



REAL Change

*Renewable Energy for
Appalachian Lands*

Ella Fox, Hattie Jenkins, Sam Weatherly, Purva
Bommireddy & Erin Campbell

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Meet The Team



Sam
Weatherly



Hattie Jenkins



Ella Fox

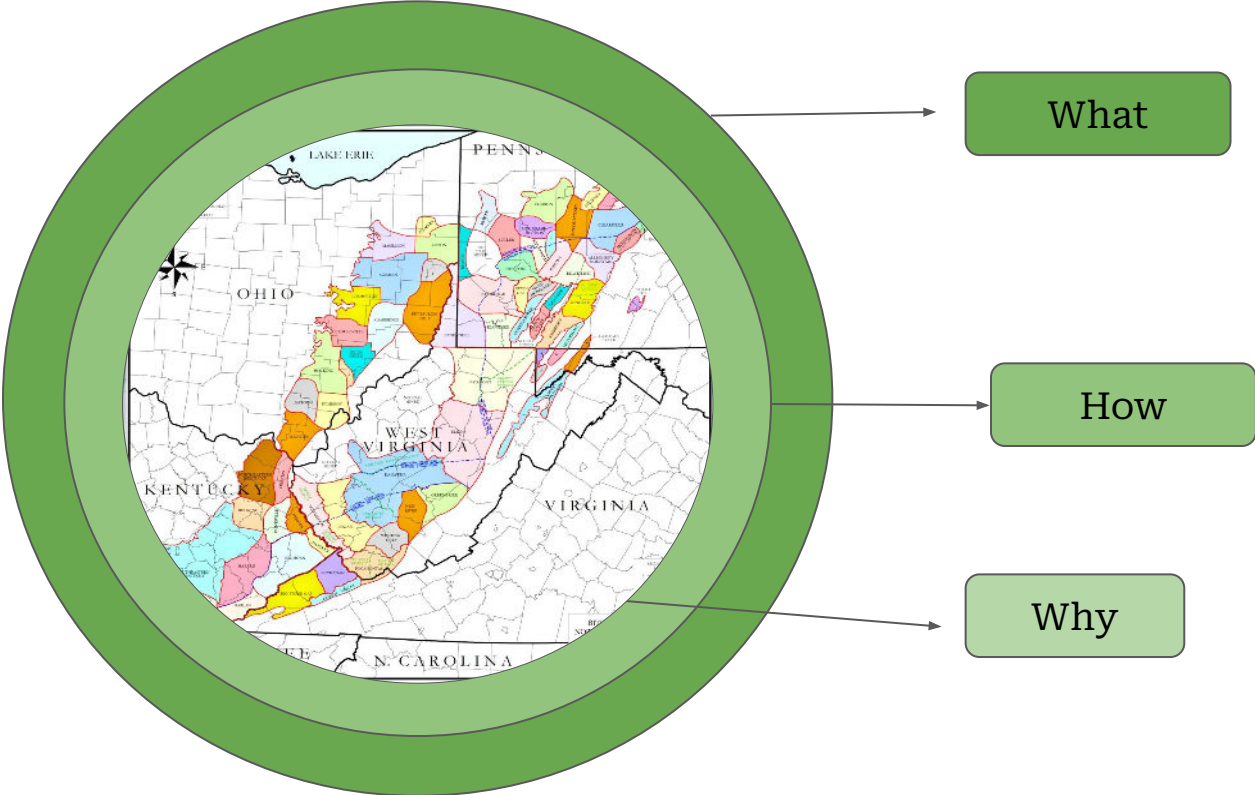


Purva Bommireddy



Erin
Campbell

The Golden Circle

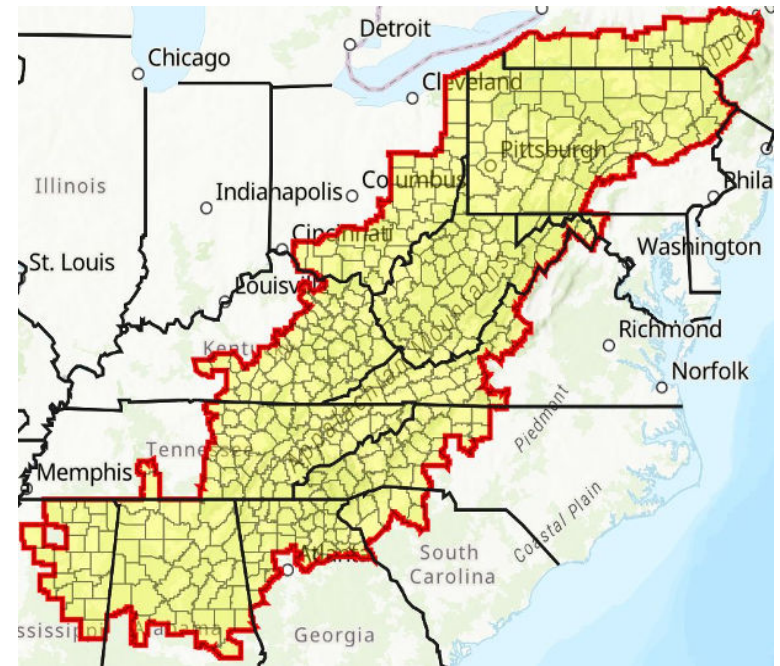


Why

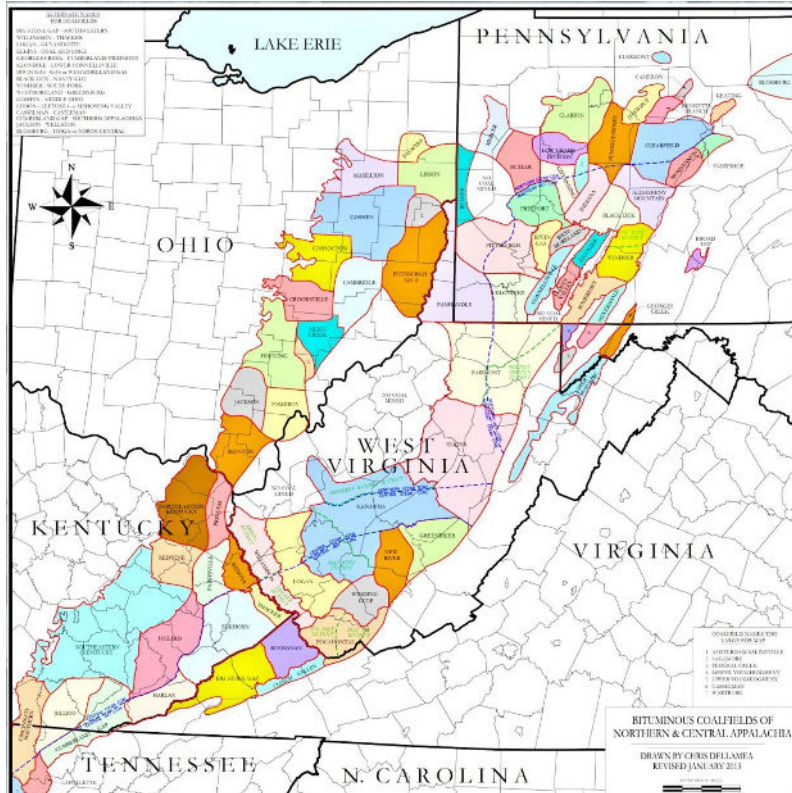
The underrepresented and impoverished communities in Appalachia often...

- are negatively affected by abandoned coal mines/plants (pollution into water)
- can not afford to implement renewable energy themselves
- need easier access to an energy overall

Therefore, they need support in their transition to a renewable energy future



How



- incentivise big fossil fuel companies to reduce emissions
- collect funds to help the Appalachian Region become green
- decommission coal plants
- later utilize area for renewables

What

Federal Government Policy Proposal

- collect taxes on companies emitting greenhouse gases
- tax money is allocated to the Appalachian Regional Commission
- ARC contracts companies to decommission abandoned mine lands
- ARC then later assists in renewable energy implementation



Social Business Model Canvas

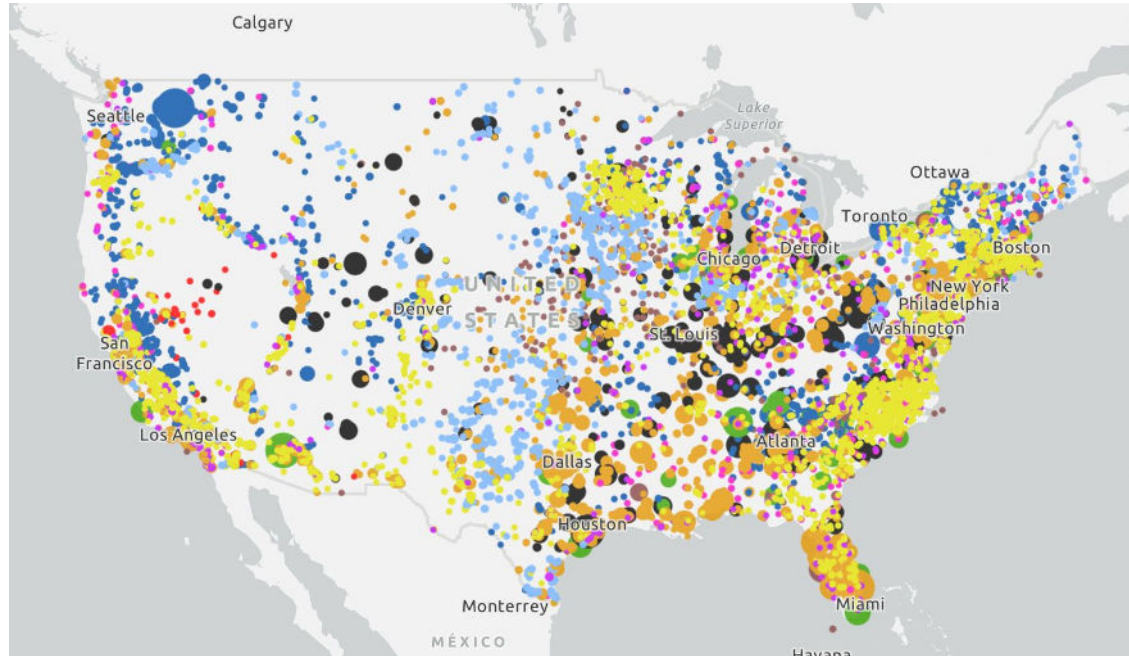
<p>Key Resources</p> <p>Administrative Support</p> <p>Property Rights</p> <p>Tax Money</p> <p><i>What resources will you need to run your activities? People, finance, access?</i></p>	<p>Key Activities</p> <p>Policy Proposal And Approval</p> <p>Decommission Coal Mines With Local Businesses</p> <p><i>What programme and non-programme activities will your organisation be carrying out?</i></p>	<p>Type of Intervention ②</p> <p>Policy</p> <p>Repurposing Abandoned Land</p> <p><i>What is the format of your intervention? Is it a workshop? A service? A product?</i></p>	<p>Segments ①</p> <p>Appalachian Communities</p> <p>Beneficiary <i>Who benefits from your intervention?</i></p> <hr/> <p>Customer ④</p> <p>Fossil Fuel Companies</p> <p><i>Who are the people or organisations who will pay to address this issue?</i></p>	<p>Value Proposition ③</p> <p>Wellbeing Improvement Clean Land</p> <p>Beneficiary Value Proposition</p> <hr/> <p>Impact Measures</p> <p>Policy Approval Reduce Mine Issues</p> <p><i>How will you show that you are creating social impact?</i></p> <hr/> <p>Customer Value Proposition ⑤</p> <p>Switch To Clean Energy</p> <p><i>What do your customers want to get out of this initiative?</i></p>
<p>Partners + Key Stakeholders</p> <p>Congress Community Local Business Landowners</p> <p><i>Who are the essential groups you will need to involve to deliver your programme? Do you need special access or permissions?</i></p>		<p>Channels ⑥</p> <p>Federal Gov ARC Local Business</p> <p><i>How are you reaching your users and customers?</i></p>		
<p>Cost Structure</p> <p>Tax Money To Businesses Decommissioning Cost</p> <p><i>What are your biggest expenditure areas? How do they change as you scale up?</i></p>	<p>Surplus</p> <p>Used For Renewable Energy Sources Later</p> <p><i>Where do you plan to invest your profits?</i></p>	<p>Revenue</p> <p>Government Policy = No Revenue No Taxes = Job Done</p> <p><i>Break down your revenue sources by %</i></p>		

Phase 1

The Policy



Energy Generation & The Appalachian Region



The Appalachian Region is dominated by coal and natural gas energy generation. These plants are showcased through orange and black dots.

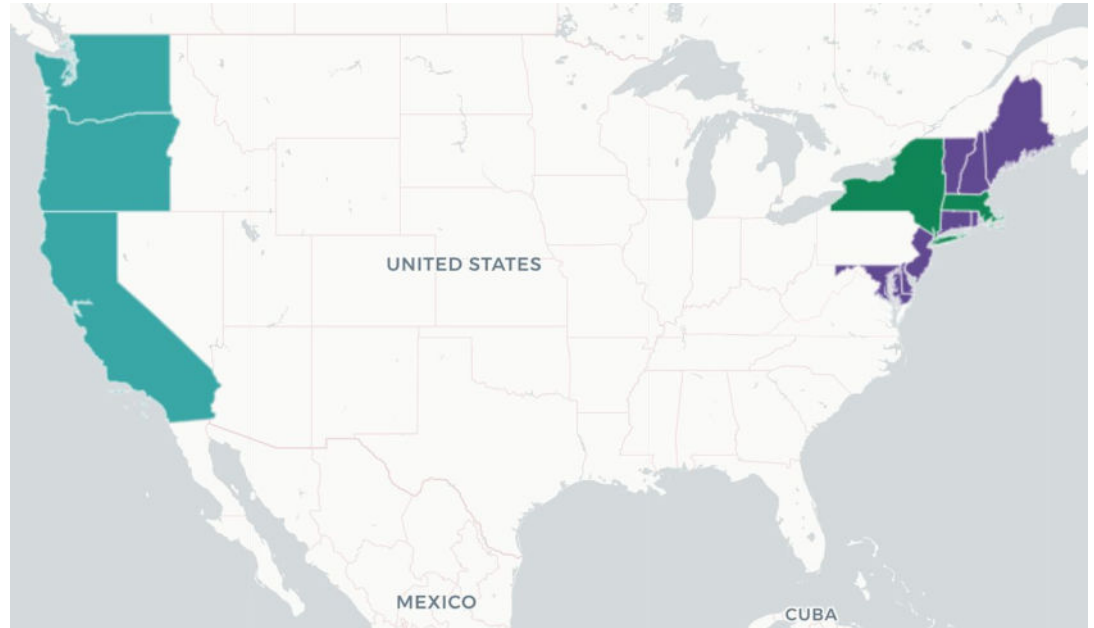
The Responsible Parties

The University of Massachusetts Amherst has published research regarding the corporations most responsible for greenhouse gas pollutants, which is further broken down by facility.

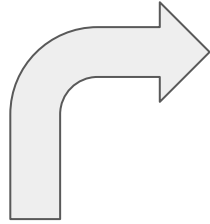
Greenhouse 100 Rank	Parent corporation or entity	2020 Emissions (CO2 equivalent metric tons)	Percentage of 2020 U.S. greenhouse gas emissions from all sources	EJ: Poor	EJ: Minority	% of CO2 equivalent emissions from a single facility	Industrial Sectors
1	Vistra Energy	95,036,473	1.6%	12%	40%	14%	Power Plants
2	Duke Energy	76,661,234	1.3%	13%	30%	15%	Power Plants, Other, Petroleum and Natural Gas Systems, Waste
3	Southern Company	75,880,072	1.3%	14%	49%	23%	Power Plants, Petroleum and Natural Gas Systems, Other
4	Berkshire Hathaway	67,213,495	1.1%	13%	37%	17%	Power Plants, Petroleum and Natural Gas Systems, Minerals, Metals, Other, Chemicals
5	American Electric Power	52,990,661	0.9%	17%	21%	19%	Power Plants, Other

Policy History

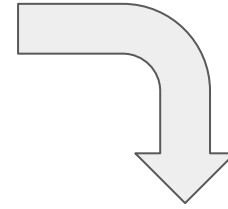
Currently, there are thirteen states that engage in command-and-control regulations creating financial incentives to reduce emissions. However, these policies are lacking within the Appalachian Region.



Policy Goals

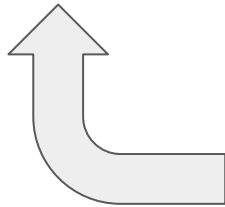


Accountability
holding the companies profiting
from continued fossil fuel usage
responsible instead of individual
burden

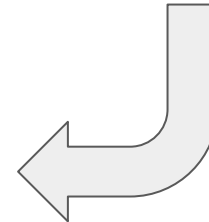


Benefits
give back to those
most affected by
pollution

Sustainability
making sustainable energy sources
more cost competitive with
non-renewables sources



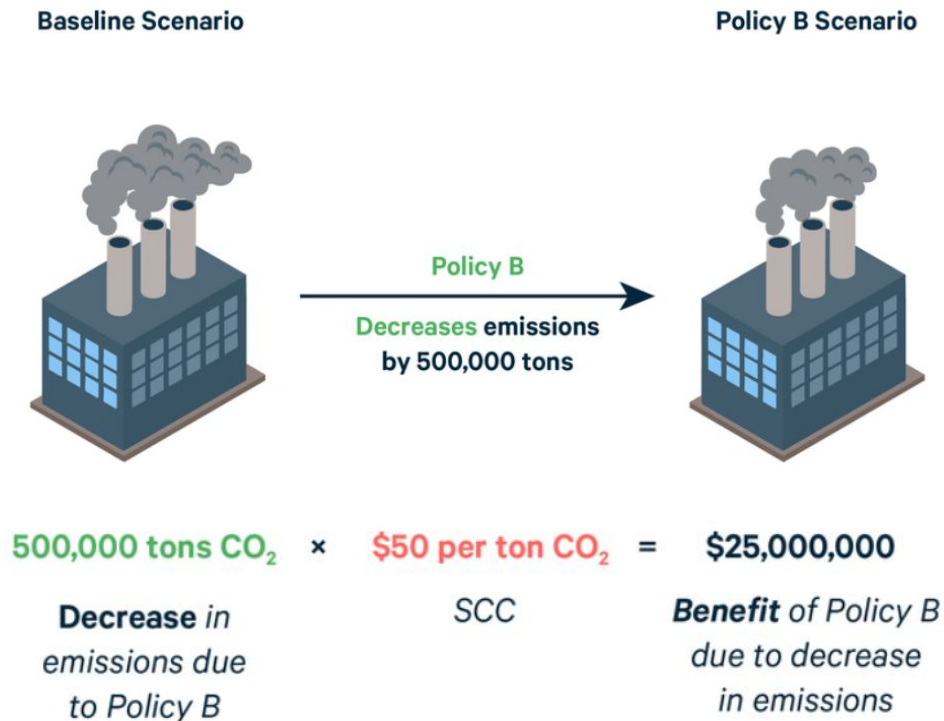
Adaptability
tax amount & allocation can
change based on the
situation



The Social Cost of Carbon & Our Policy

The Social Cost of Carbon is an estimate to the cost of the damages from one additional ton of carbon emitted. This estimate can range, but is currently evaluated at ≈ 76 dollars.

A federal law establishing a tax for companies polluting set at the amount of the social cost of carbon. These collected taxes will be allocated towards phase two and three of our proposal.



Phase 2

Decommissioning



What is it?

- Decommissioning is the process of shutting down a facility and cleaning it of contaminants to prepare for future use.
- Important factors to consider:
 - Water quality before cleaning area.
 - Groundwater resurgence and flooding.
 - Desired water quality after project completion
- Consulting companies do a variety of tests to ensure long-term stability



DECOMMISSIONING AND ENVIRONMENTAL REMEDIATION

PLANNING



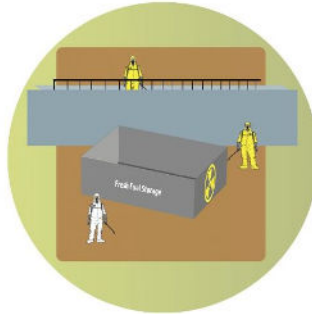
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PHYSICAL & RADIOLOGICAL CHARACTERIZATION



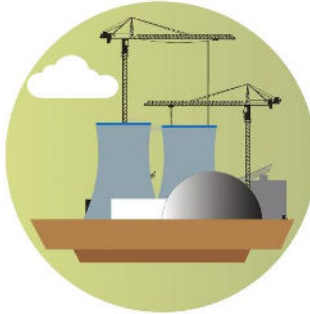
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DECONTAMINATION



3

DISMANTLING & DEMOLITION



4

PREPARATION FOR REUSE



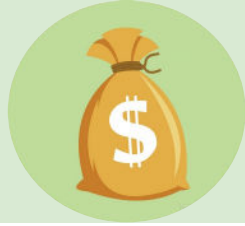
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FINAL SURVEY & RELEASE FROM REGULATORY CONTROL



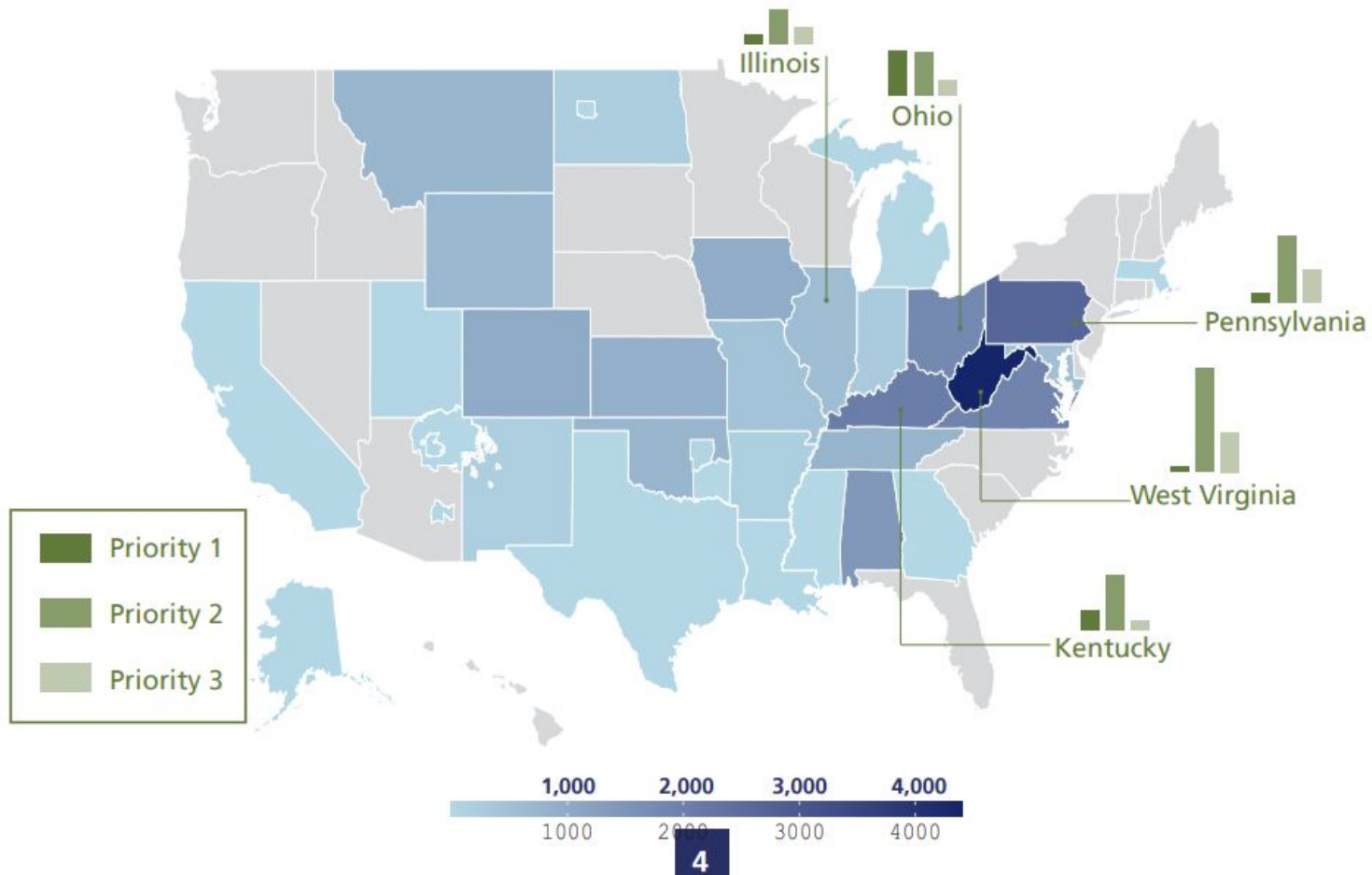
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Costs



- The United States estimates that \$11.3 billion will be needed to decommission all abandoned mine lands (AMLs).
- By only considering AMLs labeled priority 1 and located within Appalachia, we can lower this number.
 - Priority 1 = Areas affected extremely by coal mining and are a threat to public safety.
- Other ways to lower costs are to source materials and jobs locally

Figure 4: Number of AML Features in e-AMLIS Including Breakdown of Priorities for Top Five States





Phase 3

Future Work



Applying Surplus Funds



SOLAR FARMS 101: HOW DO SOLAR FARMS WORK?

WHAT ARE SOLAR FARMS?

Solar farms are large-scale solar power plants that generate electricity from sunlight.

TYPES OF SOLAR FARMS

- GROUND-MOUNTED SOLAR FARMS**
These farms are the most common type of solar farm. They consist of rows of solar panels mounted on metal racks in an open field.
- ROOFTOP SOLAR FARMS**
These farms are installed on the roofs of buildings, such as schools, businesses, and homes.
- FLOATING SOLAR FARMS**
These farms are installed on bodies of water, such as reservoirs and lakes.
- UTILITY-SCALE SOLAR FARMS**
These farms are large-scale solar power plants that generate electricity for the grid.
- COMMUNITY SOLAR FARMS**
These farms are owned and operated by a community of investors, allowing them to share the benefits of solar energy.

HOW DO SOLAR FARMS WORK?

- PHOTOVOLTAIC CELLS (PV) ABSORB SUNLIGHT**
The solar panels in a solar farm are made of silicon, a material that can absorb sunlight and convert it into electricity.
- SOLAR PANELS SPREAD ENERGY**
The energy from the sunlight is spread across the solar panels, creating an electric current.
- INVERTERS AND TRANSFORMERS CONVERT ELECTRICITY**
The electricity generated by the solar panels is converted into a form that can be used by homes and businesses.
- INVERTERS AND TRANSFORMERS TRANSFER ENERGY TO THE GRID**
The converted electricity is then transferred to the grid, where it can be used by anyone.

Solar power projects see the light on former Appalachian coal land

By Carey L. Biron

December 30, 2021 2:00 PM GMT · Updated 2 years ago

Summary Companies

- Disturbed land a smart place to put solar, authorities say
- Clean energy offers tax income to areas hit by coal mine losses
- Resistance to renewables softening in coal-dependent communities



Kentucky's Largest Solar Farm Sited at Former Appalachia Coal Mine



Jul 26, 2023

by Darrell Proctor

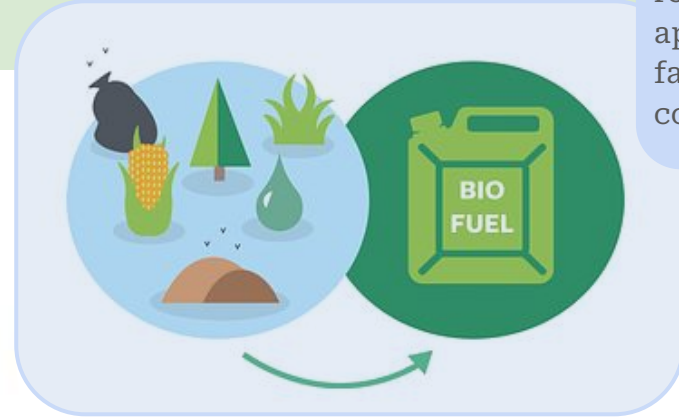
A group that includes Rivian, the California-based electric vehicle manufacturer, has announced the site of a former coal mine in Kentucky into that state's largest solar farm.

The Starfire Mine, located in Breathitt, Knott, and Perry counties in Kentucky, for years operated as one of the largest coal mines in Appalachia, producing as much as 3 million tons of coal annually at its peak. Officials from Rivian, Florida-based global renewable energy producer BrightNight, and The Nature Conservancy on July 25 said they will transform the Starfire site into "a clean energy project that would accelerate an equitable, science-based clean energy transition that maximizes positive impacts on climate, conservation, and communities."

Other Options

Geothermal:

Constant, doesn't depend on weather or require waste



Biofuel: good resource for appalachian farming communities

Wind: turbines would be beneficial in such a highly windy area



What if we run out of money?



Sustainable Development Goals

Goal 7: Affordable and Clean Energy

- Largest contributors to fossil fuels are taxed for emissions
- Money is reinvested in community and surplus for clean energy projects



Goal 8: Decent Work and Economic Growth

- Revitalizes economy by boosting decommissioning work
- Renewable energy jobs created



Goal 12: Responsible Consumption & Production

- Repurposing abandoned sites
- Clean energy developments



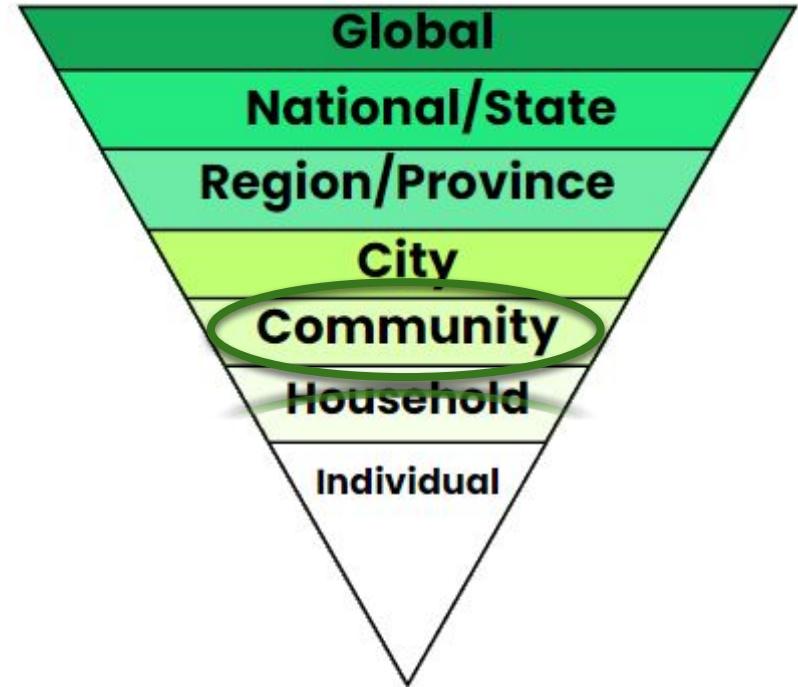
Goal 14: Life Below Water

- Addresses acid mine drainage issue
- Increases fish populations and aquatic life



Sustainability Complex

- Funding goes to **ARC**
 - Develops economic opportunities for people in community
- Removing biohazards that are polluting Appalachia
- Developments that will benefit the communities directly
 - Empowering businesses and boosting local economy





Thank You!
Any Questions?

Sources

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