

# Overview of U.S. and European Union Cap and Trade Programs



Reid Harvey, U.S. EPA  
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# Outline

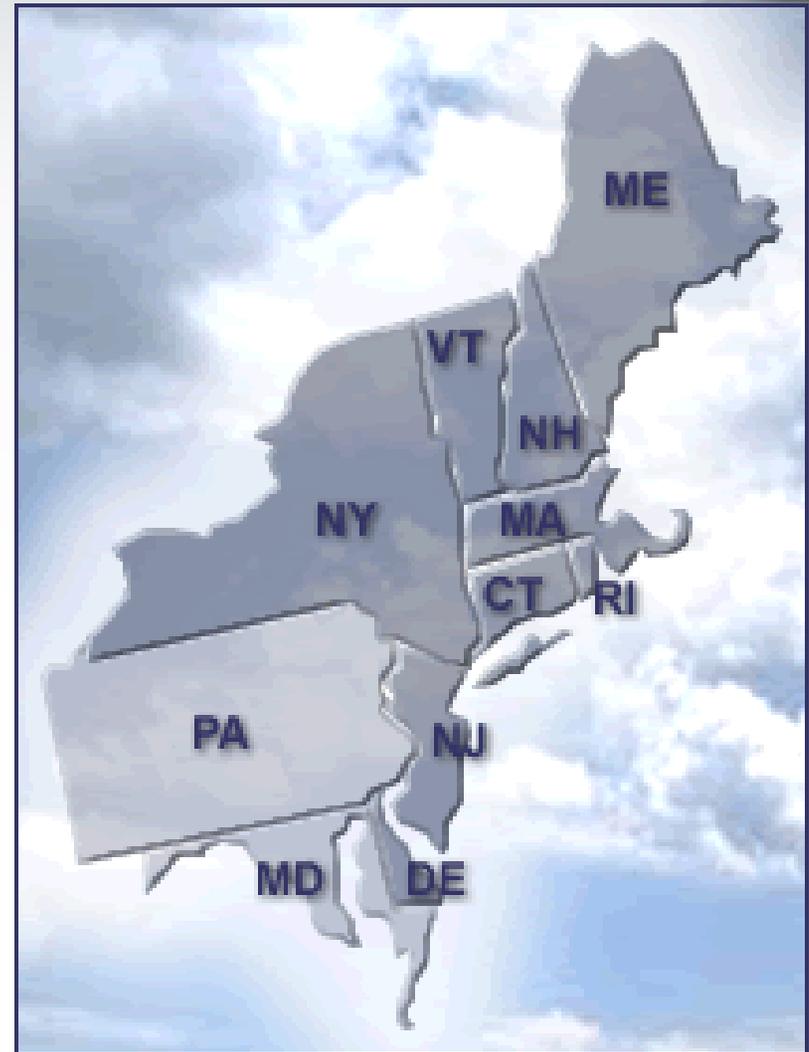


- Northeast Regional Greenhouse Gas Initiative
- California AB32 and SB 1368 programs
- European Union Emissions Trading Scheme

# Regional GHG Initiative (RGGI)



- Regional cap-and-trade program proposed by Governor Pataki
- Nine states in New England and Mid-Atlantic have joined
- MD Healthy Air Act requires the state to join RGGI by June
- MA and RI joined recently



# Summary of the RGGI Proposal



- **Coverage:** electric power sector, units over 25 MW and more than 50% of fuel is fossil (over 500 units)
- **Cap and Timing:**
  - Phase I (2009-2015) stabilize emissions at 121.3 million short tons of CO<sub>2</sub> (this is a little above 2000-2004 levels)
  - Phase II (2015-2020) 10% reduction from Phase 1 (roughly equivalent to 1990 levels)
- **Apportionment to States:**
  - Based on historic emissions but adjusted to consider electricity consumption, population, expected new sources, and other factors

# Summary of the RGGI Proposal



- Unlimited banking
- Offsets allowed in following areas:
  - Natural gas, heating oil & propane energy efficiency
  - Landfill gas capture and combustion
  - Methane capture from animal operations
  - Forestation of non-forested land
  - Reductions of SF<sub>6</sub> emissions from electricity transmission & distribution
- Offsets use
  - Limited to 3.3 percent of source's overall emissions
  - If average annual price of allowances exceed \$7, sources may use up to 5 percent
  - If price exceeds \$10
    - sources may use offsets for up to 10 percent of a plant's reported emissions
    - offsets from international trading programs will be allowed.

# California Climate Policies



- California has *many* climate initiatives including policies on efficiency and transport



- Governor Schwarzenegger signed [Executive Order # S-3-05](#) on June 1, 2005.
- The Executive Order established greenhouse gas targets:
  - By 2010, reduce to 2000 emission levels
  - By 2020, reduce to 1990 emission levels
  - By 2050, reduce to 80 percent below 1990 levels

# Assembly Bill 32 & Senate Bill 1368



- AB 32, signed by Schwarzenegger in September 2006, requires the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California's greenhouse gas emissions by 25 percent by 2020.
  - Mandatory statewide caps will begin in 2012 for significant sources and ratchet down to meet the 2020 goals.
    - In the interim, CARB will begin to measure the greenhouse gas emissions of the industries it determines as significant sources of greenhouse gas emissions.
  - The bill also provides the Governor the ability to invoke a safety valve and suspend the emissions caps for up to one year in the case of an emergency or significant economic harm.
- SB 1368, also signed in September 2006, calls for the California Energy Commissions to establish a GHG performance standard
  - The GHG emissions performance standard for base load generation would be set equal to the emissions of a combined-cycle natural gas power plant.
  - Load serving entities (e.g., utilities) would be prevented from entering into long-term financial commitments for base load generation that exceeded the performance standard.

# California Program Design



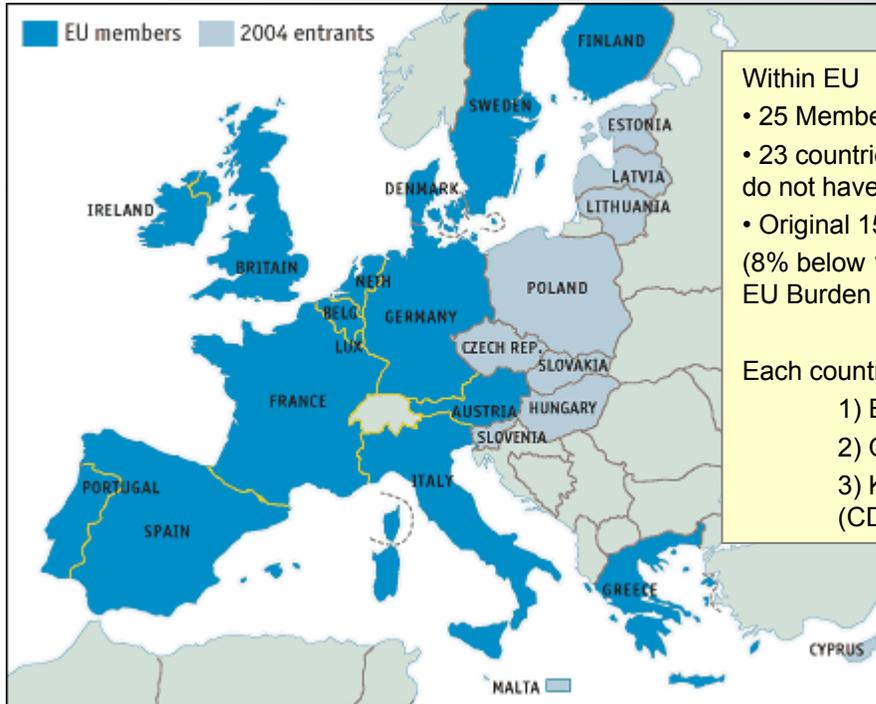
- Market Advisory Committee will provide advice on program design
- Composed of
  - Resources for the Future
  - Industry
  - Academics
  - Environmental groups
  - Governments
    - New York
    - EU
    - UK
    - US EPA
- Public meetings starting this month through June
- Recommendations due in June 2007

# California Deadlines



- Adopt a list of discrete, early action measures by July 1, 2007 that can be implemented before January 1, 2010 and adopt such measures.
- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008.
- Adopt mandatory reporting rules for significant sources of greenhouse gases by January 1, 2008.
- Adopt a plan by January 1, 2009 indicating how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms and other actions.
- Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHGs, including provisions for using both market mechanisms and alternative compliance mechanisms.

# European Union



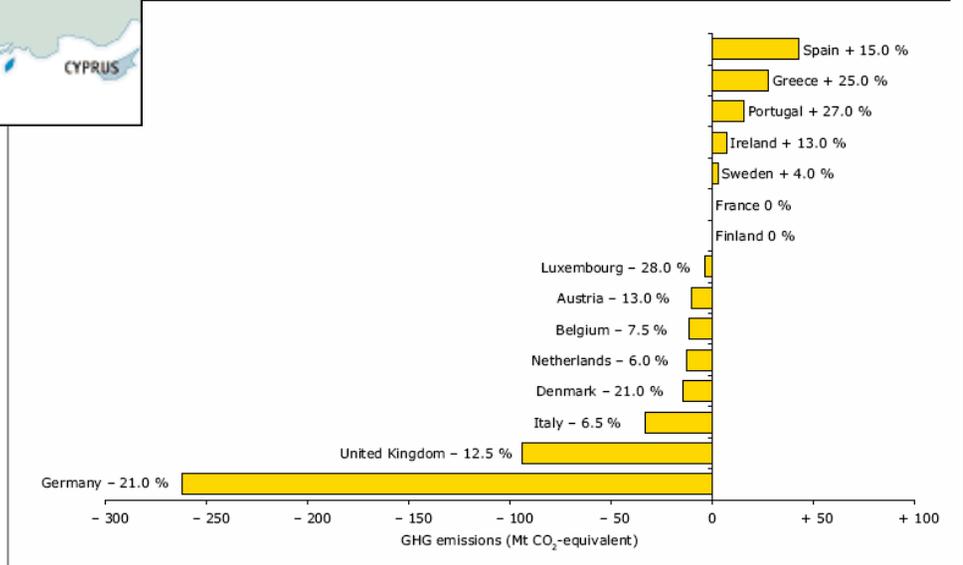
Within EU

- 25 Member states
- 23 countries have Kyoto targets as “Annex B” parties, Malta and Cyprus do not have targets
- Original 15 EU Member States have a collective Kyoto target of (8% below 1990 levels), but have differentiated responsibilities under the EU Burden Sharing Agreement

Each country will need a combination of

- 1) EU Emissions Trading Scheme (ETS)
- 2) Other national measures
- 3) Kyoto mechanisms (e.g., Clean Development Mechanism (CDM) and Joint Implementation)

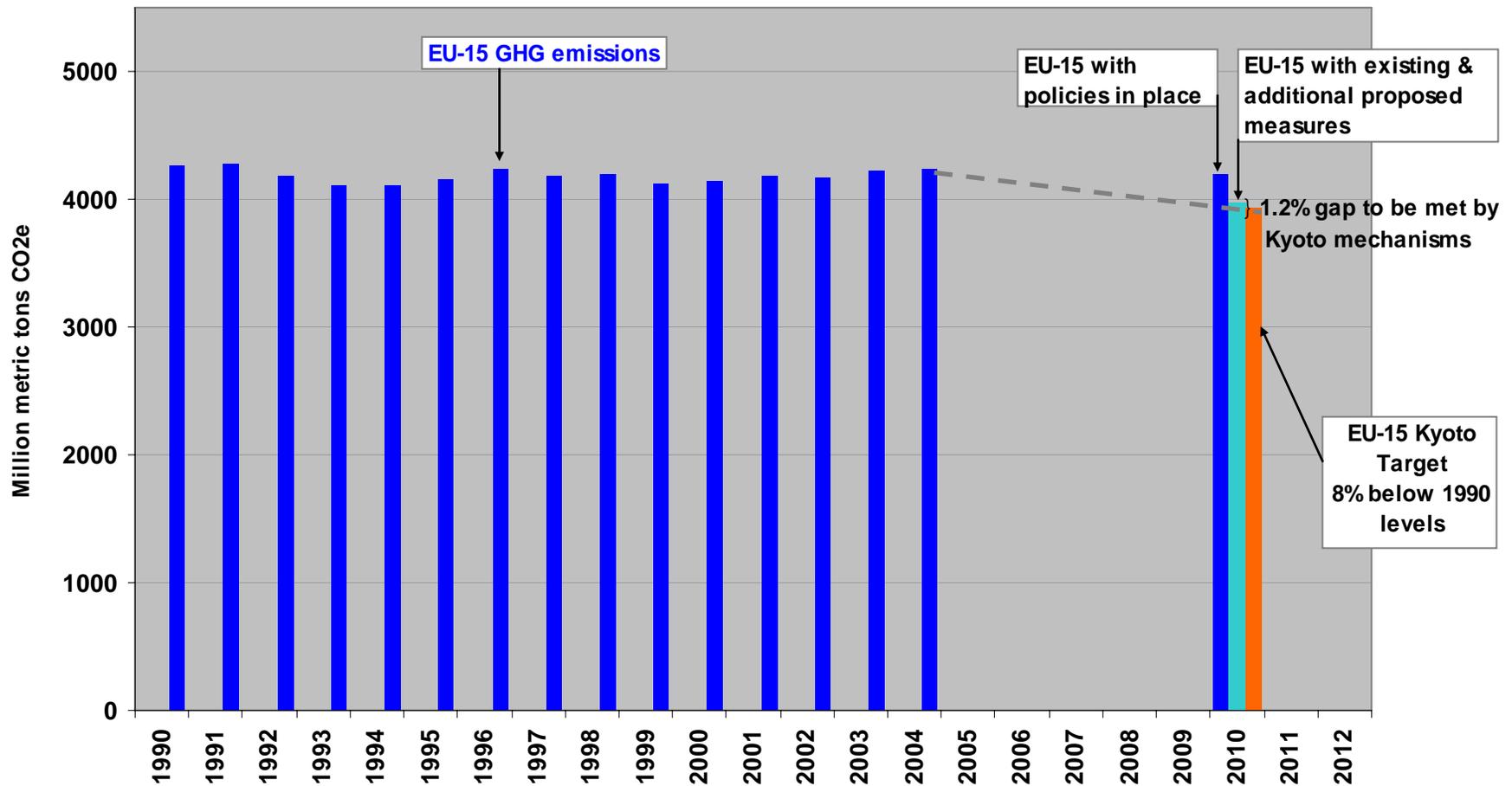
Greenhouse gas emission targets of EU-15 Member States for 2008–2012 relative to base-year emissions under the EU burden-sharing decision (19)



# EU GHG Emissions and Projections

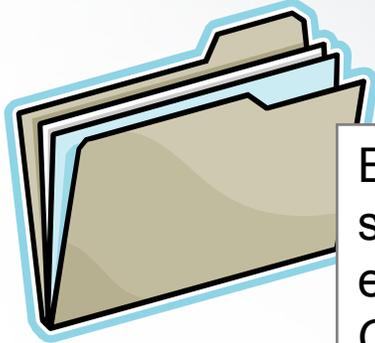


2004 EU-15 GHG emissions were 4,232 million metric tons CO<sub>2</sub>e



Source: Fourth National Communication from European Community (2006)

# EU Climate Change Program (ECCP)



ECCP is a broad portfolio of policies and measures across all sectors to reduce greenhouse gas emissions. One goal was to ensure that EU-15 will meet collective Kyoto target of reducing GHG emissions 8% below 1990 levels in the 2008-2012 period

- ECCP portfolio includes:
  - **Energy supply measures:** required promotion of renewable energy (21% of EU gross electricity consumption will be from renewable sources in 2010, currently at 14%)
  - **Energy demand measures:** 9% cut in energy consumption through efficiency (2008-2017)
  - **Transportation:** Commitments by car makers to reduce CO<sub>2</sub> emissions rate from new passenger cars by 25% below 1995 levels by 2008/2009
  - **Cross-cutting:** EU Emissions Trading Scheme (ETS)
  - Industry/Waste, Agriculture and forestry initiatives
  - Working groups to review ECCP to date, aviation, Carbon Capture and Storage (CCS), adaptation and review of EU ETS
- To achieve -8% target, EU will need
  - Additional measures
  - Clean Development Mechanism (CDM) and Joint Implementation (JI)
- Germany, Italy, UK, and Poland are M2M partners

# EU Emissions Trading Scheme (ETS)



## *EU ETS addresses 45% of all CO<sub>2</sub> emissions*

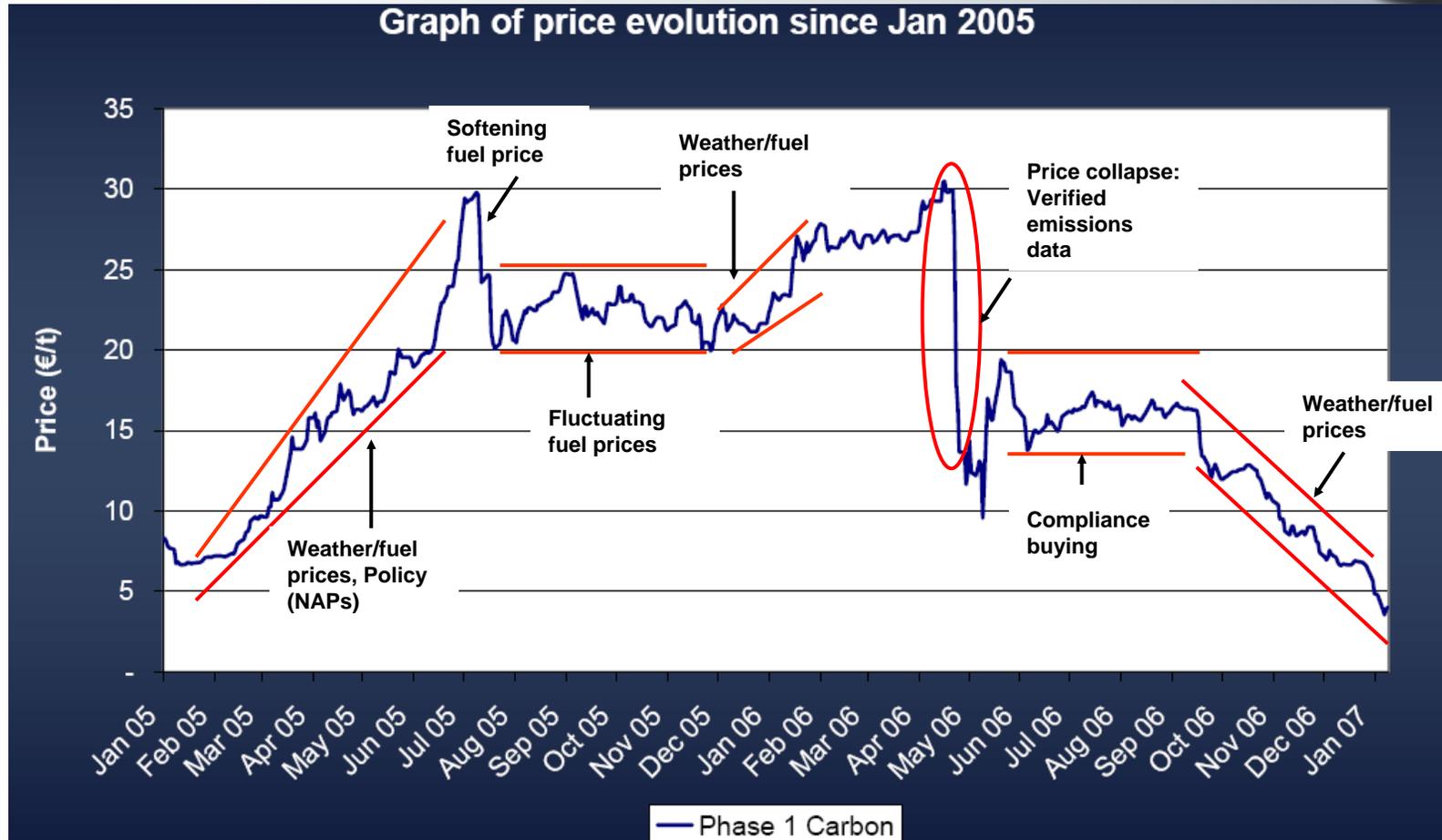
- **Caps and timing:** ~2.19 billion allowances issued annual, caps set by member states
  - 1<sup>st</sup> compliance period 2005-2007 covers only CO<sub>2</sub> emissions
  - 2<sup>nd</sup> period (2008-2012) also covers only CO<sub>2</sub> (other gases are opt-ins)
- **Coverage:** combustion and process emissions from electricity generation and selected industries
  - Energy activities, mineral oil refineries, coke ovens (installations with “rated thermal input”  $\geq 20$  MW)
  - Production and processing of ferrous metals
  - Minerals industry (includes cement, glass, ceramics, lime)
  - Pulp and paper production
- **Point of regulation**
  - Downstream
- **Allocation Approaches**
  - 1<sup>st</sup> period 95% of allowances must be allocated freely, 5% can be auctioned
  - 2<sup>nd</sup> period 90% of allowances must be allocated freely, 10% can be auctioned
- Use of Kyoto mechanisms (% of CDM credits allowed to be set by member states)
- Compliance and penalties
  - Penalties 1<sup>st</sup> period = €40/excess ton CO<sub>2</sub>
  - Penalties 2<sup>nd</sup> period = €100/excess ton CO<sub>2</sub>

# Market Size Comparison



	EU-ETS	U.S. Acid Rain
<b>Status</b>	Start-up period	Existing
<b>Sectors and applicability</b>	Electric power, oil refineries, coke ovens, metal ore & steel, cement kilns, glass, ceramics, paper & pulp	Electric power
<b>Regulated</b>	~11,400 facilities	3,000 units
<b>Political Jurisdiction</b>	25 (EU member states)	1 (U.S. Federal)
<b>Emissions covered</b>	CO <sub>2</sub>	SO <sub>2</sub>
<b>Project Offsets</b>	Yes	No
<b>Estimated value of annual allocation</b>	\$37 billion	\$3-5 billion

# EU Price Volatility



# Evaluating Emissions Trading



- Does it meet the environmental goal?
  - Are caps achieved?
  - Is monitoring accurate?
- Does the market work efficiently?
  - Sufficient sources for a liquid market?
  - Long-term certainty for investment planning?
- Is it a workable program administratively?

# EU ETS: Design and Implementation Lessons



- Caps
  - EU countries likely to meet Phase 1 cap
  - Preliminary Phase 2 caps are tighter
- Phased approach
  - Sources did not have temporal flexibility → lack of banking between periods
- Applicability –
  - Inclusive of largest emitters and sufficient sources for trading, but
  - Large number of small installations included,
    - ~36% of total installations, responsible for  $\leq 1\%$  of emissions
    - 7.5% of total installations, responsible for 75 % of emissions

# EU ETS: Design and Implementation Lessons



- Allocation
  - Large variability in allocation among member states
  - Failure to credit plant shutdowns
- Kyoto mechanisms
  - Infrastructure for accounting for CDM credits not in place
- Monitoring protocols clear and not burdensome
  - Some paper-based, some electronic reporting (Finland and others)
  - Annual reporting (more frequent in U.S.)
  - Initial release of monitoring data not coordinated
  - Role of third-party verifiers
- Allowance reconciliation
  - Functioning registry system to track allowances and ownership, but
  - Allowance transfers not public data

*EU ETS is looking to harmonize applicability across all participating countries...*

# EU Climate Policy Looking Forward



- EU ETS
  - Conducting review of ETS expected to be released by end of 2007
  - Extend post-2012 periods for long-term investment certainty (10 year periods?)
  - Linking
    - Norway
    - Discussions with the Northeast Regional Greenhouse Gas Initiative (RGGI), California, Australia
  - Expand to include other sectors
    - Aviation and other transportation
  - Expand to include other gases (opt-ins)
    - N<sub>2</sub>O from stationary combustion
    - Methane from gas engines and coal, oil and gas production
  - Recognize carbon capture and storage (CCS) as opt-in
  - EU-wide cap, not by country?

# For more information



Reid Harvey  
Climate Change Division, U.S. EPA

[harvey.reid@epa.gov](mailto:harvey.reid@epa.gov)

<http://www.epa.gov/climatechange>