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Mission:data comments on Draft Action Plan

Additional submitted attachment is included below.

May 22nd, 2015

Via Website Submittal

California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814-5512

Docket No. 15-IEPR-05, "California's Existing Buildings Energy Efficiency Action Plan"

RE: **Comments of Mission:data on the Existing Buildings Energy Efficiency Action Plan's Goal #2, "Data drives informed decisions"**

       The Mission:data Coalition ("Mission:data") is a national coalition of technology companies delivering data-enabled, energy management services and solutions.[1] With 30 companies representing nearly $1.0 billion per year in sales, Mission:data advances data access policies in states across the country in order to enable innovative new services, such as: "no-touch" virtual energy audits, device-specific recommendations to reduce energy use, alerts when energy use deviates from norms, and simple measurement and verification of demand reductions.

       Our technical and policy expertise leads us to provide these comments to the California Energy Commission (CEC) regarding the April 14th, 2015 workshop held at CEC titled "Strategies related to data for improved decisions in existing buildings energy efficiency draft action plan" and on the AB 758 Draft Action Plan for Energy Efficiency in Existing Buildings (the "Draft Action Plan").

       Mission:data strongly supports Governor Brown's goal of doubling the efficiency of existing buildings by 2030 and applauds the CEC's development of detailed recommendations for advancing this objective. Buildings consume nearly 40% of our total energy use and it has been estimated that cost-effective efficiency improvements could reduce this use by at least 20%. Data-enabled software, hardware and services can play a significant role in achieving these objectives cost effecitvely, as discussed in the Draft Action Plan.

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[1] Our members are developing innovative information technologies to achieve significant energy savings in both the residential and commercial sectors at scale. They include Alarm.com, Aztech Associates, Bidgely, BlueLine Innovations, BrightPower, BuildingIQ, Chai Energy, the Cleanweb Initiative, EcoFactor, EnerNOC, EnergyHub, Genability, Home Energy Analytics, iControl Networks, Investor Confidence Project, Lucid, Nest, Open EE Meter, People Power, Plotwatt, Rainforest Automation, Retroficiency, Solar City, Stem, Switchornot.com, ThinkEco, Verdafero, Utilisave, WattTime and WattzOn. For more information, see www.missiondata.org

Mission:especially applauds the Draft Action Plan's emphasis of customer and policymaker access to energy performance data to drive residential and commercial efficiencies. The Plan rightly identifies data access as a central pre-condition to achievement of many of the California's clean energy objectives.

We provide comments on specific sections of the Draft Action Plan below.

1.3.1 Minimum Standards for Smart Meter Data Analytics

In the interest of speed, CEC should accelerate the timeframe for issuing an initial eligibility list of "no-touch" home and building energy assessment tools to early 2016 (from Q1 2017). In order to begin providing value to consumers as early as possible, CEC should accelerate its review process. No-touch assessments are often the beginning of a customer's energy efficiency journey. For example, a homeowner might perceive efficiency upgrades to be expensive and so s/he does not take any action because the threshold is too high.

The modern convenience of a website or smartphone app lowers that threshold and engages the customer in exploring his/her options without first spending a considerable sum of money. As we know, retrofits and equipment replacement can take time, so it is even more important that energy assessment tools are put in the hands of customers as early as possible in order to have the greatest possible time in which to meet the Governor's goal of a 50% improvement in efficiency by 2030.

In the interest of flexibility, CEC should use a light touch in assessing tool eligibility rather than seek to comprehensively evaluate each tool. The field of energy assessment tools is quite broad; if CEC were to exhaustively evaluate tools, it would require years to complete assessments for each product and for each analytic dimension. Dimensions of analysis include, but are not limited to: fault detection and diagnostics (FDD), monitoring-based retrocommissioning (MBCx), efficiency measure identification, balance point analysis, statistical disaggregation of loads (lighting, heating, cooling, plug loads), peak demand analysis, cross-sectional benchmarking, anomaly detection, predictive accuracy for measurement and verification, etc. Each of these analysis methods (or "features") could be evaluated, but it is labor-intensive. Furthermore, our members release new software updates and new functionality on a very regular basis – sometimes every week. If CEC were to assess each product version against each of the features described above, CEC staff would be entirely overwhelmed.

In addition, assessment methods for data analysis tools have not been universally or systematically established. For example, Lawrence Berkeley National Laboratory (LBNL) published an "Energy Information Handbook" summarizing over 19 distinct commercial building analysis methods using interval (15-minute or 60-

minute) electricity usage data.[2] This is a helpful start, but it is hardly comprehensive; the Handbook was intended to describe only the most common analysis methods. Similarly, LBNL has only recently published testing protocols for "baselining" accuracy.[3] Baselines are important for many types of energy data analysis, but baselining is only one analysis method.

Even if CEC had unlimited resources to evaluate each software tool and version combination available on the market, Mission:data feels strongly that such a comprehensive approach will not be productive at this early stage. Energy data analysis, while not a new field, is experiencing a resurgence of interest as technology companies offer products and services to both residential and commercial customers. After recovering from the aftermath of the 2008-09 financial crisis, venture capital investment in cleantech, smart buildings, and the "internet-of-things" has returned, promising to accelerate innovations in this area. It would be premature to evaluate software tools on features we think are important today because they will likely be supplanted by others.

Thus, rather than comprehensiveness, CEC should seek to evelute tools on one or two well-established metrics that are unlikely to change in the future. For example, the ability of software to predict energy use as a function of outdoor temperature and time is not likely to become irrelevant anytime soon. Simple testing methods for prediction accuracy have been established by LBNL, as we cited above. CEC could, for example, require each eligible software tool to predict energy use for a set of sample homes or buildings to within 10% accuracy. Testing software tools on this prediction is achievable, and the CEC's objective assessment would provide some level of confidence to consumers in the marketplace about the product's accuracy.

It would be unrealistic and undesirable for CEC to evaluate energy analysis tools in an exhaustive manner. Thus, we strongly recommend that CEC pursue Strategy 1.3.1 with flexibility and simplicity in mind.

1.7 Local Government Leadership

The Commission should use "Challenge Grants," among other approaches, to persuade POUs to fully implement Green Button Connect. As the Commission knows, the IOUs released the first Green Button Connect (GBC) functionality in 2015.[4] However, none of the POUs have followed suit, despite the prevalence of smart meters. The Commission has a unique opportunity to engage

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[2] "Energy Information Handbook: Applications for Energy-Efficient Building Operations." Granderson, J., M.A. Piette, B. Rosenblum, L. Hu, et al. 2011. Lawrence Berkeley National Laboratory, LBNL-5272E.

[3] "Commercial Building Energy Baseline Modeling Software: Performance Metrics and Method Testing with Open Source Models and Implications for Proprietary Software Testing." Price, P., J. Granderson, M. Sohn, N. Addy, D. Jump. September 2013. LBNL-6602E, Pacific Gas and Electric ET12PGE5312.

[4] The IOUs' current Green Button Connect functionality is not perfect. Missing pieces include natural gas data (for PG&E and SDG&E) and pricing data, which are promised later this year. SCE has still not made Green Button Connect available to third parties for registration, despite a commitment to do so by Q1 2015.

with and persuade the POUs to implement GBC so that there is a truly uniform, technically-consistent platform state-wide.

Mission:data has recently engaged with SMUD in this area. In a letter dated April 14th, 2015 from SMUD's Board President Rob Kerth to Mission:data, Mr. Kerth wrote that SMUD staff are currently assessing a "data sharing policy," but that it must be approved by the Board prior to any implementation. No timeframe for the development of such policy, or its placement on the Board's agenda, was provided.

We strongly encourage the Commission to engage with SMUD and educate their leadership on the importance of data access and national standards. Challenge Grants could be used to further encourage GBC adoption by requiring grantees to use GBC in their efficiency programs.

Mission:data supports engaging cities and local governments as full partners to develop innovative ways of saving energy that use smart meter data. Using Challenge Grants or other mechanisms, CEC should encourage local governments to craft efficiency programs that use AMI data. For example, websites or mobile apps could be used to encourage participation amongst neighbors or local businesses in conserving energy. Local governments are often viewed favorably by residents and are thus in a position to leverage their community trust to further energy efficiency.

Several local government efficiency programs have already shown impressive results when data-driven tools are provided to residents. As one example, the City of Mountain View was one of the first municipalities to deploy advanced smart meter analytics to its residential community, engaging more than 1,500 residents to achieve a reported 5.5% reduction in electricity use and a 16.4% reduction in natural gas use, for a total greenhouse gas emisssions reduction per resident of 993 pounds of CO_2 over the period, at a per-person cost of $260. These savings are generally comparable to those achieved by PG&E's Energy Upgrade program with a per person cost of $6,621.

While these programs are different in many respect (the Energy Upgrade program includes investments in HVAC and other upgrades), these underscore the power of data to achieve significant energy savings and suggest that a broader use of energy analytics harnessing AMI data could be an effective supplement to today's Energy Upgrade programs.[5]

2.1.1 Data Exchange Protocols

We applaud CEC for highlighting data exchanges as a barrier to meeting the Governor's efficiency goals.

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[5] See "Energy Upgrade Mountain View." January, 2015 Final Report. City of Mountain View, Acterra and Home Energy Analytics.

First, CEC should establish Green Button as the required format for transmitting usage data for all Commission business. We encourage CEC to publicly commit to using Green Button for its internal business processes, as this would signal to the market CEC's commitment to the standard. Whenever consultants to CEC, efficiency program participants, or evaluators need to transmit individual usage data to or from CEC, they should be instructed to use the Green Button format. This commitment would demonstrate CEC's leadership and that CEC is truly "walking the walk" with regard to data exchange protocols described in the Draft Action Plan.

Second, CEC should coordinate with the CPUC Energy Division to establish a whole-home and whole-building energy savings calculation methodology using Automated Metering Infrastructure (AMI) data. This recommendation is related to 2.1.9, Energy Consumption Baselines. Now that interval usage data is available nearly everywhere throughout the state, it is time to make *measured energy use* an alternative to deemed savings estimates for efficiency measures.

Mission:data strongly encourages CEC to take a leadership role in working with the CPUC to establish whole-home or whole-building savings calculation standards. One method, in the residential sector, has recently been put forth by Open EE Meter (a Mission:data member) with the support of NRDC and PG&E in the CPUC's ongoing energy efficiency proceeding.[6] One benefit of this approach, among many, is significantly reduced measurement and verification expenses, which currently costs the state approximately $30 million annually.

Finally, as mentioned above in 1.7 (Local Government Leadership), we strongly recommend that CEC work with POUs to rapidly implement a fully-functional Green Button Connect system.

2.1.2   Benchmarking Data Infrastructure

CEC should urge the U.S. Environmental Protection Agency to incorporate Green Button Connect functionality into Portfolio Manager. To our knowledge, EPA recently confirmed that it would begin implementing Green Button manual upload capability into Portfolio Manager. This is a step in the right direction because it allows building owners or managers to download their usage data in Green Button format from their electric utility and easily upload it into EnergyStar. However, this still requires a manual action taken by the owner/manager. A much easier method would be with Green Button Connect, now available by PG&E and SDG&E, with SCE's implementation to be completed later in 2015.

Although the California utilities have for some time supported "automated benchmarking" (now known as EnergyStar's "data exchange service"), there are two

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[6] NRDC Response to ALJ's Ruling Regarding Comments on Phase 3 Workshop, dated April 13th, 2015. CPUC Rulemaking 13-11-005. Link

reasons why CEC should push EPA to support Green Button Connect. First, many POUs in California support neither the data exchange service nor GBC. With limited resources, it will be difficult for many smaller POUs to implement both methods in their IT systems. If time and resources only allow one method to be constructed, it is clearly in customers' best interest for GBC to be supported because it provides both the requisite data for an EnergyStar score as well as very granular interval data for diagnostic uses. If POUs were to implement only EPA's data exchange service, those customers would be forced to transfer interval data manually with a service provider, increasing the costs to energy efficiency and going against CEC's goals of "easy to access data and analytics" (Strategy 2.1.3). GBC is clearly more capable and better meets customers' and the CEC's goals of driving energy efficiency in California. (When customers need to transmit their usage data to EnergyStar, there are many third party applications available to do so for free - using the Green Button format.)

Second, EPA is in a leadership position, and a decision to support GBC sends a strong message to utilities across the nation that GBC is the "go-to" standard for exchanging meter data. It could lead to many more utilities in other states adopting GBC. How would this benefit the state of California? Since many real estate owners and managers operate nation-wide, the efficiencies gained in having GBC universally available would be substantial. Those property owners in California who own assets in other states would be pleased that CEC's leadership led to simplifications of their business processes.

For these reasons, CEC should use its influence to push EPA to adopt Green Button Connect.

2.1.3   Easy-to-Access Data and Analytics

In general, Mission:data supports convenient, machine-readable access to data of all types (in addition to metered energy use). We feel that CEC should clearly link goal 2.1.3 with 1.3.1's list of "data analytics" providers.

CEC should work to harmonize the testing processes for innovative Home Area Network (HAN) devices across IOUs and POUs. Mission:data believes CEC should consider its role in coordinating and expediting the testing of HAN products which can help achieve the Commission's energy-savings goals. Extensive testing is required before HAN devices such as smart thermostats, in-home displays, and HAN/internet gateways can be certified and ready for the market. The cost and time involved in testing is a barrier to market entry, which ultimately impacts consumer access to real-time electricity use data. Testing itself is, of course, necessary to ensure proper functioning of the device and the security of AMI systems. However, the tests can be expensive and they are unnecessarily redundant across the state's many utilities that have AMI. There are three tests required of each product: Zigbee Protocol testing, AMI interoperability testing, and application testing by the utility. We recognize that further technical analysis needs to be done to determine which tests can be "shared" amongst all utilities, given that there isn't

one standard for AMI systems and applications. But there would be substantial benefit to innovators, entrepreneurs and consumers if the time and resources required for passing the multitude of tests for each utility could be reduced to a more reasonable level.

2.1.5 Standardized Rates Information

Mission:data strongly supports CEC's goal of assembling state-wide electricity tariffs on a public website in a machine-readable form (such as JSON and XML). One of the stickiest barriers to accurate cost-savings information in efficiency projects is tariffs. It would be tremendously valuable to our members to have an online repository of *all* electricity and gas rates used throughout the state – including IOUs and POUs. We feel this would also have the effect of increasing consumer confidence in claims made by vendors about bill savings resulting from this or that technology because vendors could advertise their reliance upon a publicly-accessible, Commission-approved tariff repository.

We are aware of a DOE/NREL project to organize tariffs nationwide at www.openei.org. While OpenEI is a great starting point, especially its Application Programming Interface (API), it has not been maintained over time and so the accuracy of the tariffs is questionable in many instances. Furthermore, one of the known limitations of OpenEI's data structure is that only 60-minute intervals, not 15-minute, are supported. With many IOUs in California having 15-minute demand periods, OpenEI is not usable for many customer classes in the state. CEC would no doubt be able to significantly reduce its implementation costs by leveraging OpenEI's work to date, but should the Commission pursue this goal, the resulting repository must be sufficiently technically capable to support the full range of tariffs seen in California. We feel this tariff database would offer tremendous benefits for private companies seeking to improve the efficiency of California's homes and buildings with only a modest government investment.

We encourage CEC to implement the tariff repository as soon as possible.

Respectfully submitted,

May 22nd, 2015   _____/s/_____
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