

Comments of the Large-scale Solar Association  
on the Renewable Energy Transmission Initiative's Draft Phase 1B Report  
November 19, 2008

**I. Introduction**

The Large-scale Solar Association ("LSA") appreciates this opportunity to provide its comments on the draft Renewable Energy Transmission Initiative ("RETI") Phase 1B Report (the "Draft Report"). The Draft Report represents the hard work and countless hours of effort of RETI's consultant, Black & Veatch, as well as of a wide range of stakeholders, including environmental organizations, governmental agencies, transmission owners and renewable developers. The draft report not only identifies areas of tremendous theoretical renewable energy potential in California and in its neighbors (the Competitive Renewable Energy Zones, or "CREZs"), but for the first time seeks to provide simultaneous insight on the relative economic values and environmental concern associated with those renewable resource areas. The LSA commends all of those who have contributed to the draft report, and offers these comments to both improve on the report and allow it to form a stronger foundation for the work to come.

**II. Overall Comments on RETI, the Draft Report & the Transition to RETI Phase 2**

The goal of the RETI process is to better align transmission development with renewable procurement, identifying economic and environmentally-appropriate transmission solutions that will bring sufficient renewable energy to meet California's energy and policy needs. In particular, RETI is intended to avoid the Tehachapi experience, where developers have been ready to build since 2005-06, but transmission will not be ready until 2011-13, as well as to avoid the unnecessary controversy that has been associated with many transmission lines, by incorporating environmental and other stakeholder concerns from the outset of the planning process. RETI Phase 1B has properly investigated theoretical renewable potential, beginning the process of planning ahead that will allow transmission, which takes far longer to plan and build than generation, to be built prior to execution of procurement contracts. However, the proper focus on planning ahead does not equate to leaving planned development behind.

The success of California's Renewables Portfolio Standard ("RPS") program depends on building transmission for existing renewable energy contracts. Furthermore, the open-access transmission planning approach of the Federal Energy Regulatory Commission ("FERC") and the California Independent System Operator ("CAISO"), as demonstrated by the CAISO's recently-adopted Generation Interconnection Process Reform ("GIPR") and its predecessor interconnection rules, require utilities to interconnect generation based on expressed commercial interest, reflecting market processes and the detailed and considered expertise that developers bring to siting energy projects. Procurement decisions, and the market forces that underlie them, must be respected – especially when those decisions have been approved by the CPUC or other local regulatory authorities. CREZs with real projects that have contracts, or that have other indicia of true commercial interest and thus reasonable

and realistic development potential, must be prioritized. As economic and environmental factors dictate that transmission upgrades should be preferred over new transmission development, RETI should also prioritize CREZs that are accessible via existing transmission corridors. It follows that areas with real commercial development potential, and that are accessible via existing transmission corridors, should receive RETI's highest priority, particularly where the theoretical Phase 1B results place those areas within the acceptable range of economic and environmental results.

The draft RETI Phase 1B report correctly concludes that the renewable resource potential within the State of California and surrounding U.S. states, Baja California Norte and British Columbia is great. These resources appear to exceed California's own immediate and near-term renewable goals, offering the promise that California and its neighbors can help provide clean, climate-friendly and renewable power to meet needs beyond their own borders. The report also correctly concludes that transmission is not generally available to deliver the energy from these resources to meet demand. New and upgraded transmission must be built, in an environmentally-appropriate and economic way. Transmission planning to harvest this renewable energy must recognize both the near-term reliability needs of integrating varying intermittent resources with reasonable geographic diversity, as well as the long-term West-wide need for an integrated transmission system that will unlock the potential of the most economic, reliable and environmentally beneficial energy options for the nation. RETI is a strong step forward, which must be joined by the ongoing efforts by the Western Governors' Association Western Renewable Energy Zone ("WREZ") process, other state and regional processes, and the federal attention needed to support and implement these renewable energy planning efforts.

The RETI process will undoubtedly help facilitate the transmission planning work ahead for California and the West. It is a major step in the right direction, and a significant improvement over the relatively chaotic and uncoordinated process through which transmission planning was more driven by individual utility projects and contracting processes. While the existing process was understandable in light of the environment in which it was created, relying upon conventional resources that could be located wherever it was most convenient, the current process contains an inherent "cart before the horse" problem. Utilities conducted energy contracting processes and began negotiations with energy suppliers and developers. Transmission upgrade costs were, and continue to be, largely required to be financed by those suppliers and developers, providing an economic incentive for conventional facilities to locate in areas that caused the least transmission cost. Renewable power, by contrast, must be located where the resources are located- where the sun shines, the wind blows and geological heat is accessible. The environmental and economic benefits that renewables can provide, as recognized by renewables portfolio standards and greenhouse gas policies that rely on renewable power, simply cannot be achieved through this system. While renewable developers understand their technology and resource areas from a generation standpoint, the tasks of rethinking of the transmission system to support a clean energy economy, and of financing the significant work that needs to be done, requires the active involvement of the wide range of stakeholders embodied within RETI.

The Phase 1B process marks a significant step forward, laying the foundation for that clean energy economy. The Draft Phase 1B results themselves are initial and indicative, rather than "definitive." The report provides a basis for further inquiry as the theoretical projections of Phase 1B

are examined in the context of environmental and economic realities that are not well-suited to the universal methodologies and formulae applied thus far (such as highly fragmented ownership of land that may reduce actual developable land for economic reasons, or, similarly, the 1% development cap that provides an environmental limit to development of some lands managed by the Bureau of Land Management (“BLM”)). The next step in the RETI process, RETI Phase 2, must build on Phase 1B’s indicative results if RETI is to deliver the product for which it was formed: an optimal plan for environmentally-responsible transmission solutions that will yield the clean, sustainable, diverse and reliable power California needs to meet its renewable energy and greenhouse gas goals.

RETI Phase 2 must address two intertwined tasks together, examining both the realistic development potential of the CREZs as well as the system of transmission upgrades needed to deliver their energy. The theoretical potential of the CREZs identified by RETI Phase 1B must be tested, by examining factors that could not be readily taken into consideration in this first phase (such as the extent of market interest in developing in the CREZs, as shown through Power Purchase Agreements and other indicia of commercial seriousness, as well as, on the environmental side, important scenic issues and the aforementioned BLM development limitations). On the transmission side of the equation, RETI must recognize that transmission is an integrated system and not a collection of individual lines. The , overall costs and environmental impacts of the transmission buildout needed to achieve California’s goals may suggest a somewhat different set of CREZs than a focus on CREZs alone might dictate, in isolation and out of context of the grid as a functioning system.

Ultimately, RETI must identify economic and environmentally-responsible major transmission upgrades needed to access CREZs not on a CREZ-by-CREZ basis, but in a comprehensive fashion, based on both realistic development potential and the needs and realities of the transmission system. The final results must provide optimal solutions that will unlock the greatest quantity of diverse renewable resources not just to meet present needs, but for the clean, sustainable and climate-friendly future of California and the West. The LSA is confident that RETI will prove to be of great assistance in finding these solutions.

### **III. Comments on Specific Issue Areas**

#### **A. Assumptions & Methodology**

##### **1. Renewable Generation**

a. Large-scale Solar Technology & Cost Assumptions. Many of LSA’s members had previously raised concern regarding RETI’s technology and cost assumptions for large-scale solar. It has been widely recognized that large-scale solar costs, both thermal and photovoltaic, can be expected to decline as the extensive innovation throughout the solar industry bears fruit.<sup>1</sup> This is true not just for

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<sup>1</sup> Grama *et al*, “Concentrating Solar Power-Technology, Cost, and Markets,” pp. 65-67 (2008); Stoddard *et al*, “Economic, Energy, and Environmental Benefits of Concentrating Solar Power in California,” p. 5-4 (2006)(a Black & Veatch study, using NREL data that showed reduced costs for solar power reduction resulting from “reductions relate to technology advances, scale up, effects of mass production resulting from large scale deployment, and improvements in construction efficiency”); Western Governors’ Association’s Clean and Diversified Energy

new solar technologies, but for solar trough as well.<sup>2</sup> However, the RETI analyses are based on the implemented variety of a single technology, solar trough, which has been in service for thirty years.

The famous admonition of John F. Kennedy, that "those who look only to the past or present are certain to miss the future," is particularly apt for RETI, which is intended to provide an overall plan for renewable transmission to deliver renewable energy from plants not yet built, which will serve the needs of decades to come. The Phase 1B analyses' failure to consider the well-accepted likelihood of improvements, which can be expected to address such issues as adaptations for dry cooling as water resources become less available, mean that the projected costs for solar projects in the CREZs are not those that can be expected at the time that the transmission is implemented, but rather historic costs of little relevance to the period for which RETI is intended to plan. Unfortunately, the indicative results of the Draft Report for large-scale solar facilities thus reflect unjustly unfavorable economic rankings of CREZs containing solar resources.

Although large-scale solar will represent a mix of technologies, including varieties of both photovoltaic and solar thermal facilities, it is clear that the pricing of decades-old thermal technology that does not reflect recent advancements is not likely to be representative. The sensitivity study for thin film solar photovoltaics, by contrast, provides an indication of the likely reduction of solar costs over the time for which RETI-proposed transmission will be in service. The LSA therefore recommends that RETI use the thin-film sensitivity study cost data as the proxy cost for large-scale solar development in the CREZs, rather than unimproved solar trough. At a minimum, however, RETI must indicate, in all of the CREZ charts in which economic results are shown, how the CREZs would be ranked if thin-film costs were used in lieu of the current assumptions, in order to inform decisionmakers of the trend towards reduction of solar costs for the periods for which the transmission at issue will be used.

b. Consideration of Integration Costs, Resource & Geographical Diversity. As part of Phase 2, which will examine factors not taken into consideration in Phase 1, it is extremely important that RETI take integration costs into account. Off-peak resources will create extensive work for reliable integration into the transmission system, an issue that has caused great difficulty in other areas of the country, and that the CAISO has begun to examine for its own grid. The resulting expensive integration costs simply have not been modeled thus far in RETI. These issues, if modeled, would very likely require re-ranking CREZs; integration of off-peak resources can be expected to have environmental

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Advisory Committee, "Solar Task Force Report," pp. 1, 15-16 (2006)(stating "Initial system expense is currently the single biggest barrier to widespread deployment of solar. Worldwide experience has shown, however, that these costs can be driven down through accelerated growth sparked by temporary economic-development policies" and explaining that "Cost reductions in CSP systems will be driven by three factors – further technology development, volume production and scale-up in plant or project size. Technology development includes evolution in the performance and reliability of specific technology components, improvements in construction techniques and Operations and Maintenance (O&M) due to learning experience as more projects are installed. Volume production brings significant cost reductions with increased deployment due to decreases in manufacturing cost, material procurement costs, standardized engineering and project development costs. Large power plant sizes or multiple plants in a single project invoke economies of scale in equipment and systems"). Sargent & Lundy, "Assessment of Concentrating Solar Power Technology Cost and Performance Forecasts," pp. 9-18 (2005 update)("S&L Report").

<sup>2</sup> See, e.g., S&L Report at pp. 9-14.

consequences as well, depending upon the resources used to provide on-peak power. The selection of CREZs must take into consideration how the mix of resource types and geographical locations will change the total renewable capacity needed to not only achieve numerical renewables goals but to achieve the overall reductions in greenhouse gases California requires, as well as to attain other intended economic and environmental benefits.

c. Distortions Resulting From Inclusion of Non-Representative Projects. The inclusion of projects within CREZs that are not consistent with the overall economic and environmental performance of the majority of the projects within the CREZ appears to throw the ratings off, conveying a false sense of the overall CREZ performance. Since uneconomic and environmentally less appropriate projects are much less likely to be developed even within a priority CREZ, those outliers should have been excluded entirely, rather than subdividing CREZs to “gerrymander” them into sub-CREZs. The sub-CREZ division creates two major distortions, each of which causes undue and inappropriate negative rating of renewable areas that would otherwise receive far better, and far more realistic, results. First, transmission costs for each sub-CREZ are apparently spread over smaller numbers of generators, increasing their apparent- but not actual- transmission cost. Second, the projected costs of the sub-CREZs with outlier projects are decreased to an even greater extent than if the outliers were considered within a larger pool of resources. LSA strongly believes that CREZs should be identified by logical geographic and resource potential boundaries along with transmission solutions, and that outliers that would impact the overall rating be excluded from the analyses. It would be more accurate, straightforward and realistic to simply eliminate projects rather than including projects that would never survive the marketplace. This is a critical distortion that must be removed.

d. Energy Value Figures. The LSA questions the relatively low spread in the energy value figures in Appendix D of the Economic Assessment. The LSA has not had the opportunity to fully examine or understand the specific formulas and methodologies used to arrive at these energy values. The real marketplace shows a much greater spread in the pricing of energy and capacity, depending upon availability. The LSA suggests that RETI undertake an examination of several years of energy prices in the market place to see the relative spread between baseload, intermediate and peaking energy. In addition, with respect to solar resources, relative insolation values between CREZs should also have had a more significant impact, and it appears that this has not been properly captured. Lastly, we note that the California Public Utilities Commission is now considering the relative value of capacity of intermittent resources, including the prioritization of capacity on peak, when it is needed most and when solar energy is at its maximum output; the results of this proceeding should be taken into consideration in Phase 2, as time allows.

## 2. Renewable Transmission

a. Distortions Resulting from Treatment of Certain Planned Projects as “Sunk.” The draft report shows that the treatment of certain planned transmission projects as a sunk cost has ramifications well beyond those anticipated, creating distortions that must, at a minimum, be properly explained and placed in context. This single assumption is a significant driver of results, and provides an erroneous implication to the layperson that the total costs of CREZs served by such transmission are, on the whole, less expensive and have lesser environmental impacts than others- when the contrary may well be the case. Treating certain transmission as sunk creates a potential permanent bias toward a

CREZ tied to these transmission lines, despite the fact that some of these lines have not yet received full approval.<sup>3</sup> LSA strongly recommends that the methodology used by RETI expose all transmission costs to provide transparency and clarity to decisionmakers.

There should be nothing to hide by treating transmission as an incremental rather than sunk cost; the extent to which assumed transmission projects and the CREZs that they serve are economically sound is important information that should be available to allow a fair and transparent comparison to other projects that RETI may propose. As the sunk cost assumption alone has a substantial influence on the relative CREZ ratings depicted in Figure ES-1, affecting both conclusions and ranking to a greater degree than any other factor alone, it must be addressed and exposed in detail. At a minimum, an alternative scenario figure should be created to show the effect of this assumption (e.g., a second bubble chart showing the effect of including the costs of these projects on the relative CREZ economic and environmental ratings).

b. Costs of Interstate Transmission Improvements are Improperly Imputed Solely to CREZs. LSA is concerned that the RETI transmission costs assumptions do not take into consideration the interstate benefits of many of the grid improvements that would be associated with CREZ renewable energy delivery projects. The economics and probability of success for such interstate lines will improve when they are viewed in a regional context benefitting multiple states and provinces rather than one-way generator interconnections for the sole benefit of California's renewable energy and greenhouse gas programs. It is LSA's belief that these interstate lines will be critical for transmission reliability in the West, including the successful and economic integration of renewable resources. Renewable energy potential will be realized to a much greater extent when these interstate lines are built, and California will then be in an excellent position not just to import, but also to export and exchange renewable power across the region.

The current RETI approach treats new interstate transmission solely as a California generator interconnection issues, and therefore entirely as California costs to be associated with CREZ development. To the contrary, much of the transmission that would be put in place for purposes of delivering renewable energy from CREZs would have to be planned to serve regional transmission needs in any event, and will ultimately be more economic when other states' utilities share in the costs of this transmission. The RETI transmission cost assumptions must incorporate these interstate benefits and apportion costs accordingly, and not assign such costs solely to individual CREZs (similarly, LSA strongly believes that transmission solutions will be found that serve multiple CREZs, reducing the costs that the Draft Report associates with single CREZs). Ultimately, the RETI output should be fed into a larger interregional effort along with similar state efforts. This coordinated effort will be critical to planning the interstate transmission to best serve all of the Western states with renewable energy while maintaining a reliable grid.<sup>4</sup>

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<sup>3</sup> Although the projects for which costs are treated as sunk are planned and in various states of early development, they are certainly not all guaranteed. For example, the Sunrise project is currently before the CPUC, and the SCE's application for PV-D#2 is currently before FERC after denial by the Arizona Corporation Commission.

<sup>4</sup> For example, British Columbia has become a net importer of power. The RETI report shows the potential biomass resource in BC as a potential California import. LSA believes BC will ultimately need transmission for purposes of accessing interregional resources as well. It is very possible that BC might be importing wind power from WY and solar power from AZ or CA at the same time that BC biomass power is being purchased by California. Each state or province, and each utility, will be better off with access to multiple CREZs and multiple renewable technologies, rather than putting too much emphasis on a narrowly constrained subset of CREZs or renewable technologies.

The LSA suggests that the next phase of RETI specifically describe how regional transmission and renewable resources are to be integrated. For example, the RETI report concludes that interstate transmission is necessary to interconnect out-of-state resources. The RETI report assumes some lines current under planning will be built to import renewable power, and describes a potential transmission project linking British Columbia, Washington, Oregon and California. These interstate lines must be planned in an overall regional context, to avoid the appearance that California intends these lines to serve California alone, turning other states and provinces into export-only, cash-crop energy farms for California's sole benefit.

c. Unsubstantiated Assumptions Regarding Transmission System Costs for Distributed Generation and Smaller Projects. LSA questions the assumption that transmission costs for renewables that connect at the distribution level would not require expensive transmission upgrades. LSA's understanding is that unless projects are sited at load centers, and do not provide energy not in excess of the load center's needs, transmission upgrades may be required that may incur significant time, expense and controversy (as transmission projects near or within load centers are often difficult to implement). Distributed transmission is not usually in surplus, with few exceptions. In addition, the assumption that solar PV and biomass may be interconnected in Northern California at the distribution level is not explained; the assumption must be substantiated, and if accurate the assumption must be applied not solely to solar PV and biomass, but to other projects possessing comparable attributes with respect to transmission.

#### B. Out-of-State Resources

The LSA understands that out-of-state resources will be further examined in the next phase of RETI, and supports efforts to determine comparable economic and environmental assessments of those resources as part of this analysis. LSA appreciates the time and resource limitations that prevented more in-depth discussion and consideration of out-of-state resources, and looks forward to the opportunity to comment upon further development of these issues in the next phase of RETI.

#### C. The Renewable Transmission Grid Must be Planned for More Than the RETI Net Short

LSA believes that it would be a major error to focus only on what is necessary to meet the RETI net short as an absolute number. Many factors argue in favor for building sufficient capacity in the right environmental and economic locations for the long-term, not just enough capacity for theoretical optimal production in the short-term, including:

- the need to accommodate intermittent resources from diverse technologies and geographical areas to maintain reliability;
- the environmental interest in building once to provide sufficient capacity for the long-term future rather than imposing repeated construction and additional lines;
- the interdependent nature of the Western grid, which will require consideration of exports as well as imports and the potential that lines will not always be at full capacity; and
- the likelihood that no CREZ will be built out to its total theoretical potential.

LSA believes it will be necessary and prudent to pursue transmission plans on both an intrastate and interstate basis that have the capacity to responsibly and reliably support this clean energy future.

Given the opportunity, with the range of stakeholders involved in RETI, to plan now for the environmentally-responsible and economic grid we will need in the long-term, as well as the timeframes, complexity and difficulty in building major transmission lines, it would be most prudent for RETI to plan more comprehensively for future needs with as much foresight as we can collectively muster. If we only plan for exactly what is needed, we risk falling short, finding ourselves with fewer or perhaps uneconomic and environmentally less desirable options, as well as the potential that approved projects were undersized relative to long-term need, and could have been built with greater capacity, avoiding the economic and environmental impact of subsequent projects. Although planning and building for more than is immediately required will demand additional work and resources, LSA believes that such an effort – when coordinated on a regional basis – will actually be less work than would have been the case outside of RETI, as transmission planning of the last two decades has been incremental, involving much less broad stakeholder coordination and much more controversy.

#### **IV. Summary**

The LSA again commends Black & Veatch for its outstanding work throughout the RETI process, as well as the many volunteers from the wide range of stakeholders who are involved with RETI and have been working with remarkable diligence to make it a success for both the environment and the economy. The first phase has moved the RETI process forward, though much work remains to be done to truly achieve RETI's promise. The Draft Report, and the next phases of RETI, can only assure that RETI will contribute to the economic and environmental realization of California's renewable energy and greenhouse gas goals if:

- RETI builds on the theoretical results of Phase 1, validating CREZ potential to prioritize real projects and consider the overall system of transmission upgrades that will be needed;
- All transmission costs are treated on an equal footing, and CREZs (and distributed generation) are rated based on total comparable transmission costs, without the extreme distortions caused by treatment of some major projects as "sunk";
- RETI recognizes that major transmission is interstate in nature, serving regional needs, and that California will not merely be an importer of renewable energy, but will export and exchange renewable energy;
- RETI utilizes the cost assumptions from the solar thin-film sensitivity study in place of the pricing based on decades-old solar technology, which is widely acknowledged to decrease over the time period for which RETI is now planning;
- RETI reexamines energy values, and takes relative integration costs and capacity contributions seriously, recognizing the work that the CPUC and CAISO are undertaking in these regards;
- RETI eliminates outlier projects, rather than distort CREZ economics by gerrymandering such projects into sub-CREZs;
- RETI provides further consideration of the economics and environmental concerns associated with the contributions of out-of-state resources; and

- RETI plans not just for immediate needs, but comprehensively considers the long-term needs of California and its interaction with its neighbors, so that transmission is built in the right, environmentally-responsible places and with sufficient capacity to minimize the economic and environmental impacts of future projects that would have been avoided.

The LSA and its members look forward to continuing its work with RETI, Black & Veatch, and all stakeholders to build on RETI's accomplishments thus far, and to help RETI fully satisfy its intent and promise.