Strategies for Developing an Effective Greenhouse Gas Management Program for Ports

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Key Points for a Greenhouse Gas Strategy

- Understanding of relevance and regulatory implications
- Defining the boundaries
- Performing an emission inventory to define baseline conditions
- Defining opportunities for mitigation
- Dealing with adaptation
- Formalizing a plan
- Implementation by all stakeholders
- Continual review and improvement

Regulatory Implications

Greenhouse Gas Overview

- Regulatory arena has been slow to take-off in the U.S. due to political reasons (Europe 5+ years ahead of U.S.)
- States taking the lead
- EPA has been taking the "no legal authority" position
- Supreme Court has overruled the EPA position (April 2007)
- Greenhouse gases: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 (IPCC designated)

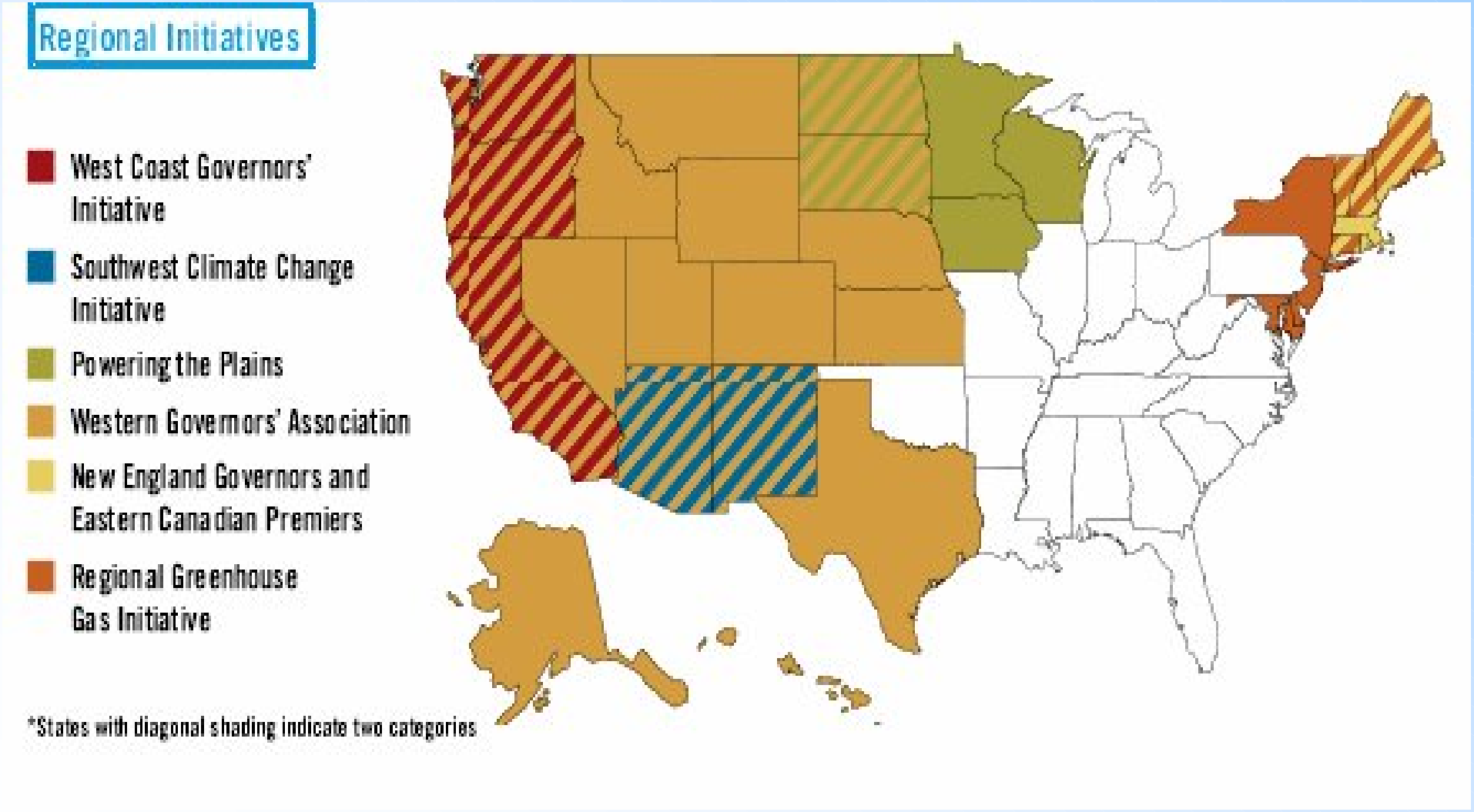
International Actions on Climate Change

- 1992 – United Nations Framework Convention on Climate Change negotiated and ratified by the U.S.
- 1995 – Berlin mandate calls for emissions targets for developed countries
- 1997 – Kyoto Protocol negotiated
- 2001 – U.S. rejects Kyoto Protocol
- 2005 – Kyoto Protocol enters into force for member countries

European Union as an Example

- Kyoto target – reduce EU emissions 8% below 1990 levels by 2008-2012
- Emission trading is key component (so called cap and trade)
- EU planning to take unilateral action to reduce greenhouse gas from ships if there is no global action by the end of the year. This is deemed significant since 40% of world fleet is controlled by European owners
- IMO GHG activity is ramping up

U.S. – Regional Initiatives



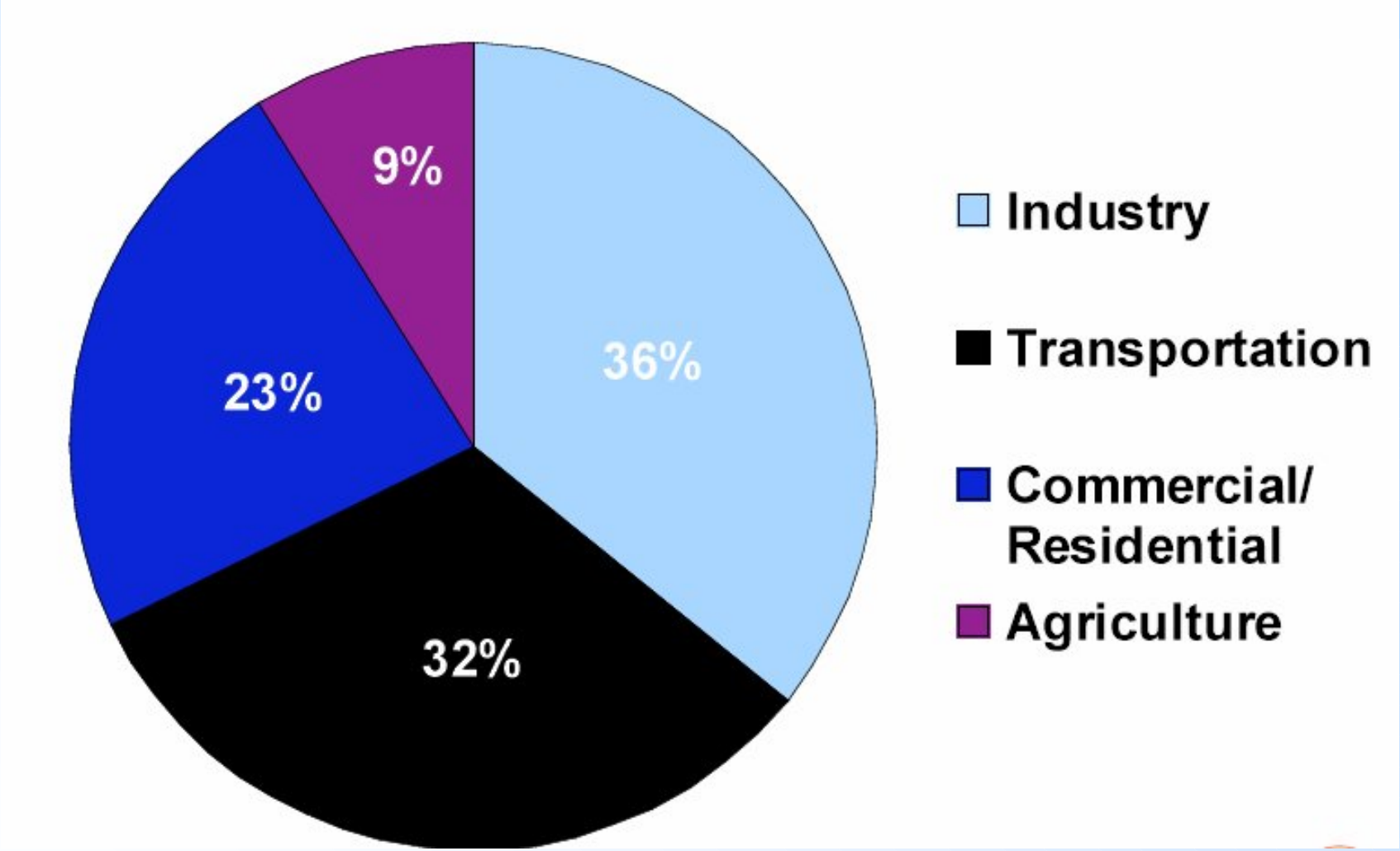
RGGI

- Program to take effect 1 January 2009
- Will regulate fossil-fired electric generating power utilities
- Establishes a CO2 cap for each of 10 States
- Auctions held quarterly to sell CO2 credits
- Revenues will fund energy efficiency initiatives and clean technology projects
- The CO2 cap will decrease over time

The Climate Registry

- Develop and manage a common greenhouse gas emissions reporting system with high integrity that is capable of supporting multiple greenhouse gas emissions reporting and emissions reduction policies for its member states/tribes and reporting entities; and
- Provide an accurate, complete, consistent, transparent, and verified set of greenhouse gas emissions data from reporting entities, supported by a robust accounting and verification infrastructure.
- Presently 39 States are participants as well as several Mexican States and Canadian Provinces.

Representative Greenhouse Gas Sources



Transportation Greenhouse Gas Emissions in Maryland (MMt CO2e)

Source	1990	1995	2000	2005	2010	2015	2020
Onroad Gasoline	17.91	19.67	21.61	23.94	25.29	26.97	28.78
Onroad Diesel	2.91	3.42	5.09	5.89	6.83	7.91	9.18
Jet Fuel/Av. Gas	1.49	1.41	1.68	1.31	1.32	1.37	1.42
Boats and Ships - Ports/Inshore	1.16	0.90	0.90	0.87	0.81	0.87	0.93
Boats and Ships - Offshore	0.21	0.35	0.39	0.31	0.33	0.35	0.37
Rail	0.39	0.27	0.05	0.06	0.06	0.06	0.06
Other	0.14	0.14	0.16	0.14	0.16	0.18	0.19
Total	**24.20**	**26.16**	**29.90**	**32.52**	**34.81**	**37.71**	**40.93**

Defining Port Boundaries

Alternatives

- Individual Port approach
- Regional approach
  - Northwest Ports Clean Air Strategy (Tacoma, Seattle, Vancouver B.C.)

Developing an Emission Inventory

Examples of Greenhouse Gas Emission Sources at Ports

- Ocean-going vessels
- Harbor vessels
- Cargo handling equipment
- Locomotives
- Vehicles
- Electrical usage (offsite)
- Dredging and DMCF construction

Guideline Status

- Presently, there are no unified guidelines for preparing greenhouse gas emission estimates for Ports. Appropriate and accepted methods do exist, however, and can be used for such inventories.

Definition of Port Boundaries

- Land-side boundary should include at least the first intermodal point
- Oceanside, several options:
  - First 25 miles from where pilot boards ship
  - Non-attainment area boundary
  - County/State boundaries
  - EPA's marine inventory in Category 3 engine rulemaking – 200 statute miles from the coast (EEZ)

More on Greenhouse Gas Emissions…

- Practically all greenhouse gas emissions from Ports are associated with the combustion of fuels
- As a result, the principal greenhouse gas emitted is CO2
- Greenhouse gas emissions associated with the consumption of electricity from a Port and its tenants are also a consideration

Calculating Greenhouse Gas Emissions

- Emissions calculated by activity levels or material throughput rates
- Key inputs needed: fuel usage, VMT, electrical consumption
- Results converted to Global Warming Potential values ($CO_2 = 1$)
- Emission factor sources: EPA, Inter-governmental Panel on Climate Change, U.S. Energy Information Administration

Greenhouse Gas Mitigation

Benchmarks for Mitigation

- Greenhouse gas reduction goals linked to year chosen as baseline
- Selection of baseline year can be an internal decision or may directed by future regulatory program

Emission Reduction Alternatives

- Idling limits (cargo equipment and vehicles)
- Truck modernization
- Transport refrigeration unit (TRU) upgrades
- Drayage truck modernization
- More efficient line-haul locomotives
- Better harbor craft maintenance
- Slower ship speeds
- Electrification (e.g., cold ironing)
- “Greenships”
- Energy conservation measures – Port side
- Market- based measures for vessels
- Cap and trade program for shipping sector

Greenhouse Gas Adaptation

Recent Studies on Effects of Climate Change on Transportation

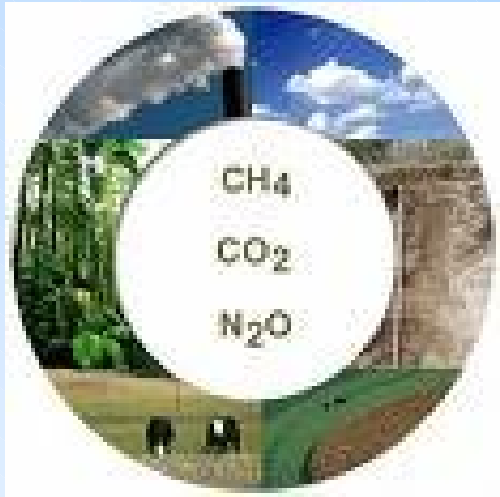
- Transportation Research Board (TRB), Special Report 290: Potential Impacts of Climate Change on U.S. Transportation (2008) *www.nap.edu/catalog/12179.html*
- U.S. Climate Change Science Project (CCSP) Synthesis and Assessment Product 4.7: Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I (2008) *www.climatescience.gov/library/sap/sap4-7/final-report/*

Information courtesy of the Port of Seattle

Greatest Relevance

- Increases in hot days and heat waves
- Increases in Artic temperatures
- Rising sea levels, combined with storm surges
- Increases in intense precipitation events
- More frequent strong hurricanes

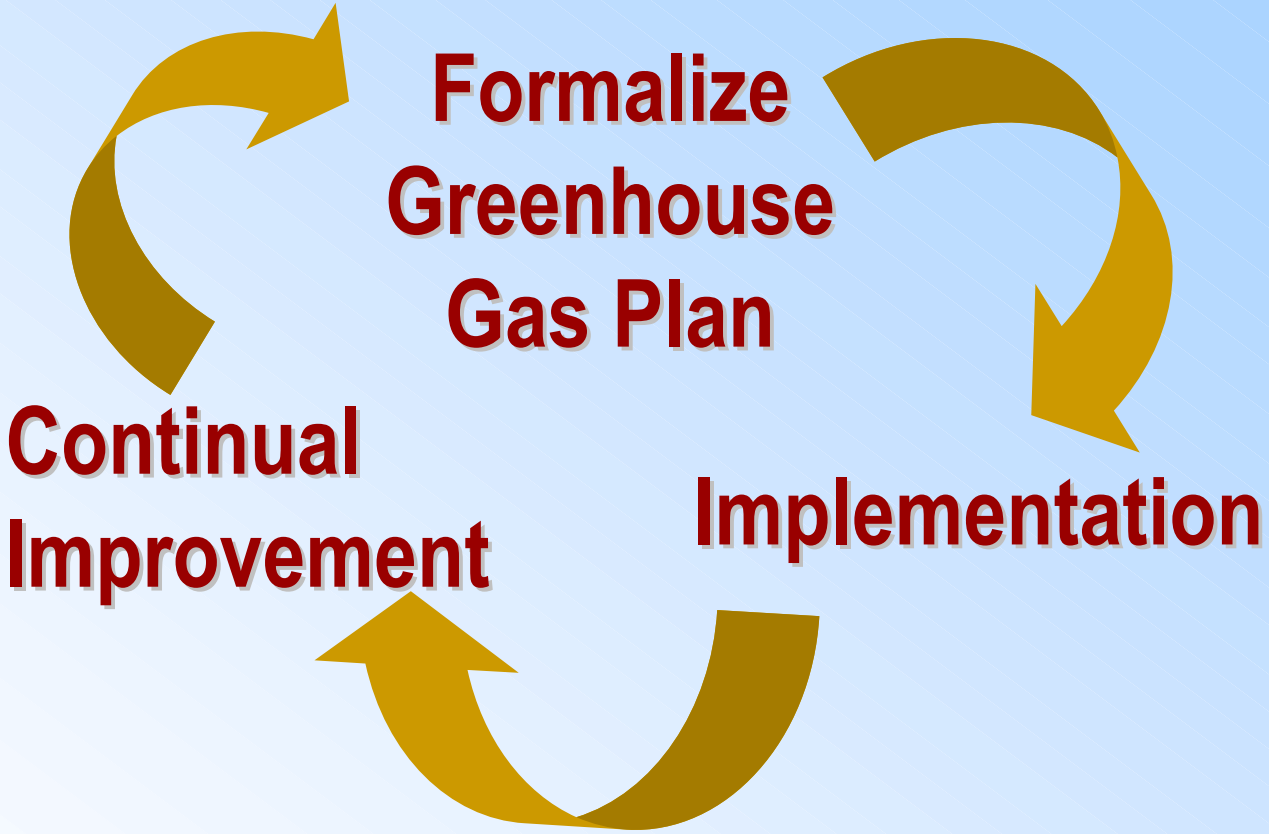
Information courtesy of the Port of Seattle



Recommended Actions

- New Federal programs to provide data and decision support tools
- Adaptation options:
  - Operational response planning (emergency management)
  - Assess vulnerable infrastructure
  - Planners to develop scenarios of concern
  - Sharing of best practices
  - Design changes
  - Overhaul insurance programs
  - New organization arrangements across boundaries

Information courtesy of the Port of Seattle



News Release

Scientists, Economists Urge Deep Cuts in Emissions
June 16, 2008

More than 1,700 of the nation's most prominent scientists and economists recently released a joint statement calling on policymakers to require immediate, deep reductions in heat-trapping emissions that cause global warming. The statement marks the first time leading U.S. scientists and economists have joined together to make such an appeal.

Questions ?

Thank you !