Business Council for Sustainable Energy

Technology and Market Roadmap to 2020

December 4, 2008

14th Conference of the Parties to the UNFCCC

Poznan, Poland

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Urgency to Reduce GHG Emissions: Why & How

Dave Schnaars
Manager, Environmental Strategies

December 4, 2008

Avoidance of Irreversible Climate Change

Hold Increase in Global Surface Temperature to 2º C over Pre-Industrial Level

Reduce Global GHG Emissions by 50% Below 1990 Levels by 2050

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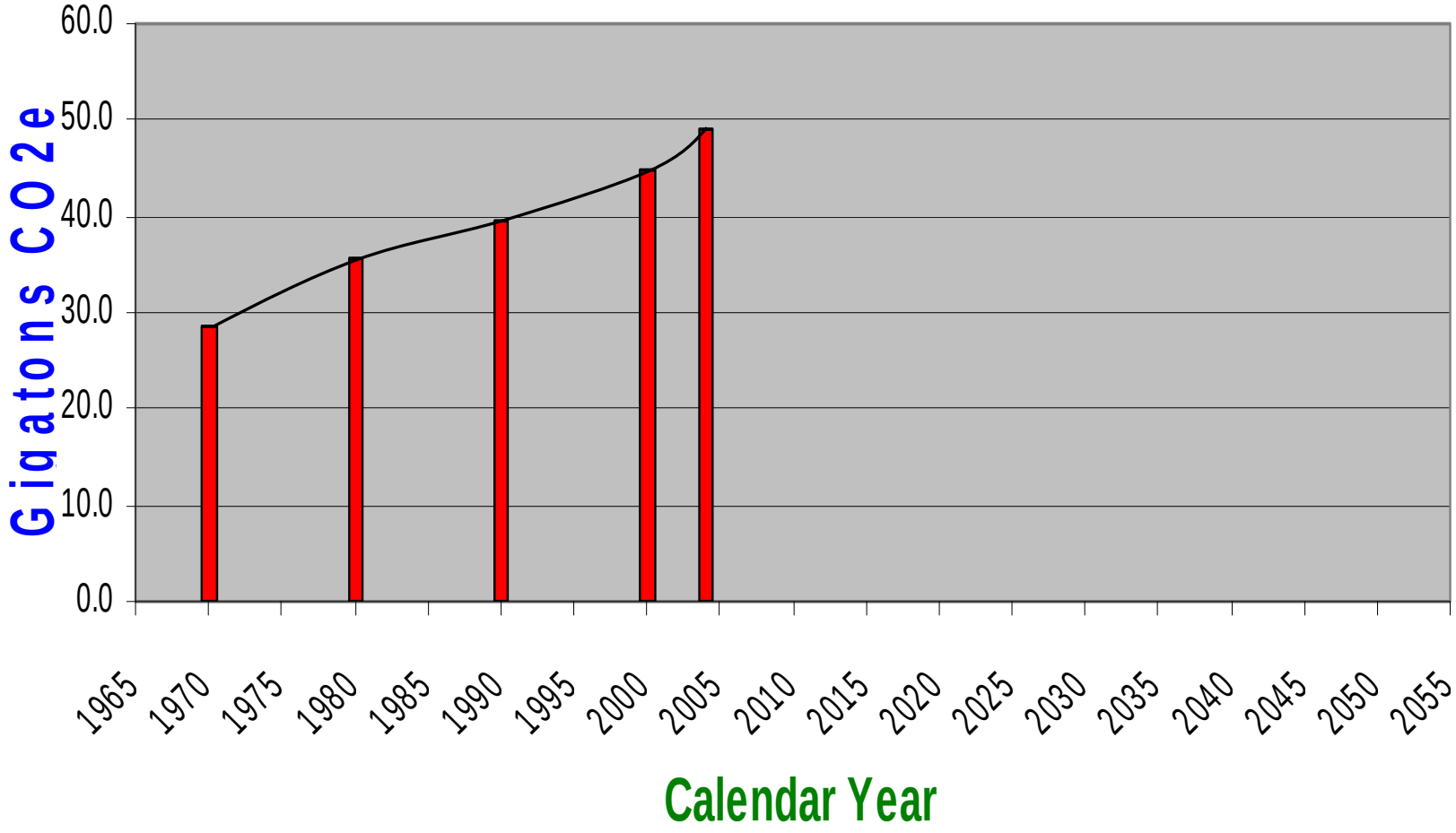
Global Anthropogenic GHG Emissions 1970-2004



Source:IPCC AR4, Synthesis Report

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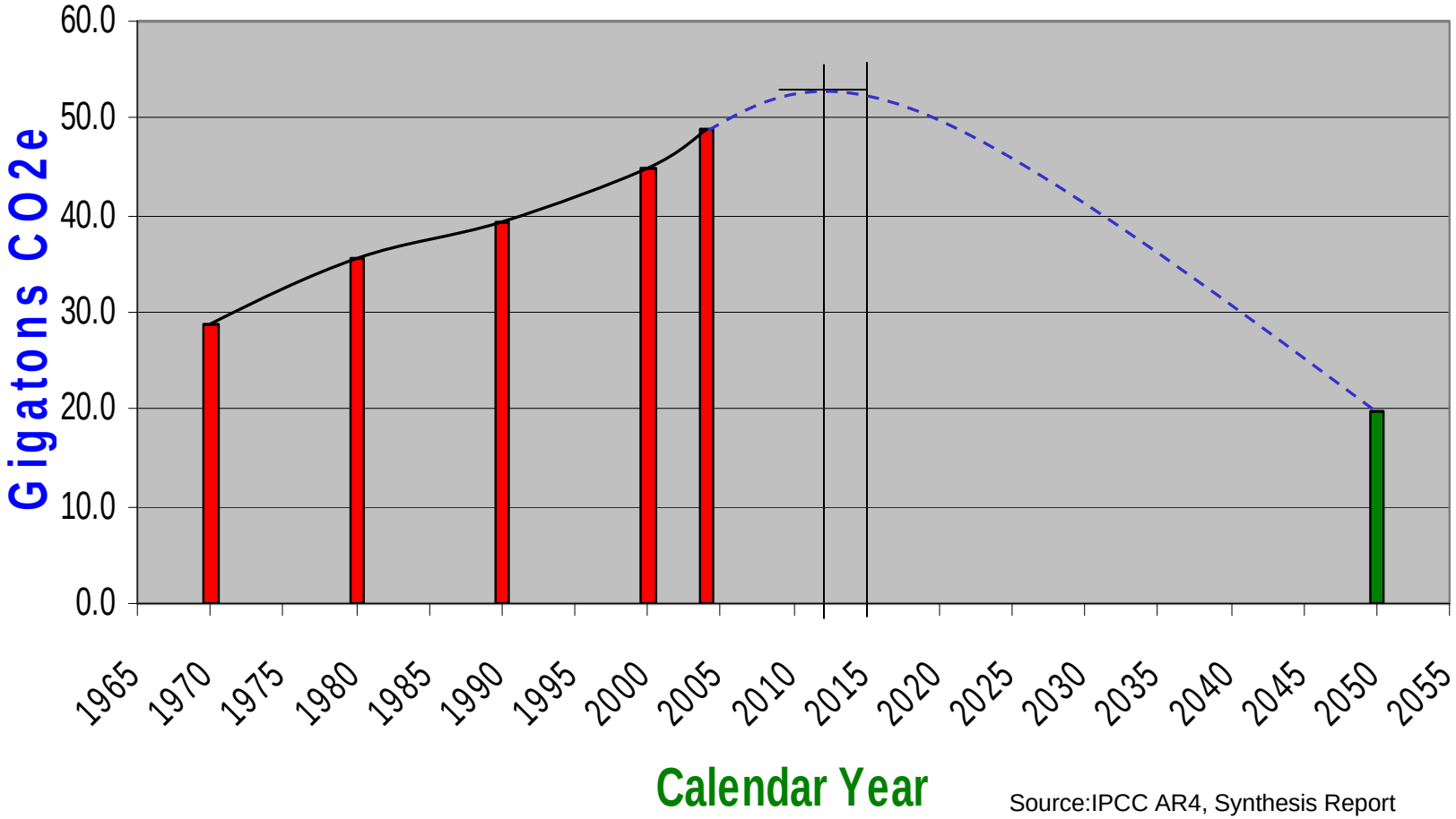
GHG Emissions Reductions Required to Limit Temp. Rise to 2º C



Source:IPCC AR4, Synthesis Report

GHG Emissions Reductions from Industrialized Countries

World GHG emissions must peak by 2015 to limit global temperature rise to 2 to 2.4º C over pre-industrial times

GHG emissions reductions from industrialized countries must be in the range of 25-40% below 1990 levels by 2020.

GHG emissions reductions from industrialized countries must be in the range of 80-95% below 1990 levels by 2050.

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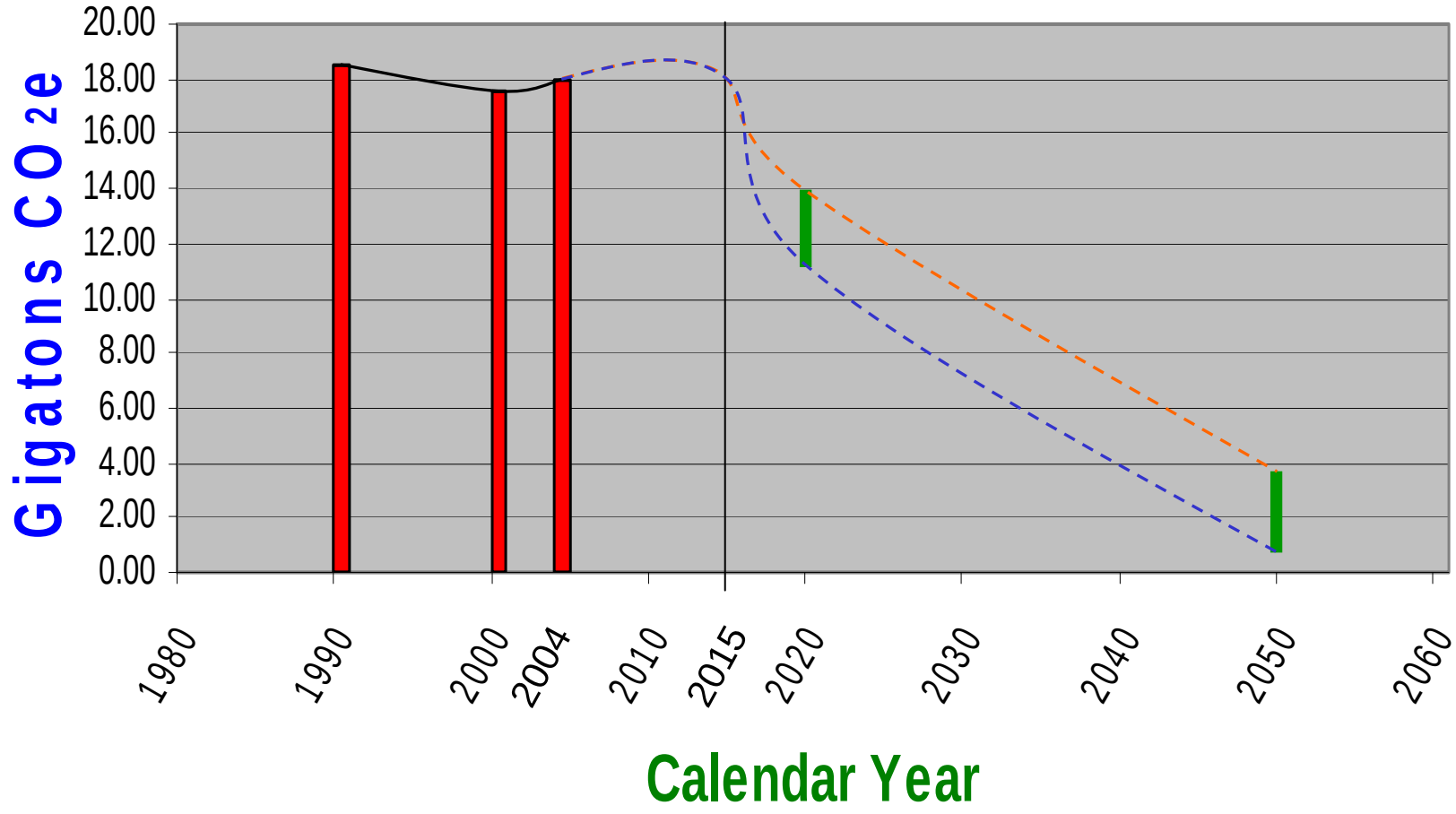
GHG Emissions Reductions from Industrialized Countries



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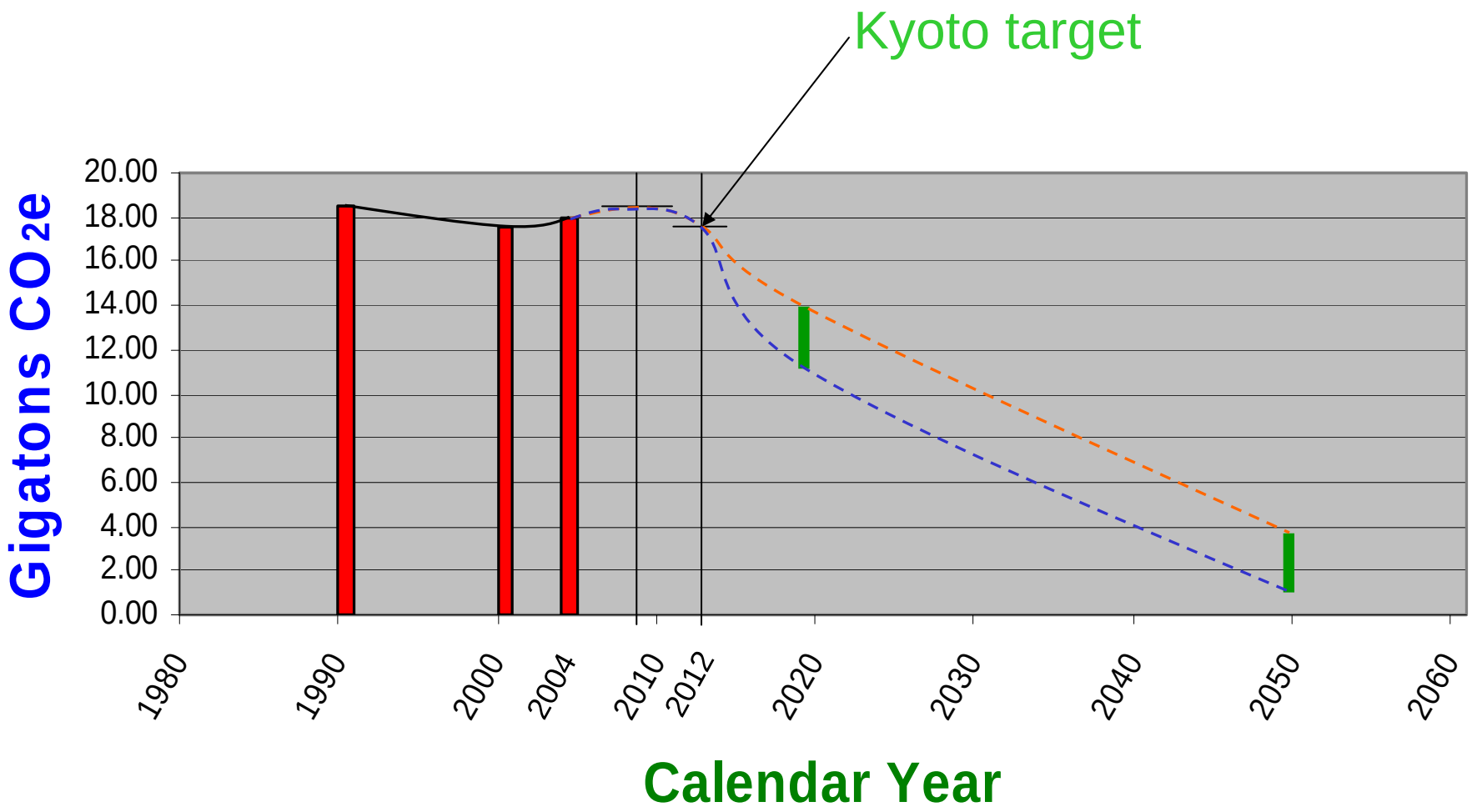
GHG Emissions Reductions from Industrialized Countries



Near-Term Climate Mitigation Strategies

Immediately deploy GHG emissions measures we have available today:

- Renewable energy
- Supply- and demand-side energy efficiency
- Natural gas

Develop stable and long-term climate change mitigation policies with price signals that encourage low and zero carbon investments

Widely employ market incentives, such as offsets, to minimize emissions reduction costs

Why Deploy Today's Clean Technologies

We have powerful tools to immediately combat climate change while we concurrently develop longer-term sustainable technologies for the future

The current global financial climate only increases the need for urgent action:

"We cannot let the financial and economic crisis delay the policy action that is urgently needed to ensure secure energy supplies and to curtail emissions of greenhouse gases. We must usher in a global energy revolution by improving energy efficiency and increasing deployment of low-carbon energy" – Nobuo Tanaka, Exec. Director IEA.

Why Deploy Today's Clean Technologies

In this environment, companies must become smarter and more energy efficient to remain or become sustainable enterprises

Deployment of clean technologies will foster a more competitive marketplace while simultaneously reducing GHG emissions

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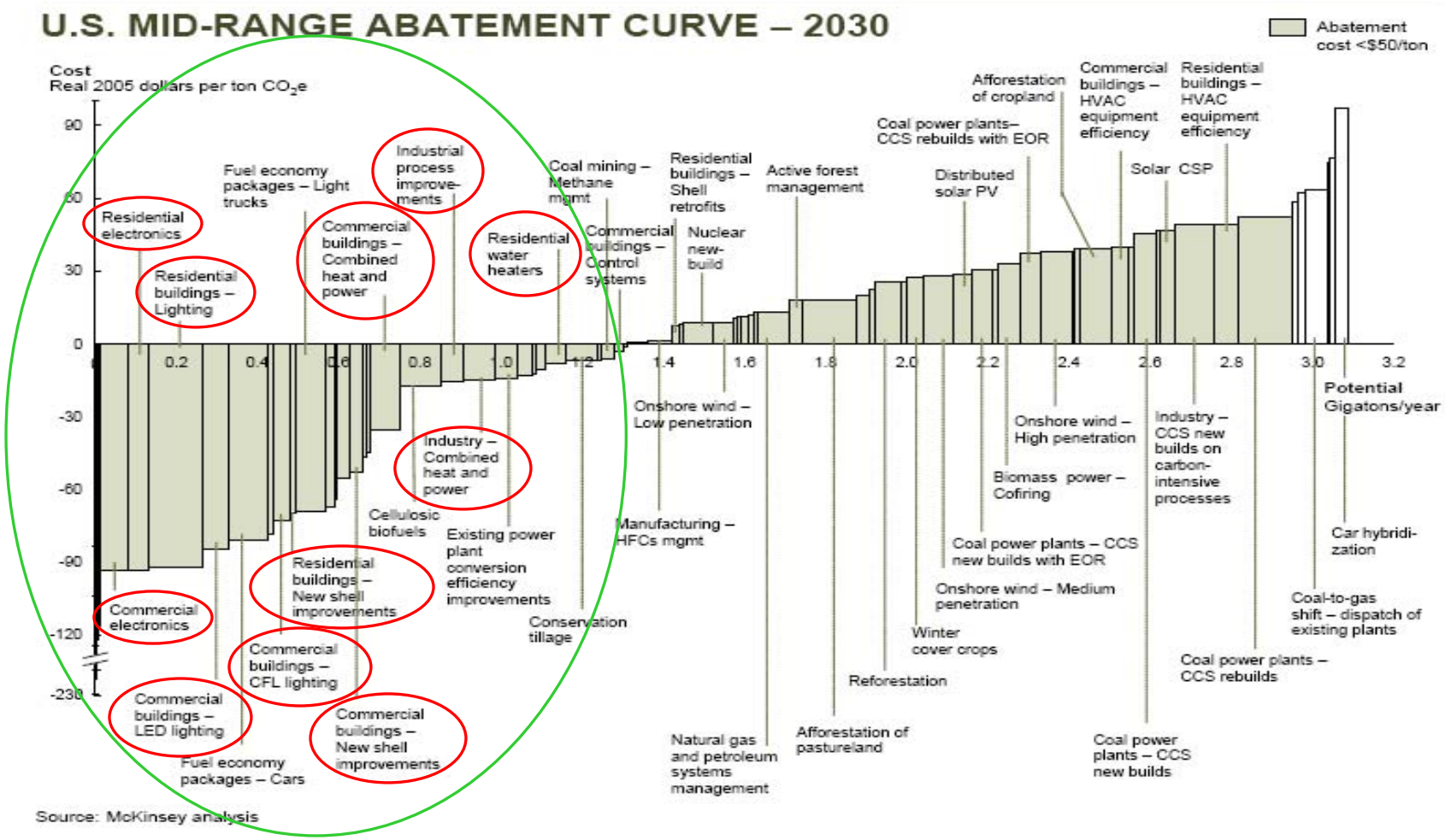
Examples of Today's Cost Effective Clean Technologies



Source: McKinsey & Co: Reducing U.S. Greenhouse Gases: How Much at What cost?, 2007

In Conclusion

The need for immediate action to avoid dangerous climate change is clear and urgent

Renewable energy, energy efficiency and natural gas present a portfolio of clean technologies which are deployable today

Climate change mitigation efforts over the next 10-15 years will have a pivotal role in our ability to reach a sustainable atmospheric CO_2 concentration level by 2050

Interstate Natural Gas Association of America

Business Council For Sustainable Energy Side Event
Technology And Market Roadmap to 2020

December 4, 2008
UNFCCC COP 14 - Poznan, Poland

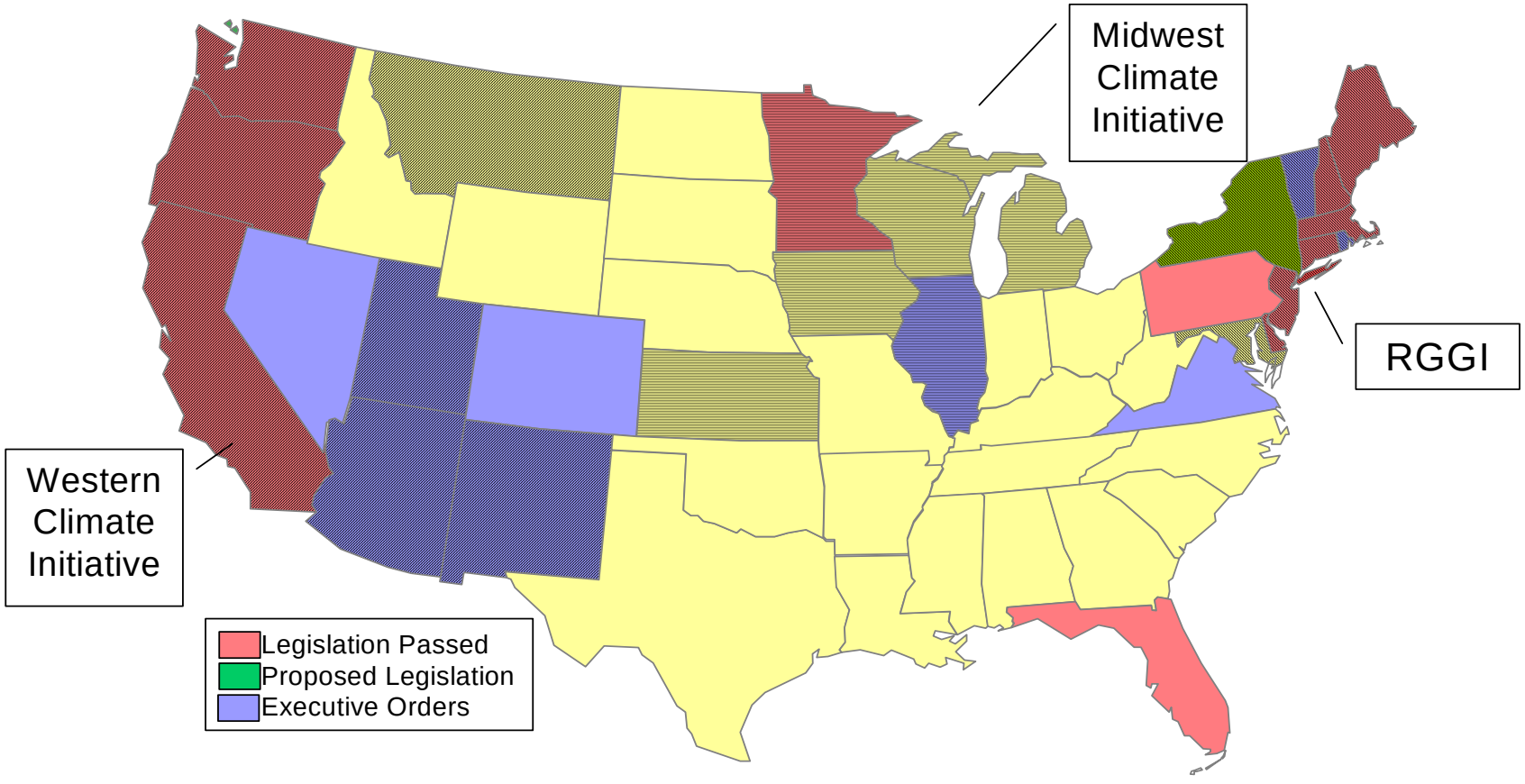
Lisa Beal
Director, Interstate Natural Gas Association of America
Washington, DC
LBeal@INGAA.ORG

- States are continuing to develop and implement individual and regional programs.
- An aggressive federal bill (S 3036) has been debated in the Senate.
  - Federal legislation will not pass before 2009 but the program details will continue to be hammered out.
- The structure is likely to be a hybrid, multi-sector cap and trade approach with complementary policies.
- How the reductions will be achieved and how the markets and energy infrastructure will change is still matter of great mystery and debate.
- Treatment of natural gas sector is still being sorted out.

State Climate Change Activities

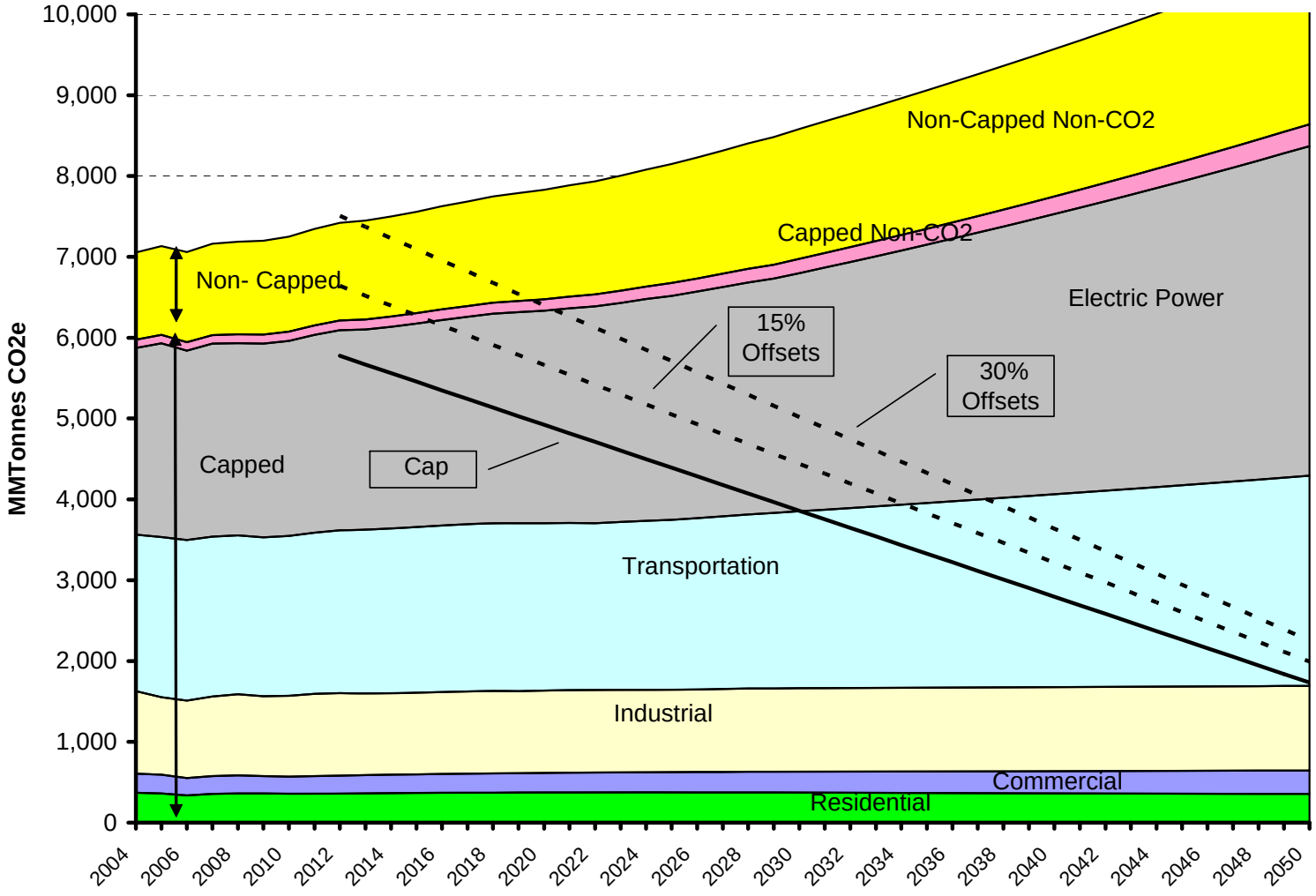
- In the absence of Federal action on climate change, states have been leading the charge.
- 33 states have developed Climate Change Plans with non-binding goals.
- 20 states have Executive Orders or legislation setting specific reduction targets.
- Regional/multi-state programs are proliferating.
- 25 states, comprising over 60% of U.S. GDP, have some form of binding target.

U.S. State Climate Actions



- Many bills offered in 2007, mostly in the Senate.
- Lieberman/Warner bill, S. 2191 emerged as the survivor in the Senate late in the year.
- Revised and brought to the full Senate as Lieberman/Warner/Boxer S. 3036 in June 2008.
  - Only limited discussion before being dropped on procedural grounds.
- Comparable House bill released by Representatives Dingell and Boucher in October.
- Positioning continuing for 2009.

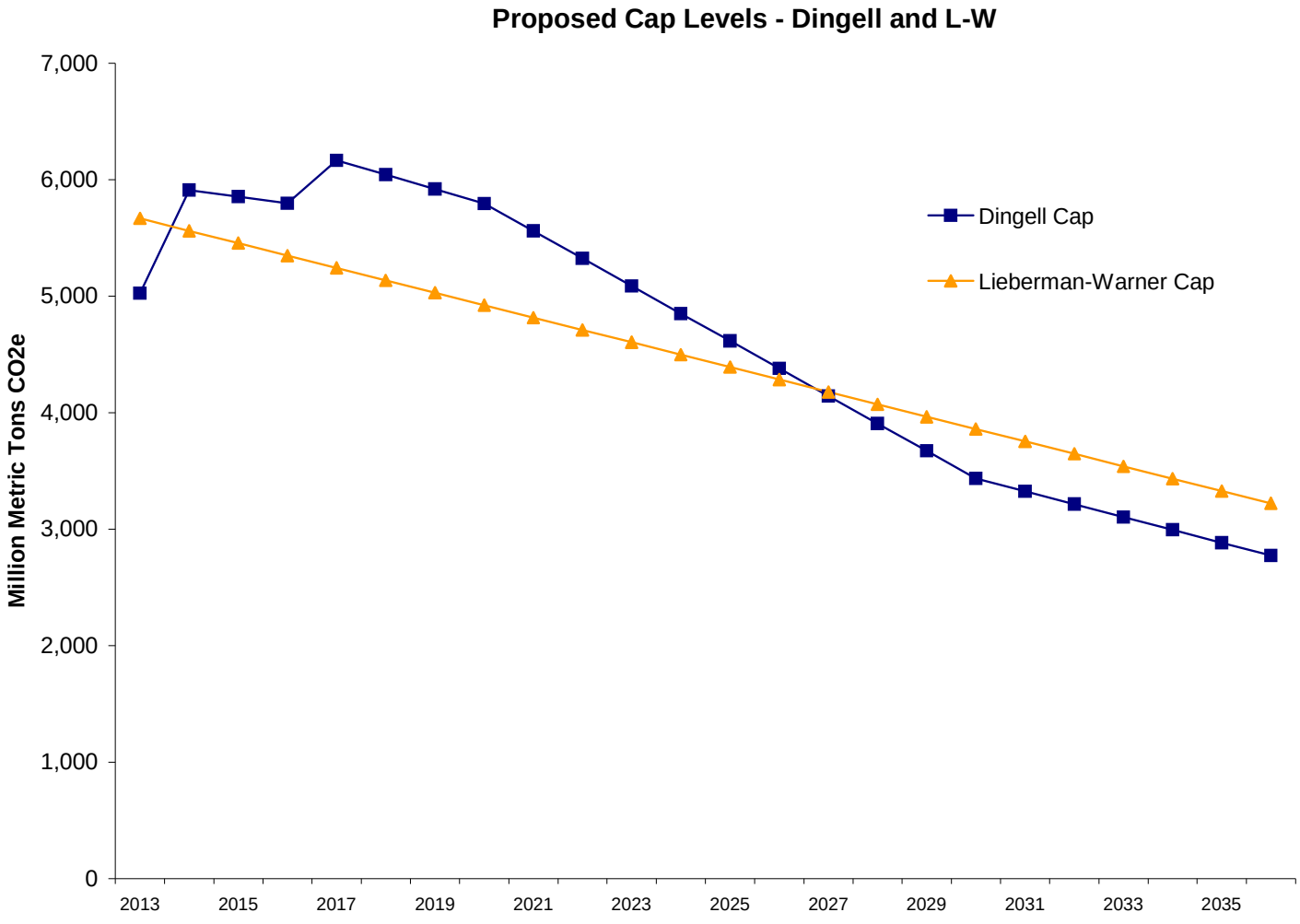
Proposed S. 3036 Cap on U.S. GHGs



Dingell/Boucher Proposal

- House entry in this year's proposals – released October 6, 2008
- No time for discussion this year, but tables a number of notable changes and modifications to Lieberman/Warner.
- Large emitters regulated downstream, transportation upstream, small emitters via LDC.
- Larger threshold for regulation – 25,000 tons/yr vs 10.000 tons/yr in earlier bills.
- Phased introduction of cap and transition to full auctions with proceeds earmarked for technology and efficiency.
- Pre-emption of state cap and trade programs.
- Banking, borrowing, offsets and strategic allowance reserve.
- Complimentary regulation of small sources and transportation.

Simple Cap Comparison – LW/DB



One More Thing...

- In response to a Supreme Court ruling affirming the EPA's authority to regulate CO_2, the EPA released the Advanced Notice of Proposed Rulemaking (ANPR).
- Lays out alternative approaches to regulating GHGs under existing regulatory structures.
- Designed to encourage legislative alternatives but provides a roadmap for regulatory paths in the absence of legislation.
- Obama administration more likely to pursue direct regulation in the absence of legislation.

Where Do We Go From Here?

- No further Congressional action this year.
- New Administration will set the agenda for possible legislation in 2009 or early 2010.
- If federal legislation is not forthcoming, state activity will continue, and may continue anyway. Conventional regulation is an option.
- Discussion of international framework will continue – Annex I countries making commitments.
- Non-annex I countries may act without joining international framework.
- U.S. may leapfrog other countries and try to develop a new framework.

The Role of Renewables and EE in California and the Western Climate Initiative

Obadiah Bartholomy

Sacramento Municipal Utility District

December 4th, 2008

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The Power To Do More.

Overview

- Climate Regulations in California
- Participation in a Western Climate Initiative
- Role of Renewables and Energy Efficiency

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California's Climate Regulations

- Implementation by the Air Resources Board
  - Statutory requirement to return to 1990 levels by 2020
  - Implementation Plan calls for 80% of reductions through Direct Regulation, only 20% left to cap and trade

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California's Climate Regulations

- Electric Sector leaned on heavily
  - Sector represents 25% of the emissions, sector will be asked to provide 26% of reductions through direct regulation, and will participate in cap and trade for additional reductions
  - Primary reduction mechanisms involve replacement of coal with renewables and energy efficiency

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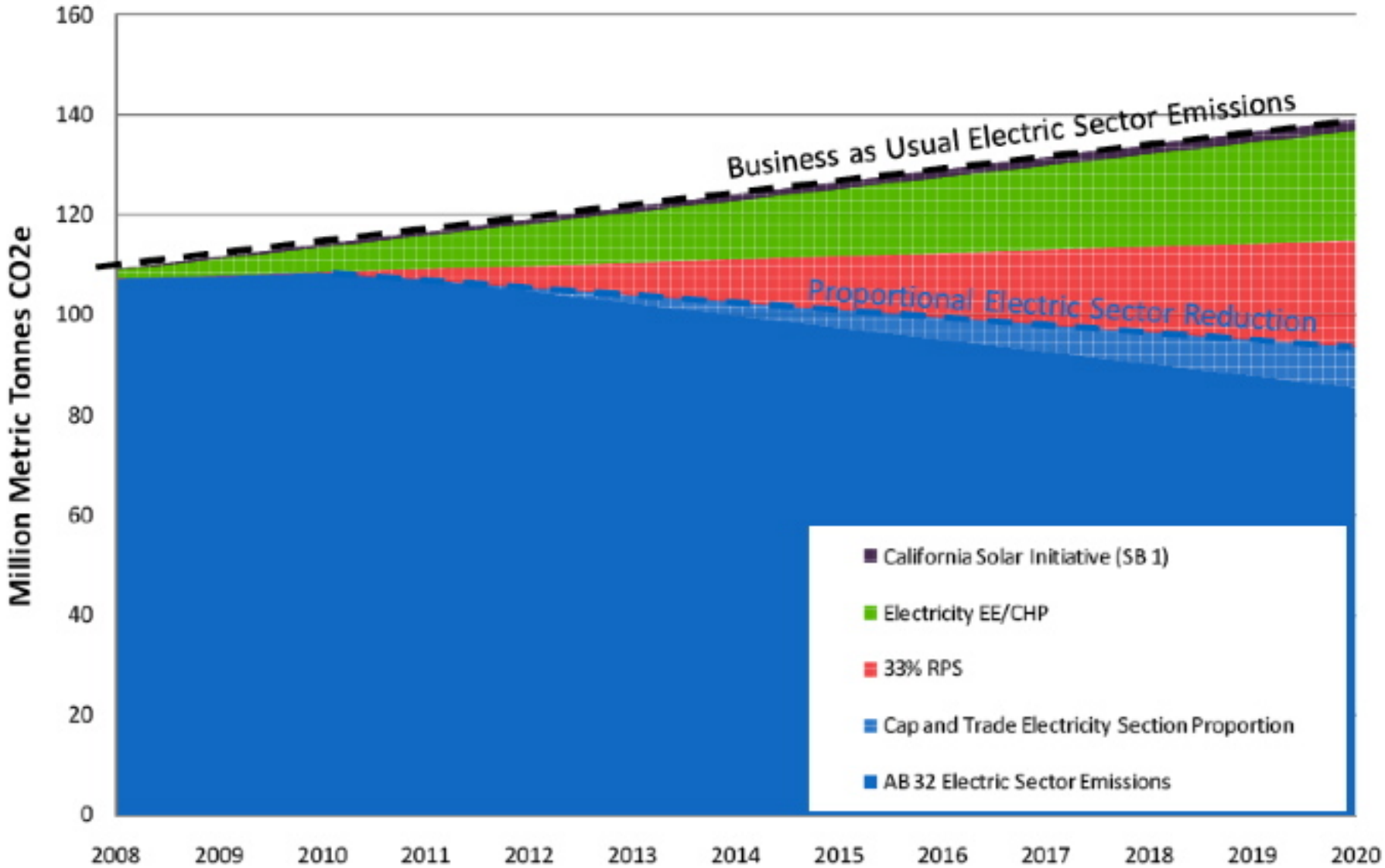
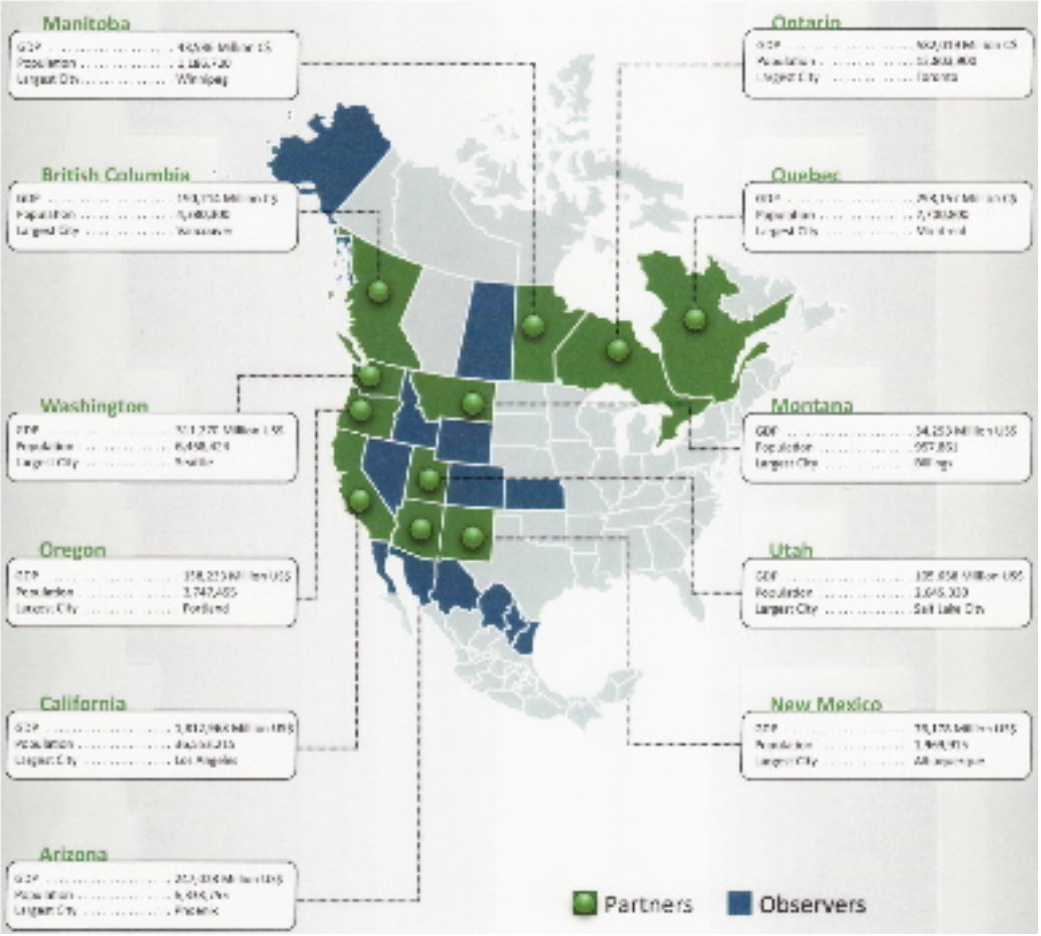
Electricity Sector Reduction Measures



Western Climate Initiative (WCI)

- 7 Western States and 4 Canadian Provinces
  - 85 million people
  - ~1.3 Billion Tonnes CO2e
- Regional Target of 15% emissions reduction from 2005 Emissions
- Non-WCI Electricity Imports Included
- Strong Role for Renewable Energy and Efficiency in framework, but left to states to implement



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Role of Renewables and Energy Efficiency

- California recommendation to dedicate electric sector auction revenue to renewables and energy efficiency
- All participating states have Renewable Portfolio Standards requiring on average ~20-25% non-hydro renewables by 2020
- Regional coordinated effort to bring on 30 GW of renewable energy by 2015
  - Western states working together to identify preferred renewable energy zones and transmission routes
  - Primary resources will be new wind and solar
- California requirements will likely more than double current levels of efficiency spending to ~$2 Billion per year
  - CA target of 100% zero net energy new homes by 2020, commercial buildings by 2030
  - Local governments tightening building standards even faster

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Summary

- Broad recognition in California and WCI that efficiency will be the cornerstone of meeting our climate targets
- Economic modeling confirms need for much more aggressive EE policies
- Regional coordination on renewables development will expedite construction of necessary infrastructure
- Focus on buildings will reverse growth in energy demand through both efficiency and on-site renewable generation

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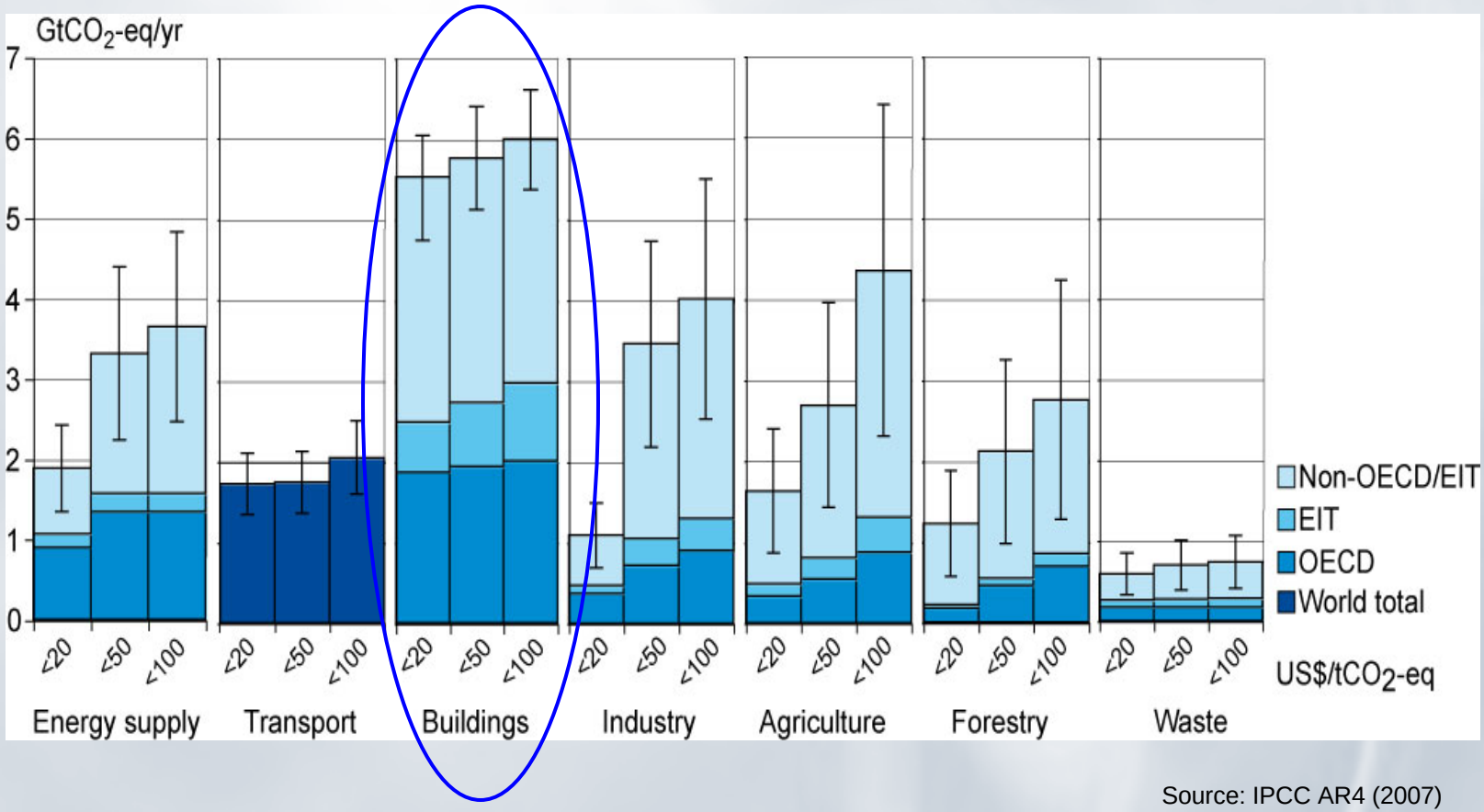
Shaping Post-2012: Building sector example

Jeff Moe

VP & Chairman,
Environmental Policy Council

Trane,
a business of Ingersoll Rand

Buildings:
Significant source for GHG mitigation



Source: IPCC AR4 (2007)

Green Buildings: Cost effective GHG mitigation

- **Significant variance in CO2 eq emissions between standard and high efficiency buildings**
  - Even more significant for existing buildings
- **Green buildings can have slightly higher first costs (+3-5%)…**

  …but, they also deliver lower life cycle costs

Green buildings represent a small portion of today's building sector

Problem or opportunity?

What is needed to capture this opportunity for emission reductions?

- **Technology can be improved…but superior technology EXISTS TODAY**
- **These technologies are not proprietary**
- **Consumers need clear & certain policy signals to make investment in green buildings economically viable**
- **National program policy signals need to be clear, but they do not need to be large**

GHG mitigation is not only possible, but readily available today

National program implementation ideas

- **Tax rebates**
- **Low or zero interest loans**
- **Green building portfolio standards**
- **National cap & trade revenues to fund green buildings**

Elements of these can be seen in recent legislative drafts in the US

Help consumers make financial decisions that are also right for climate

Post-2012 Treaty Needs

International Treaty needs to include medium and long-term policy direction & clear price signals:

- Governments shall adopt policies & standards to drive green buildings as a significant source of GHG mitigation
- The CDM needs to be streamlined to better support individual, new and existing building projects

Critical to drive consistent and effective national plan development

EcoSecurities Group plc

Carbon Market Trends & Role of Offsets

Side Event: Technology & Market Roadmap to 2020—U.S. Clean Energy Businesses Urge Action

Business Council for Sustainable Energy

December 4th, 2008, 6-7:30pm

COP14, Poznan Poland

Context is Important

- There is an urgent need for action
- Existing technologies are a crucial bridge to get us to the interim 2020 targets
- Need to think about the best policies and incentives to promote deployment of these technologies

Offset mechanisms are an existing and tested, *if imperfect*, mechanism to existing clean tech deployment by 2020

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Carbon Market Trends

- The world's carbon market exchanged 1.84 billion tCO2e in the first half of '08, up 56% on the same period last year
- World GHG markets were worth €38 billion in H1 2008 (**US$59 billion**), up 41% on H1 2007, suggesting a weighted average world carbon price of €20.61 ($32.25)/ tCO2e
- Total volume in the CDM market was 502 Mt CO2e, with a value of €7.6 billion (**US$9.6 billion**)
- In the voluntary market 42MtCO2e transacted in 2007 worth **USD$265 million;** 23% of projects were located in the US

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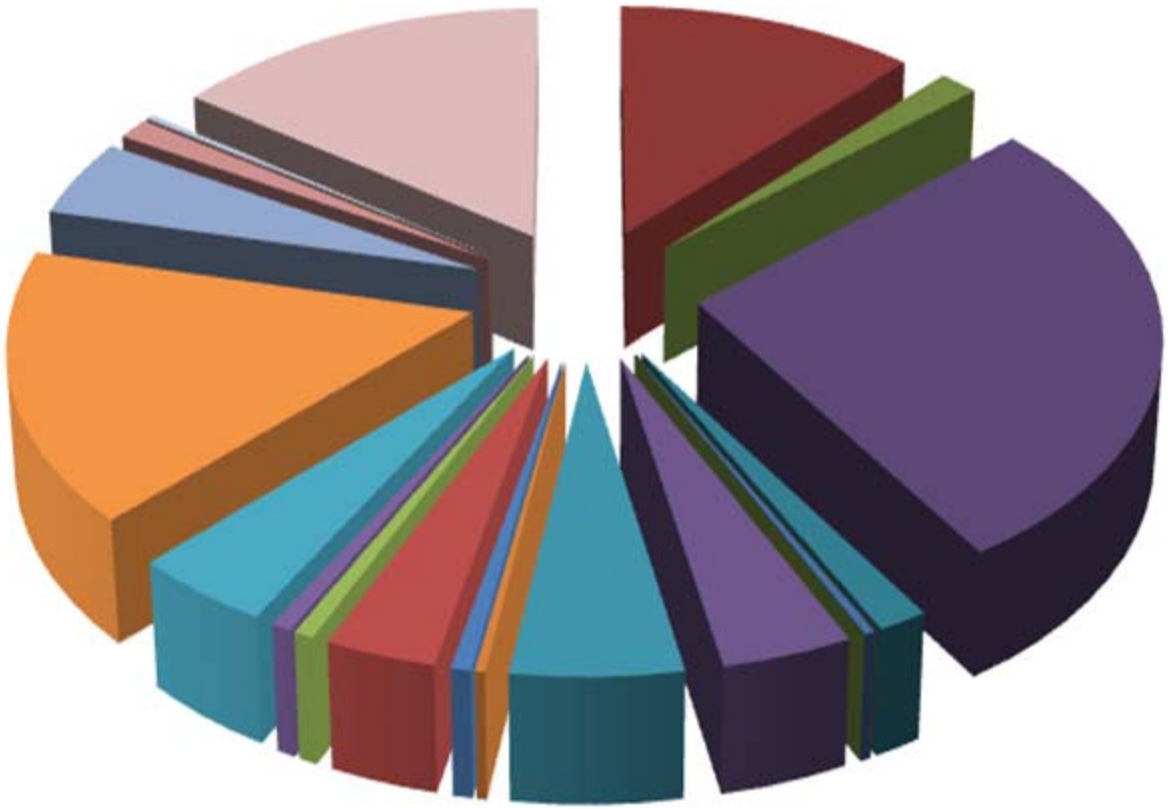
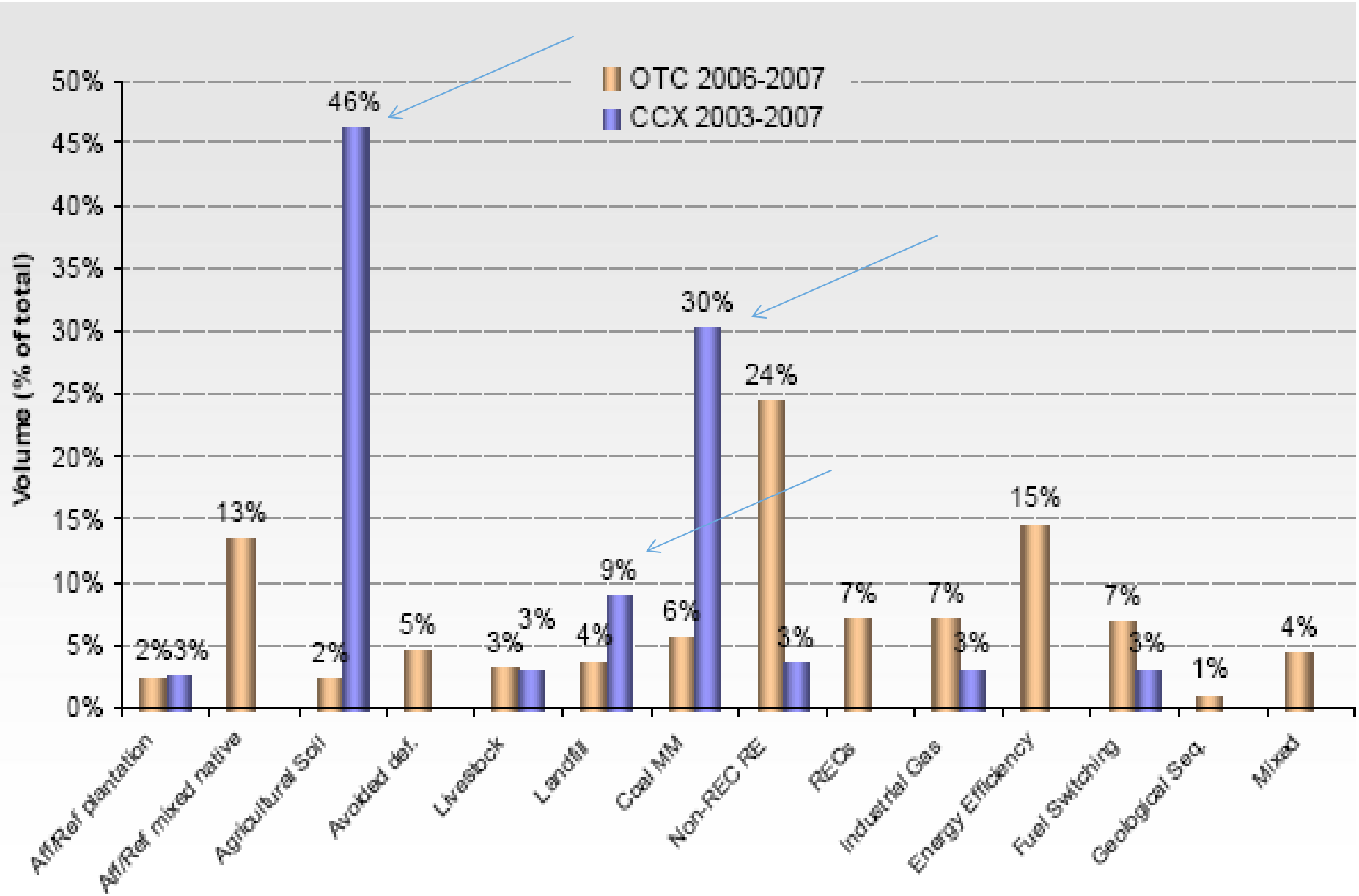


- Afforestation
- Agriculture
- Biogas
- Biomass energy
- Cement
- CO2 capture
- Coal bed/mine methane
- Energy distribution
- EE households
- EE industry
- EE own generation
- EE service
- EE supply side
- Fossil fuel switch
- Fugitive
- Geothermal
- HFCs
- Hydro
- Landfill gas
- N2O
- PFCs
- Reforestation
- Solar
- Tidal
- Transport
- Wind

ECO SECURITIES

Chart created by EcoSecurities from data in the UNEP RISOE Pipeline

Figure 14: Transaction Volume by Project Type, OTC versus CCX for Years Available[1]



Source: Ecosystem Marketplace, New Carbon Finance, CCX

Future US Offset Demand Scenarios

Potential Demand for US Offsets

	MtCO2e/yr	% of compliance obligation	2012	2015	2020
Federal	US: Lieberman-Warner	15%	866	818	739
	US: Dingell-Boucher	5%-15%	125	146	435
Regional	RGGI	3.3%	5.6	5.6	n/a
	WCI	4.0%	4	23	114
	MRP	5.3%	5	18	86
	Total regional		~15	~50	~200

Notes: Demand for offset estimates are based on offset import limits and can exceed programme demand. MRP estimates are probably on the high side as broad programme coverage is assumed, and emission reduction measures beyond cap-and-trade are not netted out. Source: New Carbon Finance

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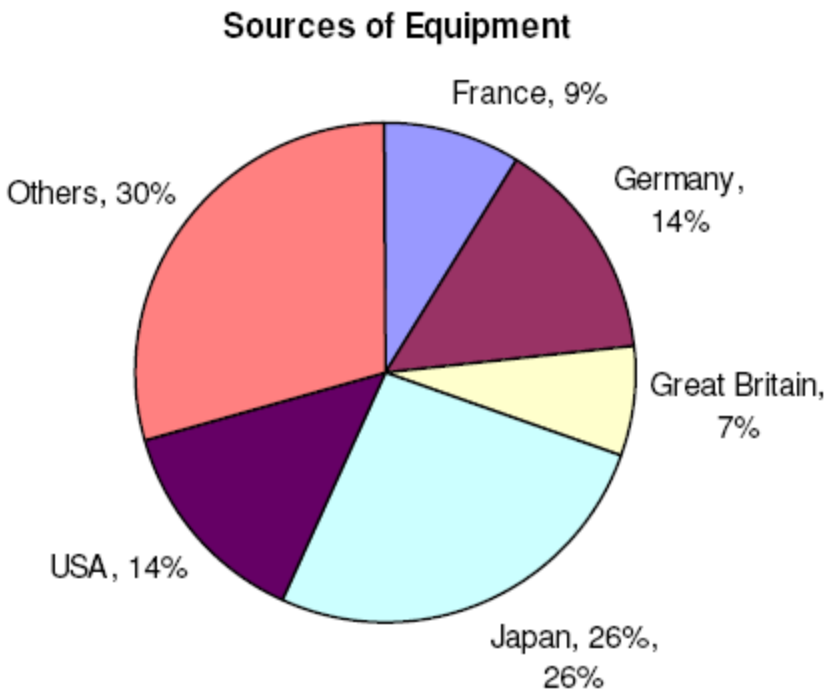
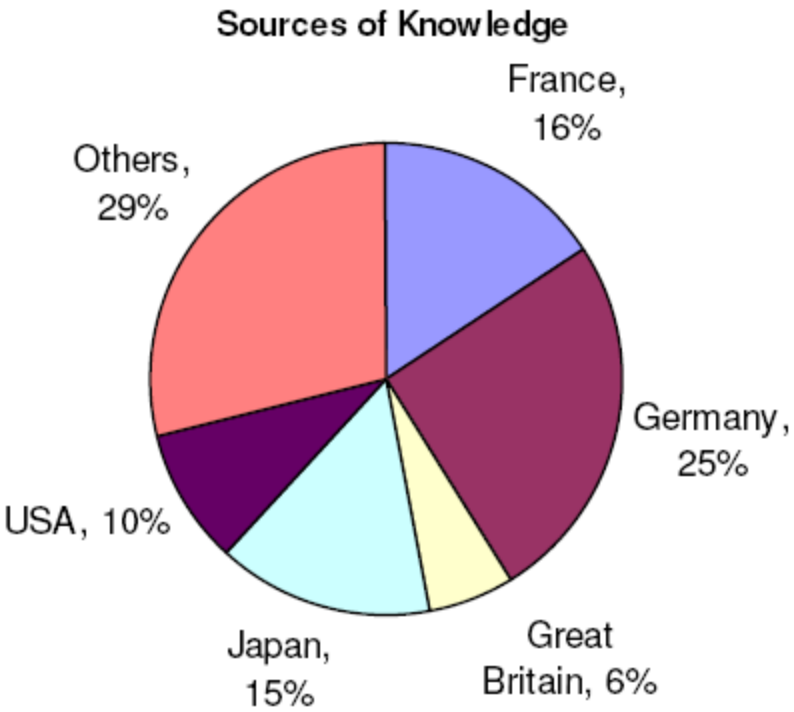
Potential for US Tech via CDM Engagement





What Does This All Mean?

- CDM figures are impressive but mask system deficiencies that must be improved upon to unleash full potential for deployment of existing clean tech, esp. EE
- Offsets can and already are under the voluntary market deploying existing technologies to reduce GHGs
- US Voluntary market figures are somewhat illustrative but expect compliance market will be a different ballgame
- Offsets can help technologies overcome market barriers and bridge the gap to 2020 as tech is further improved and new low or zero carbon tech is innovated in the US
- To achieve this, offset meths and approaches will have to change and adapt to US context and to address currently quality concerns—**US offset policy design and CDM reform is key**

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What is needed from US policy

- Clear environmentally rigorous methodologies and guidelines for project development
- Political support and public support
- Direction on the extent to which international project credits are allowed, and if so, where from/what tech types/how many?

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Concluding thoughts

- Need enabling policy and as much policy certainty as possible
- Offsets not a perfect policy mechanism but can be used to help deploy existing technologies that reduce GHGs in the medium term
- Ideally, policies and market mechs will evolve to address changing additionality standards and new market barriers to clean tech deployment as necessary
- What works changes with time—role of offsets in post-2020 roadmap TDB, mechs must be flexible, adaptable

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Aimee Barnes
Senior Manager, US Regulatory Affairs
aimee.barnes@ecosecurities.com

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