



## Examples of Alternative Energy Concepts and Projects in Arkansas

### **COGENERATION: Combined heat and power (CHP)**

CHP is on-site electricity generation that captures the heat that would otherwise be wasted to provide useful thermal energy—such as steam or hot water—that can be used for space heating, cooling, domestic hot water and industrial processes. Typically, nearly two-thirds of the energy used to generate electricity is wasted in the form of heat discharged to the atmosphere. Additional energy is wasted during the distribution of electricity to end users, i.e., “line loss”.

CHP offers a number of benefits compared to conventional electricity and thermal energy production, including:

#### • Efficiency Benefits

-CHP requires less fuel to produce a given energy output and avoids transmission and distribution losses that occur when electricity travels over power lines.

#### • Environmental Benefits

-Because less fuel is burned to produce each unit of energy output and because transmission and distribution losses are avoided, CHP reduces emissions of air pollutants.

#### • Economic Benefits

-CHP can save facilities considerable money on their energy bills due to its high efficiency, and it can provide a hedge against electricity cost increases.

#### • Reliability Benefits

- CHP is an on-site generation resource and can be designed to support continued operations in the event of a disaster or grid disruption by continuing to provide reliable electricity.

CHP facilities in Arkansas:

- Georgia Pacific Crossett: 91.6 MW Nameplate Capacity
- Domtar Ashdown Mill: 156.5 MW Nameplate Capacity
- Fourche Creek Wastewater: 1.3 MW Nameplate Capacity
- Potlatch Warren Lumber Mill: 15 MW Nameplate Capacity
- Riceland Foods Cogeneration Plant: 18 MW Nameplate Capacity
- Pine Bluff Energy Center: 236 MW Nameplate Capacity
- Columbia Flooring Melbourne: 2 MW Nameplate Capacity
- Evergreen Packaging Pine Bluff Mill: 85 MW Nameplate Capacity
- Clearwater Paper APP CB: 20 MW Nameplate Capacity
- Cross Oil Refining and Marketing, Inc: 3.5 MW Nameplate Capacity

## **BIOMASS: Utilizing biogenic fuels**

The term "biomass" refers to organic matter that has stored energy through the process of photosynthesis. Many of the biomass fuels used today come in the form of wood products, dried vegetation, crop residues, etc. Biomass has become one of the most commonly used renewable sources of energy in the last two decades, second only to hydropower in the generation of electricity.

Biomass contains stored energy. When biomass is burned, this stored energy is released as heat. Burning biomass releases carbon dioxide as well. However, plants also take carbon dioxide out of the atmosphere and use it to grow their leaves, flowers, branches, and stems.

Forest-derived biomass is carbon neutral where sustainability measures are fully implemented. This occurs where the USDA Forest Inventory Analysis (FIA) data shows that the growth rate of forests is greater than or equal to harvest levels on a broad landscape scale.

Key elements of a simple approach to regulating forest-derived biomass include:

- Recognition that biomass energy will not increase carbon in the atmosphere so long as overall forest carbon is stable or increasing.
- Use of USDA's Forest Inventory Analysis data and established science rather than complex modeling and assumptions.
- Implementation on the broadest possible scale.
- Recognition that forest products manufacturing residuals, harvest residuals and thinnings do not increase and can even reduce overall carbon in the atmosphere.

Biomass-Fueled Electricity Generators in Arkansas:

- Georgia Pacific Crossett: 91.6 MW Nameplate Capacity; Wood/Wood Waste Biomass
- Domtar Ashdown Mill: 156.5 MW Nameplate Capacity; Wood/Wood Waste Biomass
- Fourche Creek Wastewater: 1.3 MW Nameplate Capacity; Other Waste Biomass
- Potlatch Warren Lumber Mill: 15 MW Nameplate Capacity; Wood/Wood Waste Biomass
- Riceland Foods Cogeneration Plant: 18 MW Nameplate Capacity; Other Waste Biomass
- Columbia Flooring Melbourne: 2 MW Nameplate Capacity; Wood/Wood Waste Biomass
- Evergreen Packaging Pine Bluff Mill: 85 MW Nameplate Capacity; Wood/Wood Waste Biomass
- Two Pine Landfill Gas Recovery: 4.8 MW Nameplate Capacity; Landfill Gas
- Waste Management Eco Vista LFGTE: 4 MW Nameplate Capacity; Landfill Gas

## SOLAR AND WIND: Utility Projects

### Solar

- Entergy Arkansas Entergy Arkansas has entered into a 20 year contract to purchase all power produced from an 81 megawatt solar farm to be built on approximately 500 acres in Arkansas County. An affiliate of NextEra Resources LLC will build and operate the solar farm. The farm is expected to be online no later than mid-2019. The facility will produce enough clean electricity to power approximately 13,000 homes. Another comparison is that it would serve all the households in a city like Benton or Hot Springs.

- Arkansas Electric Cooperative Corporation (AECC) AECC has entered into agreements with the following entities:

- SR Highland, LLC for the purchase of energy from an up to 12 MW solar photovoltaic facility being constructed in Camden, Arkansas. The facility is located behind the meter of a Ouachita Electric Cooperation Corporation industrial customer whose demand averages approximately 4 MW. AECC will purchase all energy generated in excess of the industrial customer's instantaneous load. The facility went into commercial operation in 2015, and the agreement will extend through 2040.

- Ozarks Electric Cooperative Corporation for the purchase of energy and capacity from a 1 MW solar facility under construction in Washington County, Arkansas. The facility is expected to begin commercial operation by the end of 2016, and the agreement will extend for 25 years from the commercial operation date.

- Similar to the Ozarks ECC agreement, AECC anticipates an agreement will be signed soon with First Electric Cooperative Corporation for a 1 MW solar facility in Saline County, Arkansas. First Electric recently made a press release regarding this facility.

### Wind

- AECC AECC has entered into agreements with the following entities:

- Flat Ridge 2 South Facility, a wind-powered facility in Harper County, Kansas. The facility has 32 turbines, rated at 1.6 MW each, for a maximum capacity of 51.2 MW. The facility went into commercial operation in 2012 and the agreement will last through 2031.

- Origin Facility, a wind-powered facility in Murray and Carter Counties, Oklahoma. The facility has 75 turbines, rated at 2 MW each, for a maximum capacity of 150 MW. The facility went into commercial operation in 2014 and the agreement will last through 2034.

- Drift Sand Facility, a wind-powered facility being constructed in Grady County, Oklahoma. The facility is expected to have 54 turbines, each rated at 2 MW each, for a capacity of 108 MW. The facility is expected to be in commercial operation by the end of 2016, and the agreement will last through 2036.

-Chisholm View II Facility, a wind-powered facility being constructed in Grant and Garfield Counties, Oklahoma. The facility is expected to have 32 turbines, each rated at 2 MW each, for a capacity of 64 MW. The facility is expected to be in commercial operation by the end of 2017, and the agreement will last through 2042.

- Southwestern Electric Power Company (SWEPCO)

-SWEPCO secured 400 MW of wind resources roughly two years ago (2014).

-Additionally, SWEPCO's recent Arkansas Integrated Resource Plan projects the need for both solar and wind resources at varying levels over the next several years (2017-2030).