

Offset Supply Potentials: Uncertainties and Implications

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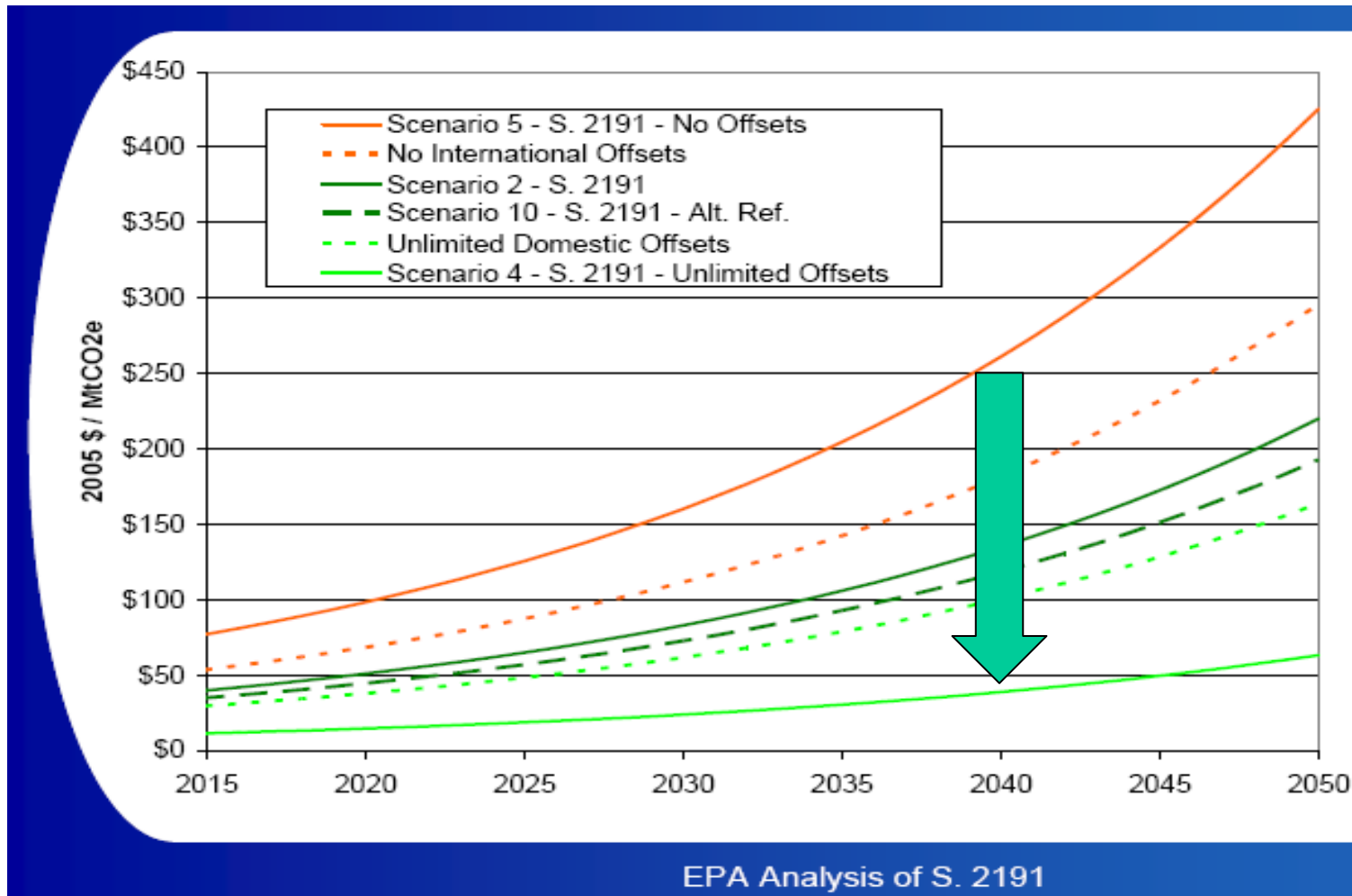
Overview

- Biological sequestration will be the principal source of domestic offsets if they are to play a significant role in a US cap & trade system
- Offset supply will be driven by price, alternative policies, global economy, and...
- Offset protocols and criteria, which will determine feasibility and emissions benefits

WRI/SEI offset supply analysis project

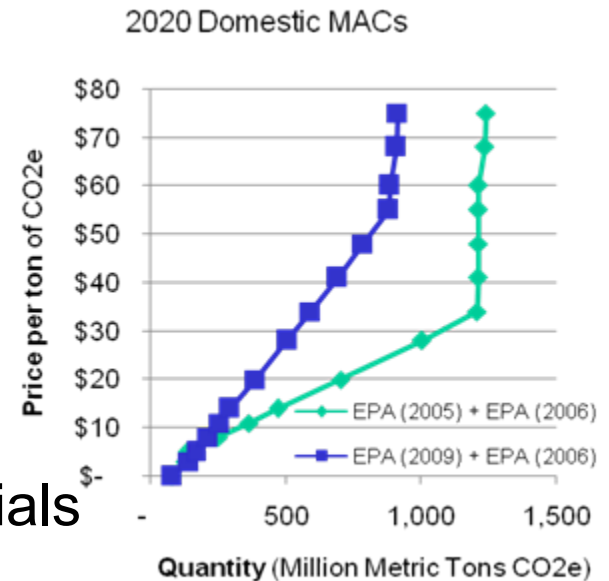
- Construct simple, transparent model
- Incorporate experience and lessons from offset markets and protocols
- Simulate outcomes of policy proposals
- Focus on domestic offsets
- Report in Summer 2009

High expectations



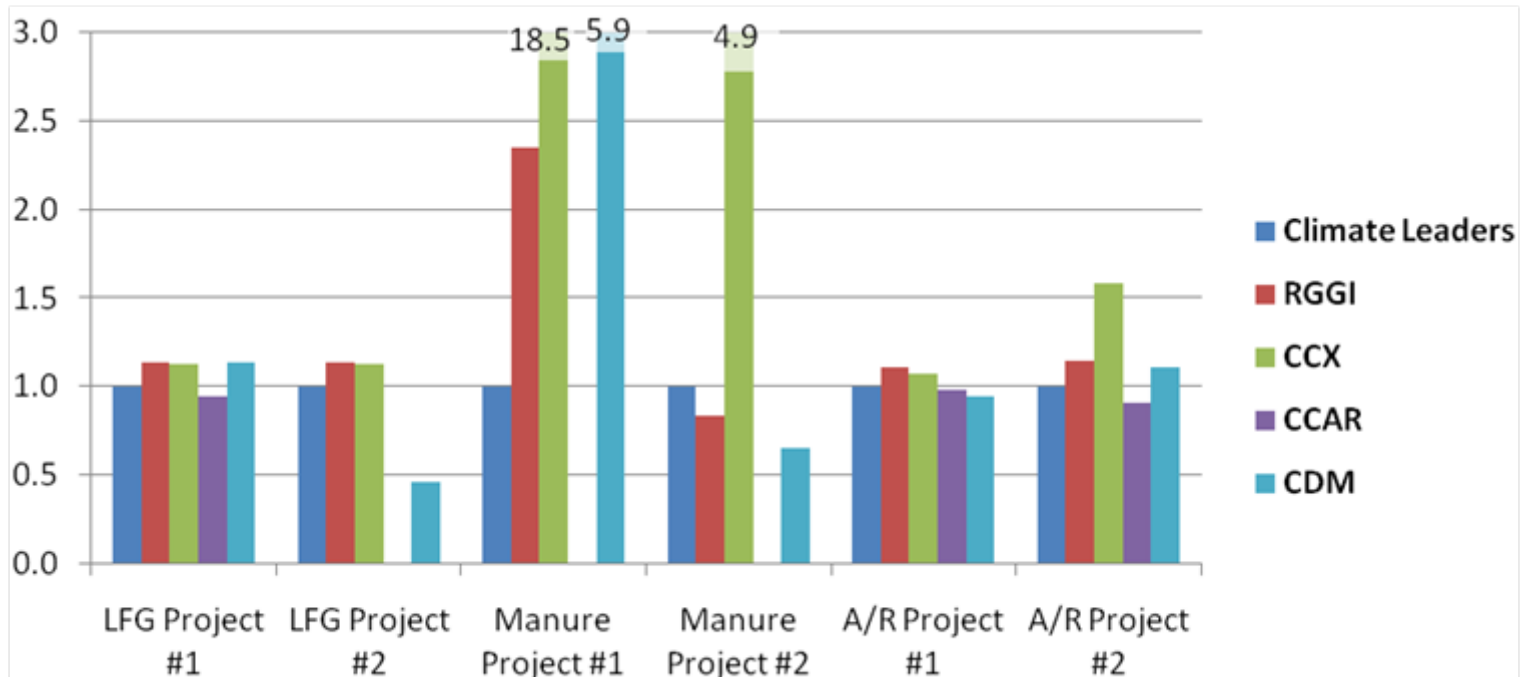
How offset supply is typically modeled

- Offset supply curves (tons of offsets available at different price trajectories)
- Policy-neutral “technoeconomic” potentials
 - Marginal abatement curves or “MACs”
 - FASOM model (ag/for) and engineering analysis (ind/waste)
- Only reductions beyond business-as-usual
- Rapid, nearly full implementation; no transaction costs
- Offset protocols and market dynamics rarely considered



A ton is not always a ton

Offsets Credited under Different Protocols, Sample Projects (Relative to Estimates using Climate Leaders Protocols)



Sample projects are illustrative: relative results will vary with project conditions

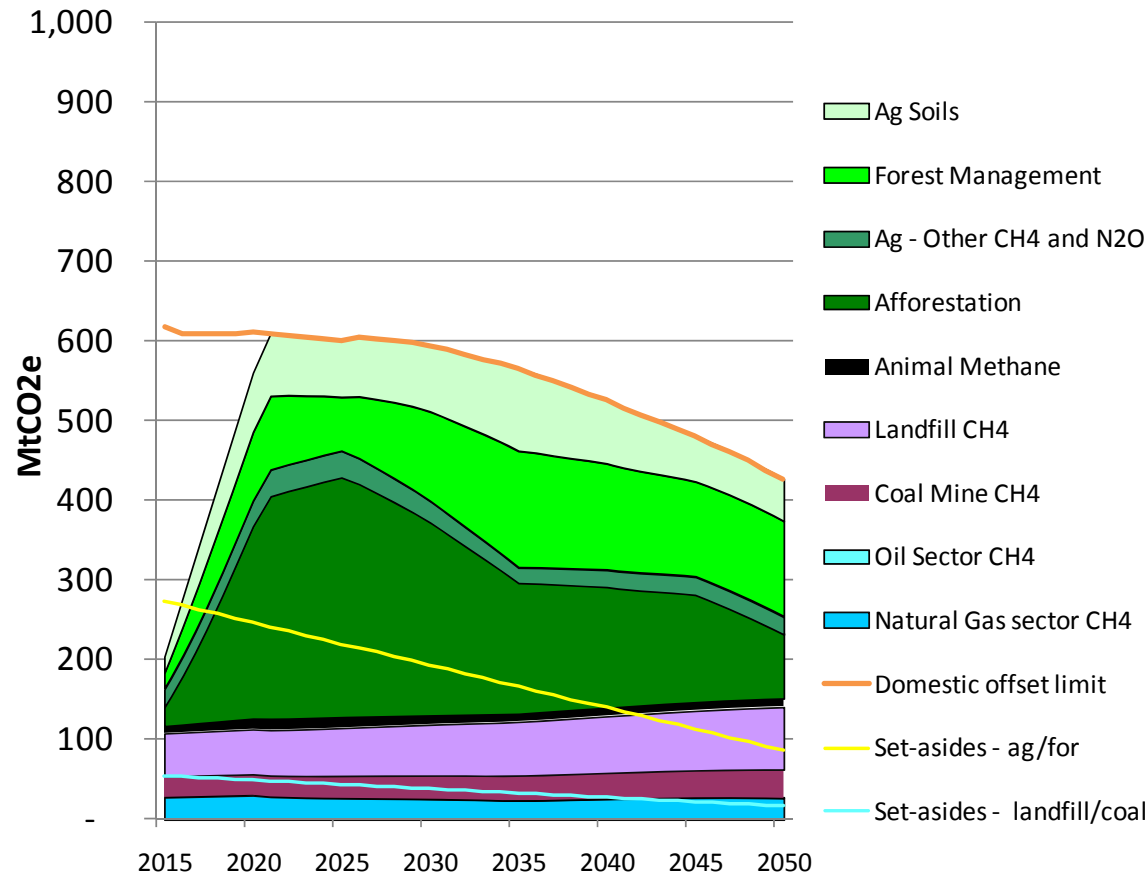
Our modeling approach

- EPA cost curves
- Factors that might spur/limit project activity or under/over credit
 - How protocols address additionality, baselines, leakage, permanence
 - Transaction costs and barriers to full implementation
 - Based on existing protocols, markets, literature, assumptions
- Policy design options: offset limits, discounts, eligibility, set asides, regulation
- Preliminary results shown here do not reflect voluntary market activity and scale up factors in early years

The difference a year makes

- Domestic offsets account for $\approx 20\%$ of overall reductions in 2020
- Biological sequestration $\approx 80\%$ of offsets
- Added activity through set asides
- Analysis based on last year's policy design, economic conditions circa 2005

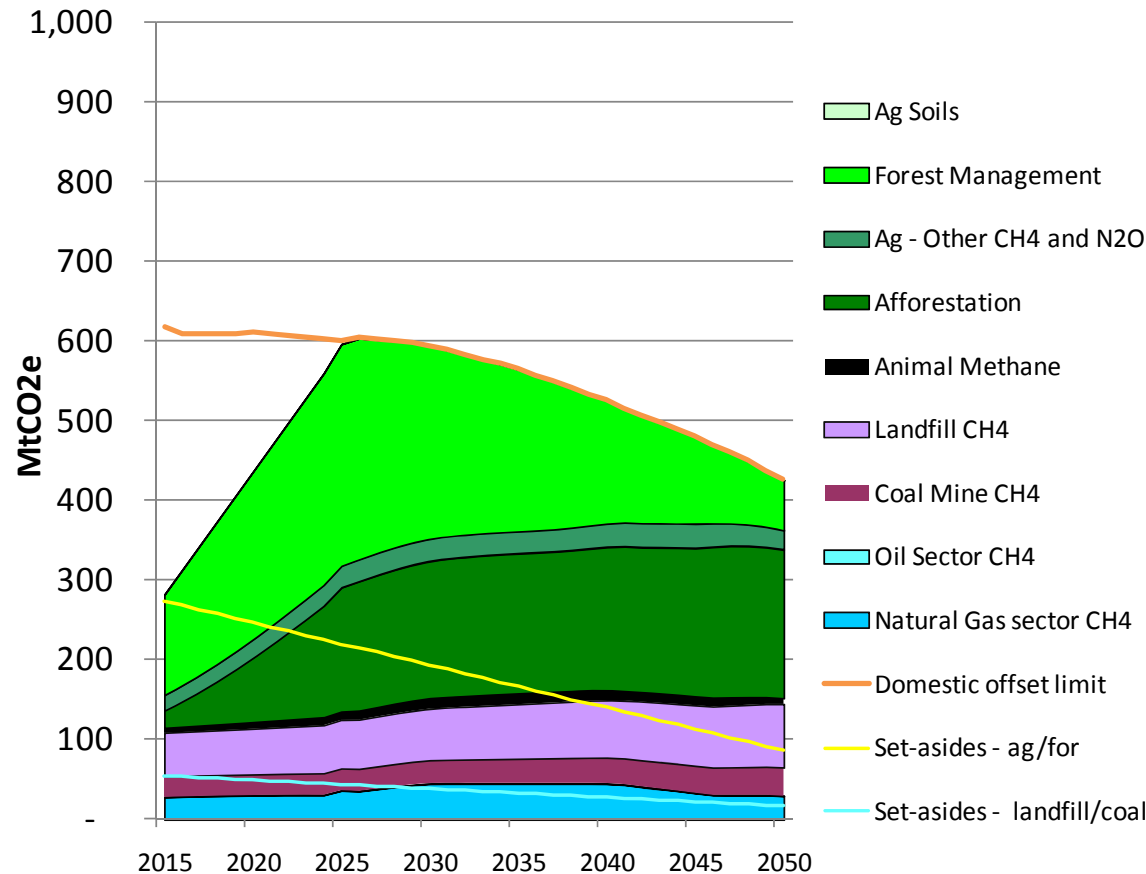
Domestic Offset Supply, 2015-2050
(Lieberman-Warner, S.2191, early MACs*)



Updated market conditions

- New MACs: higher energy, land, & commodity prices, renewable fuels standard
- Biofuel crops compete for land with offset projects
- Ag soil potential “netted out”
- Role of forest management increases

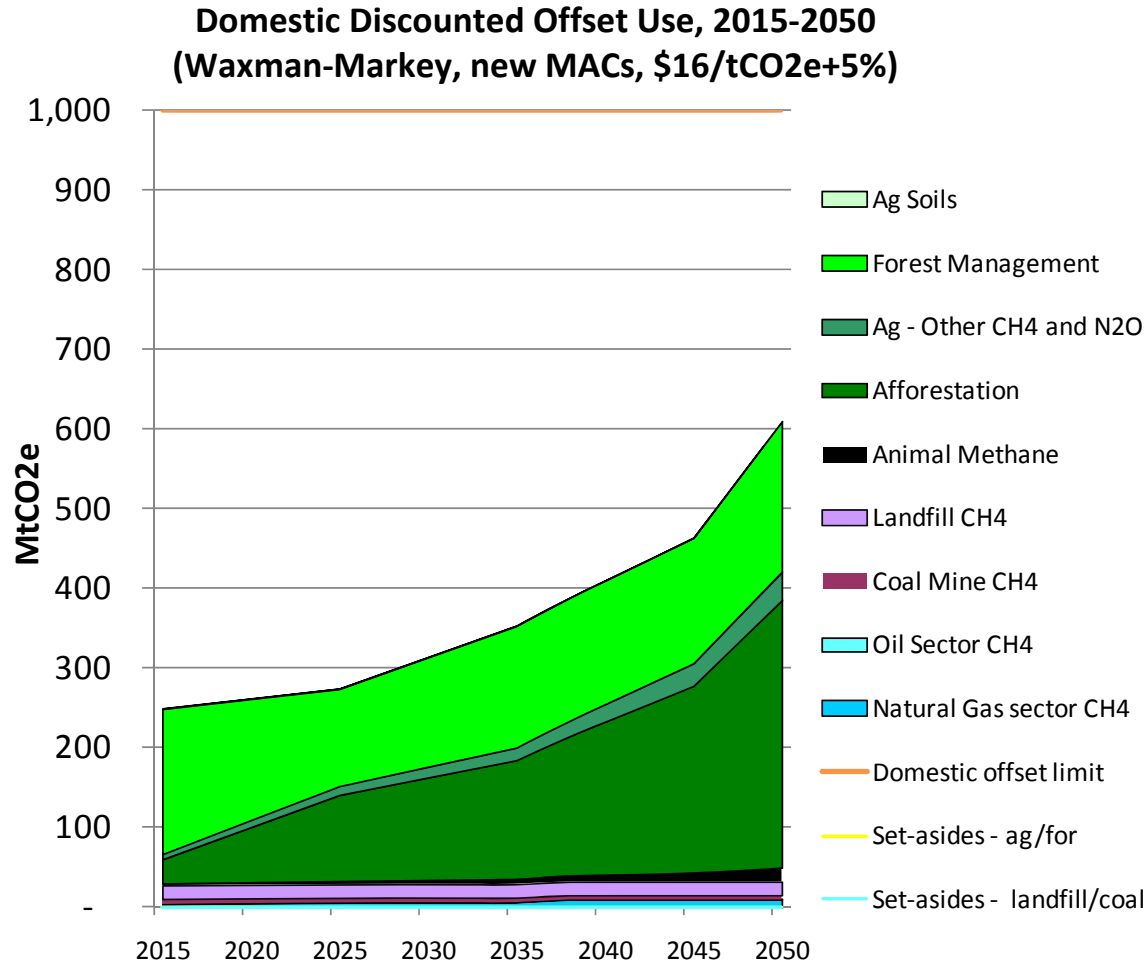
**Domestic Offset Supply, 2015-2050
(Lieberman-Warner, S.2191, new MACs)**



Preliminary analysis.

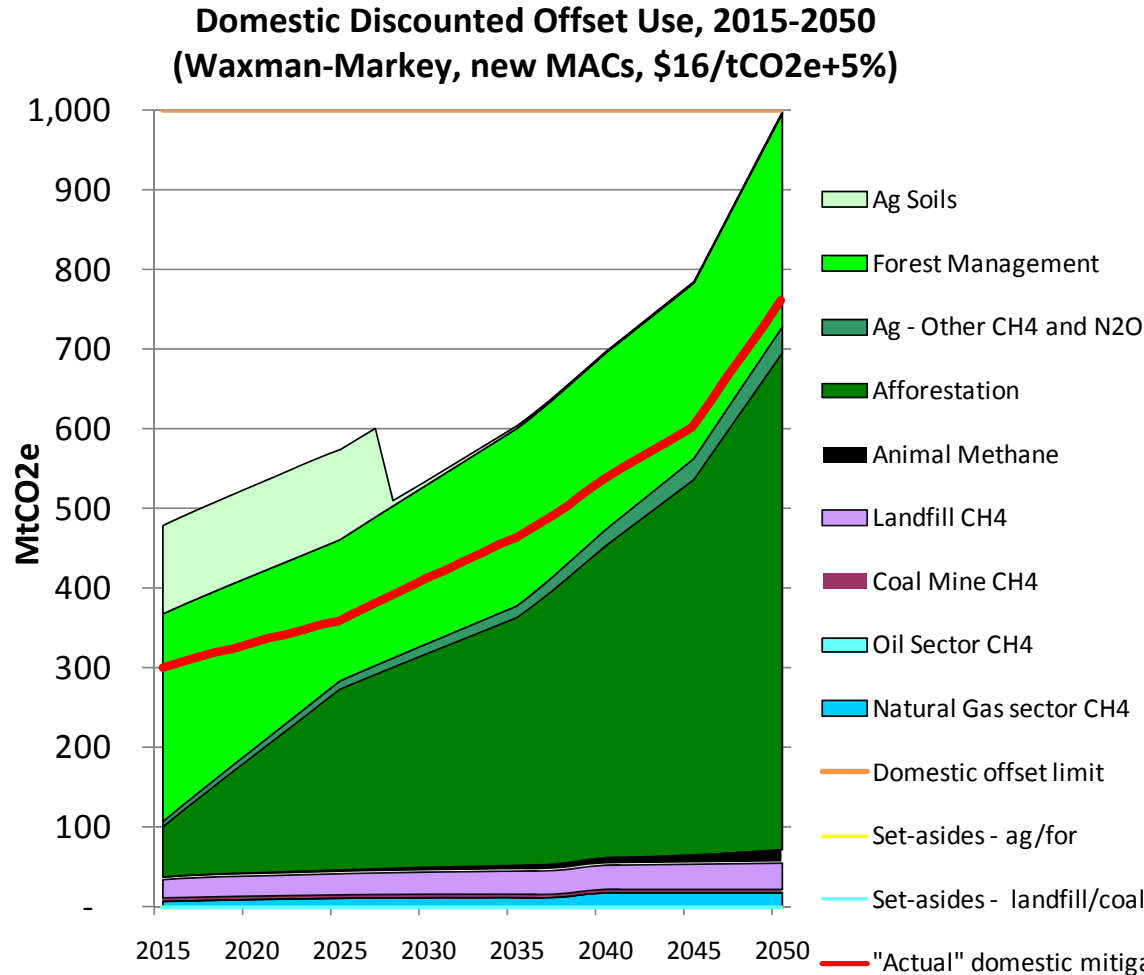
A new climate bill

- Waxman-Markey (Mar 09)
 - Domestic offset limit 1.25B with 20% discount for compliance
 - CAA regulation of large CH4 sources; not set asides
- We assume higher offset price trajectory than EPA
 - Allowance prices at \$20/tCO₂ in 2012 rising at 5%/year until limit is binding, discounted 20% for offsets
- Biological sequestration ≈ 85% of offsets



Protocols maximize crediting?

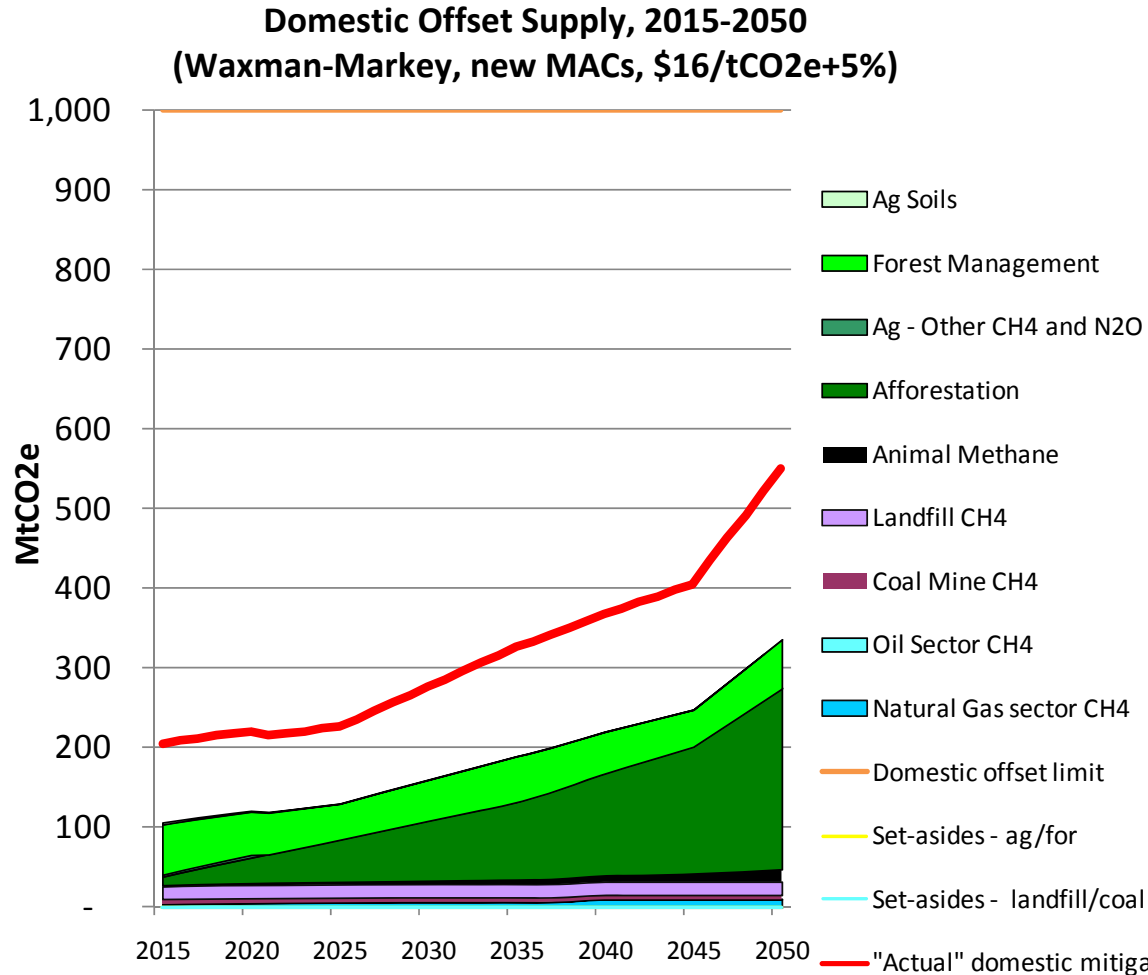
- Lenient protocols
 - Credit all BAU ag soil
 - No leakage or uncertainty discounts
 - No retained buffers
 - Generous baselines
- Offsets credits significantly greater than “actual” reductions/removals
 - Even with the 20% discount, over-credit ≈ 200 MtCO₂e in 2020
- “Actual” mitigation (real, additional) based on EPA MACs



Preliminary analysis.

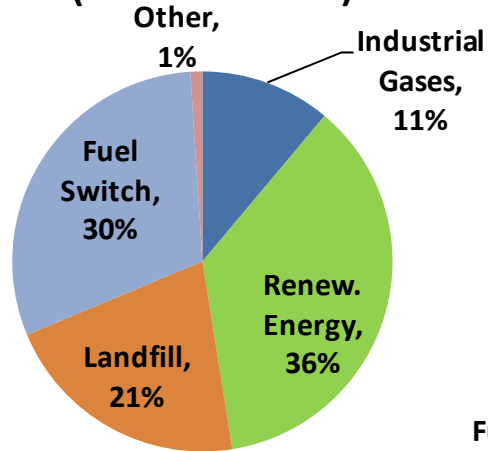
Or maximize emission benefits?

- Stricter protocols
 - Conservative baselines
 - Leakage and uncertainty discounts
 - Retained buffers
 - Assumes 100% additionality, no denied projects (for now)
- “Actual” reductions/removals > offset credits
 - With the 20% discount, added emissions benefit of ≈ 100 MtCO₂e in 2020
 - May be overstated since 100% additionality hard to achieve



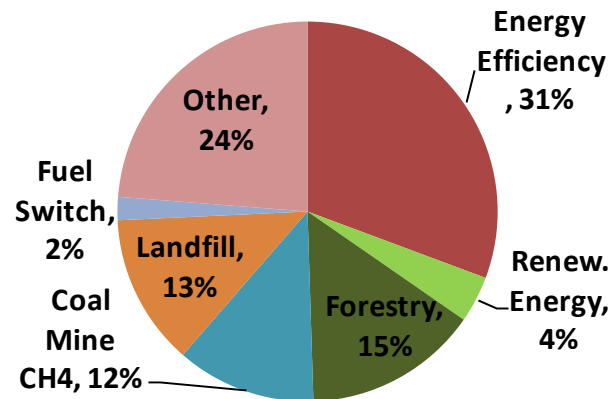
Expect Surprises

Existing and Identified Projects
(as of late 2003)

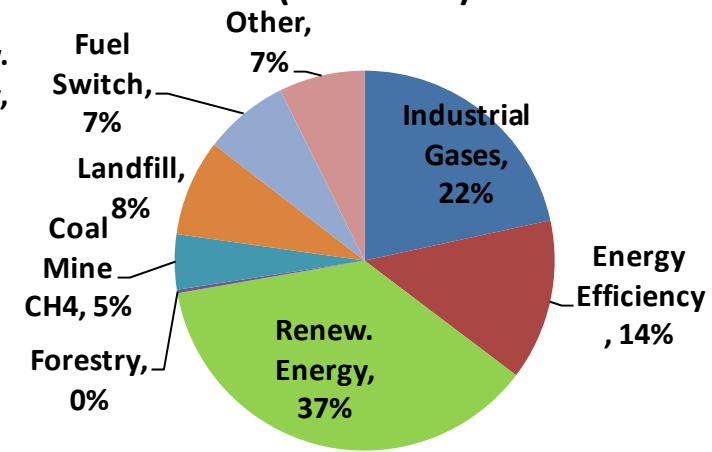


Percentage of Emission Reduction/Removals from CDM Projects

CDM Potential
(as projected in 2004)



Existing and Identified Projects
(Mar 2009)



Summary

- Domestic offsets \approx biological sequestration
- Protocols matter
- Other policies matter
- Surprises are likely