Sustainable Energy Parks on Surface-Mined Lands


Funded through a US EPA Brownfields Grant and in collaboration with Marshall University

Peter Butler, Assistant Professor of Landscape Architecture
Patrick Kirby, Director West Virginia Brownfields Assistance Center

West Virginia University

West Virginia Water Research Institute
SUSTAINABLE ENERGY PARK:
a former mine site with sufficient space, physical characteristics, infrastructure, and stakeholder support to accommodate the production of renewable energy products

Project Description:
Develop a framework for the establishment of Sustainable Energy Parks on former mine sites in Appalachia.
Premise

Sustainable Energy Parks in former coalfield communities will be able to utilize:

- existing energy and industrial transportation infrastructure
- large, contiguous tracts of land
- a labor force that is familiar with processing natural resources
- a location suitable for the production of a range of alternative energy resources.
Approach

Successful Implementation

- Combination of Renewable Energy Sources
- State and Federal Tax Incentives
- Leverage Grant Opportunities
- Community Partners
- Business Partners
Components of the Project

1. Identify potential sites
2. Determine Suitability
3. Request Interest from Community for Pilot Project
4. Develop Comprehensive Plan for Sustainable Energy Park on Selected Site
5. Showcase the Community and Project for Investment
Site Identification

- GIS Analysis
- Site Characteristics
- Evaluation of Renewable Energy Potential (Macro Level)

The research efforts produced an inventory of 612 sites throughout West Virginia that are potentially suitable options for the development of SEPs.
Suitability

- Technical Requirements
- Community Support
- Environmental Variables
- Economic Factors

1. Identify potential sites
2. Determine Suitability
3. Request Interest from Community for Pilot Project
4. Develop Comprehensive Plan for Sustainable Energy Park on Selected Site
5. Showcase the Community and Project for Investment
Site Selection

Indian Ridge Industrial Park
McDowell County Economic Development Authority

EDA Site

Legend:
- Site Boundary
- Forest
- Grass/Pasture/Crop
- Bare/Developed
- Forest in Permit
- Mine Grass
- Mine Bare
- Open Water
- Valley Fill Face
- Slurry Impoundment
- Mine Facility
Comprehensive Development Plan for McDowell County Site

Goal:
To promote financial and community investment in McDowell County through the Sustainable Energy Park Model

Objective:
Provide a Comprehensive Development Plan for a Sustainable Energy Park on the Indian Ridge Site
Anticipated Benefits to Project Partners

• Sustainable Energy Park Comprehensive Plan for development of the site

• Spotlight on the potential of a SEP site in the community to attract the attention of developers, investors, employers, and others.

• Technical assistance from experts in biofuels growth, harvesting, and processing; wind energy; solar energy; geothermal energy; land use planning; business development; and marketing.

• Detailed information on the selected former mine site.
Mapping and Modeling

- Constructed digital three-dimensional model base with LiDAR
Created a detailed inventory and analysis of the site including context of the pilot SEP area; that is, land cover, land uses, drainage, vegetation, etc.
Inclusion of Future Planned Roads
LiDAR Imaging
3-D Modeling
Master Plan Development

Complete a participatory planning process

Develop comprehensive development plan integrating land use planning, smart growth, and sustainable incentives

Create Master Plan visualizations
Participatory planning process

Expert Participation and Consultation

Local Official Participation

Community Participation

Focus Groups-
Education, Business/Industry, and Recreation

Youth Participation
Community Engagement and Input

Community Participation: Local Youth
McDowell and Wyoming County 4H camp
Glen Fork, WV during the week June 25-29, 2012
Modeling with the Community
Modeling with the Community
Community Modeling Options
Community Modeling Options
Design Concept Development and Site Programming

Project Goals and Design Context: Key Planning Concepts
- Mixed-use Development
- LEED ND (Leadership in Energy and Environmental Design for Neighborhood Design)
- Green Economy
- Ecological Design

Key Thematic Areas: “New” Energy/Landscape Ecology/Mining History

Site Programming:
- Overall Sustainable Energy Park
- Indian Ridge Industrial Park
- Forested Area

Regional Connections

Circulation and Linkages
Land Use Masterplan
Regional Land Use
Regional Trail Map
Visualizing Biomass, Solar, Wind
Visualizing Biomass, Solar, Wind and Expressway
green infrastructure central core

- Sunshine
- Wind Turbine
- Solar Panels
- Greenroof
- Bioswale
- Stormwater Reuse
- Existing Ground level
- Stormwater
- Bioretention Pond
- Switchgrass
- Highwall

Distance from Highwall to Buildings > Height of Highwall x 2
green infrastructure wetland swale
Ready for Investment:

- Identify potential sites
- Determine Suitability
- Request Interest from Community for Pilot Project
- Develop Comprehensive Plan for Sustainable Energy Park on Selected Site
- Showcase the Community and Project for Investment
Sustainable Energy Parks:
New Opportunities for Appalachian Coalfield Communities