



**Comments of the Natural Resources Defense Council on the Economic and Technology
Advancement Advisory Committee (ETAAC) Report**

December 10, 2007

On behalf of the Natural Resources Defense Council (NRDC), thank you for the opportunity to offer comments on the draft ETAAC report. We appreciate all of your hard work in putting together these draft recommendations to help inform the California Air Resources Board's (CARB) process to implement AB 32. Further, we appreciate your efforts to ensure that the state's implementation of AB 32 meets the laws multiple goals, including spurring innovation and fostering the development of new technologies.

We strongly support the draft ETAAC report's recommendation that it is important to place a price on greenhouse gas (GHG) emissions, *and* that complementary policies, particularly performance-based programs, will be needed "to spur innovation, overcome traditional market barriers, and address distributional impacts."¹

In the sections below, we provide detailed comments on certain parts of the draft report. These comments are organized by the draft report's sections, in the order that they appear in the report. Due to the comprehensive nature of the draft report and the limited time available to comment, our comments only address certain portions of the report; and while we agree with many parts of the draft report, our comments focus on suggestions for improvements. As you will read below, we disagree with a number of key recommendations and we offer some alternatives to resolve these differences. However, since we did not have adequate time to review the entire draft report in detail, our silence on other portions of the report should not be interpreted as either agreement or disagreement with those recommendations.

In addition, while the ETAAC did an admirable job covering many of the sectors and possible emission reduction measures that CARB should evaluate in assembling the scoping plan, there are some notable omissions, such as water efficiency programs and standards. NRDC submitted detailed recommendations for the scoping plan to CARB on October 1, 2007,² including some strategies that are not included in the draft report. When the ETAAC presents its report to CARB, we urge you to note the areas of focus for the Committee and to explain that some

¹ Draft report, p. 1-6

² These recommendations are available on CARB's website at www.arb.ca.gov/cc/scopingplan/submittals/submittals.htm.

important policy proposals are not included in the Committee’s recommendations but nevertheless deserve consideration by CARB.

In summary, our comments elaborate on the following key points:

Section 2(II)(A) – Create a California Carbon Trust	<ul style="list-style-type: none"> ◆ We support this proposal to create an incentive program focused on reducing greenhouse gas emissions, providing co-benefits to California and in particular to environmental justice communities, and encouraging early action by funding the incentive program through an early auction of allowances.
Section 2(II)(B) - Promote Clean Energy Innovation and Commercialization	<ul style="list-style-type: none"> ◆ NRDC strongly supports the promotion of clean energy innovation and commercialization in California, and we agree with the ETAAC that coordination of RD&D programs is essential. However, rather than creating a <i>single</i> new entity that would coordinate and consolidate all of the state’s research and investments as the draft report suggests, NRDC recommends the creation of a statewide Strategic Global Warming Solutions Research, Technology Development and Education/Workforce Development Action Plan. The Action Plan would enable California’s agencies and institutions to avoid duplication, maximize coordination, leverage resources, ensure cost-effective results, and identify gaps in necessary efforts.
Section 2(III)(D) - Cleantech Workforce Training Program	<ul style="list-style-type: none"> ◆ We agree that workforce training is one of the major challenges facing California. We urge ETAAC to strengthen this recommendation by broadening its scope to include participation of California’s public and private universities, community colleges, and technical colleges and schools, and by incorporating this recommendation as an integral piece of the recommendation to Promote Clean Energy Innovation and Commercialization (Section 2(II)(B)).
Section 3(IV) – Conserving Energy by Reducing Passenger and Freight Motor Vehicle Miles	<ul style="list-style-type: none"> ◆ We <i>strongly</i> recommend that ETAAC prioritize Vehicle Miles Traveled (VMT) reduction strategies in the overall final recommendations for AB 32 implementation. ◆ Pricing policies must be designed to raise revenue to improve the quality of public transit and other modes across the state, both to achieve equity in implementation and to ensure that asking people to leave the car at home is not an onerous burden. ◆ We suggest a primary focus on visionary transportation and land use planning to create mixed-use, walkable communities that naturally reduce the need to drive. ◆ California should prioritize development of transportation models that reflect the VMT savings of smart land use and transit investments, and localities need an alternative to LOS that reflects the quality of the transportation experience for all modes in weighing investment options.
Section 3(IV)(G) – Improved	<ul style="list-style-type: none"> ◆ We agree that shifting freight transport from truck to rail should be a top priority for improving efficiency in the freight sector. Any

Transportation Systems: Electric Freight Rail	increased rail (i.e. expansions or new facilities) should employ the cleanest, most efficient technology, utilizing electrified rail, where feasible.
Section 3(VI) – Renewable and Other Low-Carbon Fuels	◆ The report should urge the immediate adoption of environmental performance measures for the production of biofuels in order to ensure that it does not create perverse environmental consequences for California’s native habitat or unique ecological communities.
Section 4(II)(C) - Competitive Renewable Energy Zones	◆ California's Renewable Energy Transmission Initiative is a key part of the solution to increasing generation of renewables. Another part of the solution is increased coordination between federal, state and local agencies and their decision-making processes. Other actions – like expediting, shortening or limiting public review and imposing rigid timetables – will not help achieve the goal of increased renewables.
Section 4(III)(E) - A Revolving Fund for Technology Demonstration Projects	◆ NRDC supports including this type of funding mechanism as one option for funding demonstration projects and recommends that this option be incorporated into the broader recommendation of section 2(II)(B), “Promote Clean Energy Innovation and Commercialization,” above.
Section 5(III)(A) – Carbon Credit and Valuation for Early Action	◆ We agree that early action to reduce emissions is very important, however, we believe that CARB will be more effective at encouraging early action by (i) adopting a policy that clearly states the Board’s commitment to recognize early actions in designing regulations, (ii) encouraging entities to take advantage of existing opportunities like the energy efficiency programs, and (iii) adopting a policy statement that the Board will not “grandfather” allowances if it adopts a cap and trade program, or at a minimum, that the Board will not grandfather allowances using a baseline year any later than 2006.
Section 5(IV)(J) – Carbon Capture and Sequestering Strategy	◆ We agree with the draft ETAAC report that markets for carbon capture and storage technologies are immature and that the technology is available to provide emission reductions, but should only be pursued after all cost-effective energy efficiency and renewable energy opportunities are exhausted. We do not agree with the report’s recommendations for liability relief for operators, and urge ETAAC to revise the recommendation so that it would not absolve operators of legal responsibilities and liabilities.
Section 6(II)(A) – Manure-to-Energy Facilities	◆ We agree that the CPUC should investigate gas quality standards and an MPR for biomethane, in order to facilitate its use in the existing natural gas pipelines. However, care must be taken to avoid inadvertently creating incentives for the proliferation of large concentrated animal feeding operations.
Section 7 – Forestry Sector	◆ We agree with the Draft ETAAC Report that the forestry sector can contribute significantly to achieving California's GHG emissions reductions objectives. However, the draft forestry chapter falls short in a number of areas. In particular, it: 1) fails to address

	consumption of forest products which is the principal driver of forest sector emissions and demand-side forest measures; 2) omits discussion of afforestation and forest conservation, which are among the best forest sequestration options; 3) endorses the use of forest thinning as a emissions reductions measure, despite the lack of quantitative justification; and, 4) undercuts its credibility by repeating anti-environmental assertions.
Section 8 – ETAAC Review of Market Advisory Committee Report	◆ We support many of the ETAAC’s comments on the Market Advisory Committee’s report. We agree that limits on offsets would help encourage action and innovation within the capped sectors, and we urge the ETAAC to recommend that complementary regulatory policies, not offsets, should be used to achieve emission reductions in uncapped sectors, in order to contribute additional reductions towards the 2020 limit.

Section 2(II)(A) – Create a California Carbon Trust

We support this proposal to create an incentive program specifically focused on reducing greenhouse gas emissions. The Trust could usefully supplement the state’s existing programs that provide incentives for projects that reduce emissions, including the energy efficiency programs, the California Solar Initiative, and the renewable energy incentives. We further support a program that both incentivizes GHG emission reductions and focuses investments in a way that provides co-benefits to California and in particular to environmental justice communities. We also support an early auction of allowances to fund this incentive program, in order to encourage early action to reduce emissions.

Section 2(II)(B) - Promote Clean Energy Innovation and Commercialization

NRDC strongly supports the promotion of clean energy innovation and commercialization in California. A wholesale transformation of California’s (and indeed the nation’s and the world’s) energy system is needed to stabilize greenhouse gas emissions, but it will absolutely require substantially increased and targeted investments in RD&D programs as well as the creation of educational/workforce training programs (see comments on Section 2(III)(D) Cleantech Workforce Training Program). NRDC agrees with the ETAAC that coordination of these programs is essential in order to avoid duplicating RD&D efforts and to expedite the adoption of existing and new clean energy technologies.

NRDC agrees strongly with ETAAC’s endorsement of California making “an affirmative commitment to research, development and demonstration programs geared toward ghg abatement.” (p. 2-10.) We see this as including both additional funding/support and more formal and focused coordination/leverage of existing efforts. With respect to the particular areas of focus described by ETAAC, NRDC offers the following comments/recommendations. (The bolded headings are those used in the draft ETAAC report.)

Support Demonstration Finance. Although some demonstration financing is already or soon to be in place in California – for example, PIER funding for clean generation and energy

efficiency, and AB 118 funding for clean transportation – we agree strongly that much more RD&D funding is needed to achieve the reductions required by AB 32. A statewide Action Plan, described below, could identify the gaps in existing financing and direct additional RD&D investments where they would make the most difference.

Target RD&D Funding for GHG Reduction. NRDC agrees that more RD&D funding must be targeted toward greenhouse gas reductions, but we note that new technologies and programs will be most effective and beneficial if they achieve other important environmental and economic goals as well. We should ensure that the focus is on adding GHG reduction goals as a priority and leveraging, not displacing, existing priority environmental and economic goals.

Leverage California’s Centers of Innovation. NRDC strongly agrees that “there is no single source of information about what the referenced centers of innovation are working on or how their research priorities are established,” and that “[a] coordinated effort would ensure that market and policy signals reach and influence innovation centers.” (p. 2-11.) NRDC agrees that this is a problem and believes that California urgently needs a coordinated, integrated planning and coordination process to avoid duplication, maximize coordination, leverage and cost-effective results, and to identify gaps in efforts needed by California to achieve its ghg reduction goals. ETAAC suggests that “[s]uch an effort could be accomplished by a new entity charged with coordinating low carbon research efforts, or it could be accomplished by an existing private or public entity.” We offer below a recommended alternative to the ETAAC’s *single* new or existing public or private entity options.

Engage the Private Sector. NRDC supports engaging the private sector in clean energy innovation and commercialization. The roadmap suggested by ETAAC would be developed through the recommended Action Plan process described below.

Consider creating a New Entity to Coordinate These Efforts. NRDC strongly agrees with the need for more formal coordination of clean energy innovation and commercialization. The ETAAC recommends that a *single* new or existing public or private entity be established to provide this function and to administer grant funds and technology challenges. NRDC recommends an alternative to the options laid out by the ETAAC report – the creation of a statewide Strategic Global Warming Solutions Research, Technology Development, Demonstration and Education/Workforce Development Action Plan (Action Plan). The Action Plan process could achieve all of the major purposes identified by ETAAC, including focusing innovation and commercialization efforts, coordinating and serving as “connective tissue” between agencies and institutions, and providing the private sector with insight (and influence through the public process) into the structure and availability of incentive funding. It wouldn’t, however, create a new or designate a single existing entity to consolidate the programs.

Development of such an Action Plan would involve the many state agencies and institutions in the state that manage and administer global warming solutions-related research, technology development and education/workforce development programs, and would ideally be developed in a process jointly convened by the relevant state agencies and include public participation. One potential forum would be to constitute a new subcommittee within the Climate Action Team (CAT) and make sure that it is staffed with experts. While no such comprehensive planning/coordination process currently exists, several agencies and institutions have developed

their own RD&D roadmaps or strategic plans (PIER, for example, develops a strategic plan for its investments) which should make development of the broader Action Plan much easier, and Californians would benefit greatly from it.

California derives some very real advantages from having a few different agencies and institutions with diverse strengths and issue area expertise, versus a single entity, managing and administering separate research, technology development and education/workforce development programs focused on global warming solutions. One of the co-benefits identified by ETAAC is of particular importance: “orient[ing] disparate clean energy programs toward the unifying goal of ghg reductions *without decreasing importance of other goals.*” (p. 2-9, italics added.) ETAAC recognizes that there are many important economic and environmental goals that must be pursued alongside the goal of reducing greenhouse gas emissions. The Legislature recognizes the importance of these other goals, having required that measures enacted pursuant to AB 32 must be established “in a manner that minimizes costs and maximizes benefits for California's economy, improves and modernizes California's energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for California, and complements the state's efforts to improve air quality.” (Health & Safety Code, § 38504, subd. (h).)

NRDC believes that the diverse goals of AB 32, including but not limited to the reduction of greenhouse gases, will be best met by the more formal coordination of California's agencies and institutions, each with its own expertise and experience. For example, the Action Plan would ensure that the CEC implements programs consistent with the statewide plan, but the CEC's independent administration of their jurisdictional funds (PIER) would ensure that the other goals of that funding would also include reduction of local air quality impacts, lowering of total costs, and reliability improvements.

Accordingly, rather than creating a *single* new entity that would coordinate and consolidate all of the state's research and investments, NRDC recommends the creation of a statewide Strategic Global Warming Solutions Research, Technology Development and Education/Workforce Development Action Plan (“Action Plan”). The Action Plan would enable California's agencies and institutions to avoid duplication, maximize coordination, leverage resources, ensure cost-effective results, and identify gaps in necessary efforts. It would include an assessment of RD&D and education/workforce development needed to make significant progress on California's global warming and related goals, provide strategic priorities direction, include a catalogue of current and planned activities and identify where gaps in needed effort may exist.

Section 2(III)(D) - Cleantech Workforce Training Program

Training a workforce for California's expanding Cleantech economy is tremendously important. The need for a changing workforce is one of the major challenges facing California – a challenge that is exacerbated by the aging of California's energy-related workforce. In the next ten years we are facing significant numbers of retirements in critical energy-related areas, state agencies and research and technology development institutions. This challenge is apparently even higher in the energy field than elsewhere. For example, according to the “Aging Workforce Report” recently conducted by UTC Research, the median age for workers in the utilities sector is 3.3

years higher than the national average.³ “We expect to be losing a significant number of employees,” says Angie Robinson, Human Resources Manager for the Sacramento Municipal Utility District. “Over the next five to ten years, about 50 percent of our 2,000 employees will be eligible for retirement.”⁴

ETAAC suggests coordination of programs “such as the California State Advanced Transportation and Energy program within the community college system and the related Union Apprenticeship training programs within the Building Trades.” (p. 2-17.) This recommendation could be strengthened and expanded by broadening its scope to include participation of California’s public and private universities, community colleges (not only specific programs within the community colleges), and technical colleges and schools. NRDC also recommends that ETAAC incorporate this recommendation as an integral piece of the ETAAC recommendation to Promote Clean Energy Innovation and Commercialization (Section 2.II.B.).

Section 3(IV) – Conserving Energy by Reducing Passenger and Freight Motor Vehicle Miles

We commend the ETAAC report for including reference to smart growth policies as an important means to reduce transportation sector GHG emissions. We support the discussion of the three legged-stool of transportation solutions – namely reducing vehicle miles travelled (VMT), reducing the fuel carbon content, and increasing fuel economy. We would highlight that a recent analysis by the Center for Clean Air Policy suggests that a projected 40% increase in California VMT by 2020 and 70% increase by 2030 threatens to overwhelm all gains made by the latter two classes of strategies. Since transportation emissions are 40% of California’s problem, *we would strongly recommend that strategies related to VMT reduction be included in ETAAC’s overall final recommendations for high priority strategies for AB 32 implementation.*

We agree that a combination of transportation and land use planning, pricing strategies and improved analytical tools will be essential to achieve the needed reductions in transportation sector GHG emissions. We offer some general comments on ordering and framing. Pricing strategies will have to be designed carefully. If viewed as punitive measures to correct market distortions in order to simply get people to drive less they will not be politically viable. Instead pricing policies must aggressively invest revenues in creating a strong balanced transportation system in order to avoid being regressive and unjust. Many parts of California are designed such that driving is currently the most convenient transportation choice. Simply penalizing drivers without raising the quality of public transit, walking and bicycling could potentially reduce quality of life for many Californians. Pricing policies have to be designed to raise public revenue to raise the quality of public transit and other modes across the state, such that asking people to leave the car at home is not an onerous burden.

Rather than an opening emphasis on increasing the economic efficiency of the transportation system, we suggest a primary emphasis on visionary land use and transportation planning strategies that create communities that provide people with a balance of housing and

³ Arthur O’Donnell. “Brain Drain: Our Graying Utilities”, EnergyBiz Magazine Nov/Dec 2004.

⁴ Id.

transportation options, meaning other modes are just as easy – if not easier – than driving. This is the root of the problem.

In addition, we urge you to consider re-ordering your recommendations to prioritize transportation and land use planning, and sub-dividing this section into its multiple complex sub components. Trying to cram this complex subject into one recommendation leaves the reader overwhelmed and without much vital detail. Since the order is presumed to be priority order, placing transportation and land use planning strategies as recommendation E tends to reduce the importance of these vital suggestions.

Finally, we strongly support the thoughtful discussion of the need to replace LOS with a measure that is more reflective of the quality of the transportation experience for all modes. In addition, we believe all local, regional and state transportation planning models must be updated to be sensitive to density, diversity and design, thus reflecting the benefits of smart growth policies and capturing the negative induced demand and induced growth effects of highway investments meant to “reduce congestion”. Analysis by UC Davis Professor Robert Johnston suggests that any efforts to reduce congestion by providing additional lanes or accelerating traffic without incentives to use other modes actually result in *increased* VMT, an undesirable outcome, despite best efforts to reduce emissions from idling congestion.

Section 3(IV)(G) – Improved Transportation Systems: Electric Freight Rail

We agree that shifting freight transport from truck to rail should be a top priority for improving efficiency in the freight sector. Many other measures could be employed to reduce carbon impacts from freight transport, through electrification (mentioned in the ETAAC for passenger rail only) and other efficiency improvements. However, a focus on a shift from truck to rail is an appropriate start for this sector. We would add that any increased rail (i.e. expansions or new facilities) should employ the cleanest, most efficient technology, utilizing electrified rail, where feasible.

Section 3(VI) – Renewable and Other Low-Carbon Fuels

The biofuels section of the report should recommend environmental safeguards, to prevent, for example, land use change from the conversion of non-crop land (e.g., forest land, native prairie, wetlands) to biofuel production. Land use conversion will have negative GHG implications as well as habitat impacts. California needs to establish environmental safeguards to ensure that biofuels production does not create perverse environmental consequences for our native habitat or unique ecological communities. Safeguards should prevent the conversion of native forests and prairie, and the drainage of wetlands for biofuel crop production; and the extraction of biomass from national forests, areas designated by the California Natural Heritage Program as critically imperiled, imperiled, or rare at a global or state level, and old-growth and late successional forests. These safeguards should not take the form of a “research area” or study, but should be considered as minimum environmental performance measures for biofuels qualifying under the Low Carbon Fuel Standard.

Section 4(II)(C) - Competitive Renewable Energy Zones

The Competitive Renewable Energy Zones section of the report advocates promoting renewables generation in California through establishment of such zones (or CREZs), and the establishment of "a streamlined siting, environmental review and permitting process that is coordinated between the state, local and federal agencies" and an "expedited" with a "single, 'master' environmental impact statement for each renewable resource zone as a whole" to be produced "within one year." ETACC Report at pp. 5-7, 5-8.

NRDC strongly supports increasing renewables generation in CA. We also support and indeed are participating in the California Renewable Energy Transmission Initiative (RETI) which is referenced at p. 5-7. RETI, which started some six months ago, is a statewide initiative that involves all of the entities, including government agencies and utilities, that are responsible for implementing the state's renewable energy policies and development of the necessary infrastructure, as well as relevant stakeholders, including environmental and consumer organizations. As the report notes, the RETI process "will assess renewable energy zones in California [and] prioritize those zones," *id.*, on the basis of which ones can be developed in the most cost effective and environmentally benign manner. RETI will also prioritize and prepare detailed transmission plans for priority zones. *Id.* at p. 5-8. Since RETI is well underway it appears that one key part of the "possible solution" identified by the report is already in place.

It is the other part of the ETAAC Report's solution that is problematic, although not all of it. For example, the recommendation mentions the fact that the California Energy Commission and the Bureau of Land Management currently have an agreement to carry out a joint NEPA/CEQA process for renewable projects in the California Desert. NRDC strongly supports this type of coordination and agrees that it should serve as a model as recommended. However, we are concerned, first, about "streamlining" and "expediting" this process as recommended by the report. In our experience, these terms are code for restricting public involvement in decision-making about projects with significant environmental impacts, like transmission lines and generation projects. Proposals to streamline and expedite environmental review processes also frequently involve truncated opportunities for involvement by other entities in addition to the public, including government agencies and academia, which would lead to reduced input of sound scientific information. Decades of experience with natural resources decision-making has taught us that sound and enduring solutions about where and how to facilitate new renewables generation and transmission will not be achieved through limiting involvement by members of the public and other stakeholders. In fact, in our experience, time spent in planning and engaging stakeholders at the "front end" of projects leads to less controversy and delay when it comes to the actual implementation of permitting decisions, including extremely complex decisions.

We are also concerned about the one year timetable recommended in the report. Such timetables have frequently been the preferred mechanism for truncating stakeholder involvement in decision-making. Moreover, it is essential to acknowledge that there are many good reasons why review of these projects could -- and in some cases *should* -- take longer, including the need to ensure that they minimize damage to publicly-owned sensitive resources like those referenced in the report. See p. 5-7. In addition, a hard and fast timetable ignores the

fact that delays are often attributable to the failure of applicants to submit required information in a timely manner as well as to their submittal of poorly designed proposals. A rigid timetable can also serve as a disincentive to applicants to work with agencies and other stakeholders to develop optimal new lines. Adherence to such a timetable, like streamlining environmental review, is certain to produce poorly designed lines and huge controversies – both of which, in turn, will virtually guarantee long delays before new lines and new projects are actually in operation. Realization of that goal requires not a rigid timetable, but rather that proponents, regulators, local governments and others work closely together to develop proposals that will increase generation of renewables in a manner that clearly minimizes environmental damage.

Our last concern relates to the ETAAC report's reference to a single "master plan" "for each renewable resource zone as a whole." Report at 5-8. We are frankly unclear as to what is meant by this reference. However, if the intention is to have one environmental review document serve as the basis for all subsequent decisions regarding actions within the zone, we note that this would likely be inconsistent with federal environmental law which, among other things, requires new reviews under certain circumstances, such as when important new information becomes available.

In sum, the parts of the recommendation that focus on streamlining or altering the environmental review process with regard to public participation, and/or subjecting it to a rigid one-year deadline will not achieve the announced goal of the ETAAC Report and accordingly, these recommendations should be rejected. However, we agree that increasing coordination between federal, state and local agencies and processes, such as in the CEC/BLM agreement referred to in the recommendation, has the greatest chance of success and should be emphasized.

Section 4(III)(E) - A Revolving Fund for Technology Demonstration Projects

A revolving fund would be a useful financing tool for some demonstration projects, but it is not always appropriate for all situations and technologies. NRDC supports including this type of funding mechanism as one option for funding demonstration projects and recommends that this option be incorporated into the broader recommendation of section 2(II)(B), "Promote Clean Energy Innovation and Commercialization," above.

Section 5(III)(A) – Carbon Credit and Valuation for Early Action

We agree that it is very important for CARB to encourage entities to take early action, in advance of regulations, to begin reducing emissions as soon as possible. However, we disagree with the solution offered in the draft ETAAC report. The process of developing protocols for quantifying the GHG emission reductions from projects will likely take as long, if not longer, than developing the regulations themselves, thereby defeating the purpose of spurring early action in advance of regulations that will become effective in 2012.

Instead, we urge the ETAAC to recommend three key steps to promote early action. First, CARB should adopt a policy that clearly states the Board's support for early action to reduce emissions and that the Board will strive to recognize those early actions in designing future regulations. (In October, CARB staff indicated that they will be developing a policy statement for Board consideration in the spring.) Second, many existing incentives are available to reward

early actions that reduce emissions, and ETAAC should encourage businesses and residents to take advantage of those opportunities, including the utilities' energy efficiency program incentives, solar incentives, etc. Third, CARB should adopt a policy statement that the Board will not "grandfather" allowances – that is, give them away for free based on emissions – if it adopts a cap and trade program, or at a minimum, that the Board will not grandfather allowances using a baseline year any later than 2006. The primary uncertainty that is inhibiting early action is over whether CARB will grandfather allowances if the Board adopts a cap and trade program. This program design would reward increased pollution and discourage early action, therefore the surest way to encourage early action is to take this option off the table so that all entities know that any emission reductions they make going forward will benefit them.

Section 5(IV)(J) – Carbon Capture and Sequestering Strategy

We agree with the draft ETAAC report that markets for CCS technologies are immature, and that CCS is a technology (after all cost-effective energy efficiency and renewables are pursued) that can help provide long-term reductions in GHGs at the national and international level. As the AB1925 report points out, challenges remain, principally in the economic and regulatory arena. Current laws and policies make it is cheaper to vent CO₂ than to capture and sequester it. To date, CCS has not been deployed except in niche applications such as natural gas cleanup.

Technical components of CCS - capture, transport and storage - have been demonstrated at large scale in commercial applications. Technical issues are not the main reason for today's limited deployment. Unfavorable and uncertain economics are chiefly responsible. Assigning a price on CO₂ emissions alongside other accompanying policies can bridge this economic gap.

Regulatory issues also need to be clarified. CCS projects can be permitted under existing Underground Injection Control regulations, but these were never designed with CCS in mind and a great deal is left at the discretion of the regulators. To ensure the safety and efficacy of its application, it is prudent to develop rigorous environmental and public safety standards for how CCS should be performed, a process that is currently under way by USEPA. The state also needs to clarify related surface and subsurface property rights issues.

Finally, regarding long-term liability, we do not agree with the report's recommendations for liability relief and urge a more extensive discussion on the topic. The blanket term "liability" is not well defined and can encompass a number of issues, such as the liability to reconcile issued allowances under a carbon regime with actual project performance, or the discrete liabilities arising from a number of potential remediation scenarios or monitoring obligations. Within these is a range of risk profiles and costs, and further discussion on liability relief should be based on a much more rigorous analysis of these in relation to specific liabilities - not "liability" in a blanket fashion.

Industry routinely assumes risks when the rewards justify it. The main reason that liability relief is being sought is precisely because of the unfavorable economics of CCS and the uncertain rewards under today's regime. The way to address this would be through policy, not liability relief. Liability relief is not consistent with the risks associated with CCS - which are comparable to ongoing industrial activities such as natural gas storage for well-selected and appropriately regulated and operated sites. Having arrangements in place for the long-term stewardship of a

storage site is necessary, since the residence times for the CO₂ will likely outlast project operators and insurance companies. This can be achieved through financial assurance and other mechanisms, that could potentially be state-administered. NRDC however does not support absolving operators of legal responsibilities and liabilities.

Section 6(II)(A) – Manure-to-Energy Facilities

We agree that the CPUC should investigate setting gas quality standards and an MPR for biomethane, in order to facilitate its use in the existing natural gas pipelines. We believe that this possible use of biogas should be given as much attention as the possibility of using biogas to generate electricity on-site, on which the Draft Report primarily focuses. As the draft report notes, combustion of biogas to generate electricity also emits NO_x,⁵ a downside which using biomethane in the pipeline would mitigate.⁶ The Draft Report notes that selling biomethane into the natural gas pipeline may only be “financially feasible for 5 to 10 percent of state farming operations.”⁷ It is not clear what the basis is for this statement (e.g., whether this is because converting biogas to biomethane is expensive, or because farms are not connected to the natural gas grid, or because of other factors). We believe the potential for selling biomethane into the pipeline is substantial, and that the report should examine this option more thoroughly.

While the use of digesters to reduce GHGs is appropriate and should be encouraged, care must be taken to avoid inadvertently creating incentives for the proliferation of large concentrated animal feeding operations. Specifically, if digesters are found not to be cost effective for smaller dairies, CARB policies should not encourage the consolidation or expansion of small facilities in order to improve cost-effectiveness. For example, allowing the use of digesters as an offset could create additional incentives to build larger facilities or to concentrate smaller facilities which could more cost-effectively install digesters. CARB policies should protect and encourage small, sustainable livestock facilities instead of creating incentives for moving away from such sustainable practices.

Section 7 – Forestry Sector

In California, as globally, forests contribute substantially to climate mitigation. Although the current net flux into California forests is projected to decrease and eventually reverse under Business As Usual scenarios, much can be done to perpetuate and even increase the sector’s current positive contribution. The discussion draft addresses some of the more promising measures.

Overall, however, the section needs a thorough reworking. Among its most serious shortcomings, it fails to address consumption of forest products which is the principal driver of forest sector emissions, omits discussion of the best forest sequestration options, devotes much of its time to speculative and dangerous ideas about biomass thinning, and undercuts its

⁵ Draft Report, p. 6-3

⁶ the draft report seems to conflate biogas and biomethane. Biogas must be upgraded, by removing the hydrogen sulfide, moisture, and carbon dioxide, to create biomethane which can be used in the natural gas pipeline. Krich, et al, *Biomethane from Dairy Waste: A Sourcebook for the Production and Use of Renewable Natural Gas in California*, for Western United Dairywomen, July 2005, pp. 5, 47-60.

⁷ Draft Report, p. 6-5

credibility by repeating anti-environmental assertions. These and other problems are discussed below.

Forest Product Consumption

In order to effectively address the forest sector we need to focus on emissions associated with statewide consumption of forest products rather than solely on emissions from in-state forestlands. By failing to adopt a consumption orientation, the draft report ignores emissions associated with imported wood products and fails to consider measures to reduce demand for wood products such as increased recycling and wood use efficiency. These demand-side programs offer some of the most promising opportunities for reducing forest sector emissions as well as a means to reduce leakage on a statewide basis from forest sequestration projects.

Missing Sequestration Options

The greatest potential sequestration gains for California come from afforestation of currently unforested lands. Curiously, no mention at all is made of this potential in the draft report. Similarly omitted is conservation, i.e. avoided deforestation (though the draft properly notes the tremendous loss of forests to development projected for the future), and loss of carbon storage from conversion of late successional and old growth forests to early seral stages through logging. Other important mechanisms that need careful development and consideration include increased buffers and set asides in working forests, decreased wood waste through improved recycling and wood use practices, utilization of mill waste, and enhanced rotation ages.

Thinning Speculation

There are several serious problems with linking fire threat reduction to global warming mitigation. Most centrally, thinning reduces forest biomass, whereas sequestration increases it. Conversion of thinned biomass to energy is carbon neutral only if the life cycle carbon emissions are captured by forest regrowth. But forests thinned ostensibly to reduce fire threats do not add back most of the biomass removed even over long time frames. Even the partial recapture that does occur does not translate into any marginal avoided emission at all unless it exceeds the carbon releases from the process of cutting, transporting, and processing forest thinnings for biomass production. And that is speculative at best.

Biomass thinning proponents also argue that avoided emissions from forest fires justify carbon credit or investment. However, that would require that the thinning reliably reduce subsequent fire intensity over the long term. It would also require that the lifecycle wildfire emissions from the subsequent fire regime be lower than from the current one, over several fire intervals. Neither of these has thus far been satisfactorily demonstrated.

Rhetoric aside, thinning for fire risk reduction in California forests in recent years, as performed in the field by logging crews, does not have a good empirical record of reducing fire intensity compared to neighboring unthinned stands, in actual fires, at least on National Forest System lands. See Odion and Hanson, 2006, attached. And even if that were true over the near term, it would not be clear that over time, with vegetative regrowth, the same would hold. Nor are there

good empirical data or well developed modeling results to show that over time the total emissions from occasional but more intense fires in California forest types would exceed those from much more frequent lower intensity burns. In short, the intuitive notion that taking trees out of the woods means that less will go up in smoke is not fact-based.

Thinning is also a poor source of electrical fuel biomass for economic reasons. The strongest case for removing woody material to influence fire has been made for brush and very small diameter trees. Not coincidentally, their removal is least likely to entail contraindications, like the fire-enhancing effects of increased insolation and sub-canopy windspeed, and damage to under-represented wildlife habitat. Even a modest electrical generating station, however, would rapidly exhaust the available supply of such small material within an economic haul distance, perhaps in as little as ten years. Subsidies associated with putative climate benefits would only marginally widen that more-legitimate working circle. As a result, either the facilities' useful life, and chance of return on investment, would be sharply curtailed, or sourcing would move on to much less benign size classes. This risk is abated for use of thinnings as a heat source, and would be as well for smaller, mobile processing facilities, if and when they become feasible.

Thinning proponents, and the draft report is no exception, also tend to gloss over environmental co-detriments. Soil compaction, introduction of exotics, increased fire starts from human activity, wounding of residual trees, loss of wildlife habitat, erosion and disturbance from road construction and/or use, and similar impacts all mean that biomass thinning of forests entails significant harm to other environmental values. These impacts are of less concern in working forests, particularly on private lands. But on public lands, held in part for a broad suite of values, they are quite serious.

Inappropriate Rhetoric

Much of the forestry section is shot through with agenda-driven statements that come from the debate over federal lands logging. Those most in need of excision are listed here.

“Additionally, many legitimate forest management projects have been stymied by broad disagreements over forest land management” (page 7-1). The view that the “stymied” projects are legitimate is partisan. It would be hard to find many California-based forest projects that were generally agreed to have been legitimate that were stymied by management disagreements, particularly in the context of carbon sequestration.

“The durability and health of California’s forests are threatened by numerous factors that include ... lack of appropriate management in some areas” (page 7-2). It would surely be as accurate to say that their health is compromised by active management that is inappropriate.

“Conflicting policy arenas also confound progress on some otherwise logical projects, such as the ‘chicken-and-egg’ dilemma surrounding the inability to link biomass power plant development with fuel reduction programs to reduce wildfires” (page 7-2). While it is not possible to know exactly what this sentence means, it plainly is blaming policy conflict for the lack of new biomass plants to process fuel thinnings. We are aware of no factual basis for this.

As discussed above, there are serious economic and prudential barriers to establishing such plants.

“Uncertainty in fuel supply is a result of litigation (or threat of litigation) is particularly a barrier on federal forest lands” (page 7-6). Litigation problems for federal forest management arise from illegal decisionmaking. The Committee would be hard pressed to name a significant number of national forest logging projects halted for any substantial time by court action that were not ultimately found to be illegal. As noted above, there are serious barriers to sourcing biomass from federal land thinnings, but they are not the product of litigation.

“State support of “green labeled’ federal projects would firm up the supply of fuels available for biomass facilities, thereby improving the cost effectiveness of fuel treatments on adjacent private lands as well” (page 7-6). While NRDC supports robust green labeling, for several reasons we cannot view forest certification as appropriate for federal forestlands. As a factual matter, the track record of the U.S. Forest Service in recent years puts it at the forefront of law-breaking federal agencies, as evinced by the large number of environmental cases where federal courts have found it acted illegally. Certification should not be considered until this record is far in the past. Additionally, the Forest Service continues to log in areas and ways that are highly problematic from an environmental and a climate change standpoint. The most striking of these are out of state, with liquidation of wildland old growth rainforest in the Tongass being perhaps the prime example. But there are California instances as well, and for certification purposes, the agency needs to be treated consistently based on its overall behavior. And importantly, the Forest Service cannot give binding assurances about future management of the lands it is managing. It must by law decide management limits in a public process, reconsidering periodically in light of the changing views and demands of the land’s owners, the American public. Legitimate certification rightly requires long-range predictability and commitment that is not consistent with this.

Structural problems with forest measures.

In order to provide a significant contribution to achieving California’s emissions reduction targets, forest carbon mitigation projects need to be quantified and verified using a reliable and credible measurement and verification framework. The recently adopted forest protocols form the basis for this framework, but its further expansion and development should be an essential element of an AB32 forest sector strategy. To legitimate any emission reductions from forest projects, the following issues have to be dealt with forthrightly and aggressively to ensure the savings are reliable:

Leakage. Projects that preserve forestlands or decrease production of fiber products will displace demand to other venues, in the absence of effective controls, making claimed carbon benefits illusory. Notable, reforestation and afforestation in the proper locations, over time, may have negative leakage. That is, they may reduce the demand for cutting other forests and thereby increase overall sequestration beyond what the carbon they themselves capture.

Permanence. Particularly if used as offsets, forest projects threaten to enable global warming rather than slow it. Upfront credit for forest (and wood products) measures that because of

change of management, fire, or other unplanned events do not deliver long term sequestration, translates into increased carbon in the atmosphere. Financial penalties may affect the incentives of human actors, but they will not take carbon back out of the air. Strong rules to ensure that carbon projected to be sequestered actually is kept out of the atmosphere for the expected term are an essential prerequisite to providing any form of climate-based credit or incentive to forestry.

Additionality. Reforestation, avoided deforestation, and reduced harvest measures including increased rotations and buffers, all provide emission reductions only if they can meet careful standards for showing that without such treatment they would not occur.

Section 8 – ETAAC Review of Market Advisory Committee Report

We support the draft report’s suggestion that a cap should include as many sectors of the economy as is practical (Draft Report, p. 8-2), that grandfathering is a bad method of allocation to promote early action, innovation, and clear price signals (Draft Report, p. 8-3), that auction revenues should benefit disadvantaged communities (p. 8-4), that banking should be allowed (p. 8-6) and that borrowing should be limited (p. 8-7).

We suggest that the Draft Report be clearer about the difference between the state-wide cap and the cap for the cap-and-trade system, when using the term “cap.” On page 8-5, the Draft Report says that offsets can target sectors outside the “state’s cap.” All sectors of the California economy are included in the statewide cap of 1990 emissions levels by 2020, but only some sectors would be included in any cap-and-trade system. If offsets are allowed, they could target sectors outside of the scope of the cap-and-trade program, but will help the state reach the 2020 limit if they are inside the statewide cap.

The Draft Report suggests that limits on offsets could “drive up compliance costs.” (Id., p. 8-5) However, if the cap-and-trade system includes as many sectors as practical, as the Draft Report suggests, then this will create a liquid market with many lower-cost mitigation sectors with which the higher-cost mitigation sectors can trade allowances. Since offsets allow emission reductions in uncapped sectors instead of in a capped sector, theoretically there is no overall change in emissions. In other words, offsets do not help the state get any closer to meeting the 2020 cap. However, offsets may not provide equally reliable reductions in the uncapped sectors, for example, if leakage is high or reductions are not truly additional beyond business as usual, and could result in an overall increase in emissions. As such, we recommend that complementary regulatory policies, not offsets, should be used to achieve emission reductions in uncapped sectors. We agree with the Draft Report that “limits on offsets would help encourage action and innovation within a specific sector.” (p. 8-5) And if offsets are allowed, we agree that they should be limited in quantity, and subject to stringent quality standards.

We oppose a price-based safety valve because it would undermine the environmental integrity of the cap. We agree with the Draft Report’s analysis of the shortcomings of a price-based safety valve, and agree that an entity like the Carbon Trust that can help smooth out any price volatility is far preferable. (Draft Report, p. 8-8)

Conclusion

Thank you for the opportunity to provide comments on the draft ETAAC report. We urge you to modify the report consistent with the above recommendations. We appreciate the ETAAC's hard work to help make AB 32 a success.

Attachment

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FIRE SEVERITY IN MECHANICALLY THINNED VERSUS UNTHINNED FORESTS OF THE SIERRA NEVADA, CALIFORNIA

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INTRODUCTION

Much debate has centered around the effectiveness of thinning as a tool to reduce fire severity. However, thinning prescriptions vary substantially and in practice on public lands often involve relatively intensive mechanical thinning. For example, this is currently the standard prescription on national forests of the Sierra Nevada. Recent research has indicated that low thinning, in which small trees less than 20-25 cm in diameter at breast height (dbh) are cut, can reduce fire severity (Omi and Martinson 2002, Perry et al. 2004). Conversely, evidence from the Biscuit Fire in Oregon indicates that more intensive mechanical thinning, which involves removing many young and mature trees, can increase fire severity (Raymond and Peterson 2005). Potential causes of increased severity include fine-fuel loading from slash debris, faster wind speeds due to a reduction in the buffering effect of mature trees, accelerated brush growth from increased sun exposure, and desiccation and heating of surface fuels due to insolation (Raymond and Peterson 2005, Rothermel 1991).

Other authors have reported reductions in fire severity following mechanical thinning in modeled simulations of wildland fire, and in a circumstance in which a wildland fire burned through plots of a silvicultural study on the Blacks Mountain Experimental Forest in the northern Sierra Nevada (Skinner et al. 2005, unpublished data). However, localized experimental conditions may not reflect actual or feasible management practices on federal lands, and the effects of wildland fires may differ from modeling assumptions, especially after several years of post-

thinning brush growth. The hypothesis of this study was that mechanically thinned areas on national forests would not differ in mortality from unthinned areas.

METHODS

All areas known to have been mechanically thinned, and then burned in wildland fire from 2000 to 2005 within national forests of the Sierra Nevada outside of designated experimental forests, were included in the study. A total of seven sites (experimental units) within four different fire areas were located. All were in mixed conifer forest. These fire areas included the Power Fire of 2004 on the Eldorado National Forest, the McNally Fire of 2002 on the Sequoia National Forest, the Gap Fire of 2001 on the Tahoe National Forest, and the Storrie Fire of 2000 on the Plumas National Forest. To control for spatial autocorrelation, areas thinned to the same prescription within 2000 m of each other in a given fire were treated as subsamples, rather than independent data points. Spatial autocorrelation in fire behavior was found at distances less than 2000 m in a recent study in northern California forests (Odion et al. 2004).

Mechanically thinned areas were compared to adjacent unthinned areas in terms of fire-induced mortality and combined thinning/fire mortality (trees removed by thinning plus trees killed by fire), where mortality was measured as a function of basal area. This was done via transects 50 m on either side of the boundary of thinned units, beginning at the nearest access point. Along the transects, .01 ha square subplots, with corners facing E-W and N-S, were established at 100 m intervals, estimated by pacing. A total of 10 such subplots were established in each experimental unit, except in the case of both experimental units in the Storrie Fire area where smaller boundaries necessitated a commensurately smaller number of subplots (eight and five, respectively). In the other experimental units, this approach led to the sampling of three-quarters or more of the available boundary length. Portions of the boundaries were excluded from sampling wherein one side of the boundary was on a ridge or in a riparian area, and the other was not; or when one side was on flat ground when the other was on a slope. Boundary sections were also excluded when the two sides of the boundary were on different slope aspects. This was done in order to prevent such landscape features from influencing any observed differences in severity. We tested our hypothesis using a paired, two-sided t-test. Trees thinned prior to the fires were distinguished from trees killed by the fire, and then salvage logged, by the presence or absence of charring on top of stumps.

RESULTS AND DISCUSSION

Contrary to our hypothesis, the mechanically thinned areas had significantly higher fire-induced mortality ($p = .016$, $df = 6$) and combined mortality ($p = .008$, $df = 6$) than the adjacent unthinned areas. Thinned areas predominantly burned at high severity, while unthinned areas burned predominantly at low and moderate severity (Table 1). Basal area removed during mechanical thinning ranged from 28% to 48% (Table 1), and trees removed ranged from less than 20 cm in diameter up to 80-85 cm in diameter measured at stump height. In both experimental units in the Power Fire area, maximum stump diameter of thinned trees was 65-70 cm.

Table 1. Fire-induced and combined basal area (BA) mortality of mechanically thinned versus unthinned sites in mixed conifer forests of the Sierra Nevada.

Site	BA Removed	Fire-induced Mortality		Combined Mortality	
		Thinned	Unthinned	Thinned	Unthinned
Gap1	36%	100%	100%	100%	100%
Gap2	32%	86%	60%	91%	60%
McNally	36%	100%	51%	100%	51%
Power1	28%	40%	43%	57%	43%
Power2	34%	50%	14%	67%	14%
Storrie1	48%	74%	8%	86%	8%
Storrie2	37%	81%	40%	88%	40%

Possible explanations for the increased severity in thinned areas include persistence of activity fuels, enhanced growth of combustible brush post-logging, desiccation and heating of surface fuels from increased insolation, and increased mid-flame windspeeds. Given that sampling transects in thinned versus unthinned areas were only 100 m apart in each experimental unit, fire weather should have been the same for the thinned and unthinned areas sampled in each site. Thus, mechanical thinning on these sites appears to have effectively lowered the fire weather threshold necessary for high severity fire occurrence.

In all seven sites, combined mortality was higher in thinned than in unthinned units. In six of seven sites, fire-induced mortality was higher in thinned than in unthinned units. The one exception to this was the Power1 site, which had slightly higher fire-induced mortality in the unthinned area. This site was unique in that fuels had been masticated in the thinned unit just months prior to the occurrence of the Power fire (mechanical thinning occurred 4-5 years prior to the fire). It also had the least intensive removal of basal area among the study sites. However, the combined thinning/fire mortality in the Power1 site was higher in the thinned area.

The effects of mechanical thinning may be persistent. The McNally site was mechanically thinned 28 years prior to the McNally fire of 2002, yet the thinned area still burned at high severity while the adjacent upslope unthinned area burned with a mix of low, moderate, and high severity effects.

SUMMARY AND CONCLUSIONS

Mechanical thinning increased fire severity on the sites currently available for study on national forests of the Sierra Nevada. More study is needed to determine which factors, such as slash debris, mid-flame windspeeds, and brush growth, best explain this occurrence. Future studies may also explore whether there is a temporal aspect to this effect, as understory vegetation grows over time in response to reductions in forest canopy cover.

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