CEC Staff Workshop on the Potential of Terrestrial Carbon Sequestration Methods as Options for Climate Change Mitigation

May 26, 2009

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Why Offsets?

Companies regulated under a cap-and-trade program typically face three main compliance options:

- Reduce their own emissions (‘internal abatement’)
- Purchase allowances
- Buy offset credits

Offsets are a significant potential means of achieving cost containment for new cap and trade programs

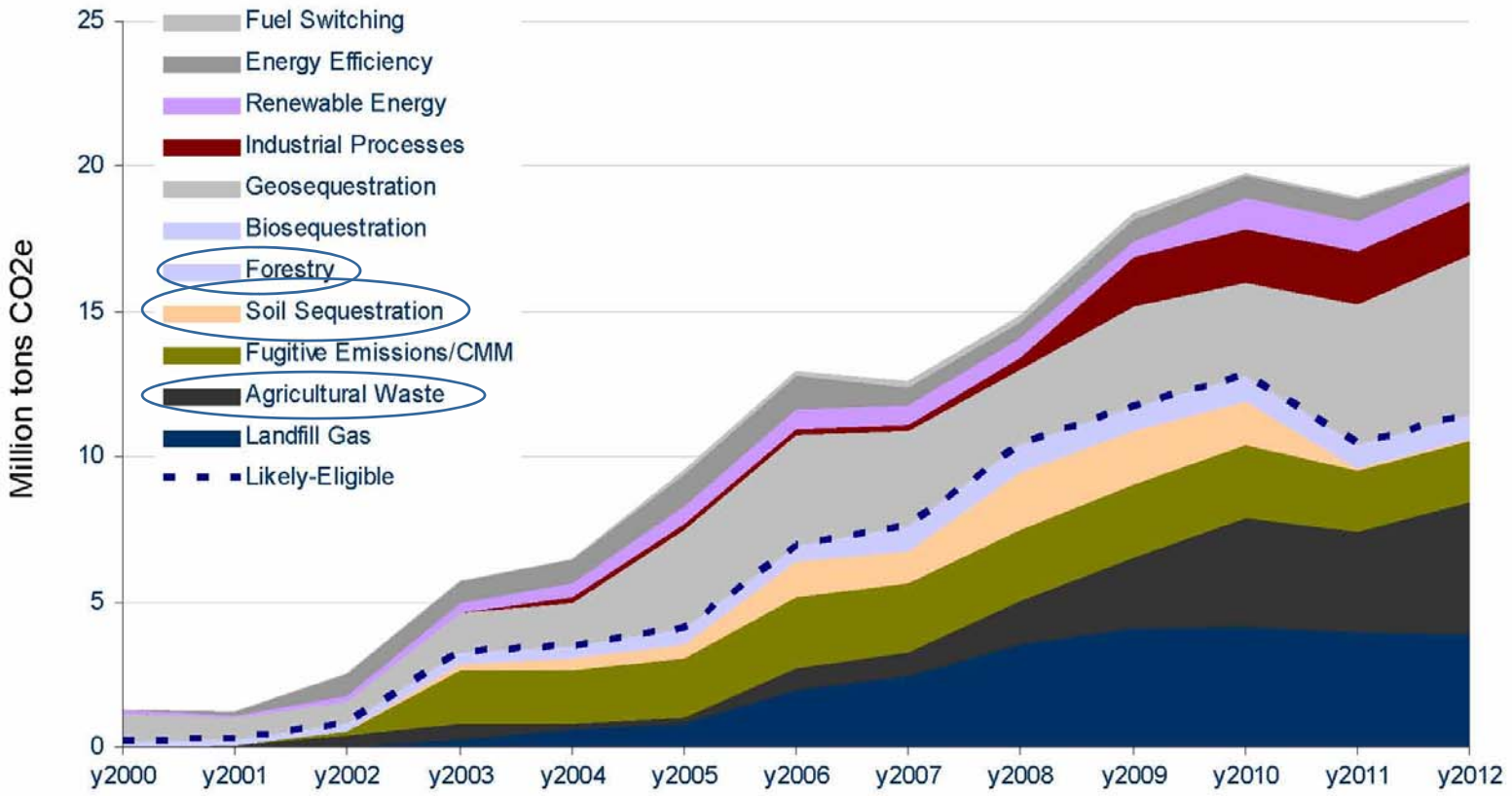
Five Offset Categories Most Likely to Qualify Under a Cap and Trade Program

- Agricultural waste
- Forestry
- Fugitive emissions (e.g., coal mine)
- Landfill gas
- Soil sequestration

Most Common Forest-Based Offset Protocols

- Forest Conservation
  - e.g., avoided deforestation
- Afforestation
- Reforestation
- Forest Management
  - e.g., extending rotations, forest thinning
- Other protocols under consideration:
  - Fuels Management
  - Prevention of Catastrophic Fires

US carbon offset pipeline with likely eligibility



PointCarbon

Source: *Carbon Market Analyst*, page 7, April 2 2009

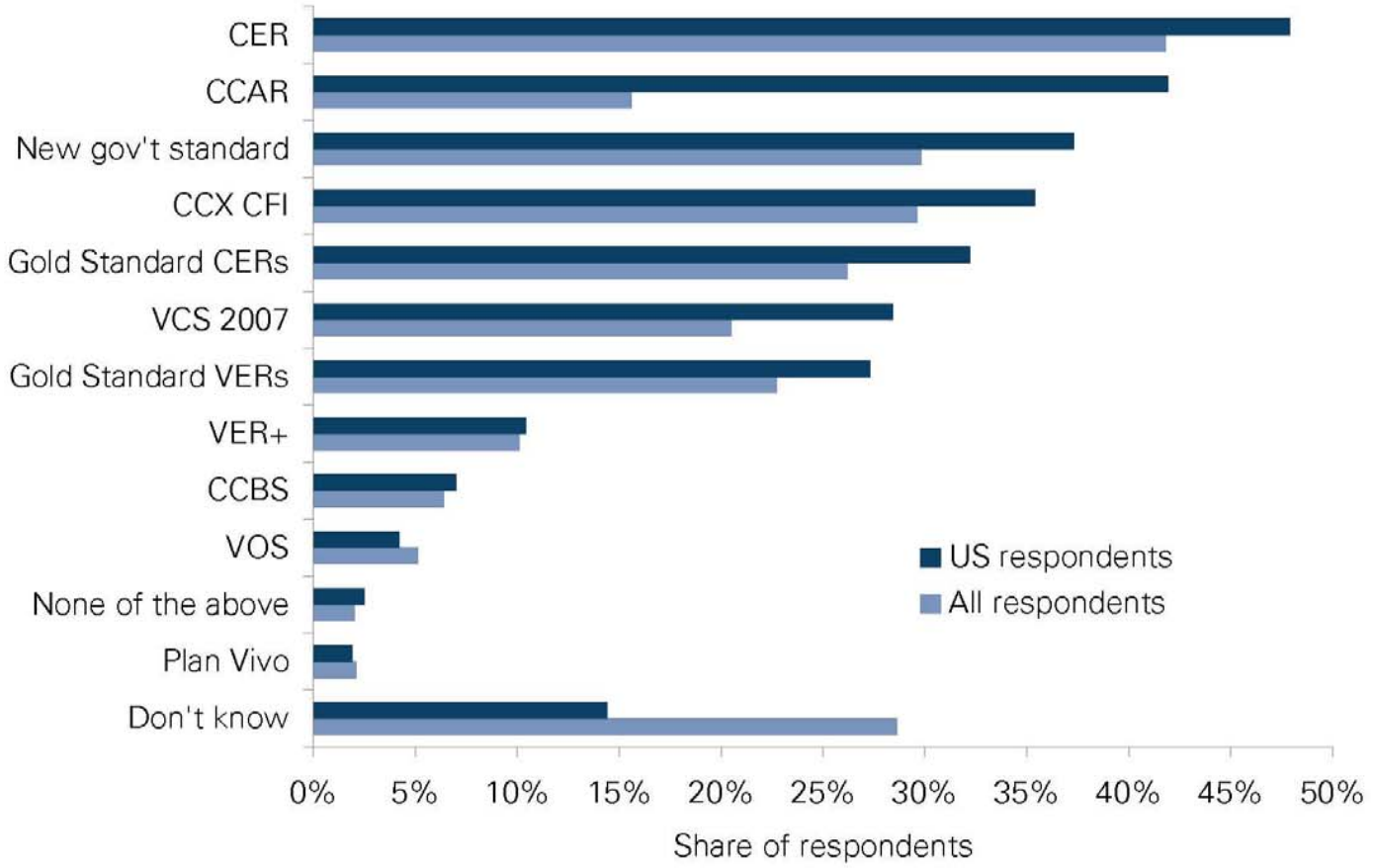
Maze of Domestic Offset Standards

- US EPA (Climate Leaders)
- CAR
- RGGI, WCI, MGGRA
- States and Local Air Districts
- CER
- VCS
- Gold Standard
- CCX
- Plan Vivo
- Others

Offset standards in US cap-and-trade

"Which of the following offset standards, if any, do you think are likely to be eligible for a US federal cap-and-trade program?" N=472

Source: Point Carbon



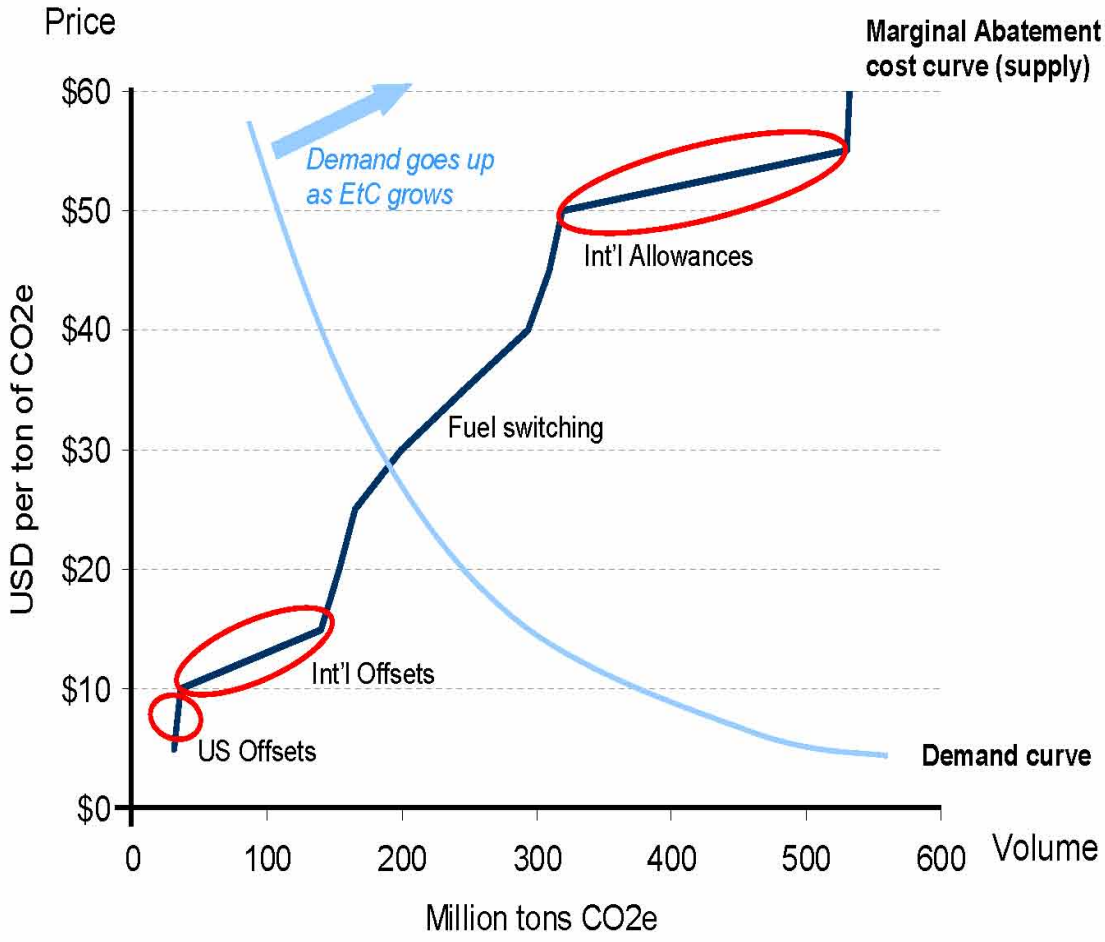
PointCarbon

Source: *Carbon 2009*, page 29, 17 March 2009

Will Domestic Offsets Satisfy Demand?

- Demand for domestic offsets will depend on how they compare to other compliance options:
  - RGGI allowance prices are currently about $3.50 per ton
  - Initially small reduction requirements = lower demand, lower supply
  - Current average over-the-counter offset prices vary from $4.00 to $9.00 a ton depending on project types and certifications
  - CAR futures trade at ~$7 a ton on Chicago Climate Futures Exchange
  - International offset prices may depend on the extent to which international offsets are eligible for EU ETS compliance
  - Fuel switching phases in over a wide range of prices

Conceptual MAC curve



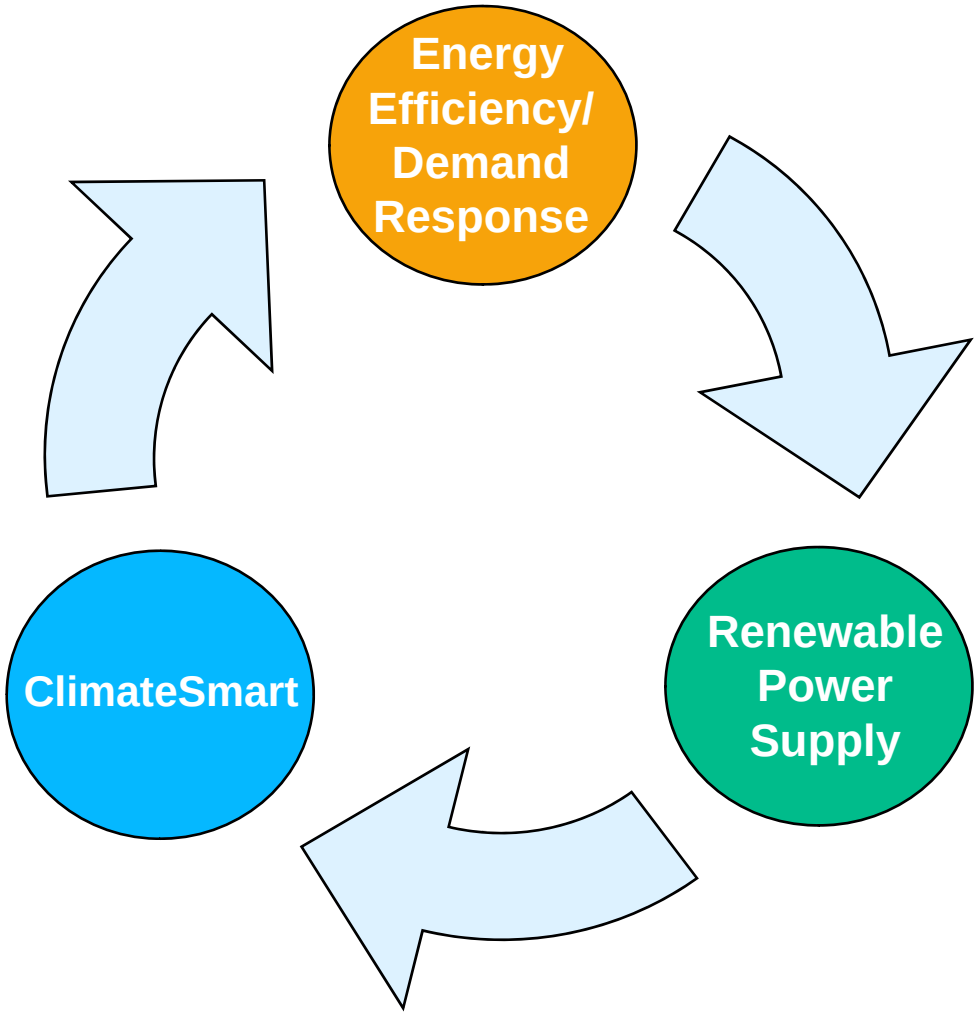
PointCarbon

Source: *Carbon Market Analyst*, page 11, April 2 2009

PG&E as a Partner and Solutions Provider

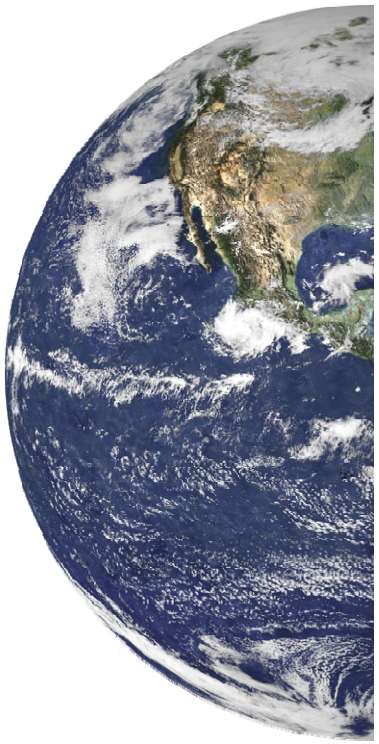
PG&E Portfolio Solution

ClimateSmart™ is part of an integrated portfolio of solutions from PG&E



What is ClimateSmart™?

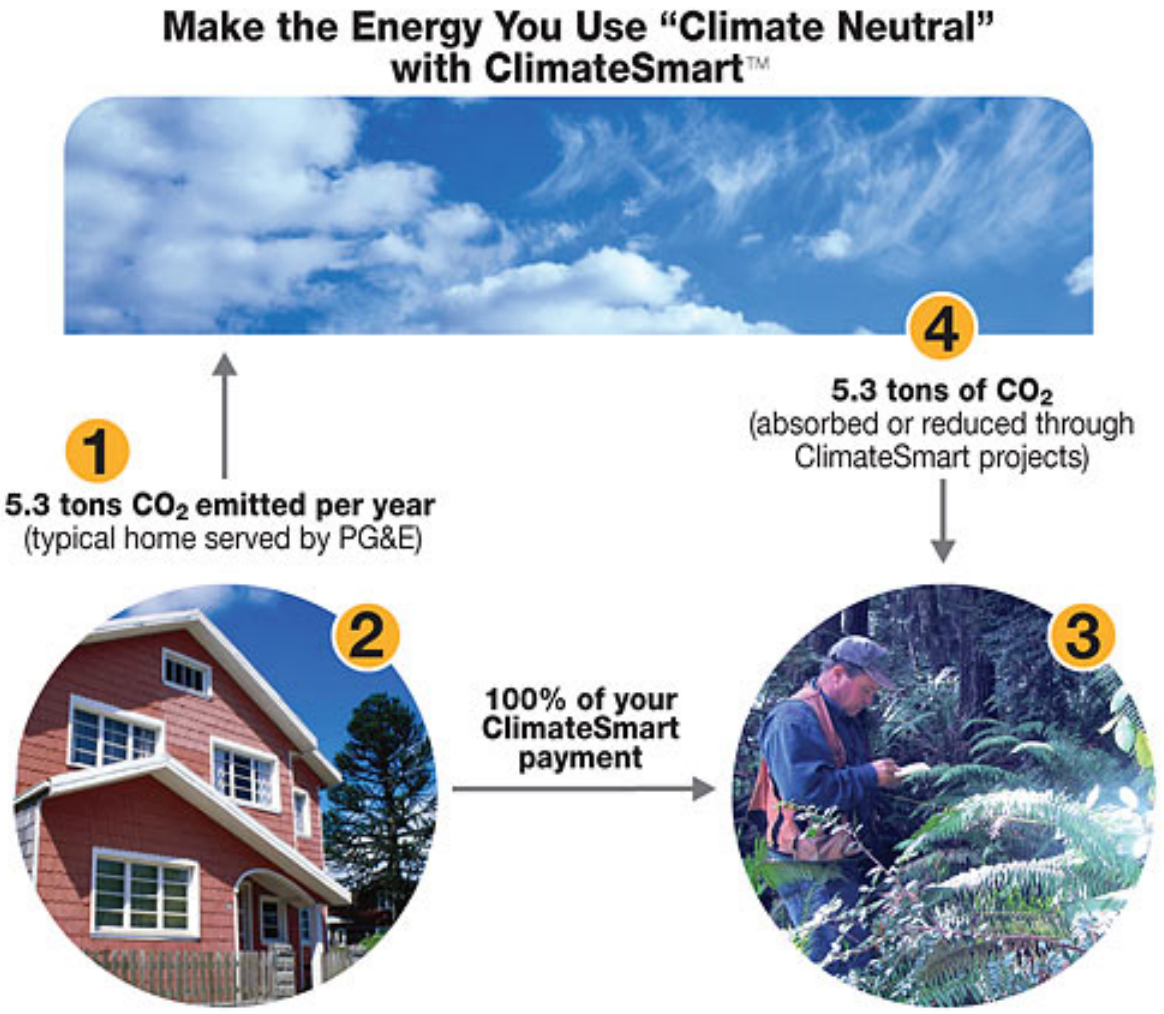
- Voluntary PG&E program to make customers climate neutral
  - Cost is based on usage – $0.00254 per kWh and $0.06528 per therm. Costs fixed through December 2009.
- Way to road test current and new CAR protocols
  - Livestock methane capture, Forest sequestration, Landfill gas capture
- Funding to develop new CAR protocols
  - PG&E is funding the development of an additional three protocols
- Option for participants to demonstrate environmental leadership
  - Developed with the help of environmental groups, regulators, and other stakeholders.
- Investment in projects that reduce greenhouse gas emissions
  - 100% invested in independent, California-based projects. Credits retired.



ClimateSmart is Rigorous

- Program was approved and is overseen by the California Public Utilities Commission. One of the requirements is for PG&E to contract for at least **1.5 million tons CO2e** of GHG emission reductions.
- PG&E is using a competitive bidding process to select the **best greenhouse gas emission reduction projects available**, using clear and stringent criteria.
- The program seeks advice from an **External Advisory Group** composed of respected community, environmental, business and governmental leaders.
- To ensure the integrity of the program, all greenhouse gas reductions for ClimateSmart will be **independently verified, registered, and retired** with the non-profit **California Climate Action Registry**.

How it Works


Make the Energy You Use "Climate Neutral" with ClimateSmart™
4
5.3 tons of CO_2 (absorbed or reduced through ClimateSmart projects)
1
5.3 tons CO_2 emitted per year (typical home served by PG&E)
2
100% of your ClimateSmart payment
3

Calculate Your Own Carbon Footprint

www.joinclimatesmart.com

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Types of carbon offsets

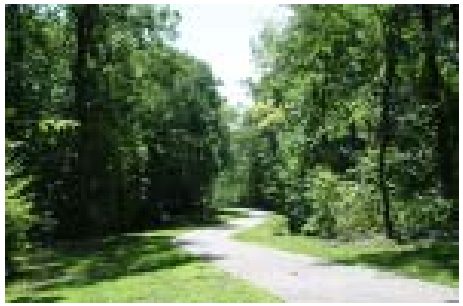
Forestry

- Carbon sequestration
- Habitat preservation
- Watershed protection
- CA is losing ~ 40,000 acres of forestland annually

Dairy Methane Capture

- Reduce impact of methane (>21 x greater impact per ton than CO_2)
- CA has ~ 1900 dairies, < 24 capture methane

Urban Forestry



- Carbon sequestration
- Urban revitalization
- Reduce energy use

Landfill Methane Capture

- Reduce impact of methane (>21 x greater impact per ton than CO2)

First Projects

Garcia River Forest

THE CONSERVATION FUND
America's Partner in Conservation

Reduces greenhouse gas emissions by protecting trees that would otherwise have been harvested and that absorb and trap carbon. With PG&E's support, Garcia River Forest will sequester 40,000 metric tons of carbon annually for the next five years.

Located within the 23,780-acre Garcia River Forest in the coastal mountain range of southwestern Mendocino County.

Lompico Headwaters Forest

Sempervirens Fund

Reduces greenhouse gas emissions by permanently preserving 202 acres of trees that were once slated for harvest and that continue to absorb and trap carbon.

Located within the 425-acre Lompico Headwaters in the Santa Cruz mountains.

Conclusions

- Offset supply key price driver until 2030
- Identify which offset protocols are most favorable to the utility sector and to California (e.g., fuel switching?)
- Embrace uniformity and avoid patchworks
- Rank protocols that need development according to how much offset revenue they would bring into California (evaluate other co-benefits too)
- Understand what technical work the protocol development bodies need to move forward with new high priority offset protocols
- Fill gaps in the technical literature in order to facilitate development, approval and demonstration of new offset protocols
- Think carefully before discounting California projects (e.g., by making them meet a higher standard that the rest of the US)
- Involve the US EPA in protocol development since they will be the agency having jurisdiction over which offsets count in federal cap and trade