



## PLACER COUNTY BIO-ENERGY FREQUENTLY ASKED QUESTIONS

For more info contact:  
Brett Storey, Placer County Biomass Program Manager  
BStorey@placer.ca.gov  
530.886.5334

### **What is woody biomass and where does it come from?**

Woody biomass is composed of trees including wood from the bole (trunk) of the tree, limbs, tops, roots, and even the foliage. Woody biomass can include shrubs and other woody plants.

The principal sources of woody biomass for energy production have historically been: 1) trees killed or damaged by fire, insects, disease, drought or that have no other use; 2) trees grown specifically for energy production; and 3) trees removed to reduce hazardous fuel accumulations or improve forest health.

Woody biomass also includes wood wastes from urban areas (e.g., construction wood, tree trimmings) and products derived from trees such as lumber, paper and byproducts of wood manufacturing (e.g., sawdust and bark).

### **What is renewable biomass energy? Why is it renewable?**

A renewable resource is one that naturally replenishes itself after it has been used or which is never depleted by use. Examples of renewable resources that are used to produce electricity include water, sunlight, wind, geothermal, and biomass.

Renewable energy technologies harness the energy in renewable energy resources. In the cases of solar, wind, and hydroelectric power, use does not deplete the resource. Biomass resources can be replenished as trees can be propagated naturally or with the help of foresters.

There are three ways in which biomass resources can be utilized for electricity: 1) conversion of materials such as urban wood wastes and mill wastes, 2) dedicated energy crops (trees, shrubs and other plants grown specifically for energy production), and 3) as a byproduct of forest management activities. For example, biomass can be produced from thinning forest stands to reduce hazardous fuel loads or improve forest health. Generally, the biomass consists of small trees that are not useable for lumber or other purposes. Energy production from such sources is sustainable as long as there continues to be forest management activities producing and replenishing the biomass.

### **What is a biomass power generation facility? How is power currently generated from wood?**

A biomass power plant utilizes woody biomass for the production of electricity and/or heat. The wood is

combusted in boiler systems and fitted with air emissions controls that create steam used to spin a turbine that produces electricity. Or, in cogeneration, the wood is used to generate both electricity and heat. Once steam is used to spin the turbine, it is extracted to provide heat for other processes (e.g., drying, heating). Finally, wood can be used in combination with other fuels such as coal, oil or natural gas to fire boilers and create electricity (also known as co-firing).

### **How big is a biomass power plant? How big is the proposed Placer County Lake Tahoe basin biomass facility?**

The intended end use of the energy and the availability of fuel/feedstock determine the capacity of a biomass power plant to generate electricity. In the U.S., most biomass power plants are associated with forest industries such as sawmills. These produce electricity and heat or steam using biomass wastes (e.g., sawdust and bark) from the sawmill operations. Electricity and heat or steam generated can be utilized for the sawmill. Excess electricity can be sold to the electrical grid. Generally, biomass power plants are larger than 15 megawatts (one megawatt is enough to service about 1,000 households for a year), but can range from less than 1 MW to over 50 MW. It takes about 8,000 bone dry tons (2 big trucks a day) of woody biomass to produce one MW of electricity on an annual basis.

The Placer County Lake Tahoe basin biomass facility is proposed to generate between 1 and 3 MW of renewable electricity.

### **What waste products does the plant produce?**

Biomass power plants produce ash (about 3 to 5% of the fuel input by weight). Depending on the source of biomass and the combustion process, power plant ash can be used as a soil amendment or in masonry and cement products.

Water used to create steam for electricity production can be recycled.

### **What air pollution issues does biomass power present?**

Biomass power plants are designed with air pollution controls for minimizing discharges of regulated air pollutants. Biomass power plants are subject to regulation by the U.S. Environmental Protection Agency, California Air Resources Board, and local air quality management districts. Biomass power plants can eliminate 95-99 percent of pollutants that would

otherwise be produced by open burning of that same biomass.

**How would biomass power impact wildfire catastrophes? Will biomass power endanger our forests?**

Throughout the western U.S., a large potential source of biomass for power production is fire hazard reduction projects. Removing biomass from the forest during the course of fuel reduction treatments will reduce the threat of wildfire and decrease the area burned in catastrophic fires. Properly executed fire hazard reduction projects can also improve forest health and make the forest less susceptible to drought, insect attacks and disease. Utilizing biomass for energy production will make fuel treatments more economically feasible by creating a market for such biomass material that currently has little or no value.

Biomass power plants therefore pose little or no risk to forests from over-cutting and actually can contribute to improvements in forest health and reduced fire hazard.

**How is it renewable energy if it emits greenhouse gases?**

A biomass power plant does produce carbon dioxide (CO<sub>2</sub>), a greenhouse gas. However, if the fuel supply is obtained as a byproduct of reducing fire hazard in natural forests, the plant emissions may be offset by the reduced emissions that would have occurred if the forest burned. Wildfires are significant sources of greenhouse gas emissions. For example, it has been estimated that the 2007 Angora fire in the Lake Tahoe Basin released 141,000 metric tons of CO<sub>2</sub> and other greenhouse gases into the atmosphere within a period of a few days. This is equivalent to the emissions from over 28,000 cars in one year.

By utilizing fuels derived from forest management that reduces the probability of wildfire and considering the natural growth patterns of biomass, a biomass power plant can be considered "carbon neutral." Biomass is a unique fuel in that it is derived from a resource that is naturally replenishing by taking in carbon from the atmosphere. Also, using biomass for electricity production may offset the use of fossil fuels, further reducing greenhouse gas production.

**Will there be an increased cost of lumber products or food produce? Will any food crops be impacted (like corn due to ethanol production)?**

As previously discussed, sources of wood for biomass power generation do not have "higher and better" uses such as conversion to lumber. They mainly consist of materials that would not be used

otherwise, such as residues (e.g., small stems, brush) from fire hazard reduction. Consequently, there would be no impact on lumber prices.

Unlike activities such as biofuels production (e.g., ethanol) that currently consume biomass useable for food (such as corn), production of electricity from woody biomass would not have an impact on food supply or prices.

**Is biomass power more expensive than other power generation?**

When compared to the direct monetary costs of power production from fossil fuels and hydroelectric power, biomass power is currently more expensive. Biomass power requires fuel that has considerable collection, processing and handling costs. However, rising coal and natural gas costs, which in turn drive up the price of electricity, are allowing biomass energy production to become much more competitive. In addition, when the currently non-monetized societal benefits of biomass use, such as reduced catastrophic wildfire, improved air quality, forest health, reduction of greenhouse gases, and renewed rural community development are factored in, biomass-based electricity provides significant benefits over fossil fuel-based electricity.

**Can biomass be used to make liquid or gas fuels? What about transportation fuels?**

Scientific and technical processes are being developed in order to convert the cellulosic material of woody biomass into useable fuels. Significant research and development is currently underway to make such conversion processes technically and economically viable. However, conversion technologies are not yet considered economical and are not used on an industrial scale (e.g., corn to ethanol). Synthetic gas fuels (syngas – similar to natural gas) and liquid fuels (ethanol and synthetic diesel) have been created in pilot-scale facilities in Europe and in limited quantities in the United States. The primary challenge of developing liquid or gas fuels from woody biomass is breaking down the complex cellulosic structure of wood into simple hydrocarbons and sugars that can be converted into liquid fuels. Because of the promise that biofuels may have for reducing America's dependence on foreign oil, significant private and public sector resources are being devoted to support research, development and commercial deployment of biomass to fuels conversion technologies.