EPA Regulation of Greenhouse Gas Emissions: Potential Impacts in Alaska

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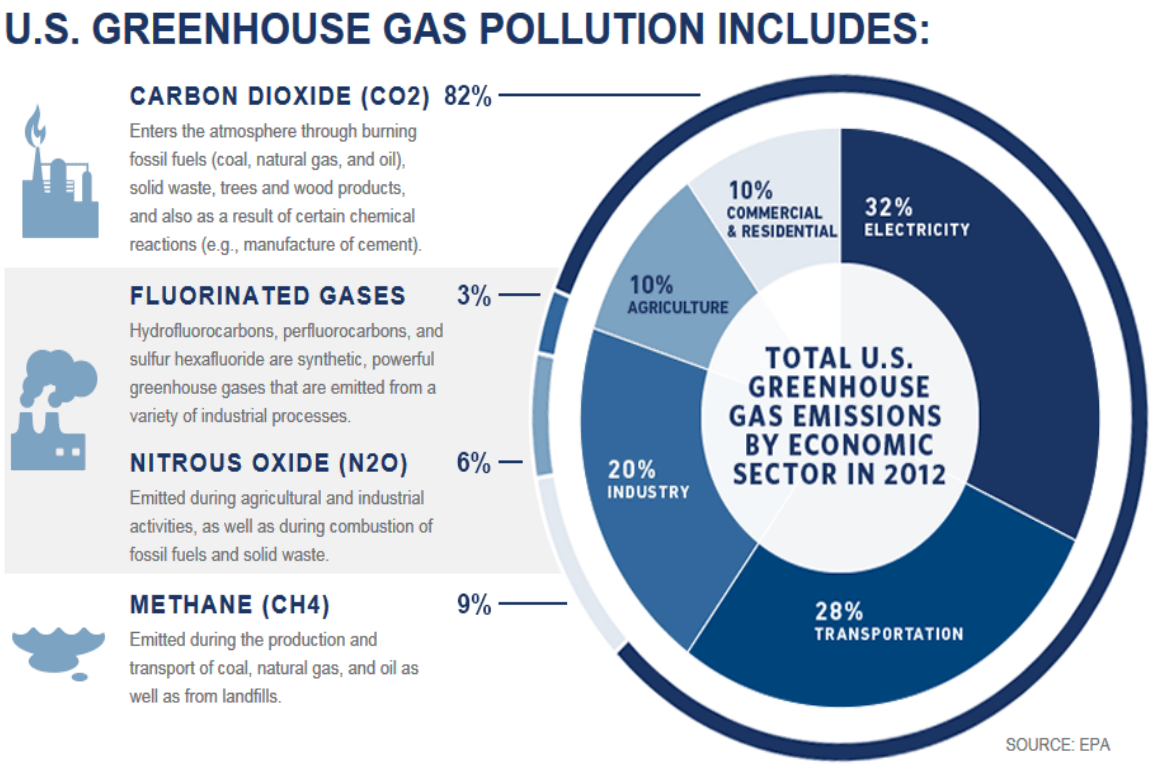
Alaska Department of Environmental Conservation
Larry Hartig, Commissioner

Greenhouse Gases

Greenhouse Gas	Common Sources and Uses	Global Warming Potential
Carbon dioxide (CO_2)	Combustion	1
Methane (CH_4)	Combustion, decomposition	21
Nitrous oxide (N_2O)	Combustion	310
Sulfur hexafluoride (SF6)	Electrical insulator	23,900
Hydrofluorocarbons (HFCs)	Refrigerants	12-11,700
Perfluorocarbons (PFCs)	Semiconductors, medical uses	6,500-9,200

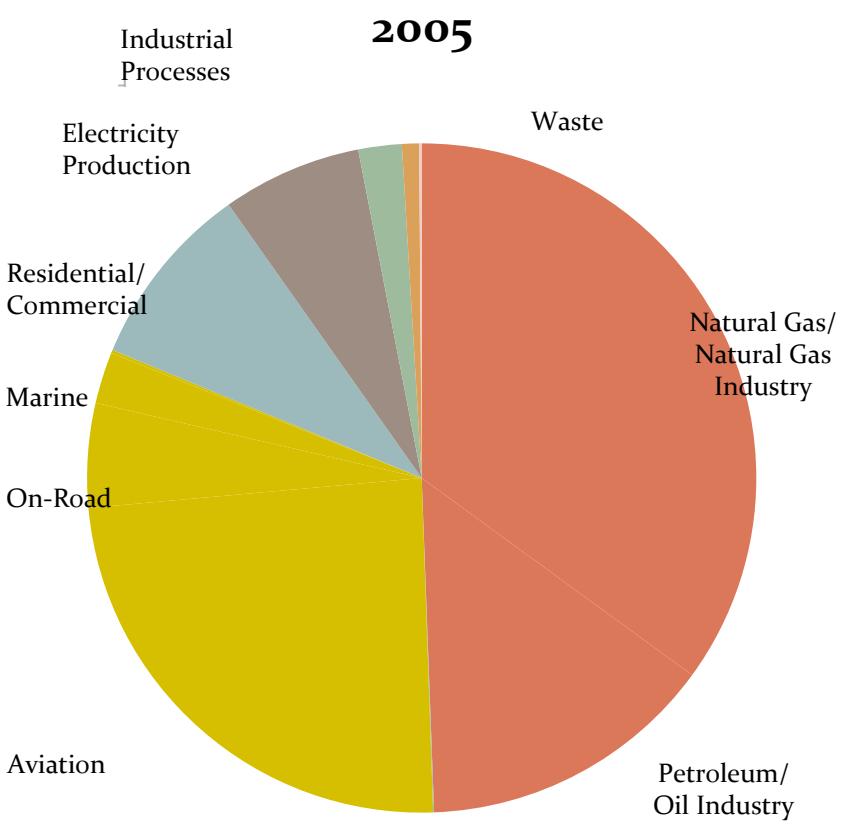
- Why Implement Carbon Standards for Electrical Generation?
  - Largest source of greenhouse gas (GHG) emissions in the U.S.
    - 32% of total U.S. GHG emissions in 2012
    - GHG emissions from electricity have increased about 11 % since 1990
    - Fossil fuel-fired power plants are the largest source of U.S. CO_2 emissions



EPA Rules and Proposed Rules Regulating Sources of GHG Emissions

- "Tailoring Rule" for major sources (PSD Permits)
- CAFE standards for vehicles, etc.
- President's Climate Plan – Power Plants*

Alaska's Sources of GHG Emissions



- Electricity Production was about 6% of total GHG emissions in Alaska in 2005
- Alaska electrical generating units covered by EPA's proposal are about 5% of the state's total 2005 GHG emissions

"Trigger Levels" for regulation of GHG Emissions from Major Stationary Sources

- Prevention of Significant Deterioration permits required before construction of large stationary sources of certain air pollutants
- EPA regulations modified "trigger levels" for PSD coverage of GHG
- Overturned in Utility Air Regulatory Group v. EPA, (U.S. June 23, 2014)
- Sources that otherwise need a PSD permit for conventional pollutants
  - Still subject to BACT for GHG
  - Still subjects about 83% of GHG emissions from these sources to BACT

President's Climate Plan

- President Obama released his Administration's Climate Action Plan in June 2013.
  - The Plan called on EPA to set carbon pollution standards for both new and existing power plants.
- A Presidential Memorandum directed EPA to:
  - Finalize rules for new power plants by no later than September 20, 2013
  - Issue proposed carbon pollution regulations for modified, reconstructed, and existing power plants (Clean Air Act 111(b) and 111(d)) by no later than June 1, 2014
  - Issue final regulations for modified, reconstructed, and existing power plants by no later than June 1, 2015
  - Include a requirement that States submit to EPA plans under Clean Air Act 111(d) by no later than June 30, 2016.

EPA's Clean Power Plan Proposals

EPA's Approach for Existing Power Plants

- Establish Best System of Emission Reduction (BSER) Considering:
  - Costs, Size of reductions, Technology, Feasibility
  - Opportunities vary from state to state depending on how electricity is generated, energy infrastructure, and other factors
- EPA sets a goal for each state
  - National goal is 30% reduction by 2030
  - Goal is expressed as a rate (lbs of CO_2 per MWh)
  - Proposed interim goal for 2020-2029 and final goal for 2030
- States develop a plan to achieve goal
  - Proposal would have state plans due in 2016 with potential for 1-2 year extension
  - States have flexibility to develop plan to reach goal
- Plan is like a SIP and becomes federally enforceable

EPA's Clean Power Plan Proposals

- EPA proposal relies on four building blocks to set state goals
  1. Improve heat rate at existing coal power plants (6%)
  2. Shift generation from coal-fired boilers to natural gas combined cycle units
  3. Increase generation from renewable energy
  4. Improve end-use energy efficiency to decrease electricity demand

Emission Units Covered in Alaska

- Emission Units covered under the proposal
  - Fossil fuel-fired power plants (coal and natural gas)
    - Must generate 25MW power
    - Must sell at least 1/3 power generated to grid
  - EPA identified five facilities/units in Alaska
    - Anchorage ML&P George M Sullivan Generation Plant #2 (NGCC)
    - Chugach Electric Association Beluga Power Plant (NGCC)
    - Chugach Electric Association Southcentral Power Plant (NGCC)
    - GVEA Healy Power Plant (coal) Unit 1
    - Homer Electric Association Nikiski Co-Generation Plant (NG high utilization simple cycle turbine)

Alaska Power Generation

- Alaska does not have electrical interconnectivity across state
  - All affected emission units under EPA proposal are inside the Railbelt
- Grid limitations and issues
  - Transmission capacity bottlenecks
  - Non-redundant in certain areas (single line limitations)
  - Concerns about opportunities for re-dispatch/wheeling power
- Natural gas is not yet available throughout the entire Railbelt region
  - State is working to:
    - encourage additional gas development in Cook Inlet and North Slope
    - enhance availability of natural gas in interior Alaska
- Potential for additional hydropower
- Renewable energy and energy efficiency programs are important
  - Focusing state renewable and efficiency investment on the impacted EGUs could divert funding from high cost rural communities
  - Limitations on managing renewable sources (at capacity of ability to incorporate non-firm renewables)

Potential Impacts to Alaska

- Increase in electricity prices in the Railbelt, particularly Fairbanks, as switch to lower carbon sources of power generation
- Significant capital costs associated with build out of grid and removal of "bottlenecks."
- Diversion of state capital dollars from rural power and other projects to paying for infrastructure to meet SIP requirements
- Restructuring of State Regulations to Make SIP (State plan) enforceable.
- New relationships among Railbelt power and transmission entities.