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California Energy Commission
Dockets Unit
Attn: Docket No. 06-BAP-1 (the Bioenergy Action Plan)
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

17 March 2006

DOCKET
06-BAP-1
DATE MAR 17. 2006
RECD. MAR 17. 2006

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The California Energy Commission and Navigant are to be congratulated for gathering together a wide body of information and input in a short time.

General Comments:

Portions of the text seem unbalanced with respect to descriptions of the current biopower industry. For example, on page 3, it is stated that the industry is facing "looming regulatory uncertainty" yet there is no supporting information for the statement (it's alluded to throughout the document but never nailed down).

The dire condition of the current bioenergy industry is debatable (it may very well be as stated, but the case is not made). The current price for biopower is certainly too low to invite new capacity into the market, yet many of the existing facilities are old enough to have paid down much of their indebtedness (unless of course they were refinanced) implying that their costs are no longer in the 6-8 cents/kWh range (as is faced by a new facility). A more rigorous vetting of industry claims should occur before they are used to set state policy (will the industry open their books for review to make their case?).

The economic and environmental advantages of biomass are continually asserted (actually alluded to because source material is not cited), yet it is not clear if there are data that backs this up. Are environmental and economic impacts of biomass utilization net-positive?

There is a general lack of attribution in the text to the source information [documents and personal communication]. The executive summary indicates that NCI held discussions with representatives of state agencies, industry and other stakeholder groups yet there is no listing or reference to these conversations in the bibliography. Attribution adds credibility and gives the interested reader a specific person or document to look into further.

Pg. 36 'Tier 1 Recommendations' - 1 a. Broad Based RFS –

An RFS should include life-cycle greenhouse gas accounting for each fuel type and/or acknowledge and adjust for differing greenhouse gas (GHG) emissions that come from different feedstocks and processes used for biofuel production (e.g., cellulosic EtOH has much better GHG performance than corn EtOH, the same is true for some biodiesel source materials). Having appropriate life-cycle GHG accounting for the possible biofuels will add value to the lignocellulosic feedstocks and their product EtOH; and other feedstocks and processes that may otherwise be too expensive.

Alternatively, one could simply specify net CO2 emissions from transportation sector and let the market decide how this is accomplished.

Pg. 37 e. 2)

CEC should require monitoring of energy and environmental performance and document the economic performance of new biomass CHP installations at state facilities (to help with gathering reliable performance data for new or emerging systems).

Pg. 37 e. 3)

Outreach could included development of biomass and bioenergy curricula for primary, middle and high schools (as part of science, environment, biology, chemistry, physics, etc. curricula).

Pg. 38 g. Direct CIWMB to:

1) Because it's statutory, this will require legislature buy-in. Technology definitions should actually be eliminated and energy/fuels/products recovery from renewable MSW should be given a position in the waste hierarchy, (see EU waste policies where energy recovery, including 'incineration' are preferred over landfilling. Note that Europe classifies all thermal conversion systems as 'incineration' but because they have set strict environmental performance standards, rather than prescribed technologies, thermal conversion in Europe is a significant component of their strategies to reduce landfill disposal and GHGs generated from the practice).

2) Because the method used to determine diversion rate in California has large uncertainties and should be viewed with skepticism, the recommendation should be to **abandon 'diversion-focused' waste management** and implement a per capita disposal limit or limits and/or limit the amount of biodegradable material that can be landfilled (see EU landfill directive). Per-capita disposal in California has been static for 10 years despite perceived high diversion rates. The state has perhaps the best system in the country for tracking actual disposal, so a 'disposal based' management policy would be at least easier to measure.

Pg. 39 3. a. 1)

Excise taxes on non-renewable transportation fuels might be easier to sell if the benefits were devoted to transportation biofuel programs (rather than all bioenergy).

Tier Two Actions

Pg. 41 3. a.

What is really necessary for solid waste management in California is a **comprehensive LCA of the complete integrated solid waste system** in the State that includes emissions and impacts of recycling (including material shipped overseas for recycling and processing), compost impacts, conventional and bioreactor landfill impacts, alternatives to landfill, etc., etc. This could build on the limited work done about 2 yrs ago (the RTI study). The science and technology to conduct comprehensive LCA on solid waste management systems exists in Europe (to a lesser extent in the US) and is integral to their environmental and GHG policy decisions.
Policy makers are currently struggling with definitions, assumptions, and decisions that are nearing 20 years old (referring to AB 939). Legacy assumptions about 'highest and best use' may no longer be correct as solid waste disposal continues to grow and some landfill capacity in some regions is quite limited which means replacement options need to decided on in the near term.

Page 9 – 'The Benefits of Bioenergy and the Need for State Action'

(first paragraph) Not only do biofuels 'represent one of the only practical near-term renewable energy alternatives to petroleum fuels', **they are the only source for renewable <u>liquid</u> fuel alternatives.**

- *(4th bullet) Improving air quality by avoiding open field burning of agricultural and forestry wastes.*

  While open burning of some Forest waste is expected to continue, agricultural open burning is expected to be reduced significantly in the near term [Note that the ban on agricultural burning is used in an example on page 25]. Open burning of rice straw has been limited to < 25% of planted acres per year for some time (and only about 15% of planted acres are burned now for disease/pest reasons). In the San Joaquin Valley, agricultural open burning is nearly completely outlawed (Florez' SB 705, Statutes of 2003). Current rice straw burning is still an environmental issue because it typically takes place in a few weeks in the fall, rather than spread out during the year.

- *(7th bullet) Increasing landfill diversion by finding value-added uses for the nearly 30 million tons of biomass disposed of annually by Californians.*

  About 25 million wet tons (16 M dry tons) of biomass (including green ADC) was landfilled in 2004.

Page 11-Table 1.

Purpose grown energy crops are not 'Agricultural Residue' and should be listed separately. Please indicate that though there is potential for these in California, none are currently grown (for energy). [The text above the Table recognizes dedicated crops are not residues].

"Corn for EtOH, and soy beans for biodiesel" would be an energy crop (rather than a residue).

Also please note comments made by others at the workshop that soybeans are not well adapted to California growing conditions.

Page 13,1st paragraph.

Suggest changing 'broiler chickens' to **poultry** to include turkeys, and layers. Biosolids and **liquid digestate** from anaerobic manure digesters can be land-applied.

Page 18, Figure 5

Figure Title should be **'Biomass Conversion Options'** (or pathways). Biomass is being converted, not biofuel.
Also, the pathways are more appropriately named **Biochemical, Thermochemical and Physicochemical**, since they all involve physical chemistry in some component of the process

Pg. 19, 1st paragraph under 'Key Initiatives...'

Could you provide information on each of the "various California groups" that have biomass initiatives underway in the state or region (their composition, charter or goal, Links for further information, etc.)?

Pg. 21 'Landfill Diversion' bullet –

The waste disposal amounts and composition seem out of date or in error. 2004 CIWMB statistics show nearly 41 M wet tons MSW were disposed. In addition, 2.6 M wet tons of 'green-waste' alternative daily cover (ADC) were landfilled for a total of more than 43 M wet tons of MSW. With the green ADC included, biomass is about 60% of total disposal (wet basis). On a dry basis, biomass is about 16 M BDT in the MSW disposal stream (or about 48% of total stream, dry basis)

Development of these new industries will enable California not only to meet but substantially exceed its current 50 percent recycling goal while reducing pollution and fostering economic growth.

Because 'diversion credit' for conversion technologies (CTs) and equating CTs with 'traditional' recycling are controversial at best and perhaps even deal-killers, I suggest that the above sentence be written to something like: *Development of these new industries will enable California to reduce the flow of material to landfills on a per-capita basis* [total flow to landfills may continue to increase though because of population increase].

Page 26 Market Barriers / Cost of Harvesting ... (last paragraph) -

The discussion of lignocellulosic feedstocks for EtOH should include their GHG advantage over corn-based EtOH (and perhaps other starch or sugar crop based EtOH).

Page 28, Need for new technology (last paragraph.)

Should expand the list of named 'new technologies'.

Biomass gasification for power includes systems and prime movers other than the integrated gasifier/combined cycle (IGCC) which is alluded to in the report.

Besides IGCC, new biopower technologies for California will include systems using producer gas to fire boilers (perhaps for improved emissions) and reciprocating engines (improved efficiency and emissions). Large reciprocating engines (0.6 to 1 MWe) will likely be best choice for medium scale bio power facilities - say up to 5 MWe - as is occurring in Europe.

Also, steam systems that operate at higher pressures and temperatures. (perhaps using natural gas for the superheat section) can operate up to 40% efficiency (i.e., supercritical steam plants). Again, look to Europe to see examples with biomass.

Page 32, Reduce market risk to stimulate private investment (bullet) – last paragraph.

The state also needs to encourage in-state biofuel production because the economic, environmental, and social benefits of in-state production are potentially significant.

Should make the stronger statement that the state should use in-state resources (biomass) for in-state biofuel production (to the extent practical).

Page 33, Accelerate commercialization of leading technology prospects. (bullet) (2nd paragraph)

For biopower, this policy could include incentives for the repowering of existing facilities at an appropriate time.

Incentives for repowering if new or advanced systems are added rather than simple replacement (should not use public funds to replace a 22% efficient boiler with the same technology that may have only slightly improved performance).

Page 34, Biofuels Strategy –

The biofuels strategy should include investigations of dedicated lignocellulosic (and oil) crops and cropping systems that are specific to California (and/or investigate how to optimize to California soil and climate regions – including agronomic and water impacts).

Page 34, 'Improve access to biomass resources' –

A key objective of the Action Plan should be to increase diversion and use of suitable biomass materials from municipal waste streams to boost fuel supplies.

Similar to an earlier comment, the use of the word 'diversion' may be problematic. This last sentence on MSW will raise (perhaps strong) objection from the compost advocates and others. Suggest leaving out reference to diversion and simply state –

'A key objective is to reduce the landfilling of suitable biomass materials for composting and bioenergy production.