

# Climate Action in Coal Country

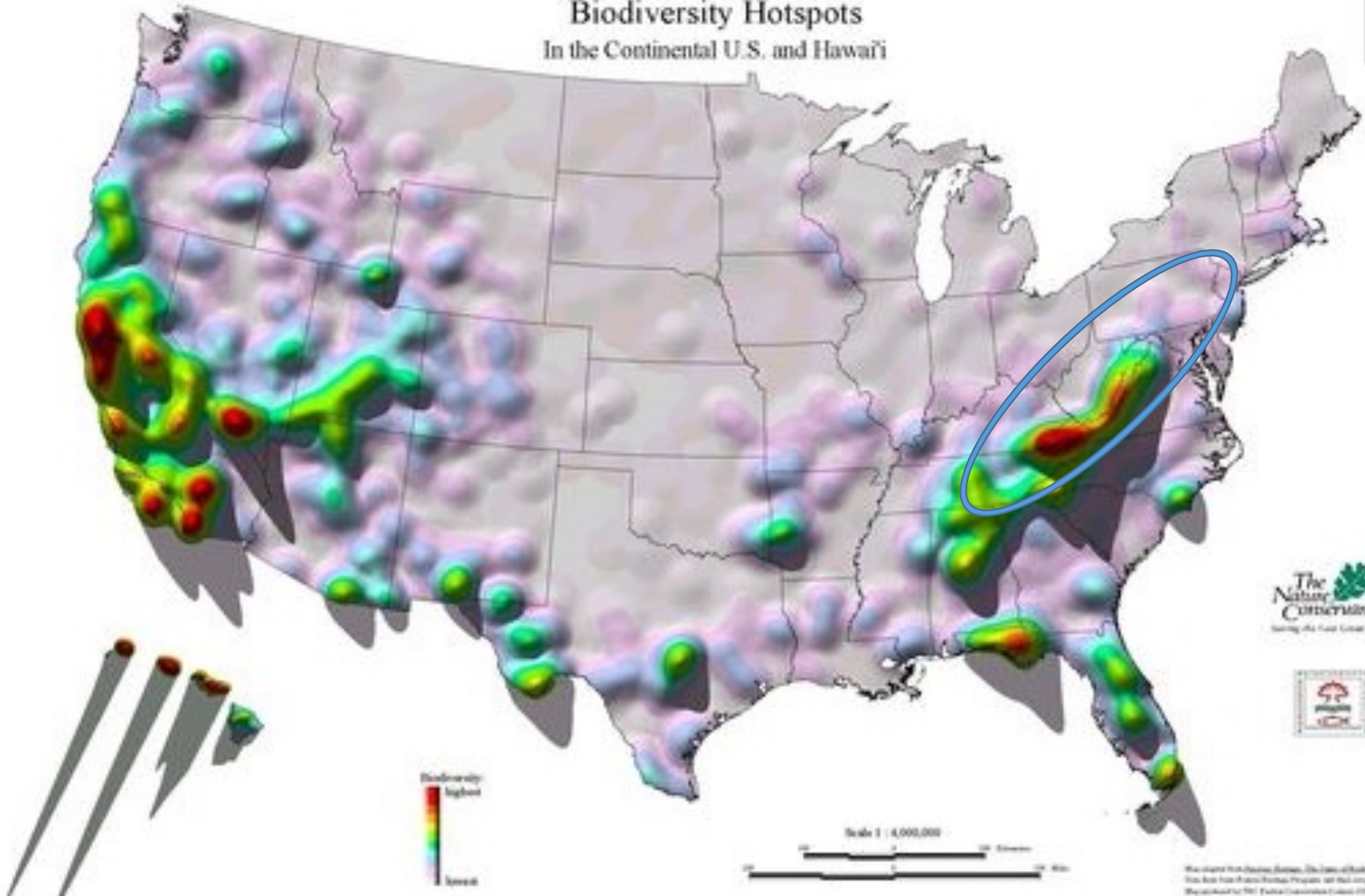
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# Biodiversity Hotspots In the Continental U.S. and Hawai'i



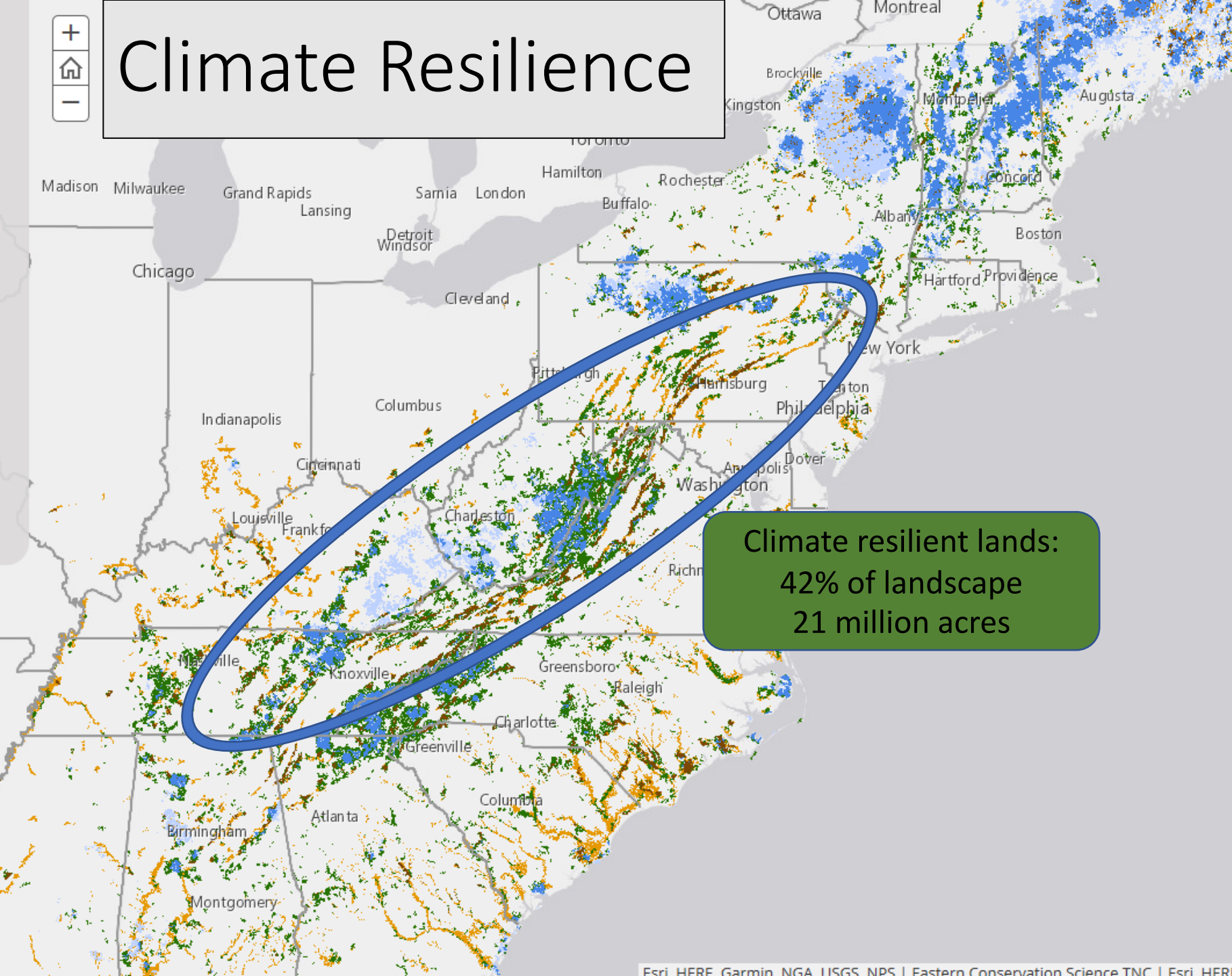
The Nature  
Conservancy  
*Saving the Last Great Places*



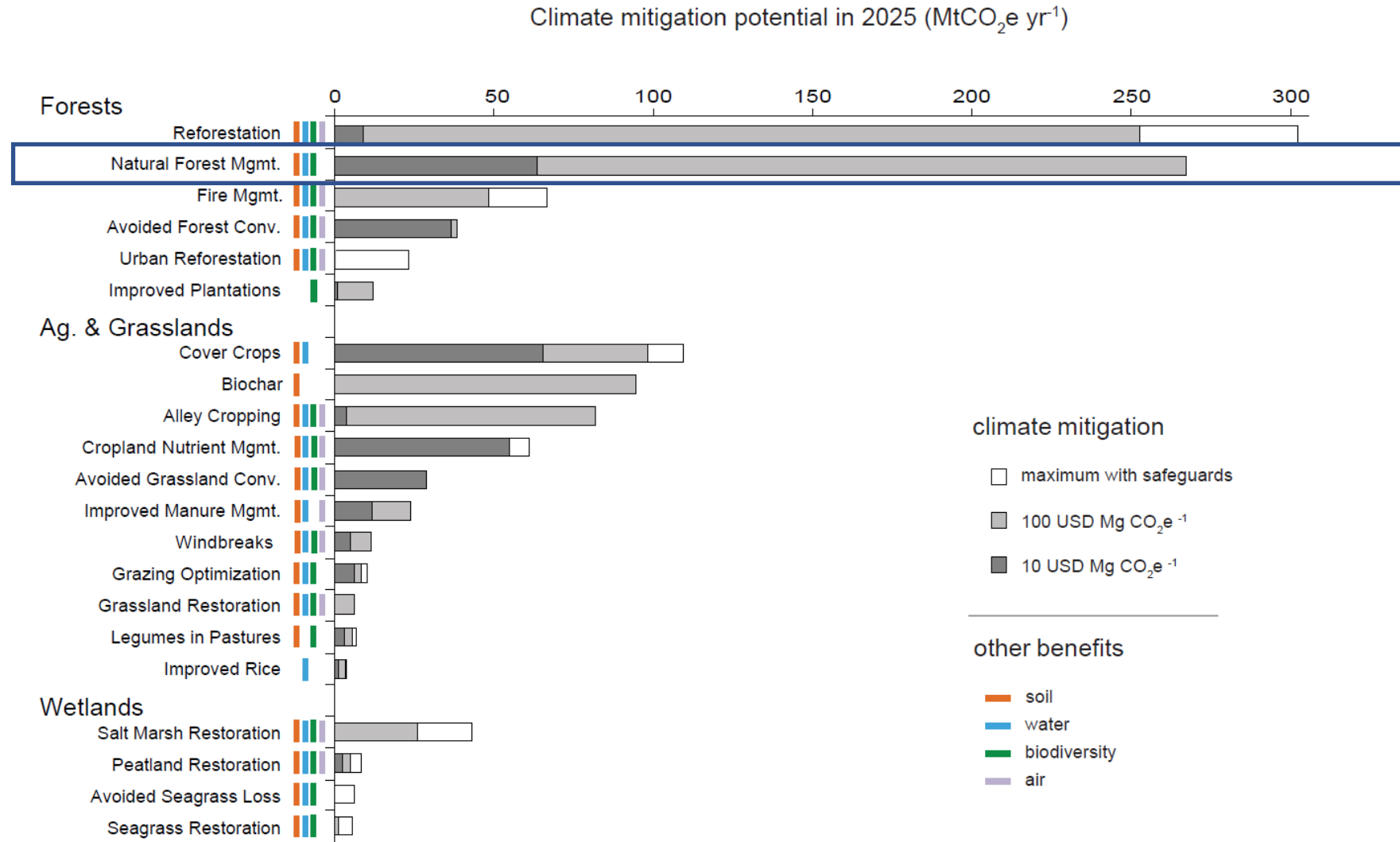
We created this Diversity Series. The topic of Biodiversity is the focus of  
the first of our Future Series Programs and the second  
illustrated by The Nature Conservancy © 2005



# Climate Resilience



# Natural Climate Solutions In The USA



Source: Fargione et al., 2018

# Aboveground Woody Biomass and Carbon Stock of the Conterminous United States

2000  
National Forest Inventory  
Data for 1999-2000

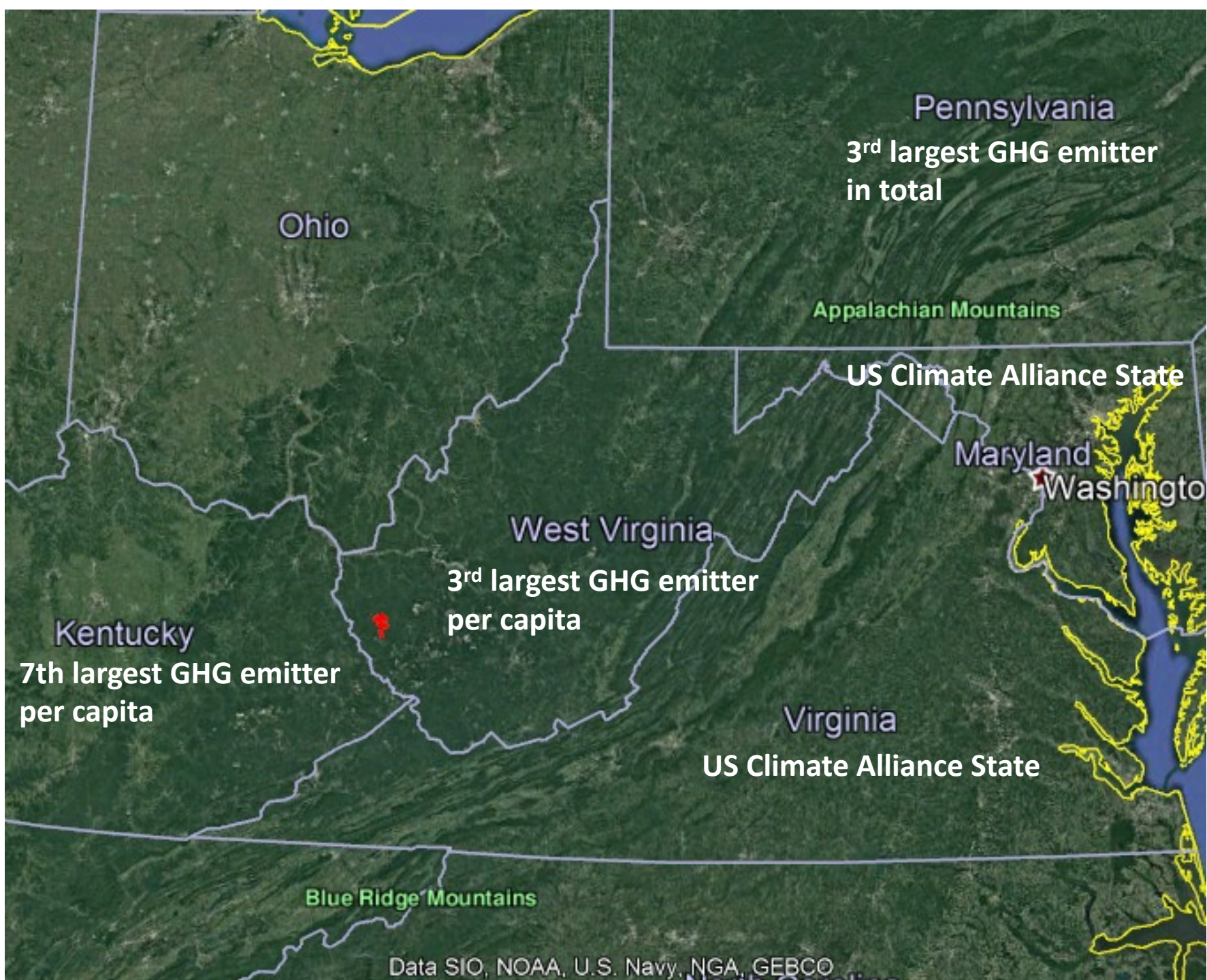


This map shows the first high-resolution, six-factor, multi-scale map of aboveground woody biomass and carbon stock for the conterminous United States. Biomass estimates are 30-m and are spatially aligned with the National Land Cover Database 2001 (NLCD 2001) published by the United States Geological Survey.

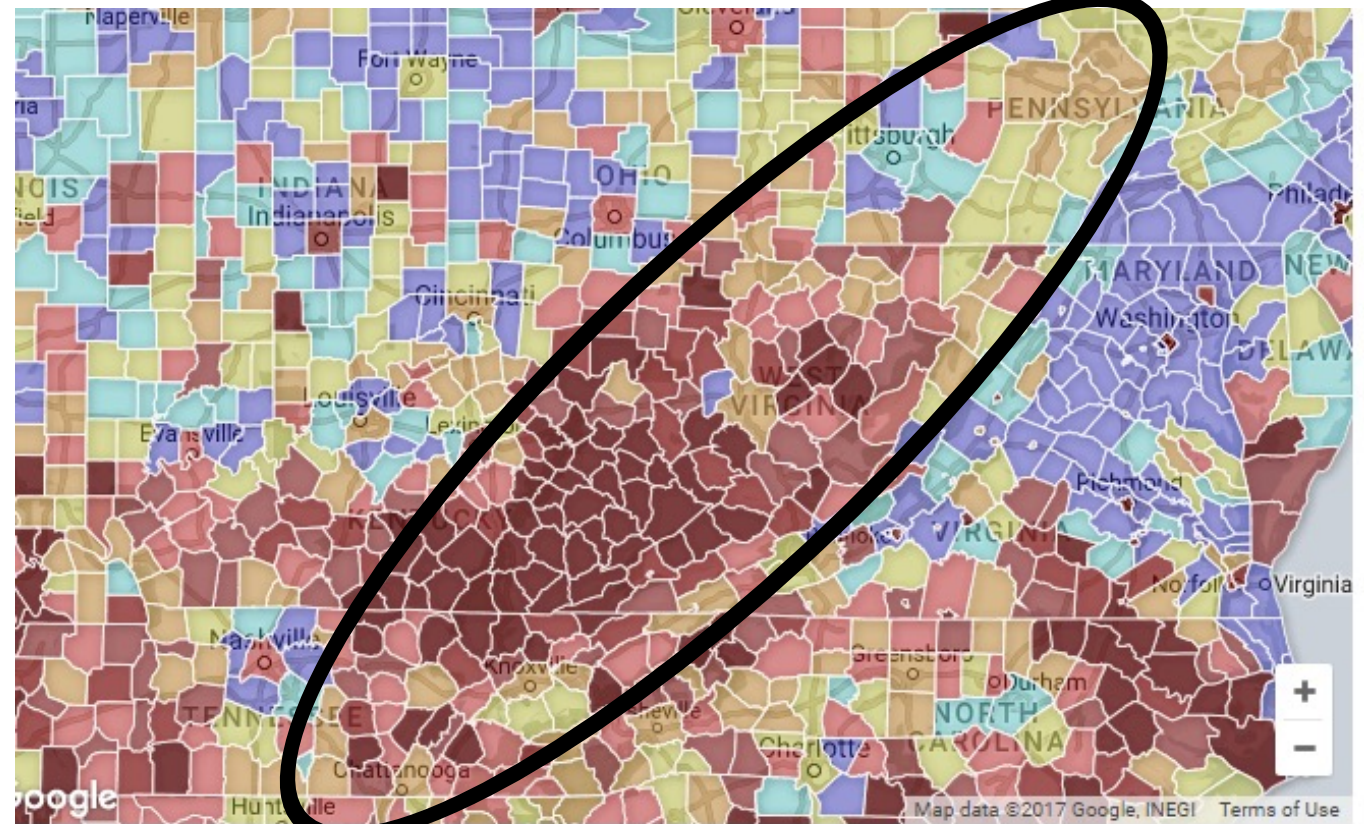
The map was produced by integrating six-year 2000 multi-scale satellite imagery (Landsat ETM+ and Shuttle Radar Topography Mission data), tree- and topographic gradient data (elevation, slope, aspect, canopy density, and soil cover), and USDA Forest Service Forest Inventory and Analysis (FIA) field reference data. Statistical regression models were developed and applied to all ecological mapping zones. Final maps were produced by reclassifying the 30-meter biomass maps. The maps shown here are generated by a map of predicted vegetation maps, produced using a two-step mapping approach and serving as a key input variable in the production of the biomass map. Aboveground woody biomass is estimated at 50% of the aboveground biomass production.

For more information and data access, visit:  
<http://www.afsc.org/biomass.html>

Map produced by the National Center for Earth and Environmental Assessment, U.S. Geological Survey, Reston, VA. Data provided by the National Land Cover Database 2001 (NLCD 2001) published by the United States Geological Survey. Data provided by the USDA Forest Service Forest Inventory and Analysis (FIA) field reference data. Statistical regression models were developed and applied to all ecological mapping zones. Final maps were produced by reclassifying the 30-meter biomass maps. The maps shown here are generated by a map of predicted vegetation maps, produced using a two-step mapping approach and serving as a key input variable in the production of the biomass map. Aboveground woody biomass is estimated at 50% of the aboveground biomass production.



A hot spot  
for carbon,  
climate  
resilience  
and...  
**poverty**



= CCHD-Funded Organizations    = Featured Story of Hope

**PLACES OF HOPE:** CCHD-funded organizations. Filter.

- All Markers
- Neighborhood Improvement [2]
- Agriculture [3]
- Environmental Justice [4]
- Economic Justice [5]
- Civil Rights [6]
- Economic Development [7]
- Target Population [8]

**ZOOM IN**

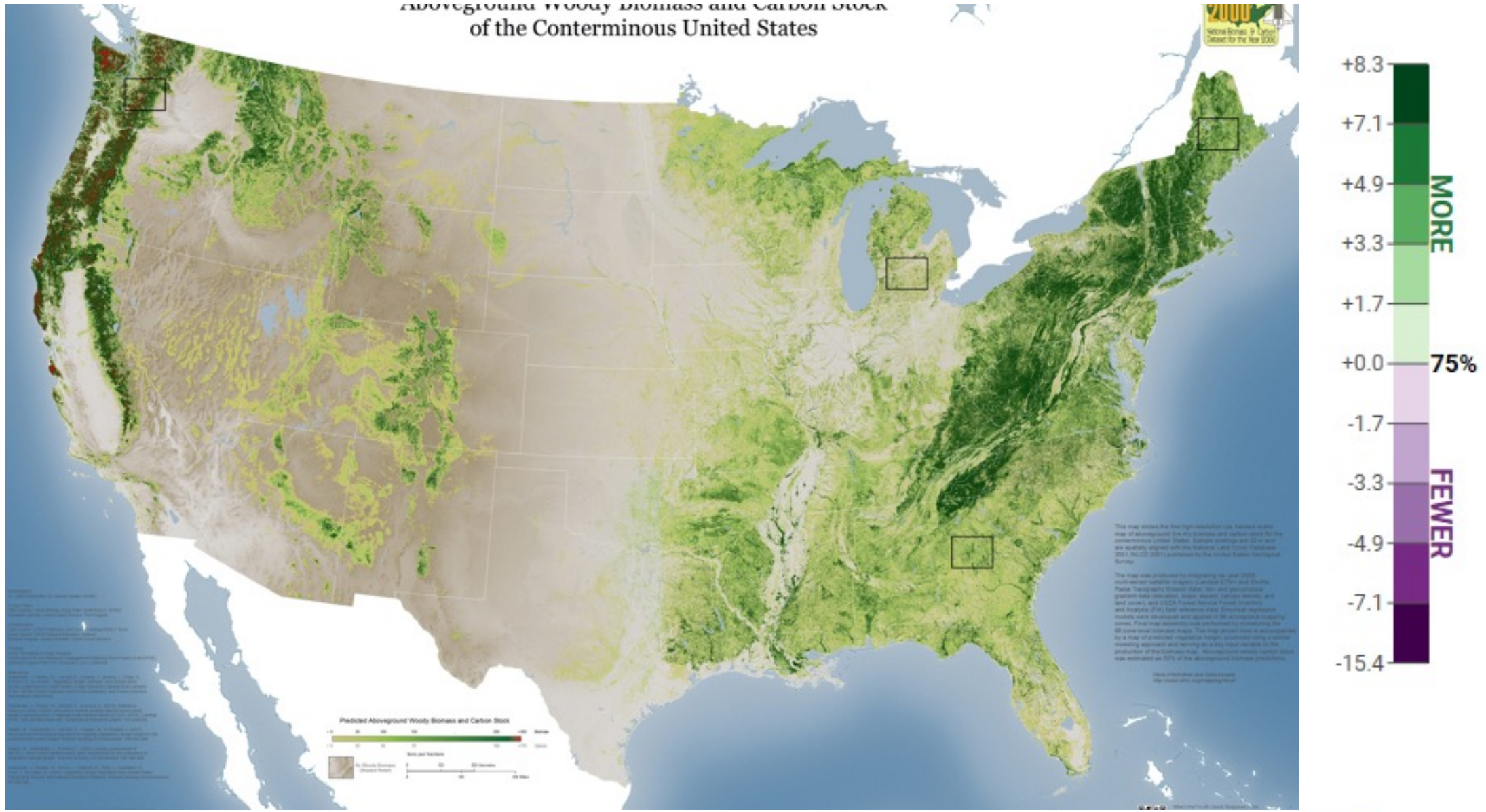
select a state ▼

Smaller counties require a zoomed view to be visible. Use the zoom controls on the map or select a state above.



Map data source: U.S. Census Bureau, Small Area Estimates Branch, Release Date: November 2011

# ABOVEGROUND WOODY BIOMASS AND CARBON STOCK of the Conterminous United States



Source: Yale Program on Climate Change Communication



# How do we turn a paradox into power...?

- High carbon emissions
- High poverty
- High resistance to climate action

Yet...

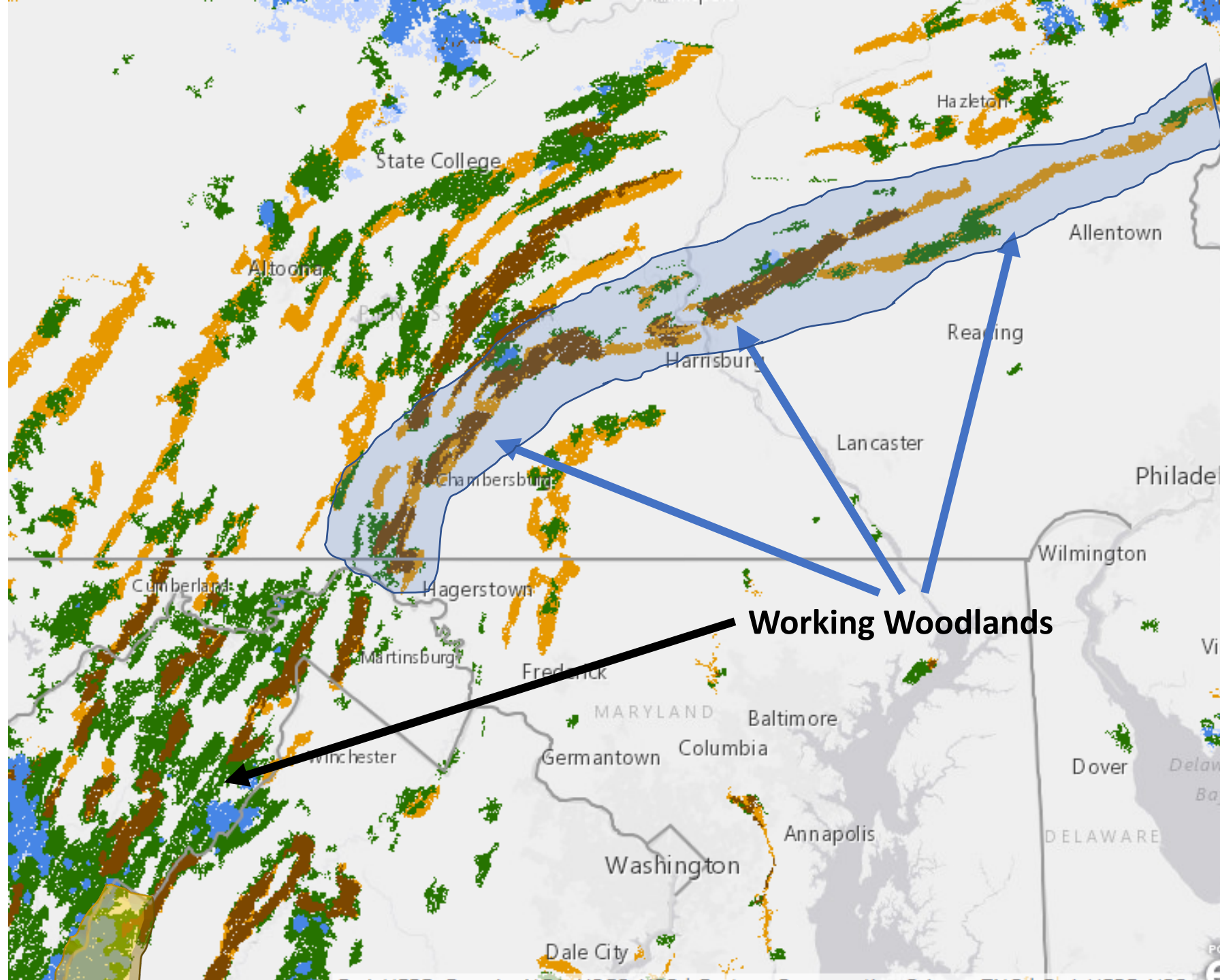
- High climate resilience
- High carbon forest and Natural Climate Solutions potential



# What is Working Woodlands?

Working Woodlands helps landowners conserve their forest and earn new sustainable revenues.

- Working forest conservation easements and agreement
- Forest Management plan and FSC certification
- Forest carbon project development and sales
- Generally properties over 2,000 acres
- **67,000 acres and 12 projects**



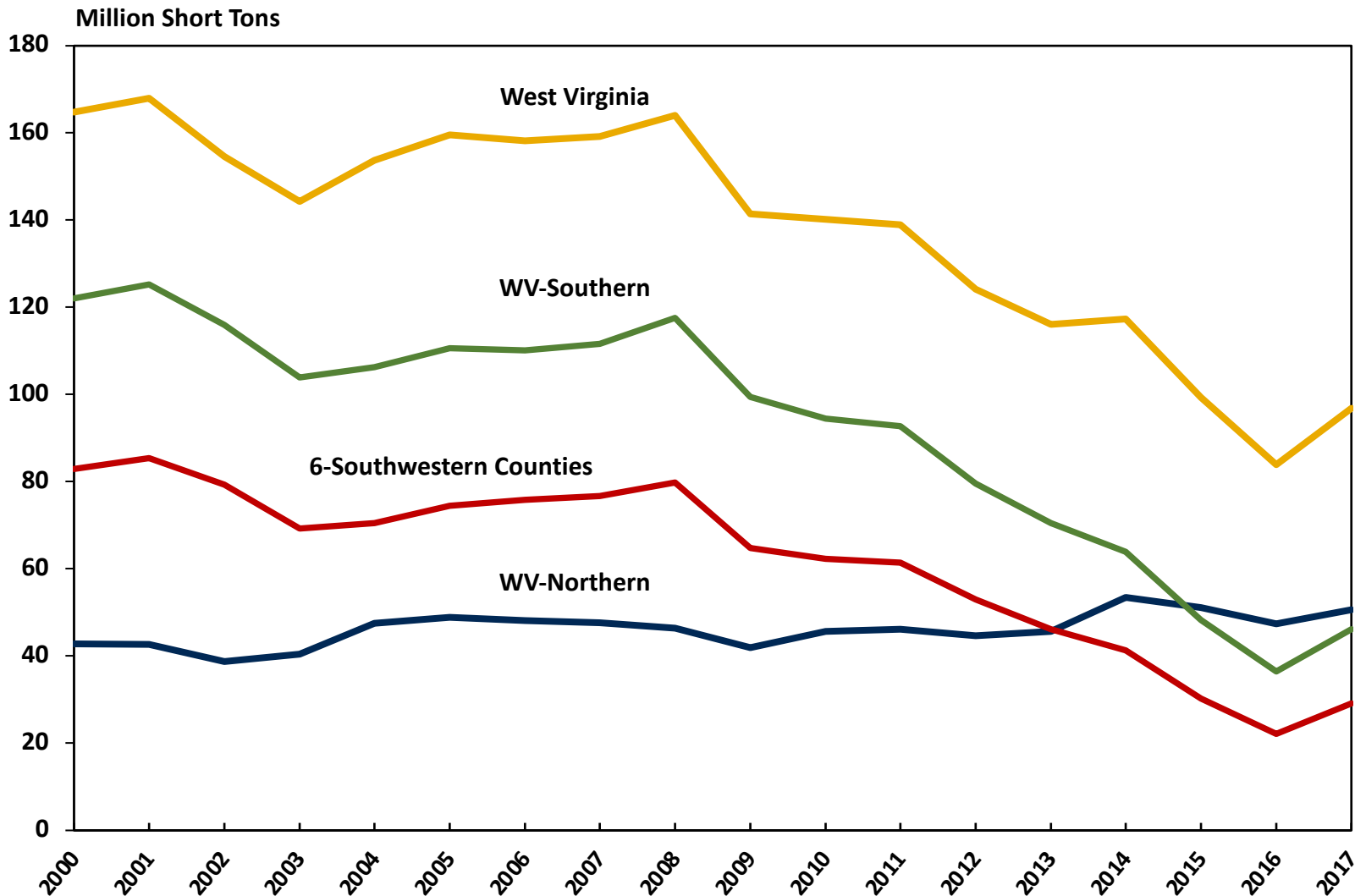
Forest carbon  
finance to protect  
climate resilient  
forests

# Climate Solutions for Coal Country

- 1.5-2 million acres of deforestation from coal
- Tens of millions of acres of high carbon stock forest
- 7 million acres of industrially owned coal/timber land



# Coal Production by Regions



Source: Mine Safety and Health Administration (MSHA) and Energy Information Administration (EIA)  
Note: The 6-Southwestern counties include Boone, Logan, McDowell, Mingo, Wayne, Wyoming



What is next for West Virginia's economy?



Reforestation of former mine lands

Forest carbon sequestration

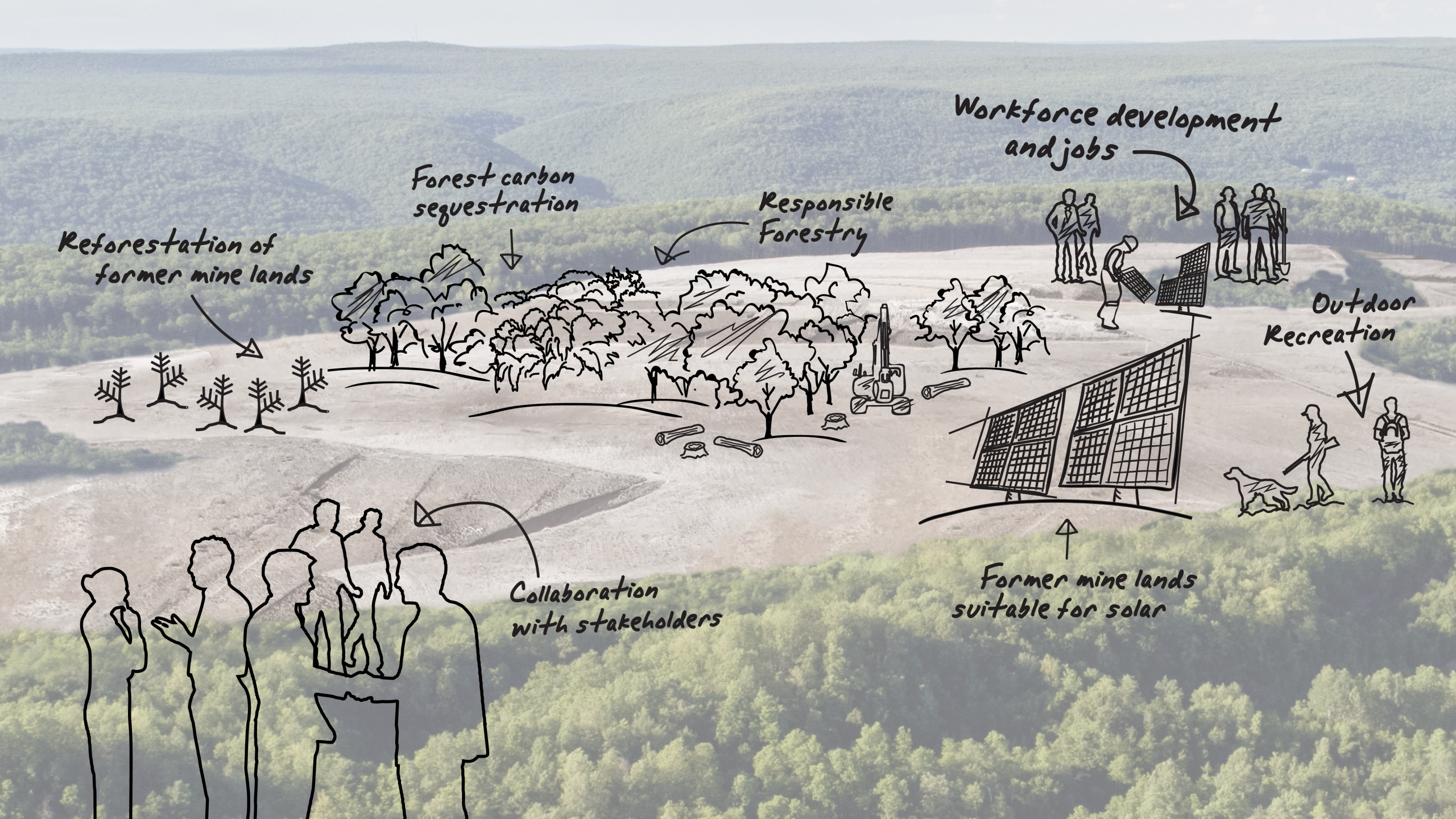
Responsible Forestry

Workforce development and jobs




Outdoor Recreation

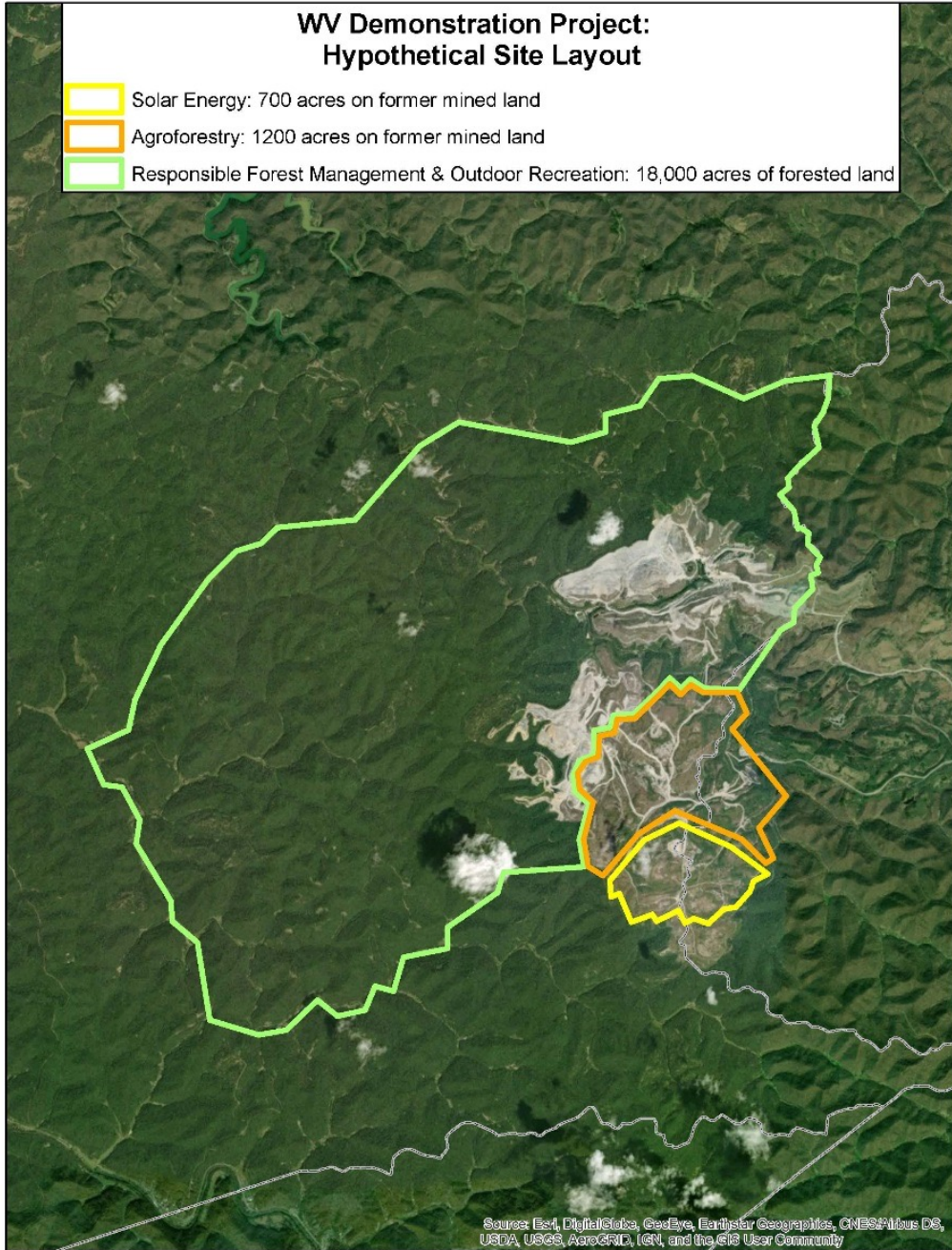
Collaboration with stakeholders

Former mine lands suitable for solar



### WV Demonstration Project: Hypothetical Site Layout

-  Solar Energy: 700 acres on former mined land
-  Agroforestry: 1200 acres on former mined land
-  Responsible Forest Management & Outdoor Recreation: 18,000 acres of forested land



Demonstrate climate-friendly  
economic development  
activities on former surface  
mine lands

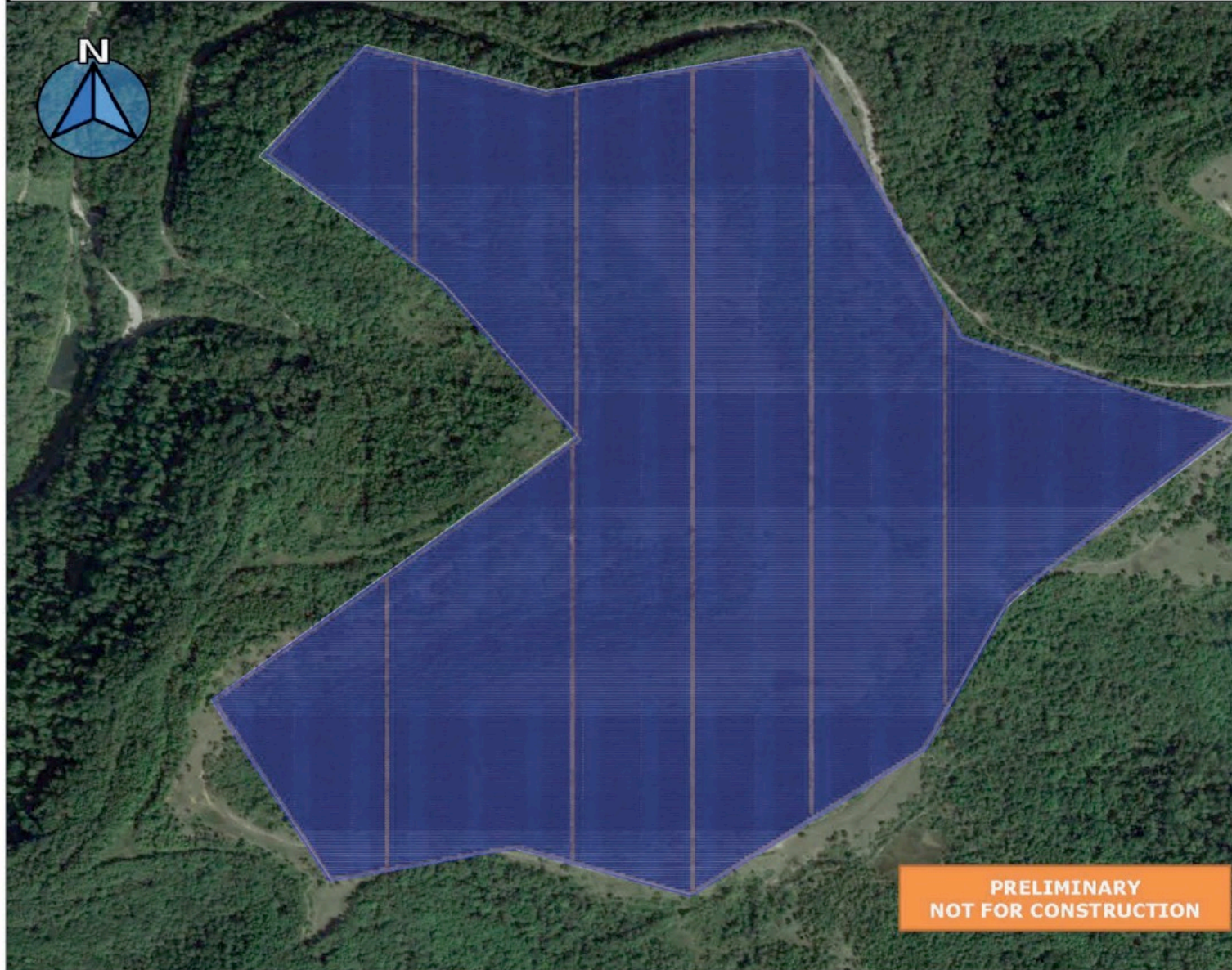
Core business units:

- Solar energy
- Forest carbon & responsible forestry (Working Woodlands)
- Outdoor recreation
- Agroforestry



# West Virginia Site 4

## PROJECT INFORMATION



<i>Project Capacity (DC)</i>
<b>85,000 kW</b>
<i>Project Capacity kW (AC)</i>
<b>65,000 kW</b>
<i>Potential Designs</i>



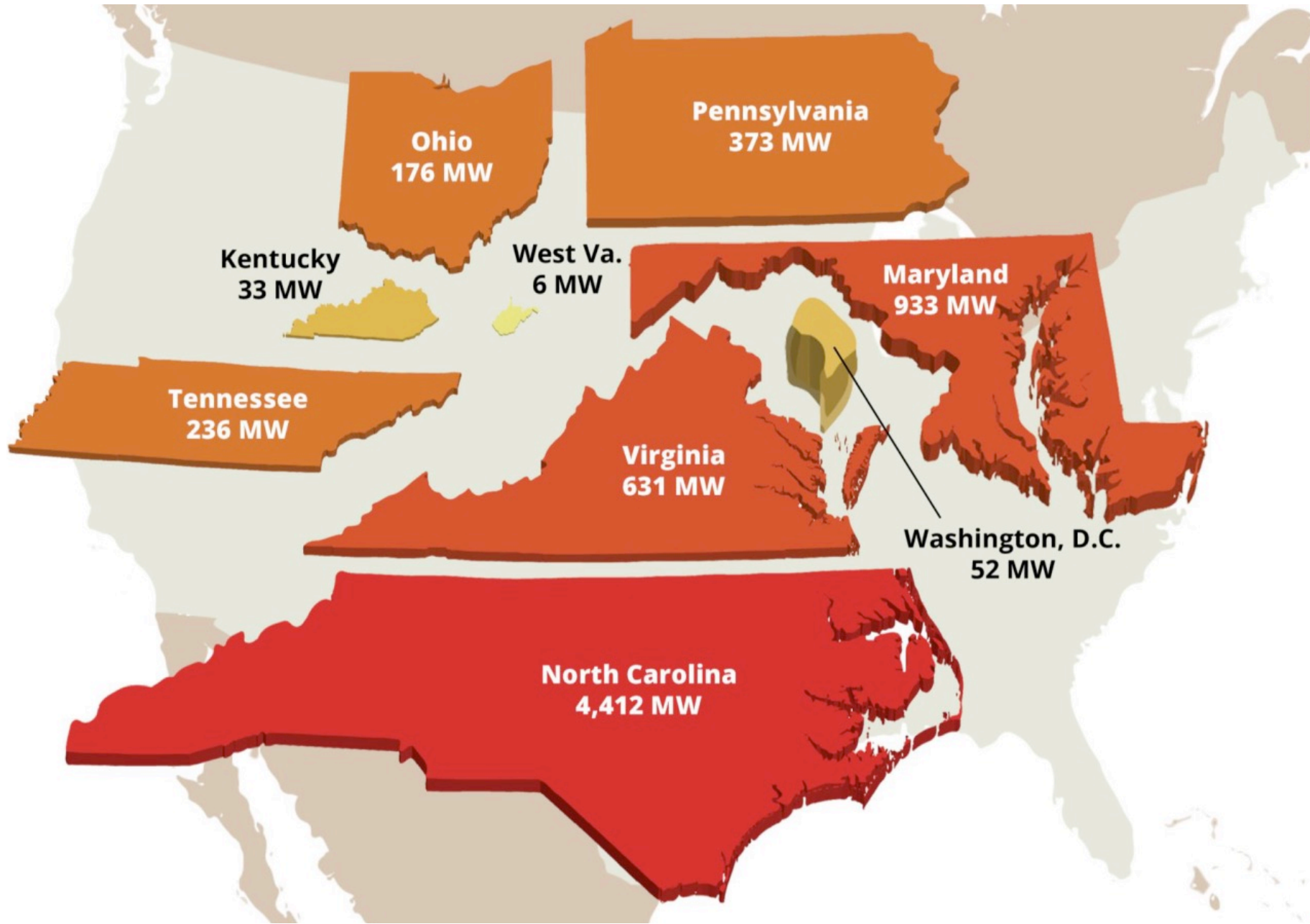
**PRELIMINARY  
NOT FOR CONSTRUCTION**



\*Assumes 470 watt solar modules

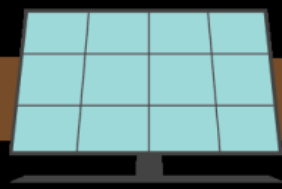
Acres                    206

Acre/MW(AC)        3.169



ON DEGRADED LANDS

ON FORESTED LANDS



+ WATER QUALITY -

+ CO<sub>2</sub> CARBON SEQUESTRATION -

+ BIODIVERSITY & WILDLIFE -

+ POLLINATORS ≈



FOR SALE





# Virginia's 'Green New Deal' exposes what Democrats really care about -- and it's not the environment

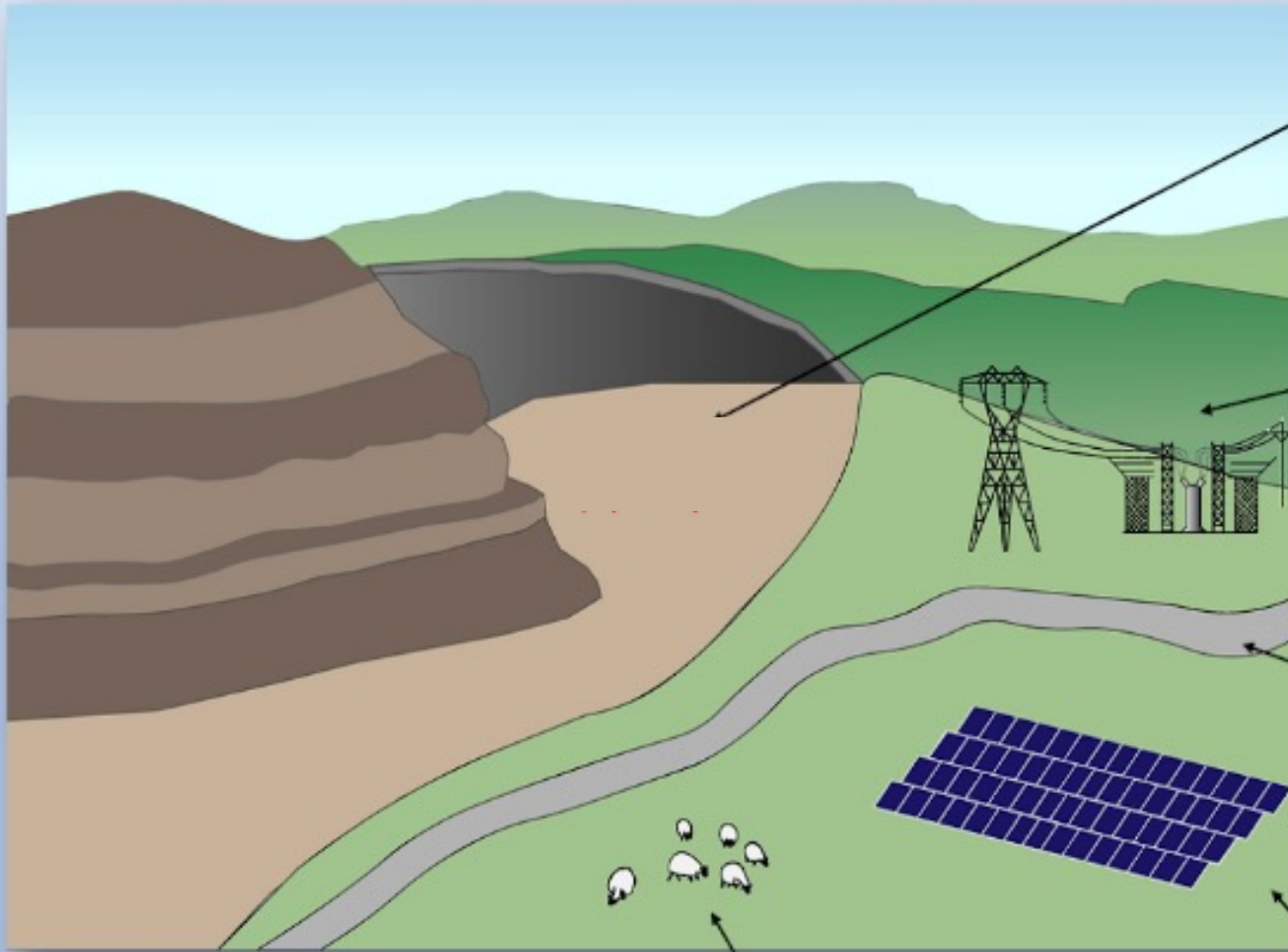


**OPINION** By Lauren DeBellis Appell | Fox News



## Massive East Coast solar project generates fury from neighbors in Virginia

Renewable energy company sPower is trying to build the biggest solar project on the East Coast, a 500-megawatt solar farm on 6,000 acres in Virginia, but neighbors are voicing their concerns.



### **Workers and Equipment**

Surface mine workers and equipment can be used to prepare the site for solar

### **Nearby Utilities**

Nearby substations and power lines allow for connections to the grid

### **Existing Roads**

Existing haulroads provide access to deliver solar equipment

### **Multiple Uses**

Solar on minelands is compatible with other uses such as grazing

### **Flat, Cleared Land**

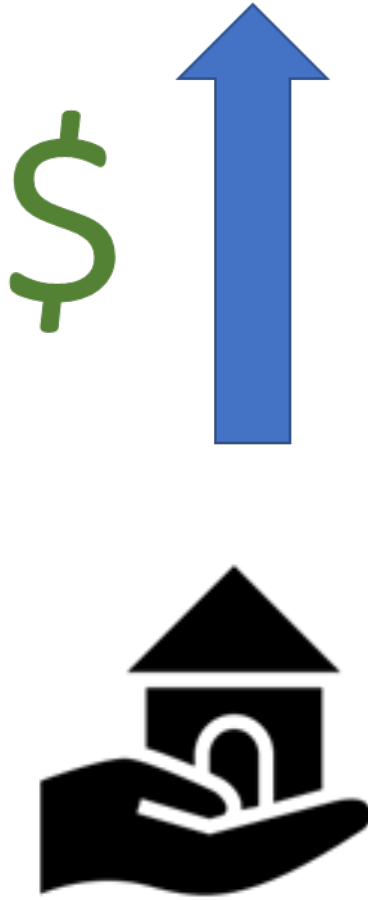
Relatively flat, cleared land facilitates solar development



# Key partners / Stakeholders



Property owners

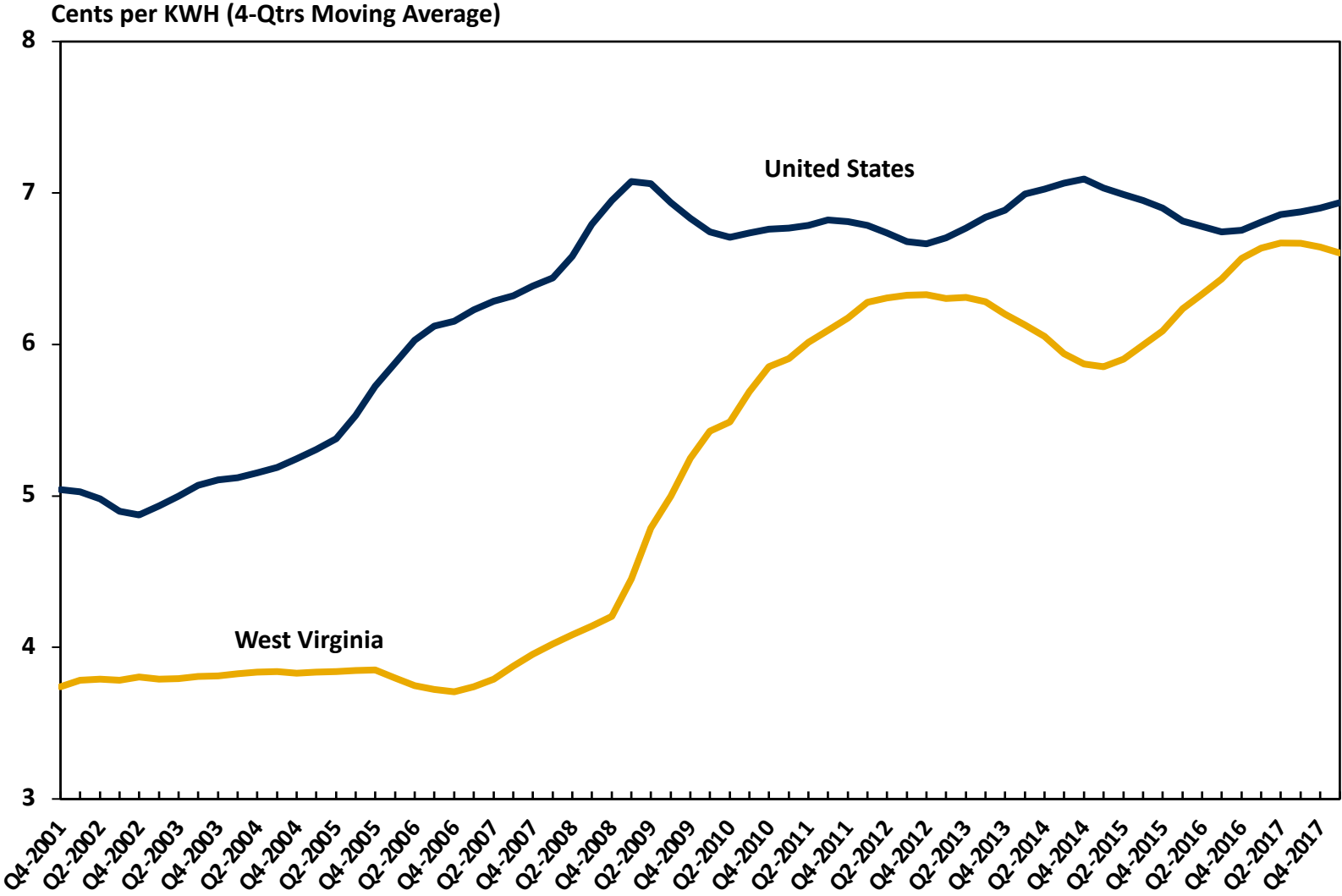


Mining companies





# Average Retail Price of Electricity for Industrial



Source: US Energy Information Administration



## Unsubsidized levelized cost of energy - comparison based on utility-scale generation since 2009

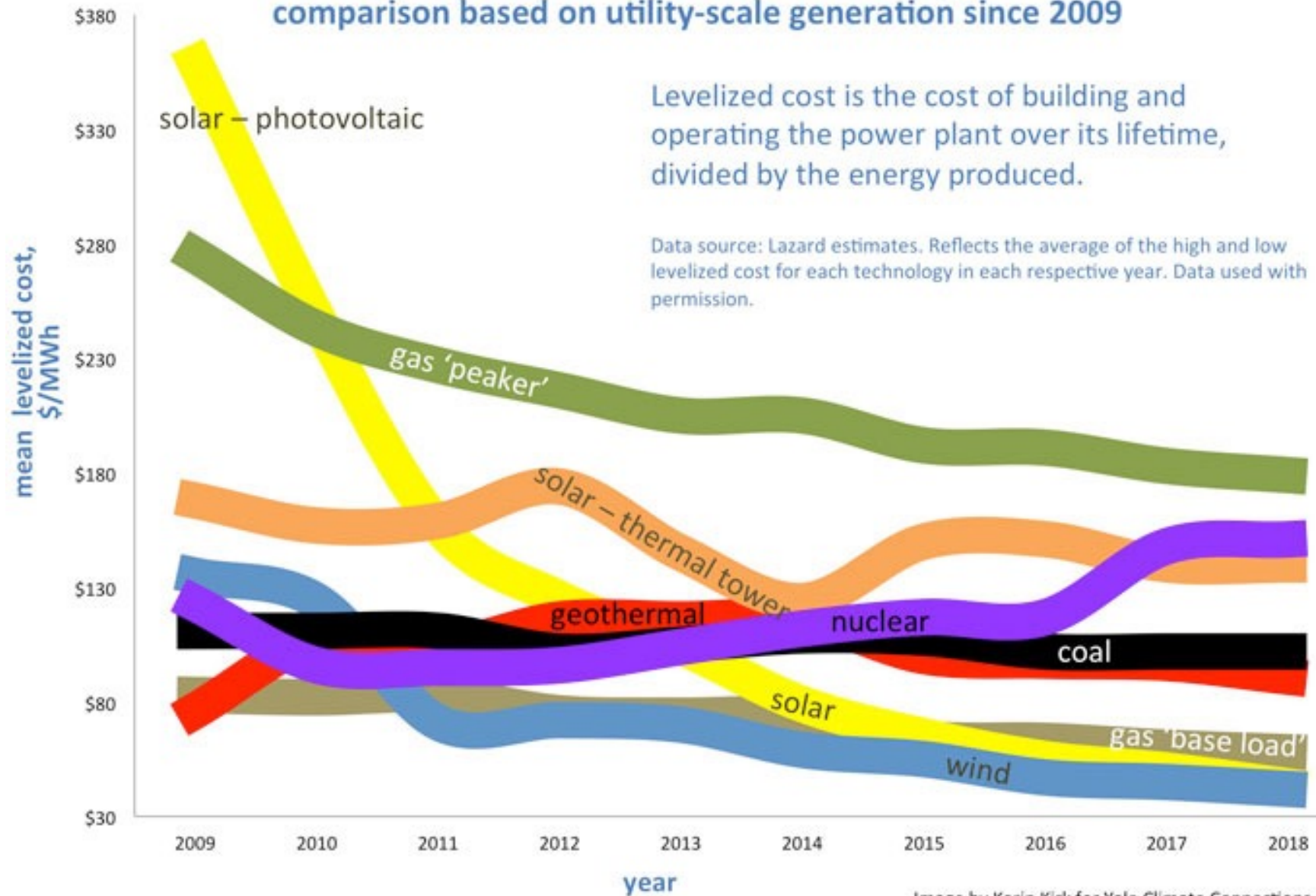
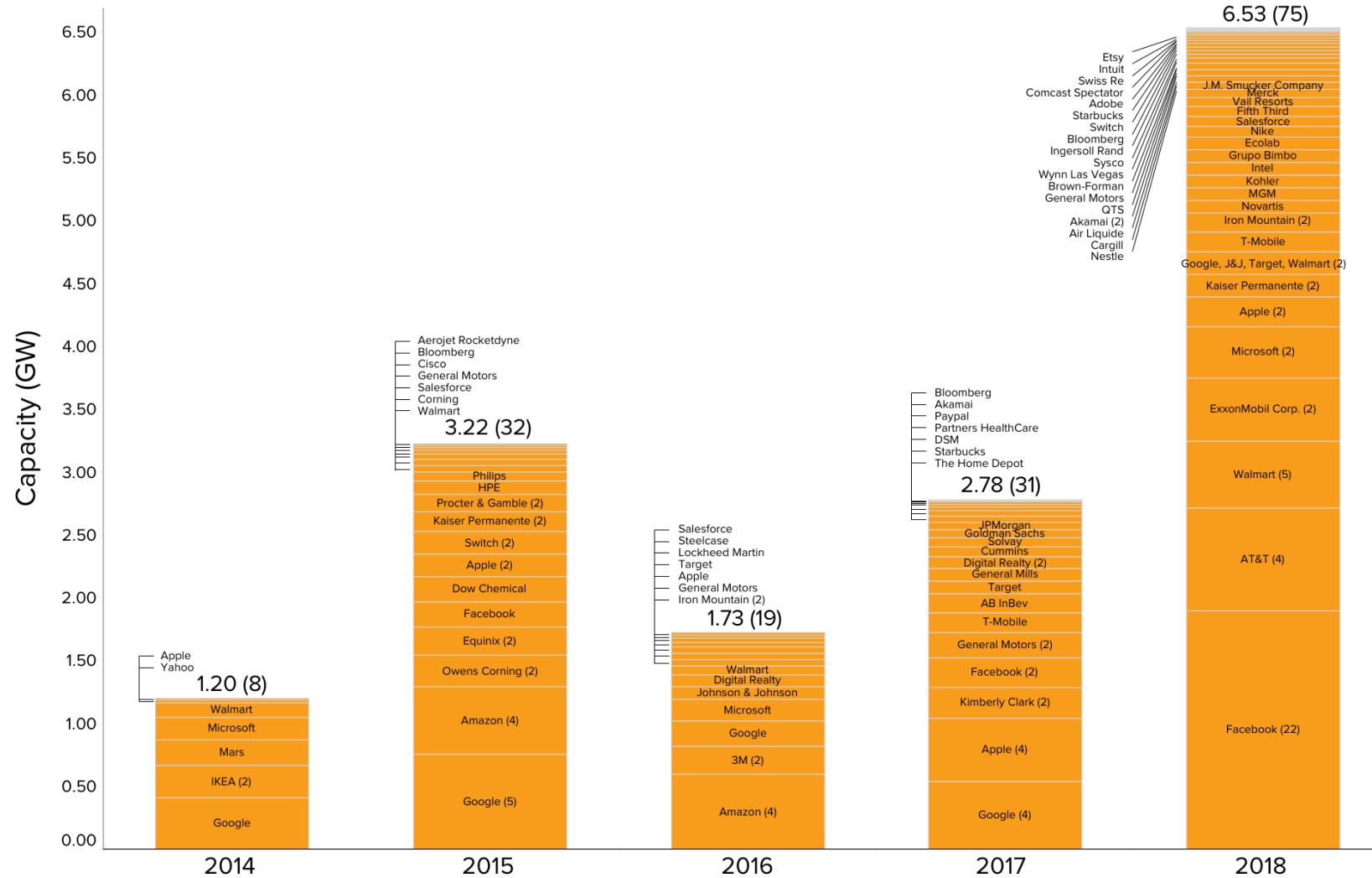


Image by Karin Kirk for Yale Climate Connections



# Corporate Renewable Deals 2014 – 2018



As of December 31, 2018. Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US, 2014 – 2018. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. (#) indicates number of deals each year by individual companies.

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Overcoming Real  
and Perceived  
Barriers to a  
Climate-Friendly  
Economic Model



Reforestation of former mine lands

Forest carbon sequestration

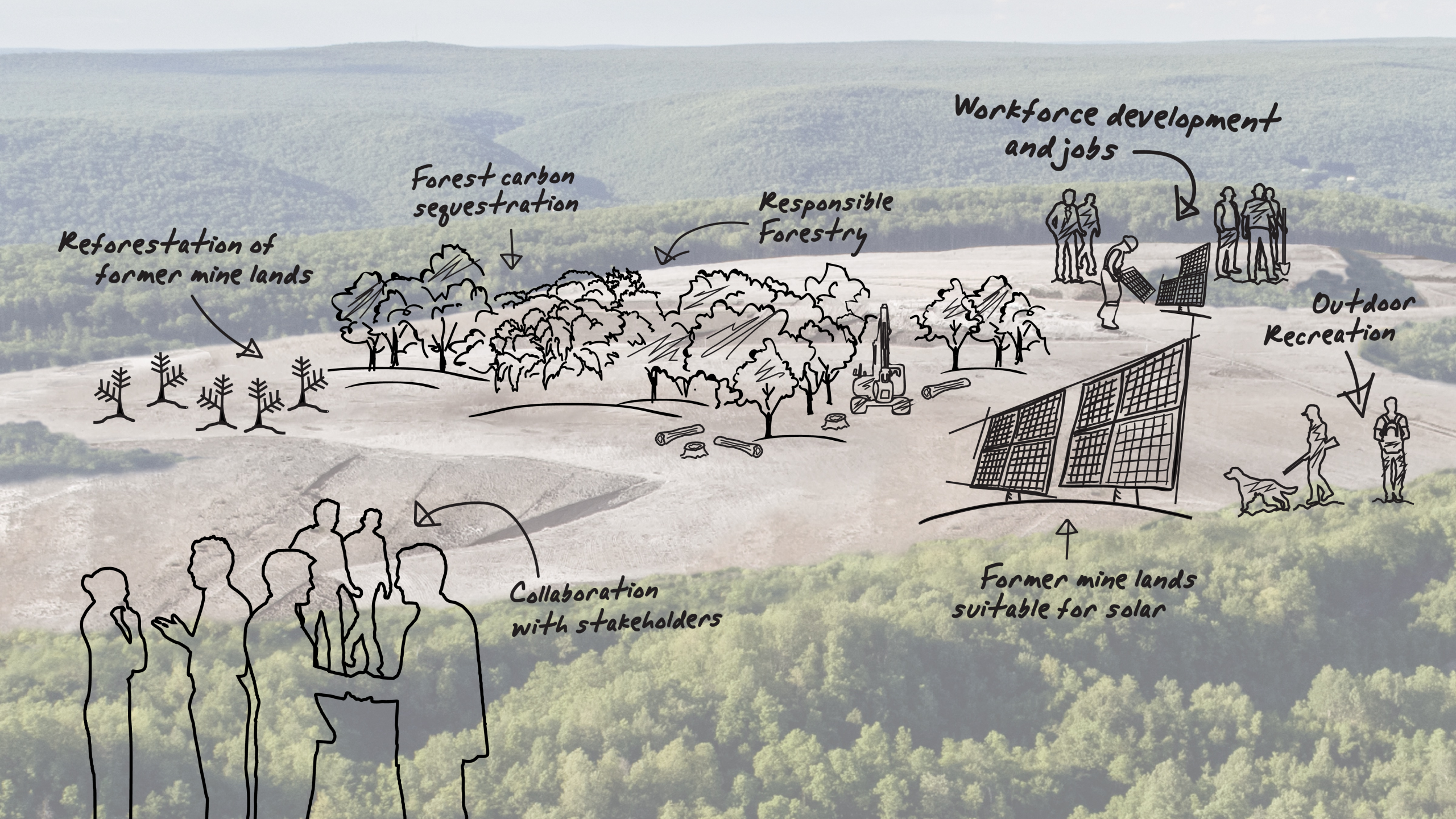
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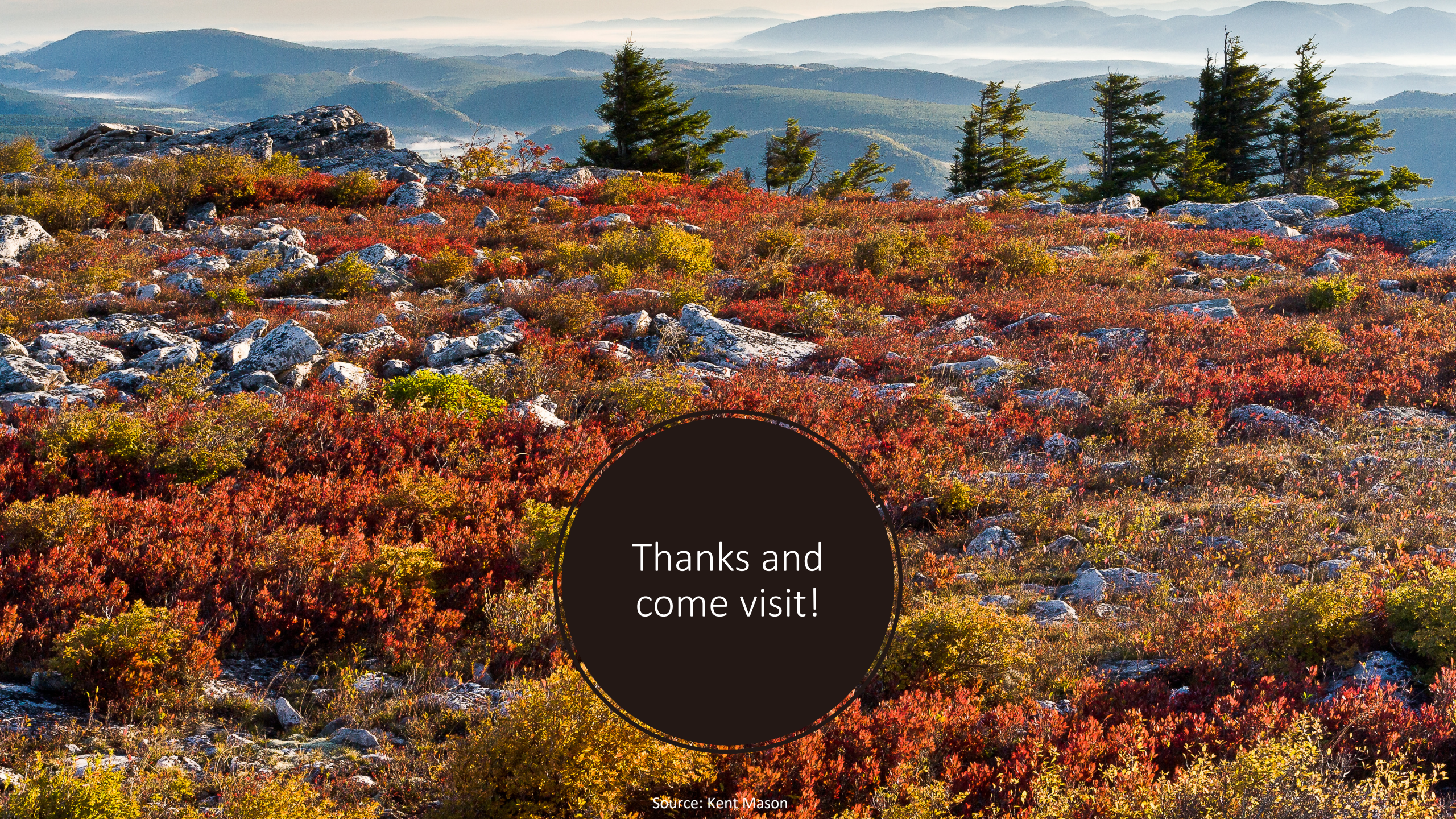


# Lessons learned

- Lead with climate in USCA states (NJ, VA, MD)
- But we must change the narrative on climate everywhere and NCS can help
- Seeing is believing...demonstrate on the ground to landowners, policymakers and influencers



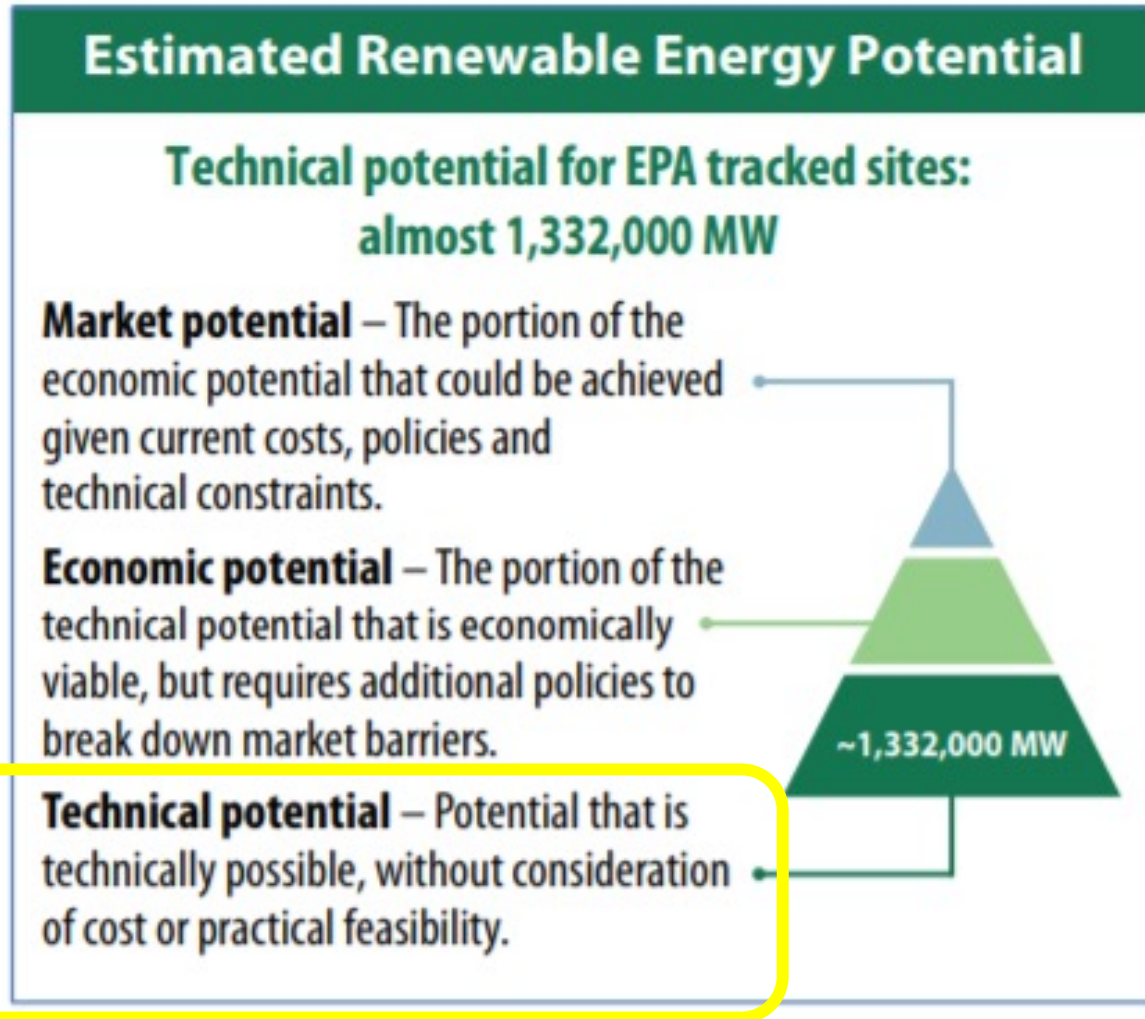




Thanks and  
come visit!

Source: Kent Mason

# Scale of solar opportunity on degraded lands



Screening Results	All Sites		
	Sites	Acres	Est. Capacity (MW)
All Technologies	133,890	43,968,753	1,332,842
Solar	133,890	43,933,587	1,090,146
Wind	64,935	38,166,920	348,184
Biomass	37,129	32,237,784	393,900
Geothermal	110,593	40,808,323	NA