JDMT, Inc

December 28, 2010

California Energy Commission
Dockets Office, MS-4
RE: Docket No. 10-BAP-01: 2011 Bioenergy Action Plan
1516 Ninth St
Sacramento CA 95814-5512
(Sent via email to docket@energy.state.ca.us; one hard copy mailed on this date)

SUBJECT: Docket No. 10-BAP-01: Submission of Written Comments on
- **Preparation of the 2011 Bioenergy Action Plan**
- **List of Actions by State Agencies (Chapter 6, as Appendix A)**

We are pleased to submit our written comments to the California Energy Commission in response to request by the state's Bioenergy Interagency Working Group for feedback on the Preparation of the Draft 2011 Bioenergy Action Plan (2011 Plan)[1]. The Working Group has also asked for comment on the Actions[2] committed to by the Air Resources Board, Energy Commission, Environmental Protection Agency, Natural Resources Agency, Public Utilities Commission, Water Resources Control Board, and Departments of Food and Agriculture, Forestry and Fire Protection, and Resources Recycling and Recovery.

The 2011 Plan identifies actions that state agencies will be taking to implement Executive Order S-06-06, committing California to generating 20 percent of the state's renewable energy from biopower (biomass to electricity) by 2010 and 2020, and producing 20 percent of its biofuels (biomass-based transportation fuels) within the state by 2010, 40 percent by 2020, and 75 percent by 2050. As summarized by CEC staff during the December 14, 2010 workshop[3], California is woefully behind on accomplishing this mandate. The 2011 Plan therefore is intended to dramatically alter this trend. The Working Group will consider all comments and is expected to finalize the 2011 Plan early next year.

General Comments

1. There is a prevailing confusion regarding the use of terms "biomass", "bioenergy" and "biofuels" that needs to be discussed very early in the 2011 Plan. For example, when presenting background for "biofuels", only *liquid* biofuels are considered, while without the production of *solid* biofuels, our large-scale *bioenergy* industry would not exist. This omission is reflected in the general lack of Working Group consideration of the requisite aggregation infrastructure necessary to stabilize the *biopower* supply chain.

[1] Staff Draft Report, 2011 Bioenergy Action Plan. December 2010. CEC-300-2010-012-SD. See: http://www.energy.ca.gov/2010publications/CEC-300-2010-012/CEC-300-2010-012-SD.PDF
[2] Preparation of the 2011 Bioenergy Action Plan, Appendix A: List of Actions by State Agency. See: http://www.energy.ca.gov/bioenergy_action_plan/notices/2010-12-14_Appendix_A.pdf

2. Bioenergy generation, whether expressed as production of electricity, heat, or solid, liquid or gaseous fuel, requires that a series of events progress methodically from source to product. The least explored concept within the 2011 Plan is exactly what is missing in our overall bioenergy industrial sector: an effective, flexible and resilient supply infrastructure. It was this solid-fuel biomass feedstock supply chain that collapsed following 1996 changes to bioenergy contract terms and led to the closure of so many facilities, and it remains the lack of a resilient supply that is most crippling to procurement of risk-based financing, for existing plant maintenance and new plant development.
3. The absence of historical retrospection, one from which we might all learn from mistakes made, hampers the prospective necessary for our state's bioenergy planning. There is no lack of critical assessment, only an apparent reluctance to publicly identify in the actions of our agencies and our industrial sector, crucial past failures and short-comings. The most telling example is seen in this lack of supply chain infrastructure investment, in the idea that if we "*build it* (a regional biopower plant), *they will come* (with zero-dollar fuel)".

Specific Comments
Our specific comments are intended to provide examples of implementation steps, recommending one or more functional tasks that directly act upon the defined objectives. Our recommendations are not expected to be either exhaustive or highly prioritized; instead, we hope to emphasize the relationship between the conceptual planning element, and the necessity to act.

4. Chapter 2, page 8, par. 3, line 1: Differentiate between types of "biofuel". This section describes only *liquid* biofuel production. Solid and Gaseous biofuels need brief description and quantification by type and source, with that brief introduction referenced to a later chapter expansion of detail. If we are indeed to broaden the overall systems-approach consideration of *supply chain*, it is critical that elements of that infrastructure be properly introduced in context.
5. Chapter 2, page 13-14: It would be helpful here to explain the current relevant permitting processes, beyond this reference to the multi-agency support for anaerobic digestion. Brief statements regarding status of the permitting process for other types of bioenergy / biopower facilities could then lead into more thorough examination, later in the Plan.
6. Chapter 3, Objectives of the 2011 Bioenergy Action Plan, Page 15:

   It would be useful if the subtending sections were both numbered and subtitled according to the five stated objectives. Please note that Objective 4, "Commercialize Next Generation Conversion Technologies", is not the same as the section title on page 22, which is entitled "Fund Research and Development".
7. Chapter 3, Objective 1 - Increase Bioenergy Production at Existing Facilities, Pages 15-18:

   Given the current and impending state and federal regulations relevant to conversion of waste and biomass into heat, power, fuels and other commodities, this section needs to be expanded to include repowering, co-firing and fuel switching *at our existing biopower facilities*, as with coal-fired plants, for reasons discussed below.

   a. Direct combustion of biomass can be augmented with more advanced conversion, via thermal, microbial and/or physio-kinetic conversion technologies. Should regulations constrain direct-combustion biopower facilities to use of strict biomass only, to the exclusion of waste-sourced and classified biomass, addition of ancillary non-combustion conversion equipment could provide a path to ensure existing plants

remain active and idle plants find sufficient feedstock economy and diversity to re-start. An aggressive public-private technical and economic assessment of this multi-technologic repowering potential, in advance of a federal mandate, is advisable.

b. Idle biopower facility retro-fitting and repowering analyses need to include sensitivity to the increased need for emissions controls. Emissions management from older direct-fired plants requires an order of magnitude greater volumetric control than would same-generation rated non-combustion conversion. To the extent that emissions control equipment scale impacts cost, non-combustion Best Available Control technology for emissions costs less, per unit of energy generated.

c. Federal rulemakings impacting biopower are focused on increased control over direct-combustion-based waste-to-energy, but encourage non-combustion thermal processing. Concurrently, the definition of what constitutes "waste" or "biomass" is proceeding toward a position of no de minimis, such that direct combustion of any amount of feedstock legally categorized as "waste" could change a biopower plant's legal characterization to "waste incinerator", and initiate substantially increased assessment, oversight and enforcement.

d. Analysis and re-development of a feedstock supply chain must be considered, if indeed it the Working Group's number one Objective to maintain and expand existing facilities. No new facility will be "bankable" now without proof of a diverse and resilient feedstock supply. The same should be considered critical for our existing plants. On a per-facility basis, assessment of existing technical and actual feedstock availability is needed. From this, the relative cost and design of infrastructure investment should be considered a crucial element in estimation of and implementation support for societal, environmental and economic costs and benefits associated with this first Objective.

8. Chapter 3, Objective 2 - Construct New Bioenergy Facilities, Pages 18-20:

The section is an excellent if overly-brief review of biomass availability according to work of the California Biomass Collaborative (CBC), which has effectively produced a California biomass baseline current to 2007-2008.

a. The comment is made that further site-specific assessment will always be needed; what needs to be noted in the 2011 Plan is how this baseline work can be continually updated and improved upon. Considerable agency-sourced financial support is both needed and warranted. Beyond this, the use of the baseline needs to be explored and advertised, engaging both existing project owner/operators as well as anyone seriously considering bioenergy development. Such a sponsored pre-feasibility service would dramatically lower cost and risk for parties considering development of new facilities.

b. Bioenergy generation must consider (a) feedstock, (b) conversion mechanism(s), (c) site constraints, and (d) regulatory oversight. Each type of feedstock must be matched with specific technical conversion capacity, at an acceptable location and within the bonds of permissibility. Each of these elements deserves discussion in context of constructing new bioenergy facilities.

c. Not all biomass is created equal: when considering sources from urban waste streams in particular, the legal definition usually differs from the colloquial. What may scientifically be described as a form of "biomass" is legally constrained by categorization as a "waste". Such definitions are subject to interpretation and to legal challenge, as well as to revision of the underlying laws. Thus the quantification of technically and economically accessible biomass in California, as presented, confuses

what may be utilized as a fuel for direct combustion (as in our existing facilities) from what is appropriate for non-combustive thermal, microbial and/or physio-kinetic conversion. Parsing the quantities and types of biomass presented in the CBC baseline in a matrix assigning appropriate and permissible types of conversion technologies would provide a logical and useful tool. Dedicating long-term state support for on-going data collection, analysis and refinement would provide a data standardization mechanism for all bioenergy development in our state.

9. Chapter 3, Objective 3 - Develop Integrated Biorefinery Facilities, Pages 20-22:

   a. "Integrated Biorefinery" development must start with the feedstock supply chain. The requirements and characteristics of this requisite infrastructure development differ strongly between urban, forest and agricultural sources. "Biorefining" should be conceived as the entire process, with acquisition from multiple sources, movement through a complex of multi-technology process trains, into a varied and redundant distribution network, for ultimate delivery to end-users. Integration of only the specific *equipment* in a particular processing configuration is too narrow a focus, especially when considering state-wide planning.

   b. Water quality should be added to the list of potential synergies. Water quality is at least as important as an economic incentive for California as are energy and fuels. The technique of phyto-remediation is federally approved as a compliance mechanism in water basin strategic planning, particularly where contamination is high in agriculturally-sourced nitrogen and salts. Integrating soil and near-surface groundwater remediation with biocrop production using "hyper-accumulators[4]" could increase the environmental benefit, and broadly reduce economic cost and risk for both agriculture and bioenergy. Exporting that biocrop for conversion would effectively concentrate and control the contaminants. The closed-loop economic synergies should substantially ease both the burden of remediation and the cost of feedstock.

   c. Just as selection of the type of conversion technology for biorefining must suit the feedstock, the location, and the permissibility, the *scale* of that technology is also critical to integrated biorefinery process planning and implementation. The 2011 Plan would benefit from consideration of a multi-step acquisition, aggregation, pre-processing and transport model as is common to each of the major industrial sectors, forest, agriculture and urban waste management. The current model for bioenergy assumes a central, single plant configuration, while industrial integration demands a staged movement from raw materials to finished product. Community-scaled bioenergy installations can be cleanly and efficaciously incorporated in a staged progression of feedstock to a regional facility.

   d. This "biorefinery supply chain" hub-and-spoke model reflects the common waste management infrastructure to a degree, where rural Transfer Stations act as collection points for movement of waste toward more regional waste management facilities. Indeed, existing Cal Recycle-permitted Transfer Stations are often well positioned for expansion to include Chip/Grind operations, incorporating non-waste biomass collection and pre-processing prior to transfer. A thorough assessment of potential acquisition hubs ("wood lots") that considered existing and possible waste-related Transfer, Chip & Grind facilities could help in establishing the needed network.

[4] Fast growing biomass that excels at extracting and bio-accumulating nitrogen, salts and other contaminants.

e. Finally, it is reasonable to examine the potential of associating community scale Conversion Technologies with these rural acquisition and pre-processing hubs. A combined heating, cooling and power generation (CCHP) installation could convert a fraction of the locally aggregated biomass feedstock, off-setting local energy costs, with the savings used to maintain the acquisition and processing hub on a long-term, year-round basis. Excess biomass would then be consistently available for transport further along the supply chain.

10. Chapter 3, Objective 4 - Fund Research and Development, Page 22:

Please note that the title given this section does not correspond to Objective 4, stated as "Commercialize Next-Generation Conversion Facilities". The Objective, however named, remains to facilitate application of advanced technology for bioenergy development and should be consistent throughout the 2011 Plan.

a. The single most critical barrier to advanced waste and biomass conversion technology acceptance, funding and implementation is the lack of support for and access to standardized, accredited external efficacy validation. There must be a mechanism where technologies may be demonstrated and tested under the auspices of expert third-party data vetting. A federal program of this nature exists, although it is currently under-utilized for Conversion Technology assessment.

The Environmental Protection Agency maintains Environmental Technology Verification (EPA ETV) Centers, with six areas of focus: Advanced Monitoring Systems (AMS), Air Pollution Control Technology (APC), Drinking Water Systems (DWS), Greenhouse Gas Technology (GGT), Materials Management and Remediation (MMR), and Water Quality Protection (WQP). A cross-cutting program, Environmental and Sustainable Technology Evaluations (ESTE), assesses urgent measures and multi-disciplinary challenges. Of the six centers, the MMR center's mandate is most aligned with Conversion Technology vetting.[5]

b. There has been Congressional interest in locating a Western Regional MMR facility here in the Sacramento region, potentially to be sited within the McClellan Industrial Park.[6] The Park already operates the US Army's Renewable Energy Testing Center RETC), managed on contract by Technikon. An EPA ETV MMR facility would complement, rather than duplicate, the RETC's activities.[7]

c. The Department of Energy, Energy Efficiency & Renewable Energy program (EERE has established Regional Industrial Application Centers (RACs) throughout the states, initially focused upon advancing combined cooling, heating and power (CCHP). The program broadened, resulting in numerous Clean Energy Application Centers. RACs remain dedicated to assessment of potential projects, especially Industrial Assessments seeking energy efficiency modification opportunities. Two collaborative centers are located in California, associated with University of California campuses at Irvine and Berkeley, both provide a coordinated albeit academic approach to CCHP

[5] Materials Management and Remediation Center, Florida facility overseen by EPA and managed under contract by Battelle; Teri Richardson, EPA Project Officer. See http://www.epa.gov/nrmrl/std/etv/center-mmr.html

[6] Discussions with energy staff in the offices of Congresswoman Matsui and Congressman Dan Lungren, April 2010. Briefing packet provided to Congressional offices, available upon request.

[7] US Army Renewable Energy Testing Center (RETC); see http://www.wix.com/technikonretc/retc_us

development.[8] It is worth noting that other RACs have become strong supporters for alternative and renewable energy / distributed generation; the Gulf Coast Clean Energy Center[9] has developed a program of regional leadership that might prove a useful expansion of California's own Centers. There would be strong synergies to be explored between a potential Western Regional ETV MMR program, and our existing DOE Clean Energy Centers.

11. Chapter 3, Objective 5: Remove Statutory and Regulatory Hurdles, Page 23:

    We agree with the observation regarding amendment to existing regulation. Discussions with legislative staff during development of AB 1090, a bill attempting to accomplish this goal with respect to Conversion Technologies, identified a legal mechanism that may provide an alternative approach: a "Point of Law" challenge may be lodged with legislative counsel where an element of a new law conflicts with an element of existing law.

    Much of the confusion attendant to eligibility certification for waste-sourced energy would be remedied, if the prescriptive criteria in our Public Resources Code were to refer to existing code that already controls air and water quality, production of hazardous waste, and standards for recycling versus disposal.

12. Chapter 4, Siting, Permitting and State Policy Challenges, Pages 25-26:

    a. One problem worth noting is that the current Best Available Control Technology (BACT) and Lowest Achievable Emissions Rate (LAER) programs actually are disincentives to technologic innovation: whenever a facility developer improves upon the existing standard, the compliance "bar" is reset. This is prescriptive, rather than performance based. Design and development of emissions controls should be held to a stabile, analysis-supported level rather than intentionally establish a mandatory policy of "one-ups-manship".

    b. A second concern involves the existing Air District policy whereby air quality control based upon site-specific characterization versus regional, basin-wide conditions. This "silo" permitting approach problem is identified briefly in the Plan on page 29, second bullet, but needs further case-specific assessment.

       The EPA promotes a policy of "incremental mitigation"[10], whereby older, dirtier methods and systems are displaced by installation of newer, cleaner technologies.

       Unfortunately, in the case of dioxins and similar toxic congeners, no state air quality background level assessment has been completed, and thus there is no quantification of basin-wide balance in emissions production. This leaves Districts to assess only on-site conditions at the social, environmental and economic expense of missed opportunities for such methodical, basin-wide systems upgrading. This is particularly pertinent to multi-site adoption of Conversion Technologies for diversion of waste from landfilling.

       One approach that shows promise is broader use of the Strategic Air Basin Plan, an environmental assessment and planning tool similar to a programmatic environmental

[8] UC Irvine and Berkeley collectively manage the Pacific Clean Energy Center, see www.pacificcleanenergy.org.
[9] Gulf Coast Clean Energy Center, see www.gulfcoastcleanenergy.org.
[10] EPA discussions of control of dioxin production, see http://cfpub.epa.gov/ncea/CFM/nceaQFind.cfm?keyword=Dioxin

impact report (PEIR) under the California Environmental Quality Act (CEQA). Such a plan could establish technology "trade-offs", documenting and in some way accrediting replacement and upgrading.

13. Chapter 4, Siting, Permitting and State Policy Challenges, Page 27:

    Please provide a reference for access to Governor Schwarzenegger's letter to the EPA.

14. Chapter 4, Siting, Permitting and State Policy Challenges, Page 30:

    a. A regulatory policy entitled "Cessation of Waste" in New York can perhaps provide a model for California, which defines what is required to remove a resource from legal standing as a "waste".[11] A material sourced from waste is considered no longer a waste, when petitioned to the state agency of purview and approved in writing upon a tested basis for a beneficial use.

15. Chapter 4, Sustainable Feedstock Sourcing and Transportation, Pages 33-36:

    This is a well-developed section with sufficient detail to focus beyond generalities. A few minor points may be made:

    a. Agricultural products can be transported in "trains" of container, often six or more units towed by a vehicle, over rural roads. Such multi-container transport is prohibited for forest products, although this could provide one ready solution to low-impact removal of biomass from timber landings to aggregation hubs. Pilot cars may be necessary, but the prohibition should be removed.

    b. Use of "Integrated Analysis Models" for supply chain assessment would be an appropriate step for consideration of multi-facility, multi-staged hub-and-spoke infrastructure as well, where aggregation hubs are linked to rural community scale bioenergy-CCHP installations (see comment 9.e, above).

16. Chapter 4, Economics and Financing, Pages 36-38:

    a. The entire annual feedstock demand need not be under long-term (10 year minimum) contract, for a bioenergy project to be bankable. Following commodities trading practices for ethanol facilities, and other supply-demand manufacturing operations, financiers may be able to accept a supply assurance ratio of 60% long-term contract, 20% mid-term contract (3 to 5 year term) with the remaining 2% left to short-term and spot market. Spot-market biomass availability and pricing are highly volatile, following overlapping and unrelated cycles of agricultural / silvicultural harvest and maintenance. Contracting well in advance (2 to 3 years) for feedstock from the removal of an orchard, for example, can move normally "spot-market" materials into the mid-term category and help stabilize economics. Long-term contracts are at a premium when compared to mid-term feedstock pricing, yet risk-reduction value to a facility can off-set slightly higher asking price for put-or-pay, 10-year-minimum supply contracts.

    b. Investment in feedstock supply chain infrastructure, as discussed in comments above, should be considered when financing new facilities or even re-investing in existing biopower plants. Because contracts for long-term supply are at a premium, there should be a slight margin available on the pro forma of a regional facility, to create a reliable supply chain.

[11] New York State Department of Environmental Conservation. NYSDEC Sub-part 360-1.15 BENEFICIAL USE, (b) Solid waste cessation.

c. In one (proprietary) feasibility assessment of a potential regional biorefinery being considered for northern California, capital development cost approached $250 million. Banking interests agreed that 10-15% of this cost, from $25 to $37 million, could be dedicated for establishment of ancillary acquisition and pre-processing hubs, each associated with a local CCHP installation. The rationale was predicated on provision of low-risk, long-term feedstock supply. The model indicated that 12 to 24 hubs could thus be developed surrounding the regional site, each scaled to use a fraction of the local feedstock while at least partially supporting year-round acquisition and pre-processing. This number accounted for periodic cycling of feedstock availability at any one hub, ensuring the minimum (60%) long-term supply to the regional center at an acceptable level of risk.

17. Chapter 4, Funding for Research and Development, Pages 38-41:

a. The industrial funding granted for advanced biofuels work by British Petroleum to University of California Berkeley should be noted and briefly described. Industrial support, especially from the petroleum industry, is a substantial if controversial source of next generation conversion technology funding.

b. The EPA ETV program, noted in comment 10.a. above, supports advancement of technology through two parallel programs. Each ETV Center issues solicitations for specific technologies to be chosen for testing, demonstration and verification within their respective Center's area of focus, while the ESTE program more aggressively addresses multi-technologic and cross-cutting issues. In both cases, industrial developers find limited financial commitment associated with their participation.

c. Each or our nation's National Laboratories have dedicated programs pertinent to advanced conversion technology research and development, and each tends to have its own specialization. Pacific Northwest National Laboratory[12] has a very active public/private partnership program assessing pyrolysis for production of bio-char and bio-oil; Oakridge National Laboratory's[13] financial modeling work with BioCost and RETScreen programs, providing modular cost assessment tools that standardize pre-feasibility project development and reduce development risk and cost.

A closer relationship between California agencies and federal laboratories could help direct federal efforts toward support of state Objectives. The relationship of federal laboratory R&D to provision of funding for meeting California's bioenergy and biofuels development deserves discussion in this section.

18. Chapter 4, Statutory and Regulatory Issues, Pages 41-43:

a. Reauthorization of the Renewable Energy Program should encompass far more than production incentives for solid-fuel biomass, and solar installation. Needs for production incentives extend to all sectors of renewable energy generation.

b. Comparison to petroleum-based fuel production, for purposes of "leveling the field" of competition, would show that much of the support provided that industrial sector is in the form of externalization; many critical infrastructure concerns that would raise the cost of petroleum-based fuels to the public remain sequestered in support mechanisms outside of the balance sheets. The analogy for bioenergy development would be that

[12] Pacific Northwest National Laboratory, Fundamental and Computational Sciences Directorate. See http://www.pnl.gov/science/highlights/highlight.asp?id=806.
[13] Oak Ridge National Laboratory, Bioenergy Program. See: http://www.ornl.gov/sci/bioenergy/

the requisite feedstock supply and delivery mechanisms should be supported broadly by society, rather than show as a direct cost to Bioenergy. This is the essence of "zero cost fuel", long the mantra for our existing biopower industrial sector.

c. The statement is made (page 41, par. 3) that, *"…existing biomass cannot compete effectively with other renewables because, unlike other renewables, biomass facilities must procure their fuel and transport it to the facility*." First, it could be said that *geothermal renewable energy* has to procure its fuel; thermal conditions certainly are not available on the land surface where the plant is to be located, but must be "procured" at depth. But for Biomass, perhaps en lieu of production incentives, there is a stronger need for supply chain infrastructure support. Investment in community scale acquisition and pre-processing "wood-lot" hubs, such that those operations can be maintained on an on-going, multi-year basis rather than their historic 'boom-and-bust" operation, may be a better use of state funds.

d. The Public Interest Energy Research (PIER) program has repeatedly proven high value to California as a functional mechanism for needed support. The process for submission could be streamlined and the application requirements standardized, perhaps lowering administrative costs. PIER should be reauthorized.

e. Municipal Solid Waste (MSW) to Renewable Electricity: The first sentence exemplified the confusion inherent in this topic. Simply being *renewable* does not equate to being composed solely of *biomass*. The Working Group needs to agree upon a clear statement of terms and inclusion of that Glossary would be appropriate at this point, defining the current understanding of what can be considered as "renewable". In so doing, underlying conflicts might be highlighted and better resolved, such as the question of de minimis: how much of a feedstock, statistically, must be composed strictly of non-fossil sourced material, to be considered a "renewable feedstock"? We may not have answered this question, but it should as a minimum, be restated with clearly defined terms.

f. For MSW conversion to Renewable Energy, the legal debate has served a vocal opposition with two key arguments: (1) insufficient third-party verified data of efficacy, and (2) "waste" is to be avoided, not "enshrined as a renewable resource".[14] The first issue, need for externally verified test data, is well recognized in the 2011 Plan and in our comments, above. The Sierra Club crystallized this demand: "…During the three-plus years that the issue has been debated in the legislature, our mantra has been "show us the emissions data." Without credible verifiable real-world data on the effects on our air and water, we can not support any policies that would favor or subsidize such plants."[15]

   The second point expresses a near-religious societal opinion, one that isn't easily dismissed and thus should be directly addressed.

   Kinetic separation of mixed municipal solid waste is the business of Materials Recovery Facilities (MRFs), and is a critical step in integrated waste management. California's

[14] Sierra Club Goals, Zero Waste. See http://www.sierraclub.org/committees/zerowaste/garbage/.
[15] Sierra Club, California; San Francisco Bay Chapter. "The New Alchemy of Garbage". Bill Magavern, 2005. See: http://sanfranciscobay.sierraclub.org/yodeler/html/2005/11/feature7.htm

promulgation of the 1989 Integrated Waste Management Act[16] instituted a regulatory mandate for percentage recovery of recyclable materials from that mixed flow, and for diversion for disposal.

MRFs operate within this mandate, but on a notoriously narrow economic margin. Operational decisions determine what is removed from the waste stream according to daily recovered commodities prices: Cardboard sells well today, so more resources are dedicated to removal of cardboard from the conveyors. Woody biomass segregated from construction and demolition debris (C&D) remains acceptable for sale as "hog fuel" at our Biopower facilities, and thus often constitutes a large percentage of the recycling accounted for by the MRF to the municipality and the State. But Recycling as a societal mandate is not free, or even inexpensive to accomplish, and diversion above 50% recovery will require both adherence to a more stringent diversion mandate, and an increased monetization of the service to maintain acceptable return on the industrial and municipal resources expended. In a tight economy, the EPA has recognized that lower prices received for recyclables recovered results in greater disposal[17] [18], although the common accounting methods do not easily reveal this premise. In reality, the more closely we observe the current practice of separating waste-sourced materials for oversees shipment as "Recycling", the less it seems justified. If we can't prove the method of Recovery is less environmentally damaging than simple destruction plus new acquisition, there is no net gain.

The state-wide need for conversion of this 50% post-recycling residual into commodities beneficially diverted from disposal, whether energy, fuels, raw materials or foundation chemicals, has become a strong force driving advanced technology commercialization and project development. Examples have been discussed in the 2011 Plan, including the efforts of Los Angeles County.[19] Separation of the "biogenic fraction" from this heterogeneous, contaminant-laden residual appears to satisfy both the societal and regulatory demand, yet such separation is a matter of degree: how "clean" is clean enough? This leads us back to de minimis, as discussed in comments 7.c and 18.f, above. It also focuses on our technical ability to perform such separation, and the cost of those methods. De minimis and technical efficacy vs cost are two appropriate tasks for agency-supported assessment.

19. Chapter 5, A Bioenergy Action Plan for California, 1. Actions Addressing Siting, Permitting and Regulation:

    a. In 1997, the California Environmental Protection Agency (Cal/EPA) established the California Government Online to Desktops (CalGOLD) Website to assist in providing businesses the information they need to comply with environmental and other regulatory and permitting requirements. CalGOLD offers direct Internet links and

[16] AB 939: Integrated Waste Management Act (Sher) of 1989. For Cal Recycle synopses, see http://www.calrecycle.ca.gov/Laws/Legislation/calhist/1985to1989.htm and http://www.calrecycle.ca.gov/Archive/21stCentury/Events/FutureMar99/issues1.htm

[17] Personal dialogue, April 2010. Jesse Miller, Solid Waste and Energy Recovery & Waste Disposal Branch, Materials Recovery & Waste Management Division, Office of Resource Conservation & Recovery, US Environmental Protection Agency.

[18] Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2008. United States Environmental Protection Agency, Solid Waste and Emergency Response (5306P). Washington, DC EPA-530-F-009-021, November 2009. http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2008rpt.pdf

[19] See www.socalconversion.org

contact information to state, local, regional, and federal permitting authorities for more information.[20]

b. As with AB 1318 Wildfire Emissions Offset Credits, the 2011 Plan could direct agencies to explore Waste Management Emissions Offset Credits, crediting specific waste management alternatives that show a long-term, measurable reduction in emissions per unit of waste compared to existing management methods.

20. Chapter 5.2. Actions Addressing Sustainable Feedstock Challenges, Pages 46-50:

a. It is important to recognize that California biomass project developers may have international sustainability responsibilities, despite our country's position on the Kyoto Accord. Internationally-recognized sustainability certification will have value beyond our local economy and can act as a draw for international investment. Similarly, international corporations with facilities in California may consider biomass-driven repowering. This is of particular interest to manufacturing and processing facilities with high demand for both heat and power.

b. Increase Use of Forest Biomass – local air districts have used enforcement of the Uniform Fire Code, coupled with state and federal funding and multi-agency cooperation, to develop chipping programs n the Wildland-Urban Interface (WUI). A general absence of local "wood lots" as aggregation and pre-processing areas hampers use of the collected biomass for biopower, and materials are more frequently spread as mulch.

c. Increase Energy Production form Urban Derived Biomass – See discussion in comment 18.f: "urban derived biomass separated from municipal solid waste" is a question of de minimis. How clean must the biomass fraction be, and how clean *can* it become, after being mixed with MSW? Agencies need to determine whether a percentage biomass in mixed waste will equate to a percentage "renewable" when used as fuel or if a strict de minimis must be certified.

21. Chapter 5.3. Actions Addressing Economics and Financing Challenges, Pages 50-52:

a. Subsection 5.3.1. Ensure Continued Operation of Existing Biomass Facilities After Contract Expiration – Modeling analysis of feedstock availability and transport heuristics, surrounding each location in the network of existing biopower facilities, may indicate unused or at least under-utilized sources of acceptable feedstock. This assessment should take into account the need for direct investment in and development of a reliable long-term supply chain with strategically located aggregation, pre-processing, storage and handling hubs. Such modeling is being developed by the California Biomass Collaborative at this time, based on biomass baseline data. See discussion, comments 15 and 16, above.

b. Subsections 5.3.4. Funding for Integrated Biorefineries, and 3.5. Funding for Advanced Biofuels and Renewable Energy Facilities – See comment 9 above, as this asks for reconsideration of what constitutes a biorefinery, and suggests again that the provision of reliable long-term supply chain infrastructure may be the most critical investment.

[20] State of California, Governor's Office of Economic Development. See http://www.calgold.ca.gov/faqs.htm

22. Chapter 5.5. Actions Addressing Legislation and Statutory Challenges, Pages 53-55:

    In general, see Comment 18 above, regarding reauthorization of Energy Commission programs.

    a. Subsection 5.5.3. Support for Legislative Changes to the Statutory Definition of MSW Conversion – See Comment 11 above regarding pursuit of Point of Law challenges to the stipulated conversion technology criteria now in the Public Resources Code. It is patently unreasonable to disallow a legal activity already encompassed by standing statute, to establish an arbitrary industrial sector control. Of course a manufacturing facility is permitted to generate a hazardous waste, or emit air pollutants, or discharge wastewater; that facility must adhere to the same existing series of stringent laws as any other manufacturing facility.

    b. See also Comment 14, regarding need for legislation to define Cessation of Waste, that amount of processing required to remove the onus of "waste" as a legal standing, from materials recovered from the waste stream for beneficial uses.

23. Chapter 6. Recommendations for Additional State Actions (Appendix A): The following comments represent Actions not listed in Appendix, or are refinements to listed Actions. Suggestions are made regarding lead agencies.

    a. **Glossary of key terms**: Where legal definitions are available, these should be provided; where more than one interpretation is common among the agencies, each should be given. Concepts associated with key terms need reconsideration: for example, production of "Biofuel" is first and foremost the acquisition and management of solid biomass from source acquisition through pre-processing to biorefining, especially if securing our existing BioPower facilities is our first objective.

       CEC - Lead Agency; circulate to all other Working Group members.

    b. **Supply Chain Infrastructure**: Our comments offer numerous areas where discussion of supply chain infrastructure would be appropriate, considerably more often than is evident in the 2011 Plan. Repeated reference is made in the Plan to the importance of feedstock, yet planned analyses usually do not include this component. All elements should be revisited to consistently explore importance of acquisition, pre-processing, and feedstock movement from forest, agricultural and urban sources.

       CalRecycle – Lead Agency for Urban source supply chain; CDFA - lead for Agricultural infrastructure; CalFire – lead for Forest and wildland/urban interface (WUI) supply chain development, in three concurrent and coordinated assessments.

    c. **Lessons Learned**: An historical examination should be developed of the near-complete collapse of our Biopower industry following changes to the Public Utility Regulatory Policies Act, starting with the issuance of the Blue Book in September 1996. The National Renewable Energy Laboratory released a detailed review of these changes, in 1997.[21] The Forest Service was assessing the potential negative impact on rural "chip market" feedstock source communities, during the summer before the

[21] Electric Utility Restructuring and the California Biomass Electricity Industry. Ralph Overend, 1997. National renewable Energy Laboratory, NRELk3R-430-22766 UC Category 600 DE97000252. See http://www.osti.gov/bridge/purl.cover.jsp;jsessionid=2E03637D2BC39632FB21F590D0B28FAA?purl=/481486-scE2E4/webviewable/

collapse, and anticipated the shrinkage in distance of economical transport that severed the supply chain and stranded more distant feedstock sources.

CalFire – Lead Agency, coordinating with US Forest Service and supported by CEC and CPUC data, supported by Cal Biomass Collaborative analyses.

d. **Permit Web Portal:** An interactive, hyper-linked coordinated and maintained overview of all relevant permitting is an excellent idea, but one that carries a large data management burden. Comments above have noted that the Governor's Office site CalGold, which although the right idea, is unfortunately not well-maintained. Linking the detailed biomass data tracking developed by the Cal Biomass Collaborative to an updated CalGold portal would increase the utility of both tools.

   CalEPA – Lead Agency supported by CEC and functionally maintained by California Biomass Collaborative.

e. **BioPower Co-Firing, Fuel Switching and Multi-technology Retrofitting**: What is considered high-priority for Coal-fired power plants should be assessed for our existing direct-combustion BioPower facilities, particularly given the trend of federal restrictions on direct combustion of feedstock redefined as "waste". Technical solutions are available; multiple-option economics, alternative feedstock source testing and state-federal permissibility sensitivity should be directly addressed by state agency analysis to meet Objective 1, ensuring longevity for our existing BioPower industry.

   CEC – Lead Agency, supported by ARB in public-private partnership with BioPower Industrial sector.

f. **New Bioenergy Facilities:** Expand upon Biomass Availability Baseline developed by California Biomass Collaborative, developing methods for constant updates in each source sector, Urban, Agriculture, and Forest.

   Establish education and outreach, whereby existing bioenergy facility owner/operators and prospective new facility developers actively work with and improve upon the data. Link this work to the Web Portal concept noted above.

   Consider that development of "bioenergy" is a multi-step process, and consistently address the entire infrastructure rather than sole facilities.

   Using data of the CBC Biomass Baseline, methodically start analyzing and documenting potential feedstock constituents to provide a basis for future source testing. Expand data in baseline to reflect both availability and composition, per feedstock type.

   CEC – Lead Agency, directing and supporting CBC work, coordinated with state-funded lab work.

g. **Integrated Biorefinery Development**: Revisit concept to reflect entire supply chain as one "biorefining" infrastructure. Investigate feasibility and economics of multi-stage, multi-technologic approach to supply chain infrastructure development. Spur investment as an element of broader biopower and biorefinery implementation.

   CEC – Lead Agency; support of all others.

h. **R&D**: Establish federally-funded Environmental Technology Verification program, extending EPA's Materials Management and Remediation program to a Western Regional Center, but focused on Conversion Technologies. Coordinate with

Congressional representatives. Assess, then market our Sacramento Corridor as prime regional location.

Strengthen working relationships with each federal agency, including the Departments of Energy, Defense, and Commerce that can in some way assist in third-party validation of conversion technologies. Stress a pro-active, rather than reactive, stance regarding all federal mandates impacting bioenergy, biofuels, and advanced conversion for recovery.

Directly engage the breadth of our National Laboratories in the process of vetting necessary to satisfy the environmental community's call for verifiable Conversion Technology data. Use the ARB LCFS and DG certification program as a basis to certify efficacy of specific technologies for specific biomass and waste sourced feedstock conversion toward manufacture of specific products.

Broaden interaction with UC Irvine and UC Berkeley RACs; expand and direct to engage the Conversion Technology industrial sector and the potential locations for Conversion Facility integration as Industrial Assessment Centers following DOE success with the Gulf Coast Clean Energy Center and elsewhere.

Seek reauthorization of PIER and Renewable Energy programs, based on a reassessment of need and focus. Broaden REP to address all of renewables industry, not only BioPower and Solar. Utilize PIER structure to form closer coordination with federal agencies and labs to direct investigation of feedstock supply chain, and for Conversion Technology vetting.

CEC – Lead Agency, coordinating with all others.

i. **Regulations and Permitting**: Request that the California Attorney General, as the Working Group's counsel, review and opinion of Point of Law approach, whereby Conversion Technology criteria are amended to refer to existing statute rather than reframe otherwise legal activities as single-industry prohibitions.

   Continue interaction with federal rulemakings, but develop "Plan B" approach while there remains time to avoid another Biopower industrial collapse.

   Stress use of Programmatic Environmental Impact Reports and CEQA-equivalent regional actions by Air and Water control agencies using Life-cycle analysis approach to weigh "incremental mitigation" per EPA direction. Establish an environmental "credit" mechanism promoting replacement of older, dirtier technologies and methods with newer, cleaner management. This is especially pertinent to waste management, recycling, resource recovery and disposal.

   Seek to develop a "Cessation of Waste" regulatory stance, defining the amount of processing necessary to remove a material from waste status and recertify as a non-waste, when destined for recovery and beneficial reuse.

   Review state and national concept of "biogenic fraction", and establish a cohesive legal program for feedstock identification, analysis and certification.

   Cal EPA / Attorney General – Lead Agency, coordinating all others.

j. **Waste Management Hierarchy**: Follow European lead, and press for re-definition of California's Waste Management Hierarchy as: Reduce, Reuse, Recycle, Recover, Dispose. Recognize formally and legally that waste conversion for Recovery is a worthy and appropriate step between classic Recycling and end-of-use Disposal.

Differentiate between Recovery for energy generation (heating and cooling), and "molecular recovery" that allows reintroduction of foundation materials back into manufacturing process.

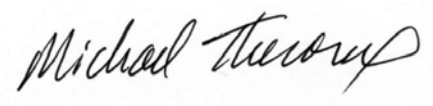
CalRecycle – Lead Agency closely coordinated with CEC.

24. Chapter 7. Implementation of the 2011 Bioenergy Action Plan, Pages 58-60: There is at this stage a need to engage industrial, institutional and association expertise, to inform agency actions and to result in functional bioenergy development. A Task Force approach with technical, fiscal, social and environmental subcommittees may be a useful model.

This completes our comments. We thank you for the opportunity to comment on the proposed 2011 Bioenergy Action Plan, and on the proposed actions by state agencies. We are available for further discussion should staff find this useful. Please call me at (530) 823-7300 or (530) 613-1712 (cell), if you have any questions.

Sincerely,

JDMT, Inc



Michael Theroux
Vice President

cc: Sarah Michael – CEC
Howard Levenson – Cal Recycle