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California Energy Commission
Dockets Office, MS-4
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SUBJECT: Docket number 11-IEP-1A
California Clean Energy Future

We are pleased to provide comments on the California Clean Energy Future planning process for revision of the Overview, Implementation Plan and Roadmap as posted to the program website. We attended the workshop conducted by the California Energy Commission's Integrated Energy Policy Report (IEPR) Committee on July 6, 2011 jointly with the California Air Resources Board, California Environmental Protection Agency (CalEPA), California Independent System Operator Corporation, and California Public Utilities Commission, and offer comments.

California's prior governor established difficult "clean energy" goals that are outlined in the 2010 Clean Energy Future overview. Our agencies now find those goals have been re-defined to reflect Governor Brown's 2020 energy policy goals, as well as the recently enacted 33 percent renewable portfolio standard. The implementation policies and monitoring mechanisms must be "refreshed" as the agencies are accountable for attainment. The new roadmap toward a California Clean Energy Future will require new thought, quick action and aggressive pursuit.

According to the Workshop notice: "The agencies are looking for feedback on how to measure progress in meeting the policies identified in the California Clean Energy Future Overview document and on how to execute the policies and track progress in a transparent and effective way." Our comments are intended to aid in establishing a new conceptual framework for assessment, initiating a more realistic and flexible implementation, and better over-all monitoring of all aspects of that pursuit.

Comments on Revision of the Overview of California's Clean Energy Future

Public Process Access: Although the stated intent of the workshop organizing committee was to receive feedback, the format of that meeting precluded any serious public comment, opting instead for agency monologues and a series of lengthy dialogues between the dais and members of an invited panel. Late in the day, the floor was opened to general public comment, but by that time many of the agency representatives and most of the attending public had already left. The individual panel member's comments were certainly of value, but it is possible that comments from the floor might also have provided mission critical information.

Revision & Response Timing: This preview and revision is not formally a Rulemaking in the sense that timelines are informal, but the amount of written material to be reviewed is large

and the allotted public review period initially announced was far too short. We appreciate the extension for submission of comments until July 20, 2011.

Purview Representation: CalEPA Deputy Secretary Anthony Eggert offered the well-worn quote that "what you can't measure, you can't manage", as an introduction to the overview of the California Clean Energy Future, and to the topic of metrics assessment. Mr. Eggert asked that those attending consider if indeed the agencies were using the right metrics.

We might reply with a revision of the above quote, saying that *what you don't manage, you don't measure*. Although "siloing" is clearly recognized as a hazard of having so many agencies tasked with so many closely inter-related issues, at a minimum the Committee should have striven for inclusion of as many of those silos as were needed to represent the diversity of management regimes impinging on California's energy future, clean or otherwise.

Notably missing from the table were Resources Agency representatives; clearly, Clean Energy planning must include our state agencies with purview over Agriculture, Forestry, Water and Waste. A value-chain approach to energy monitoring and management logically takes into account the local, state and federal policy-driven regulatory framework that controls waste and biomass, water and geothermal resources. Energy-provision related benefits, barriers, challenges and inequities in these sectors must be considered to determine if there is a "level playing field" with other sources. If the development of California's Clean Energy Future does not take into account the *managers* of these resources, what they *count* will not be adequately considered.

All-Energy Approach: Renewable energy is only one part, and the minor component, of California's energy future. To realistically measure and manage "clean energy" it must be done in context of *all* energy, clean and "dirty".

As Chair Weisenmiller observed during the workshop, understanding and measuring California's use of coal for power is necessary if we wish to observe and encourage the *decline* of that usage. Governance is already in place for almost every feedstock source, and it is to a much more inclusive and supportive relationship with the agencies and associations already monitoring those sources that a new Clean Energy Future approach must appeal.

Organization of Metrics - The Value Chain Approach: Prior to asking agency staff to present on each of the proposed Metrics, the workshop was asked to consider if there might be another way to *organize* the process that accounts for progress toward stated energy goals in California. We would like to offer just such a conceptual re-organization.

A measurable outcome is expected from research, development, commercialization and governance, in terms of a "clean energy" supply for California. That quantifiable outcome, whatever it might be, is the result of the processes that make it available. A mix of types of clean energy is desired; market penetration and adoption of each type of energy must rely on the processes that culminated in that sector's availability. Energy must come from *somewhere*, must have been generated by the conversion of *something*.

Ms. Heather Raitt, Assistant Executive Director on Climate Change, presented four key areas wherein Metrics had been identified: (a) Demand, (b) Supply, (c) Transmission, and (d) a catch-all component, "additional supporting processes". We submit these are elements of a

value chain with varying degrees of efficacy and a broad array of inherent oversight mechanisms.

Demand is draw upon the end of a supply chain. Much of our governance over energy has been focused on modifying demand, through imposed restrictions and quotas to offering temporary incentives and policy preferences. Yet "demand" becomes less manageable, as an example, when we consider on-site generation and distributed combined heat and power. Who will measure and manage *this* element, using what combination of the metrics chosen? Demand is best understood as the result of all factors acting upon an Output. Without clearly accounting for the pathway leading to that output, it is probably unrealistic to expect effective management of Demand, as the controls occur all along that pathway, not simply at the end.

Supply as described in the program documents is too narrowly defined. In context of an end-to-end value proposition, *supply* must encompass everything from the origination of resources which eventually are converted to energy and not simply the last step of provision to the end-user. Here, we find total lack of representation of purview over those sources that contribute to so many "pathways": one obvious example would be the long-standing assessment of *biomass* as a renewable feedstock. Where is this accounting and management represented in the current Metrics consideration?

Transmission most aptly describes the paths of the products of the value chain from generation to end-user. Controls over *transmission* are naturally of high priority for agencies with specific purview over only the final pipe and wire infrastructure required for delivery of energy products. There is a hazard inherent in assigning too much weight to end-point controls. There is also a need to consider how implementation of "smart grids" and on-site generation will complicate our understanding of transmission.

Additional Supporting Processes as outlined in the Overview constitutes a mixed accumulation of physical systems and managerial methods. Rather, we might define a *Process* category as that combination of systems and methods present at any point along the value chain that effect conversion from one raw form of a resource into another more accessible and beneficial form. It appears that all other components currently assigned to this catch-all category might then be more appropriately considered as "modifiers" along the value chain.

A value chain modeling effort must identify and assign placement of each step from source to end-user. A number of basic rules apply, the first being *Check Your Precepts*. If statewide governance is intended to optimize management of the progress of clean energy adoption in California, then it is imperative that all elements be accounted for, not simply those usually measured by the agencies leading the accounting. Prior to judgments of value, a methodical enumeration of components is advised.

All-Energy Input-Process-Output Modeling: A value chain may be best understood when reduced to an *Input – Process – Output* model. This orders, or *organizes*, all components of and controls upon the progress to the diverse agreed-upon socio-economic outcomes, one goal of which is attaining a portfolio of 33% renewable energy by 2020.

Input to the energy value chain includes a broad range of feedstock types, some inherently containing more contaminants or environmental toxins than others. Yet it is not the *feedstock* that solely determines whether energy generated will be clean or dirty, it is the entire sum of acquisition, transport, processing, delivery and even specific pattern of *usage* that determines

socio-economic and environmental "friendliness". For example, high purity natural gas is still a public heath hazard in a poorly maintained energy conversion device. Old coal-fired energy generation is far dirtier than our newest "clean coal" technologies; "coal" as a feedstock type may be clean or dirty depending on the Process, and is worthy of consideration whether one is pre-disposed to shun or support the use of coal.

A quick list of "energy inputs" might include, but certainly would not be restricted to solar, hydro, geothermal, biomass, waste (including waste heat recovery), fossil-based sources and nuclear reactivity. The category list must be left open; already, new science has been indicating that energy may be scavenged simply from the *motion* always present in our environment.

Process certainly includes standard refining and reforming industrial approaches, whatever the feedstock. Globally, our society has passed a time when a fuel refinery only accepts fossil-based crude oil as input to their complex process, for, to paraphrase a colleague in the EPA: "Hydrocarbons is where you find 'em". Society can choose or not to support blending fossil and non-fossil feedstock for fuel and energy generation, but *first* we must account for and measure their presence en toto, if any one component is to be kept in proper context of the whole.

Much inter-agency attention has been upon the individual technologic components of Process. Most debate regarding "cleanliness" stems from whether one system for accepting an input feedstock for processing into the energy value chain is inherently better, more advanced, less polluting, or at least more socially acceptable than some other Process technology. In truth, *any* system may be operated well, or operated poorly; an emphasis on Best Management Practices regardless the type of conversion mechanism used for processing is probably more likely to provide the desired "clean energy" result.

Again, check precepts: is there any real reason *not* to include the broadest possible array of Process elements in the Matrix? Comparisons of proper usage and operational mode would be much more comprehensive with the wider view, and the likelihood that any one system will provide an all-in-one answer is abysmally small. Count, monitor, manage, and reserve judgment until reliable third-party data are available, and most important, focus on the Output.

Output amounts and types are subject to a bewildering array of mechanisms, policies and controls. Many of the listed Metrics are in this category as Demand-side management constructs. Certainly these are of high value, yet as stand-alone measurements within the whole, their utility is lessened when parallel mechanisms are impinging upon the process *without* being subjected to the same level of scrutiny.

One common cry from the renewables community is for a "level playing field". In the Output category of our envisioned Value Chain matrix, the lack of a life-cycle assessment approach that accounts for well-to-pump impacts of petroleum as an input for energy is an example of that un-levelness: examples abound, where stringent controls on production of "clean energy" create hurdles that directly competing fuel and energy pathways do not need to overcome.

Once again, a matrix approach that reserves judgment and simply accounts for *all* outputs appears warranted. It is not necessary to even *know* all the activities, impacts, controls and benefits along a particular Process ending in an identified Output, to "get it on the board". The

Output of all energy, clean or dirty, should be measured according to consistent and comparable criteria.

Energy Matrix Attributes: An accounting and enumeration of all elements of an energy value chain as described here must be a "live system", always open to additions, deletions, revisions, refinements. As the matrix is populated with known types of Input, Processes and Outputs, each needs to be assigned *attributes*, the characteristics that differentiate it from other similar elements. This presents of course the classic problem of any taxonomy, whether to "lump or split" closely related categories of elements. "Meta-data" rules must be applied, and where necessary, open to universal change as knowledge is improved.

Input attributes would appropriately describe, at any one time, the agencies of purview and the policies, rules, regulations and laws pertinent to that energy feedstock component.

As an example, there are many different local, state and federal agencies impact "biomass"; some impacts are feedstock type and source specific, others are more generic. Having diverse types of biomass slotted as Input provides a way to sort out the controls over each type, group of types, and category of groups.

It is not necessary to "start from scratch"; the meticulous work of the California Biomass Collaborative under direction of the "re-invigorated" Interagency Bioenergy Working Group has certainly provided an accounting of types, sources and quantities. The Bioenergy Action Plan has determined that indeed those "attributes of purview" need to be associated with the biomass types; this then provides an example of where the current Clean Energy Future implementation can step in and provide coordinating influence.

Similar data sets define, with widely varying levels of accuracy and thoroughness, a broad array of Input types to the California Energy value chain. The task following on matrix placement becomes one of linkages to existing data sources and purviews, and identification where such sources and purviews are absent or unsatisfactory for an identified type.

Process Attributes describe placement along continua rather than discrete, unique types of processes. A great deal of presumption of "cleanliness" overlays recognition and understanding of processing types. Pre-supposing results in whole categories, although recognized and clearly described in scientific terms, are somehow unworthy of inclusion within our current concept of what is, or is not, "clean energy". Using a matrix approach encourages assigning attributed *after* inclusion, rather than assuming attributes and therefore precluding the proper placement within the whole.

There is a great diversity of governance in place, and in many cases, there are examples of the sort of "redundant legislation" that Governor Brown expects to be eliminated. With a slotted Process in proper matrix-position context for comparison with other Processes, methodical identification of purview, constraints, standards and expectations can occur. By this method, it is possible to see the trends that often quite arbitrarily defeat or at least diminish the ability to employ any one process to its best advantage.

Indeed, there may well be processes that simply should not be allowed to be part of California's energy future. There seems to be a concurrence regarding the need to cut back on coal usage, as an example, and the broad policy to implement this focuses on controlling the *direct combustion process* that currently effects coal conversion to energy. Yet unless

alternatives to direct combustion for processing coal are tracked and described, the likelihood is that coal combustion will continue longer and remain "dirtier" than society and society's regulatory body would prefer.

Output Attributes are what is typically considered when selecting mechanisms to encourage or discourage specific patterns of energy usage. As the topic is *energy*, it is the *energy agencies* contributing their Metrics as methods of monitoring clean energy governance efficacy: again, agencies are not often tasked with monitoring what they do not have the purview to manage.

When the attributes impacting the degree, or percentage, of a particular type of energy output are considered, it is necessary to ask who controls, who oversees, who provides, and who uses. Everything from the release of an energy product from the endpoint of Process must be considered Output, including the wastes and impacts associated with delivery to the end-user.

As an example, the separate *transmission* of hydropower-sourced energy to high-use metropolitan regions may be described as a specific delivery network. Dedicated wire networks and the pipeline infrastructures necessary to utilize remote generation fields are certainly identifiable sub-systems in their own right, yet the overall *transmission infrastructure* must be viewed and understood in relation to its effectiveness in getting a product to an end-user.

Energy output delivery is no different than any other commodity; the ability to safely and cost-effectively reach the Market determines to a large degree the commercial success of that value chain. Disparities can be found in access to that infrastructure: disputes between owners and new potential users regarding fees for use and cost of expansion, differences in specifications of what may be transmitted, complications in accurately measuring what product originates from what producer. These are examples of inequalities built within the infrastructure, needing perhaps even more attention and dedicated resource planning than construction of new pipes and wires.

Conclusion and Recommendations

Two closely related organizational concepts are offered to improve understanding of energy generation and delivery in California. First, we suggest that provision of *energy* constitutes an inter-related complex of value chains, of identifiable pathways from source to end-user. Second, we offer an Input-Process-Output model by which all forms of energy value chains may be identified, measured, and compared.

Agencies measure what they manage or intend to manage. For example, access to feedstock is critical to the energy value chain for nearly all sectors, but impacts to feedstock availability, whether positive or negative, tend not be considered because they are not strictly within the purview of "energy management." A cohesive state-wide energy policy must take into account access and availability from source to end-user.

Rather than consider efficacy against a set of standard performance precepts of what constitutes "clean" versus "dirty," judgments are made in advance, and entire sectors of potential energy provision are disparaged. Coal is not inherently dirty; it is the industry-standard Process that converts coal to energy that has been the problem. Waste pollutes less when carefully controlled through an advanced conversion Process than when left to common management ending in landfill disposal. *Any* processing system can be run well or poorly, and

it is the Process performance rather than the feedstock source that should dictate considerations of environmental cleanliness.

We are recommending an inclusive method facilitating direct comparison of the energy value chain of the status quo vs. that of the proposed Process. The question, "Clean, compared to *what*?" needs to be answered. Using existing Process as the baseline for comparison establishes the basis for informed management leading to identification of Clean Energy.

We are *not* recommending that agency governance incorporate every aspect of each energy value chain. Indeed, in most cases, *less* governance would be preferred. We feel that more good will be accomplished by identifying and eliminating regulatory inequities than could be accomplished by more grants, loans or incentives.

We appreciate and do not underestimate the enormity of the task at hand to order all forms energy provision to our state. Yet we also see that much of the data are already being managed, that the task is more about *inclusion* of these disparate management regimes than of wholly new constructs.

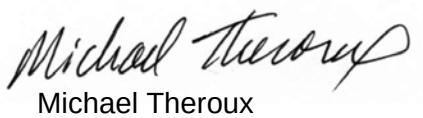
Data management for extremely complex and constantly changing conditions must be based on a holistic and inclusive initial identification of elements, followed by a rational placement of each in context of the other elements. This "database" approach is already a well-developed field of inquiry; its application to policy-laden purview decision-making may only recently have become possible. Society is no longer constrained by the sheer scale of the requisite data storage, organization, extraction, analysis and constant maintenance. The data can be gathered, but there are often far more subtle reasons for not doing so than simply data storage capacity.

If California is to implement the rapid increase in development of renewable energy as mandated, we must at a minimum *identify* every possible pathway. Once positioned in context of other pathways in the overall energy value chain, we can methodically enumerate attributes, among which will be that part of the spectrum of social, environmental and economic appropriateness we tend to collectively call "Clean Energy".

Please contact me at mtheroux@jdmt.net or (530) 613-1712 (mobile) if you have any questions or wish to discuss further.

Sincerely,

JDMT, Inc



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