

Overview of U.S. and European Climate Change Programs



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Presented at LSU Energy Summit
October 24, 2007



Outline



- US State and Regional Climate Programs
- US Federal Climate Initiatives
- European Climate Programs

State Actions on Climate Change



Type of Action	Number of States
Regional Greenhouse Gas Initiative (RGGI)	9
Statewide GHG Emission Cap (CA)	1
Renewable Energy Portfolio Standards	23
GHG Emission Targets	14
Vehicle GHG Emission Standards	11
Mandatory Reporting for Stationary Sources	7
Eastern Climate Registry	10
Multi-State Climate Registry	38
Western Regional Climate Action Initiative	5

Regional GHG Initiative (RGGI)



- Regional cap-and-trade program covering the Electric power sector
- Ten states in New England and Mid-Atlantic have joined
- **Cap and Timing:**
 - Phase I (2009-2015): Stabilize emissions to about 2000-2004 levels
 - Phase II (2015-2020): Reduce emissions 10% from Phase 1; about 1990 levels



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 CO₂ (this is a little above 2000-2004 levels)
 - Phase II (2015-2020) 10% reduction from Phase 1 (roughly equivalent to 1990 levels)
- **Flexible mechanisms:**
 - Cap and trade
 - Banking of allowances
 - Domestic offsets
 - International offsets

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

California Climate Policies



- **GHG Cap:**
 - Legislation (AB 32) signed in September 2006
 - Requires regulations to reduce California's GHG emissions 25 percent by 2020
 - Mandatory statewide caps begin in 2012
- **GHG Standards:**
 - Power sector standard (SB 1368) signed September 2006; requires all electricity in CA to have CO₂ emissions rate equal to clean natural gas
 - Vehicle standards:
 - New vehicles sold for 2009 model year and beyond must meet GHG emissions standard
 - 10 other states have adopted the law; litigation underway

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.

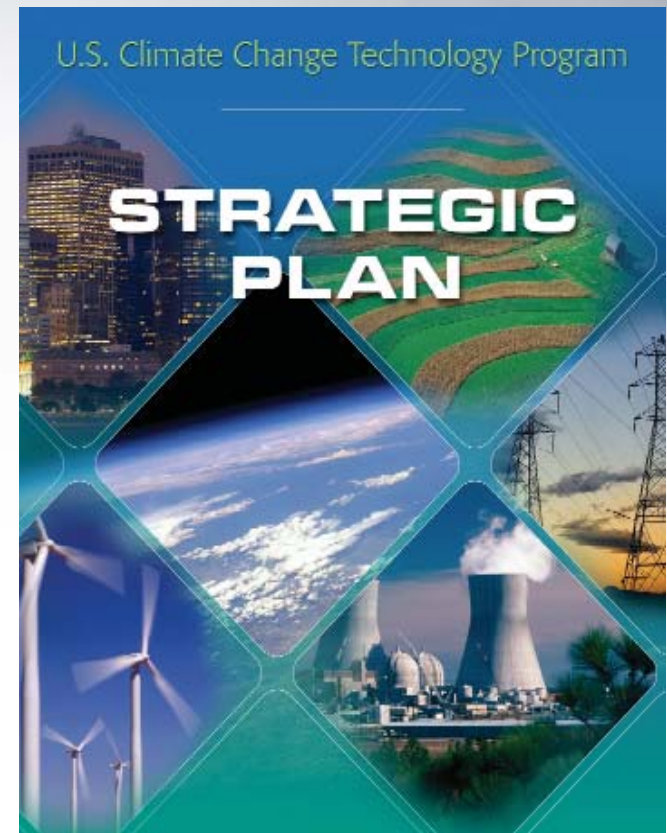
US Federal Initiatives



U.S. Climate Change Technology Program (CCTP)



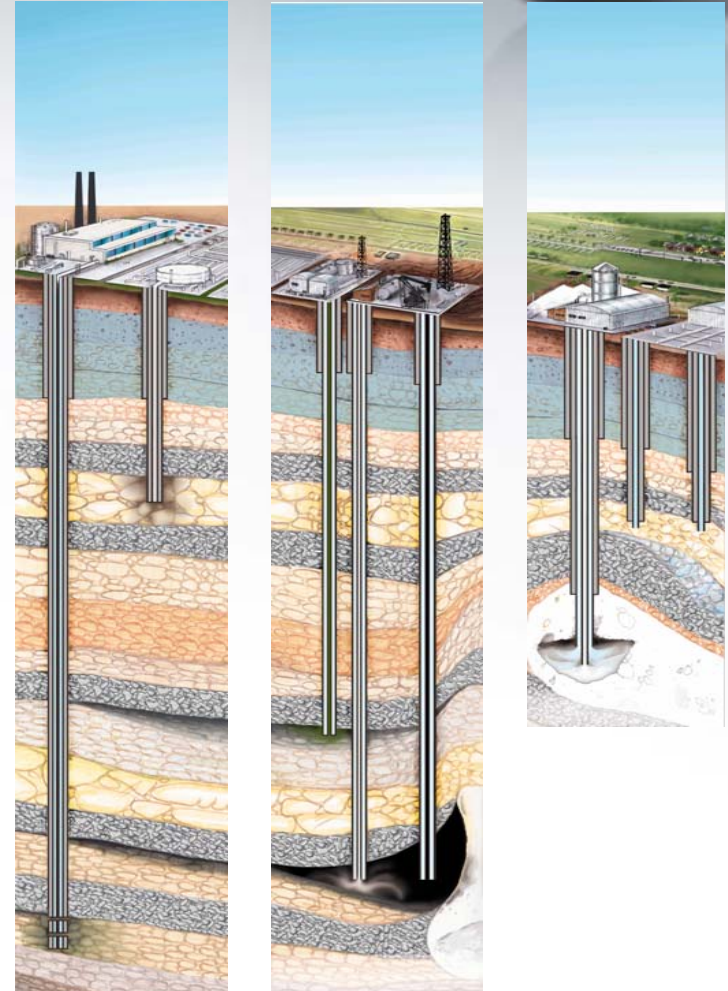
- Annual investment of more than \$5 billion in climate change research, technology, and tax incentives
- U.S. Climate Change Technology Program – 6 Working Groups:
 - 1) Reduce emissions from energy use
 - 2) Reduce emissions from energy supply
 - 3) Capture/sequester CO₂
 - 4) Reduce emissions of non-CO₂ GHGs
 - 5) Improve capabilities to measure and monitor GHG emissions
 - 6) Bolster contributions of basic science to technology development



Geologic Carbon Sequestration



- Carbon dioxide capture and storage (CCS) is an important longer-term climate mitigation technology
 - US has large underground storage reservoirs
 - Successful deployment of technology would enable large GHG reductions with continued use of fossil fuels (especially coal)
- DOE leads U.S. R&D efforts to advance CCS technologies including FutureGen and Regional Sequestration Partnerships
- EPA is working with DOE, with a focus on risk assessment and to ensure R&D supports regulatory development
 - Co-led by Office of Water (Underground Injection Control Program) and Office of Air (Climate Change Division)



Climate Technology-Related EPA Programs



- **Energy Efficiency**
 - ENERGY STAR
 - Qualified Projects
 - Commercial and Industrial
 - Residential Homes
 - National Action Plan on Energy Efficiency (NAPEE)
- **Clean Energy Development**
 - Green Power Partnership
 - Combined Heat and Power Partnership
- **Cross-Sectoral Initiatives**
 - Climate Leaders
 - State Energy-Environment Partnerships
- **Non-CO₂ Gases**
 - Methane
 - High-Global Warming Potential
- **International**
 - Methane to Markets
 - Asia-Pacific Partnership
- **Transportation**
 - Renewable Fuels
 - Fuel Efficiency
 - Hydraulic Hybrid
- **Water Quality**
 - Underground Injection Control
- **OSW**
 - WiseWise Partnerships

GHG transportation rules



- President's announcement of May 14 Executive Order
 - EPA to engage in interagency process
 - Use available authority to develop regulations to respond, in part, to Supreme Court's decision in *Mass v. EPA*
 - Issue proposed rule for comment, final rule by end of 2008

- President's 20-in-10 goal
 - Reduce gasoline consumption by 20% in 10 yrs (2017)
 - Vehicles
 - Reduce projected annual gasoline use by up to 8.5 billion gallons: an estimated 5% reduction in gasoline use
 - Would require on average up to a 4% increase/yr in fuel economy for new vehicles
 - Fuels
 - 35 billion gallons (ethanol equivalent) of renewable and alternative fuels, phased in 2010 to 2017

US International Initiatives



- Multilateral initiatives
 - Asia Pacific Partnership
 - Methane to Markets
 - Sequestration, Hydrogen, and Nuclear Initiatives
- Major Economies process - by end of 2008
 - Long-term global goals
 - Nationally defined mid-term goals and strategies
 - Sector-based approaches for improving energy security and reducing greenhouse gas emissions

Methane to Markets: International Opportunities



- Goal: Advance cost-effective recovery and use of methane as a valuable clean energy source in four sectors:
 - Coal mines
 - Landfills
 - Oil and gas systems
 - Agriculture (manure waste management)
- 20 Partner Countries
- Over 500 Project Network Members:
 - Private firms
 - Multilateral development banks
 - Government agencies/corporations
 - Other NGOs
- *New Opportunity: Partnership Expo, Beijing (Oct-Nov, 2007)*



European Programs





European Union



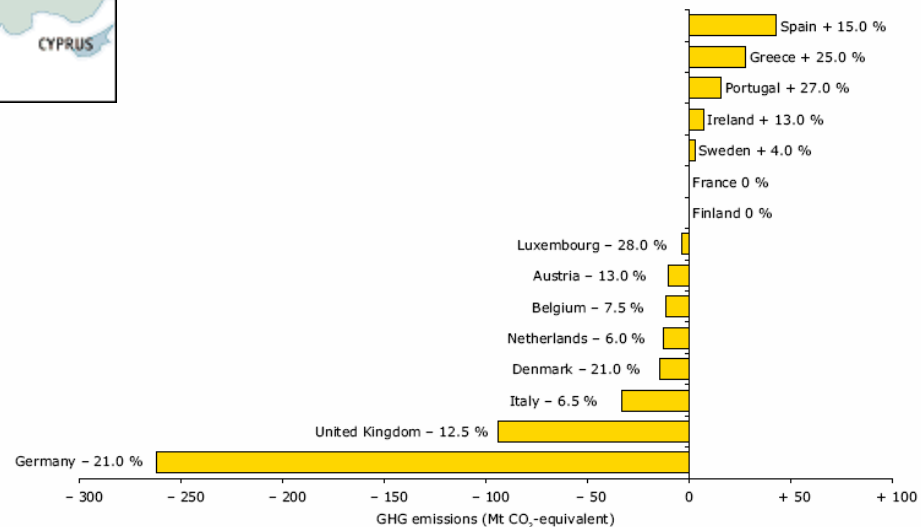
Within EU

- 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)

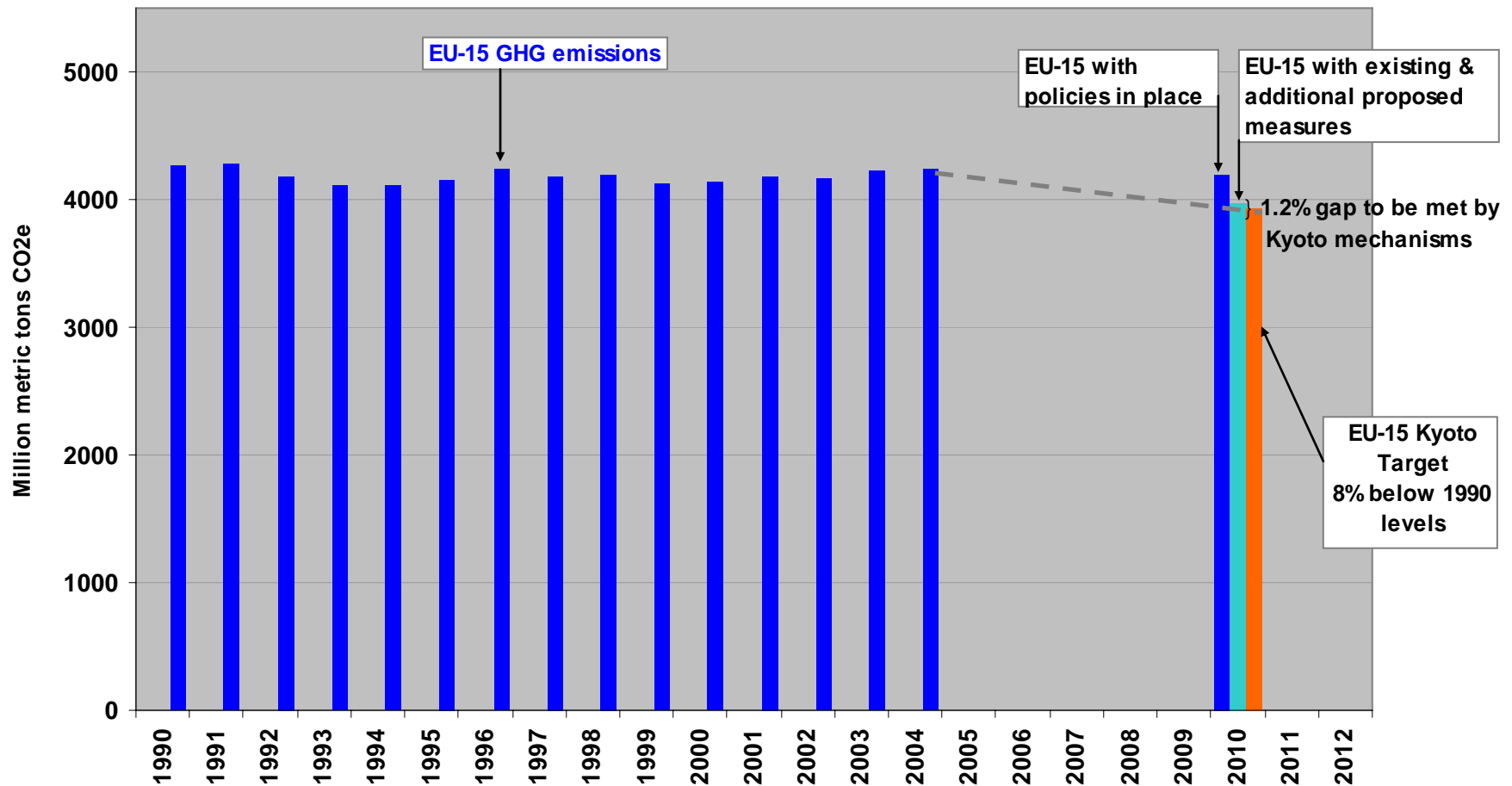
Greenhouse gas emission targets of EU-15 Member States for 2008–2012 relative to base-year emissions under the EU burden-sharing decision ⁽¹⁹⁾





EU GHG Emissions and Projections

2004 EU-15 GHG emissions were 4,232 million metric tons CO₂e



Source: Fourth National Communication from European Community (2006)

EU Emissions Trading Scheme (ETS)



EU ETS addresses 45% of all CO₂ emissions

- **Caps and timing:** ~2.19 billion allowances issued annual, caps set by member states
 - 1st compliance period 2005-2007 covers only CO₂ emissions
 - 2nd period (2008-2012) also covers only CO₂ (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**
 - 1st period 95% of allowances must be allocated freely, 5% can be auctioned
 - 2nd 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 1st period = €40/excess ton CO₂
 - Penalties 2nd period = €100/excess ton CO₂

Market Size Comparison



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

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)
 - N₂O 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



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