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Development of the California Energy Commission Investment Plan for the Electric Program Investment Charge Program	Docket No. 12-EPIC-01 docket@energy.ca.gov

PACIFIC FOREST TRUST COMMENTS ON THE FIRST TRIENNIAL INVESTMENT PLAN FOR FUNDS ADMINISTERED BY THE CALIFORNIA ENERGY COMMISSION FOR THE ELECTRIC PROGRAM INVESTMENT CHARGE PROGRAM

August 17, 2012

I. OVERVIEW

The Pacific Forest Trust respectfully submits these comments regarding the first triennial investment program for the Electric Program Investment Charge (EPIC). We commend the California Public Utilities Commission (CPUC) for including an allocation of EPIC funds to bioenergy generally. However, we would like to emphasize the importance of specifically dedicating funding support to help develop commercially viable and ecologically sustainable, well-distributed, community-scale energy generation from forest biomass. Developing community-scale forest bioenergy advances many of California's policy goals and captures substantial ratepayer benefits that are not achieved from larger-scale biomass facilities. Despite this, community-scale biomass faces a competitive disadvantage when vying for investment with larger bioenergy facilities that enjoy considerably greater economies of scale. There are several opportunities within the EPIC investment plan to help facilitate the permitting, financing and demonstration of small-scale forest biomass facilities. Key areas for support should include:

- **Guidance to ensure the ecological sustainability of forest biomass energy.**

Guidance is needed to ensure that energy generation from forest biomass advances rather than undermines environmental goals. Forest biomass projects that receive state support should facilitate the ecological restoration of excessively dense forests, removing trees to help create forests that are ecologically resilient in the face of a changing climate. While fuels treatments are extremely important to restoring the health of forests adversely affected by fire suppression, undertaking biomass harvest at excessive levels or in forests where fuels reduction is not ecologically warranted can compromise ecosystem health.

State investments in forest biomass should be coupled with meaningful guidance and requirements regarding desired post-harvest conditions. This should also include an evaluation of the volume of biomass available in a given region from treatments that improve long-term ecological function.

Guidance is critical to ensuring that forest biomass utilization is undertaken in a way that addresses the unnatural forest conditions resulting from decades of fire suppression. It also will be necessary to ensure that financial incentives for biomass do not lead to excessive carbon debts or other ecological harm, which will be the key policy challenges facing forest biomass utilization.

- **Performance tariffs to support energy generation from distributed, community-scale forest biomass.**

Distributed, community-scale forest bioenergy can achieve many ratepayer benefits, but the public-good nature of these benefits means that they currently are externalized from the marketplace. As a result, California's energy markets fail to provide sufficient energy generation from distributed, community-scale forest bioenergy. Performance tariffs for energy generation from this approach would help internalize some of these benefits and begin to correct this market failure.

- **Coordination of resource information to facilitate permitting and project evaluation.**

The EPIC program can provide funding for important resource assessments that will be useful for evaluating opportunities for various types of renewable energy projects and helping facilitate project evaluation and permitting. Beyond the support for individual assessments, the EPIC program should evaluate opportunities to coordinate the myriad resource assessments that have been conducted in the past and aggregate these into a single information resource. Organizing the existing information and studies into a usable format would help project developers and would prevent re-inventing the wheel.

- **Grants for capital investment in distributed, community-scale forest biomass energy generation facilities.**

High capital costs currently deter investment in distributed, community-scale forest bioenergy and inhibit the widespread commercial adoption of proven, community-scale conversion technologies. Grants for capital costs would help overcome this hurdle and promote the greater commercial viability of community-scale forest bioenergy.

II. BACKGROUND

On May 24, 2012, the CPUC issued decision 12-05-037 regarding the proceeding on the Electric Program Investment Charge (EPIC). Decision 12-05-037 officially authorized EPIC funding collections at $162 million annually from January 1, 2013 through December 31, 2020.[1] The funds generated through EPIC generally will be allocated among the following three support areas: applied research and development, technology demonstration and deployment (TD&D), and market facilitation.

Applied Research and Development

The applied research and development support category will dedicate $55 million annually to investment in applied science and technology that provides public benefits but for which there is no current clear business case for private investment.[2] While the CPUC staff proposal does not specify the exact areas of applied research, examples from the past include activities to reduce the environmental barriers to energy deployment.[3] This support area holds great potential for addressing environmental barriers to bioenergy development, including overcoming research gaps on the ecological sustainability and climate impacts of bioenergy.

Technology Demonstration and Deployment

The CEC will administer $45 million of the $75 million annually dedicated to TD&D, and a 20% portion, or $9 million, of the CEC-administered TD&D funding will be allocated specifically to supporting the development of bioenergy. According to the CPUC staff proposal, projects within the TD&D support area should provide "an opportunity to better understand the operations of an emerging, pre-commercial technology at a scale and in an environment that is reflective of actual operating conditions."[4]

Market Facilitation

The market facilitation support area allocates $15 million annually to addressing non-price barriers to the adoption of clean technologies, such as overcoming information gaps.[5] This support area will be particularly important with respect to forest biomass, where considerable research is needed regarding the amount of feedstock materials available on an ecologically sustainable basis.

III. FOREST BIOENERGY

Promoting distributed, community-scale energy generation from forest biomass presents an important opportunity to advance many of California's policy objectives for renewable energy and economic development. Despite this promise, however, distributed, community-scale generation from forest biomass currently is far from realizing its full potential in California.

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[1] California Public Utilities Commission. Decision 12-05-037 (May 24, 2012), p. 73.
[2] *Id.,* at 32.
[3] *Id.*, at 33.
[4] California Public Utilities Commission. Electric Program Investment Charge Staff Proposal (February 10, 2012), p. 21.
[5] *See* note 2.

Policy Setting
As the CPUC staff proposal recognizes, bioenergy presents an important opportunity to advance renewable energy generation within the guiding principles given by the CPUC for EPIC funds.[6] This approach also will promote a variety of other state policy objectives, including Executive Order (EO) S-06-06 and Governor Brown's Clean Energy Job Plan.

Executive Order S-06-06 commits California to a target of generating 20% of its renewable energy from biomass by 2010, and maintaining this level of generation through 2020. In response to EO S-06-06, the CEC developed the State Bioenergy Action Plan, which highlights the potential of bioenergy to reduce dependence on foreign oil or imported natural gas while diversifying California's energy supply. It also finds that the promotion of bioenergy creates green jobs, enhances rural economic development, and promotes local economic stability. Furthermore, the plan emphasizes that the use of residues from wildfire fuel reductions can diminish the occurrence of large, costly wildfires, protect watersheds and ecosystems, provide an alternative to the open burning of these materials, and increase the efficiency and profitability of forestry.[7] Prominent among the State Bioenergy Action Plan recommendations to capitalize on this potential is the enhancement of the economics of biomass development through state incentives. These incentives should recognize the public benefits of biomass, and could include feedstock incentives, environmental adders, and research and development grants—all support types that align well with the investment opportunities outlined under EPIC.[8]

In addition to EO S-06-06, promoting community-scale, distributed generation also would advance the goals of Governor Brown's Clean Energy Jobs Plan, which calls for the addition of 20,000 MW of new renewable capacity by 2020. This 20,000 MW of new renewable capacity includes 12,000 MW of localized generation close to consumer loads, such as community-scale forest biomass.[9]

Current Potential
Existing biomass resources in California are sufficient to supply a substantially larger amount of renewable electricity than currently is being generated.[10] Of all of California's technically available biomass resources, in-forest biomass has among the largest resource-development potential.[11] Almost half (14 million BDT/yr) of the 32 million BDT/yr of biomass technically available in the state is from the forest sector.[12] Accordingly, the forest sector has the potential to provide fully half (1,910 MW) of the total generation capacity technically possible from biomass.[13]

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[6] *See* note 4, at 22.
[7] California Energy Commission. 2011. Bioenergy Action Plan. CEC-300-2011-001-CTF, p. 1.
[8] *Id.* at 3.
[9] California Energy Commission. 2011. Integrated Energy Policy Report. CEC-100-2011-001, p. 28.
[10] See note 7, at 2.
[11] See note 7, at 25.
[12] California Energy Commission. 2008. An Assessment of Biomass Resources in California, 2007 (Draft Report). PIER Collaborative Report, Contract 500-01-016, p. 127.
[13] *Id,* at 128.

IV. RECOMMENDED SUPPORT AREAS

Despite the considerable potential of forest biomass in California, economic challenges largely have prevented its commercial development. Given this, we believe that EPIC provides an ideal investment vehicle for overcoming these challenges and furthering the development of renewable energy within California. In particular, we believe the following four investment areas represent the best approach to advancing community-scale forest biomass and the considerable ratepayer benefits it provides:

1. **Guidance to ensure the ecological sustainability of forest biomass energy.**

The development of energy generation from forest biomass has the capability to help restore California's forests, reduce wildfire risks, and provide a less carbon-intensive alternative to fossil fuels. By creating a revenue stream for fuels reduction residues, incentives for forest bioenergy can help defray treatment costs and advance forest restoration projects that would have been curtailed or forgone otherwise. When used as a substitute for carbon-intensive fossil fuels, the use of bioenergy also may result in net climate benefits.

While the potential of forest bioenergy is great, ensuring the realization of these benefits is complex. Fuels reduction treatments are essential to the ecological restoration of forests adversely impacted by fire suppression. However, fuels reduction treatments are not ecologically suitable in all forest types, and may undermine forest health if undertaken where inappropriate. Further, while the substitution of bioenergy for fossil fuels may result in net reductions of atmospheric GHGs, its net climate impact is dependent upon a variety of context-specific parameters, including: the fossil fuel system displaced, the productivity and original condition of harvested, and the timescale used for the evaluation of climate impacts, among others.[14]

Given these complexities, guidance is needed to ensure that incentives for forest bioenergy target activities that promote the ecological restoration of forests and do so in a way that minimizes net carbon emissions to the atmosphere. This guidance should include specific, stand-level guidelines for post-harvest conditions to ensure that biomass feedstocks are sourced from sustainable fuelsheds. The AB 118 process is working to address similar issues regarding bioenergy feedstock sustainability, and could provide a valuable reference for developing this guidance. To take advantage of this and other state efforts to address bioenergy sustainability issues, the CEC should consult with California Resources and other relevant agencies as it develops its own sustainability guidance.

[14] IEA Bioenergy. (2009). Bioenergy—A Sustainable and Reliable Energy Source. Energy Research Centre of the Netherlands, E4Tech, Chalmers University of Technology, and the Copernicus Institute of the University of Utrecht.

2. **Performance tariffs to support energy generation from distributed, community-scale forest biomass.**

California has abundant biomass resources from forest waste streams, and the utilization of these feedstocks for bioenergy has the potential to provide considerable public benefits.[15] Despite this opportunity, however, market-based pricing mechanisms for electricity, transportation, and waste-management currently do not consider all of the benefits bioenergy provides to local communities, and fail to provide a sufficient amount of energy generation from distributed, community-scale forest biomass. These externalized benefits coupled with the cost of feedstock collection and transportation remain a considerable economic challenge to the development of bioenergy.[16] Providing a small performance tariff for energy generation arising from distributed, community-scale forest biomass would help correct this market distortion and internalize some of the many public benefits provided by this approach.

3. **Coordination of resource information to facilitate permitting and project evaluation.**

As the CEC works to address environmental, permitting, and resource sustainability concerns surrounding the development of bioenergy through EPIC, it will be critical that this information is aggregated in a single, easily accessible location. Ensuring that this information is integrated in a user-friendly fashion will increase the ease and efficacy with which it is used, and prevent duplicative efforts and inefficient resource expenditures. The ready availability of planning and permitting resources will be especially crucial in rural areas where local municipalities may be unable to employ full-time staff to provide these services.

4. **Grants for capital investment in distributed, community-scale forest biomass energy generation facilities.**

Providing grants to help defray initial capital costs would assist in overcoming one of the foremost challenges to developing distributed, community-scale forest biomass energy generation. Small (5-10 MW) to very small (<5 MW) CHP facilities are viable in California, but tend to have higher upfront capital costs, higher operation and maintenance costs, and less-replicable designs than larger-scale bioenergy facilities.[17]

While economies of scale may be achieved from larger facilities, this approach has many drawbacks when compared to distributed, community-scale generation. The substantial feedstock demands of larger facilities require fuel to be trucked from great distances. The considerable costs associated with long haul distances can intensify pressures to harvest nearby forests at levels that are ecologically unsustainable. Further, unlike distributed generation, large, centralized facilities require substantial transmission infrastructure, and convey few benefits to the grid in terms of overall demand reduction.

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[15] See note 7, at 3.
[16] *Id.* at 2.
[17] Pinchot Institute for Conservation. Forest Sustainability in the Development of Wood Bioenergy in the U.S. (June 2010), p. 21.

Distributed, community-scale biomass generation is proven to be technically viable, with communities across Europe having installed more than a thousand smaller scale (<10 MW) CHP power plants to provide both heat and power to urban and rural communities. In addition, smaller, advanced wood combustion (AWC) technologies are remarkably efficient (up to 90%), produce minimal amounts of GHGs and other air pollutants, and are linked to the sustainable management of local forests.[18]

Despite this potential, however, the pre-commercial nature of many AWC systems and their attendant capital costs can deter potential users. If these initial hurdles can be overcome, however, paybacks are often less than 10 years, with small projects generally becoming revenue positive on a shorter timeframe than larger projects. While larger projects may benefit from economies of scale and a greater ability to attract equity investors relative to community-scale projects, these advantages often are negated by the greater potential for supply-chain risk, ecologically unsustainable feedstock supply demands, and public disapproval.[19]

Rather than building larger-scale plants on the order of 50 MW to 100 MW, which can require more than 1.2 million tons of sustainably supplied wood annually, many communities are better served by facilitating the construction of several smaller facilities distributed across the region and located in conjunction with a user capable of utilizing the thermal energy produced during the production of electricity. In many cases, the net energy produced by smaller distributed facilities is greater—albeit in the form of both useful thermal energy and electricity—than that achievable by a larger, centralized facility.[20]

Despite these advantages, the market for small- and community-scale systems that convert biomass into heat, power, or CHP has been slow in developing. There are countless communities, facilities, and utilities that are either developing or evaluating prospective biomass applications, but the market readiness of conversion technologies varies widely. The National Renewable Energy Laboratory (NREL) recommends that entities wishing to support the development of these technologies should consider funding demonstration projects of near-commercial technologies in their states.[21] Specifically providing EPIC grant support to distributed, community-scale forest biomass presents California with an opportunity to do just that.

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[18] Richter et al. 2009. Wood Energy in America. *Science* 323: 1432-1433.
[19] See note 13, at 33.
[20] *Id.,* at 32.
[21] Peterson, S., & Haase, S. 2009. Market Assessment Report of Biomass Gassification and Combustion Technology for Small- and Medium-Scale Applications. National Renewable Energy Laboratory Technical Report NREL/TP-7A2-46190, p. 16.

V. BENEFITS OF COMMUNITY-SCALE FOREST BIOMASS

Distributed, community-scale forest bioenergy fits well within the guidelines given by the CPUC for EPIC investments. While the CPUC provides general guidelines for the disbursement of EPIC funds, specific funding details are left to the investment plans to be developed by the CEC and the three IOUs.[22] In the portion of TD&D funds allocated to bioenergy, the CPUC does not distinguish between different types of bioenergy technologies meriting support. Rather, general guidelines are given directing the CEC to support projects that "showcase technologies and/or operational approaches that have been proven to be technically viable, offer meaningful prospects to enhance the economics of bioenergy within a reasonable timeframe/at a reasonable scale, are broadly applicable, and are not already being demonstrated elsewhere."[23] To achieve this, the staff proposal directs administrators to develop investment plans that provides "reasonably detailed information regarding the selection criteria that will be used in making ultimate demonstration funding determinations."[24] These investments should be guided by the following general principles:[25]

- Achievement of ratepayer and societal benefits;
- Advancement of AB 32 and EO S-3-05;
- The loading order from Energy Action Plans;
- Low-emission vehicles/transportation;
- Safe, reliable, and affordable energy services;
- Economic development; and
- Efficient use of ratepayer funds.

Investment in distributed, community-scale forest bioenergy has the potential to advance California's renewable energy goals while advancing these guiding principles in the following ways:

Ratepayer and Societal Benefits

The achievement of ratepayer and societal benefits is defined in terms of the extent to which supported activities promote greater reliability, lower costs, increased safety, and/or enhanced environmental sustainability in the specific context of the provision of energy services. These supported activities should map to the electricity system "value chain," which entails:[26]

- Grid operations/market design;
- Generation;
- Transmission;
- Distribution; and/or
- Demand-Side Management.

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[22] See note 1, at 8.
[23] See note 4, at 23.
[24] *Id.,* at 21.
[25] See Note 1, at 12.
[26] *Ibid.*

The utilization of forest biomass for energy generation can provide many of these benefits, and readily can be mapped to the different components of the electricity system value chain. By providing an important source of baseload generation, biomass generation can improve overall grid reliability. Because distributed biomass generation facilities require relatively little transmission capacity to wheel power to load centers, strategically locating biomass generation facilities across California also can save money by reducing the need for transmission system upgrades.

The use of forest biomass for energy generation also can help save money by promoting forest restoration treatments where transmission infrastructure is threatened by catastrophic wildfire. Currently, over 21 million acres in California are considered high priority for reducing wildfire risk.[27] Forest restoration treatments are critical to reducing fire severity and preventing damage to transmission infrastructure on these lands. This proactive approach both helps increase safety for rural communities and can avoid the great costs necessary to replace transmission infrastructure lost to catastrophic wildfire.

In addition to these benefits, promoting the use of forest biomass also can help assist with demand-side management. Where electricity conventionally has been used for heating, thermal energy from combined-heat-and-power (CHP) biomass generation can help reduce overall electricity demand. When undertaken at the community scale, forest biomass also can further environmental sustainability in context to the provision of energy services by providing a renewable substitute to fossil fuels and restoring the health of nearby forests.

AB 32 and EO S-3-05

The staff proposal states that supported activities also should promote GHG emissions mitigation and adaptation in the electricity sector at the lowest possible cost. These activities should advance the AB 32 goal of 1990 emissions levels by 2020 and/or the longer-term EO S-3-05 goal of 80% below 1990 emissions levels by 2050.[28] One of the key findings of the 2011 California Bioenergy Action Plan is that increasing the state's bioenergy production will help achieve the state's climate change goals with a sustainable and dependable resource.[29]

By displacing non-renewable, fossil energy sources, community-scale biomass has the potential to further these goals. However, energy generation from forest biomass is not without its own GHG emissions to the atmosphere, and these must be taken into account. For biomass utilization ultimately to yield net GHG benefits to the atmosphere, sufficient time must elapse for forest regrowth to re-sequester carbon emitted from biomass combustion. This not only requires that net benefits be considered at a coarser temporal scale, but it also demands that regrowth is allowed to occur on the lands originally harvested. Ensuring the sustainability of biomass utilization, however, requires a guarantee that fuel demand does not outstrip the feedstock supply available from forest restoration residues.

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[27] California Department of Forestry and Fire Protection. 2010. California's Forests and Rangelands: 2010 Assessment. Fire and Resource Assessment Program, p. 10.
[28] See note 1, at 13.
[29] See note 7, at 2.

Loading Order
The loading order from Energy Action Plans establishes the preferred set of technologies on which states should rely in the provision of energy services. This order is given as:[30]

1. Energy efficiency and demand response;
2. Renewable energy, both distributed and utility scale; and
3. Clean fossil generation, if necessary.

By providing a source of thermal energy, community-scale biomass can address the first component of the loading order by helping diminish electrical demand for heating. Community-scale biomass also follows the second component of the loading order by providing a source of distributed, renewable energy.

Safe, Reliable, and Affordable Energy Services
The staff proposal directs that supported activities should also provide safe and reliable energy services at reasonable cost. As previously noted, community-scale biomass can increase overall safety by reducing wildfire risk to communities. It also can heighten the reliability of energy services by providing a source of baseload generation. Community-scale biomass also can increase affordability by promoting energy self-sufficiency in rural areas. By purchasing locally generated biomass energy, rural communities are enabled to retain these monies within the locally economy instead of sending them abroad to purchase fossil fuels.

Economic Development
Supported activities should benefit the California economy to the greatest extent practicable.[31] Due to the prohibitive cost of transporting forest biomass, facilities must be sited in the rural areas from which forest residues arise. The jobs created from forest treatments and the establishment and operation of energy generation facilities can contribute substantially to rural communities that are currently enduring considerable economic hardship. According to the 2011 California Bioenergy Action Plan, achieving the state's bioenergy goals has the potential of adding over 15,000 jobs in California's rural communities over the next decade.[32]

Efficient Use of Ratepayer Funds
Investments should efficiently use ratepayer monies, and should not be used to support activities that are duplicative to those being undertaken elsewhere.[33] As the 2011 California Bioenergy Action Plan highlights, considerable untapped potential currently exists with respect to the utilization of California's bioenergy resources. Given this, there is great potential for using EPIC funds to overcome the hurdles to better realizing the full potential of California's forest biomass resources. In particular, the plan highlights currently unresolved challenges in biomass utilization with sustainable feedstock sourcing and transportation, financing, and research and development challenges related to next generation technologies, biomass feedstock sustainability, and feedstock

[30] See note 1, at 13.
[31] *Id.,* at 14.
[32] See note 7, at 5.
[33] See note 1, at 14.

production systems (2011 Bioenergy Plan, p. 41). Applying EPIC funds to overcoming the challenges presents an important opportunity to more fully achieve the considerable potential of forest biomass given in the 2011 bioenergy plan. Finally, if community-scale forest bioenergy also includes thermal generation, this approach could lead to greater net energy generation than larger-scale biomass facilities that generate only electricity. Given this, EPIC support for community-scale generation presents a compelling opportunity to achieve a greater energy return on the ratepayers' investment.[34]

VI. CONLCUSION

Despite the potential of distributed, community-scale forest bioenergy, the failure of California's market-based pricing mechanisms to consider many of its public benefits has resulted in an insufficient level of energy generation from this approach. Community-scale generation technologies remain largely pre-commercial, and require substantial up-front capital investments from small, rural energy developers. Specifically targeting a portion of EPIC funding at supporting distributed, community-scale generation and other research activities would help overcome these challenges. Grant assistance would defray high capital costs, advancing the deployment of community-scale generation technologies and promoting the eventual commercial viability of this approach. Performance tariffs would assist in internalizing some of the public benefits arising from this approach that currently are externalized in the California's energy markets. Finally, support for feedstock assessments and sustainability guidance would help promote the development of forest biomass energy at a level that does not exceed the ability of California's forests to supply biomass on an ecologically sustainable basis.

Respectfully submitted,

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[34] See note 13, at 32.