



Redefining Our Boundaries.

Looking Ahead.

Duke Energy's Low Carbon Strategy Initiatives for West Virginia December 8, 2009



Low Carbon Initiatives for West Virginia

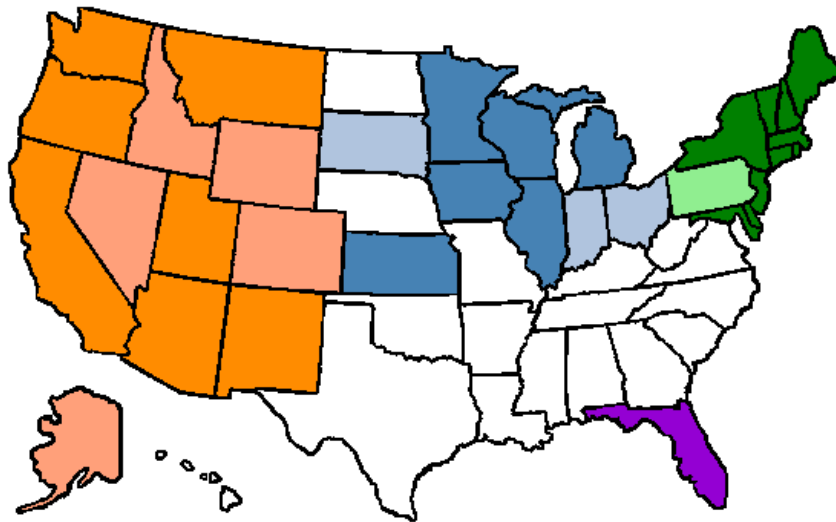
- ➔ Status of US Climate Change Policy
- ➔ Fossil Fuel Users: Options for Compliance
- ➔ Offsets in a Cap and Trade System
 - Protocols/Methodologies for Early Offsets
- ➔ Opportunities for West Virginia: Carbon Offset Projects
 - Forestry
 - American Chestnut
 - Coal Mines
- ➔ Biomass and Coal
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Status of US Policy

Regional initiatives are already trading, leading the way...

...while Federal legislation that would instantly create the world's largest carbon market looks set to pass in the next 12-24 months



- Regional Greenhouse Gas Initiative RGGI
- RGGI Observer
- Midwestern Regional GHG Reduction Accord
- MRHGRA Observer
- Western Climate Initiative
- Western Climate Initiative Observer
- Individual State Cap-and-Trade Program

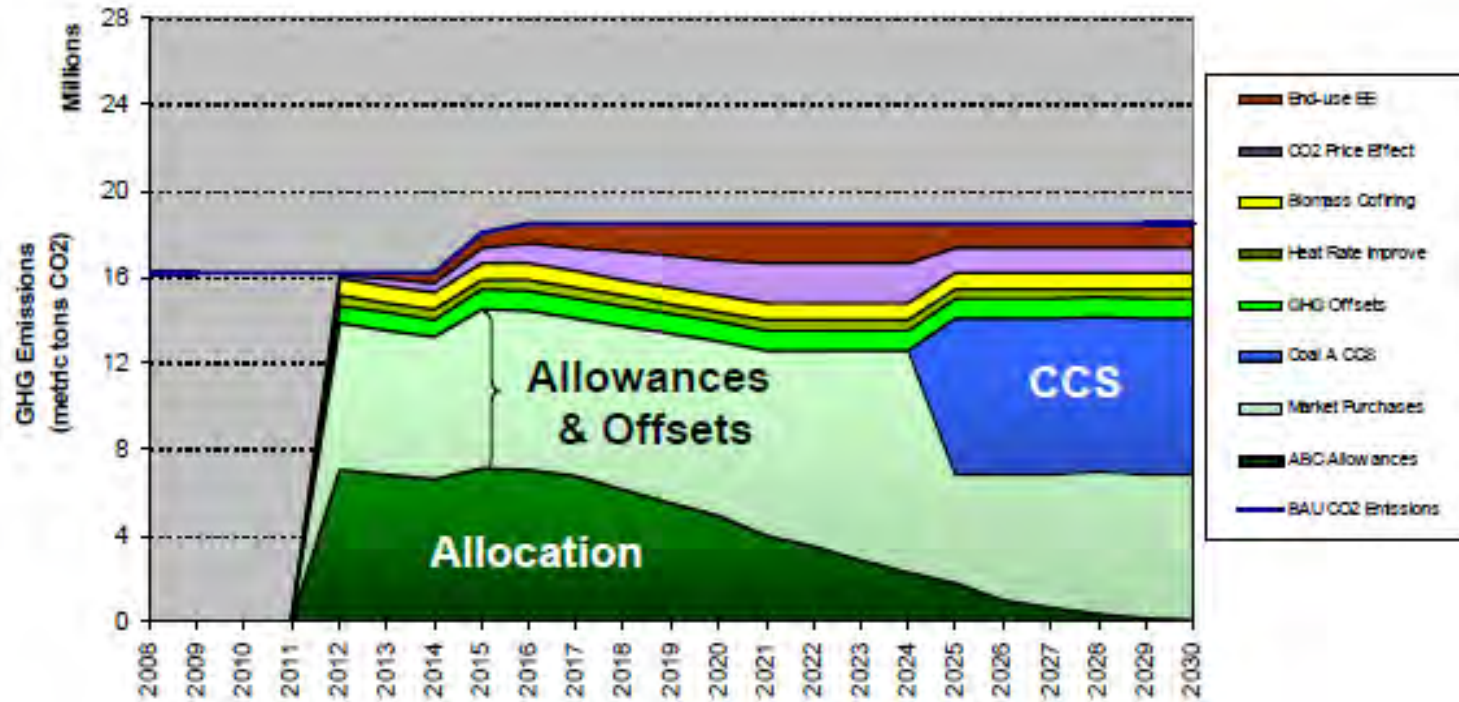
- Waxman - Markey** passed out of House on June 26, 2009
 - *Allows use of up to 1 billion offsets from domestic sources per year*
- Kerry - Boxer** passed out of the US Senate Committee on Environmental and Public Works on November 9, 2009. Further movement is delayed until Spring, 2010.
 - *Allows use of up to 1.5 billion offsets from domestic sources per year*
- Stabenow Amendment**
- Offsets feature prominently as a **cost-containment mechanism**
- Offsets can be **banked** for future use
- Early Offset Supply** provisions admit offsets from certain projects and protocols undertaken before enactment of the program



Fossil Fuel users always have a need for Offsets

Closing ABC's Projected "Compliance Gap"

Buying Offsets & Allowances are Key Components of Future Corporate CO2 Compliance



Allowance –Government-granted permission to emit a certain quantity of greenhouse gases (GHG).

Offset –GHG emission reduction, often certified by a third party, that is generated by a *non-capped entity*.

Allocation - Free allowances allocated by the EPA.

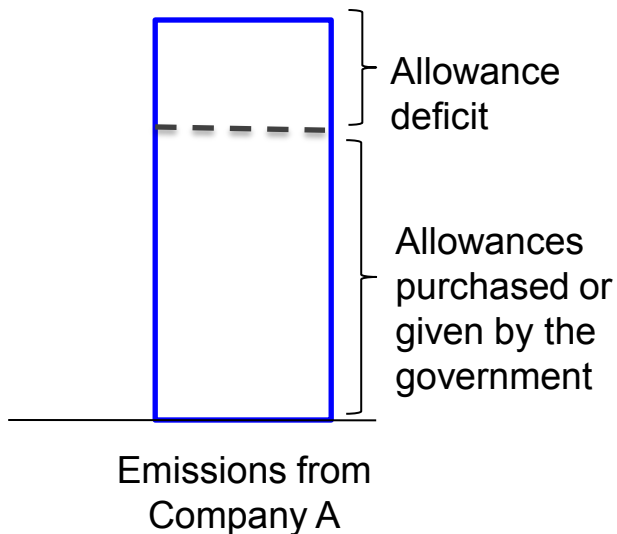


Offsets in a Cap & Trade System

If a capped entity exceeds its cap, it must respond by...

*...reducing its emissions, buying additional allowances, or purchasing offsets**

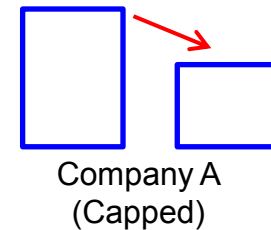
Emissions from Capped Sources



Response Options

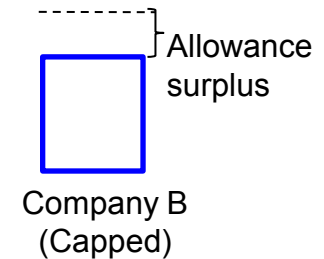
Option 1 – Reduce Emissions

Invest in internal emission reduction projects



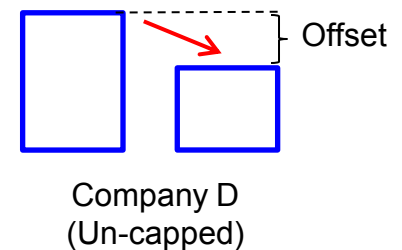
Option 2 – Buy Allowances

Buy additional allowances from a capped entity that has a surplus or from the regulators directly



Option 3 – Buy Offsets*

Buy offsets from a non-capped entity that reduces its emissions

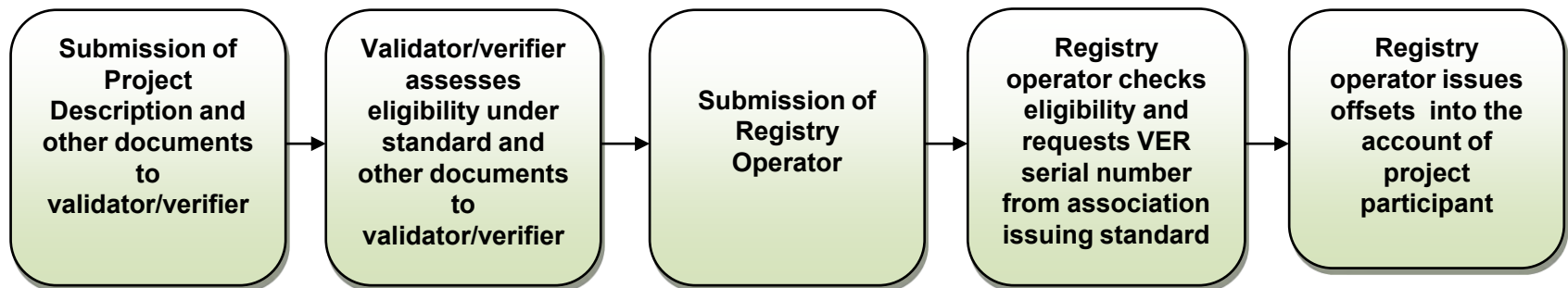




What is an Carbon Offset?

- The equivalent of a metric tonne of CO₂e generated by the reduction, prevention or sequestration of greenhouse gasses (GHG) from sources not covered under existing regulations or legislation.
- **Attributes of High quality, pre-compliance carbon offsets**
 - Additional
 - Permanent
 - Real
 - Measurable
 - Verified
 - Enforceable

Registration Process of Carbon Offsets.





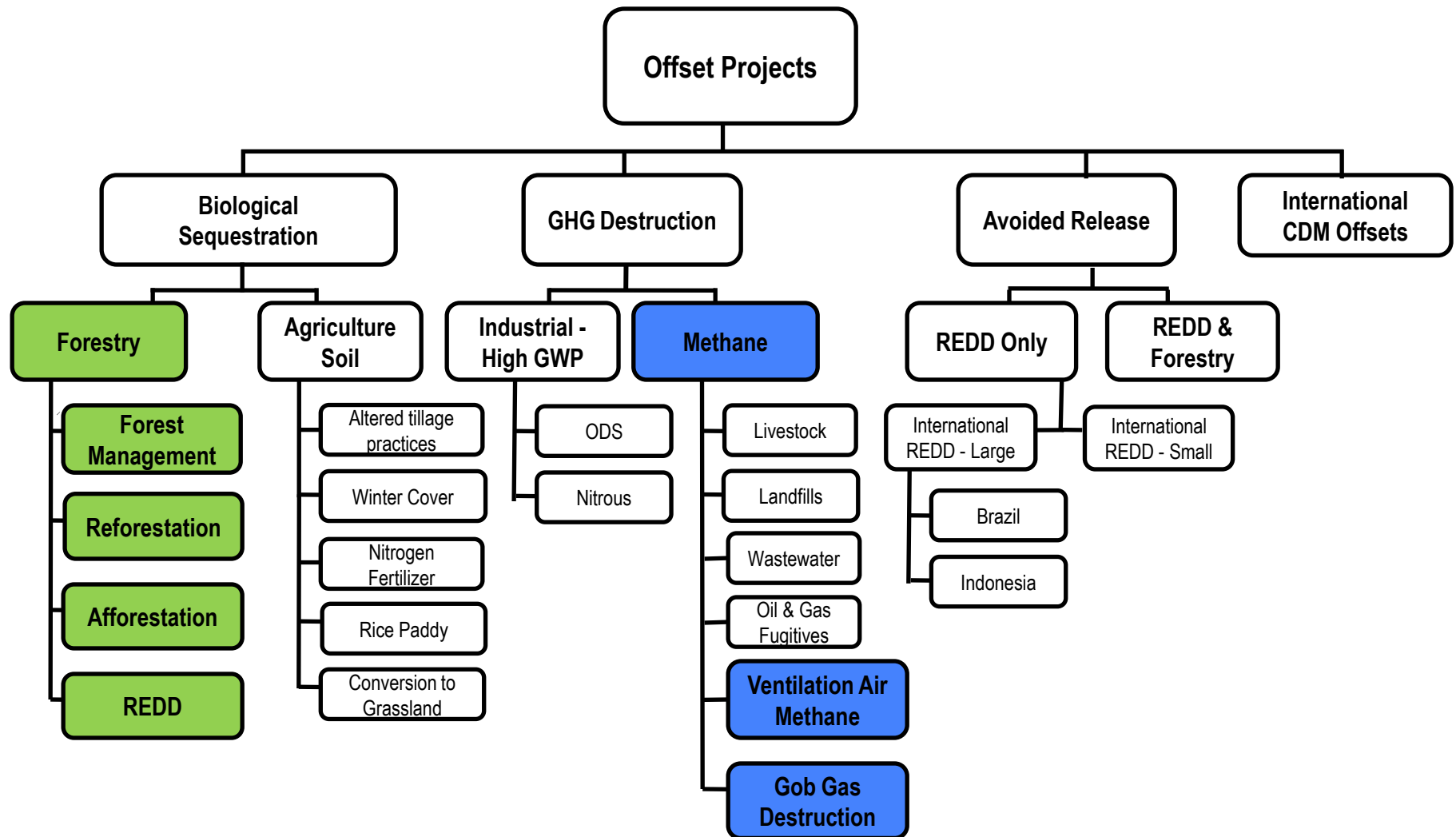
Protocols/Methodologies for Early Offset Supply

Project Methodologies are developed through public or peer review process and verified by independent third party.

- **Climate Action Reserve (CAR)** (www.climateactionreserve.org)
 - Forest Project Protocol Version 3.1 (October 22, 2009)
 - Coal Mine Methane Project Protocol Version 1.0 (October 7, 2009)
- **Voluntary Carbon Standard (VCS)** (www.v-c-s.org)
 - Improved Forest Management
 - Improved Forest Management Through Avoidance of Re-logging and Rehabilitation of Logged Over Forest
 - Improve Forest Management through Extension of Age Rotation
 - Coal Mines – Accepts methodologies developed by the UNFCCC Clean Market Mechanism and CAR
- **American Carbon Standard (ACS)** (<http://americancarbonregistry.org>)
 - The American Carbon Project Registry: Forest Carbon Project Standard (March, 2009, Version 1)



Opportunities for West Virginia: Carbon Offset Projects





Forestry Carbon Offsets

- **Improved Forest Management (IFM)** – Modification to forestry practices to enhance sequestration over time. Examples include lengthening the harvest-regeneration cycle, adopting low-impact logging or abandonment of clear cutting practices, protecting seedling establishment from wildlife, and conservation via reduction of forest land allocated for timber harvests.
- **Reforestation** – Tree planting on lands that in the more recent past were in forestry, excluding the planting of trees immediately after harvest. (10/yr without forest under Kyoto). Land not forested as of January 1, 2009 under Kerry-Boxer is eligible. An example is restoring trees on severely burned lands or reclaimed surface coal mines that will not regenerate without intervention.
- **Afforestation** – Tree planting on lands previously not in forestry (50/yr without forest under Kyoto). An example is the conversion of crop, pasture and/or rangeland to forestland.
- **Reduced Emissions from Deforestation and Degradation (REDD)** – Protection of forests (not previously harvested for timber and threatened by logging or clearing). An example is paying landowners to sustain forested land rather than convert it for other purposes.

***West Virginia is the Third Largest Forested State with over 11.9 million acres.
Forestry Management represent one of the Largest Opportunities for low cost offsets.***



American Chestnut – “Redwood of the East”



American Chestnut

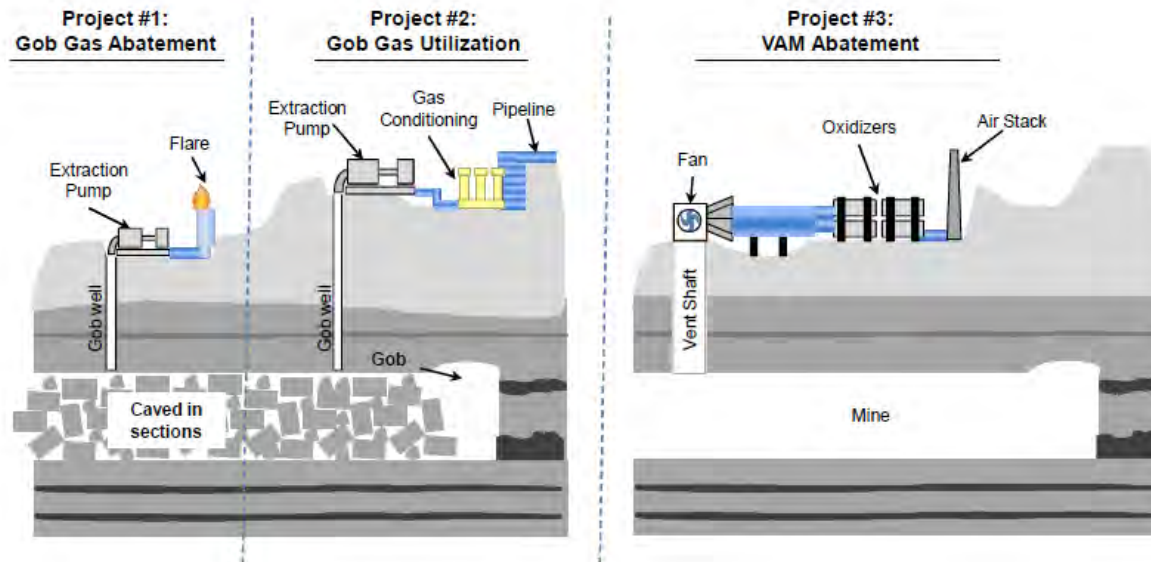
- Asian bark fungus from imported Asiatic chestnut tress created the chestnut blight
- Once over 3 billion trees (25% of trees in Appalachian Mountains) dwindled down to less than 100
- A former valuable resource in timber and nuts, as well as an abundant food source for wildlife
- Tree’s rapid growth rate makes it one of the best sponges for greenhouse gases
- Well suited for surface mine reclamation

Forest Health Initiative - Biotechnology

- Bring the American Chestnut back in three years
 - Introduce blight-resistant genes from Chinese chestnut
 - Address science, regulatory and societal issues with biotechnology
 - Work with key scientists, government agencies and environmental groups
- Duke Energy is providing \$1.5 million



Methane Destruction for active Coal Mines



- **Ventilation Air Methane for Coal Mines** - Ventilation Air Methane (VAM) projects destroy the 0.5 – 1.5% of methane in ventilation air for coal mines through oxidation.
- **Gob Gas Destruction** – Methodologies for destroying or utilizing gob gas are included in a positive project list for federal compliance.

The coal mining industry in West Virginia is one of the largest in the Nation, ranking second in annual coal production.



Biomass and Coal



- Co-firing test burn for Walter C. Beckjord Station in New Richmond, Ohio
- Scheduled for Feb/March, 2010
- 1% to 5% biomass blend on heat basis with coal purchased from West Virginia
- 2000 – 10,000 tons of biomass for test burn
- Barge from mile post 70 on Kanawha River to New Richmond
- 1/4" top size chips
- Ohio Renewable Energy Credits



Summary of West Virginia Opportunities



- West Virginia: Carbon Offsets
 - Forestry
 - Coal Mine Methane
- Biomass Supply
 - Blends with Coal
 - 100% Biomass to Power