Oregon Global Warming Commission:

KeepOregonCool

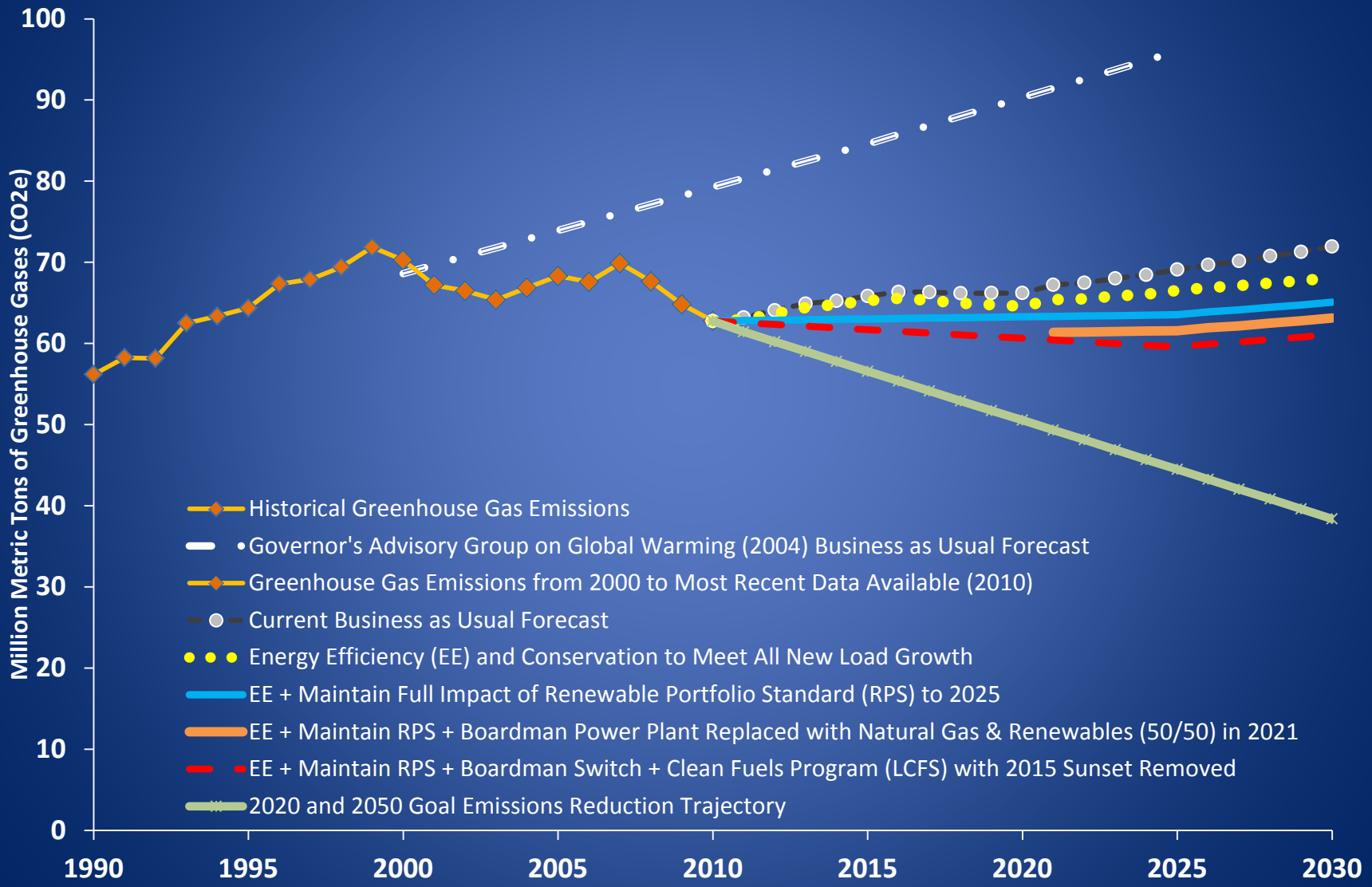
Oregon Global Warming Commission

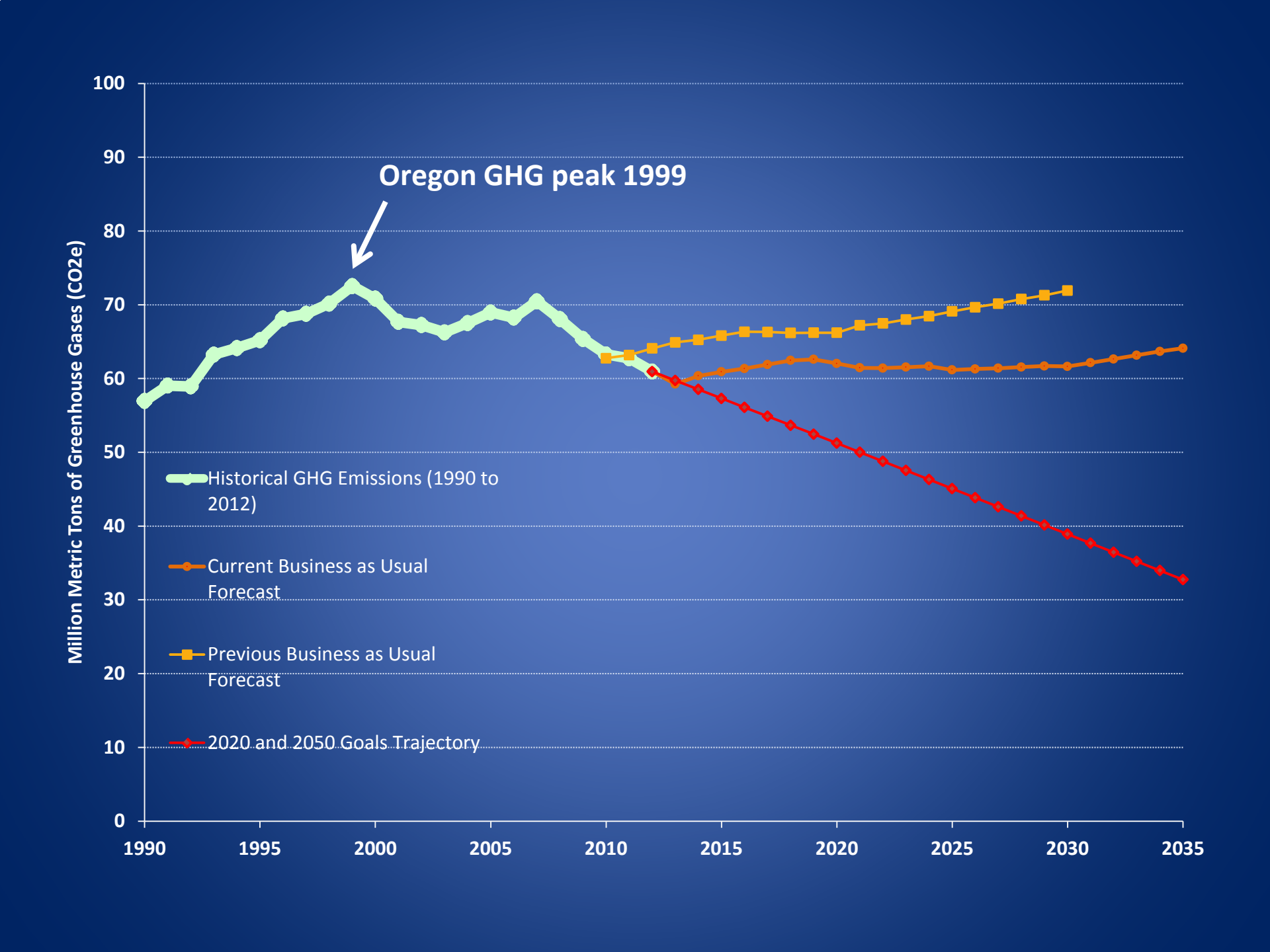
Oregon's Roadmap to 2020

http://www.keeporegoncool.org/content/roadmap-2020

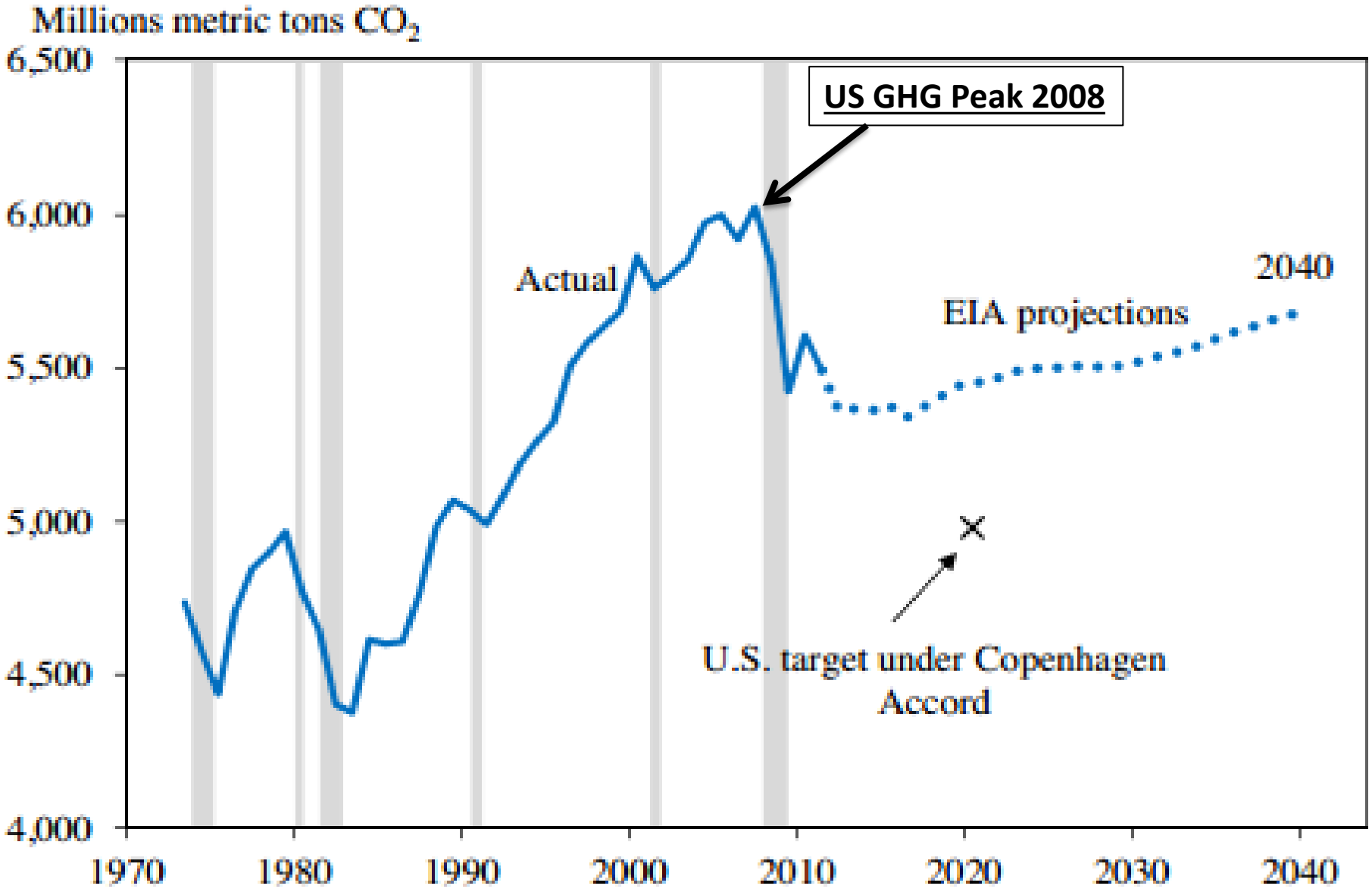
- OR Emissions, Goals, Actions tracked since 2004
- OR met 2010 goal; 2020 ?
- Set 2035 Goal
- “wedge” analysis: measures + tax/cap

Progress Toward Oregon's Greenhouse Gas Reduction Goals




Oregon GHG peak 1999
Million Metric Tons of Greenhouse Gases (CO2e)
100
90
80
70
60
50
40
30
20
10
0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
Historical GHG Emissions (1990 to 2012)
Current Business as Usual Forecast
Previous Business as Usual Forecast
2020 and 2050 Goals Trajectory

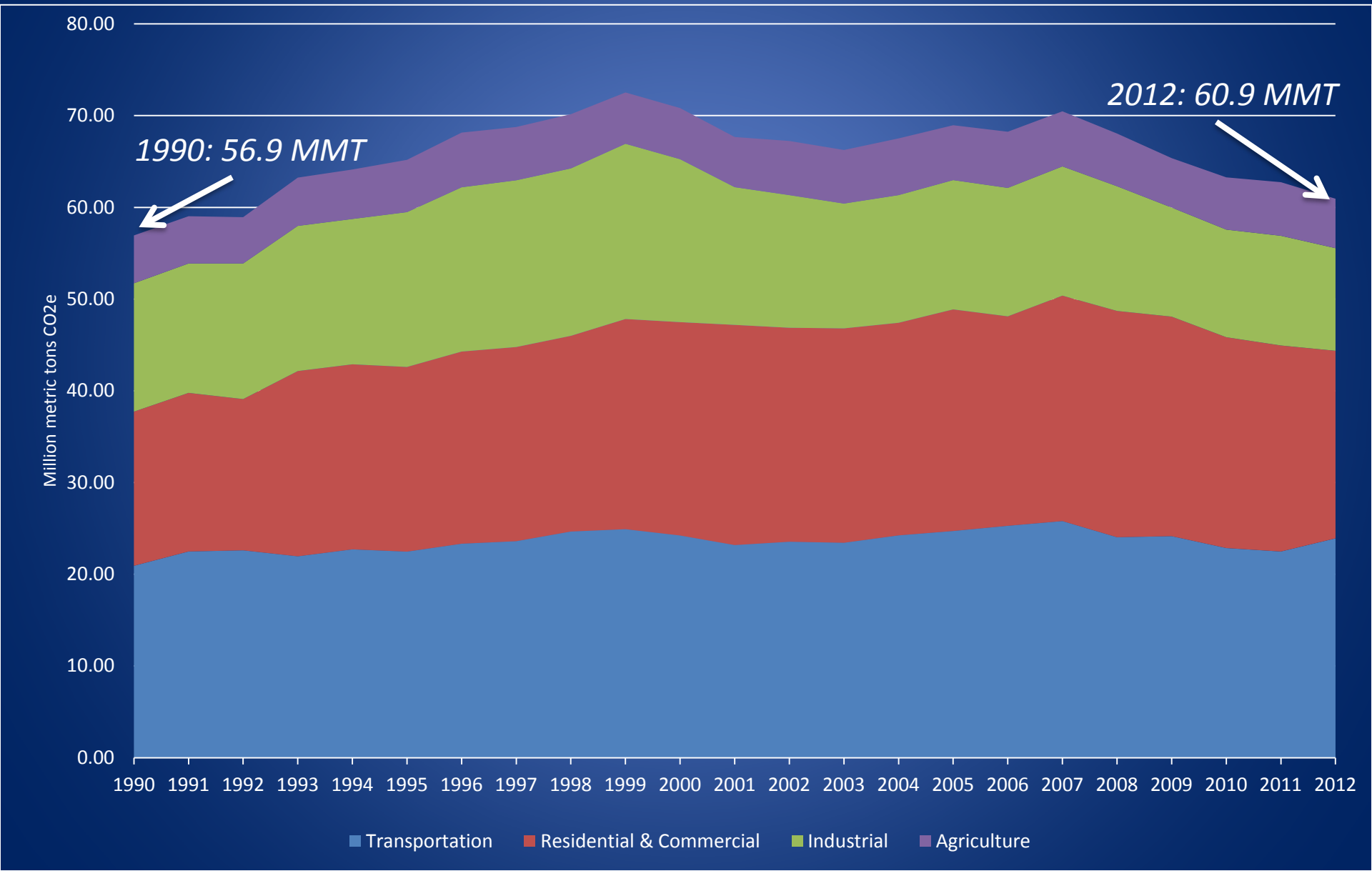
U.S. Energy-Related Carbon Dioxide Emissions, 1973–2040



Note: Shading denotes recession.

Source: EIA (2012b).

Figure 1: Oregon Emissions by Sector 1990-2012 -- (MMTCO2)



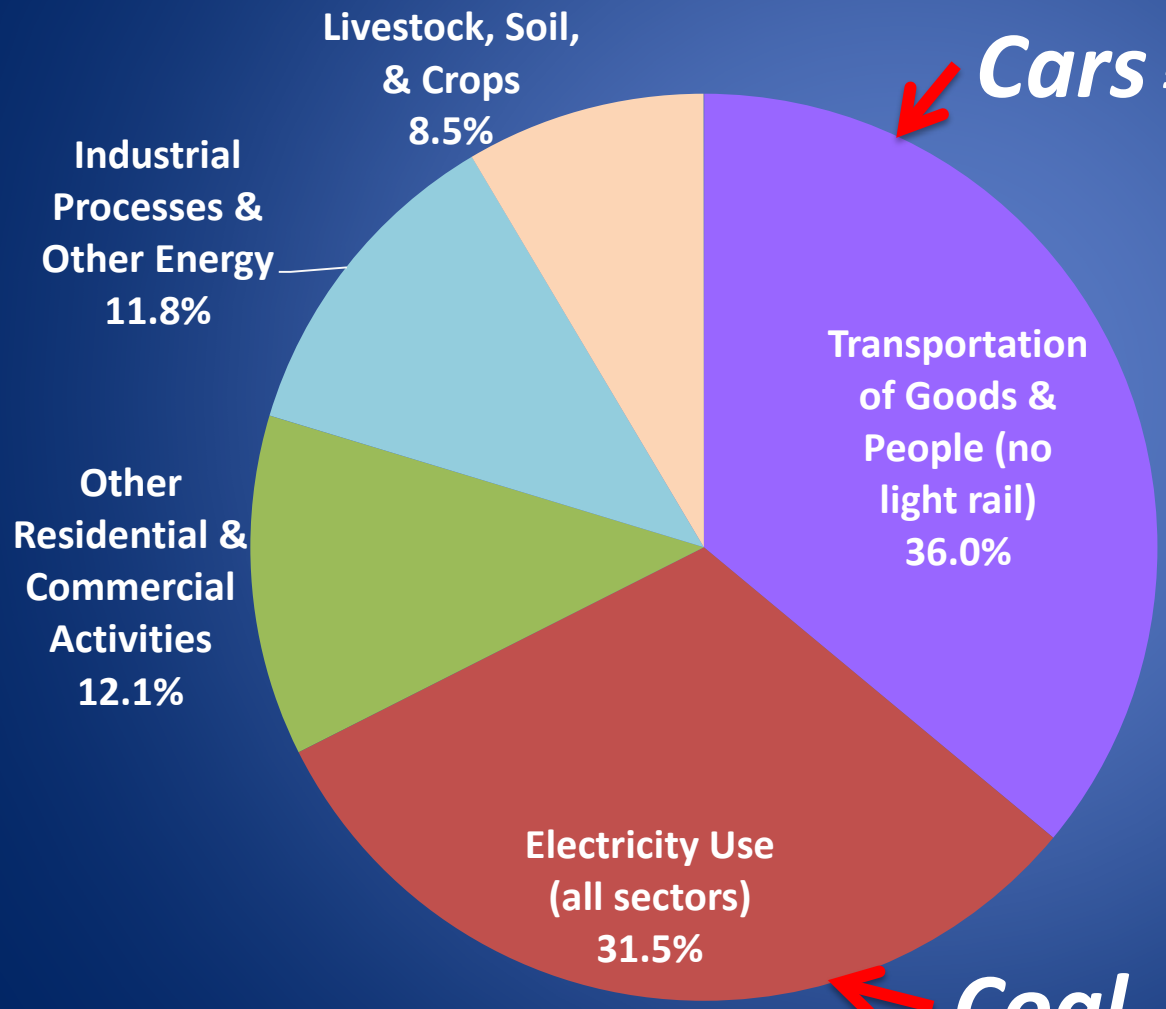
OR GHG's _ Alternate Calculations

	1990 (MMTons)	**2012** (MMTons)
Total GHGs	56.9	60.9
Per Capita GHG (OR)	0.02	0.015
Per Capita GHG (Multnomah Cty)	0.015	0.010
Per Oregon GDP (GHG per MM$*)	0.877	0.296
[OR GDP $Billions in 2009$	$64.8	$205.7]

Consumption Based GHG Inventory

	2005	**2010**	**2012**
GHG (MMTons)	75.4	75.2	77.0

Oregon Greenhouse Gas Emissions 2010 (with electricity broken out from sectors)



***Cars** = about ¼ of OR GHG*

***Coal** = about ¼ of OR GHG*

CARS + COAL

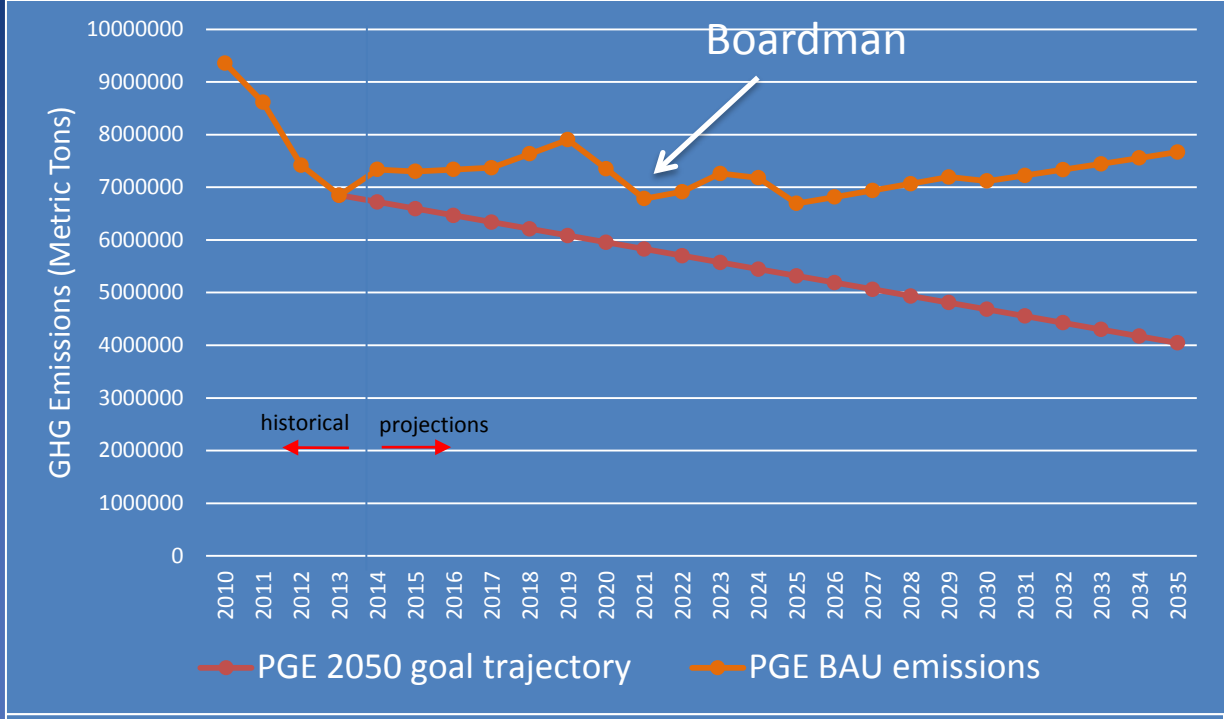
= 50% of Oregon GHG Emissions

PGE Boardman Coal Generator, Boardman, OR

Principal Coal-burning plants serving PNW/IW loads

[Plants shown all deliver to PNW loads and may deliver to local or other interstate loads also]

PGE Projected CO2 Emissions and 2035/2050 Goal Trajectory



PAC Projected CO2 Emissions and 2035/2050 Goal Trajectory

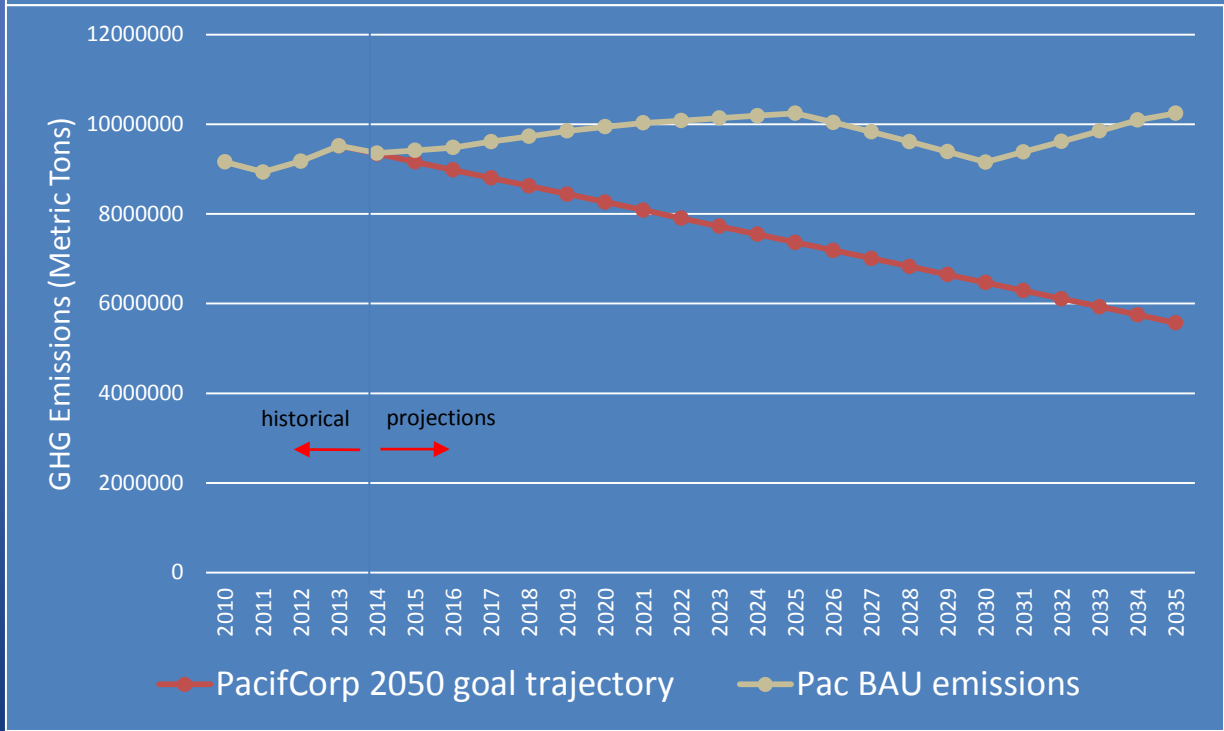
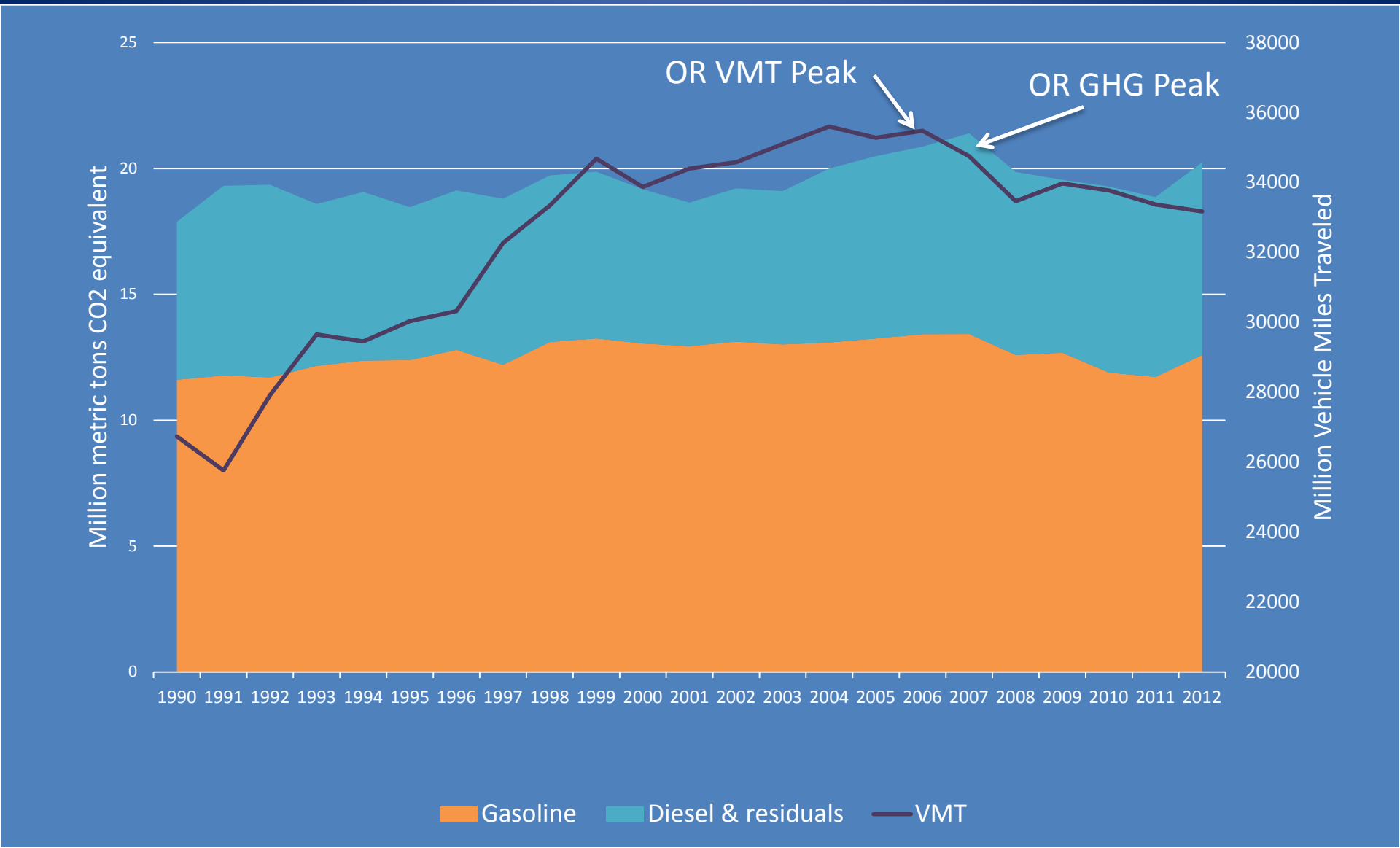
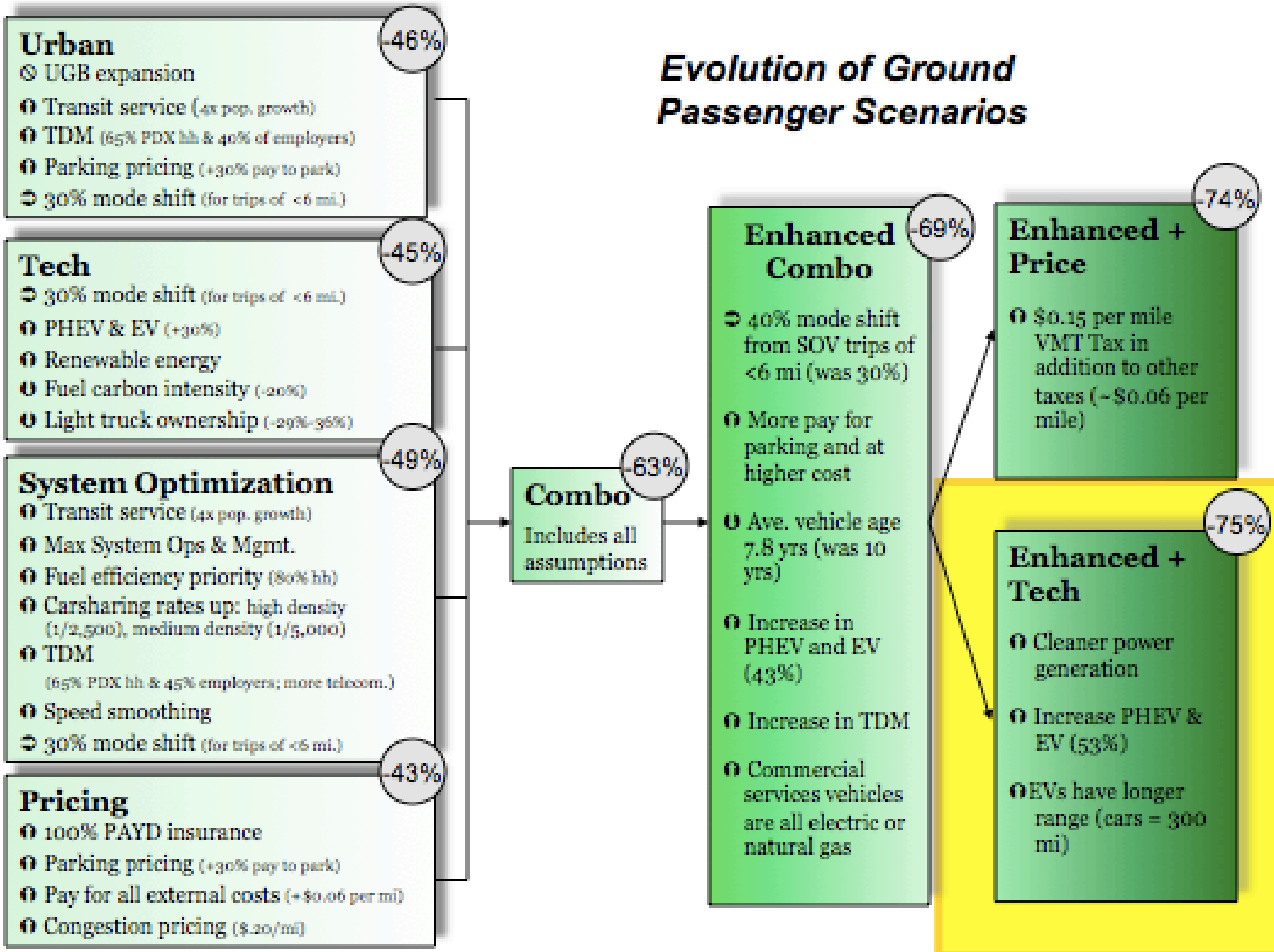


Fig. 3: OR Emissions from Motor Gasoline and Diesel (MMTCO2e); and Statewide Total Vehicle Miles Traveled (MM)



Evolution of Ground Passenger Scenarios



Cars and Coal

Est. Carbon-Equivalent MPG*: Electric Vehicles

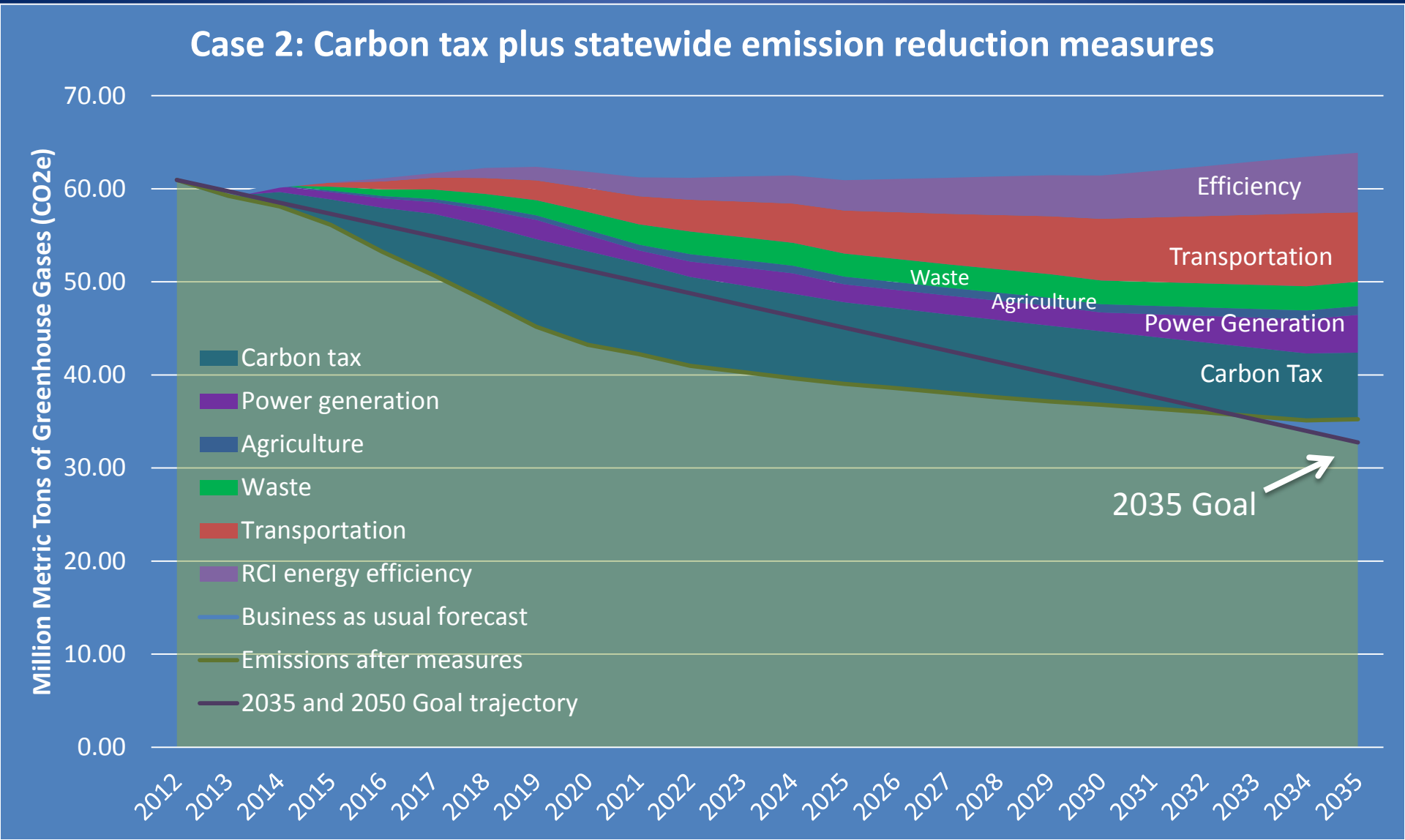
Wichita, KN (SWPP) –	74% coal/8% gas	= 35 mpg*
Raleigh NC (SRVC) –	45% coal/9% gas	= 55 mpg*
Seattle WA (WECC) –	<3% coal/<1% gas	≥112 mpg*

Oregon Utilities

PacifiCorp	*±66% coal / ±17% gas*	*= ± Wichita*
PGE (post-Boardman)	*± 9% coal / ±63% gas*	*= ±Raleigh*
Eugene (EWEB/COU)	<1% coal / ±1% gas	*= ± Seattle*

*Miles per gallon equivalents per UCS

Fig 11: OR GHG Goal Trajectory and Emission Reduction Wedges



2015 Report Recommendations

- Set a [midway] 2035 GHG Goal
- Develop interim "benchmarks" by sector
- Address equity effects
- Track and "upload" technology (e.g., energy storage)
- Reduce in all sectors; ***begin*** **with "Cars and Coal"**
- ***Leverage federal GHG initiatives: CAFE + CPP***
- Develop consumption-based goals and actions

Help From the Feds - *Cars*

- Auto/light truck "CAFE" efficiency standards
  - Goals: 35.5 mpg by 2016; 54.5 mpg by 2025
  - On target? (30.1 mpg – August, 2013)

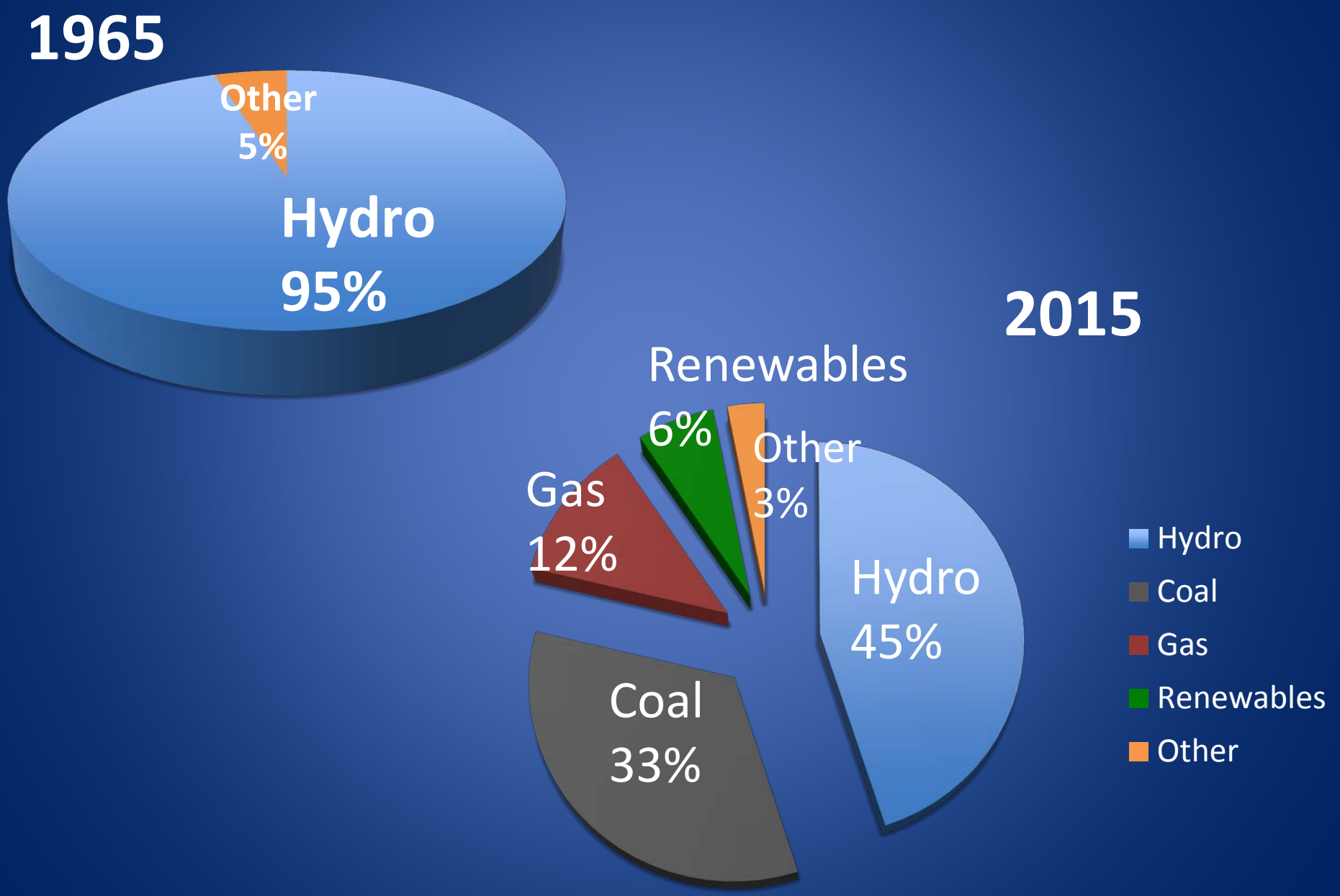
- Over-The-Road Truck fuel economy standards adopted (next: rail, air?)

Help From the Feds - *Coal*

- 2014: Clean Air Act S. 111(b) regulates carbon emissions from *new* power plants

- 2015: S. 111(d) regulates carbon emissions from *existing* power plants
  - Goal: 32% reduction by 2030 (from 2012)
  - Each state gets its own target
  - Tools: (1) plant efficiency; (2) shift from coal to gas; (3) shift to renewables; (4) efficiency

Coal and Oregon's Electric Power System



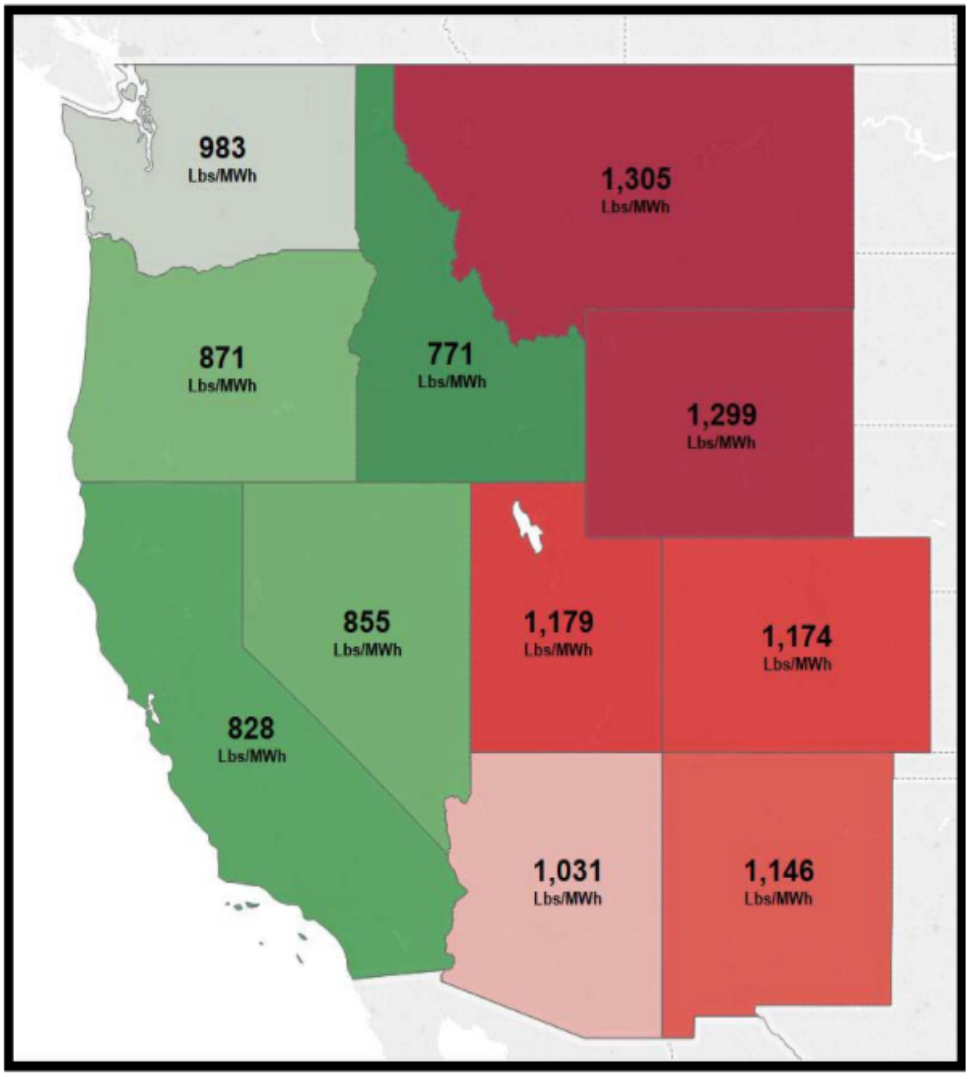
Principal Coal-burning plants serving PNW/IW loads

[Plants shown all deliver to PNW loads and may deliver to local or other interstate loads also]

Clean Power Plan Final Rule: Targets

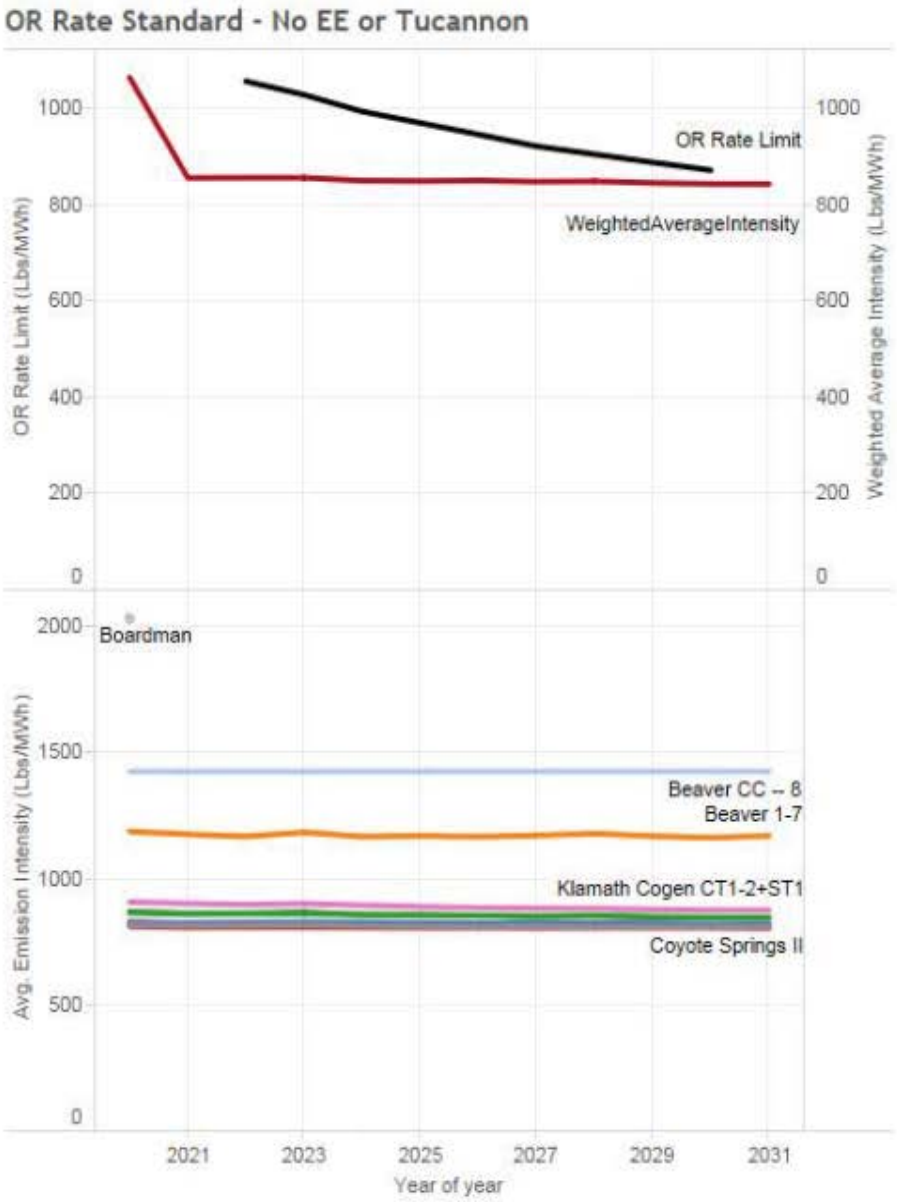
- On August 3rd, President Obama announced the release of the final Clean Power Plan
- Significant changes relative to the proposed rule
- Oregon's target less stringent, Montana's more stringent

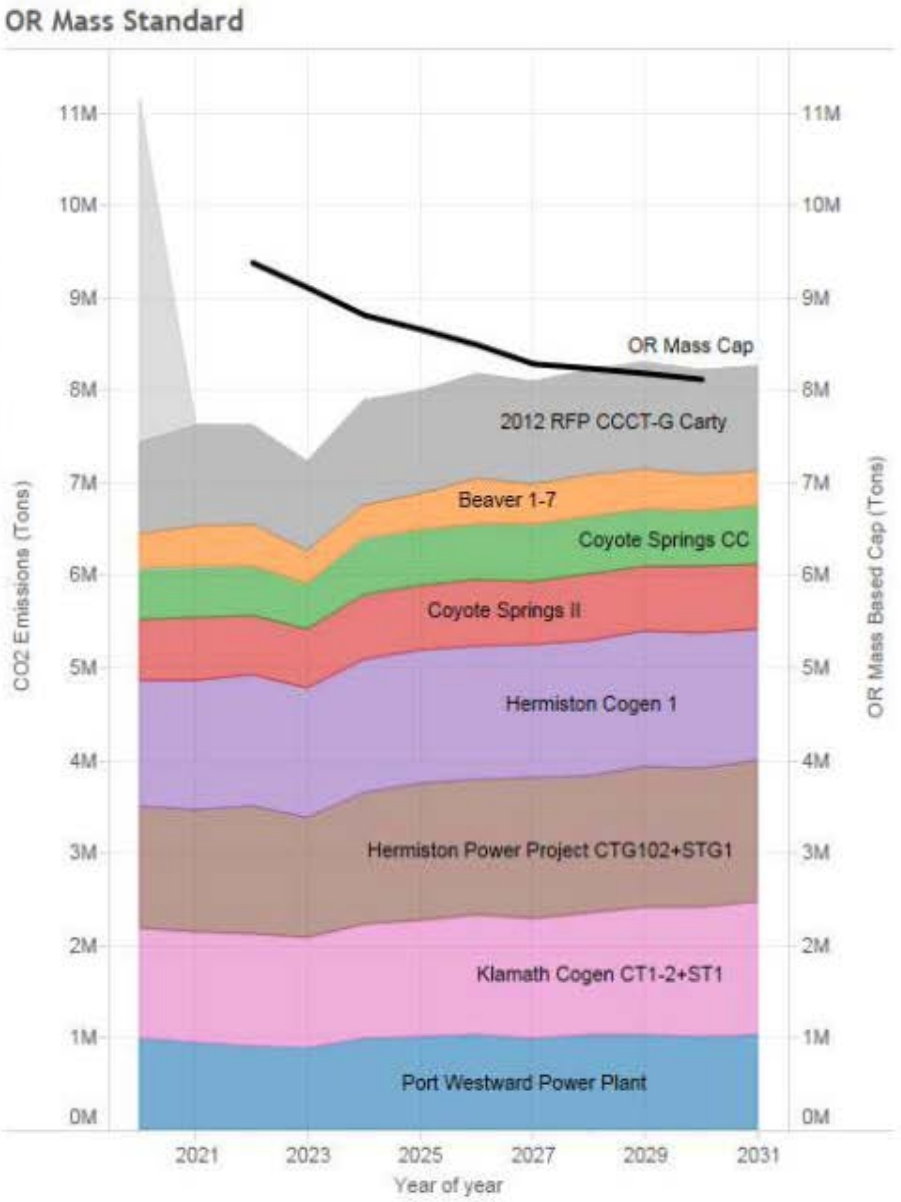
State	Rate Based	Mass Based
Oregon	871 Lbs/MWh	8,118,654 Tons
Montana	1305 Lbs/MWh	11,303,107 Tons



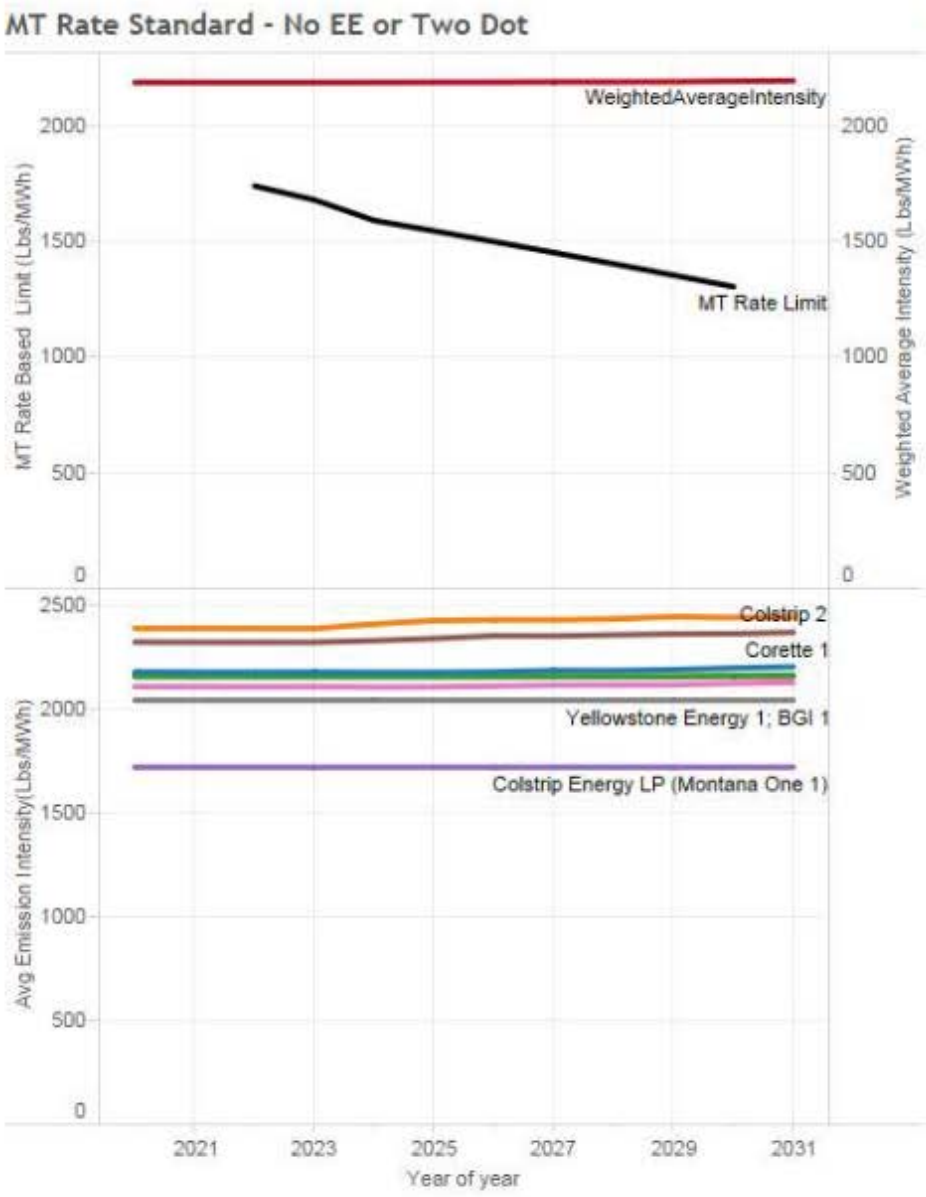
OR CPP Compliance Outlook

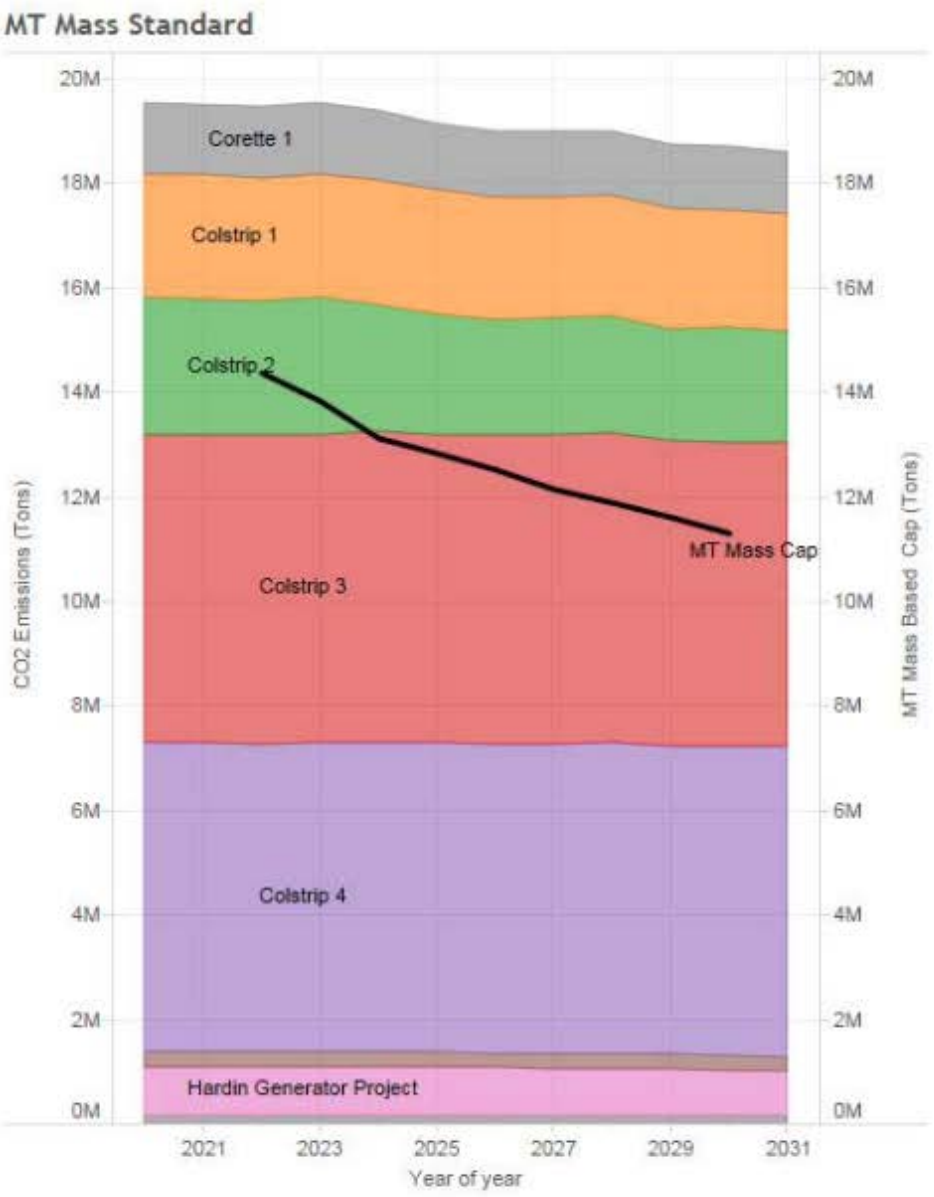
[Assumes no added EE/RE]

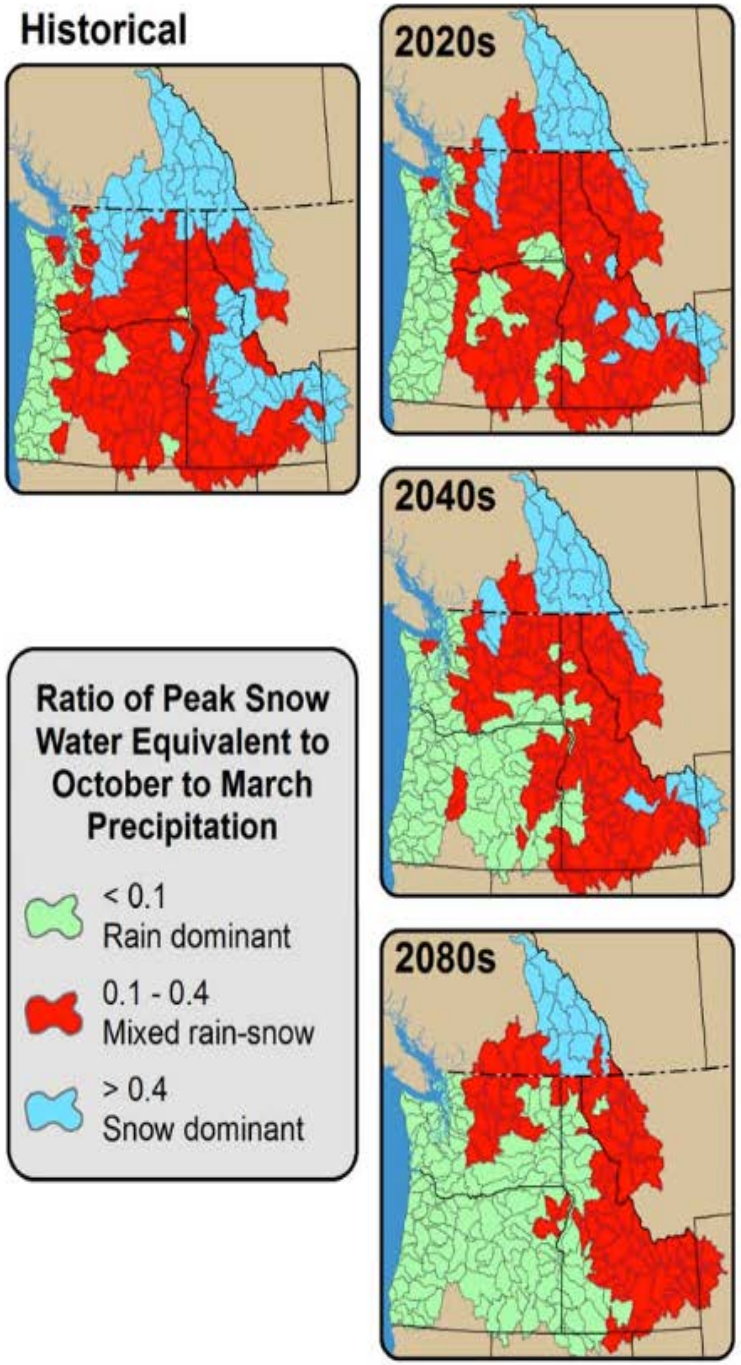




MT CPP Compliance: and Colstrip Coal Plant





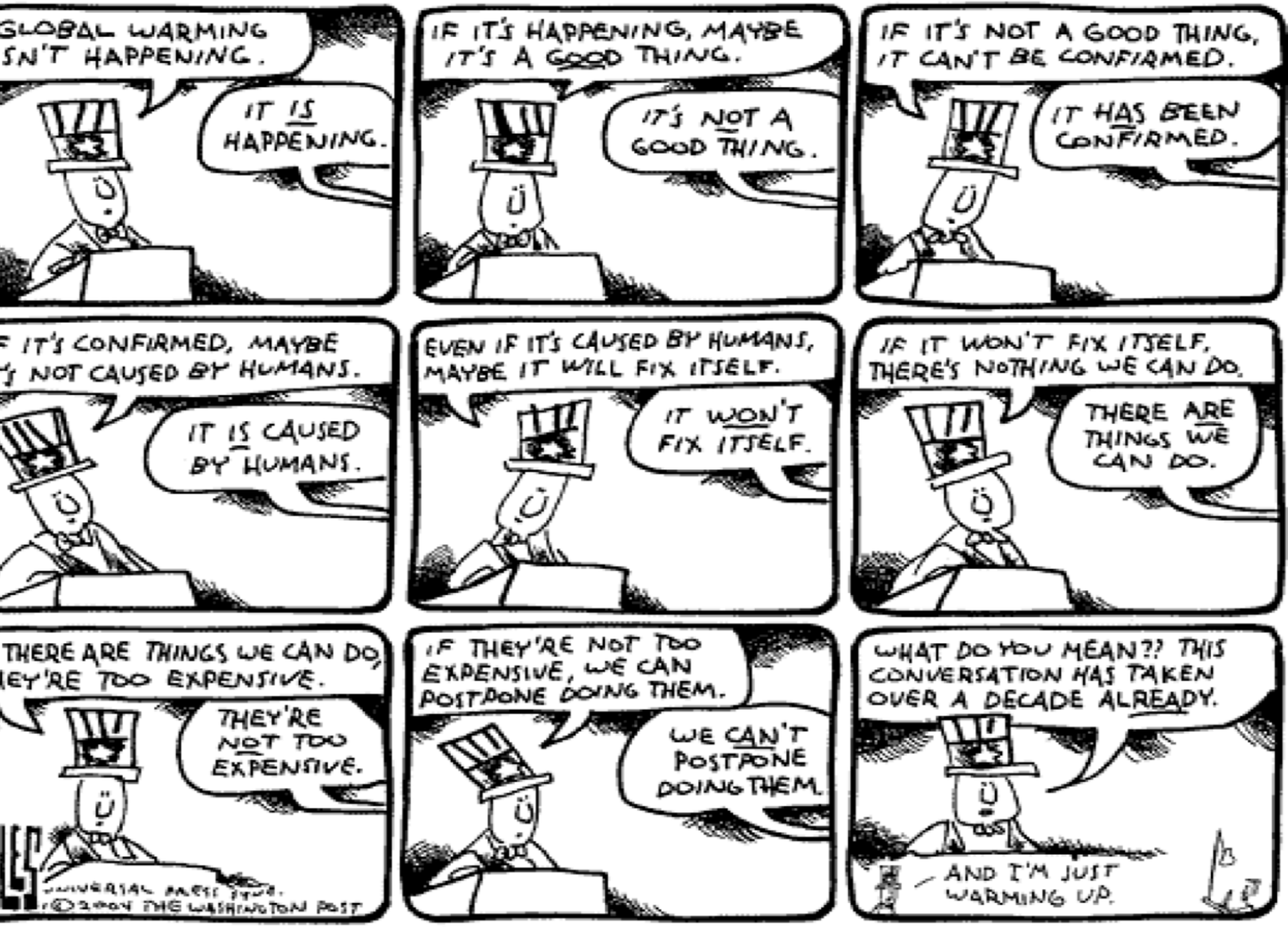


- **Figure 5 - The classification of PNW watersheds into rain dominant, mixed rain-snow, and snowmelt dominant and how these watersheds are expected to changes as a result of climate warming based on the SRESA1B emissions scenario (Source: Hamlet et al., 2013 reproduced in Dalton et al., 2013)**

Oregon Climate Change Research Institute 2015

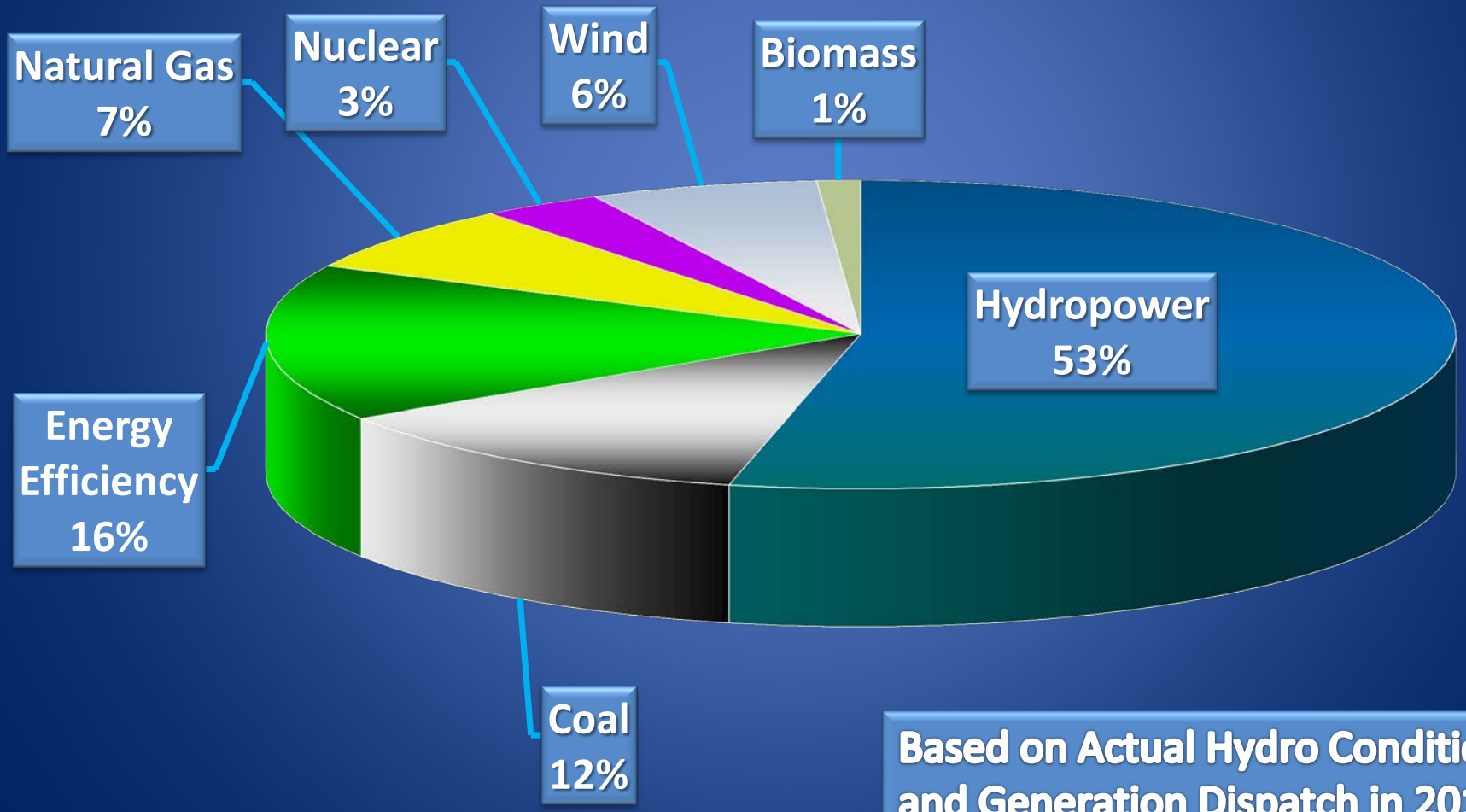
Canyon Creek Fire, August 2015


South Carolina 2015
“Once in a Millennium” Storm



Oliphant - Wash Post 2003

Energy Efficiency Is Now The Northwest's Second Largest Power Resource



Based on Actual Hydro Conditions and Generation Dispatch in 2012

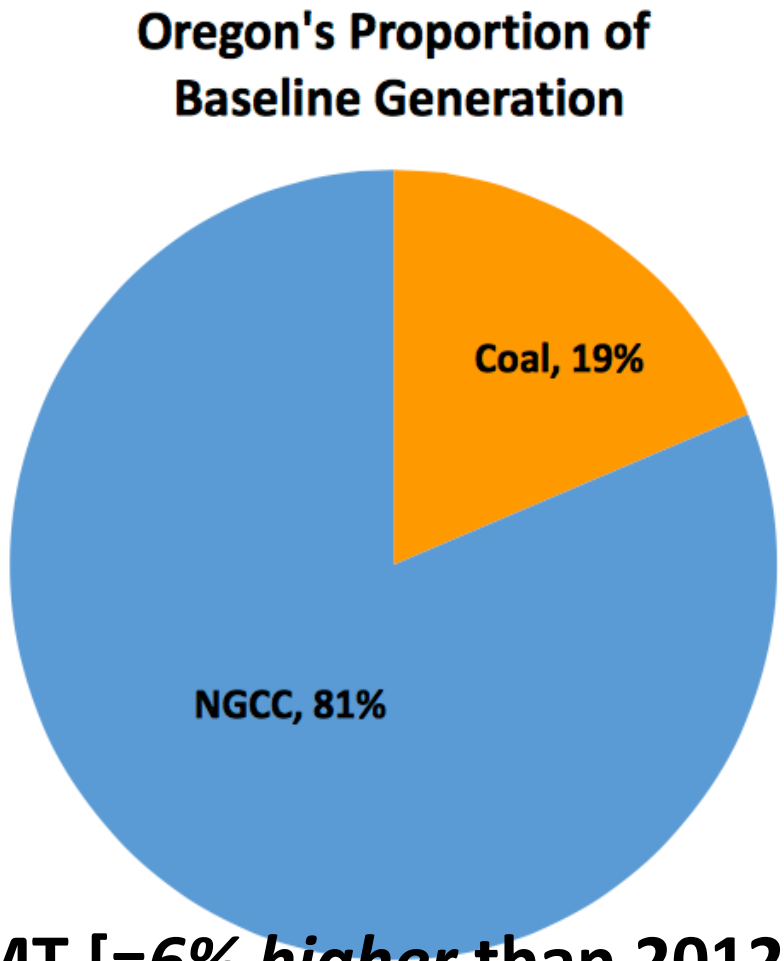

Calvin and Hobbes
WATTERSON
IT'S TRUE, HOBBES, IGNORANCE IS BLISS!
ONCE YOU KNOW THINGS, YOU START SEEING PROBLEMS EVERYWHERE...
..AND ONCE YOU SEE PROBLEMS, YOU FEEL LIKE YOU OUGHT TO TRY TO FIX THEM...
..AND FIXING PROBLEMS ALWAYS SEEMS TO REQUIRE PERSONAL CHANGE..
...AND CHANGE MEANS DOING THINGS THAT AREN'T FUN! I SAY PHOOEY TO THAT!
BUT IF YOU'RE WILLFULLY STUPID, YOU DON'T KNOW ANY BETTER, SO YOU CAN KEEP DOING WHATEVER YOU LIKE!
THE SECRET TO HAPPINESS IS SHORT-TERM, STUPID SELF-INTEREST!
WE'RE HEADING FOR THAT CLIFF!
I DON'T WANT TO KNOW ABOUT IT.
WAAAUGGHHH!
I'M NOT SURE I CAN STAND SO MUCH BLISS.
CAREFUL! WE DON'T WANT TO LEARN ANYTHING FROM THIS.

PARIS?

Oregon CPP Rate-Based Goal

[OR 2030 *mass-based* goal 8.1 MMT – from 2012 base 7.7 MMT]

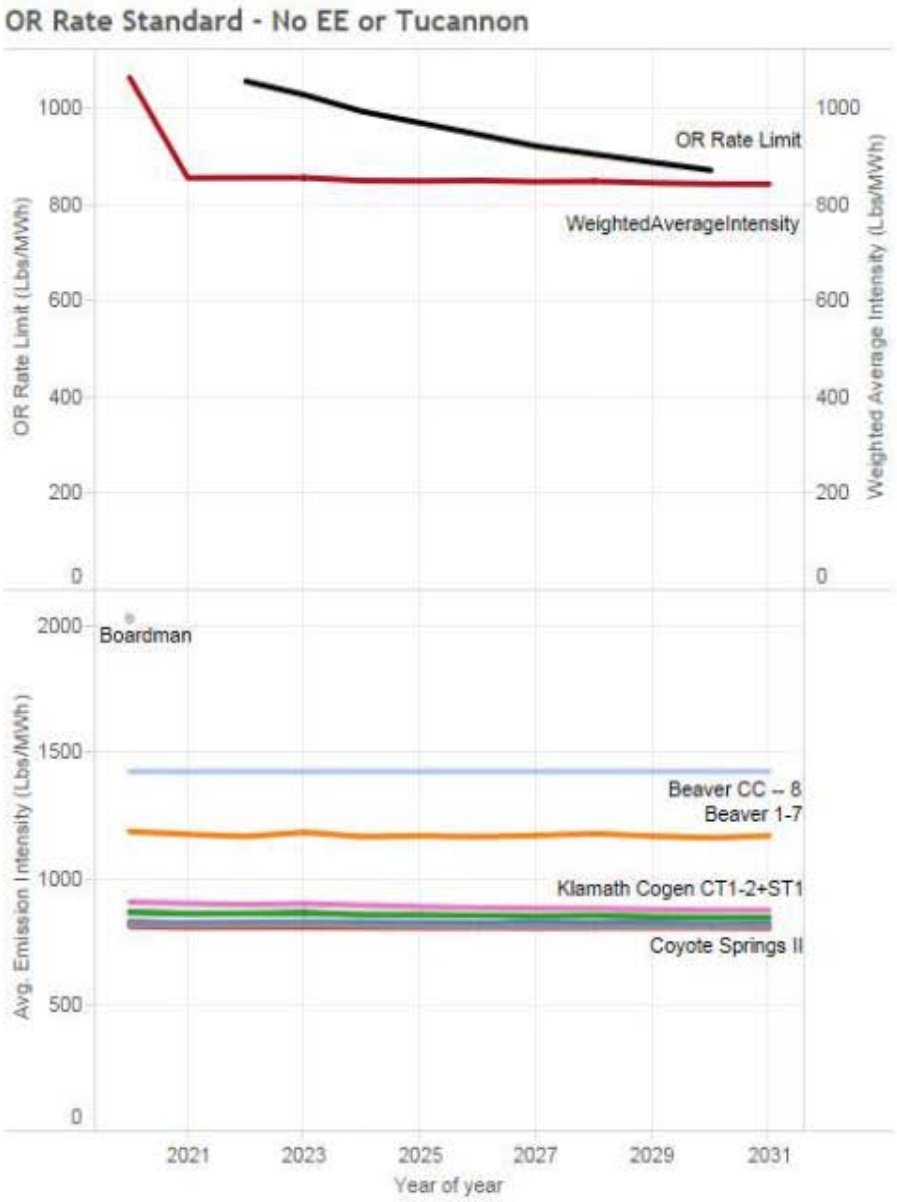
- State goals result from the baseline proportion of Coal and NGCC generation
  - Coal BSER = 1305 Lbs/MWh
  - NGCC BSER = 771 Lbs/MWh
- Oregon's State Goal:
  - 19% x Coal BSER
    + 81% x NGCC BSER
    871 Lbs/MWh

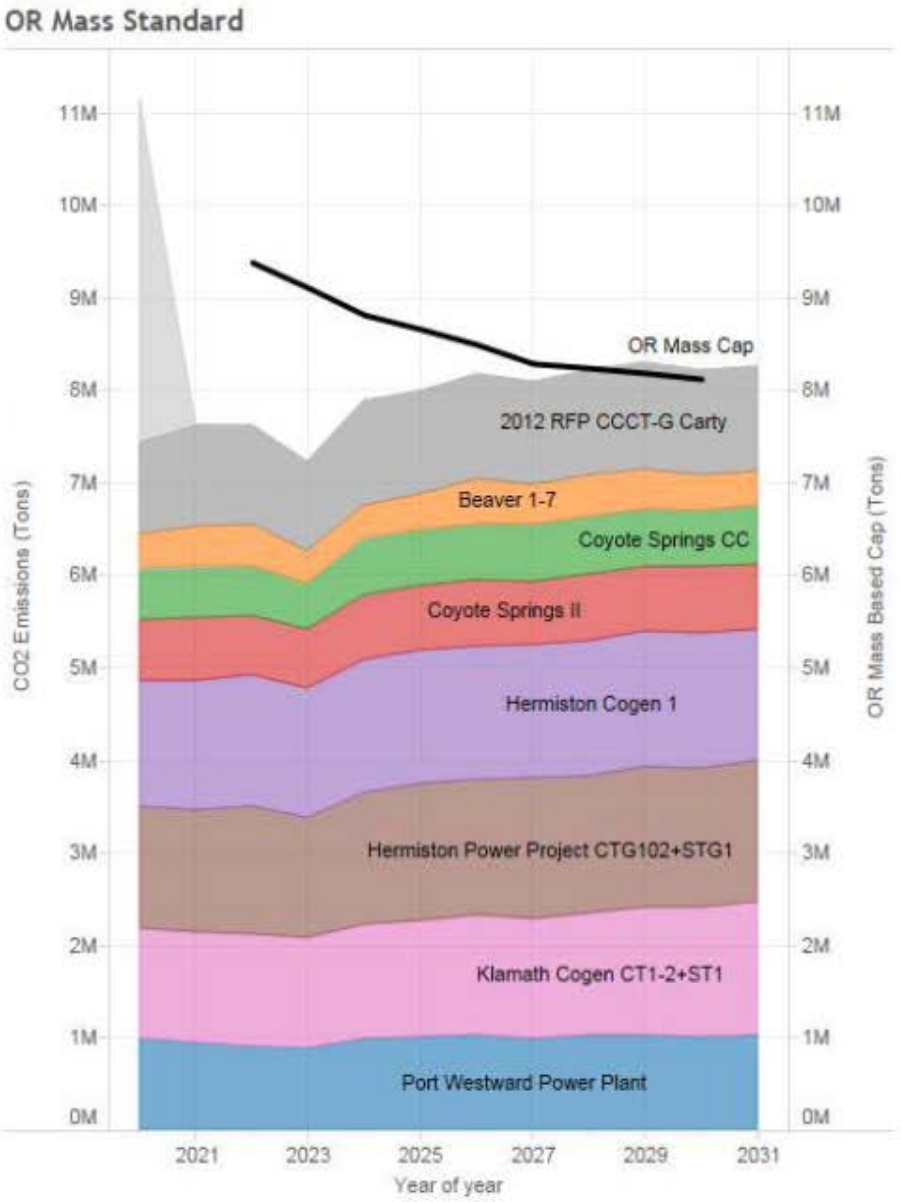


Or: mass-based 2030 goal: 8.1 MMT [=*6% higher* than 2012]

OR CPP Compliance Outlook

[Assumes no added EE/RE]





OR Consumption-Based Emissions

- "Consumption-based Emissions" Inventory
- GHG's associated with (1) what we buy, (2) how we use it, (3) how we dispose of it
- *Includes* GHG's from imports (flat screen TV's from China; shoes from Viet Nam)
- *Excludes* GHG's from OR exports (Intel chips)

	2005	**2010**	**2012**
GHG (MMT)	75.4	75.2	77.0