



An aerial view of the flooded Interstate 5 overpass looking south in Chehalis, Wash. A storm that battered the Pacific Northwest left behind flooded homes, fallen trees and washed-out roads, including the region's largest highway, which was covered with 10 feet of muddy water.

Photo by Bruce Ely

Global Data Points

Global emissions are up 30% since 1990

CO₂e atmospheric concentrations are 50% above pre-industrial levels

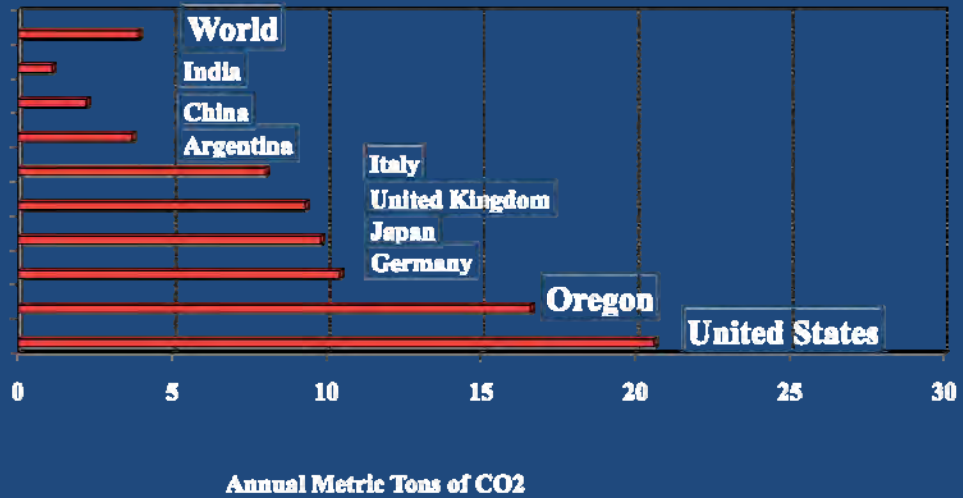
Sea levels are rising at double the average rate of the 20th Century

Projected temperature increases by 2100: 2° F to 10° F

2000 – 2009: latest “hottest” decade on record

World population at 6 billion, headed for 9 billion

CO2 Emissions Per Capita from Fossil Fuels

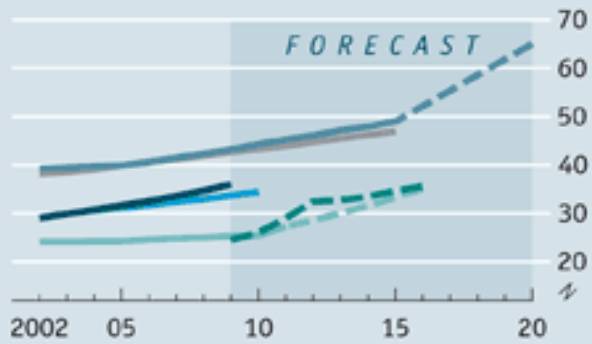


Abating thirst

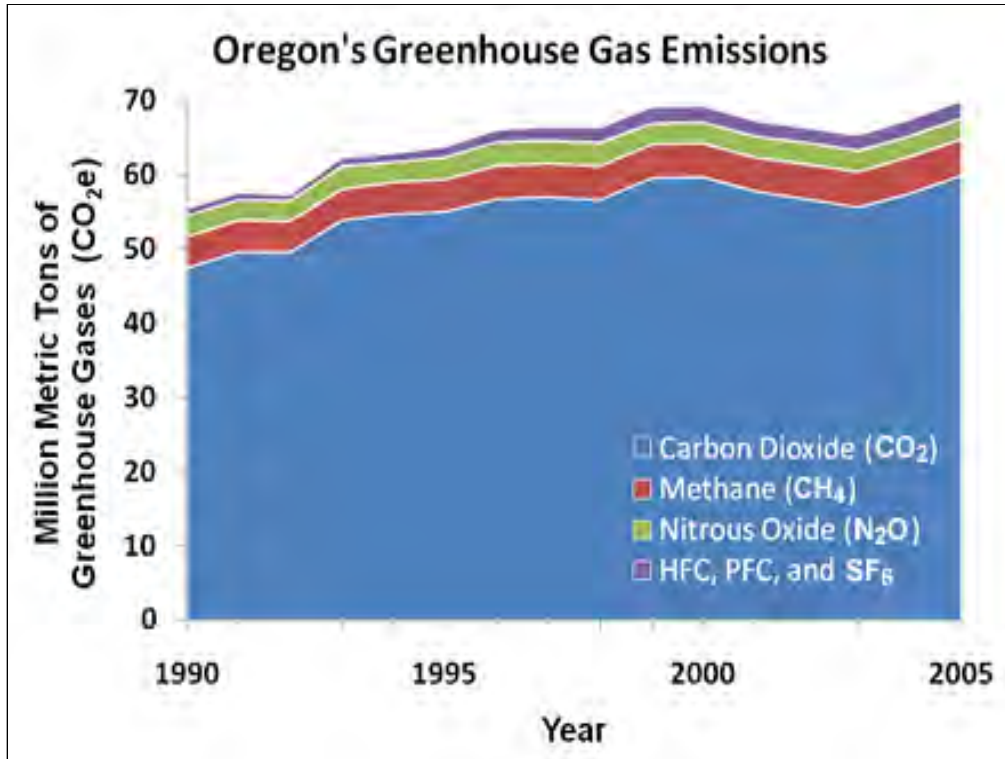
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Fuel standards for new passenger vehicles, mpg

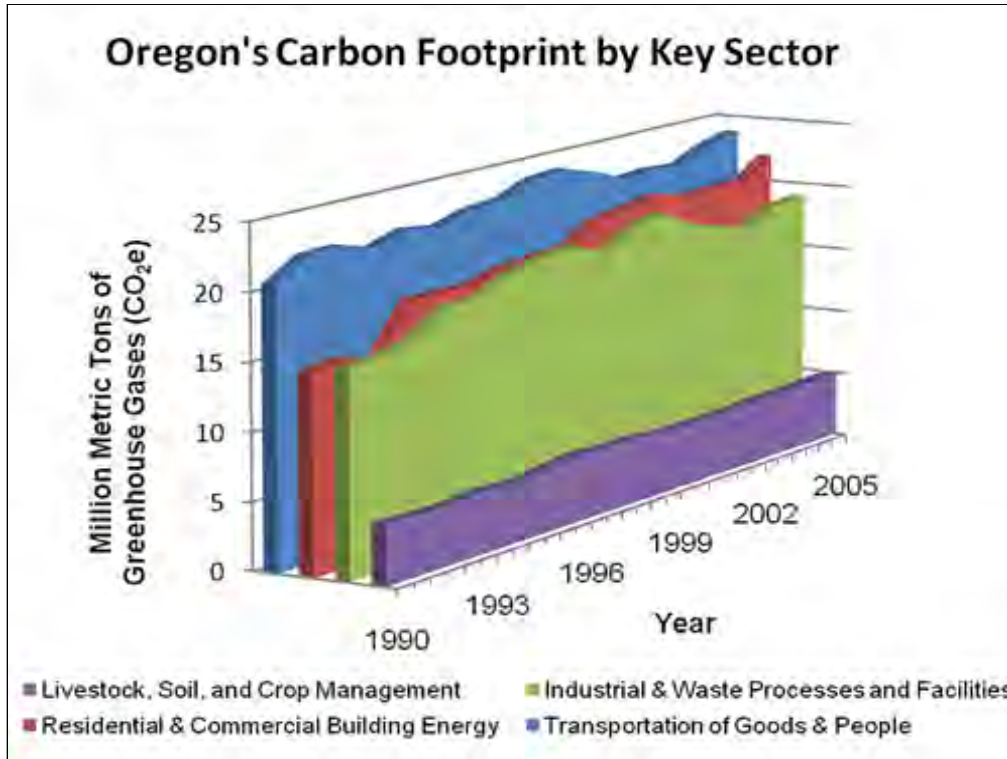
European Union Japan China
Australia California United States



Source: Lin Jiang, The Energy Foundation *Dashed lines: proposed or contested
Solid lines: enacted



OR carbon emissions up >20% since 1990



Light vehicles in OR metropolitan areas = 10% to 20% of Oregon GHG emissions (ODOT)

Transportation Data Points - US

US population up 40% since 1980; VMT up 100%

US autos/light trucks produce 17% of US emissions -- and rising
-- of national GHG emissions (overall transport share: 28%)

1970 - 2000: US population grew 25%; developed land grew at
almost *double* that rate (47%)

Transportation Data Points - Oregon

Oregon per capita VMT flat since 1990; absolute VMT up 22%

Oregon GHG emissions from transportation up $\pm 12\%$ since 1990

Absent effective policies, Metro GHG emissions are projected to rise 49% by 2035 (with 58% population growth)

To meet State GHG reduction goals for transportation, per capita gasoline use will have to drop from 567 gallons to 68 gallons (ODOT GreenSTEP)

Solutions

Vehicle technology + Low Carbon Fuels (e.g., 200 MPGe EV's)

Land Use/Urban Design (TRB: doubling metropolitan densities = 5% to 25% VMT reduction, 1% to 11% GHG reduction)

Low carbon urban transportation infrastructure: transit / bicycle / pedestrian / telecommute alternatives

Other options: "transit –on-demand"; retail delivery services; IT services (congestion avoidance; parking availability locator)

Four EV's offered commercially in Oregon in 2010; 1000 EV public charging stations in Oregon MPO's by end of 2010

But EV's powered by coal-based power plants only reduce emissions by 40% to 50%

Portland has seen 17% per capital VMT reduction since 1990 with land use planning + increasing transit/bicycle/TSM options ; Growing Cooler projects 8% to 15% VMT reduction

My Iphone . . .

20% of auto emissions in urban areas come from circling the looking for parking

Brian Gregor: "It seems to me that we will probably will need to count on transitioning the passenger car fleet to EVs by 2050 in addition to reducing VMT. The VMT reduction will be necessary to compensate for limitations on improving GHG intensity of heavy vehicles. Even with VMT reduction, we'll probably need some advanced biofuels (e.g. cellulosic ethanol and/or algae biodiesel) for the heavy vehicles."

Costs / Savings

Oregon is exporting \$9 billion/year for imported transportation fuels

That figure would be higher but for Portland Metro area saving \$1.1 billion/year in transportation costs (vs. median urban area)

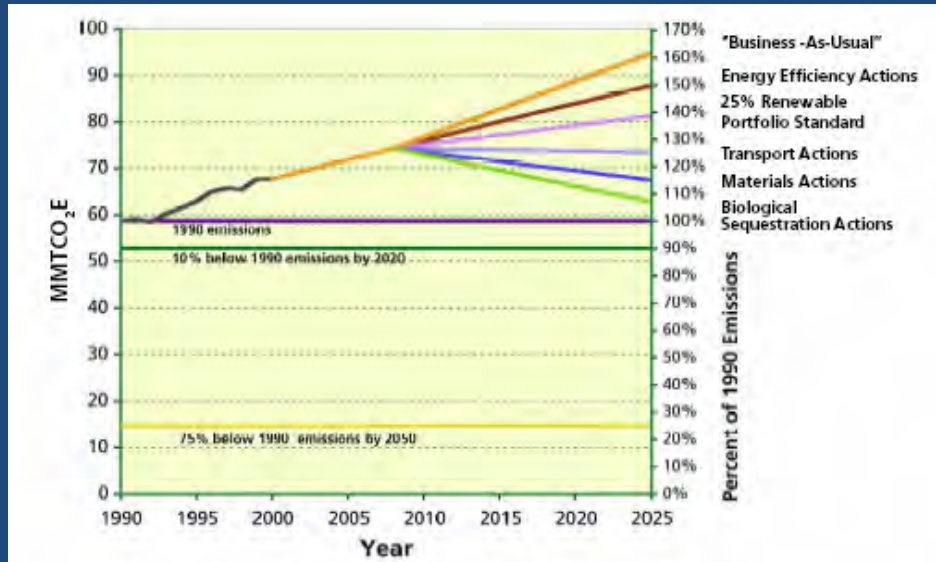
To realize savings, Oregon, US need to assist MPO's with investment dollars, planning/management tools

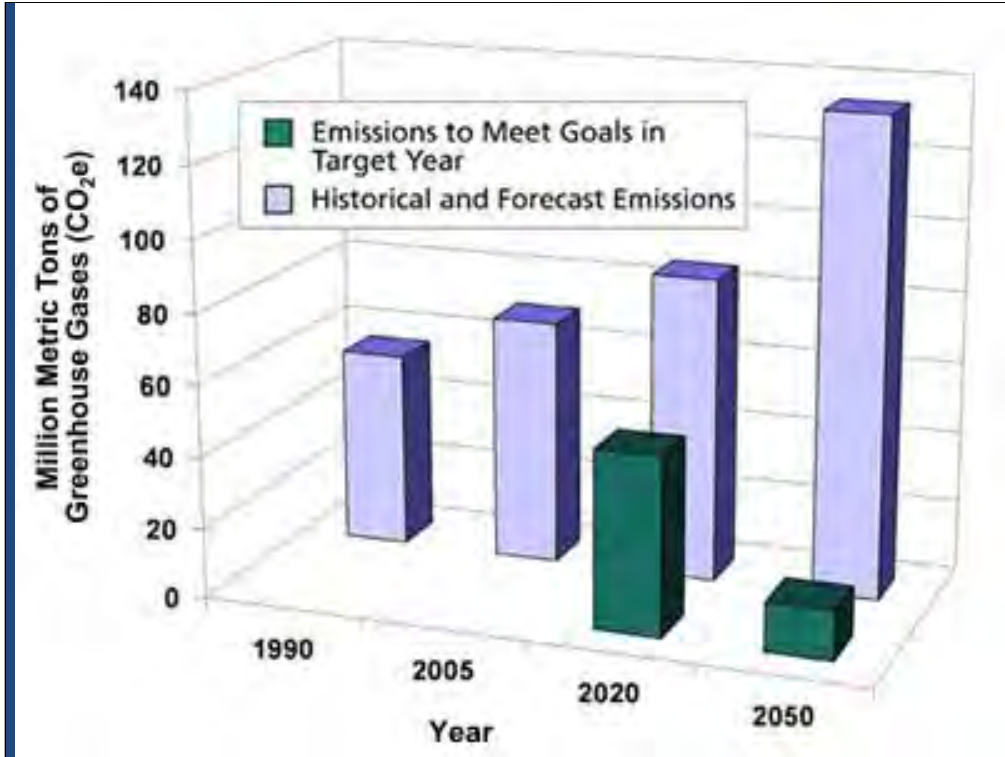
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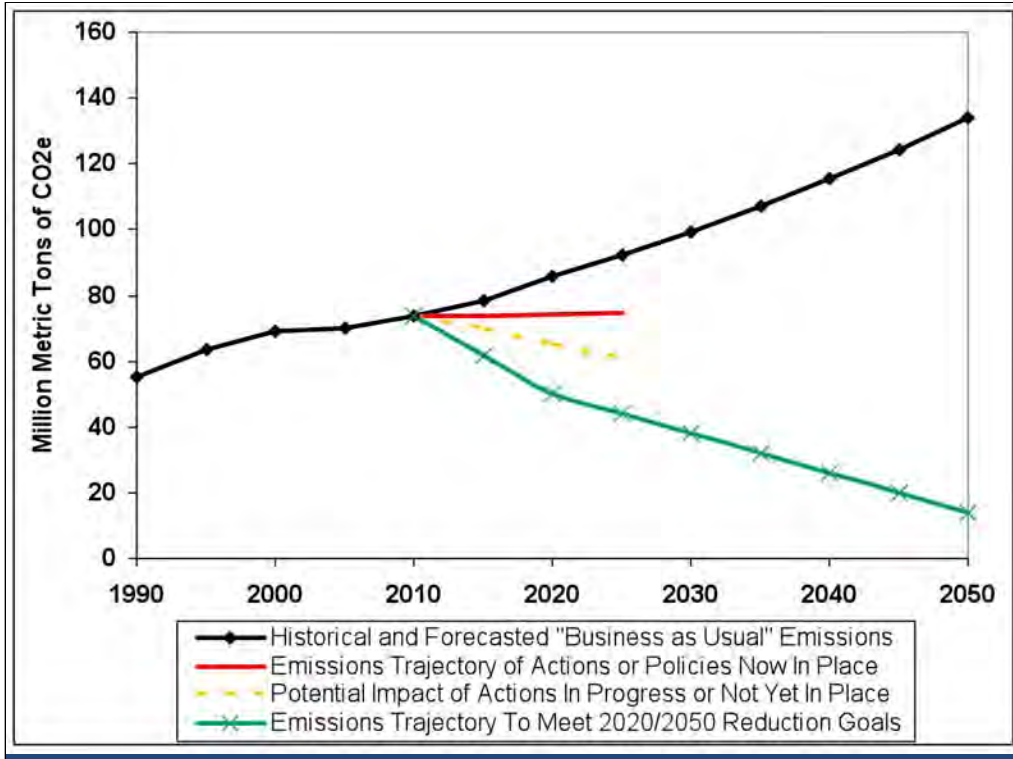
. . . Metro is also saving 100 mm hours in commuting time -- @\$15/hr = \$1.5 billion more

Overall cost of reducing GHG emissions estimate (by IPCC, USEIA, McKinsey, others) at \pm 1% GDP net = \$120 billion/year

Governor's Advisory Group 2004 recommendations to reverse increase of GHG emissions







Transformational Change

US Carbon Efficiency

1980: 0.93 tonnes / \$1000 GDP

2005: 0.53 tonnes / \$1000 GDP

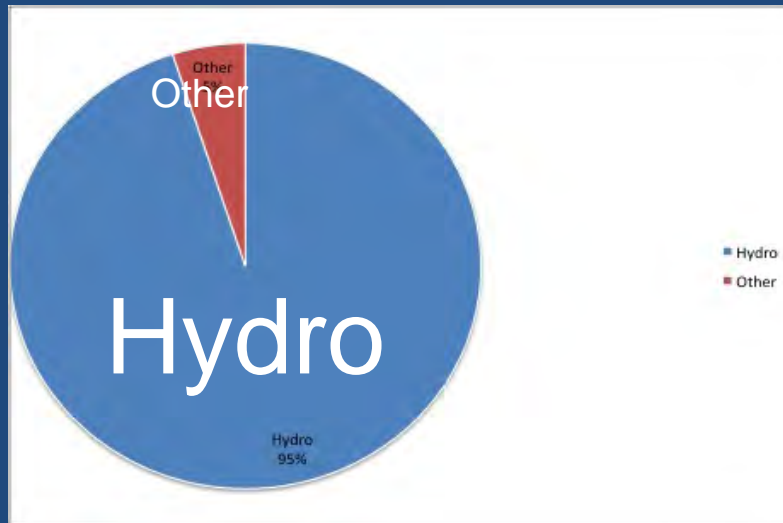
*To reach 2050 goal: **0.05 tonnes** / \$1000 GDP*

US Labor Efficiency . . . improved by 10X between
1800 and 1950

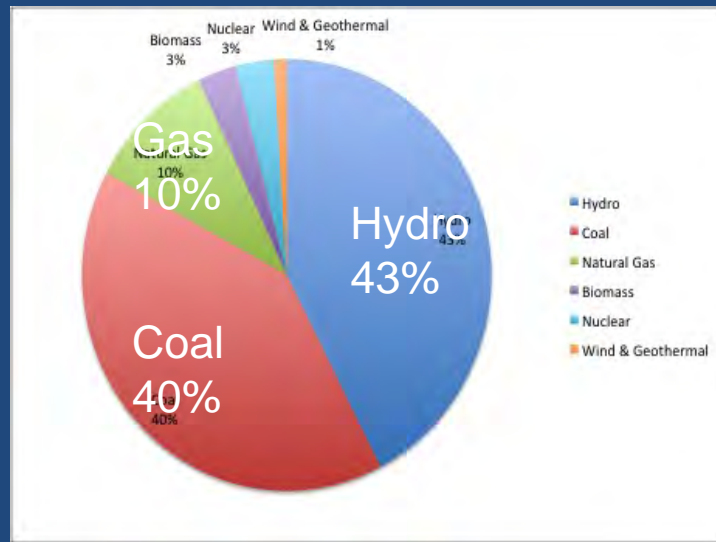
US Agricultural Energy Efficiency . . . improved by
50% since 1950

Labor Efficiency/Productivity increase by displacing human/animal labor with energy + technology

Transformational Change?

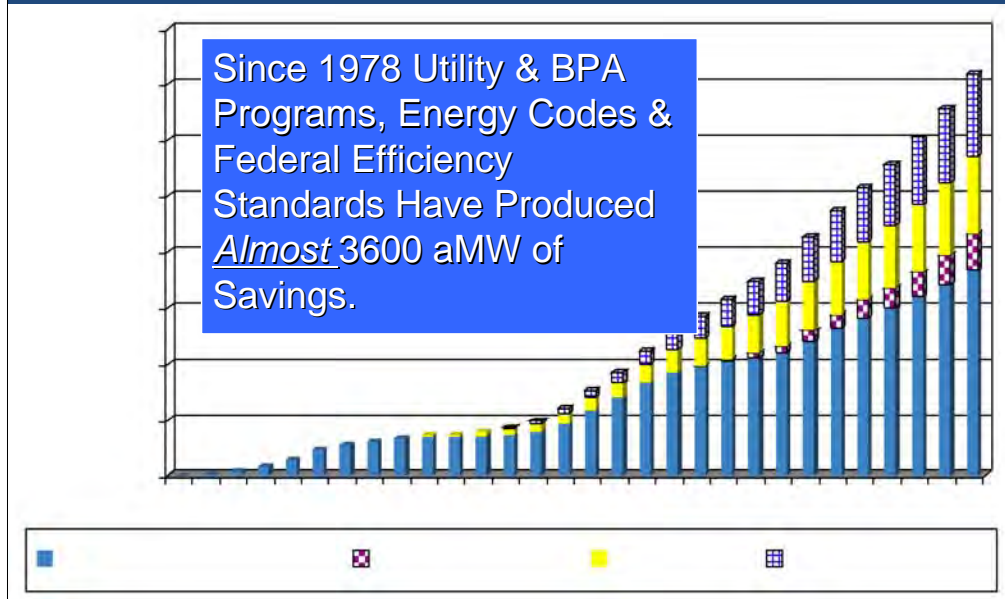


Oregon Electricity Supply Mix - 1964



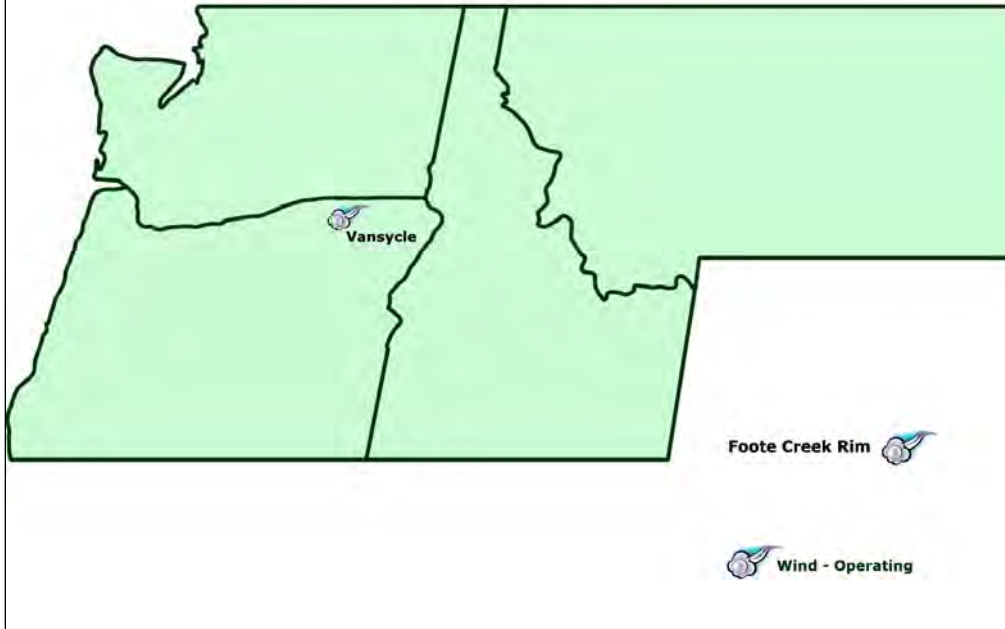
Oregon Electricity Supply Mix - 2004

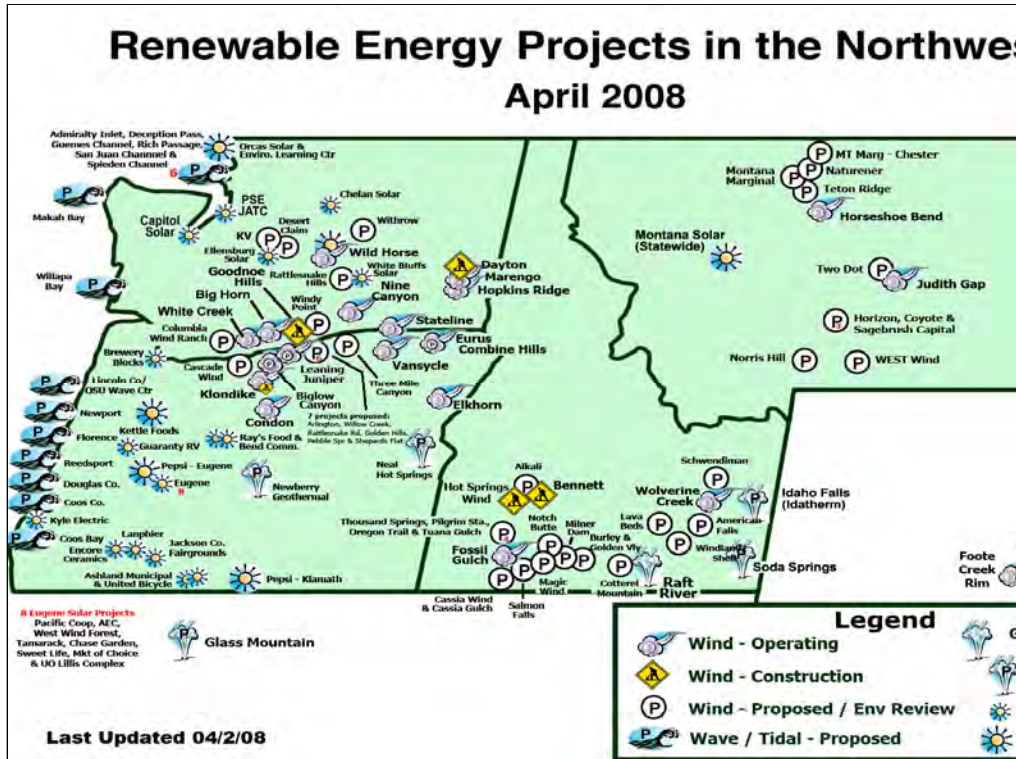
PNW Energy Efficiency Achievements 1978 – 2007



New regional EE 20 year goal – 5800 aMW

Renewable Energy Projects in the Northwest 1998





2004 – NW Power Council projected 250 MW to 500 MW wind by 2008; Actual was 3000 MW



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The Economist

DECEMBER 10TH-14TH 2005

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Democrats' abortion error

LEXINGTON, PAGE 40

Iraq's coming election

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Trade, farms and the poor

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Books of the year

PAGES 93-96



Don't despair

Grounds for hope on global warming



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“Now is the time to confront this challenge (to our planet) once and for all.”

“Delay is no longer an option. Denial is no longer an acceptable response.”

President Elect Barack Obama, committing to reduce carbon dioxide emissions 80% by 2050 and invest \$150 B in new energy-saving technologies (November 18, 2008)