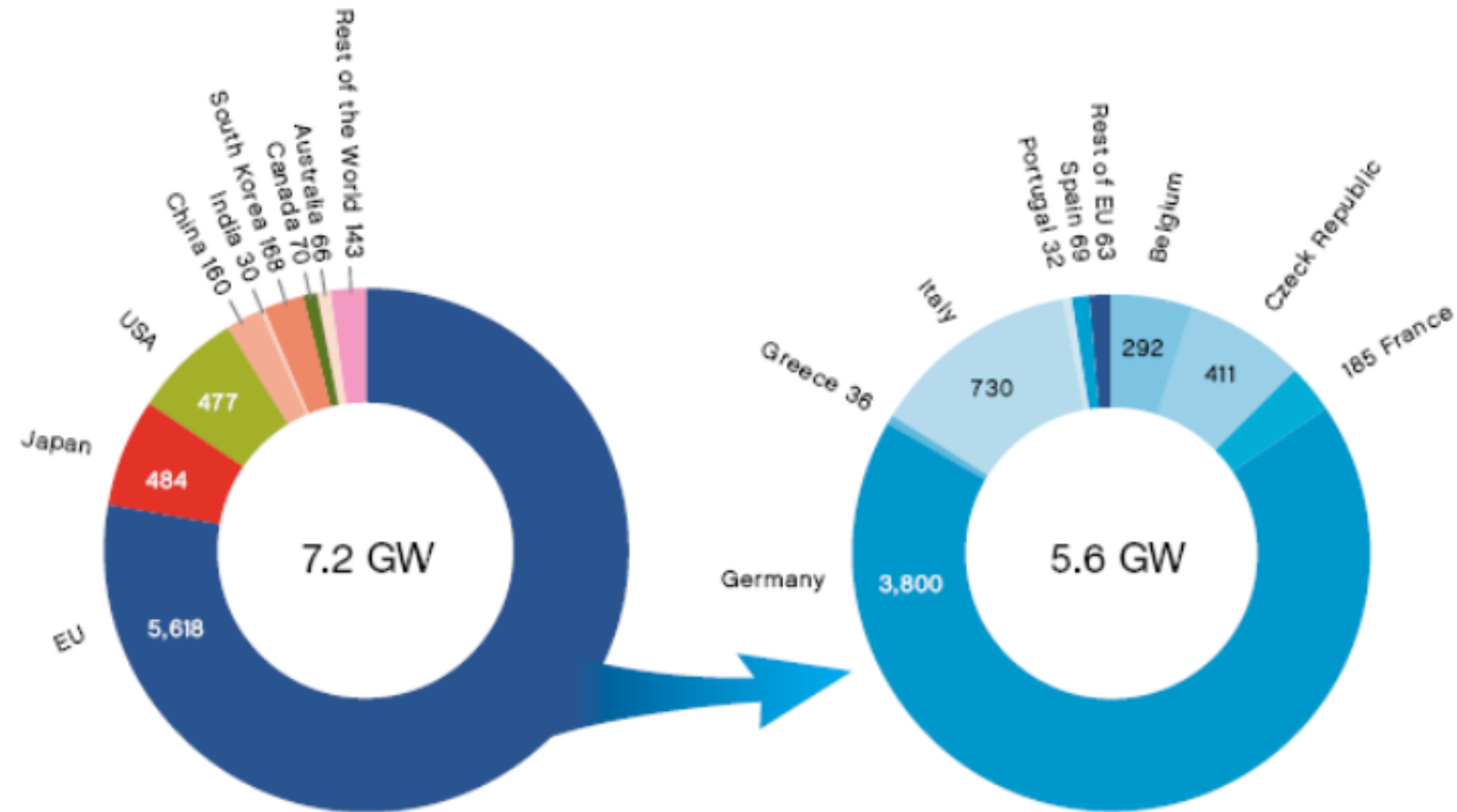
Milestones

- 1991: First Feed-in Law (FIT with low tariffs)
- 1991-1995: 1,000 roofs program (grants)
- 1999-2003: 100,000 roofs program (loans)
- 2000: Renewable Energy Sources Act (EEG) (FIT)
- 2004: Amendment of EEG (FIT)



German PV (cont'd)

World & EU PV, 2009

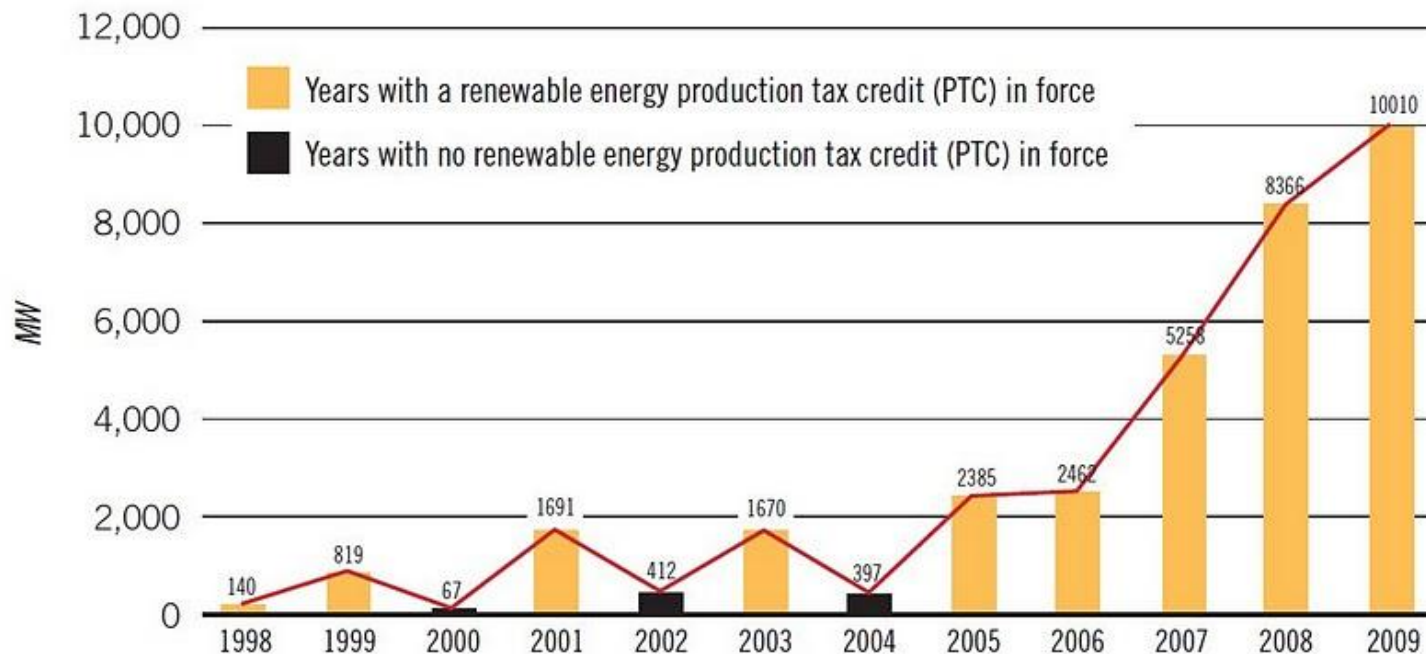


(from EPIA's *Global Market Outlook for Photovoltaics...*)

Production Tax Credit

- Pay for total energy *produced*
- Guarantee energy delivery for every dollar spent

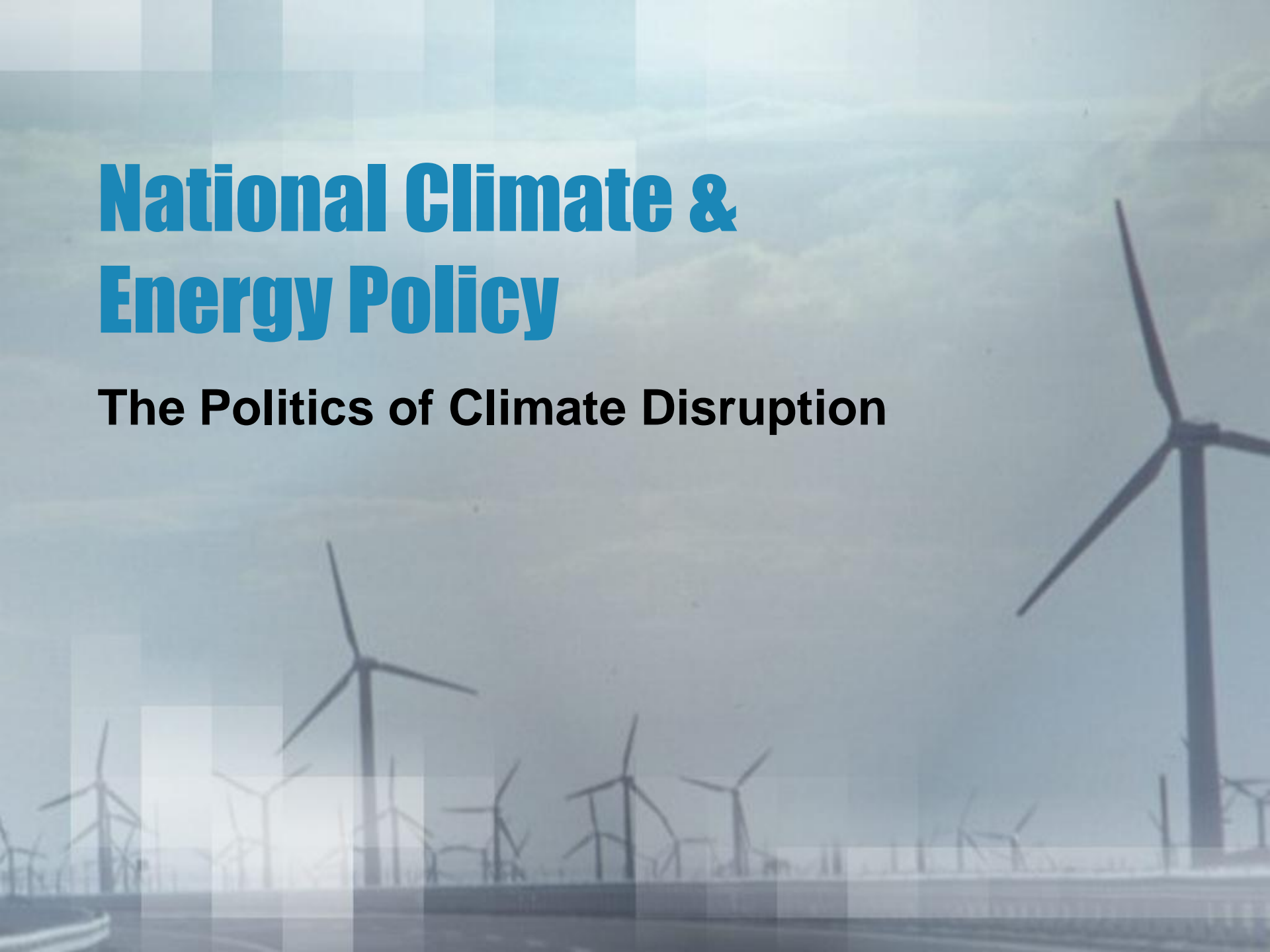
Net Annual Installed Wind Power Capacity in the United States, 1998–2009



Source: American Wind Energy Association

National Climate & Energy Policy

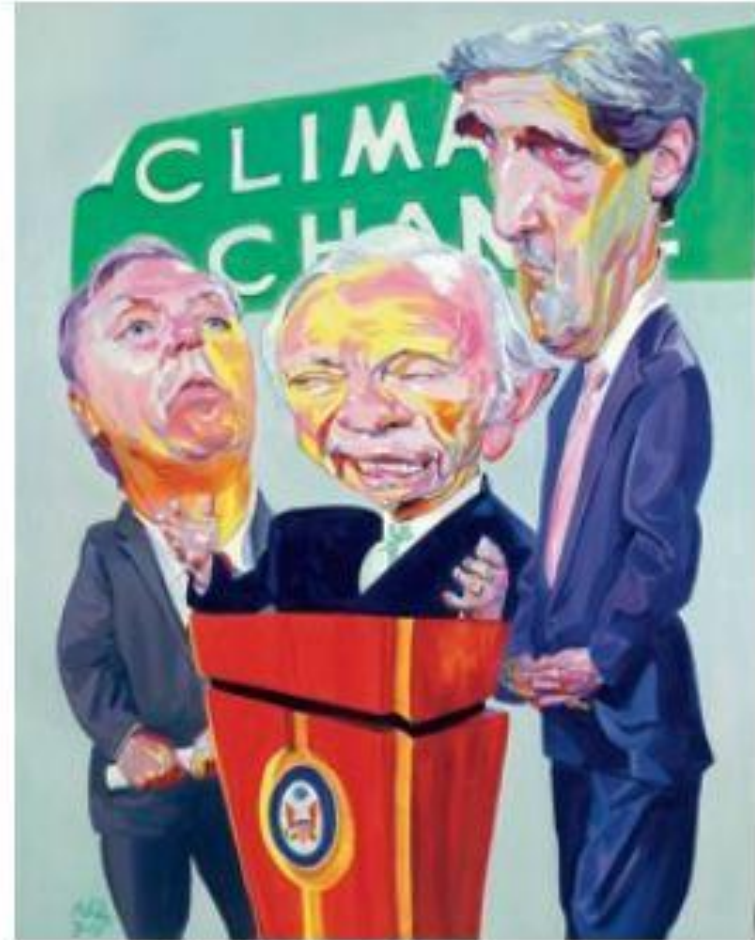
The Politics of Climate Disruption



The Great Missed Opportunity

Kerry-Graham-Lieberman Bill

- Cap-and-Trade Bill
- Cut Emissions 17% Below 2005 Levels by 2020



Lindsey Graham, Joseph Lieberman, and John Kerry each sought a kind of redemption through climate-change legislation.

What Does the U.S. Have?

- The EPA GHG ruling
 - CO2 = a harmful pollutant under the Clean Air Act
- Investment and Production Tax Credits (Etc.)
- Okay Green Stimulus



Source: Robins, Clover, and Singh 2009.

What Doesn't the U.S. Have?

- **Price on carbon**
 - Carbon tax
 - Cap-and-trade
 - Cap-and-dividend (money generated from pollution permits goes directly back to consumers)
- **National Renewable Portfolio Standard**
- **National Energy Efficiency Standard**
- **National Feed-In Tariff**
- **Sufficient Gas Tax**



Any Questions?

