Background

During the past five years, over 4.5 million acres of California forests have been impacted by wildfire. Costs to suppress these wildfires have averaged approximately $1.2 billion per year. Numerous scientists predict increasing size and severity of fires unless aggressive forest restoration treatments are implemented. These treatments involve removing the excess biomass 'fuel' (mostly brush and small diameter trees) built up in the forests, which reduces the severity and scale of wildfires. This fuel reduction work used to be integrated into timber harvest contracts which balanced the costs with the economic value of large trees. But with the increased environmental concerns over large tree removal, as well as the housing market crash, logging activity and the corresponding reduction of forest fuel has been greatly reduced. Without the value of large trees to offset the cost of biomass fuel removal, public land managers have been unable to keep up with the need for fuel reduction, with the result that California's forest ecosystems are at greater risk to catastrophic wildfire.

In order to create a new economic model that supports forest fuel reduction and wildfire mitigation, the forest biomass generated as a byproduct of forest restoration activities must generate sufficient economic value to cover the costs of collection, processing, and transport. Recent innovations in biomass energy technology provide an opportunity for the economically and environmentally sustainable use of biomass to create renewable energy for California at the same time protecting the state's valuable forests, and the region's communities, from catastrophic wildfire. Development of additional biomass power generation facilities in the Sierra Nevada Region that utilize forest waste would provide a ready market for biomass removed as a byproduct of forest restoration activities.

California leads the nation in deployment of biomass power generation capacity. There are just over 30 commercial scale biomass power generation facilities in commercial operation, the majority of which rely upon agricultural residues, urban woody waste, and sawmill residues rather than forest biomass directly from the forests as a primary fuel source[1]. Recently, however, there has been significant advancement of biomass conversion technologies that facilitate the efficient use of forest biomass as a primary feedstock for power and heat production. The first of these is the development of technologies appropriate for clean, efficient, small-scale, bioenergy facilities. These new 'gasification' facilities range in scale from .5 MW to 3 MW and can be easily located in forest communities, particularly in areas where there is an abandoned sawmill site. These facilities are sized to utilize biomass fuel sustainably removed from the forest within a 20 to 30 mile radius for fire safety or forest health purposes. A further innovation is the utilization of the waste heat from these bioenergy facilities to pre-dry the forest biomass, improving the efficiency of the gasification process.

[1] Electricity – Woody Biomass Utilization 2012. University of California. 11/2/2012. http://ucanr.edu/sites/WoodyBiomass/Woody_Biomass_Utilization_2/Energy/

Although none of these new forest biomass 'gasification' facilities are currently operating in the State, several are under development. These include a 1 MW project in Calaveras County (Wilseyville), which has completed a feasibility study, a 2 MW facility in Placer County which has completed its Environmental Impact Report (EIR), and a 1 MW facility in Madera County (North Fork), which has completed a feasibility study and is currently engaged in pre-development design/engineering and California Environmental Quality Act (CEQA) documentation. The SNC has been providing assistance to the Wilseyville and North Fork projects, which are both in low-income communities suffering from economic dislocation from the reduction in local timber harvest activity. It is intended that these two projects will act as demonstrations for other communities in the region where forest bioenergy would be both feasible and beneficial.

These issues are starting to be addressed at the state-wide level. A 2012 state Bioenergy Action Plan was released in August. This plan, prepared by the Bioenergy Interagency Working Group, acknowledges the benefits of forest biomass, stating:

> "Increased utilization of forest biomass residues improves community safety and forest health by offsetting costs of forest restoration, fuel reduction, and forest thinning treatments. These activities reduce wildfire hazards and mitigate wildfire damage to public health and safety, natural resources, infrastructure, and public and private property. Restoration activities can also make forest ecosystems more resilient to the effects of climate change. Community-scale distributed generation facilities using forest biomass residues are important for forest restoration and protection as well as community development. Scaling bioenergy facilities to the community's resource potential ensures that biomass use is environmentally and economically sustainable. Sustainable development will promote long-term economic and social stability in rural, economically-disadvantaged communities by providing construction, plant operation, and in-forest biomass collection and transportation jobs."

The 2012 Bioenergy Action Plan includes a broad array of action items related to the promotion of forest bioenergy. The SNC is identified as one of the key responsible agencies for these action items, particularly as regards to outreach and assistance to stakeholders and assisting collaborative efforts related to the development of small scale forest Bioenergy facilities.

Collaborative efforts are particularly important in promoting forest Bioenergy development because there are so many factors involved in creating successful projects. These include:

- The price that utility companies pay for the power produced (set by the California Public Utilities Commission (CPUC));
- Analysis of the correct size of the facility so that it utilizes the amount of biomass that will be sustainably harvested for forest health and fire safety;

- Identification of suitable sites for bioenergy facilities;
- Utility company policies and procedures regarding interconnection with the power grid;
- Community capacity to implement large development projects; and,
- Funding for feasibility, predevelopment, and implementation costs.

Collaborative groups representing different agencies and stakeholders can help make sure that these issues are addressed in a coordinated manner to reduce the many obstacles to successful project development.

One collaborative group that addresses these issues is the Biomass Working Group, which includes representatives from federal and state agencies, forest and energy industries, conservation and community development groups and technical experts. The SNC is an active member of the working group and has provided coordination assistance and additional resources for the activities it undertakes. In addition, SNC participates in the State Bioenergy Group which is coordinating the Bioenergy Action Plan implementation.

Over the past year, SNC Staff and consultants have worked hard to address funding, policy development, and technical assistance needs related to forest biomass projects. Specific achievements include:

- Providing funding and staff support, as well as assisted in securing funding from other sources, to the North Fork Bioenergy demonstration project to complete their feasibility study and select a technology provider and development team;
- Providing funding and staff support to assist with the completion of the Wilseyville project feasibility and engineering study;
- Obtaining a U.S. Forest Service (Forest Service) grant for the North Fork project to move forward into predevelopment work;
- Compiling information about public and private funding mechanisms and building relationships with financial managers
- Providing input and information for the state Bioenergy Action Plan;
- Providing information relevant to the CPUC's rulemaking process regarding pricing of Bioenergy power;
- Providing information relevant to the CPUC's rulemaking process regarding standard power purchase agreements between Bioenergy facilities and utility companies;
- Providing information relevant to the CPUC's rulemaking process regarding interconnection policies and procedures;
- Developing public information materials regarding the benefits of forest biomass for forest health and wildfire protection; and,
- Communicating the multiple benefits of forest Bioenergy and best known technologies.

Current Status:

As previously noted, the Governor's 2012 Bioenergy Action Plan assigns the SNC to take responsibility for a number of action items regarding the statewide development of forest bioenergy. Specific responsibilities include:

- Continue working with stakeholders and expanding the forest biomass collaborative to identify and promote small-scale forest biomass projects that reduce fire hazards, restore healthier, more resilient forests, provide renewable energy, and promote rural economic development.
- Update research on bioenergy utilization co-benefits and quantify the cost-benefit of biomass use.
- Coordinate the Biomass Working Group, a collaborative of agencies, stakeholders and technical experts, to:
    - Refine criteria for "community-scale" biomass energy facilities, identify a few candidate projects, and seek developers and cost-share for deploying and demonstrating commercial and emerging community-scale bioenergy technologies.
    - Provide input to CPUC and others on ratepayer and other benefits of converting forest biomass to energy; identify areas where additional research is needed, and coordinate with and/or secure funding from state agencies, private and federal sources, Western Governors' Association or others for this purpose;
    - Identify and seek private, state, including public interest research, and public goods charge, and federal funding for feasibility studies, pilot and demonstration projects, and research to support community-scale biomass utilization projects.
- Develop screening criteria to help local agencies determine the applicability of community scale woody biomass technologies and projects in their communities.
- Pursue Federal Funding Opportunities for Bioenergy: State and Federal agencies will coordinate to identify and pursue opportunities for federal research, development, and commercialization of bioenergy facilities, including funding from the US Department of Agriculture, Forest Service, Environmental Protection Agency, Department of Energy and other federal partners.

Since the Bioenergy Action Plan was published, additional legislation regarding forest biomass has been signed into law. Senate Bill 1122 (Rubio, Chpt 612 Stats. 2012), adds new benchmarks for the development of small scale forest biomass projects. It requires the state's electrical corporations to collectively purchase 50 MW of generating capacity from new small scale (3 MW or less) bioenergy projects using byproducts of sustainable forest management.

Senate Bill 1122 adds new urgency to the SNC's responsibilities under the Bioenergy Action Plan by adding an additional 50 MW of forest biomass from at minimum of 16 new facilities in the next 10 years. This will take a concerted and coordinated effort and SNC is prepared to continue playing a lead role in the development of forest bioenergy facilities in the Sierra Nevada Region.

SNC management has allocated resources to this area of concentration, including staff members Kim Carr and Nic Enstice and consultants Elissa Brown and, more recently, Mike Chapel, whom recently retired from the Forest Service and is now serving as a contractor to the SNC.

Next Steps

Focus areas for the SNC's Forest Bioenergy Team's activities, working with Cal Fire, Forest Service and other partners, over the next year will include:

- Continuing to provide project support for the North Fork and Wilseyville Projects; provide support as capacity allows for Placer County and other projects in the Region;
- Developing financing and investment models for project implementation, including private funding, tax credits, Energy Commission Electric Program Investment Charge (EPIC) funding, etc. Team members have already met with the Northern California Community Loan Fund to discuss potential for utilizing New Market Tax Credits for forest bioenergy projects;
- Providing grant writing assistance for appropriate funding opportunities such as the U.S.D.A. Rural Business Enterprise and Woody Biomass Utilization Grants;
- Addressing barriers to project implementation, such as complicated grid interconnection requirements;
- Identifying the most appropriate sites for forest bioenergy and providing information and assistance to interested communities;
- Convening stakeholders to address critical forest management and environmental concerns, such as the definition of 'sustainably harvested biomass';
- Providing targeted education for representatives of key agencies, such as the CPUC, the Energy Commission, and the Air Resources Board; and,
- Developing educational materials, coordinating and leading a series of workshops and engaging in various public information efforts.

Recommendation

This is an informational item only; no formal action is needed by the Board at this time, although Boardmembers are encouraged to share their thoughts and comments.