

Energy and the Cascading Costs of Reactive Nitrogen

Breakout Group #8

We are at a crossroads:

- Old energy paradigm/new energy paradigm
 - Large \$ reserves to deal with both
 - Whichever route: huge impact

Crossroads

- Need portfolio solution delivering energy in different ways (plug-in vehicles) – plug when appropriate
 - Infrastructure is critical – smart grid/metering initiatives
 - Electricity relates to a portfolio already in terms of generation & use
 - Petroleum use must define – single source

Crossroads

- Storage is key
 - Plug-in hybrids act as storage
- Need to look at these Nr trade-offs
- Watch for trade-offs between Carbon and Nr in any solution

Crossroads

- Biofuels: Nr not the only issue
 - Water & energy balances
 - Land use changes – cropping changes potential to increase Nr – especially short-term grain-based
 - Question what part and proportion of the portfolio is appropriate for biofuels
 - Question whether liquid fuel emphasis is best way to go

Crossroads

- Institutional approaches
 - Energy Star Program
 - 2007 energy act re: biofuels important to enforce
 - California low carbon standards should also include low Nr
- Changing public behavior
 - Conservation
 - Changing consumption patters
 - Diets
 - Transportation patterns

Crossroads

- More - Changing public behavior
 - Health concerns as a threat
 - Providing real-time information energy, Nr, water
 - Price fuel relatively high
 - True life-cycle costing to set prices
 - Need for education on Nr issue
 - Caps & allowances for carbon
 - Include Nr & coordinate between the two

Crossroads

- Changing the consumer's choice
 - Getting Scotts to change Iowa fertilizer formula
 - Tackling the supply chain
- Third party assessments
- Other Institutional approaches
 - Credit stacking Carbon/Nr
 - Low carbon and Nr fuel standards
 - Pollutant trading
 - Carbon [Nr] pricing through Cap!
 - Cannot continue dirty systems
 - Incentives must be for cleaner solutions [Caps/emissions]

Crossroads

- Concerns – 20 -> 30% achievement of Nr low-hanging fruits
 - How can a trading system go beyond that?
- Post treatment through wetlands vs. pre-treatment of Nr or reducing introduction of Nr (Dutch style water management system)
 - Need accounting system & Nr credits to cover land costs
 - Requires multi-institutional approach & multi-objective view
 - Start offsetting treatment (credits)

Crossroads

- Reconsider what is a point source
 - Example: pumped/levied farm lands