

# Greenhouse Gas Regulatory Update

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# Relevance of Current and Pending GHG Regulations for Ports

- Regardless of the financial crisis, states and local governments are expected to move ahead with GHG regulation.
  - Opportunity to generate revenue through carbon auctions
  - Strong public concern about climate change and GHGs
- Ports and their tenants need to take action now to begin planning for regulation. If no action is taken, must plan to implement what others decide.
- Ports and their tenants need to understand there are two yardsticks by which they will be measured:
  - Regulatory
  - Public/political perception
- Emerging regulations are conflicting and inconsistent; as a result, all the more reason to get involved to educate regulators about “real-life” application of these regulations.

# General Overview

# Greenhouse Gases, Sources, Global Warming Potential and Carbon Equivalents

GHG	Major Sources	“Current” 1996 U.N. IPCC GWP	“Future” 2007 U.N. IPCC GWP
Carbon Dioxide (CO <sub>2</sub> )	Fossil fuel combustion, manufacturing processes, transportation, and waste combustion	1	1
Methane (CH <sub>4</sub> )	Landfill gas, anaerobic digestion from industrial wastewater treatment, coal mining, agriculture, and gas distribution	21	25
Nitrous Oxide (N <sub>2</sub> O)	Agriculture, fertilization, transportation (commercial, heavy duty, on road and off-road), and nitric adipic acid production	310	298
Hydrofluorocarbons (HFCs)	Refrigerants, foam blowing, and fire fighting	140 to 11,700	140 to 9,800
Perfluorocarbons (PFCs)	Electronics manufacturing, refrigerants, and aluminum smelting	6,500 to 9,200	4,800 to 9,200
Sulfur Hexafluoride (SF <sub>6</sub> )	High voltage switch gear, magnesium smelting, gas-filled training shoes	23,900	22,800

GWP = Global Warming Potential (i.e. 1 ton of CH<sub>4</sub> = 25 tons CO<sub>2</sub>) – source: United Nations

# GHG Regulation: Four Types Emerging

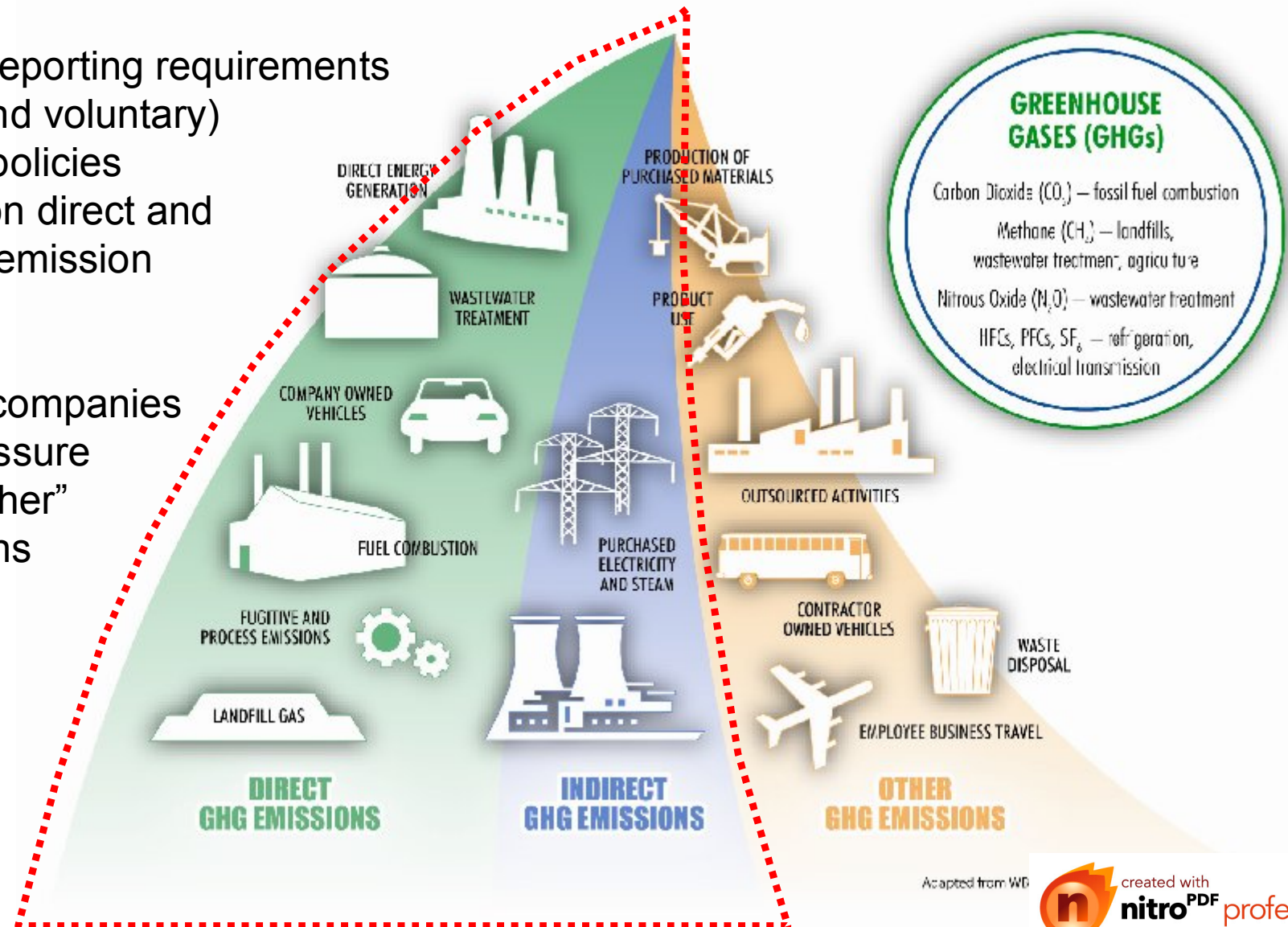
GHG Regulation Type & Examples	Example of Requirement	Potential Impact to Companies	
		Direct	Indirect
<b>Mass-Based</b>			
<ul style="list-style-type: none"> <li>Targets, Timetables &amp; Trading</li> <li>Automotive Tailpipe Standards</li> </ul>	<ul style="list-style-type: none"> <li>1990 levels by 2020</li> <li>19% reduction by 2016</li> </ul>	\$\$\$	\$\$
<b>Product-Based</b>			
<ul style="list-style-type: none"> <li>GHG Generation Performance Standards for Electricity Sales</li> <li>Low Carbon Fuel Standard</li> </ul>	<ul style="list-style-type: none"> <li>1,100 lbs CO<sub>2</sub> per MWh</li> <li>10% CO<sub>2</sub>e reduction by 2020</li> </ul>	\$\$\$	\$\$\$
<b>Mitigation of Impacts</b>			
<ul style="list-style-type: none"> <li>Neutralize impact of GHG Emissions for EIR/EIS</li> </ul>	<ul style="list-style-type: none"> <li>Offset GHG emissions for life of the project</li> </ul>	\$\$\$	\$
<b>Prohibition</b>			
<ul style="list-style-type: none"> <li>Ship electrification at ports</li> </ul>	<ul style="list-style-type: none"> <li>Permits denied</li> <li>No new construction unless CO<sub>2</sub> captured &amp; sequestered</li> </ul>	\$	\$\$

\$\$\$ = relative magnitude of cost

# Focus of Regulations: Direct and Indirect GHG Emissions

Regulations, reporting requirements (mandatory and voluntary) and financial policies are focusing on direct and indirect GHG emission sources.

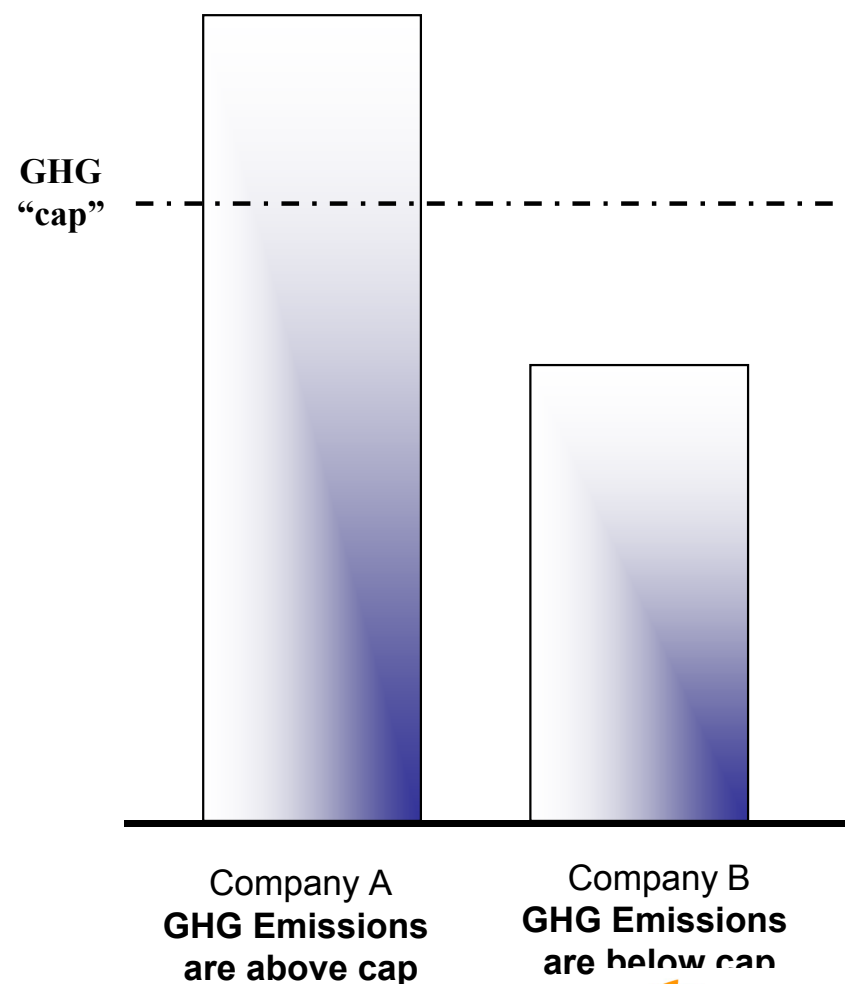
Increasingly, companies are under pressure to address “other” GHG emissions



Adapted from WRI

# GHG “Cap and Trade” Programs

- **CAP:** Government limits the total amount of GHG emissions.
- **ALLOWANCES:** Companies will either be allocated or will have to purchase allowances to cover all GHG emissions.
- **OFFSETS:** One ton of GHGs removed from—or prevented from entering—the atmosphere.
- **TRADING:** To comply with cap, companies can buy or sell offsets and possibly allowances via:
  - auction,
  - company to company, or
  - brokers or traders.



# Anticipated Direct and Indirect Costs of Federal GHG Regulation

- Economic modeling by CDM and others estimate that national carbon regulations will lead to:
  - GHG emission offset credits in the \$50 to \$80 per ton range by 2020
  - Increases in electricity prices greater than 25% by 2015 and 40% by 2020
  - Increases in wellhead natural gas prices greater than 20% by 2020
  - Reductions in GDP greater than 2% (\$400 billion in losses) in 2015
  - \$7-10 trillion program cost. \$3 trillion program value over 38 years

Sources: Altos Management Partners, CRA International, the Nicholas Institute, the Clean Air Task Force, and US EPA. Analysis of 2008 Lieberman-Warner S 2191 (all bullets except last); last bullet from US EPA analysis of S 3036



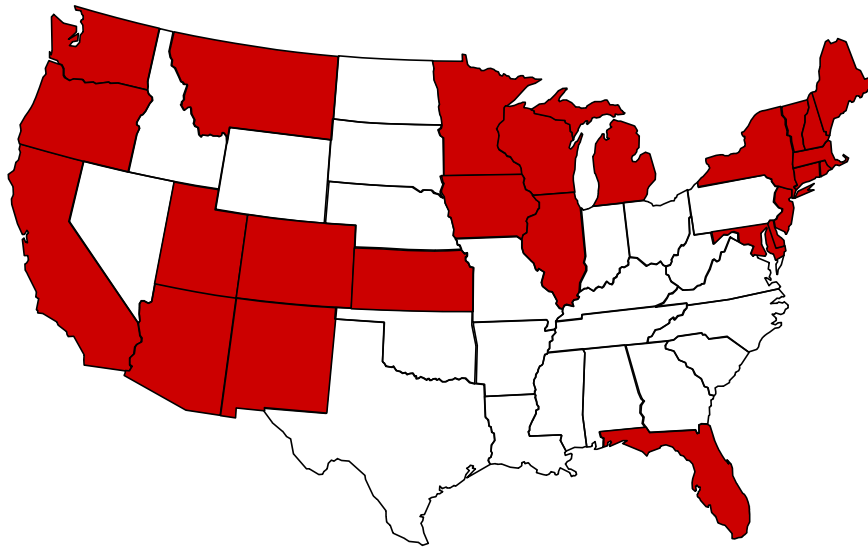
# Regulatory Activity Affecting Ports

## States, Regions, Federal, and International

# State Regulation: A Patchwork of Targets

41 States with GHG Targets, 2008 Legislation or Commissions

**Majority of States: Reduce GHGs to 1990 levels by 2020; 60-90% below 1990 by 2050**



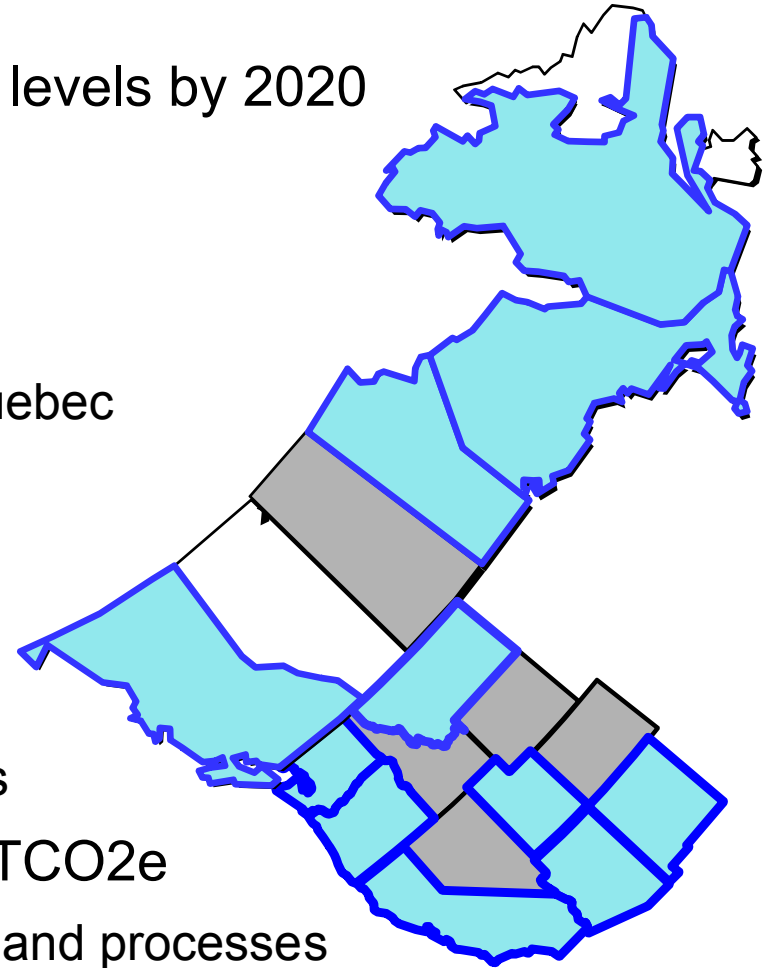
**GHG Reduction Targets**  
 - Cap & Trade Programs -  
 25 States w/ Targets & Timetables  
 4 Canadian Provinces  
 3 Regional C&T Programs



**“The Climate Registry”**  
 - National GHG reporting -  
 39 States  
 7 Canadian Provinces  
 6 Mexican States

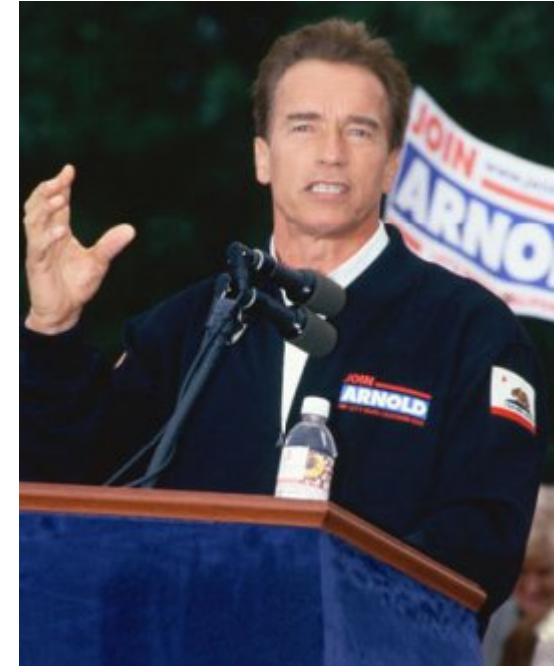
# Regional Regulation: Western Climate Initiative (WCI)

- Cap and Trade Program: 15% below 2005 levels by 2020 (2% below 1990 levels)
- 7 States: AZ, CA, MT, NM, OR, UT, WA
- 4 Canadian Provinces:
  - British Columbia, Manitoba, Ontario and Quebec
- Observers:
  - U.S.: AK, CO, ID, KS, NV, WY
  - Canada: Saskatchewan
  - Mexico: Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora, Tamaulipas
- 2012 Cap and Trade Threshold: 25,000 MTCO<sub>2</sub>e
  - 1st phase: electricity, industrial combustion and processes
  - 2nd phase (2015): commercial, residential, and transportation combustion
- 2011 Reporting Threshold for 2010 emissions: 10,000 MT CC



# California: “The Global Warming Solutions Act of 2006” (AB 32)

- Reduce six GHGs 25% by 2020; 80% below 1990 levels by 2050
- 44 “Early Action Initiatives”
  - 9 actions enforceable by 2010
  - 35 actions enforceable by 2012
- 2009: Mandatory GHG reporting by major sources emissions for CY 2008.
  - Electricity generation > 1MWh
  - Petroleum Refineries/Chemical Plants
  - Cement plants
  - Major industrial combustion/process sources
    - Current: > 25,000 tpy CO<sub>2</sub>
    - Future: > 10,000 tpy CO<sub>2</sub>e
- 2012: Mandatory GHG reduction program. “Scoping Plan” underway. Mix of cap and trade, command and control, and voluntary ef



# California: “The Global Warming Solutions Act of 2006” (AB 32)

- Goods Movement Emission Reduction Plan (GMERP) and the 2007 State Implementation Plan (SIP) contain measures designed to reduce the public health impact of goods movement activities.
- CA Air Resources Board (CARB) is already requiring ship electrification at ports
  - 0.2 MMTCO<sub>2</sub>E in reductions by 2020
- CARB incorporated Heavy-Duty Vehicle-Efficiency measure into the Goods Movement measure.
  - A Heavy-Duty Engine Efficiency measure could reduce emissions associated with goods movement through improvements which could involve advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories.
  - CARB will consider setting requirements and standards for heavy-duty engine efficiency in the future if higher levels of efficiency are not being produced either in response to market forces (fuel costs) or federal standards
  - 3.5 MMTCO<sub>2</sub>E in reductions by 2020

# California: Additional GHG Actions with Implications for State and Federal Programs

- GHG generation performance standard for all electricity sold in the state. Equivalent to natural gas fired power emissions.
- Low Carbon Fuel Standard: 10% reduction in vehicle fuel by 2020
- Tailpipe Standards: 25% reduction for SUVs, 19% for cars by 2016
- California Environmental Quality Act (CEQA):
  - “Threshold of Significance” that triggers GHG offsets is different in different jurisdictions. Governor’s standard due in 2010
  - Litigation by 3rd parties over EIR analysis and mitigation of GHGs
  - Litigation by AG Brown: zero threshold of significance, scope III reporting, full offsets, additional commitments
  - Recent case law: baseline is ‘actual’ instead of ‘potential’ emissions
- AG Brown petition to US EPA on marine vessel, aircraft and off-road GHGs
- Ocean-going vessel (OGV) speed reduction program
  - Goal to achieve reductions in NO<sub>x</sub>, SO<sub>x</sub>, PM and CO<sub>2</sub>

# Federal Government: A Change in Direction

## President-elect Obama

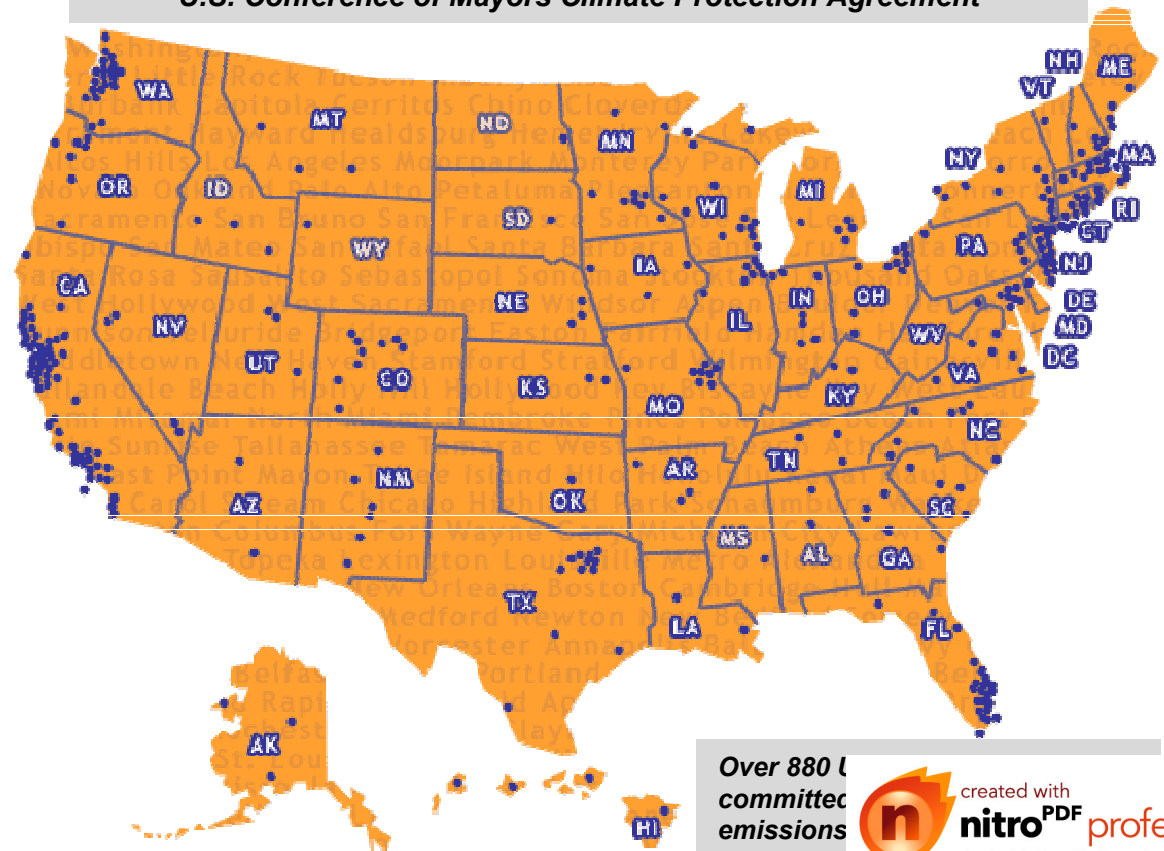
- Supports aggressive cap and trade programs and will work with Congress to pass legislation
- Several Executive Orders expected
- Anticipated reversal of EPA denial of state tailpipe regulations
- Anticipated reversal of EPA draft ruling on its GHG regulatory authority
- Anticipated mandatory GHG reporting regulations for sources greater than 10,000 MTCO<sub>2</sub>e



# Local Governments: Ambitious Goals

- U.S. Conference of Mayors Climate Protection Agreement
- Individual City Initiatives

U.S. Conference of Mayors Climate Protection Agreement



Over 880 local governments committed to reducing greenhouse gas emissions

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# European Union

- EU Emissions Trading Scheme
- Launched 2005; CO<sub>2</sub> focus; now 10,000 facilities
  - 2020 Target: 21% below 1990 levels
  - 2007 ETS over-allocation; 2008 recovery
  - Current CO<sub>2</sub> price: US \$31/ton
- Phase II (2008-2012): energy generation, combustion; refining; coke ovens; iron and steel; cement; glass, lime, bricks, ceramics, pulp and paper, board.
- Phase III (2013-2020) expansion proposed: petrochemicals, ammonia, aviation\*, aluminum, N<sub>2</sub>O from acid production and PFC from aluminum sector. 60% of allowances will be auctioned. Centralized cap and trade program
- Phase I and II member states currently set their own targets and will focus on vehicles, shipping, buildings and waste



# Thank You

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