

**Comments of the Natural Resources Defense Council (NRDC) on the  
Draft 2013 Integrated Energy Policy Report (IEPR)**

**Docket 13-IEP-1A**

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Submitted by:

Lisa Xue

lxue@nrdc.org

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## **I. Introduction**

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer comments on the “Draft 2013 Integrated Energy Policy Report” (draft IEPR). NRDC is a nonprofit membership organization with a long-standing interest in minimizing the societal and environmental costs of providing the reliable energy services that Californians demand. We represent our nearly 80,000 California members’ interests in receiving affordable energy services and reducing the environmental impact of the state’s energy consumption.

NRDC appreciates the ongoing effort of the California Energy Commission (CEC) staff to address the numerous energy issues facing California and applauds the overall focus of the draft IEPR on increasing energy efficiency and meeting renewable energy targets. We provide comments on a select number of chapters and recommend that the Commission adopt the final 2013 IEPR with the following additional suggestions.

## **II. Chapter 1: Energy Efficiency – Progress Toward Achieving Energy Efficiency Targets**

- 1. We recommend that the CEC include statewide goals for energy efficiency in the final IEPR and begin conducting a comprehensive AB 2021 report to ensure the state scales up efforts to achieve California’s climate goals.***

California has shown great success in capturing energy savings through our efficiency policies over the past four decades. However, we must scale-up our efforts to meet the state’s longterm climate goals and we look to the commission to set us on the right path. Therefore, the CEC should produce an estimate of statewide energy efficiency potential and a best estimate for utility targets over the next ten years. The vast majority of publicly owned utilities (POUs) submitted ten-year targets to the CEC in March 2013 for the POU’s annual energy efficiency report, and the CPUC (or Commission) has produced ten-year “Mid Case” estimates of energy efficiency potential in its 2013 Energy Efficiency Potential Study.<sup>1</sup> The CEC has received and analyzed these data and should provide a best estimate of these ten-year targets in the final IEPR.

Furthermore, the IEPR rightly notes that the CEC is required “to develop statewide energy efficiency potential estimates and targets for California’s publicly owned and investor-owned utilities” per AB 2021. The Commission should therefore get started right away on the

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<sup>1</sup> CPUC/Navigant, 2013 California Energy Efficiency Potential and Goals Study, Final Draft Report (August 2013).

AB 2021 report to set specific energy efficiency targets over the next decade and provide clear recommendations for how the state can dramatically scale-up energy efficiency.

2. ***We recommend the CEC work with public power and provide the necessary support to ensure they are capturing all potential cost-effective energy efficiency; reaffirm the importance of independent evaluation, measurement, and verification; and modify the interpretation of challenges with cost-effectiveness showing.***

The POUs have played a significant role in contributing to statewide energy efficiency savings while also lowering bills for their customers and reducing pollution. However, as the IEPR notes (p.34), POU energy savings and investments have been leveling off in recent years and many are not on track to meet the intent of AB 2021. Therefore, we recommend that the CEC continue to work with the POUs to set aggressive targets based on a transparent analysis of the POU potentials and explore strategies to help POUs meet these targets. We incorporate our analysis of the POUs' March 2013 status report on energy efficiency achievement for reference as Attachment A.

#### *Evaluation, Measurement, and Verification(EM&V)*

In addition, evaluating and reporting on energy efficiency achievements – as well as areas for improvement - is critical to the future success of efficiency programs. Such information is essential for program planners, stakeholders, and policymakers to better understand the impacts of efficiency programs, know which successful programs should be continued or expanded, and modify programs that are not performing as expected. The final IEPR should reflect the fact that the original requirement for POUs to conduct and annually report their independent EM&V analyses remains unchanged. NRDC and the Northern California Power Agency (NCPA) agreed that AB 2227 continues this annual EM&V requirement, as described in the attached joint NRDC/NCPA letter.<sup>2</sup> We therefore urge the commission to modify the following language in the Draft IEPR, to include this interpretation in the final IEPR, and to ensure the language does not minimize the value of transparency and reported information.

We offer the following suggestions for your consideration:

~~“This consolidation will streamline the process and allow the POUs to focus their resources on implementing efficiency programs rather than on more easily reporting their savings. Under the consolidated requirements, POUs will provide updated targets every four years rather than every three,~~

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<sup>2</sup> See Attachment B: RE: *Energy Efficiency in California's Public Power Sector*

as was originally required by AB 2021. However, AB 2021 did not change the requirement that POU's must conduct independent EM&V and report the results on an annual basis, as agreed to by the Northern California Power Agency and the Natural Resources Defense Council." (p. 32 of Draft 2013 IEPR)

### *Cost-effectiveness*

Cost-effectiveness of energy efficiency programs is calculated using input assumptions determined by summing total costs and total benefits of running the programs. Costs comprise largely the total costs to the utility of administering programs and the costs of customers' investments, depending on the type of cost-effectiveness test used. Benefits include the monetary benefits of the energy, as well as the supply-side resources avoided due to the programs. However, the differences in the revenue structure as well as the financial structure between investor-owned utilities and POU's do not impact the cost-effectiveness calculation in any way.

Therefore, we strongly recommend the CEC amend the following sentence:

"Cost-effectiveness is ~~difficult to compare~~ sometimes calculated differently between POU's and IOU's both because of the differences in their regulatory, ~~financing and revenue~~ structures and for lack of data about cost-effectiveness inputs for individual POU's." (pp. 33-34, Draft 2013 IEPR)

### **3. *We urge the Commission to include location efficiency, energy performance ratings, and plug load standards as part of or in support of the ZNE definition.***

In the draft IEPR, CEC proposes the following definition for a zero net energy (ZNE) code building: "A ZNE Code Building is one where the societal value of the amount of energy provided by onsite renewable energy sources is equal to the value of the energy consumed annually by the building at the level of a single "project" seeking development entitlements and building code permits, measured using the California Energy Commission's Time Dependent Valuation (TDV) metric. A ZNE Code Building meets Energy Use Intensity by building type and climate zone that reflect best practices for highly efficient buildings."<sup>3</sup>

While we generally support this definition for a ZNE code building, we offer the following specific comments for additions and modifications:

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<sup>3</sup> IEPR, Page 28

*Location efficiency should be integrated into the final ZNE definition.*

Currently, the definition of a ZNE code building does not account for the location of a building, which can greatly affect a building's overall energy use and costs. For instance, while a typical home's energy bills might range from under \$1000 to \$5000 annually depending on a home's efficiency, transportation costs for a location inefficient home might be as high as \$12,000 annually. Failing to integrate location efficiency into the definition of a ZNE code building could create a perverse incentive that encourages the development of location inefficient buildings in order to accommodate onsite generation. We recommend that the definition of a ZNE code building be modified to include a metric for a building's location efficiency and that the definition should reward buildings that are more location efficient.

*An energy performance index should be used instead of the Energy Use Intensity (EUI) metric.*

While we support what we believe is the intent of the EUI metric –to ensure that best practices for efficiency are met before onsite generation is sized or added – we do not think that a maximum EUI requirement is a workable metric to implement. Given the vast array of building types and levels of energy services, it is likely to be extremely challenging to come up with specific EUI targets that are applicable across a range of buildings. We think that it would be more workable to develop an energy performance index or asset rating, which would accomplish the intent while normalizing for a range of occupancy types and levels of energy service.

*Efficiency of plug loads and appliances should be encouraged through the ZNE code definition.*

In the draft IEPR, the CEC states that a “ZNE Building Code determination will be based on “typical” levels of portable “plug load” equipment.” (p.29) Plug loads and appliances are responsible for the majority of electricity use in residential and commercial buildings in the US (EIA 2013), and an even higher share in efficient buildings in California. While the building codes cannot influence what portable equipment is brought into the building later, they should account for the fact that there will be plug loads and appliances brought into the building during its operation, and that a building cannot be truly ZNE in the real world if the building only meets ZNE when plug loads and appliances are excluded.

Therefore, the standards should account for an estimated efficient electrical load for plug loads and appliances in line with load levels achievable for this equipment by type of space given state and federal standards, and California utility incentive programs in effect at the period of time being considered. While this will not match the exact energy use in each occupied building,

it will at least give occupants of ZNE buildings a chance to achieve ZNE in real life while occupying the building. Building codes also have a role to play in minimizing plug load and appliance energy consumption. For instance, regulations for plug load energy reporting and control: sub-metering, communications networks, plug load controls for demand/response and price responsiveness, and designing a building for energy efficient server rooms and closets.

Including plug loads and appliances in the definition of ZNE will also provide a strong connection between building and appliance efficiency policies, as well as an incentive for a comprehensive approach to achieving ZNE during operations.

### **III. Chapter 2: Demand Response—Backup Generators**

Our comments on “Chapter 2: Demand Response” are discussed in a separate, jointly submitted “Comments of the Environmental Defense Fund (EDF) and Natural Resources Defense Council (NRDC) on the California Energy Commission’s 2013 Integrated Energy Policy Report Draft Lead Commissioner Report (IEPR)”, dated October 29, 2013, by Lauren Navarro of EDF and Pierre Bull of NRDC.

### **IV. Chapter 4: Electricity—Preliminary Forecast of California Energy Demand**

- 1. We urge the Commission to correct the serious error in the draft IEPR, which puts forth an outdated statewide forecast, by including a forecast that includes all reasonably expected energy savings from efficiency.***

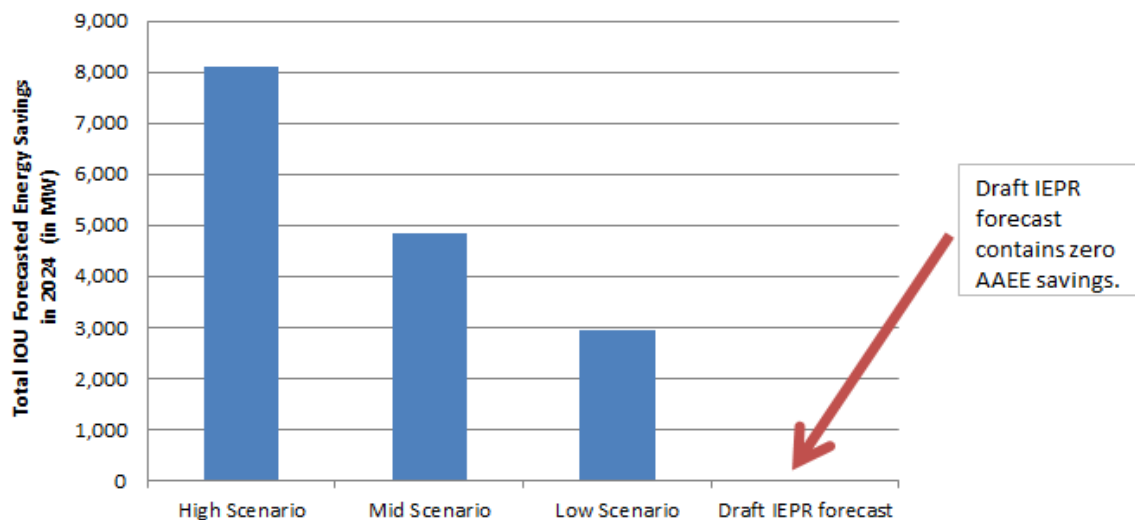
We appreciate the CEC’s work, along with the CPUC and California Independent System Operator (CAISO), to coordinate on energy efficiency issues throughout the year. However, the California Energy Demand forecast in the draft IEPR does not fulfill the CEC’s previous commitment to include a reasonable amount of energy efficiency into the CEC’s demand forecast. In fact, the draft IEPR includes a demand forecast that omits 100% of the Additional Achievable Energy Efficiency (currently known as AAEE, previously known as “incremental uncommitted”).

The draft IEPR uses an outdated forecast from May 2013 (p. 76-77), which does not



include any additional achievable energy efficiency savings.<sup>4</sup> Since May 2013, the CEC, CPUC, and ISO have worked together with stakeholders to estimate energy efficiency savings over the next ten years that are achievable through energy efficiency programs, codes, and standards. The CPUC conducted a significant potential study and various parties have reviewed and discussed the results. The CEC has also produced estimates of how much energy efficiency is reasonably expected to occur. We present the Mid Case Scenario of AAEE savings in Figure 1 below, which materially alters the demand forecast currently in the draft IEPR. To comply with the state’s effort to use efficiency first in the loading order and to ensure efficiency is used in resource planning to reduce the need for investments in conventional power, it is critical for the CEC to include a reasonable amount of AAEE savings in the Final IEPR.

**Figure 1: Draft IEPR Forecast Omits All Additional Achievable EE Savings<sup>5</sup>**



Furthermore, the CEC has committed to using a statewide forecast that included reasonable amounts of energy efficiency in its IEPR process: “[T]he agencies will work together in each IEPR cycle to arrive at a single recommended forecast that encompasses both the CEC adopted electricity demand forecast and the CEC adopted additional achievable energy efficiency forecast.”<sup>6</sup> Since that commitment in February 2013, the CEC, CPUC, CAISO, and stakeholders have invested significant resources into discussing and revising energy efficiency

<sup>4</sup> “Uncommitted efficiency impacts are not estimated for this report; staff analysis for this purpose will follow later in 2013.” CEC, *California Energy Demand 2014-2024 Preliminary Forecast*, p. 5 (May 2013).

<sup>5</sup> Data from: CEC, *California Energy Demand 2014-2024 Revised Forecast*, Table 2: Combined IOU AAEE Savings by Type, 2024, p. 5 (October 2013).

<sup>6</sup> “B. Weisenmiller, M. Peevey, S. Berberich, Letter to the Honorable Alex Padilla and the Honorable Jean Fuller, p. 3 (February 28, 2013) [hereinafter “Padilla/Fuller Letter”].

forecasts. We therefore urge the CEC to include reasonable amounts of additional achievable energy efficiency in the final IEPR.

*Reasonably Expected To Occur Savings for Investor-Owned Utilities (IOUs)*

At a minimum for investor-owned utility energy savings, NRDC recommends that the CEC adopt the Mid Case Scenario of energy efficiency savings, which the CEC presented at the October Revised Forecast workshop. The Mid Case Scenario is a conservative estimate of future energy savings. In fact, the experts that developed the models underlying this “Mid Case Scenario” called this estimate “conservative” at the October Revised Forecast Workshop.<sup>7</sup> The Mid Case Scenario is conservative because it: (1) assumes that utilities’ efficiency programs never improve over time, (2) excludes all future adopted federal appliance efficiency standards, (3) does not include the full potential from retro-commissioning of buildings, and (iv) only includes a subset of all emerging technologies and de-rates the savings of those emerging technologies based on “risk adjustment factors.”<sup>8</sup> For these reasons, the Mid Case Scenario is an extremely conservative estimate of the likely savings in the IOU territories, and is the minimum the CEC should use in the final demand forecast.

*Reasonably Expected to Occur Savings for POU*s

For the publiclyowned utilities, the final forecast should be changed to include the POU’s ten-year targets, which are reasonably expected to occur. Currently, the forecast excludes the vast majority of savings from future POU efficiency programs even though the POU’s conducted long term energy efficiency potential studies this year, and submitted the results to the CEC in March 2013. POU’s expect to save over 1,300 MW over the next ten years through their energy efficiency programs.<sup>9</sup> Their estimate is conservative, only seeking to achieve less than half of the cost-effective savings available.<sup>10</sup> However, the current forecast excludes the vast majority of the POU’s savings, only including one out of these ten years of savings, which is unreasonably low.

**2. We urge the CEC and joint agencies to fulfill their commitment and adopt one forecast,**

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<sup>7</sup> “ . . . I’ve always considered that the Mid case is a fairly conservative look going forward.” CEC, Revised Forecast Workshop Transcript, p. 93 (October 1, 2013).

<sup>8</sup> See NRDC comments on the Revised Forecast for full details on the conservative nature of these estimates. NRDC, Comments of the Natural Resources Defense Council on the Lead Commissioner Workshop on Revised Electricity and Natural Gas Demand Forecasts 2014-2024, (October 15, 2013).

<sup>9</sup> CMUA/NCPA/SCPPA, Energy Efficiency In California’s Public Power Sector- A 2013 Status Report (March 2013).

<sup>10</sup> POU’s estimated that the total amount of cost-effective savings were over 3,300 MW over ten years. *Id.*

*inclusive of efficiency, to avoid the risk of over-procuring conventional resources.*

As committed to earlier this year, we urge the Commission and joint agencies to settle upon a single demand forecast that includes expected energy efficiency. In February 2013, the CEC, CPUC, and CAISO agreed to make significant changes to their respective planning processes in order to come to agreement on a single forecast that includes energy efficiency savings: “We will increase the transparency of and coordination between our respective procurement and transmission planning processes by using one demand and additional achievable energy efficiency forecast that will be developed with CAISO and CPUC input during the Integrated Energy Policy Report proceeding.”<sup>11</sup> The joint agencies made clear that this would be a single forecast case that would include additional achievable energy efficiency.<sup>12</sup>

In the past, each entity used their own forecasts, for the biennial IEPR report, for transmission plans, and for procurement decisions, but some omitted energy savings from future energy efficiency efforts altogether. Thus, the agencies’ commitment to produce a single forecast that includes a reasonable amount of future energy efficiency savings is an important step forward. Timeliness of this joint forecast is critical to avoid the risk of authorizing unneeded power plants in the CPUC’s long-term procurement proceeding. Furthermore, in the February 2013 letter to Senators Padilla and Fuller, the joint agencies committed to agree upon a single forecast by November 2013.<sup>13</sup> The purpose of the joint forecast was to inform procurement plans and avoid the procurement of unnecessary power plants.<sup>14</sup> Subsequently, in May 2013, the CPUC opened a new procurement process in order to address local procurement needs in Southern California (Track 4 of the Long Term Procurement Plan proceeding, R.12-03-014). To meet the agencies’ original commitment to determining one forecast and in order to impact the procurement plans for Southern California, the CEC and joint agencies should release a proposal for the joint forecast as soon as possible.

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<sup>11</sup> B. Weisenmiller, M. Peevey, S. Berberich, Letter to the Honorable Alex Padilla and the Honorable Jean Fuller, p. 6 (February 28, 2013).

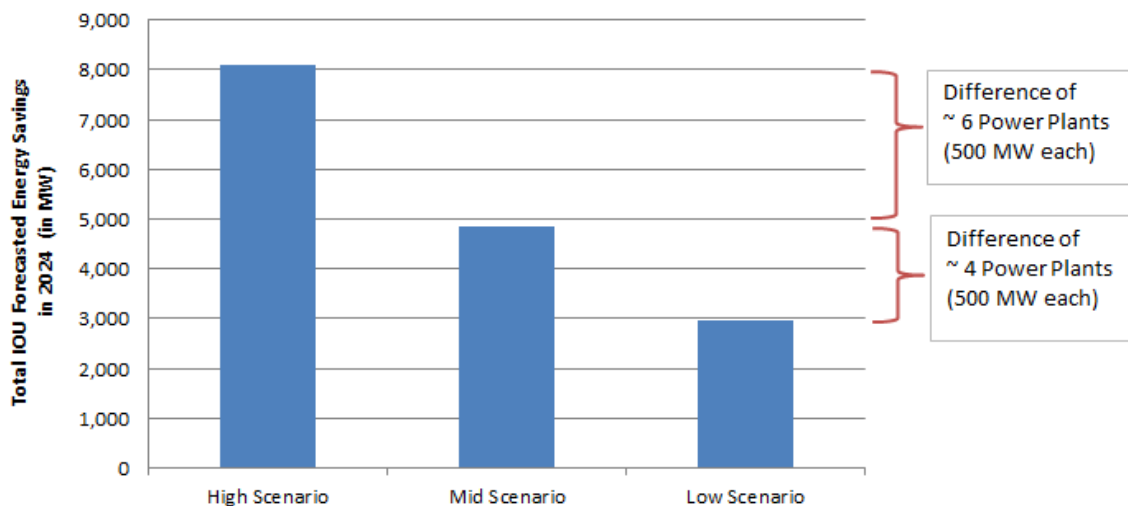
<sup>12</sup> “As noted above, the agencies will work together in each IEPR cycle to arrive at a single recommended forecast that encompasses both the CEC adopted electricity demand forecast and the CEC adopted additional achievable energy efficiency forecast.” *Id.* at 3.

<sup>13</sup> “November 2013: . . . The three agencies agree on a single forecast case, including additional achievable energy efficiency, . . .” *Id.* at Attachment 1: Schedule for 2013 IEPR, at A-1.

<sup>14</sup> “[I]t is crucial to appropriately and consistently consider energy efficiency savings in energy forecasting, electricity procurement planning, and transmission planning to avoid over- or under-building the electricity infrastructure, . . .” *Padilla/Fuller Letter* at 1.

In the CPUC’s Long-Term Procurement Proceeding, the current schedule is set to decide whether any, and if so, ‘how many,’ new power plants will need to be built in Southern California (Track 4) as early as January 2014. However, any delay in the CEC’s final demand forecast runs the risk that the CPUC may not benefit from the use of the updated forecast in its final decision. As shown in Figure 2 below, the difference in estimated needs among the investor-owned utilities due to the differences in the CEC’s various forecasts could be the equivalent of ten large power plants (500 MW each). Therefore, it is critical that the Energy Commission fulfill their commitment as soon as possible in order to avoid the risk of building unneeded power plants in California.

**Figure 2: Underestimating Energy Savings Has Significant Consequences<sup>15</sup>**



## Chapter 4: Electricity – Once-Through Cooling

### 1. *We encourage the CEC to adopt the following suggested language modifications to more accurately represent the current status of once-through cooling policies and implementation.*

- p. 95: ~~Unwillingness of the~~ “The State Water Resources Control Board has established a clear process to Modify Once-Through Cooling Compliance Dates, should modification be necessary to maintain reliability.”
- p. 97: "Close monitoring of such programmatic activities is needed to determine whether energy efficiency impacts or demand response capabilities are actually being developed, given actual amounts and actual locations, are

<sup>15</sup> Data from: CEC, *California Energy Demand 2014-2024 Revised Forecast*, Table 2: Combined IOU AAEE Savings by Type, 2024, p. 5 (October 2013).

displacing to displace more or less generation than was expected. If preferred resources are higher than expected, some present day authorizations for conventional generation may be made unnecessary.”

- p. 98-99: "The CPUC, the Energy Commission, and the California ISO need time to address the design and funding for incremental energy efficiency, combined heat and power, and demand response. However, energy efficiency is the fastest resource to come online, especially compared to conventional generation, making it an ideal resource to meet upcoming needs."
- p. 99: "The SWRCB OTC policy considers the possibility that delays in adopted compliance dates might be justified by delays in developing infrastructure needed to allow a specific OTC power plant to retire. However, the energy agencies have not yet suggested to SWRCB that such a delay is needed and have not completed any studies showing that the timeline for a preferred infrastructure project needed for local capacity requirements or other criteria would justify a delay for a specific OTC facility or unit. The SWRCB has indicated it will take such recommendation very seriously. It is unclear what constitutes enough evidence for the energy agencies to make such a recommendation or for SWRCB to accept it in the face of likely opposition from environmental advocates seeking to maintain the original OTC compliance schedule."

**2. *We urge the CEC to correct the figures in the “Study 4” column of Table 13.***

The numbers shown in Table 13 are incorrect and inconsistent with other studies. (p.92) First, in the column labeled “Study 4: 2012 LTPP Track 4 w/o SONGS,” the bottom three rows under the header “Results” should not be listed as hard figures, since there is a range of estimates that have been produced in the California Public Utilities Commission long-term procurement planning proceeding. Specifically, there have been many recommendations in the proceeding for no additional capacity in LA and SD. Therefore, the correct range should be 0 to 1,922 MW for LA Basin and 0 to 612 MW for San Diego. Since no study results have been adopted, the full range of options should be presented in the IEPR.

In addition, on p. 92 of the draft IEPR, the “Total Repower & New Gen” estimates for Study 4 yields are estimate of over 4,500 MW for the LA Basin and SD combined. This is a much higher result than those reported in ISO, SCE, and SDG&E’s testimonies. The table provided below, taken from ISO’s testimony in the Track 4 CPUC proceeding, shows a recommendation of maximum of 2,534 MW of “Total Repower and New Gen” (That is, 1,922 MW in LA and 612 MW in SD). The final IEPR table should be updated to include values that are supported by and consistent with this testimony.

**Table 13 – Residual Resource Needs in 2022 Without SONGS**

Scenario	Track 1 Decisions (MW)		Track 4 Studies (2022) (SONGS Study Area = LA Basin + San Diego) (MW)				Residual Resource Needs (Total Track 4 – Maximum Track 1) for SONGS Study Area (MW)
	LA Basin	San Diego	DR Assumptions Modeled for Studies***	Inc. EE Assumptions Modeled for the Studies	System- Connected DGs (Commercial Interest)	Identified Resource Needs Without SONGS	
80%/20% (LA/SD) Total Resource Development Scenario	1,800*	308**	198	983	1,016 (Installed) 457 (NQC)	4,642	4,642 – 1,800 – 308 = 2,534 Breakdown: LA Basin (1,922) San Diego (612)
Two-thirds/One- Thirds(LA/SD) Total Resource Development Scenario	1,800*	308**	198	983	1,016 (Installed) 457 (NQC)	4,507	4,507 – 1,800 – 308 = 2,399 Breakdown: LA Basin (1,222) San Diego (1,177)

Source: CAISO, Track 4 Testimony Of Robert Sparks On Behalf Of The California Independent System Operator Corporation, R.12-03-014, p. 26 (August 5, 2013).

## Chapter 5: Strategic Transmission Investment Plan

NRDC believes the strategic transmission plan is in many respects a robust view of the near term transmission needs for the state. It correctly identifies the numerous transmission projects already under construction or imminently so that facilitate meeting California's Renewable Portfolio Standard (RPS) goals. However, the IEPR should continue to advance more policies to support (a) meeting future transmission needs for both imported and in-state generation suitable for increasing the penetration and integration of preferred renewable energy resources, (b) facilitating the development of low conflict areas in-state, and (c) prioritizing transmission options that provide multiple values to Californians.

- NRDC recommends that the CEC consider additional transmission proposals and consolidate transmission upgrades to support development of Westlands Competitive Renewable Energy Zone CREZ.***

The Gates to Gregg upgrade (2022) and Warnerville-Bellota upgrade (2017) are

necessary to open the Westlands for in-state transmission projects to be in service in the next decade. The Central Valley CREZ is capable of eventually providing more than 2GW of photovoltaic solar power from chemically impaired farmlands slated to be removed from service. However, the in-service date of 2022 for the Gates to Gregg upgrades is deferred too late for this to occur. Furthermore, even the combination of the two upgrades mentioned above is inadequate to serve the eventual planned build-out of the Wetlands CREZ. Deferring this transmission another nine years could drive away investment for the solar projects in this area.

We therefore recommend the commission consolidate and make further contemporaneous transmission upgrades to support opening and developing Westlands CREZ. We also urge the CEC to consider additional transmission proposals to allow for more transfer capacity in the Central Valley to promote a fuller and faster build-out of the Westlands CREZ.

**2. *We recommend that the CEC coordinate in-state land use and transmission planning by developing a class of lines that prioritize multiple grid and renewable integration.***

NRDC applauds the enhanced coordination among California's energy agencies on transmission issues in effort to reduce transmission approval delays. While much improvement has been made in moving past a reliance on interconnection requests to designate needed transmission, we can still do better. We agree with the analysis on p. 112, which highlights the difficulty faced by developers whose projects are not included in portfolios sent to CAISO due to the commercial interest tests applied by the CPUC. While this appears reasonable on some levels, it excludes transmission with multiple values to the state electrical system needed to serve existing or potential renewable energy zones.

We believe the “multi-value transmission projects” model adopted by the Mid-Continent ISO has real potential value for California.<sup>16</sup> For example, priority could be placed on transmission that is essential to alleviating congestion, providing access to transmission-limited grid services (such as pumped hydro), and serving as a resource zone. Moreover, accelerating generation in areas we wish to encourage (e.g. Solar Programmatic Environmental Impact Studies, Desert Renewable Energy Conservation Plan, or Westlands) would also be prioritized<sup>17</sup>. MISO calls these “Multi Value Projects” (MVPs) and allocates costs in a “postage stamp”

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<sup>16</sup> See report: MISO, Multi-value Project Portfolio, Results and Analyses, January 12, 2012

<sup>17</sup> For more information on siting for transmission projects, please see Attachment C.

fashion as the lines have benefit for all its customers. While a California version of this concept might be slightly different, it is importance for a future in which grid support and integration concerns are equally or more important to us than simple expressions commercial interest.

**3. *NRDC recommends the CEC develop DRECP-like process for the Central Valley targeted at meeting future energy needs and export opportunities.***

NRDC strongly supports the establishment of a Desert Renewable Energy Conservation Plan model (DRECP) for the Central Valley. Utilizing a planned development/conservation strategy for the Central Valley has large benefits that NRDC supports, including:

- Degraded areas with high resource potential
- Forward looking conservation that can aid species and habitat adaptation in the face of expected climate impacts
- The ability to rationalize and prioritize transmission with multiple values, such as:
  - access to nearby load centers
  - congestion relief and prevention on nearby transmission (such as Path 15)
  - reliability enhancement such as improving the access to and utilization of existing and transmission constrained pumped hydro storage at Helms
  - opening future resource zones on disturbed, chemically altered farmlands, reducing water resources conflicts and creating economic benefits in an impoverished part of the state
  - accelerating the ability to convert higher percentages of our electricity system to carbon free generation
  - in-state diversity of generation sources and load shapes.
  - ability to scale transmission needs into the future by utilizing master planning
  - eliminating barriers to PPAs for Central Valley renewable generators by providing access to transmission and aiding compliance with the deliverability requirements of prospective utility procurers
  - greater certainty for investors financing both projects and transmission

For these reasons, we recommend that the CEC utilize, to the extent practicable, existing environmental survey work done on the Central Valley (such as that assembled by the Nature Conservancy) to expedite zone designations and transmission corridor identification. We also urge that the transmission improvements needed for the Westlands CREZ are not delayed as this process unfolds.

**4. *The draft IEPR should include a recommendation for state support of inclusive energy imbalance market (EIM) governance structures to foster broader and deeper regional***



*participation and enable higher levels of renewables.*

NRDC strongly supports the proposed establishment of a CAISO EIM and believes that the IEPR should focus additional emphasis on state support for governance structures for the proposed EIM that would encourage additional entrants into the market. CAISO has done an excellent job launching the program and continued state support for their regional marketing is essential to the success of this vital renewable energy integration and regional electricity coordination tool.

NRDC strongly agrees with exploring and supporting the acquisition of resources from around the West to meet higher penetration and Carbon reduction goals. We especially support and applaud California's leadership in fostering operational coordination across the Western Interconnection (WECC footprint). The benefits to California are numerous, including:

- Reducing integration challenges.
- Lowering the cost of renewable electricity serving California commercial, industrial and residential customers (E.g., studies done by WECC indicate that the cost of generation from very high capacity factor renewable generators can save California electricity customers up to \$600 million a year over generation costs for renewable energy resources produced more locally with lower capacity factors).<sup>18</sup>
- Taking advantage of the uncorrelated variability of renewable resources across the western interconnection which provides balancing services to our own renewable resources, especially wind resources.<sup>19</sup> The development of a regional EIM, such as that proposed by CAISO is an integral step toward creating a real-time regional energy market that will facilitate the balancing the variability of renewable energy resources from one part of the West with those from another.
- Sharing reserve resources.
- Avoiding construction of unnecessary peakers and other fossil generation which can be displaced by renewable energy from some of the highest quality resource areas in North America.
- Creating procurement incentives that lead to more rapid displacement of fossil resources both serving California and other western load centers. This benefit strongly supports AB 32 carbon reduction goals by potentially reducing CO2 emissions from sources not directly controlled by California interests.
- Improving operational controls of the grid, renewable energy forecasts, coordination and/or consolidation of balancing authorities, and faster scheduling and dispatch of

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<sup>18</sup> WECC, "10 Year Regional Transmission Plan Summary," August 2011

<sup>19</sup> See Naughton, Jonathan, Parish, Thomas and Baker, Jerad, January 2013, Wind Diversity Enhancement of Wyoming/California Wind Energy Project, Wind Energy Research Center (WERC), College of Engineering and Applied Science, University of Wyoming

renewable energy and flexibility resources across wide parts of the West. These improvements lead to a more flexible, reliable and cost effective grid that provides California with opportunities to buy and sell resources that are lowest cost and best fit our operational needs. WECC's Variable Generation Subcommittee has performed analysis showing that just *one* of these improvements – 10 minute scheduling – would save western electricity customers up to or more than a *Billion* dollars *annually*.<sup>20</sup>

## Chapter 8: Transportation Energy

NRDC commends Energy Commission staff for their extensive efforts to conduct the transportation energy demand and fuels market assessment and forecasts. The IEPR is extremely valuable in informing California's critical long-term energy planning decisions with necessary information, with a goal of conserving resources and protecting the environment and public safety while enhancing reliability and the economy.

1. *We encourage the CEC, working together with other state agencies including the Air Resources Board, to incorporate an analysis of overall state fuel expenditures to show the effects of state's various policies.*

We thank CEC staff for responding to some of our comments to the June 26, 2013 workshop, including adding additional charts showing fuel costs on a per-mile basis for all fuels (in addition to a cost per gasoline gallon equivalent).<sup>21</sup> Doing so will help policymakers and consumers compare fuels more on an “apples-to-apples” basis since vehicles have different efficiencies. We encourage the CEC to continue to develop more consumer-friendly metrics.

In terms of costs, we also encourage CEC not only to present their forecasts of fuel prices, but also overall fuel expenditures over time. Fuel bills or expenditures, rather than rates or per-gallon metrics, are ultimately the appropriate measure for the state to examine the results of efforts to reduce fuel expenditures over time in the transportation sector. This includes policies such as the clean vehicle and fuel incentives programs, California's Clean Car Standards, regional efforts to reduce the need to drive (SB375), and the diversification of our fuel sources. We urge the commission to work with other state agencies, including the Air Resources Board,

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<sup>20</sup> Hunsaker, Matt, Samaan, Nader, Milligan, Michael, Guo, Tao, Liu, Guangjuan, Toolson, Jacob, December 30, 2012, “Balancing Authority Cooperation Concepts to Reduce Variable Generation Integration Costs in the Western Interconnection”, WECC

<sup>21</sup> “Comments of the Natural Resources Defense Council on the June 26, 2013 Workshop on Inputs and Methods for Transportation Energy Demand Forecasts,” Docket Number 13-IEP-1L, Submitted by: Max Baumhefner

to present overall fuel expenditure trends with the implementation of these policies, as well as a reference case absent these policies.

**2. *NRDC recommends that the CEC provide greater details and clarity on the bottom-up or project data that contributed to scenarios that support meeting key state targets.***

NRDC agrees with the CEC analysis that, under a number of reasonable scenarios, a rapid increase in alternative, low-carbon fuels could meet a number of key state targets—including displacing petroleum, increasing biofuel production and meeting the LCFS. We commend the commission for including “Alternative Fuel Growth Estimates” (Table 17, P.191) and we recommend providing greater details on how fuel volumes were assessed, as well as potentially a low and high estimate for pathways such as biofuels, biogas, fossil natural gas, and electricity. We also note that the cellulosic volumes in 2020 appears conservative, compared to the latest 2013 Biofuels Market Update report by Environmental Entrepreneurs. We encourage the CEC to continue reviewing both domestic and global market developments, as the advanced biofuels market is a constantly evolving one.

We recommend the CEC provide greater clarity on the bottom-up to the alternative fuel data, such as separating out current or expected production capacity data versus the estimated amount that can be delivered to California. For example, while current global capacity for hydroprocessing to produce renewable diesel is pegged at about 740 million gallons globally, another 300 million gallons of capacity is expected by end of next year with completion of the Diamond Green Diesel, Emerald Diesel, and Eni facilities.<sup>22</sup> In addition, clarity on which feedstocks or technologies are encompassed under the “cellulosic” category would be welcome.

**3. *We urge the CEC to better incorporate the new efforts and plans developed since the adoption and implementation of the State’s “Sustainable Communities Strategy” (SB375) since 2009.***

One of the largest changes since the last IEPR in the transportation sector has been the adoption or consideration by MPOs (Metropolitan Planning Organizations) and counties of individual “Sustainable Communities Strategy” plans. These local agencies include the

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<sup>22</sup> <http://www.biofuelsdigest.com/bdigest/2012/05/09/renewable-diesel-surges-emerald-biofuels-announces-major-project-in-louisiana/> in addition to industry consultant data.

Sacramento Area Council of Governments, Southern California Association of Governments, the Metropolitan Transportation Council of the Bay Area, and San Diego Association of Governments, and San Joaquin Valley MPOs.

The current travel demand scenarios presented in the IEPR do not appear to reflect these potentially large changes in transportation investments and patterns. We urge the CEC to incorporate a travel demand scenario (or scenarios) that reflects these important implementation milestones in our State's transportation investment plans, which may result in changes to CEC's transportation fuel demand forecasts.

## **Conclusion**

NRDC appreciates the opportunity to comment on the draft 2013 IEPR and recommends that the Commission adopt the 2013 IEPR with the inclusion of the aforementioned recommendations.

# Appendix A



September 11, 2013

David Modisette  
Executive Director  
California Municipal Utilities Association  
915 L Street, Suite 1460  
Sacramento, CA 95814

Jim Pope  
General Manager  
Northern California Power Agency  
651 Commerce Drive  
Roseville, CA 95678-641

Bill Carnahan  
Executive Director  
Southern California Public Power Authority  
1160 Nicole Court  
Glendora, CA 91740

RE: *Energy Efficiency in California's Public Power Sector*

Dear Mr. Modisette, Mr. Pope and Mr. Carnahan:

On behalf of the Natural Resource Defense Council, we commend the California Municipal Utilities Association (CMUA), Northern California Power Agency (NCPA) and Southern California Public Power Authority (SCPPA) for producing a thorough report documenting the energy efficiency activities of California's publicly-owned utilities (POU): *Energy Efficiency in California's Public Power Sector: A 2013 Status Update* (2013 Status Report).<sup>1</sup>

POUs have made significant strides at improving energy efficiency since 2006: saving over 550 MW (equivalent to a large power plant), which will lower customer bills by over \$1 billion and avoid over 1.2 million metric tons of greenhouse gas emissions every year.<sup>2</sup>

Energy efficiency continues to be the cleanest and cheapest resource available, and all California utilities need to dramatically ramp up these efforts to achieve the state's ambitious 2050 climate goals cost-effectively.<sup>3</sup> Yet public power's impressive growth in efficiency savings and investments has now flattened. Furthermore, the POUs' energy saving targets for the next decade are *less* aggressive than past targets and are aiming for less than half the energy savings that are available—energy savings which are cheaper than alternative supplies.<sup>4</sup>

Rather than aiming lower, NRDC urges the POUs to:

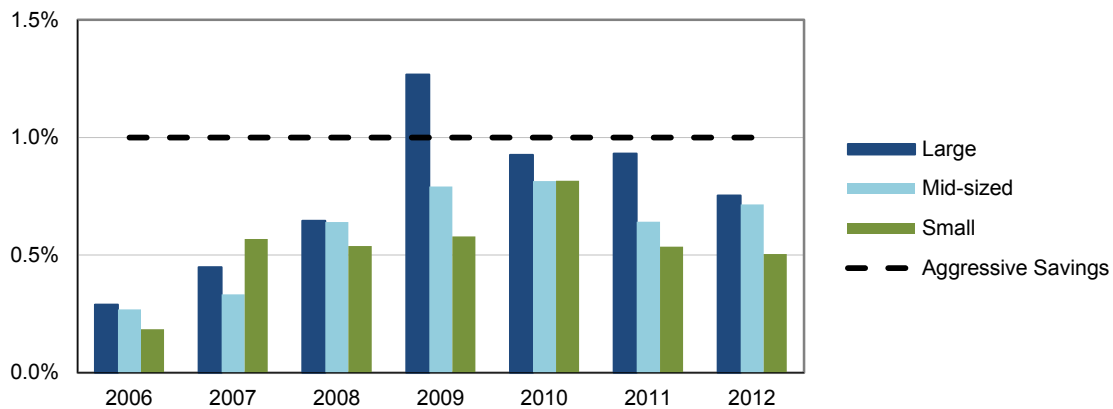
- Set more aggressive energy saving targets to help California get on track to achieve the state's long-term greenhouse gas reduction goals;

- Steadily increase investments in energy efficiency programs to ramp up energy savings;
- Engage in more statewide collaboration and efforts to help customers do more comprehensive efficiency upgrades to yield greater energy savings; and
- Ensure energy savings are independently verified, and help establish a statewide collaborative forum to build confidence in efficiency savings estimates through a transparent process.

### **Falling short of aggressive savings**

Leading efficiency programs across the nation save at least 1% of electricity sales every year.<sup>5</sup> As a group, the POUs are below this threshold for aggressive savings, only achieving energy savings of 0.7% of sales. Figure 1 shows energy savings for large, medium and small POUs ramped up between 2006 and 2009,<sup>6</sup> when a handful of utilities reached aggressive savings of 1% of sales.<sup>7</sup> Since then, however, savings have declined for large and small POUs, while savings at mid-sized utilities have flattened. While the effects of the recent economic downturn have contributed to this trend, there are several other likely factors influencing the decline, including static levels of investments, low energy saving targets, and reduced energy saving estimates for some measures.

**Figure 1: Energy Savings as a Percent of Electricity Sales**



Sources: CMUA, NCPA, SCPPA and the California Energy Commission (CEC)

Overall, POUs are investing 1.7% of revenues in energy efficiency programs, down from 2.0% in 2009 (see Figure A3 of Appendix A). This is contributing to lower energy savings and putting the POUs well below the leading programs around the nation at 2.5% of revenues.<sup>8</sup> Utilities should increase investments in efficiency programs to achieve aggressive levels of cost-effective energy savings.

Energy efficiency programs continue to provide significant benefits to customers with more than double the benefit for every dollar invested. However, the POUs' aggregate benefit-cost ratio of 2.4 indicates that while EE programs continue to be cost-effective, there are also significant deeper energy savings that are not being captured.<sup>9</sup> A high benefit-cost ratio suggests that POUs may be largely capturing the cheapest energy savings (i.e., 'cream skinning'), and thereby missing the potential for more comprehensive opportunities to save customers even more money on their energy bills.

### **Most POUs' targets are not aggressive**

The ten-year targets set by POUs have important implications for long-term planning of efficiency programs, utility resource procurement and planning, and getting on track to meet the state's greenhouse

gas reduction goals. To achieve California's 2050 greenhouse gas reduction goals cost-effectively, all utilities must increase energy savings dramatically.

However, the POU's new ten-year targets, in aggregate, are slightly *lower* than the last targets set in 2010.<sup>10</sup> The new targets are also lower than the POU's energy savings today.<sup>11</sup> Since on average POU's exceeded their targets last year by 15%, the new lower targets are unwarranted.<sup>12</sup> More than half the POU's met or exceeded their targets in 2012, but only 4 of the 41 utilities set aggressive targets to save more than 1% of sales each year going forward: Anaheim, Glendale, Pasadena, and SMUD (see Figure A4 of Appendix A).

The POU's ten-year targets are based on estimates of the potential for future energy savings. However, POU's should not constrain the potential based on past accomplishments.<sup>13</sup> Instead, the potential estimates, and the resulting targets, should reflect what could be accomplished using best practices to capture all cost-effective energy savings. On average, the POU's targets would capture less than 40% of the cost effective potential identified in 2023. As the vast majority of POU targets are below the best practice benchmark of savings of 1% of sales per year, NRDC urges the POU's to reassess the true market potential without limiting future potential progress by past EE program accomplishments.

### **Evaluating energy savings**

Independent evaluation, measurement and verification (EM&V) is essential for customers and utilities to know how much energy is saved and explore how to continuously improve programs, yet the majority of POU's still do not conduct independent EM&V. NRDC commends the POU's for renewing their commitment to independent EM&V in the 2013 Status Report,<sup>14</sup> and it is time to follow through. To help meet this commitment to independent EM&V, NRDC urges the POU's to continue to work toward leveraging resources when possible to conduct EM&V studies and partner with other POU's, state agencies, private utilities and other stakeholders to establish a statewide, collaborative technical forum to independently vet energy savings estimates through a transparent process.

### **Scaling up efficiency**

California's POU's have made tremendous progress at ramping up energy efficiency since 2006, and now is not the time to scale back. POU's should take full advantage of the cheapest and cleanest resource by aiming for more aggressive energy savings to help meet the state's long-term greenhouse gas reduction goals and save customers money. We look forward to continuing to work with you to lower customer bills, improve air quality and curb global warming by scaling up energy efficiency.

Sincerely,



Stefanie Tanenhaus  
Sustainable Energy Fellow



Sierra Martinez  
Legal Director, California Energy Project

cc: Commissioner Andrew McAllister, California Energy Commission  
Rob Oglesby, Executive Director, California Energy Commission  
Sylvia Bender, Electricity Supply Analysis, Deputy Director California Energy Commission  
Sandra Fromm, California Energy Commission  
Cynthia Rogers, California Energy Commission  
Elena Giyenko, California Energy Commission



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<sup>1</sup> NRDC appreciates the report's inclusion of lifecycle costs for the first time. At 2.7 cents/kWh saved, the POU's energy efficiency efforts are clearly a great investment for customers, compared to the avoided cost of generation at 9 cents/kWh for a natural gas combined cycle facility. Avoided cost from: CPUC, Resolution E-4442, p. 2 (December 2011), [http://docs.cpuc.ca.gov/word\\_pdf/final\\_resolution/154753.pdf](http://docs.cpuc.ca.gov/word_pdf/final_resolution/154753.pdf).

<sup>2</sup> Avoided GHG emissions derived from: CARB, Climate Change Scoping Plan Appendices, Vol. 2: Analysis and Documentation, p. I-23 (December 2008), [www.arb.ca.gov/cc/scopingplan/document/appendices\\_volume2.pdf](http://www.arb.ca.gov/cc/scopingplan/document/appendices_volume2.pdf).

<sup>3</sup> California Council on Science and Technology, *California's Energy Future: The View to 2050*, p. 3 (May 2011), <http://ccst.us/publications/2011/2011energy.pdf>.

<sup>4</sup> The POU's new ten-year targets, in aggregate, are only 40% of the cost-effective savings the potential study identified.

<sup>5</sup> The American Council for an Energy Efficient Economy (ACEEE) sets the top tier of energy efficiency savings at 1.2% of sales. The top 9 performing states all have savings that exceed 1.0% of sales. ACEEE, *The 2012 State Energy Efficiency Scorecard*, pp. 30-31 (October 2012).

<sup>6</sup> Large, Mid-sized and Small categories based on 2012 sales. POU's with annual sales in 2012 greater than 5,000 GWh are defined as 'Large', with annual sales between 500 and 5,000 GWh are 'Mid-sized', and with sales less than 500 GWh are 'Small.'

<sup>7</sup> Banning, Glendale, Healdsburg, LADWP, Pasadena, Silicon Valley Power, SMUD, and Truckee Donner reported aggressive savings of 1% of sales in 2009.

<sup>8</sup> ACEEE sets the top tier of energy efficiency investments at 2.5% of revenues, which the top 10 performing states all exceeded. *The 2012 State Energy Efficiency Scorecard*, pp. 25-26 (October 2012).

<sup>9</sup> The 2013 Status Report Data reports a benefit-cost ratio of 2.7, however the total benefits divided by total costs for POU EE programs yields a ratio of 2.4. Total Benefits/Total Costs = \$299,146,825/\$126,936,631 = 2.36

<sup>10</sup> POU's new ten-year targets are 3% lower than the targets set in 2010. This calculation includes the preliminary 2013 10-yr targets for LADWP.

<sup>11</sup> As a percent of projected sales, POU's annual target in 2014 is 7% lower than what they actually saved in 2012. Because Industry, LADWP, Trinity, or Victorville did not submit complete information of sales, projected sales, savings, or targets, they are omitted here.

<sup>12</sup> Average of POU's actual savings as percent of targets does not include Victorville or Industry (which did not report savings) or San Francisco PUC (which did not report AB2021 targets in 2010) or LADWP (which reports targets on a gross basis and savings on a net basis).

<sup>13</sup> The 2013 Status Report states: "The [EERAM energy efficiency potential] model utilizes a "bottoms-up" approach, using...past energy efficiency program accomplishments, and decision maker variables that help drive the market scenarios." 2013 Status Report, p. 29.

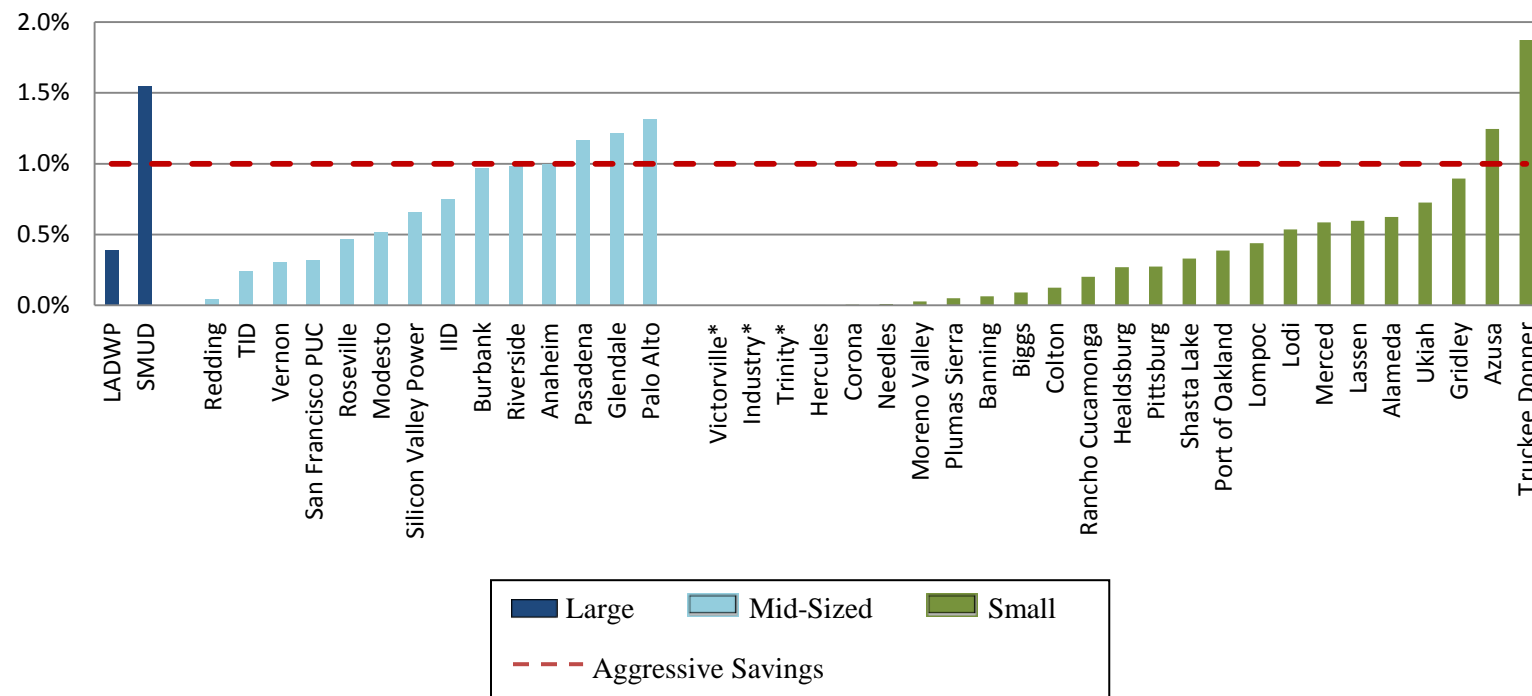
<sup>14</sup> The 2013 Status Report states: "[P]ublic power commits to annual submittals of the results associated with independent EM&V analyses, consistent with the original provision of AB 2021." 2013 Status Report, p. 22.

## Appendix: Charting POU's Energy Efficiency Efforts

### Notes for all Figures:

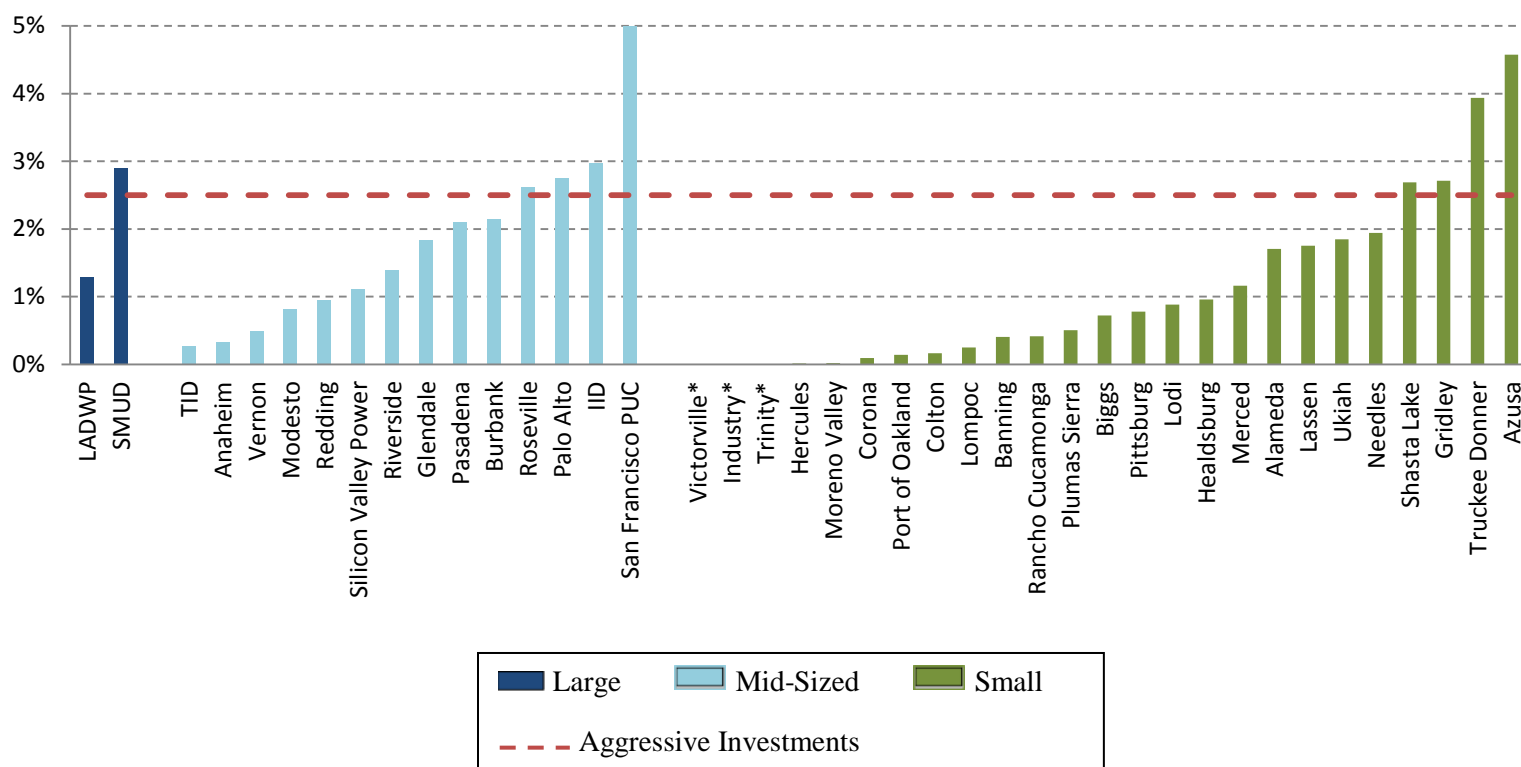
- Data sources are listed on page 7.
- An asterisk (\*) denotes insufficient data available for the POU.
- Large, Mid-sized and Small categories based on 2012 sales. POU's with annual sales in 2012 greater than 5,000 GWh are defined as 'Large', with annual sales between 500 and 5,000 GWh are 'Mid-sized', and with sales less than 500 GWh are 'Small.'

**Figure A1: Annual Energy Efficiency Savings as a Percent of Sales (2012)**



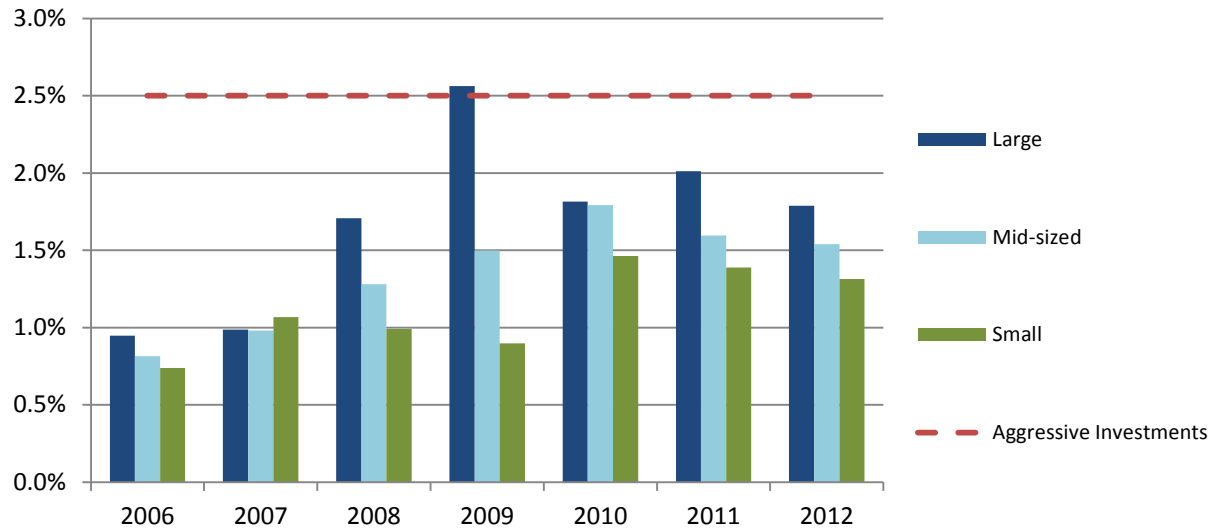
Note: Anaheim, Azusa, Glendale, Palo Alto, Pasadena, SMUD, and Truckee Donner are the only seven POU's that reported aggressive energy savings in 2012 (>1% of sales).

**Figure A2: Energy Efficiency Investments as a Percent of Revenue in 2012**



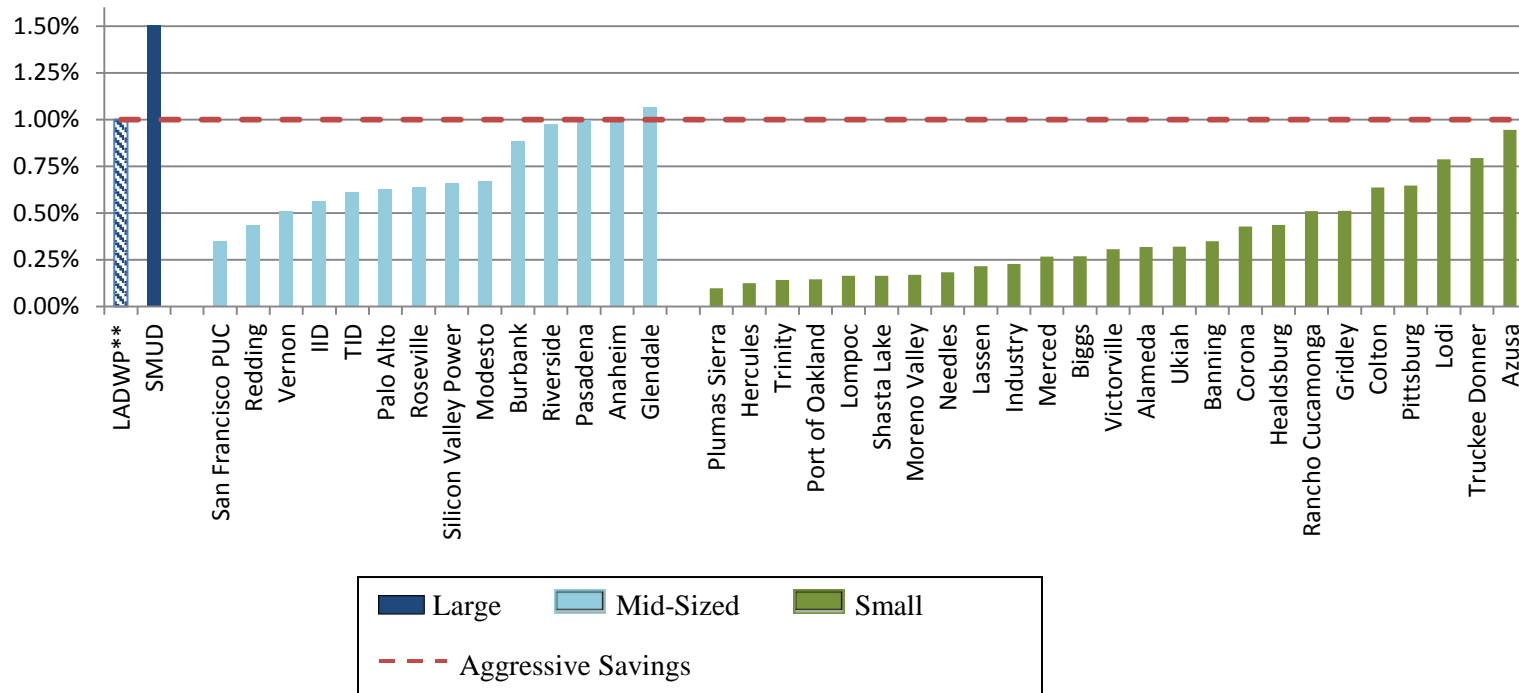
Note: Azusa, Gridley, Imperial ID (IID), Palo Alto, Roseville, San Francisco PUC, Shasta Lake, SMUD, and Truckee Donner invested more than 2.5% of revenue in energy efficiency efforts in 2012, reaching aggressive levels.

**Figure A3: Energy Efficiency Investments as a Percent of Revenue**



Note: Investments in EE as a percent of revenue have decreased across all sizes of POUs since 2011.  
(Aggressive levels of investment are indicated by at least 2.5% of revenue.)

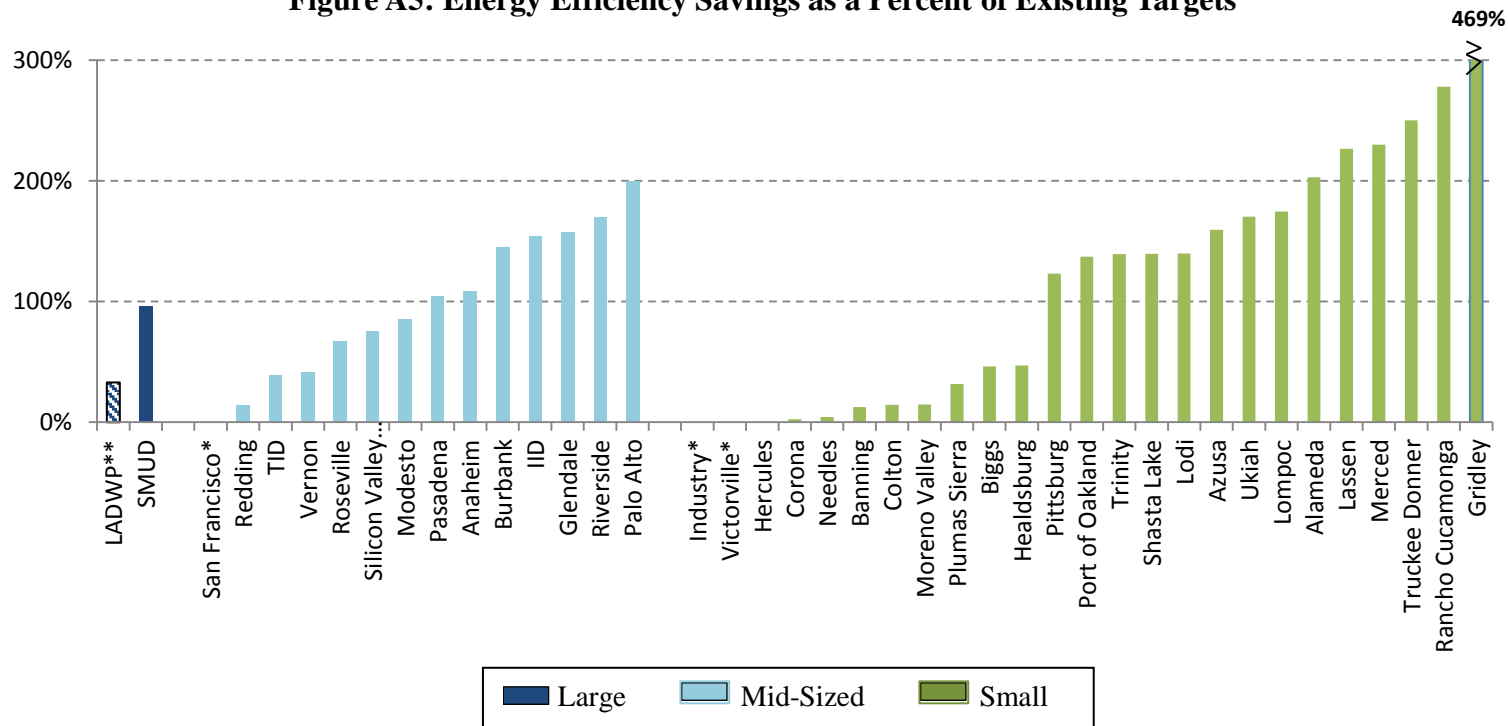
**Figure A4: POU Ten-year Targets as a Percent of Projected Sales**



Notes: Anaheim, Glendale, Pasadena and SMUD are the only four POUs to set new aggressive ten-year EE targets. However, Azusa and Riverside are just under 1% of sales, and Burbank (which increased its targets by 20%) is also close. While Pittsburg, Burbank and Lodi still have room to increase targets, they improved significantly from their previous targets.

\*\* LADWP's targets are preliminary and on a gross basis, while the rest of the POUs are on a net basis.

**Figure A5: Energy Efficiency Savings as a Percent of Existing Targets**



Note: POU's set ten-year energy efficiency targets every few years. The targets adopted in 2010 for 2012 savings were largely met or exceeded by the POU's 2012 actual energy savings achievements.

\*\* LADWP's adopted 2011-2020 targets are on a gross basis, however, savings are reported on a net basis, therefore LADWP's targets are shown in Figure A5 but not included in the comparison made in the text of this letter, that current savings are greater than 2014 targets .  
2013 Status Report (p. 108)

*Notes:*

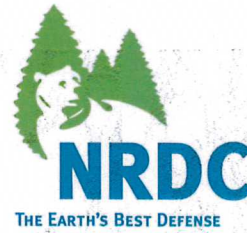
- (1) Calendar Year 2012 = Fiscal Year 2011-2012 as indicated in CMUA, *Energy Efficiency in California's Public Power Sector: A 2013 Status Report*. Prior years follow the same pattern.
- (2) All data is reported by the POU's and not verified by NRDC
- (3) All averages are weighted

*Sources:*

- (1) Reported FY 11-12 data from the March 2013 POU EE status report: *Energy Efficiency in California's Public Power Sector: A 2013 Status Report*. CMUA, NCPA, SCPPA. Available at: <http://cmua.org/wpcmuu/wp-content/uploads/2013/03/FINALv3-SB-1037-AB-2021-Report-Appendices.pdf>.
- (2) Reported FY 11-12 sales and revenue data provided by S. Mac at the CEC, email communication on April 4, 2013.
- (3) Reported FY 05-06 through FY 10-11 data are from 2006-2012 CMUA Status reports (Energy Efficiency in California's Public Power Sector: A Status Report) Available at: <http://www.ncpa.com/current-issues/energy-efficiency-reports.html>.
- (4) AB 2021 10-year energy efficiency target data for 2014-2023 from: *Energy Efficiency in California's Public Power Sector: A 2013 Status Report*. p. 37. CMUA, NCPA, SCPPA.
- (5) Forecasted POU sales data provided by J. Changus at NCPA, email communication on April 8, 2013.
- (6) AB 2021 10-year energy efficiency target data for 2011-2020 from: *Energy Efficiency in California's Public Power Sector: A 2010 Status Report*. p. 38. CMUA, NCPA, SCPPA. [http://www.ncpa.com/images/stories/LegReg/2010%20SB1037%20Report\\_Final\\_\\_03152010\\_.pdf](http://www.ncpa.com/images/stories/LegReg/2010%20SB1037%20Report_Final__03152010_.pdf).

# **Appendix B**





April 3, 2013

Commissioner Andrew McAllister  
California Energy Commission  
1516 Ninth Street, MS-31  
Sacramento, CA 95814

**Re: NCPA and NRDC Joint Statement Regarding Evaluation of Energy Efficiency Programs and Assembly Bill 2227**

Dear Commissioner McAllister:

The Northern California Power Agency<sup>1</sup> (NCPA) and the Natural Resources Defense Council (NRDC) would like to share with you our joint position regarding the impacts of the recently enacted Assembly Bill (AB) 2227 on energy efficiency evaluation.

As you are likely aware, public power utilities across the state have long recognized the importance of evaluating the effectiveness of utility energy efficiency programs. Publicly owned utilities (POUs) view the requirements of Public Utilities (PU) Code section 9505, as amended in AB 2227, as maintaining the original annual reporting requirements contained in AB 2021 (Levine, 2006).

Since the passage of AB 2021 in 2006, each publicly owned utility has been required to report, on an annual basis, the results of an independent evaluation that measures and verifies its energy and demand savings ("EM&V analysis"). Specifically, AB 2021 required that "Each local publicly owned electric utility shall report annually to its customers and to the State Energy Resources Conservation and Development Commission . . . the results of an independent evaluation that measures and verifies the energy efficiency savings and reduction in energy demand achieved by its energy efficiency and demand reduction programs."<sup>2</sup> The POUs include their EM&V analyses in their annual reports to the Commission, due on March 15 of each year.

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<sup>1</sup> NCPA members include the cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara, and Ukiah, as well as the Bay Area Rapid Transit District, Port of Oakland, and the Truckee Donner Public Utility District. NCPA's Associate Member is the Plumas-Sierra Rural Electric Cooperative.

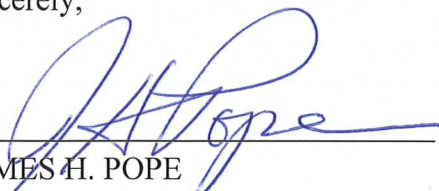
<sup>2</sup> AB 2021, Ch. 734, Section 3(e)(3). (Formerly PU Code § 9615(3)(e)(3).)


NCPA and NRDC believe that nothing in AB 2227 and the amendments to PU Code Section 9505 are intended to change the original requirements of AB 2021 with regard to these EM&V analyses and reports. Specifically, language in the statute memorializes POU commitments to continue annual reporting to the Commission on the total investments in energy efficiency, descriptions of the program expenditures, cost-effectiveness of the programs and expected savings, the sources of funding, and methodologies and inputs used to determine cost effectiveness (§ 9505(a)). Because the intent of AB 2227 was not to change anything substantive from the previous version of the PU Code, annual submittals of the results of independent EM&V analyses are still required, consistent with the provision of AB 2021 quoted above.

As an added point of commitment, it is also the intention of NCPA to inform Commission staff whenever an EM&V report is complete, independent of the due date for the energy efficiency report.

Both NCPA and NRDC look forward to the development of guidelines for independent evaluations of energy efficiency and demand reduction programs. We urge the Commission to reflect public power's commitment to meeting the original EM&V requirements in AB 2021 in its guideline publication. We also look forward to continuing to work with the Commission to pursue all cost-effective energy efficiency.

Sincerely,

  
\_\_\_\_\_  
JAMES H. POPE  
General Manager  
Northern California Power Agency

  
\_\_\_\_\_  
RALPH CAVANAGH  
Co-Director, Energy Program  
Natural Resources Defense Council

cc: Chairman Robert Weisenmiller, California Energy Commission  
Commissioner Karen Douglas, California Energy Commission  
Commissioner David Hochschild, California Energy Commission  
Commissioner Janea Scott, California Energy Commission  
Robert Oglesby, Executive Director, California Energy Commission  
Office of Governmental Affairs, California Energy Commission  
Patrick Saxton, Advisor to Commissioner McAllister, California Energy Commission

# Appendix C

# AMERICA'S POWER PLAN



SITING:

## Finding a Home for Renewable Energy and Transmission

Carl Zichella *Natural Resources Defense Council*  
Johnathan Hladik *Center for Rural Affairs*

## REVIEWERS

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We would like to offer sincere thanks to our knowledgeable group of reviewers:

**Allison Clements**, The Sustainable FERC Project

**Liese Dart**, The Wilderness Society

**Linda Davis**, Western Governors Association

**Randy Fordice**, Great River Energy

**Jimmy Glotfelty**, Clean Lines Energy Partners

**Gary Graham**, Western Resource Advocates

**Mike Gregerson**, Midwest Governors Association and the Great Plains Institute

**Kit Kennedy**, Natural Resources Defense Council

**Ginny Kreidler**, National Audubon Society

**Rob Marmet**, Piedmont Environmental Council

**Julia Prochnik**, JAS Consulting

**John Shepard**, Sonoran Institute

**Byron Woertz**, Western Electricity Coordinating Council

**Tom Wray**, Sun Zia

Comments to ensure the accuracy of references to the Renewable Electricity Futures Study were provided by Doug Arent and Trieu Mai of the National Renewable Energy Laboratory.



## EXECUTIVE SUMMARY

The power plants, poles and wires that generate and deliver electricity to consumers and businesses are a hallmark of modern society. An efficient system requires wires to transmit and distribute electricity where it is most needed to keep the system in balance. But the grid is aging and consumers are increasingly demanding efficiency and clean energy. This paper focuses on the institutional innovations that can help modernize America's grid—by making changes to the way we plan for, site and permit clean power generation and transmission infrastructure.

Today's siting process starts with a series of applications to each governmental agency with jurisdiction in a particular area, with different agencies often requiring different assessments of land-use. This can be a particular challenge for transmission line projects that cross many different jurisdictions. Several changes to today's process can help accelerate smart siting.

Policymakers have many options to accelerate siting for new generation and transmission needs. First, system operators must manage demand for energy, and take advantage of America's existing grid. This paper then focuses on the reforms needed to locate, coordinate and expedite any new generation or transmission that the grid system requires. In short, policymakers should:

- Optimize the existing grid infrastructure.
- Fully use available planning processes.
- Employ "Smart from the Start" criteria.
- Improve interagency, federal-state and interstate coordination.
- Work with landowners to develop new options for private lands, including innovative compensation measures.
- Refine the process to support siting offshore wind developments.

New approaches will require engaging stakeholders early, accelerating innovative policy and business models, coordinating among regulatory bodies, employing smart strategies to avoid the risk of environmental and cultural-resource conflicts and improving grid planning and operations to take better advantage of existing infrastructure and reduce costs of integrating more renewable energy.

This paper provides detailed recommendations for how to accomplish this. Modernizing the grid and transitioning to clean power sources need not cause harm to landowners, cultural sites or wildlife. On the contrary, taking action today will provide long lasting benefits.





# INTRODUCTION

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The National Renewable Energy Laboratory's *Renewable Electricity Futures Study*<sup>1</sup> (*RE Futures*) finds that it's feasible to produce 80 percent of America's power from renewables by 2050. Yet doing so would require enormous changes in the way we plan for, site, permit, generate, transmit and consume renewable electricity. Innovation — both technological and institutional — will be the cornerstone of this effort. Beyond more efficient solar cells and bigger wind turbines, American *businesses and institutions* will need to find innovative solutions for locating new generation and transmission.

The need to site and build a new generation of transmission infrastructure continues to increase. Current and expected investment trends suggest now is the time to act. Between 2000 and 2008, only 668 miles of interstate transmission lines were built in the United States. The past four years have seen a greater commitment to infrastructure improvement, but the nation continues to fall short. Annual investments during 2009 to 2018 are expected to reach three times the level of annual transmission additions in the previous three years. More than one quarter of transmission projects currently planned through 2019 are designed to carry power generated by new, non-hydro renewable resources. The Midwest Independent System Operator (MISO) estimates that up to \$6.5 billion in transmission expansion investment will be needed by 2021 in that region alone. In the West, estimates range as high as \$200 billion over the next 20 years.<sup>2</sup>

It will be critical to implement reform ahead of the next wave of expected projects. America needs a new paradigm, one that removes barriers to new projects and takes into account lessons learned over the past 10 years. Reform must reflect a new approach to siting — one that recognizes the effect wholesale power markets have on transmission planning, and one that meets the needs of landowners, wildlife and society as well as project sponsors and investors.



## FINDING THE SWEET SPOTS FOR RENEWABLE ENERGY

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Modernizing America's electric grid will be a monumental job. While distributed generation will play a big role in America's clean energy future, on-site power alone cannot bring us to 80 percent renewables. The amount of energy needed is too vast, especially as the economy rebounds and economic growth continues. We will need major additions of centralized renewable energy generation, and some of the very best renewable energy resources are far from population and energy demand centers.

NREL calculates that a gross estimate of land needed for an 80 percent national renewable electricity future would be equivalent to less than about 3 percent of the U.S. land base, up to 200,000 square kilometers. Such large-scale developments must be located with extreme care for culturally rich areas, species protection and wildlife habitat.





## Land-Use Implications of Low-Demand Core 80% RE Scenarios and the High-Demand 80% RE Scenario\*

Total Land Use (000s of km<sup>2</sup>)

RENEWABLE TECHNOLOGY	LAND USE FACTOR	LOW-DEMAND CORE 80% RE SCENARIOS	HIGH-DEMAND 80% RE SCENARIOS	DESCRIPTION
Biopower	25,800 GJ/km <sup>2</sup> /yr	44-88	87	Land-use factor uses the midrange estimate for switchgrass in Chapter 6 (Volume 2). Other waste and residue feedstocks are assumed to have no incremental land use demands.
Hydropower	1,000 MW/km <sup>2</sup>	0.002-0.10	0.06	Assumed only run-of-river facilities, with land use based only on facility civil works with no flooded area. Although not evaluated here, inundated area associated with run-of-river facilities would increase these values.
Wind (onshore)	5 MW/km <sup>2</sup>	48-81 (total) 2.4-4 (disrupted)	85 (total) 4.2 (distributed)	Most of the land occupied by onshore wind power plants can continue to be used for other purposes; actual physical disruption for all related infrastructure for onshore projects is approximately 5% of total.
Utility-scale PV	50 MW/km <sup>2</sup>	0.1-2.5	5.9	Direct land use of modules and inverters.
Distributed rooftop PV	0	0	0	Systems installed on rooftops do not compete with other land uses and no incremental land use is assumed here.
CSP	31 MW/km <sup>2</sup>	0.02-4.8	2.9	Overall land occupied by CSP solar collection fields (excluding turbine, storage, and other site works beyond mirrors).
Geothermal	500 MW/km <sup>2</sup>	0.02-0.04	0.04	Direct land use of plant, wells, and pipelines.
Transmission	See Description	3.1-18.6	18.1	Assuming an average new transmission capacity of 1,000 MW and a 50-m right-of-way.
Storage	See Description	0.017-0.030	0.025	Land-use factors of 1,100 m <sup>2</sup> /MW, 500 m <sup>2</sup> /MW, and 149 m <sup>2</sup> /MW were assumed for PSH, batteries, and CAES, respectively. See Chapter 12 (Volume 2) for details.

Renewable Electricity Futures Study

Volume 1: Exploration of High-Penetration Renewable Electricity Futures

**Table 1.** RE Futures land-use estimates

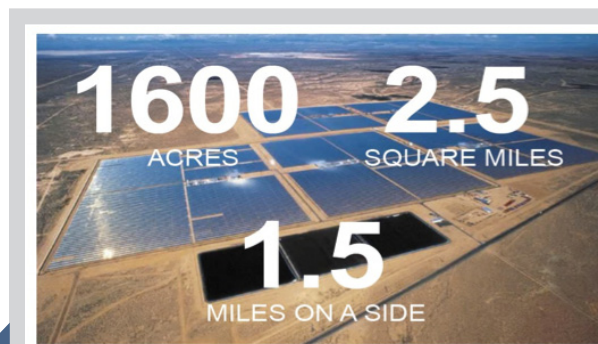
\* National Renewable Energy Laboratory, 2012. "Renewable Electricity Futures Study." Hand, M.M.; Baldwin, S.; DeMeo, E.; Reilly, J.M.; Mai, T.; Arent, D.; Porro, G.; Meshek M.; Sandor, D. eds. 4 vols. NREL/TP-6A20-52409. Golden, CO: National Renewable Energy Laboratory. <[http://www.nrel.gov/analysis/re\\_futures/](http://www.nrel.gov/analysis/re_futures/)>

Given the scale of these projects, several important considerations can help guide developers, policymakers and grid planners as they make decisions about where and how to locate new generation and transmission. These considerations include:

- Location of high-quality renewable resources.
- Generation profiles of the resources (i.e., when during the day does the wind blow).
- Impact on landscape, including both natural and cultural resources.
- New options for siting on private lands.

The first consideration in siting generation and transmission is the presence of high quality renewable resources. Planners and developers can use some key questions to identify such sites: what is the solar insolation per square meter? What is the wind speed at 80 meters above the ground? How many hours per year is the wind blowing at the right speed to drive a turbine efficiently? These are extremely important questions; developing optimal sites means that fewer acres of land or nautical miles of ocean need be developed to produce the energy we require. But the location of these high-quality resources is just one piece of the puzzle.

The kind of centralized projects<sup>3</sup> we are talking about are very large, and can sometimes span several square miles (see figure 1). Large developments mean substantial physical impacts on the landscape, as well as impacts on valued natural and cultural resources. Wildlife habitat will be destroyed in the process, at a time when many species are already under stress from overdevelopment and a changing climate. Decision-makers must factor these impacts into location selection.



**Figure 1.** 354 MW Solar Energy Generating Station, California desert<sup>4</sup>

Additionally, decision-makers must pay special consideration to private land owners. Private landowners play an invaluable though often overlooked role in the siting and construction of both generation and transmission infrastructure. Particularly in the Eastern Interconnection, transmission projects are built almost exclusively on private land. How landowners are treated throughout this process can determine whether projects are more rapidly approved and developed or delayed and even halted.

## Today's process

To begin any discussion of how to improve siting practices in the U. S., one must first consider today's approach. When a new transmission project is conceived and drawings begin, developers first apply to each state's own Public Utility Commission — or relevant siting authority — for a "Certificate of Need" and a route permit. The same process is used whether the project is being proposed by an investor-owned utility, a private investor, a public power district or a rural cooperative. A typical application includes an estimate of costs, a justification of need and at least one proposed route to study. If the proposed project crosses federal lands, as is typical in the Western Interconnection, it triggers the National Environmental Policy Act (NEPA) process. In most instances, the independent transmission developer will first pursue and complete NEPA on his project, at least through the Final Environmental Impact Statement (EIS) stage (or Record of Decision, in some cases) prior to initiating serious permitting activity in state jurisdictions. This is normally done to allow incorporation of the NEPA record by references in the state siting hearings and application process. California has a siting process under the California Environmental Quality Act (CEQA) that allows for more formal parallel activity with NEPA.

In deciding whether to grant a "Certificate of Need," state Public Utility Commissions overwhelmingly focus on two distinct sets of issues: 1) operational and economic need for the proposed project and 2) environmental impact of the proposed project.

*Operational and Economic Need* considers whether the line has significant market value, how it would fit into the state's integrated resource plans, whether new generation sources need it to deliver their power and whether it is needed to ensure reliability or meet new demand.

*Environmental Impact* generally involves a full evaluation of the line's environmental impact, whether the construction will affect endangered species, open new areas to development, involve sensitive ecological areas or give rise to visual or aesthetic concerns.

The Commission's final decision prioritizes benefits to in-state ratepayers. A Certificate of Need is granted once the project has been reviewed, tradeoffs have been evaluated and the Commission has determined that the proposed line is in the public interest. This designation allows the applicant to begin building on public lands and negotiating easement terms with affected landowners. In most cases, it allows developers to exercise eminent domain authority if private land negotiations fail.

Several changes to today's process can help accelerate smart siting.

## RECOMMENDATIONS FOR POLICYMAKERS

Policymakers have several options to accelerate siting for new generation and transmission needs. First, system operators must manage demand for energy and take advantage of America's existing grid — these topics are touched on here, but covered in more detail in other papers in this series.<sup>5</sup> This paper focuses on the reforms needed to locate, coordinate and expedite any new generation or transmission that the grid system requires.

In short, policymakers should:

- Optimize the existing grid infrastructure.
- Fully use available planning processes.
- Employ “Smart from the Start” criteria.
- Improve interagency, federal-state, and interstate coordination.
- Work with landowners to develop new options for private lands.
- Refine the process to support siting offshore wind developments.

The following sections describe how policymakers can do each of these things.

### Optimize the existing grid infrastructure

Any siting discussion should start with the idea of getting more out of infrastructure that has already been built. Optimizing grid management practices can save enormous amounts of time and capital, while reducing the footprint of development. Operating efficient markets for generation and other grid services can help,<sup>6</sup> as can adopting dynamic transmission line rating.<sup>7</sup> Another optimization tool is considering the generation profiles of resources in different locations. Variable resources that operate at different times of day can reduce integration challenges, prevent the construction of unnecessary reserves and more completely utilize existing transmission lines. Grid optimization is the most efficient way to reduce the need for new generation and transmission lines. A next-best option is to site new renewable energy generation in places with feasible access to existing transmission. Once existing infrastructure is maximized, decision-makers should begin to consider the actions outlined in the following sections.

DECISION-MAKER	RECOMMENDATION
ISOs/RTOs <sup>8</sup> , DOI, WECC, state authorities	Add grid optimization to siting criteria or the renewable zone formation process.



## Fully Use Available Planning Processes

While the focus of this paper is siting, it is critical to fully consider the *planning* process as a precursor to siting. Many organizations, notably the Western Electricity Coordinating Council (WECC) in the western U.S., western Canada and Mexico, perform a variety of studies that attempt to understand infrastructure needs 10 or 20 years in the future. This process does not attempt to predict the future. Rather, it seeks to identify strategic choices that will guide infrastructure development needs. The planning process also does not attempt to supersede the siting process. Rather, it seeks to identify issues that will need to be addressed when a project enters siting consideration. One of the goals of the planning process is to expedite the siting process. By understanding and mitigating issues early, detailed siting analyses should proceed more quickly.

Specific issues that can be addressed in the planning process include:

- Transmission expansion needed to facilitate meeting expected load with available resources.
- Policy initiatives such as Renewable Portfolio Standards (RPS).
- Environmental and cultural risks.
- Economic variables such as fuel prices and emission costs and their effects on resource choices.
- Resource and transmission capital costs.

## Employ “smart from the start” criteria

Locating new generation carefully and strategically can avoid most conflicts. This approach has become known as “Smart from the Start.” The Interior Department has adopted many of the concepts inherent in this approach to guide both onshore and offshore renewable energy development. Originally introduced in 2005, many Smart from the Start criteria have been put into practice in federal, state and regional generation and transmission siting processes in recent years. Projects and organizations using these criteria include: the Department of the Interior’s Solar Program, the Department of Energy Regional Transmission Expansion Policy Project, the Western Governors Association, the Bureau of Land Management’s Arizona Restoration Design Energy Project, the Bureau of Ocean Energy Management’s offshore wind Smart from the Start program and the WECC’s Transmission Planning and Policy Committee.

## Smart from the Start Siting Policies and Criteria

- Consult stakeholders early and involve them in planning, zoning and siting.
- Collect and use geospatial information to categorize the risk of resource conflicts.
- Avoid land and wildlife conservation conflicts (including national parks and other protected areas) and prioritize development in previously disturbed areas.
- Avoid cultural resource conflicts (historic sites, tribal resources, etc.).
- Identify excellent renewable energy resource values.
- Establish, when possible, pre-screened resource zones for development .
- Incentivize resource zone development with priority approvals and access to transmission.
- Consider renewable energy zones or development sites that optimize the use of the grid.
- Maximize the use of existing infrastructure, including transmission and roads.
- “Mitigation that matters” (durable and planned conservation improvements at larger scales).
- Where zoning is not feasible (as in much of the Eastern Interconnection), use siting criteria based on the above principles.

The Smart from the Start approach is valuable for siting both generation and transmission, but is most effective when used for both at the same time. It can also be helpful in delivering efficient use of existing transmission resources.

Two of the Smart from the Start principles are particularly important for accelerating renewables:

- Establish, when possible, pre-screened resource zones for development.
- Where zoning is not feasible (as in much of the Eastern Interconnection), use siting criteria based on the above principles.

### Establish renewable energy zones

Pre-screened zones for renewable energy can dramatically accelerate time to market for new generation. This streamlines siting hurdles for all projects involved, and can help government agencies prioritize projects and work together to assess impacts efficiently and bring new infrastructure online more quickly.

Texas pioneered renewable energy resource zoning in 2005 to develop transmission for remote wind energy projects. Today, nearly 11,000 megawatts of wind capacity have already been constructed in Texas, and the state expects to add at least 18,500 megawatts more. The Electricity Reliability Council of Texas (ERCOT) is responsible for developing the transmission, and has estimated that up to 3,500 miles of new lines are needed to bring the new wind capacity to the state's load centers. Texas' proven renewable energy zones will be critical to making this happen.

Building on Texas' model, many other states have found renewable energy zoning to be an important strategy for prioritizing environmentally desirable, lower conflict sites for new generation and transmission. Some form of renewable energy zoning has since been adopted by state and federal agencies in California, Arizona, Colorado, Nevada, Utah and across the west. California's Renewable Energy Transmission Initiative identified renewable energy development zones statewide and recommended transmission upgrades to serve them. The California process enhanced the environmental values portion of the zoning process, as compared to Texas' process, by developing the first-ever environmental screening process for ranking the relative risk of environmental and cultural conflicts in new transmission proposals (see figure 2).

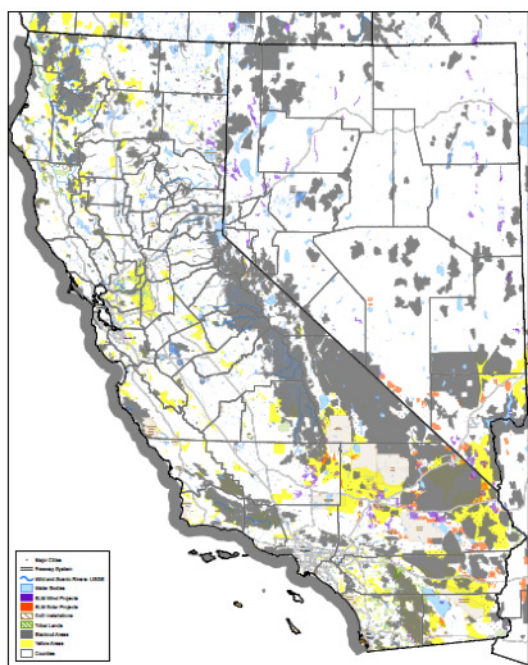
WECC's Regional Transmission Expansion Project is a transmission planning process funded by a stimulus grant from the U.S. Department of Energy (DOE) that uses geospatial information to identify the risk of encountering environmental and cultural resource conflicts. The project uses 10 and 20 year plans for its analysis, developed by an unusually diverse set of stakeholders to forecast transmission needs in the Western Interconnection under a variety of futures.

Establishing renewable energy development zones remains in its infancy in the Eastern Interconnection, owing to the fact that the region is far more complex: with three times as many states, far less federal public land and a much more diverse set of wildlife and environmental management regimes. Ownership in

the East is so complex that resource zoning is often impractical if not impossible. Still, for transmission, the Eastern Interconnection Planning Collaborative is completing a planning initiative, funded by the DOE that may include a tool (see figure 2) that uses geospatial information to suggest the location of potential renewable energy development zones. The project is engaging diverse stakeholders to develop scenarios of future transmission needs. Siting criteria will likely be the default approach for these areas, and will be extremely valuable in avoiding areas at high risk for environmental and cultural resource conflicts.

Argonne National Laboratory has undertaken an innovative mapping effort to cut through the complexity of the Eastern Connection at a system level, and the lab's work is very promising for renewable energy zone and environmental risk modeling in the region. For example, Argonne's tool has numerous layers of data that could be used to identify more optimal, lower-conflict sites for renewable energy and transmission development. Even more promising: the WECC Environmental Data Task Force is currently considering the possibility of populating the Argonne platform with data from the west to create a uniform national database to ease renewable energy and transmission siting for planners, project developers and the public.





**YELLOW & BLACKOUT AREAS**

**Figure 2.** Ranked environmental and cultural risk zones for the state of California.<sup>9, 10</sup>

Other states are using landscape-level analysis to locate renewable energy and transmission projects. Oregon is currently developing a landscape-level renewable energy planning analysis that could result in the identification of promising low impact resources areas, or de facto zones.

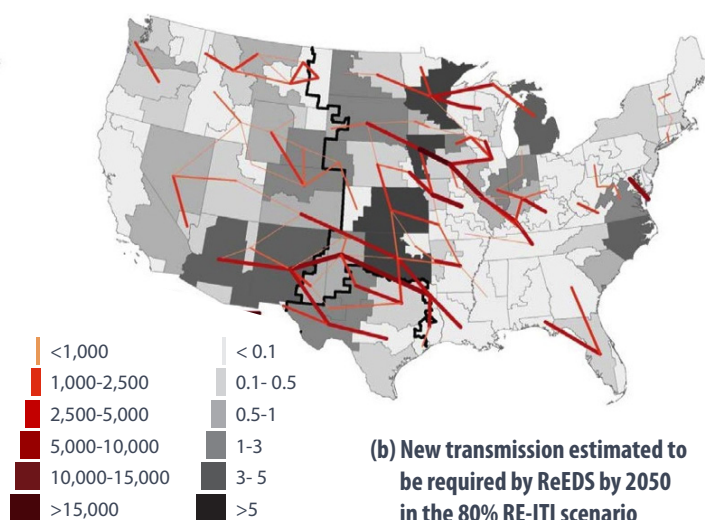
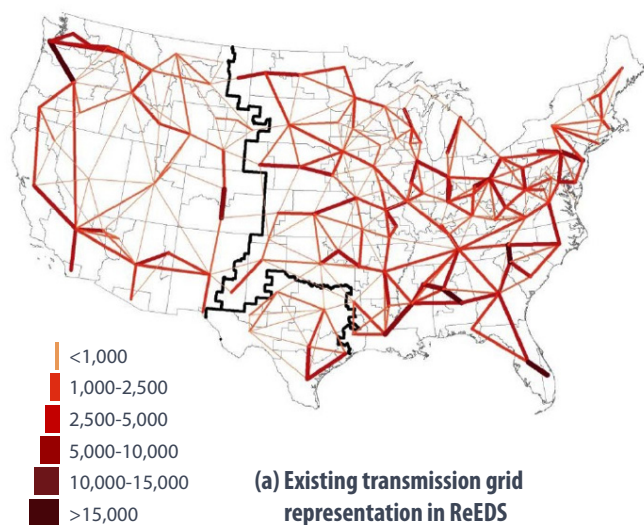
DECISION-MAKER	RECOMMENDATION
WECC, state authorities, Power Marketing Administrations, FERC, transmission sponsors, utilities	Fully utilize available planning processes to identify issues early in the process that will need to be addressed ultimately when a project enters siting consideration. One of the goals of the planning process is to expedite the siting process. By understanding and mitigating issues early on, detailed siting analyses should proceed more quickly.
FERC, RPEs, BLM, DOE, DOI, EIPC, state authorities	Use data from regional planning processes and Smart from the Start principles in choosing transmission solutions (such as in Order 1000 planning), renewable energy zones, development sites and federal energy corridors.
FERC, RPEs, BLM, DOE, DOI, EIPC, state and local authorities	Consider renewable energy generation and transmission development and siting simultaneously. Develop clear siting criteria where zones are not possible.
Congress, DOE, DOI, national labs, State and local authorities	Create and maintain national cultural and environmental conflict risk data and mapping capabilities to support federal, regional and state-level generation and transmission siting. Develop clear siting criteria where zones are not possible



## Improve interagency, federal-state and interstate coordination

The lack of coordination within federal agencies and between the federal and state agencies has been a major hindrance to siting renewable energy projects, but substantial progress has been made in the last four years. The Obama administration took action in 2009 to address the coordination issues raised by both environmental and renewable energy development stakeholders. A Memorandum of Understanding (MOU) delineated how federal land managers and the Energy Department would coordinate on project approvals for both generation and transmission siting on public lands. The MOU was signed by the heads of U.S. Department of Agriculture, Department of Commerce, Department

of Defense, Department of Energy, Environmental Protection Agency, the Council on Environmental Quality, the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation and Department of the Interior. Leadership at the Secretarial level in the Interior Department resulted in the establishment of four Renewable Energy Coordination Offices tasked with focusing agency resources on managing siting issues on public lands. The offices reached out to several states that were expecting large amounts of renewable energy, and useful partnerships were established to facilitate joint permit activities. By coordinating these permitting activities, sequential environmental reviews can be eliminated while still addressing all the requirements of both state and federal processes. The resulting uptick in project approvals has been dramatic.



**Figure 3.** Existing transmission (a) and potential 2050 transmission (b).

For example, a partnership between the Departments of Interior and Energy and the state of California, as well as leading environmental stakeholders, resulted in permits for more than 4,000 megawatts of renewable generating capacity in less than a year. The largest solar projects ever developed are under construction in California, as are the transmission system upgrades needed to bring their power to customers. They are collaborating on large-scale resource conservation and infrastructure planning, drafting the largest Habitat Conservation Plan ever attempted. The plan is being prepared through an unprecedented collaborative effort between the California Energy Commission, California Department of Fish and Game, the U.S. Bureau of Land Management and the U.S. Fish and Wildlife Service. When completed, this joint effort will identify resource areas (essentially zones) that will be interconnected to the grid and that will enjoy swift siting approval for new renewable energy generation.

One of the most important lessons from this work has been that land and wildlife conservation efforts – and new mitigation strategies – need to be developed in tandem with project planning. Taking these impacts into account early enhances stakeholder participation. Getting the right parties involved as early as possible is an essential element of success.

## Interagency coordination

A federal Rapid Response Team for Transmission (RRTT) was established in 2009 to close the gap between new renewable energy generation and the transmission to bring it to market. The RRTT seeks to improve the overall quality and timeliness of the federal government's role in electric transmission infrastructure permitting, review and consultation through:

- Coordinating statutory permitting, review and consultation schedules and processes among federal and state agencies, as appropriate, through Integrated Federal Planning.
- Applying a uniform and consistent approach to consultations with Tribal Governments.
- Resolving interagency conflicts to ensure that all involved agencies are meeting timelines.

## Federal-state and interstate coordination

Some progress has been made in coordinating federal and state actions, but much more remains to be done. Long-distance transmission lines crossing several states face the most acute problems. For example, a project usually needs to go through a review in each jurisdiction, and the reviews often happen in series rather than at the same time. This can add huge costs and delay projects for years.

Public Utilities Commissions hold the authority to approve transmission line siting in most states. But some states have three or four separate entities involved

in transmission approvals and siting. And while most states have some statutory recognition of the need to coordinate on transmission with their neighbors, 11 states are still statutorily silent on this topic.<sup>11</sup>

The variation in the way states handle siting presents an unnecessary level of complexity that frustrates public interest groups, landowners and project developers alike. Project developers are often overwhelmed by having to coordinate with many agencies — from natural resource departments to land-use entities. A single agency could be established in each state to ensure that permit requirements are not duplicated, but that the process includes all-important considerations. A one-stop-shopping approach to siting in each state would greatly expedite and enhance siting for interstate transmission.

Congress took steps to address interstate coordination via the Energy Policy Act of 2005 (EPAc 2005), encouraging collaboration between states in two important ways. First, it authorized them to form interstate compacts to create their own rules to govern siting of new lines. This authority has not been used successfully to date, but it may yet prove important in expediting transmission projects that cross state lines. For example, the Council of State Governments is currently exploring ways to improve interstate coordination and better take advantage of this interstate compact tool. Second, the EPAc 2005 gave the Federal Energy Regulatory Commission (FERC) “backstop” siting authority for certain transmission corridors that DOE identified as critical to grid reliability. This meant that if states did not reach a siting agreement within a year, FERC was allowed to site the line. This provided a strong incentive for state coordination, but subsequent court rulings undercut the FERC’s backstop authority as granted in EPAc 2005.

Two years later, FERC’s Order 890 opened up transmission planning to all stakeholders and tied payments (“open access tariffs”) to developers’ ability to meet nine transmission planning principles: coordination, openness, transparency, information exchange, comparability, dispute resolution, regional participation, congestion studies and cost allocation. But interconnection-wide programs either did not exist or lacked the authority to allocate costs or select projects until last year.

FERC took decisive action to reform transmission planning by adopting Order 1000 in 2012. This is the most beneficial FERC policy ever adopted for renewable energy development. Order 1000 requires regional and interconnection-wide planning, enabling broader benefits and wider and fairer cost distribution for new transmission. The order also requires that the need for states, utilities and system operators to comply with public policy mandates, such as state and federal laws such as renewable portfolio standards, must be considered in selecting transmission options eligible for federal cost allocation. Moreover, Order 1000 requires that incumbent utilities surrender their right of first refusal to build certain kinds of transmission lines in their service territories. This can save time and money for independent transmission investors, driving down the risk they see in new transmission projects. In addition to requiring regional planning and driving down investment risk, Order 1000 requires planners to consider alternatives to transmission that can meet system and energy needs. These alternatives might include demand side management, distributed generation and energy efficiency programs. These requirements are likely to result in vast improvements in planning coordination across broad geographies and better resource choices for the grid system as a whole.

The Federal Energy Regulatory Commission's Order 1000 emphasizes stakeholder involvement, public policy goals and transmission competition. It also encourages grid planners to assess alternatives (distributed generation, demand-response, etc.) on equal footing. Here are some reasons why this Order could unlock transmission siting for remote renewables:

- |   |   |
|---|---|
| <p>1. Non-traditional stakeholders (consumer advocates, environmental groups, Native American tribes, etc.) have a seat at the table. The result: more buy-in throughout the process, as well as better solutions with fewer conflicts.</p> | <p>State involvement in selecting the needed transmission and allocating costs reduces the likelihood of FERC having to exercise backstop siting authority.</p> |
| <p>2. States are treated as key stakeholders. They can help make choices about transmission alternatives, giving them a greater interest in siting lines quickly while resolving local land use conflicts.</p>                              | <p>3. Planners must identify beneficiaries. Concerns about paying for other states' benefits could be reduced if not eliminated.</p>                            |
|   | <p>4. The transmission planning process is required to be more transparent and open.</p>  |

FERC backstop siting authority can play an important psychological role in encouraging states to coordinate and lead in transmission planning, making it a useful siting tool. The best value of backstop siting is not in its exercise, but in the *possibility* of its exercise. One of the most potent arguments against FERC's backstop siting authority was the indiscriminate way that DOE originally defined its National Interest Electric Transmission Corridors (NIETC) in EPLA 2005. Those "corridors" encompassed entire eastern states as well as most of Arizona and southern California. State and public opposition was understandable and should have been expected. But FERC backstop siting authority could

be very effective for Order 1000 transmission lines. The Order 1000 process involves states and regional planners, considers environmental and cultural risks by using regional planning data, and ensures that alternative solutions are weighed.

A pair of promising, interrelated initiatives to coordinate interstate transmission authorities is unfolding as of this writing. The Western Governors Association (WGA) is convening a transmission siting and permitting task force to coordinate transmission interstate transmission development across state and federal jurisdictions, and perhaps equally importantly, between state and local jurisdictions. The DOE is also developing a transmission

“pre-application process” in coordination with WGA, state and local authorities and transmission sponsors, environmental and other stakeholders, to identify and avoid conflicts that could block transmission *before the* NEPA process begins. In so doing, it is hoped that NEPA can proceed with greater efficiency and less conflict, shaving years off of the approval time for interstate transmission lines needed for renewable energy projects.

DECISION-MAKER	RECOMMENDATION
Congress, DOE, FERC	Facilitate the participation of non-traditional stakeholders in regional and federal (FERC Order 1000) transmission planning by providing financial support to stakeholder representatives .
Congress, state authorities	Redefine FERC backstop siting authority to apply to lines selected through and whose costs were allocated in Order 1000 planning.
DOE, FERC	Adopt the use of environmental and cultural risk screens in federal corridor designation processes required under EPC Act 2005 and federal transmission planning efforts, such as the implementation of FERC Order 1000.
State authorities	Neighboring states with renewable energy resources and transmission needs should act to harmonize siting requirements and explore the possibility of creating interstate compacts for this purpose and to facilitate regional planning for renewable energy transmission.
State authorities	States should consider the establishment of a one-stop siting agency for large energy and transmission projects. Applicants are overwhelmed with having to deal with multiple agencies, from natural resource departments to land use entities. Because one of the main goals of this project is to save time for permit applicants without sacrificing important considerations, having one agency ensure that permit requirements are not duplicated can substantially shorten an applicant’s timetable.
CEQ, DOE, States, Counties	Complete and implement a transmission pre-application process to shorten NEPA compliance timelines.

## Work with land owners to develop new options for private lands

The past decade has seen increased investment in transmission. More lines now traverse state boundaries. The scope of each proposed transmission project continues to grow. Now more than ever transmission lines are affecting private land and productive agricultural ground, at a time when commodity prices are at all-time highs and land prices are reaching unprecedented levels. Considered in tandem with the growth of renewable resource development, these changes indicate that the function of the electric grid has evolved. For the most part, however, each state's approach to transmission siting has stayed the same. Typically, states are required to legally review issues of project cost, environmental impact, size, type, timing, cultural and historical impacts, among others. These issues fall generally into the two categories: need and environmental impact. By focusing primarily on project need and environmental impact, states often undervalue the interests of the landowner when approving and subsequently siting a proposed transmission line.

If negotiations break down between the transmission provider and a landowner, the transmission provider can most often fall back on eminent domain. Intended as a reflection of fair market value, eminent domain in fact often fails to adequately compensate landowners. Eminent domain does not account for the subjective value each landowner places on a parcel of ground, nor does it compensate landowners based on the heightened land values that come from land assembly and potential development. Eminent domain also fails to account for the decrease in value of each landowner's remaining land, as prospective buyers often find encroaching infrastructure aesthetically troubling.

Prominent recent cases such as the Montana-Alberta Tie-Line and the Keystone XL pipeline show that opposition to eminent domain remains intense. Attorneys in the Upper Midwest and the Great Plains are now handling more eminent domain cases than ever before. Each time a new project is proposed, transmission developers in these regions are faced with a bevy of opponents. This can have a dramatic effect on the cost of siting as project developers pay millions for litigation and state agency administrative costs. Just one holdout can delay development for years.<sup>12</sup>

Eminent domain, however, is not always available. "Determination of need" – the most important prerequisite for eminent domain – requires the transmission developer to demonstrate that the proposed project is needed and the siting authority to confirm that construction of the project will serve the public interest. Because many state siting statutes and regulations have not been updated to account for expanding interstate balancing areas, they continue to base the determination of need on benefits to in-state ratepayers only. Often state statutes prohibit non-utilities from applying for a determination of need, or refuse to grant non-utilities eminent domain even if their application is successful. Siting authorities in states such as Massachusetts and Mississippi have declined to site proposed projects that cross state lines but do not deliver ratepayer benefits exclusively to in-state citizens. Moreover, eminent domain is not an option for merchant transmission lines in several states (e.g., Illinois, Maryland, New Hampshire and Nebraska), making it very difficult to build new transmission to support renewable energy development.



While eminent domain must remain available as a necessary last resort, providing viable alternatives will accelerate siting of the infrastructure needed to deliver renewable energy. Several options exist:

- *Special Purpose Development*

*Corporations* (SPDCs) focus on providing landowners with another option for just compensation. The condemning authority creates an SPDC, allowing the landowner to choose between two options. Landowners can either opt to receive the traditional fair market value for the parcel or they can elect to receive shares in the SPDC. The value of these shares is commensurate with the fair market value of the parcel the landowner has committed to the project. The condemning authority then sells the SPDC to a transmission developer at auction. The sale increases the value of the SPDC, and the landowners' shares are transferrable on the open market. Each shareholder is entitled to project dividends. The result is that the landowners' compensation is tied directly to market value, unlike traditional "just compensation." By giving landowners a stake in the project's success, things can move more quickly and fairly. This framework is applicable to utility-owned transmission projects; a merchant developer does not have a mechanism for recovering equity dilution from rates and may instead prefer to offer landowners annual payments tied to project royalties.

- *Landowner Associations* refer to groups of landowners that come together with a shared interest. These associations have been particularly successful for wind development, and are also suitable for shorter transmission lines. Each participating landowner is given a proportional share of ownership in the association based on the amount of land they want to make available for development. As an association, landowners then approach developers for projects. Members of the association that physically host turbines or transmission infrastructure are given a premium, but all members of the association receive a portion of profits.
- *Tender Offer Taking* enables developers to test landowner interest in several corridors by drawing proposed boundaries for a given project, and offering an above-market price for all landowners within the boundary. The developer then confidentially monitors acceptance, and goes forward with the project once a predetermined threshold is met (applying eminent domain authority to any remaining holdouts). If the threshold is not met, the developer shifts attention to a different corridor. Tender offer taking is well-suited to large projects that can be broken into discrete segments.

- *Good Neighbor Payments* represent ongoing payments to landowners that are near enough to a new project that it affects them even if it does not require taking over their land. For example, wind farm opposition sometimes comes not from direct landowners but from neighbors who are affected; thus wind developers often pay neighbors annually for noise impact. This concept could be applied to transmission development by providing annual payments to aesthetically affected landowners and neighbors. In the case of a landowner, good neighbor payments would be in addition to any easement negotiation made. Developers could also pay bonus payments to farmers who are affected by infrastructure on the land they cultivate.
- *Self-assessment* enables landowners to report the value of their land once a plan to condemn is announced. The landowner's tax liability is then adjusted to the reported value. The condemning authority then decides whether to take the land at the reported price or look elsewhere. If the developer chooses to look elsewhere, the landowner is thereafter prohibited from transferring his land for less than the announced value. This solution allows

the landowner to assign a personal value to the benefit or deterrent of hosting new infrastructure. A variation of self-assessment involves an opt-in mechanism whereby a landowner can choose to receive a property tax break in exchange for agreeing to be subjected to condemnation.

- *Annual payments* allow landowners directly impacted by transmission projects to receive compensation tied to the amount of power transmitted on the line. Under this scenario, payments are distributed each year the project is in service. Payments can be adjusted yearly, to account for inflation, and can be augmented in the event that the agreed upon right of way is used for an additional purpose. Annual payments could provide the landowner with a greater sense of ownership in the project, decrease the incidence of landowner holdouts and ensure compensation commensurate with the growing value of land. The Colorado-based Rocky Mountain Farmers Union has proposed a version of this concept for both transmission and wind farm development.



Any significant change in siting policies will require action on the part of the relevant state legislature or siting commission. However, there are steps that utilities and developers can take right now to repair their relationship with affected landowners. At a minimum, each utility or developer should engage landowners early and often. Today, landowners are often not even notified until the developer has submitted a proposed route and been granted the power of eminent domain. Meeting with landowners before a route is submitted allows affected parties to point out problematic areas and suggest a new approach. Open communication before a route is approved can help mitigate concerns, speed the process and solidify the role of the landowner as a participant rather than a spectator.

For example, many utilities have learned that the biggest impediment to an efficient siting process is landowner concern. They have since adopted a practice of soliciting early feedback. When feedback is solicited at the same time as the siting process, concerns are greatly reduced and the entire procedure becomes much more efficient. Many utilities now realize that holding landowner meetings more often than required can dramatically improve project efficiency. When new rights of way are needed, affected landowners and community stakeholders may be able to outline a developable route. These early steps can save developers and utilities time and money.

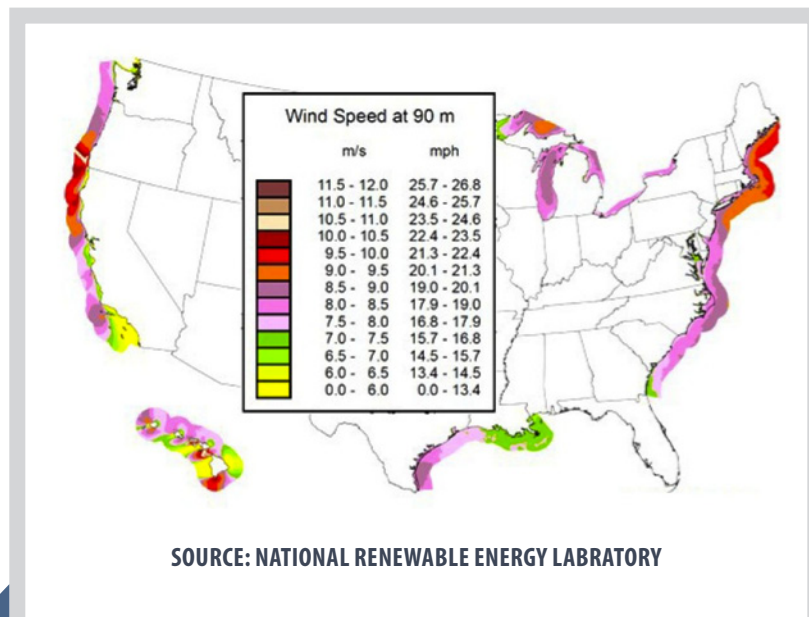
DECISION-MAKER	RECOMMENDATION
State authorities	Enable condemning authorities to create Special Purpose Development Corporations.
State authorities	Enable local governments to implement a self-assessment policy.
PUCs, state authorities	Approve developer and utility costs to work with Landowner Associations, employ Tender Offer Taking, allow for annual payments, and make Good Neighbor Payments.

## Refine the process to support siting offshore wind developments

America's spectacularly rich offshore wind potential is located relatively close to major load centers—especially along the Atlantic coast. Offshore wind can be a balancing resource, and is well-suited to replace fossil generation now being retired in ever-larger amounts. In part to facilitate this opportunity, the Bureau of Ocean Energy Management (BOEM) has created a version of "Smart from the Start" for offshore wind that begins by identifying promising areas via planning and analysis then opens them for competitive leasing. Developers must submit a Site Assessment Plan and a Construction and Operation Plan. These Smart from the Start areas are still subject to Coastal Zone Management Act review, and developments are subject to full NEPA review.

This BOEM initiative has streamlined the leasing program by eliminating redundant NEPA requirements, speeding up adoption of vast amounts of new renewable energy in the Eastern Interconnection, the most coal-dependent

part of the nation. The first lease sales under the program were announced by the Interior Department in November 2012 in the waters off of Rhode Island, Massachusetts and Virginia.



**Figure 4.** America's offshore wind resources.<sup>13</sup>

Still, BOEM's version of Smart from the Start lacks a cornerstone of its land-based counterpart: early and meaningful participation from a broad range of stakeholders. To date, BOEM's Smart from the Start process has been a purely intergovernmental effort, largely excluding public interest stakeholders and traditional users of coastal resources — a divergence from land-based Smart from the Start programs. This flaw

could undermine the success of the offshore siting effort. Early buy-in from affected stakeholders is important, so they do not hear about the project for the first time during the required public comment period under NEPA. By involving stakeholders earlier, developers can benefit from decreased opposition and early identification of major conflicts and proposed solutions.

BOEM's offshore wind program also currently lacks data regarding marine and avian wildlife migration and behavior. Addressing this data gap should be a priority, and can help avoid NEPA issues during project development. Obtaining better information early on

will make the site selection, planning, and analysis process much more reliable. This data would also be valuable during the more stringent NEPA review that wind development projects must pass before beginning construction.

DECISION-MAKER	RECOMMENDATION
BOEM	The Interior Department and its BOEM should prioritize data gathering, research and monitoring for marine and avian wildlife populations, behavior, and migration—both baseline and related to wind energy development. This research should be immediately initiated and incorporated into environmental assessments used to establish Wind Energy Areas.
BOEM	The Interior Department through BOEM should require more open stakeholder participation as part of the intergovernmental task force processes for Wind Energy Area identification as part of the BOEM Call for Nominations.

## CONCLUSION

America has made substantial progress deploying and interconnecting new renewable energy resources, with thousands of megawatts of renewable power having entered the grid in recent years. The U.S. Energy

Information Administration estimates that in 2012, wind power additions alone outstripped additions from all other sources, including even the natural gas sector with its historically low prices.

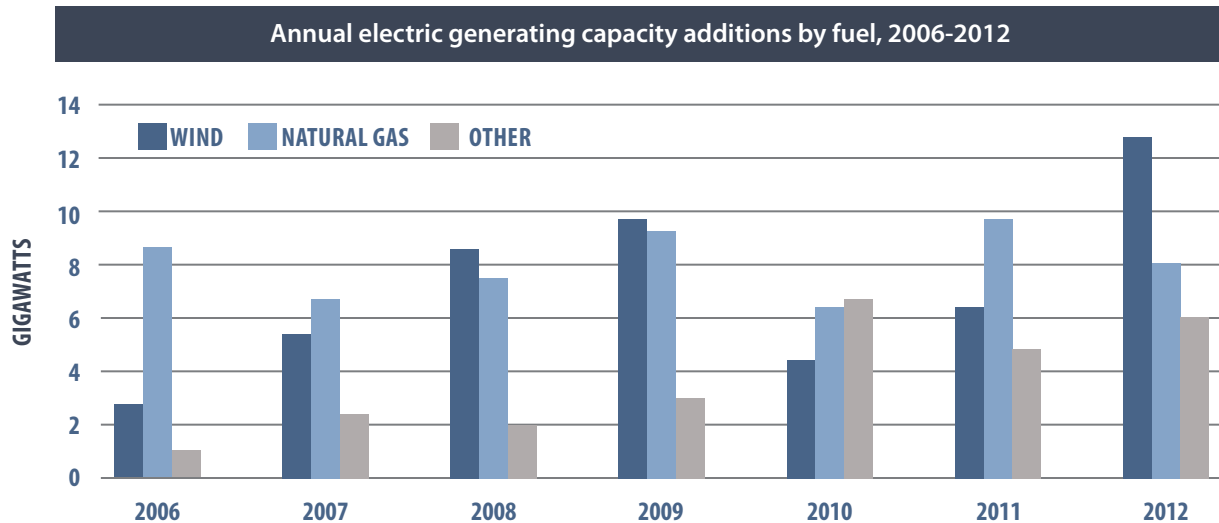


Figure 5. New power capacity additions by year.<sup>14</sup>

Yet while this data is encouraging, renewables still comprise a relatively minor share of America's overall electricity generation. Reaching 80 percent renewable energy by 2050 will require a major expansion of both generation and transmission infrastructure. In order to accomplish such a shift, new approaches to siting will be necessary. As described in this paper, these new approaches will require the early engagement of stakeholders, innovative policy and business models, better coordination among regulatory bodies, smart strategies to avoid the risk of environmental and

cultural-resource conflicts and improved operation and expansion of the grid to take better advantage of existing infrastructure and reduce costs of integrating more renewable energy. We already know how to do much of this – and most importantly, we know that accelerating renewable energy adoption needn't cause harm to landowners, cultural sites or wildlife. On the contrary, as a part of the effort to remedy climate change and stem the profound economic and environmental consequences it will cause, taking action today will provide long lasting benefits.

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- 5 See America's Power Plan reports by Hogan; Jimison and White.
- 6 See America's Power Plan report by Hogan.
- 7 See America's Power Plan report by Jimison and White.
- 8 See Appendix 1 for a list of acronyms.
- 9 Yellow areas are areas in which development is constrained and challenged by environmental conflicts. Gray areas are areas off limit to development by statute, rule or policy.
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## APPENDIX A. ACRONYMS

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<b>BLM</b>	Bureau of Land Management
<b>BOEM</b>	Bureau of Ocean Energy Management
<b>DOE</b>	U.S. Department of Energy
<b>DOI</b>	U.S. Department of the Interior
<b>EIPC</b>	Eastern Interconnection Planning Collaborative
<b>FERC</b>	Federal Energy Regulatory Commission
<b>IPPs</b>	Independent Power Producers
<b>ISOs</b>	Independent System Operators
<b>PMAs</b>	Federal Power Marketing Administrations
<b>PUCs</b>	State Public Utilities Commissions
<b>RPEs</b>	Regional Planning Entities (other than ISOs or RTOs)
<b>RTOs</b>	Regional Transmission Organizations
<b>WECC</b>	Western Electricity Coordinating Council

