

Why Renewable Energy in Arkansas?

Submitted to the ADEQ/PSC Staff for Consideration on October 29, 2014

The following is a compilation of the benefits of renewable resources in Arkansas, potential units of energy from each, and jobs which will be created.

“Arkansas can be at the heart of a new clean energy future for America if the right policies are put in place, starting with a national commitment to reduce emissions of global warming pollution, support energy efficiency, and advance development of homegrown renewable energy. Some policies and programs to support clean energy development have been implemented but much more needs to be done.” (Analysis of the Rural Economic Development Potential of Renewable Resources. National Resources Defense Council. Martin R. Cohen. ©2009. p.18).

A. Benefits of Developing the Renewable Energy Resources in Arkansas

1. **Less emission of carbon particulate, mercury, carbon dioxide, and other greenhouse gasses, and easing of Arkansas' contribution to health and climate disasters.**
2. **Greater ease for Arkansas in meeting the EPA proposed guidelines for carbon mitigation in the 111 (d) Implementation Plan** regarding existing coal plants to meet standards of the Clean Air Act.
3. **About 130 lives and the chronically impaired health of about 2,600 Arkansans more each year would be saved, due to reduced coal ash particulate in our air.** In addition, our health will be improved as a state when the emissions from other states are reduced, too, and vice versa.

Just closing or greatly changing the dispatch levels of White Bluff and the Independence Coal Plants, taken together, will save the terrible combined effects of their particulate (PM2.5) and greenhouse gases. (Study by engineering research firm, Abt Associates. 2010). These are but some of many facts which have triggered the EPA to issue new guidelines on reducing carbon particulate.

4. At the national level, when the dirtiest old coal plants are out of commission, **\$100 billion of health care dollars spent on lung diseases and deaths from carbon particulate emissions will be saved** by state government, federal government, individuals and families, and insurance companies. Health care costs and premiums all across the state and nation will go down, and renewable energy sales, service, and jobs will go up. (www.sierraclub.org: see: Beyond Coal Campaign.)
5. **Thousands of career jobs a year in a clean environment producing clean energy will be created.** Coal plant workers can be re-trained for clean energy

jobs by the Dislocated Worker Program of the US Department of Labor, so that no jobs need be lost. There is a place for these workers in the green economy.

6. Individual RE producers creating their own electricity will save money on energy bills, and those producing surplus kilowatts will experience more income. Some states like South Carolina have seen utility bills reduced by renewable energy increases, with CSP solar estimated at about 6.7 cents/kWh.

7. Because of solar, wind and storage in batteries, **electric power production will become more evenly distributed**. Energy flowing towards the grid from widely distributed solar systems will stabilize the grid, reducing grid failure due to storms in a local area and reducing the need for dirty fuel.

8. Arkansas farmers would save money on energy by expanding the use of renewable energy through the use of more energy efficient equipment: solar or other energy to offset their operating costs. Also good for farms is in-ground geothermal technology for heating and cooling, which is especially efficient for cold weather in the South.

9. Food security will be improved as renewable energy replaces coal. Farmers know that crops have temperature limitations for germination and fruiting. When the temperature rises to over 3.6 degrees F more than before 2005, disaster will strike about half of our vegetables in the South, putting these growers and some animal producers out of business. (www.usda.gov)

B. Job Generation Estimates from Renewable Energy Production

Jobs in the renewable energy industry often follow those in energy efficiency which include energy auditors to assess the viability of the building for solar or other applications; trained carpenters to weatherize and tighten up that existing building to make them airtight enough to make the renewable equipment worthwhile. Then, renewable energy jobs that follow are those of mechanical and electrical engineers to design the system and the equipment; transporters to send the equipment; retailers to advertise, warehouse, and sell the equipment; trained installers to install and provide occasional maintenance or repair; and trainers for techs and teachers of various engineering skills.

In terms of teaching jobs, schools such as UALR are providing degrees in Construction Management, and most are oriented towards sustainable building design. Arkansas has an active US Green Building Council chapter, and it is doing training around the state for builders interested in more sustainable, energy efficient building techniques. Seminars for consulting fees abound for teaching government employees and interested parties how to utilize renewable energy.

In the lending and real estate arenas, designers of solar systems are also teaching realtors how to value renewable energy systems for purposes of pricing

buildings and helping customers get loans for such systems. This expands the RE skill set and meets the demand for employees who can handle such issues.

The precise number of such jobs to be provided ranges from 3,000 to 10,000 new career jobs, depending on the speed at which the federal and state incentives or priority setting at the state level goes.

C. Potential Estimated for Each Renewable Resource (Clean, non-carbon)

The Arkansas Energy Office has a publication on the renewable resources in Arkansas. It is available at www.arkansasenergy.org/

1. Solar: The US Energy Information Office study published estimates in 2011 for Arkansas' potential for solar power to be these, and they represent enough to produce what we are now using and then some into the future. Remember that the energy does not have to be produced onsite:

121,306 GWh for urban-utility PV;
4,986,389 GWh for rural-utility solar; and
8,485 GWh for rooftop PV solar.

(Study in the report, Just Energy Policies: Reducing Pollution and Creating Jobs. NAACP: Environment and Climate Justice Program. Feb., 2014)

Solar design, installations, sale of equipment, manufacture of equipment, advertisement, transportation, maintenance, teaching, training of technicians, and more are the kinds of jobs created in the solar industry. One estimate predicts 3,000 career jobs per mW of nameplate capacity created in solar work. Again, solar batteries and transmission are areas for jobs and for all the other roles just mentioned.

2. Wind: 500 permanent jobs for each 1,000 MW of capacity @ a height of 80 meters, and estimates put Arkansas' potential at **9,200 MW, yielding \$830 million in economic activity in 30 years**. The economy of the Mississippi River Delta farming communities could be transformed by large and small wind operations, coupled with biofuels, solar, hydropower, and storage. Even if only half of that potential yield is do-able, due to National Forests, bird migrations, or landowner preferences, 4,600 mw is nothing to sneeze at.

See 80 meter wind map for locations of wind in Arkansas, www.AWEA.org, or see it at the following site:

(apps2.eere.energy.gov/wind/windexchange/.../wind_maps/ar_80m.pdf)

At 100-150 meters, the wind potential is even greater in Arkansas. Estimates by the US Energy Information Office for wind production in Arkansas is at **22,892 gigawatts of capacity**.

Currently, SWEPCO is buying wind from Oklahoma's OG & E, which is cheaper than coal energy, so Arkansas is missing out on the wind industry. While our wind resource is lower than that of Oklahoma, Texas, and Missouri, it is free for the taking after the initial investment in leases and equipment start-up and is rated at low to moderate at the 80 meter height. But 22,892 gigawatt hours is nothing to sneeze at: individual and community wind production in regions with similar wind resources in Kansas and Iowa are powering thousands of homes and businesses every day.

Job numbers in Little Rock, Jonesboro, Ft. Smith, and other communities show over a thousand jobs (and growing) for the manufacture of wind blades, turbines, and lithium parts for wind batteries. These are possibly due to our location and reasonable land and tax prices. For all aspects of renewable energy production and distribution, there will be engineering, technical, and sales jobs for manufacturers and workers with these special skills. The Governor's Commission on Alternative Energy website contains documents from wind and hydro experts who have made presentations on Arkansas' potential in these areas.

Job training for system design in college programs in Arkansas have been gearing up to meet the demand for system design, such as the Renewable Energy Engineering four year degree at John Brown University in Siloam Springs, AR. Training in renewable energy system design for industry is the focus of that program, and it has recently had quite a few graduates. This degree program provides seven faculty jobs and prepares graduates for jobs in the clean energy industry.

3. Geothermal: Our groups could not locate estimates on the amount or job-production of geothermal power, but geothermal will primarily apply to new construction. In-ground geothermal, considering the temperature of the earth a natural resource, would be a way to create energy efficiency in all types of buildings where there is adequate ground around them and terrain which permits digging.

The other type of geothermal energy, deep geothermal, such as we have near Hot Springs and Eureka Springs, involves tapping into volcanic underground hot water, requiring experts at drilling and skilled management of the resulting hot water. The water provides steam which can be used to turn a turbine and create motion, or it can heat the water for a variety of uses. Its energy would be fairly constant, which is one of its assets. The 4-H facility at Ferndale heats its hot water this way, as do a number of residences in Arkansas.

4. Hydropower:

The most up to date assessment of newly identified water power resources in

Arkansas comes from “An Assessment of Energy Potential from New Stream-reach Development in the United States led by DOE's Oak Ridge National Laboratory (ORNL)”, and it also provides a national picture of the remaining new hydropower development opportunities in U.S. rivers and streams. This study includes the identification of social, economic, and environmental attributes of the stream reaches, some of which are in nearby wilderness or wild and scenic areas, in addition to the technical power potential.

“The nationwide assessment concluded that the technical hydropower resource potential for Arkansas is 1,108 MW and that is 5,964,000 MWh.” (<http://energy.gov/eere/water/hydropower-resource-assessment-and-characterization>).

Hydro power is a resource that does not need large amounts of land, and it can furnish clean energy for residential and commercial and industrial applications. The area served by adding dams to key locations on the Arkansas, Mississippi, Ohio, and Tennessee rivers would power 250,000 homes. (http://nhaap.ornl.gov/sites/default/files/ORNL_NPDSolar_USMap20140307.png)

Dams will take 4-6 years to secure federal funding for and to build. So they are a longer term solution than rooftop solar for individual homes and businesses.

Continuing from the DOE's assessment done by the Oak Ridge Lab, “For the nation, it is 85 GW of capacity. When federally protected lands—national parks, national wild and scenic rivers, and wilderness areas—are excluded, the potential is over 65 GW of capacity or 347 GWh/year of generation.” See the **fact sheet** summarizing the study's methodology and findings by state. (<http://energy.gov/eere/water/hydropower-resource-assessment-and-characterization>)

To recap, all these four forms of renewable energy create a multitude of new jobs in system design, installation, training, teaching, construction, manufacture, sales and advertising, transportation, and maintenance. In addition, ones such as hydropower require parts and linkages with other industries from batteries and mining to pipe-laying and dam-building.

D. Role to be Played by a Clean Power and Jobs Bill in Facilitating Distributed Renewable Energy Generation

The Clean Power and Jobs Act would include a price set by the PSC which the public utility electricity consumer will pay for renewable energy, and it is a common way for states to incentivize their renewable energy industry and distribute the production of electricity more evenly than it currently is distributed, which can stabilize the grid at peak usage. Distributed power puts energy production into the hands of more people and gives them the freedom to enhance their incomes while producing clean energy, which matters to people concerned about the atmosphere and regulators.

This small added cost to the usual cost of the electricity per kW paid by public utility consumers goes to pay the renewable energy producers up to the amount of their bill. Renewable energy complies with the Clean Air Act, due to the fact that the generation produces no carbon dioxide. With a State or Federal Carbon Tax and Dividend, low income consumers will not be affected by an initial increase in the utility rate, since increases will come back to them in the form of a check or credit towards their bill or taxes.

At present, Arkansas, bending to its fossil fuel lobbyists, ties the hands of its renewable energy industry, the millions of kilowatts, and the thousands of jobs it can generate for our state by not having a feed-in tariff, a serious barrier to investors who might like to create large solar or wind projects. To pass such a tariff would assure that many consumers will start producing their own solar or other renewable energy and will need consultation, installers, people to sell them equipment, and maintenance: these are good, clean jobs.

Wal-Mart, Target, and other large corporations would like to use renewable energy, but they would first like to see the Arkansas Legislature pass a bill with a higher maximum production capacity than those which the legislature has previously rejected. Just increasing rooftop solar limits does not help them.

Other mechanisms that will help when maximized are the wind and solar production tax credits at the federal level. Carbon taxes, carbon fee and dividends, and cap and trade are other possibilities. Large wind projects and Concentrated Solar projects are designed and are in the pipeline, waiting for such incentives to be granted long term.

E. Role to be Played by a Carbon Fee and Dividend Policy to Reduce Carbon

A carbon fee and dividend program sets a fee on industries emitting carbon dioxide and particulate, and it returns the dividends to the citizens. Citizens can use the dividends to pay utility bills, reduce their income taxes, or purchase renewable energy equipment or sources. The fee and dividend will stabilize our climate and oceans and slow down the mass extinction of species. It will put America in a position of leadership on climate legislation and in green

technology. Foreign governments will be forced to adopt the same carbon price levels as we do or pay taxes at our ports for the privilege of polluting.

It will decrease our dependence on foreign oil, substituting low-carbon energy made in the U.S. When we substitute coal or gas for green energy made in America, it creates more jobs than coal creates. Decreasing our dependence on foreign oil increases our national security, since trillions of dollars of our military budget is spent protecting the free flow of oil and propping up the hostile governments that control it.

The transition to clean energy will clean our air of smog, ozone, fine particulate matter and other pollutants caused by burning fossil fuel. It will clean our lakes, rivers, land, and oceans from the mercury poisoning caused by burning coal, the toxic leachates from coal mine tailings, and salt brines and toxic solvents from drilling for fossil fuels. Arkansas could use its own Carbon Fee and Dividend to go even further into reduction of pollution and damaging of the planet.

Organizations such as NRDC and the Citizens' Climate Lobby have proposals for using carbon taxes of various sorts to achieve carbon mitigation goals which exceed the EPA guidelines in the June, 2014 guidelines for compliance with Section 111(d). (www.nrdc.org; www.citizensclimatelobby.org)

F. Conclusions

Renewable energy needs to be an important part of the 111(d) plan to reduce carbon emissions in Arkansas. So far in the discussion at the ADEQ/PSC stakeholder meetings, we have heard only passing reference to the building block covering the value of cleaner energy and job creation. We have not heard accurate assessments of individual solar PV, utility scale solar, wind or geothermal, hydropower, biogas generation, bio-digestion, or bio-fuels in the alternatives to dirty coal required by the 111 (d) guidelines. That is the reason for this meeting.

It is very worrisome and threatening to our air quality that burning fossil fuels are still the mindset of the largest percentages of decision-makers selected to be on the panel of stakeholders. This, we believe, is a serious omission which will hold Arkansas citizens and its renewable energy industry back, as well as retard compliance with clean air standards set forth in the Clean Air Act, Section 111 (d) and goals beyond the EPA guidelines that will be necessary to significantly slow down the pattern of destruction of earth's atmosphere. Action should be taken now to correct this serious omission to the discussion, ADEQ's comments to the EPA plan, and to the State's Implementation Plan.

Therefore, we support the following actions on the part of ADEQ:

1. The closing of White Bluff and Independence coal fired plants.
2. Inclusion of significant renewable energy resources produced in Arkansas and neighboring states in the S.I.P. under the 111(d) guidelines.
3. Increased reduction of carbon emissions by other carbon-emitting industries such as concrete and steel manufacturing, treatment of lumber, and agricultural burning.
4. Greater containment of methane emissions in oil and gas drilling. We do not accept that natural gas is the way of the future for energy generation in Arkansas, except as the shortest bridge to a renewable energy future, due to the fact methane is more dangerous to the atmosphere than carbon dioxide.
5. Assistance in passing a bill to incentivize clean renewable, distributed energy in Arkansas in the 2015 legislative session, to be part of the Arkansas Clean Power and Jobs Plan, a coordinated plan by the renewable energy and conservation associations, working together.
6. Assistance in passing a state cap and trade or carbon fee and dividend legislation to further the goals of reducing carbon dioxide. We think the recent EPA guidelines under Clean Air Act section 111 (d) are not sufficient to clean the air of greenhouse gases in a timely fashion.
7. Coordination with the PSC to make sure that recommendations related to the above are going to come about in a timely manner. Arkansas needs every boost to compete well in the clean air and renewable energy business.

We would appreciate a written response to this document at your earliest convenience. Thank you.

Respectfully Submitted,

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