

The Michelle for Colorado team has reviewed the Colorado need for increased initiatives to combat climate change and reduce carbon footprint. The team has established a plan that uniquely provides an alternative to current electric power supply to augment current demand with safe, carbon free power while maintaining reliable, cost effective energy supply. The plan:

- Aims to provide base load power at 100% carbon free
- Provides Economic redevelopment of retired / to be retired coal mines within the state
- Reprograms jobs and industry in areas that could become depressed if steps such as these are not taken
- Increases Intra-state as well as Inter-state commerce

The Michelle for Colorado team believes that a redevelopment effort utilizing the Energy Park initiative could be beneficial to Colorado for enterprise growth, positive steps to be carbon free, and provides thousands of new high paying jobs while increasing commerce across the state.

Background

Coal Mines in the Western US are typically Open Pit (above the surface). A mature mine will typically have a large pit due to mine excavation, many times traveling across the hillside following the ore vein. After use, the mine is required to reclaim its property in accordance with EPA and Colorado state regulatory requirements. Reclamation is necessary to secure the site for alternative land uses as well as protecting the health and welfare of the population in the region.

One type of land reuse could be to dedicate the reclaimed property to an Energy Park Development reuse. The reclamation fund could be redirected to land redevelopment and many of the existing jobs could be refitted to the safe construction and operation of an Energy Park. The Colorado Division of Reclamation identifies all active and inactive mines. Reference is made to the web site noted below. In reviewing the current and inactive coal mines, there is no lack of properties that could be re-aligned for Energy Park Development. (<https://gis.colorado.gov/dnrviewer/Index.html?viewer=drms>)

This white paper attempts to address a broad range of options that could be integrated in a Statewide Energy Option that would be beneficial in arresting the negative degradation we are experiencing in climate change as well as complying with goals for carbon footprint reduction.

What is an Energy Park?

Like an industrial park; the Energy Park Enterprise is for mostly Electric Power Production and sometimes other infrastructure supply. That Power Production is transmitted to a customer base that could include both intrastate and interstate transmission.

The Energy Park consists of multiple base load energy production resources inclusive of **clean and green** renewables (solar, wind) and safe clean sources utilizing **fail-safe** nuclear SMR, hydro-electric, pump storage, and gas for peak power needs.

In today's environment, one could draw a conclusion that the State of Colorado may want to or need to ban future coal mine development and the use of coal as an energy source. Many scientific journals are pointing to the fossil fuel harming the environment due to adverse effects of this fuel source to our climate.

Capital should be available based on utility and private support. The Energy Park may be a venture that is developed through a combination of consortium / private enterprise and existing public utilities. Development is subject to availability of land, transmission access and readily available infrastructure and utilities. The aim of redevelopment and reuse would be:

- provide cleaner source of power reducing the carbon footprint in the state,
- provide low cost and reliable energy to the consumer
- redevelop areas of Colorado where an old mine is retired, or an existing mine is approaching the end of life of mine
- provide commerce and jobs to areas that would be depressed if the development is in an area where an existing mine is to be retired.

Selection criteria

- Should have a significant amount of dedicated real estate to allow the right kinds of zoning and buffer for safe operation and future expansion. The energy park strategy is not a new concept and is viewed as a viable economic redevelopment methodology when retiring large complex facilities; the challenge has always been the sanctioning and deeding of land resources.
- Energy parks require a good transportation plan and access is important. Road/Highway, Rail, as well as other types of industrial access is key. The reason is an energy park requires heavy machinery and infrastructure in construction and operations through supply chain management to keep things running efficiently and in a cost-effective manner.
- Energy Parks ideally should be reasonably close to an established main grid system for high voltage transmission.
- The biggest plus you need for the siting and operation of an energy park is a community and state that have trained workforce; desirous of placement of heavy

Energy Park Option for reuse of reclaimed Coal Mine Properties

equipment and electric power and a permitting staff that are welcoming the placement in “my backyard”.

In Colorado; the Energy Park could make use of existing high voltage main line transmission / distribution across the Rockies. Ideally, a selection from low population areas with sufficient buffer zones could add to the safety of the operations. Placement could be in the northern and southern borders where multiple existing / retired mine properties are located.

There is good transportation, transmission and distribution going north-south and the majority of the business and population are in the north-south corridor on the East side of the state. The energy park could consist of Renewable Energy (wind, solar); Peaking power plant gas turbine machines running on gas and Small Modular Nuclear Power Units (SMR's) at the 300MW size (each). If at all possible, the use of pump hydro storage and battery storage may have some possibility.

A fully developed energy park could have:

- Base Load Plants:
 - A wind farm of 50 wind turbines; 5MW to 10MW wind turbines totaling > 350MW placed in the site buffer zones
 - Solar Farm of Panels; totaling 25 MW (more to run institutional load of the facility) placed in the site administrative zones
 - 5 SMR's totaling 1500MW which gives 4 units always running and one unit going through outage maintenance and refueling every 4 years
- Peak Load Plants
 - 5 Gas Turbine Plants at 50MW with a waste heat recovery boiler & turbine (100MW) which would give 4 units always running (one spare) totaling 300MW
- Substation with total size of approximately 2200 MW

Jobs and increased tax base within the state

- Construction:
 - Maintain a in-state work force of approximately 1000 craft and laborers for a 5 to 10-year period, depending on speed of construction and size.
 - Establish out of state jobs of some 500 workers (unless Colorado could attract a manufacturing enterprise for power equipment supply)
- Operations Staffing approximately 1800 direct primary jobs, equivalent number as secondary outside the Energy Park Enterprise. Typically, these facilities would operate for a 40-year life cycle.
 - Wind Farms: 100 operations, maintenance and outage repair plus supply chain warehousing
 - Solar: 25 operations/maintenance
 - Gas Turbines: 100 operations/maintenance and another 50 for outage maintenance

Energy Park Option for reuse of reclaimed Coal Mine Properties

- 5 Nuclear SMR's: 1000 full time staff; inclusive of 300 schedule outage folks rotating over the 5-year period
- Transmission and Distribution / substation: 100 personnel
- Administration: 200 management and staff, compliance and regulatory
- Engineering outsource: 100 each year
- Cost: Initial Capital Cost:
 - Wind Turbines @ \$ 1,200/ kw installed cost; \$360,000,000 (\$360 Million)
 - Gas Turbines and Waste Heat Recovery Boiler @ \$1500/ kw installed cost; \$450,000,000 (\$450 Million)
 - Solar Panels @ \$1200/ kw installed cost; \$30,000,000 (\$30Million)
 - SMR's @ \$ 3,500 / kw installed cost; \$5,200,000,000 (\$5.2 Billion)
 - Substation and Electric Grid power connection; assume \$300Million
 - Owner Costs (management, permitting, legal, staffing, operational readiness, community relations) \$500Million
 - 2175MW which could equate to approximately \$ 7 to \$ 8 Billion; minus cost for Land;

Advanced technical training

The Energy Park will employ re-educated mine workers and other sources of technical skill base. As an added plus, a technical school could be sited in the Energy Park area to promote skill base training in support of the facility continued operations.

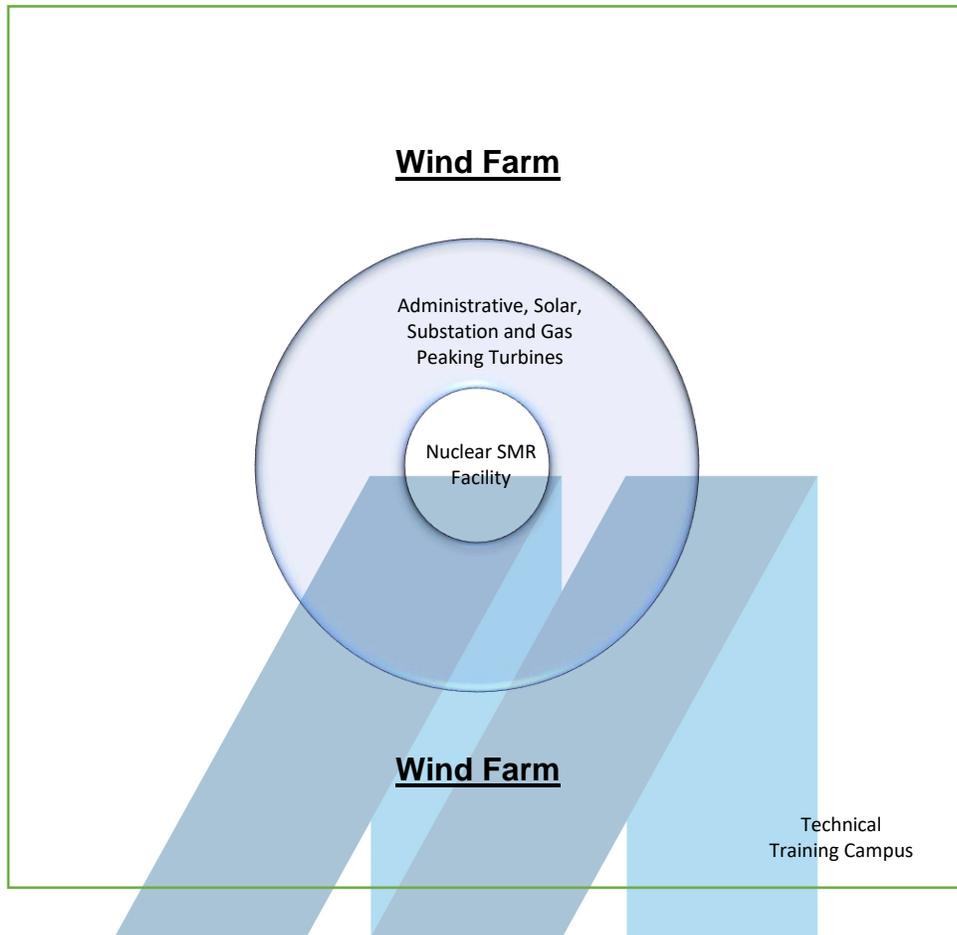
Consideration could be given to build a technical school extension facility in association with the State Education System of Higher Learning and locate it in the outer buffer area of the Energy Park.

Land footprint

A good-sized reclaimed and decommissioned open pit hard rock mine could be as large as 8,000 to 10,000 hectares which equates to 19,000 to 24,000 acres. The siting of an Energy Park could easily fit in an area such as this. The layout of an Energy Park would have three areas within its boundaries. Buffer Zone, Administrative and substation T&D Zone and the SMR production zone.

- The Wind Farms would be located in the outer buffer zone of the property.
- The administrative zone would locate all office complexes, warehouses and solar and gas turbine peaking plants.
- The Inner zone would contain the SMR's

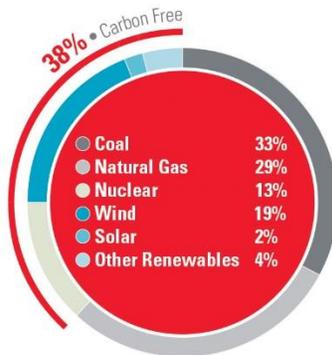
Below is a layout of the three zones for Energy Park Development



Energy Production vs Carbon Footprint

If an Energy Park were to be constructed in the northeast and southeast region as well as the north-west border of the state of Colorado; it could amount to 6,525 additional Megawatts of safe and clean fueled Electric Power. Xcel Energy reports that it supplies 18,000 Megawatts of Power to the multi state region inclusive of Colorado, upper Midwest states, New Mexico and portions of Texas.

ALBERT
— FOR U.S. SENATE —

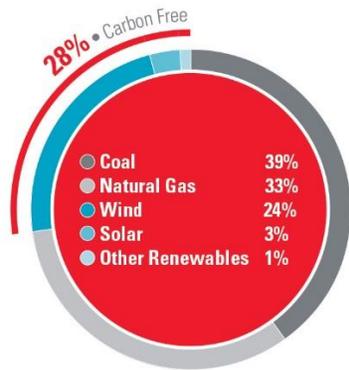


Xcel Energy 2018 Carbon Footprint

(https://www.xcelenergy.com/energy_portfolio/electricity/power_generation)

Energy Park Option for reuse of reclaimed Coal Mine Properties

Xcel Energy reports that 38% of all its power source for this multi-state region is carbon free (approximately 6,840 Megawatts). In Colorado it is reported that 28% of the Colorado Energy is Carbon Free. With the Energy Park Initiative, minus the use of peaking power for gas turbines, the Colorado carbon free footprint could be significantly reduced and could establish Colorado as a Carbon Free Energy Producer.



Xcel Energy 2018 Colorado Carbon Footprint

(https://www.xcelenergy.com/energy_portfolio/electricity/power_generation)

The Michelle for Colorado team believes that a redevelopment effort utilizing the Energy Park initiative could be beneficial to Colorado for enterprise growth, positive steps to be carbon free, and provides thousands of new high paying jobs while increasing commerce across the state.

MICHELLE
= FOR U.S. SENATE =