

# RFP #13PS5048 Energy Efficiency Potential and Goals Study for 2015 and Beyond

## Statement of Work

### 1. Scope of Work

This section contains the Navigant team's work plan to conduct the Energy Efficiency Potential and Goals Study for 2015 and Beyond (2015 Study).

#### Task 1 Potential and Goals Study Update

##### *Key Deliverables:*

- **Comprehensive project scoping plan.** The scoping plan will include any necessary adjustments and updates to the submitted proposal, a project schedule, and an updated work plan. The scoping plan will define the expectations of the final work product to be delivered to the Commission at the end of the study. Interim reports will be initiated with scoping plans that either coordinate with the overall project scoping plan, or clearly define the interim deliverable if it represents a special research request or study effort not anticipated under the primary report scoping plan.
- **Regular progress reports to the Demand Analysis Working Group (DAWG).** The team will coordinate with and support Energy Division on reporting project progress and results to DAWG members and stakeholders as needed through conference calls, WebEx presentations, and in-person meetings.
- **Draft and final reports.** The team will produce a written report that presents updates to the model, detailed explanation of the steps taken to calculate the potential, a series of tables and charts to supply as input to the goals, and all other required results. The draft reports shall be presented in a public workshop for comments, the final report will be edited based on workshop comments.
- **Functional models and user guide.** The Navigant Team will produce a transparent, accessible model in the Analytica platform to perform all the calculations required to estimate potential under various user-defined scenarios. The 2015 Model will be optimized to run on a mainstream personal computer. The Navigant team will also deliver a model user guide that contains methodological information on model background and set up and provides step by step instructions on using the model.
- **Routine briefings and trainings.** The Navigant team will work with Commission staff and other interested stakeholders to provide briefings and informal training sessions on the potential model inputs and results.

#### Task 2: Additional Achievable Energy Efficiency (AAEE) Savings Forecast

##### *Key Deliverables:*

- **The Additional Achievable Energy Efficiency (AAEE) savings.** The team will produce model runs and results for the AAEE savings forecasts as defined through a collaborative effort with the CPUC, CEC, and CAISO. The team will deliver an accompanying memo describing the methodology and results. The schedule for delivery of model runs and associated reports will be coordinated with each agency's production schedule.

#### Task 3: Energy Efficiency Targets for Greenhouse Gas Reductions

##### *Key Deliverables:*

- **Identify areas of uncertainty about additional sources of savings.** The Navigant Team will help identify new sources of savings and provide methodology on how and why they may or may not be incorporated into the model.
- **Develop stretch goals for carbon reduction and greenhouse gas accounting:** The Navigant Team will expand methodology and calculations beyond the Task 1 approach where possible to help the state identify additional sources of carbon reduction.

#### **Task 4: Metrics to Support the Strategic Plan Update**

##### *Key Deliverables:*

- A document summarizing the inventory and assessment of metrics
- A document summarizing draft recommended metrics (qualitative and quantitative) for revised goals. The memo shall provide projected additional energy savings estimated from new or ongoing strategic plan strategies and activities, by strategy or goal as requested, through 2025.
- Prepare presentations for and present at two stakeholder meetings covering metrics as well as baseline use for the selected sector/segments
- A document summarizing recommendations for additional metrics as needed: as well as progress indicators

##### *Project Schedule/Milestones*

The Navigant team understands there is no formalized schedule from the CPUC regarding deliverables due to the uncertainty of the timeline for the formal proceeding process and due to the future scope for the rolling portfolio cycle. However, we present a preliminary schedule for the first phase of the study. Figure 1 contains our proposed preliminary project schedule and milestones; it is the result of multiple near term deliverable needs:

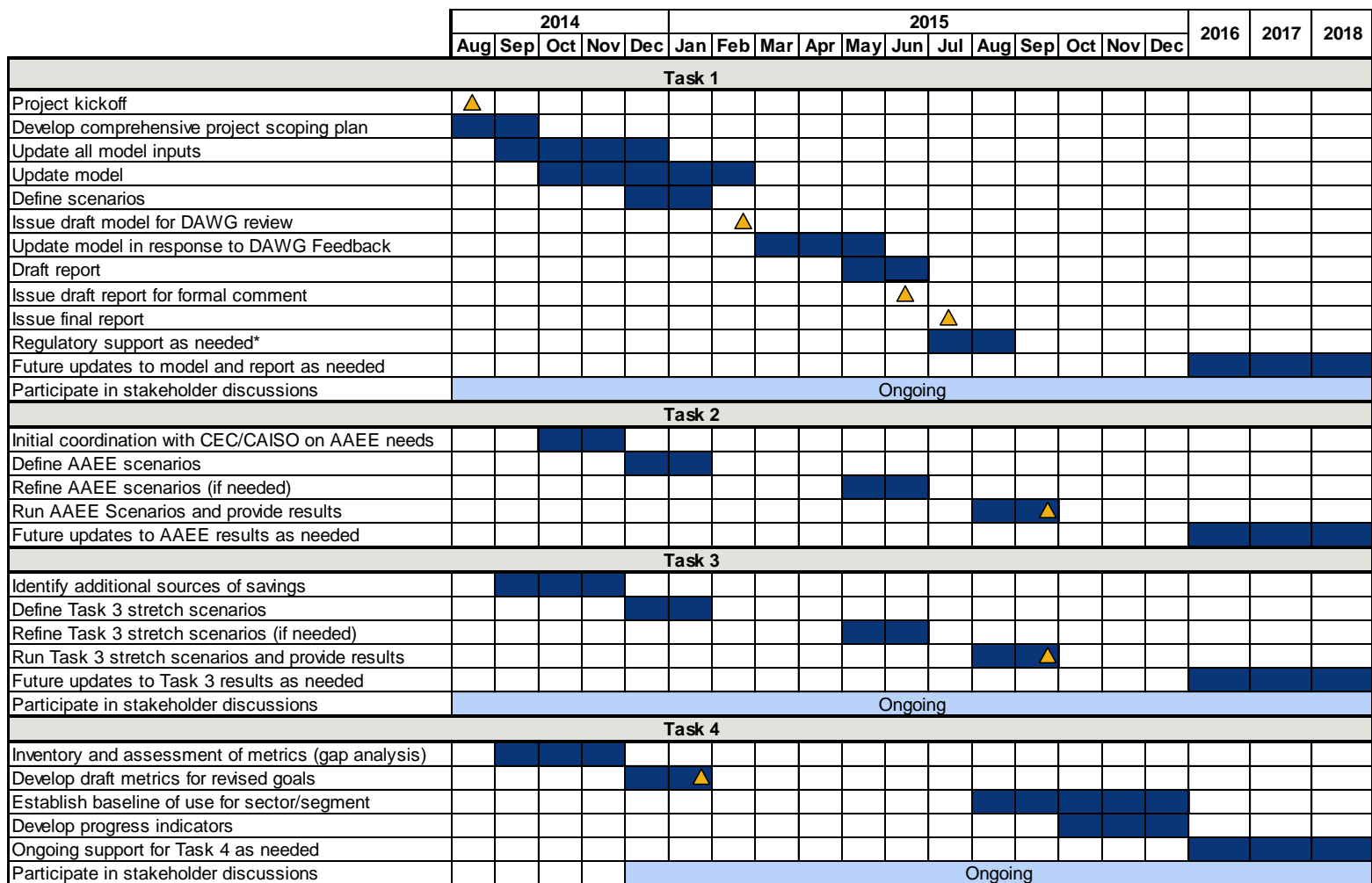
- Deliver results in time for the CPUC to set IOU goals for the 2016 program year and beyond.
- Deliver results for the CEC's 2015 draft demand forecast, by April 1, 2015

Our scope of work includes future updates to the model as needed to serve various stakeholder needs. Future updates will likely occur in 2016 and beyond; we will work with the CPUC to better define the timeline for the future updates based on relevant regulatory timelines. This project will support multiple ongoing efforts listed below. We will work with CPUC and other stakeholders to coordinate on schedule and milestones needed to support these efforts.

- Transmission planning updates which occur annually
- IERP updates which occur annual (minor or major updates are made depending on the year)
- LTPP updates which occur continually based on local resource adequacy analysis need

Our scope of work also includes (with varying degrees of frequency): ongoing discussions with the CPUC, IOU representatives, and the DAWG; presentations at public workshops; and presentations at other targeted stakeholder groups. The frequency of these meetings will be defined in our *Comprehensive Project Scoping Plan*.

Figure 1. Preliminary Project Schedule/Milestones



▲ - Key milestone

\*We anticipate some minor support is needed between the time the final report is released and the goals are set (planned for August 17, 2014)

## *Ongoing Technical Analysis and Commission Updates*

Following the completion of the various tasks by late 2015, Navigant will continue to provide on-going technical analysis and updates of the goals and potential study results to CPUC staff through the contract term period.

It is our expectation that many of the issues associated with the rolling portfolio cycle will be considered during the conduct of Tasks 1 and 2, and as such, will be incorporated into our analysis. However it is our expectation that several of other important policy issues will not be resolved in the time schedule required to complete the update of the goals and potential results such that the IOUs can develop their plans for the rollout on January 1<sup>st</sup> 2016. The Navigant team stands ready and able to support the CPUC with ongoing technical analysis and CPUC updates as needed.

## **2. Work Plan**

### *Overview and Introduction to Structure of Analysis*

Four primary uses<sup>1</sup> of the 2015 Study correspond to the four Task descriptions in the RFP:

1. Inform the CPUC as it proceeds to adopt goals and targets, providing guidance for the next IOU EE portfolios. The potential model is a framework that facilitates the stakeholder process. The model helps build consensus for goals by soliciting agreement on inputs, methods, and model results.
2. Guide the IOUs in portfolio planning and the State agencies in forecasting for procurement, including the planning efforts of the CPUC, CEC, and CAISO. Although the model cannot replace IOU program planning activities, it can provide supplementary information. Navigant will also work with the California agencies to develop outputs in a manner that is most appropriate for their planning and procurement needs.
3. Inform strategic contributions to greenhouse gas reduction targets. As the rules and impacts of AB32 are gaining traction, the model must account for GHG savings estimates. This will provide an opportunity to understand how extensively IOU programs and energy efficiency can help meet AB32 goals. Navigant will work with the CPUC and stakeholders to develop stretch GHG reduction scenarios.
4. Develop metrics for the Strategic Plan. The plan identifies a number of strategies that move beyond current approaches and lays the groundwork for their implementation. . The 2015 Study is expected to inform, as well as be informed by the Strategic Plan, by helping to provide metrics, including projections of additional energy savings estimates, for the 2015 Strategic Plan Update Goals. This may include aligning the potential model with strategic plan initiatives, identifying appropriate metrics, characterizing the baseline, developing scenarios, and creating a tracking mechanism.

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<sup>1</sup> Navigant understands that other appropriate uses for the study may arise over the course of the project. We will coordinate with the CPUC, stakeholders, and other agencies to meet other uses that may be needed.

## ***Task 1. Discussion of Methodology and Modeling Approach and Walk-through***

### **Residential and Commercial Measures**

#### ***Overview of general research approach***

The general approach to the residential and commercial sector forecasts will be to retain the existing Analytica modeling structure and improve model veracity and capability. For the 2015 update, Navigant will review the results and analysis from the 2010-12 EM&V studies and work with Commission staff and consultants to determine what updates are necessary to align the estimated potential to the EM&V study results.

- Continuously vet measure level inputs based on new data sources. The potential model is where DEER, workpapers, impact evaluations, and market studies are combined to present a full picture of the measures and their market characteristics. Navigant will continue to refine measure inputs that are warehoused and documented in the online Measure Input Characterization System (MICS).
- Coordinate and cooperate with the ex ante team on improving accuracy and efficiency of incorporating DEER and workpaper parameters and values into the potential model. The Navigant team will meet with the ex ante team to simplify the process of aggregating deemed measures into the correct format for the potential mode. The Navigant team will work with CPUC staff to assist in:
  - Setting up meetings with the ex ante team
  - Coordinating the DEER timeline and deliverables with this study's timeline and data needs
- Identify additional sources of potential. The Navigant team will seek out additional sources of potential by expanding the stakeholder group to include a broader set of market actors to refine modeling capabilities on new technologies, conservation initiatives, and program delivery mechanisms.
- Refine scenario capabilities, including processes used to develop ad hoc analysis requested for ongoing policy guidance.

#### ***Proposed updates and revisions to the current approach***

CFL potential analysis from the 2013 Model will be revisited. The 2015 Study will be able to benefit from more recent evaluation data, and Navigant proposes to refine the forecast of residential lighting potential as follows;

1. Update the current CFL performance and market assumptions used in the model with new market data, cost values, and DEER savings estimates becoming available from the 2010-2012 evaluation cycle
2. Develop new residential lighting model scenarios that explore various policy and technology / market considerations, including;
  - a. Policy scenarios. Assembly Bill 1109 (Huffman) does not mandate a removal of CFL lighting from the market. It simply directs the CEC to reduce residential lighting energy use by 50% and commercial/outdoor energy use by 25% by 2018. Even with these performance requirements CFL lighting remains a cost effective option for addressing residential market potential. The 2013 Model increased annual residential CFL market potential in 2015 by 43% in the when compared to the 2011 Study to be more consistent with recent program activity and trends, as shown in

**Error! Reference source not found.**, and more reflective of AB 1109 design. Navigant proposes to work with the CPUC to model various CFL policy options such as caps to CFL market potential or polices targeted at specific CFL applications, such as specialty bulbs.

- b. Technology/Market scenarios. It's likely that LED lighting will replace a large share of the CFL market. At present, LEDs have about the same efficacy (i.e. lumens per watt) as CFLs, but LEDs will become much more efficient over time.
- c. Navigant will coordinate with various industry experts and the stakeholder and initiatives discussed in the 2013-2015 Lighting Action Plan.

Estimating savings from a system based approach. Estimating savings associated with systems will be approached in several ways.

1. Refining existing system forecasts. The potential and goals model currently estimates savings for 13 different commercial and residential whole building configurations. These systems will be updated with current evaluation results providing impact, cost, and market data.
2. Defining additional system. In addition to systems already defined, the Navigant team will engage in defining new building level systems, such as building or campus level energy management systems.
3. The Navigant team will work with commission staff to define and potentially include operational efficiency measures, such as the following:
  - Technologies where there is no significant replacement/installation of equipment or modification to existing equipment but nonetheless lead to energy savings;
  - Measures or actions that save energy as a result of operational changes; and
  - Re-commissioning and monitoring-based persistent commissioning activities.

Disaggregation of saving potential in the residential market by building type and ownership status. The capability to assess potential by residential building type already exists in the model, though was not reported in the 2013 report. At present there is not the capability to disaggregate results by ownership status. Navigant will engage commission staff to determine;

- How to add the capability to model residential ownership type, including what characteristics and inputs are necessary to produce this forecast.
- Determine the process needed to vet the results of an ownership forecast

Management of data inputs and analysis outside of the modeling structure.

During the 2013 Study effort, the Navigant team compiled an extensive set of measure-level data for the residential and commercial including approximately 60,000 unique rows of measure characteristics that allow the calculation of technical, economic, and market potential for each measure by climate zone, building type, and service territory. All of the measure-level data, including details on all sources used, and any data inputs that were adapted to fit format of model or involve additional analysis outside of the Analytica modeling structure, is available online through the Measure Input Characterization System (MICS) . The Navigant team will retain this same transparency of inputs and outputs in any future engagement. Communication and stakeholder process

The tasks requested in the RFP, and other modeling enhancements necessary to support a rolling a rolling portfolio environment will require an expanded stakeholder process. Early in the project, the Navigant

will engage commission staff and other stakeholders to define the most effective and efficient process to support stakeholders who use the various EE forecasts, and stakeholders that supply data used by the model.

## **Agricultural, Industrial, Mining, and Street-Lighting<sup>2</sup> (AIMS) Measures**

### *Overview of general research approach*

The Navigant team's approach to the AIMS sectors is to refine and update the 2013 analysis and results. This effort will support the continuous improvement process developed by Navigant at the start of the 2011 Study to sustainably enhance the value of California's energy efficiency potential discussion.

### *Proposed updates and revisions to the current approach*

Current and past goals for Agricultural and Industrial custom programs may be higher than what IOUs can achieve. The Navigant team will re-evaluate savings potential in this area to re-calibrate the baseline and provide a more accurate savings potential based on the various Industry Standard Practice (ISP) studies that Commission staff and the utilities have conducted in recent years.

Navigant will also rely on other sources to revise estimates of potential, as it did for the 2013 effort, including the Manufacturing Energy Consumption Survey (MECS),<sup>3</sup> the American Council for an Energy-Efficient Economy (ACEEE),<sup>4,5</sup> and the DOE's Advanced Manufacturing Office (AMO).<sup>6</sup>

### *Communication and stakeholder process*

The Navigant team will coordinate with the staff and stakeholders engaged in the ongoing effort to revise the Industrial chapter of the Strategic Plan as well as staff, the ex-ante team, and the IOUs that have conducted or will conduct ISP studies. While the AIMS focus will generally relate to the industrial sector, Navigant looks forward to addressing stakeholder input for the entirety of AIMS to refine the 2013 potential estimates.

- **Agriculture:** This sector relates to industrial with respect to ISP. Navigant will incorporate ISP analysis into agricultural end-uses and work with stakeholders to identify new measure opportunities to include in the 2015 update.
- **Mining:** This sector relates to oil and gas extraction and ISP will also apply here. Similar to the agriculture sector, Navigant will incorporate ISP analysis and work with stakeholders to understand new opportunities.
- **Street Lighting:** This sector's potential was fully established in 2013. However, Navigant will engage stakeholders for opportunities to update results with new market data, where available.

## **Existing Conditions Baseline**

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<sup>2</sup> The Street-Lighting measures to be included in AIMS measures includes all non-utility owned systems such as municipal-owned street-lights, privately-owned street and parking lot lights, roadway signage lights, and traffic lights.

<sup>3</sup> MECS. EIA. Last Accessed June 20, 2014. <http://www.eia.gov/consumption/manufacturing/>

<sup>4</sup> ACEEE, Elliott et al. A Defining Framework for Intelligent Efficiency. June 2012. Report Number E125.

<sup>5</sup> ACEEE, Trombley. One Small Step for Energy Efficiency: Targeting Small and Medium-Sized Manufacturers. January 2014. Report Number IE1401.

<sup>6</sup> DOE. AMO. Last Accessed June 20, 2014. <http://energy.gov/eere/amo/advanced-manufacturing-office>

November 4, 2014

The 2015 Study will consider savings possible from a baseline started at existing conditions for selected measures that historically do not meet the code. Navigant understands that IOUs are only allowed to incent and claim savings above the current energy efficiency level required by code. However, there may be additional untapped savings in retrofits that would not otherwise be installed by building owners to conform to code.

The 2013 Model actually allows for modeling of existing conditions baseline but the 2013 Study didn't utilize that functionality. A simple change in settings within the model is all that is needed to update the calculation methodology. The list of measures and the modeling parameters that should be considered for existing conditions baseline will be developed according to the steps outlined below:

1. Review all available data sources. This will include multiple sources from within California and elsewhere:
  - a. Navigant will review baseline assumptions in CPUC sponsored initiatives such as the IOU program tracking databases. Additionally, the Navigant team will engage the CPUC ex-ante contractor to assess market baseline assumptions in DEER, and also baseline assumptions articulated in work papers and custom project review. Navigant will also review data collected during the 2010 – 2014 EM&V projects such as CMST, CSS, CLSS, and other market analysis efforts such as ongoing efforts to define industry standard practices.
  - b. The Navigant team will engage other agencies to assess baseline assumptions in non CPUC planning activities that are relevant to the PGT measure list. This will include, for example, assumptions in CEC sponsored databases such as RASS and CEUS databases, and also baseline efforts associated with ongoing code development initiatives. Reports authored by other agencies and entities, such as ARB and LBNL, will also be reviewed.
  - c. Navigant will investigate other potential industry data sources not developed in California such as ongoing efforts at U.S. DOE to develop appliance standard, or industry market and advocacy groups such as the Association of Home Appliance Manufacturers (AHAM) or ASHRAE.
2. Interview IOU program managers. While it is not certain whether the IOUs track existing conditions baselines, Navigant will nonetheless interview program managers and other EE program personnel to obtain their perspectives about the existing condition baseline based on their experiences in the field. This will include interviews with contractors, such as direct implementation contractors, who typically record baseline conditions as part of direct installation projects.
3. Interview CPUC experts. Navigant will interview CPUC's in-house and consultant experts to obtain their perspectives about the existing condition baseline based on their extensive knowledge and insights.
4. Compile data to reflect existing condition baseline. Navigant will compile the information obtained in Items 1-3 above into the formats required for the model. Navigant will discuss the possibility of convening a Delphi panel with CPUC staff and other experts to vet draft baseline model inputs, contingent upon CPUC/ED approval of Delphi panel protocol and participants.
5. Integrate final inputs into P&G model. Once specific measures are identified and data parameters are finalized, Navigant will incorporate the final existing condition baseline inputs into the 2015 model update.



Given that this issue has become a higher priority with the Commission, Navigant proposes to conduct Steps 1-4 from above early on in the project (i.e., during Q4 2014). Step 5 will be completed around the time that the 2015 model update is completed (around late Q1 2015).

### **Emerging Technologies (ET) Measures**

The 2013 Study included multiple emerging technologies (ET); in the 2015 Study, the Navigant team will add new ETs and refine data relating to existing ETs (those included in the 2013 Study). The team will use the same approach used in the 2013 Study to forecast adoption of emerging technologies over time. This update will keep all the ETs that were in the 2013 Study and further increase the number of ETs considered. Additionally the data for ETs in the 2013 Study will be reviewed and updated to increase the quality of the analysis.

The Navigant team will undertake a process to add additional ETs beyond those considered in the 2013 Study where appropriate. A gap analysis will be conducted to identify additional ETs to consider. This analysis will:

- Identify the sectors and end uses for which limited or no ET savings was present in the 2013 Study,
- Seek input from the IOUs and the CPUC on which ETs are currently being perused in portfolios or are seen as the most promising in the near term,
- Leverage information available from the IOUs emerging technologies programs and the emerging technology program tracking database managed by the CPUC,
- Leverage Navigant's existing knowledge to expand the list of possible ETs,
- Specifically consider a more comprehensive view of HVAC technologies including technologies outlined by Navigant for the DOE<sup>7</sup> such as Advanced Ventilation Duct Registers, Advanced Vapor Compression Condensers, and Heat Pump Maximizers,
- Consider the potential of combinations of measures,
- Specifically consider for lighting and HVAC control technologies.

Once new ETs are identified, the Navigant team will develop and conduct a screening process to select which ETs should be added to the 2015 Study. The screening process will incorporate stakeholder feedback. We will add up to 10 new ETs across the Residential and Commercial sector.

Once the ET measure list is set, the Navigant team will characterize each new ET and revisit the characterization of past ETs (those included in the 2013 Study). The team will update measure data such as cost, savings, applicability, lifetime, and baseline conditions as appropriate. Data sources will include IOU work papers, DOE analysis, and other available case studies. The team will also:

- Revisit data related to LEDs considering lighting quality standards, baseline and replacement wattages, and cost and efficacy changes forecasted for the future. We expect better data on LED costs will be available for the 2015 Study. Navigant has conducted multiple LED market studies for the DOE and is currently conducting one for the California IOUs.
- Review ET risk factors with IOUs and CPUC. ET risk factors in the 2013 Study were used to ensure ET potential remained conservative.

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<sup>7</sup> U.S. DOE. *Energy Savings Potential and RD&D Opportunities for Residential Building HVAC Systems*. October 2012

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The approach to expanding the analysis of ETs will incorporate feedback from the CPUC, IOUs, and other stakeholders as necessary.

## **Codes and Standards (C&S)**

### *Overview of general research approach*

The Navigant team will update the analysis of Codes and Standards (C&S) in the 2015 Study. C&S impacts potential in two ways:

1. Adjust the overall potential as the IOUs can claim a portion of C&S savings
2. Decrease the potential from certain IOU rebated measures as the baseline energy consumption decreases thus affecting unit energy savings
3. True-up C&S potential for savings already accounted for in the forecast.

The general methodology used in the 2013 Study to examine the impacts of C&S will be used in the 2015 Study with several modifications. Similar to the 2013 Study, C&S components will be included in varying degrees in scenario analysis.

### *Proposed updates and revisions to the current approach*

The Navigant team will review the 2013 Study approach with input from Commission staff, making updates to the methodology and updating input data with the best available information from CPUC evaluations, CEC analysis, and IOU filings. The 2013 Study reported net IOU estimates for savings for the purpose of setting IOU goals and total net C&S estimated savings for purposes of demand forecasting; the 2013 Model could also produce gross C&S savings. The Navigant team will work closely with Commission staff to get context on estimates supporting the model.

Calculation of IOU estimated savings from C&S will have a key methodological update in the 2015 Study. The Navigant team understands the policy is to allow the IOUs to claim incremental savings relative to the previous code or standard annually until an updated code or standard comes into effect. In the absence of a previous code, the baseline is average market practice. The Navigant team will work with the CPUC to understand which C&S components are affected by this policy and update the model calculations accordingly. In addition, Navigant will work closely with Commission staff to align assumptions with CPUC policy and EM&V practices, e.g. measure life.

The Navigant team will also update input data for C&S analysis leveraging the best available information from CPUC evaluations, CEC analysis, DOE analysis, IOU filings, and internal Navigant team knowledge. The Navigant team will work with CPUC C&S experts to provide updated data for the purposes of this study.

- **Title 24 Updates**
- **Title 20 Updates**
- **Federal Standards updates**
- **Compliance rates**

### *Impacts of C&S on IOU Rebate Programs*

The 2013 Study modeled the impacts of C&S on IOU rebated measures as a change in the baseline energy consumption (thus a reduction in the unit energy savings). This approach will continue in the 2015 Study.

- **Dual Baseline Issues:** Establishing savings for early retirement measures requires a more sophisticated approach than for replace on burnout measures due to timing issues in the counterfactual case. For replace on burnout measures, the baseline is simply the code equipment at the time of installation. For early retirement measures, though, the baseline is the existing equipment for what would have been the remaining life of that equipment. Then the baseline changes to the code equipment at the point in time corresponding to the end of life of the existing equipment. The dual baseline is further complicated with forecasted generational advances in code. Navigant's approach fully articulates the counterfactual and produces a baseline that accounts for current code and any number of future code changes.

Navigant will review the approach and data available with relevant CPUC experts and vet all assumptions with relevant stakeholders.

### *Communication and stakeholder process*

The stakeholder process for codes and standards will be expanded to greater participation by Commission staff to confirm current C&S lifecycle accounting practices and evaluation methods are reflected in the model design and operation.

### **Financing**

Our approach for the update of the financing analysis is to leverage planned studies to gather California-specific parameters related to financing. The Navigant team includes the CPUC-lead for the finance research and evaluation, Opinion Dynamics (ODC). ODC is currently conducting primary research to understand the potential effects of financing in California. Specifically, as part of the baseline finance study effort, ODC will be gathering California specific data that can feed into the 2013 Model, including:

- **Residential and non-residential financing market landscapes:** The baseline research will allow our team to examine the potential (by segment) for additional savings due to financing
- **The need for, and willingness to participate in, financing programs:** We will analyze the percentages of the population in need of or that are interested in financing by segment
- **The potential incremental effects of financing:** We will validate whether financing removes market barriers to energy efficiency. The baseline research will also seek to gain an understanding of whether there are tradeoffs between financing and rebates.

Recognizing the 2013 financing model relies on secondary data and expert interviews for some key model inputs, there are opportunities for model enhancements such as:

- **Additional research on sensitive model variables:** The current model is most sensitive to two key variables- the implicit discount rate and percentage of population eligible for financing by sector. We will conduct additional research to refine and validate the implicit discount rate and population eligibility and fine tune the model to estimate incremental potential due to financing. In the 2013 Model, we used primary data from a survey of a Midwest utility's residential and non-residential customers to estimate the iDR without financing. Our approach for the next model includes gathering this information specifically for California by obtaining preliminary results and insights from the ODC finance baseline study.

- **California financing market characteristics:** To ensure the model aligns closely with California market; Navigant will utilize primary data from the finance baseline study as much as possible. Our team has already started to think about, and provide input to current finance baseline research efforts.
- **Additional research on other financing mechanisms:** As financing programs develops throughout the U.S., Navigant proposes to monitor and review EE financing delivery and evaluation results from other States. Navigant plans to compare and validate model parameters and results to programs outside California.

## **Behavior and Conservation**

### *Overview of general research approach*

In the 2013 Study, the Navigant team modeled behavioral program effects through an extensive review of the research available at the time. Across both residential and commercial, we examined equipment changes and usage-based changes (i.e., changes in usage/maintenance of equipment). We also recommended ways in which the model could be improved for the future. These included: (1) developing a better definition of the specific actions taken as a result of behavioral programs, (2) bringing in new research around the multi-year persistence of behavior-based savings for the various potential program types, and (3) better documenting the penetration of behavioral programs and the overlap between programs at the site or customer level.<sup>8</sup> In addition, the CPUC has in early 2014 commissioned a study by Opinion Dynamics Corporation (ODC) to assess the IOUs integrated work on: 1) EE behavior pilots and programs; 2) smart meter / AMI assumed EE/DR pilots and activities; 3) the general state of the CA “behavior” service provider market; and 4) promising behavior pilots throughout the country, including data on savings and other parameter estimates from these pilots. The study is expected to be completed by late 2014. An estimate of and summary of concerns around EE behavior or conservation savings also included within the IOUs Smart Meter / AMI business plans, and as such potentially in need of special treatment within the EE Potential and Goals study and subsequent CPUC decision making to avoid the double counting or double funding concerns referenced in D. 10-04-029 (pps 36-41).

### *Proposed updates and revisions to the current approach*

Our approach for the next behavioral update to the model is to:

- Provide broader definition of what constitutes “behavior”
- Augment behavior assumptions through review of the results of the ODC study, and additional newer literature and expertise. Coordinate with the ODC and any additional planned studies to gather primary research on California-specific behavioral parameters
- Integrate and update behavioral assumptions in the model
- Provide guidance on any “special treatment” recommended for EE behavior savings within the PGS to avoid the double counting / funding issues raised in D. 10-04-029
- Quantify technical, economic and achievable potential for defined behaviors

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<sup>8</sup> California Public Utilities Commission, Analysis to Update Energy Efficiency Potential, Goals, and Targets for 2013 and Beyond. Navigant Consulting, Inc. and Hescong-Mahone Group, 2012, pp. 49.

## **Whole Building Energy Efficiency**

### ***New Construction***

The 2015 Study will need to consider non-energy benefits and distributed generation benefits as many purchase/construction decisions are made on factors beyond energy efficiency savings alone. These additional factors need to be captured and monetized to accurately assess the willingness of customers to build/purchase ZNE buildings and subsequently future market adoption of ZNE buildings. The Navigant team will discuss with the CPUC how these additional factors may impact the cost effectiveness of ZNE packages as reflected in the 2015 Study and how distributed generation from ZNE buildings should be included in the 2015 Study. Depending on the timing and any additional Commission guidance on the topic, the team may also review if distributed generation can be counted towards IOU EE goals in future program cycles within the Potential and Goals Study.

### ***Retrofit***

The same methodology will be followed in the 2015 Study, though the team will seek improved data. Data from EUC project tracking was reported as full in invoice costs presented by contractors to customers. The costs are not necessarily representative of the true incremental cost of the upgrade; as such past evaluations and modeling showed a very low cost effectiveness results for residential whole building retrofits. The Navigant team will need to adjust cost parameters to better reflect the true incremental cost. Similar to ZNE analysis, and based on CPUC staff input, the 2015 Study may need to consider non-energy benefits as evaluations have shown purchase decisions are made based on non-energy benefit factors.<sup>9</sup> Additional data source for residential retrofits will include impact evaluations of the EUC Program, IOU work papers, and CPUC dispositions. The Navigant team will review available data with the CPUC and stakeholders relating to EUC.

The Navigant team will characterize commercial whole building packages using the same methodology as the 2013 Study. There is limited real world data (like the EUC program) to rely upon for commercial whole building packages. Comprehensive measure packages used in the 2013 Study will be updated. Each package of measures will be assembled from individual measures and will represent a weighted average installation by a typical participant. In assembling these packages, only measures from the commercial measure set will be eligible for inclusion. The Navigant team will take new 2013 T24 requirements into consideration understanding that some renovations will trigger compliance with code removing potential measures from the package and reducing savings potential. The team will also work with CPUC staff to provide distinct potential estimates for newly constructed non-residential buildings as compared to potential from major (“to the studs” or “tenant improvement project”) renovations, preferably by customer segment or building type. In developing the packages, the Navigant team will choose appropriate measures that maximize energy savings. Bundle savings include adjustments to specific measure savings based on other measures in the bundle. Adjustment factors include accounting for competing measures and for interactive effects between measures. Attempts will be made to develop packages that will help achieve the deep savings in retrofits required to meet the goal of 50% of existing buildings achieving ZNE levels by 2030. The assembled packages will be vetted with the CPUC and stakeholders and will align with estimated renovation rates, by building type/market segment, as noted above.

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<sup>9</sup> SBW Consulting, Inc. 2010–2012 PG&E and SCE Whole House Retrofit Program Process Evaluation Study. December 2012

### **Embedded Energy in Water:**

The Navigant team proposes the following approach to incorporating embedded energy savings in the 2015 Study:

- Work with the CPUC and IOUs to determine the scope of water-energy measures to be included in the potential study and to quantify the annual water savings and other relevant data for the selected measures
- Leverage the CPUC water/energy cost effectiveness study calculators (expected to be complete in October 2014) to obtain energy intensity factors to calculate embedded energy savings
- Apply the same methodologies used for residential and commercial measures to forecast adoption of water-energy measures
- Discuss the appropriateness of using marginal vs. average water supply energy intensity with the CPUC as well as considerations for IOU vs. non-IOU energy savings

### **Support AAEE and LTPP**

#### *General Research Approach*

For 2015 and Beyond it is possible to develop more granular estimates of locational potential by enhancing the climate zone level forecasting capabilities in the 2013 Model with datasets available from the Commission and the IOUs.

#### *Approach to Near Term Planning Support*

The following is a description of a more refined method of allocating projected incremental energy efficiency savings, which requires considerable new data, and will be feasible for post 2014/2015 TPP cycles, contingent on the availability of data. The methodology is consistent with the approach specified by CEC in the October 2013 memo addressing allocation of EE and the load bus level<sup>10</sup>. The methodology involves six steps

1. Climate zone level AAEE potential is estimated consistent with the approach used in the 2013 Model. These forecasts are vetted using multiple sources, including IOU sales data and Commission databases tracking locational ex-ante and ex-post program activity.
2. The AAEE potential for the Residential, Commercial, and AIMS sectors is output and aggregated from the model results at the climate zone level across all voluntary IOU programs.
3. Customer sector projected climate zone area impacts are a readily available output from the model and may be further allocated to reasonable and appropriate levels of locality based on available IOU data. Note that such allocation schemes would be derived as a percentage of climate zone or system sales, and metrics that are common between the model and IOU data (i.e. CEUS building types, NAICS codes, etc.).
4. The distribution of customer sector impacts by climate zones are determined by the relative contribution to the total customer load for each locality in that sector and climate zone.

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<sup>10</sup> Allocating Additional Achievable EE Savings to Load Busses. Mike Jaske, California Energy Commission. Revised 10/18/2013

5. Additional achievable impacts by locality may be determined by summing the impacts across all customer sectors from each locality.
6. Within the 2013 Model, appliance standards and building codes can be defined at the sector level, and allocations of forecasted potential can be accomplished consistent with the methodology defined for voluntary IOU programs

As the 2013 Study modeling inputs are already disaggregated to the IOU, customer sector, building type, and climate zone level; future updates planned for the 2015 Study including further vetting of the modeling inputs and outputs may allow for more refined estimates of potential at additional levels of appropriate granularity. Functionally, the process of extracting and aggregating the model results is consistent across all modeled utilities due to the IOU-specific inputs and outputs provided by the model.

### *Communications and Stakeholder Process*

As discussed in Task 2, the Navigant team will work with the joint agencies and other stakeholders involved in transmission and distribution planning, and resource adequacy to establish reasonable and appropriate frameworks that will allow them to develop forecasted EE potential scenarios at various ranges of granularity.

### **Inform Strategies for California's Greenhouse Gas Reduction (GHG) Targets**

Navigant will update the 2013 Study methodology and EE program modeling to capture GHG reduction estimates and the impacts of program design on GHG reductions from EE. We will evaluate whether there are additional EE resources, programs, and technologies that can increase the GHG reductions from EE.

The 2015 Model will include an option to consider societal benefits for GHG reduction beyond the traditional technical potential, economic potential, and market potential. The societal benefits will include AB32 allowance cost projections and other compliance options such as offsets.

Three possible levels of granularity may be used to account for GHG reductions from demand side measures:

- **Hourly intensities** – An hourly approach would require integrating historic and simulated generation dispatch data. Past GHG studies that use this approach have used commercially available software (such as PLEXOS)<sup>11</sup> to understand the carbon intensity of electric energy in different regions for each hour and heat rate of power plants operating on the margin. Then the hourly carbon intensity results would be applied to load reduction profiles for each measure to create a GHG reduction estimate for each hour of each year. These results would be aggregated to an annual result. This approach is the most rigorous, however, the energy consumption and savings data for many DEER measures are only available at an annual level and would need to be disaggregated either by measure or use category to develop an hourly savings profile.
- **Seasonal intensities by peak period** – This approach would create carbon intensities by season (i.e., heating versus cooling season) and by peak period (i.e., on-peak versus off-peak). These periods would be defined separately for each utility. The GHG intensity data and the measure coincidences with each period can be derived from publically available information. This approach would require less effort than the hourly approach, but would be expected to produce results with a degree of

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<sup>11</sup> <http://energyexemplar.com/software/plexos-desktop-edition/>

precision only slightly less than the hourly approach, since it captures the most substantially different modes in grid GHG intensity.

- **Annual intensities** – This approach would apply publically available annual carbon intensity data for each utility to the annual kWh savings estimates. Although straightforward and easy to implement, annual intensity values would still produce reasonable GHG estimates, although not as precise as hourly or seasonal values. This approach might serve as a useful placeholder to produce preliminary GHG results while a more rigorous approach is being developed, implemented, and vetted.

The Navigant team expects to use develop separate stretch scenarios independent of the needs for Task 1 and Task 2. The current CARB Scoping Plan for AB32 establishes higher EE goals than currently in use. The Task 3 analysis will help policy makers and EE program designers understand what would need to change in order to achieve corresponding higher savings levels. The GHG reduction valuation could be applied in the cost-effectiveness assessment of IOU programs to better align with the intent of AB32.

Navigant’s analysis of the GHG reduction potential of EE options will also support CPUC in identifying EE resources, technologies and program designs that have significant GHG reduction potential. This will help CPUC evaluate policy options to better incentivize EE programs that focus on the GHG reductions. For example, Navigant may include energy and GHG savings potential analysis of coupling storage, distributed generation, and energy efficient construction in residential and commercial buildings to enable zero net energy buildings. The Navigant team will work with the CPUC and stakeholders to understand the desired scope of these additional savings sources, including how to disaggregate zero net energy building strategies and assumptions related to different technology paths. General scoping for this task will occur during the early phases of Task 1 as decisions made on Task 3 scope may affect model structure, methodology and inputs. The final report will include learnings and recommendations for the possible program or policy improvements in the spirit of stretching for AB32 GHG reduction targets.

## **Additional Policy Updates to 2013 Study**

### *Overview of general research approach*

The Navigant team worked on multiple policy modelling requests during the 2013 Study. This work included a variety of modeling requests and timelines from which the team has developed the following general approach to modeling individual policies;

1. *Anticipate a dynamic environment.* During the 2013 Study the Navigant team fielded frequent requests to provide forecasting and modeling for various initiatives, including some listed in the RFP. The team understands the dynamic nature of modeling policy requests and anticipates that additional requests will likely be continuous and come from a variety of legislation. For example, the parameters used to model financing might be affected by SB 1121<sup>12</sup> that enhances existing clean energy financing program, or AB 2045<sup>13</sup> which expands financing for nonresidential properties.
2. *Engage early.* Requests are often made with short timelines making it difficult to staff and QA/QC policy analysis. Navigant will work with commission staff to define a process to identify potential policy modeling initiatives in advance.

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<sup>12</sup> [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140SB1121](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB1121), amended June 10, 2014,

<sup>13</sup> [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB2045&search\\_keywords](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB2045&search_keywords), amended April 23, 2014



3. Vet the scope. Because the Navigant team will be engaged earlier in the policy modeling decision making process, Navigant will be able to provide improved statements of work and budget estimates for each policy analysis effort. The statement of work will be vetted through with all impacted agencies/entities such that method and deliverables are clearly understood.
4. Carefully define scenarios. Policies may require additional scenario capabilities that are not included in the model capabilities developed to set IOU goals. During discussions on scope and intent, it will be important to assess what scenarios are needed for policy analysis and how these can be achieved. For example, AB 758 has the capability to mandate retrofit to code at time of sale. If this mandate is a desired scenario it should be decided early in planning so adequate resources are allocated.
5. Integrate results. Navigant has observed that many custom scenarios can be run for various policies that impact only one market segment, such as the impact of Prop 39 on the K-12 school market, or other policies that impact a single delivery mechanism, such as the potential of AB 758 to impact code. Each separate policy model and scenario might provide a perspective to select stakeholders that does not manifest when higher level planning forecasts are run (i.e. AAEE scenarios). To avoid disconnect between specific policy models and broader planning scenarios it will be important that underlying assumptions can be coordinated. For example, if an AB 758 specific scenario includes a forecast of 'to code' initiatives at time of sale, the modeling parameters for this policy specific effort should be considered for inclusion in a high case scenario of the broader AAEE forecast.

#### *Proposed updates and revisions to the current approach*

The following provides some initial insight to the issues and approaches related to modeling the policies referenced in the RFP.

Proposition 39. The current model has the capability to model K-12 and community college building types. The approach to modeling Prop 39 activity will be to vet the model inputs for these sectors against other data sources (e.g. IOU sector sales data, etc., ESCO project performance data) to confirm that the current potential forecasts are reasonable. Additionally, it will be important to define scenarios parameters because prop 39 is not administered by the IOUs, and some modelling assumptions, like the TRC, are not relevant in defining economic potential.

AB 758. This legislation presents a very broad agenda and a key task for modeling in a way that informs policy will be to accurately scope the mechanisms by which the program will drive the market for efficiency in existing buildings (mandatory initiatives at time of sales, etc.). This is complicated by the fact that there will likely be significant overlap with existing voluntary and mandatory programs, making incremental impacts hard to isolate. Additionally, there may be some issues assessing economic (and market) potential resulting from different cost tests being applied by the CEC and CPUC. Specifically the CEC uses time-dependent valuation (TDV) to calculate cost-effectiveness, and this values energy efficiency differently for the TRC test. It may be that the potential model will need to include broader cost effectiveness capability to accurately account for AB 758 potential

AB 1103. The possibility that AB 1103 will generate benchmarking information on commercial will be a benefit to the potential model in that this data set may, over time, provide current baseline metrics to help calibrate the potential model forecasts. Navigant will engage AB 1103 implementation teams to understand how benchmarking data can be used to improve the veracity of forecasts on select commercial building types.

Update to cost effectiveness parameters. The Navigant team will work with the Commission to identify and incorporate changes or updates to the current cost-effectiveness methodologies. The cost effectiveness

calculations in the 2013 Analytica model are modular and can be updated without changing the architecture of the model.

Policies related to the Energy Efficiency Strategic Plan. Navigant will support the development of policies related to the strategic plan based on the analysis and strategic plan support approach defined in Task 4.

### ***Communication and Stakeholder Process***

The Navigant team will work with commission staff to define a general stakeholder process template that might be used in modeling policy. Policy initiatives can have broad or narrow stakeholder groups, and their agendas may be parochial or broad, depending on the policy. A stakeholder engagement on policy modeling would include defining the scope of parties interested in the policy and recruiting policy representatives. This group would then help develop key scope of research, scenario definitions and key objectives. It would be the Navigant team's responsibility to relate specific policy investigations to the broader IOU goal setting and AAEE scenario activity.

### ***Task 2. Additional Achievable Energy Efficiency Savings Forecast***

The Navigant team will use the 2015 model to similarly engage and meet multiple stakeholder needs, but will refine the process for generating scenarios to forecast Additional Achievable Energy Efficiency (AAEE)<sup>14</sup>. In the 2015 and Beyond effort, Navigant proposes to retain the existing set of modelling variables<sup>15</sup>, but revise how scenarios are defined such that endogenous variables are more aggressively explored. For this effort, endogenous variables are model inputs can be influenced by policy and program design, such as incentive levels and the resulting market effects. Conversely, exogenous variables are market forces over which policymakers and DSM industry practitioners have no influence, such as changes in California's building stock resulting from fluctuations in the broader economic climate.

Navigant proposes to develop new AAEE (and IOU goal setting) scenarios to explore policy drivers that can influence costs, market drivers, and consumer attributes towards DSM.

- Changes in avoided costs may be explored by consider how various policies might change avoided costs, such as changes to environmental externality adders, that might influence market potential by changing payback characteristics.
- Changes to incentive levels might be explored in concert with new information on incremental costs. Additionally. It may be that incentive covering 100% of incremental costs are explored some measures.
- Changes to cost tests will be explored as benefit-cost policy evolves, or variations in program operational and administrative costs can be modeled to explore alternative program delivery modes.
- Quicker adoption of EE can be modeled by adjusting the drivers in the Bass diffusion model based on higher level of word mouth and advertising effects resulting from policy drivers. AB 758 is an example of a policy driver that might influence word mouth and advertising effects through more aggressive marketing, education and outreach.
- Modeling higher overall levels of adoption by decreasing the implied discount rate (IDR) used to model consumer willingness to invest in EE most are considered. A lower IDR implies a consumer

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<sup>14</sup> This is an estimate of the energy efficiency savings from that could be realized through utility programs that are incremental to the savings already accounted for in the Energy Commission's current forecast.

<sup>15</sup> Some modeling variable might be added to accommodate certain policy and strategic plan initiatives

sees less risk in investing, and is also willing to accept longer payback as an expression of higher perceived underlying value. Policy drivers that might influence this include AB 1103 which might make investors more amenable to investing in commercial properties with higher energy performance scores.

- Additionally “savings accounting” assumptions may need to be discussed as part of collaborative meetings with CEC. For example the 2013 AAEE scenarios used net measure savings instead of gross measure savings estimates. Similarly, codes and Standard savings estimates for AAEE include all C&S savings in an IOU territory (less naturally occurring market addition estimates) while 2013 Study was focused on IOU claimable savings only.

To set AAEE scenarios the Navigant team will take multiple steps:

1. Share the Task 1 scenario assumptions and results with the CEC and explore new scenarios based on locational requirements, or consideration of additional policy drivers and consumer attributes
2. Discuss the sensitivity of model results to key variables (such as rebate levels, compliance rate, discount rate, etc.) with the CEC
3. Discuss the granularity of results needed (sector, region, end use, etc.)
4. Work with CEC to collaboratively set draft scenarios taking into account the need for reliable, dependable results that can be counted on as a resource for transmission and generation planning
5. Share draft scenario assumptions with the CPUC and DAWG
6. Refine scenario settings as needed and run model to produce results

The Navigant team will, in conjunction with the CPUC, conduct frequent and regular outreach to participating agencies and stakeholders in the development of the 2015 Model, keeping AAEE scenario development in mind. The DAWG will remain the forum through which stakeholders will be engaged.

### ***Task 3: Energy Efficiency Targets for Greenhouse Gas Reductions***

Navigant’s mission for Task 3 is to create the most flexible and inclusive bottom-up potential model possible. Navigant will apply three approaches to creating GHG scenarios:<sup>16</sup>

1. Including non-traditional measures and technologies to most completely capture the full potential of new and emerging technologies. These non-traditional measures may not have been previously included in IOU programs and may not currently be considered cost-effective. Furthermore, the non-traditional measures may not be categorized purely as “energy efficiency measures” in the traditional sense, but still produce reductions to usage of electricity and natural gas (e.g., storage, distributed generation, ZNE, etc.).
2. Develop a feasible-stretch scenario for model inputs and methods to show the greatest potential savings that stakeholders agree could be realistic. These may include ambitious targets for adoption rates, technology development, avoided cost assumptions, stock turnover, incentive levels and reduced market barriers.

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<sup>16</sup> Navigant views this Task as separate from the IOU goal setting task (Task 1). All tasks will use the same model, but scenarios for Task 3 are not expected to be used for Task 1. This explicit separation will be necessary to fully engage stakeholders in the envisioned stretch process to characterize the “possible” rather than the “probable.”

3. Develop a maximum-stretch scenario that most closely meets CARB targets to better articulate how extensively the policy, portfolio, and market assumptions of today would need to change in order to meet the Scoping Plan targets.

The accounting of the GHG reductions from EE programs will be built into Navigant's Potential and Goals model for the 2015 update study. The updated model will include an option to consider societal benefits for GHG reduction beyond the traditional potential study resource savings. This will allow Navigant's analysis and other CPUC studies to consider additional value to EE resources due to GHG reductions beyond simple avoided cost economics. Additionally, GHG prices may be used to further account for customer willingness considerations due to GHG regulations.

In order to improve the GHG accounting of potential EE resources, Navigant will leverage the sector/end use level data that the Potential and Goals model produces to consider the time-of-use reductions in energy usage due to the EE rather than simply the aggregate load reduction and peak load reduction. Navigant will work with the CPUC to define the proper time resolution for this analysis. The partitions will be designed to help capture California-specific issues such as the requirement for ramping up thermal units in the evenings after sun-down as depicted in the "duck" graph. The benefit of this is that it will allow the overall analysis to properly account for the impact of seasons and time-of-use in California on the time-varying GHG intensity of energy generation.

To complete the analysis of GHG accounting for the categories of EE resources being considered, Navigant will use the outputs and scenarios from CPUC and utilities previous studies such as the Greenhouse Gas Modeling of California's Electric Sector through 2020.<sup>17</sup> The data developed in this project will be used as inputs in the GHG calculator for the key scenarios used by the CPUC in their planning. The outputs of this exercise will be GHG reductions for each class of EE resource that can be modeled in the rest of the Navigant analysis. Linking the EE analysis with the GHG calculator will allow the Navigant analysis of potential EE categories and the amount of EE in each category to be made consistent with other CPUC GHG reduction studies. This will mean that the results of Navigant's work will be maximally useful to the CPUC for developing inputs and scenarios in the GHG planning and modeling.

#### ***Task 4: Metrics to Support the Strategic Plan Update***

##### **General Research Approach**

The Navigant team will work with commission staff and its strategic plan consultants to support the various elements of the updated general work plan, and associated Action Plan updates. The following provides an outline of how the Navigant team will approach the areas of support outlined in the draft work plan.

1. Derive Plan's Goals with Energy Savings Potential of Specific Strategies. This step requires the Navigant team review with commission staff and its strategic plan consultants each draft updated Strategic Plan chapter and/or action plan and assess which goal or strategy can be aligned with the potential model, and also where adjustments to the model may be necessary to accommodate plan components.
2. Update to Align Plan with Current Potential and Goals Study. The team will work to align both the model and plan. It may be that not every strategy within a goal needs to be quantified to develop a

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<sup>17</sup>E3, "Greenhouse Gas Modeling of California's Electric Sector through 2020." V3b, prepared for CPUC, Oct. 2010. [https://ethree.com/documents/GHG%20update/CPUC\\_GHG\\_Revised\\_Report\\_v3b\\_update\\_Oct2010.pdf](https://ethree.com/documents/GHG%20update/CPUC_GHG_Revised_Report_v3b_update_Oct2010.pdf)

representative metric. For example, goal 2 of the HVAC action plan<sup>18</sup> addresses quality HVAC installation and maintenance. Of the four strategies outlined under this goal, only strategy 2-2, Launch a Consumer Marketing and Education Campaign to Support the Brand and Stimulate Market Demand might be investigated within the Bass diffusion structure of the model.

3. Identify Specific Baseline for Key Areas. In many cases baselines will be provided by variables already vetted in the Measure Input Characterization System. However the Navigant team will take this opportunity to further review and improve baseline assumptions.
4. Develop Specific Metrics that Translate to Goals. Navigant will develop a range of outputs that can serve as goals. This might include annual incremental goals, or goals disaggregated into measure categories, sectors, climate zone or other distribution area definition.
5. Develop Intermediate Characterizations of the Market Using an Adoption Curve for Specific Measures. The analytic engine of the 2013 Model is based on measure level diffusion curves and the Navigant team will work with plan representatives to produce adoption curves for measures that are impacted by strategic plan activity.
6. Look at how a Scenario Analysis Might Affect an Update. The Navigant team envisions this will be a multistep process, including;
  - a. The Navigant team will work with representatives from each draft updated Strategic Plan chapter and/or action plan to define scenarios relevant to their specific action plan
  - b. Navigant will consolidate the various scenario requests in to a limited set of broader scenarios such that a manageable set of variables can be defined and reported.
  - c. Navigant will work to align this strategic plan variable into the broader IOU and AAEE goals to be incorporated by other agencies and stakeholders.
7. Create a Progress Tracking Mechanism to Measure Progress Towards Goals to the year designated in each strategy. The Navigant team will provide specific baseline (starting point) metrics and incremental and cumulative goals through the year designated in each strategy. Multiple trajectories may be stated to represent a range of scenarios.
8. Identify Additional Savings Beyond that Currently Required in Potential and Goals Study. It is most likely that additional savings exist beyond what is included in potential model. The Navigant team will define what draft updated Strategic Plan chapter and/or action plan strategies and goals can be modeled, and which cannot be accounted for in the potential model.

### **Formulation of Strategic Plan Metrics and Targets**

To formulate metrics our process will be to go through each plan with the various plan development teams and identify which strategies and goals can be modeled within the context of the potential model structure and design. The following provides a brief indication of the metrics that might be possible for each action plan. The Navigant team is aware that these action plans are being revised into updated draft Strategic Plan chapters, as well as, in some cases, additional action plans

Codes and Standards Action Plan. Strategies 2, 3, 4, and 5 address code compliance<sup>19</sup> and metrics might be established by refining the code compliance modeling capability in the existing model.

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<sup>18</sup> HVAC Action Plan Heating Ventilation Air Conditioning 2010-2012, March 2011

<sup>19</sup> Strategy 2: Develop and enhance the electronic infrastructure and supporting tools to enable the advancement of Building Energy Efficiency Standards and compliance improvement; Strategy 3: Enhance education and training

*New Residential Zero Net Energy Action Plan.* Goal 1 intends to create deep awareness of the value and benefits of ZNE with homebuyers and builders and it is possible to model various levels of consumer uptake of residential ZNE systems defined in the 2013 Model. Additionally, Goal 4 promotes a robust financing market, and this might be used to create new financing scenarios to be investigated through the financing analysis capabilities built into the 2013 Model, including updated estimates of implied discount rates.

*Industrial Action Plan.* The existing industrial plan provides metrics that can be modeled, such as 'California industry's energy intensity will be reduced by 25 percent from the current baseline by 2025'. However, this plan will be complicated by interactions with emerging GHG markets and the need to clarify policies on operational savings.

*Local Government Action Plan.* The Strategic Plan has broad goals for the over 600 local governments in California. Two main goals are for these entities to adopt above-code energy mandates and adopt "reach" codes. These actions would be included in the Codes and Standards metrics described above. The other three goals for this action plan encompass additional savings from local government facilities or innovative community energy efficiency programs, and it may be that potential for these actions can be identified as a subset of commercial market potential forecast.

*Research and Technology Action Plan.* This plan has distinct activities to increase energy efficiency through research and development within integrated building design & operation, market intelligence & consumer acceptance, plug loads, and advanced HVAC technologies. While many of these activities require appropriate implementation to reach market acceptance, the Potential & Goals study can coordinate with this plan to create various technical and market scenarios to enhance the models emerging technology forecasts.

*HVAC Action Plan.* Several of the twenty separate strategies listed under the four goals can provide modeling variables that can be used to develop action plan performance metrics. These generally include strategies targeting specific equipment and code initiatives, or select whole building efforts.

*Lighting Action Plan.* The vision of the lighting chapter of the Strategic Plan provides metrics that can be modeled, such as "by 2020... [market] transformation will achieve a 60-80 percent reduction in statewide electrical lighting energy....". Members of the Navigant team have been supporting the development of the Lighting Action Plan since 2012.

*Zero Net Energy Commercial Building Action Plan.* Metrics will be developed for both the voluntary and mandatory components of the new construction and retrofit markets outlined in the 2011 plan.

### **Communication of Strategic Plan Metrics and Targets**

The Navigant team will work to tie together the Potential & Goals Study and the Strategic Plan so that the Potential and Goals provides quantitative support for the Strategic Plan. This will involve a stakeholder process that has several components and compliments current planning protocols;

- Developing a schedule that will clearly lay out the touch points and key stakeholders involved throughout the process. Our primary goal will be to establish a transparent and collaborative process. Rather than develop a whole new communication protocol, we envision that our communication around the Strategic Plan metrics and targets will rely heavily on the already-established stakeholder groups and processes. Because stakeholder engagement varies by Strategic Plan chapter and action

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initiatives for improving compliance; Strategy 4: Expand coordination and outreach initiatives to improve compliance; Strategy 5: Support efforts towards Standards compliance at the local level.

November 4, 2014

plan, our first step will be to identify and document the CPUC-point person and key champions within each Action Plan area.

- Establish a broader list of parties for comment. We also understand that for some of the areas that do not already have insights from a broader community, there may be a need for broader community outreach (for example, insights from retailers or manufacturers of key end uses). We value this insight, and (depending on the area) we will establish a broader list of parties for comment. Any efforts for broader community outreach will be coordinated with the CPUC point-persons.
- We anticipate using Workshops and collaborative discussions with stakeholders to help us understand and finalize Strategic Plan inputs to the model. Where relevant, we will also use existing web-based tools (e.g., Base Camp, the PDA) already designed to communicate with stakeholders.