

Roadmap for Solar on Mine Lands

EMERGING OPPORTUNITY TO GROW THE WEST VIRGINIA ECONOMY, ATTRACT NEW EMPLOYERS, INCREASE INVESTMENT AND CREATE JOBS

Executive Summary

INTRODUCTION

This report lays out a roadmap for West Virginia to build upon its legacy as a domestic energy provider by capitalizing upon the vast land base of former surface coal mines as sites for new solar generation facilities. **Preliminary analysis suggests there are up to 400,000 acres of former mine lands and other brownfields that could meet minimum site suitability requirements for large-scale solar across central Appalachia. If this land area was harnessed for solar development, it could double the total solar capacity that has been installed in the United States to date.** Solar developers are scrambling to find suitable sites across the region. If West Virginia were to implement a fair and predictable policy framework, the state has a unique and timely opportunity to become a global leader as the broader market transitions to a new energy economy.

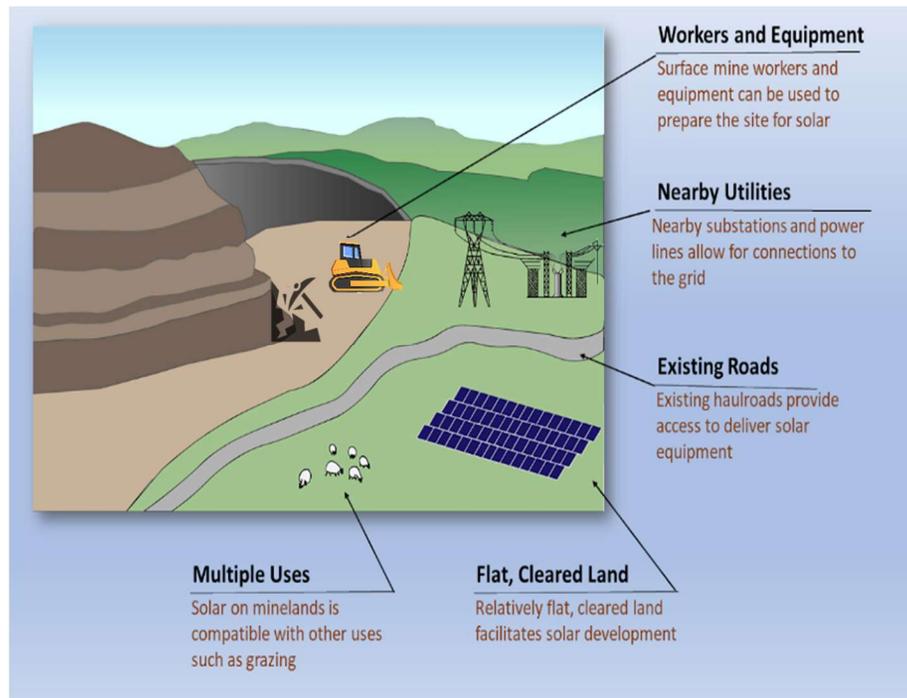


FIGURE 1 - ADVANTAGES OF FORMER SURFACE MINE LANDS FOR SOLAR DEVELOPMENT

DEVELOPING SOLAR ON FORMER SURFACE MINE LANDS WOULD UNLOCK ECONOMIC OPPORTUNITIES TO:

- **create new jobs and retrain laid off coal industry workers** and others to apply transferable skills such as heavy equipment operation for site preparation and electrical wiring;
- **attract new manufacturers and employers to the region** as large companies are increasingly choosing to locate their facilities where they have access to renewable energy to lock in the financial benefits of long-term fixed-priced power while furthering their corporate social responsibility and environmental goals;
- **replenish much needed tax base for local communities and state budgets** that have dwindled with the decline in coal markets;
- **create new revenue streams for mine land owners** by turning unproductive liabilities into potentially profitable assets; and
- minimize land use conflicts from all forms of energy exploitation, thus making it a **win-win-win for nature, economy, and climate by avoiding conversion of forests and farms**, allowing them to continue to provide myriad resources including, clean water, clean air and carbon sequestration.

STAKEHOLDER PLAYBOOK

Growing the solar energy industry with installations on West Virginia mine lands requires leadership and action from six key stakeholder groups:

- **government leaders and regulators**
- **electric utilities**
- **surface and mineral property owners**
- **corporate off-takers**
- **mining companies**
- **nonprofit organizations & local solar industry advocates**

Independently, these players could make some headway toward developing pilot projects or amending key policies; collectively, they can maximize their impact and have the greatest likelihood of success to see West Virginia capture new investments, new jobs and new revenue from solar energy developments. Here we present a playbook of actions that each stakeholder group may choose to take to facilitate redevelopment of former mine lands for large-scale solar.



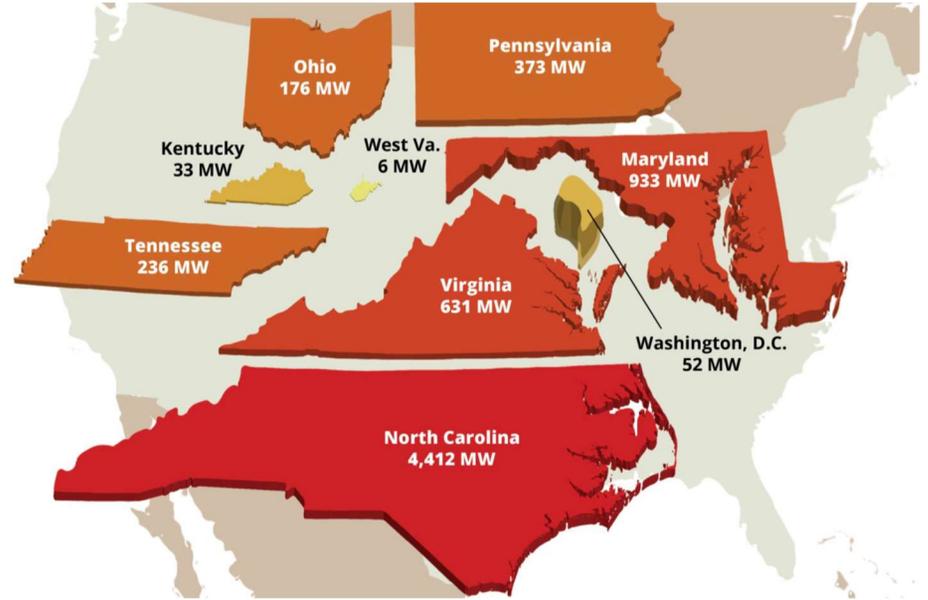
GOVERNMENT LEADERS AND REGULATORS

West Virginia generates almost all its power from coal, and despite enjoying historically low electricity rates for decades, industrial electricity costs have risen by seven percent per year over the last two years.¹ A diversified fuel mix could

help stabilize prices to the benefit of the broader economy, though would require that legislative and non-legislative actions be taken by government leaders and regulators to create a more fair and predictable market framework.

¹ West Virginia Forward. Undated. West Virginia Forward Strategy for Economic Development and Growth. West Virginia University, Marshall University, and the State of West Virginia.

FIGURE 2 – WEST VIRGINIA'S SOLAR MARKET COMPARED WITH SURROUNDING STATES' THAT ARE BOOMING BECAUSE OF FAIRER & MORE PREDICTABLE POLICY FRAMEWORKS. SOURCE: SEIA, 2018



ELECTRIC UTILITIES

A broadening view of electric utilities' long-term goals to provide affordable electricity and reduce greenhouse gas emissions has led an increasing number of utilities across the country to embrace solar. West Virginia utilities stand to benefit from solar-friendly policies, which would allow them to hedge against future increases in wholesale electricity costs, expand and diversify their portfolio of rate-based assets and reduce risks associated with their current emissions profile that could potentially lead to stock price volatility. Also, if pilot projects and new policies attract businesses and sustain existing businesses that require solar electricity, this could create economic activity that might help to reverse the current trend of rate base erosion in West Virginia.



SURFACE AND MINERAL PROPERTY OWNERS

Much of West Virginia's land and minerals are owned by large landholding companies. Many of these companies have collected lease and royalty payments from coal mining companies and a variety of other enterprises sited on their land, such as timber operations or natural gas wells. For many generations, coal mining has generated most of the revenue for landholding companies. Today, however, large landowners are looking for new or replacement revenue streams due to the downturn of mining in the region. Solar could provide a viable long-term land use option and provide revenue to landholding companies in the form of lease payments during the typical lease term of 20-30 years.



CORPORATE OFF-TAKERS

Nationwide, large businesses are making vigorous commitments to sustainability and renewable energy. For example, Google powers 100% of its operations, including many data centers, with renewable energy through power-purchase agreements in which they are often a direct "off-taker" of electricity from a specific project. Amazon, one of Appalachia's largest employers, is committed to achieving 100% renewable energy usage across its global infrastructure and is currently constructing new wind and solar farms in Ohio, Virginia, Indiana and North Carolina. West Virginia is already home to numerous manufacturing operations with significant electric bills. Corporate off-takers wishing to utilize solar in West Virginia can use the state's existing net metering rules; however, those installations are limited in size and are often not enough to cover the entire demand of the largest electricity users, or those with 100% renewable energy goals. Powering sites like those with solar on West Virginia's former mine lands will require new policies.



MINING COMPANIES

Siting income-generating solar arrays on former mine lands can help offset reclamation costs while making productive use of existing infrastructure, such as transmission lines, substations and access roads that previously served the coal mine. There is precedent for this idea in Nevada, where the State Environmental Commission added "renewable energy development and storage" to the list of acceptable post-production uses for mines in 2018. Mining companies could also potentially generate new revenues for performing site preparation on previously reclaimed mines that may be suitable for solar.



NON-PROFITS & LOCAL SOLAR INDUSTRY ADVOCATES

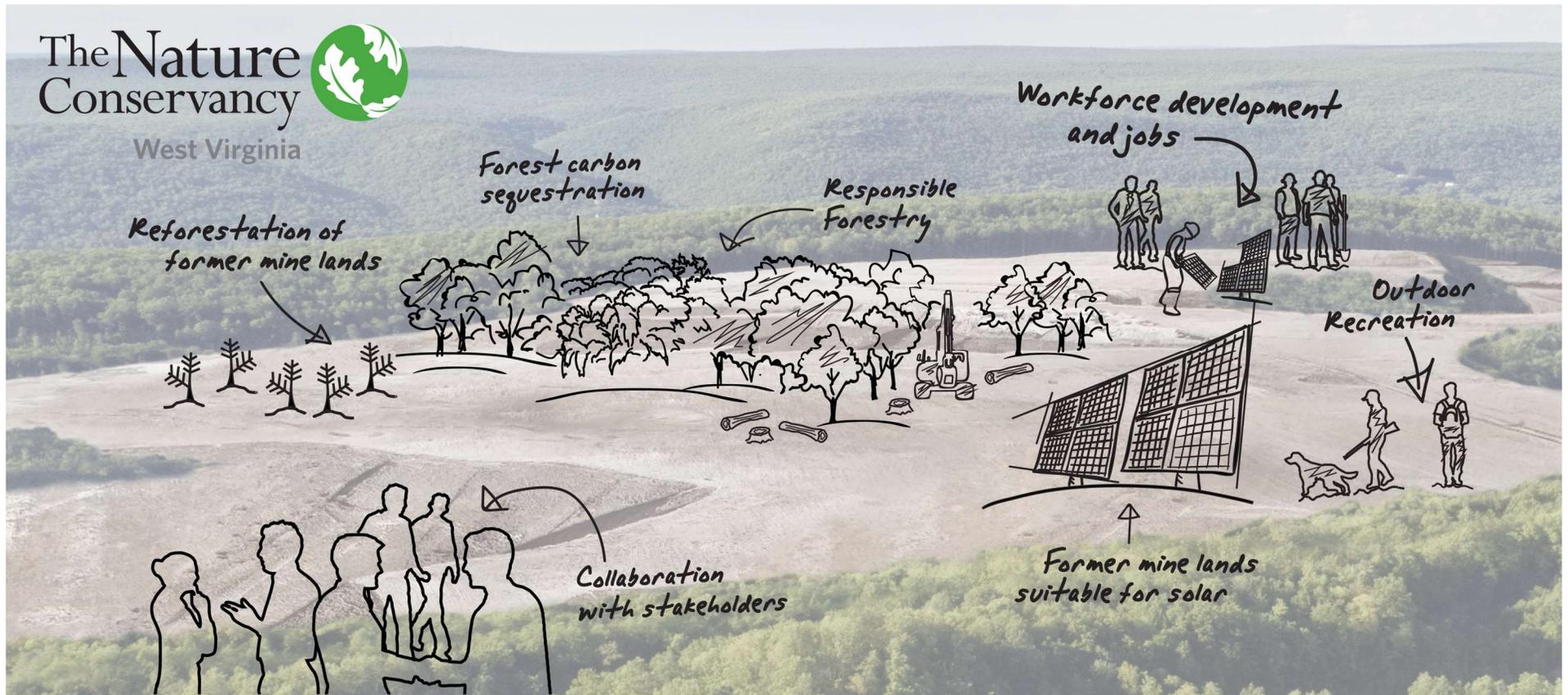
Non-profit organizations, local solar industry representatives and other advocates are leading the advancement of solar in West Virginia. Promoting large-scale solar development on former mine lands will require working within these established networks to focus resources—both human and capital—on achieving necessary changes.

FOR ADDITIONAL INFORMATION:

Download the full report at www.nature.org/westvirginia

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Since 1951, The Nature Conservancy has worked to protect the lands and waters on which all life depends. From our historic work in land and water conservation to cutting-edge research that influences global policy, The Nature Conservancy is constantly adapting to take on our planet's biggest, most important challenges. Our vision is a world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives. To that end, The Nature Conservancy is working in West Virginia to invest with new partners in new ways to contribute to economic diversification, as the world transitions to a low carbon future.

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