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Memorandum

To: Jason Harville, Commissioner MacAllister, Vice Chair Gunda, CEC Staff

From: Hal Nelson, CEO; Hunter Johnson, CTO

Date: 26 January, 2023

Subject: Comments on 22-MISC-03 Energy Data Modernization and Analytics

This document responds to the CEC's request for comments on the Energy Data Modernization and Analytics workshop. We appreciate the opportunity to comment on the workshop.

Res-Intel is a CEC-funded analytics firm that is currently working with all the electric IOUs in California to improve the effectiveness and efficiency of their demand side management programs. We have performed building energy benchmarking on about 100,000 multifamily complexes in California; more than are benchmarked annually in the US EPA's Portfolio Manager tool. We received CEC grants #58076A/14-09G and #57356A/11-1 under the Public Interest Energy Research program.

We want to start with some stylized facts that drive our recommendations but that shouldn't be (too) controversial.

1. The vast majority of energy savings, utility bill relief and GHG emissions reductions are in the existing building sector.
2. It is difficult to get property owners to enact whole building retrofits as evidenced by the sunseting of Energy Upgrade California program that struggled to obtain energy savings and cost-effectiveness goals.
3. Historically marginalized and hard-to-reach customers can benefit the most from the demand side management (DSM) programs but have the fewest financial and technical resources to enable participation.
 - a. The multifamily sector houses the largest share of extremely vulnerable residents in terms of housing, food, and energy insecurity.
 - b. The naturally occurring affordable housing (NOAH) subsector is least energy efficient and is the most vulnerable to displacement and gentrification.
4. Municipalities and community-based organizations are essential implementation partners to scale up DSM program outreach and success.
 - a. California will not be able to meet its equitable decarbonization goals without including these stakeholders as full partners.



Energy Data Modernization and Analytics have the ability to reach across silos and improve California's residents' quality of life and economic outcomes. To do this requires energy analytics, specifically energy-use intensity (kBtu/sqft), at the PROPERTY level and not at the meter or census tract level. This is hard to do, but has huge benefits for reducing energy burdens and improving quality of life. NOAH housing has been identified at the mass-scale through Res-Intel's comparative rent analytics, property attributes, and non-invasive income qualification tools. [Our analysis](#) of over 60,000 multifamily properties in California shows that NOAH properties are predominantly low-rise, tenant-metered, and have much higher energy use intensities (EUI) than non-NOAH properties.¹ NOAH properties in DACs have even higher energy burdens likely due to additional landlord deferred maintenance.

Property Aggregation and Meter Matching: Calculating property level energy analytics requires aggregating tax lots into properties to obtain sqft estimates, and then accurately matching utility service addresses on property street addresses. The TECH sector presentation for the CEC's [Dec 2022 workshop](#) shows the limitations of existing approaches to targeting based on flawed meter matching. The contractor results were only for the single-family detached sector (excluding 2-4 single family and all multifamily), and yet are still missing about ½ of SCE residential meters; apparently due to low rates of successful matching between property addresses and utility service addresses.²

In contrast, Res-Intel's [Benchmark.AI platform](#) will be used by Multifamily Whole Building program administrators and implementers in California in 2023 and matches 95-98% of utility meters to properties.³ It also provides rooftop solar potential (kW and kWh), energy use intensity, energy burden, income qualification, heating, cooling and whole building energy benchmark scores, along with predictions about tenant vs master metering, customized electrification measure recommendations, best contact information, and many other key variables for stakeholders to persuade property owners to equitably electrify their properties. The tool also creates remote energy audits on the user dashboard without having to roll a truck.

We are extending the Benchmark.AI platform to include the single-family and commercial property sectors in the 1st quarter of 2023.

Program Design: With property level energy analytics, CEC programs can target incentives at the *property level*, not at the Census tract level. Rolling up program eligibility to a "geography" results in the ecological fallacy where all properties in that geography are held up to have the same attributes (median income, racial composition, etc). Given big data analytics and cloud computing, we can micro-target at the individual property level instead. Then the benefits from

¹ https://aceee2022.conferencespot.org/event-data/pdf/catalyst_activity_32349/catalyst_activity_paper_20220810190441310_e606f5bc_c781_4ef3_81f6_11b7d46ca0b4

² <https://efiling.energy.ca.gov/GetDocument.aspx?tn=248093&DocumentContentId=82406>

³ https://res-intel.com/wp-content/uploads/Res-Intel_Benchmark-AI-Dashboard-Summary.pdf



DSM programs can then be inclusive to LMI properties across the state and not only in DACs, tribal areas, etc. This is especially important in rural areas that have pockets of energy poverty but that don't meet DAC eligibility criteria.

Broadening Outreach: We propose the CEC consider the use of a public-facing version of a dashboard that gives authorized CBOs access to non-personally identifiable information (non-PII) about the properties in their community. This information is similar to the information from the CEC's Benchmarking Ordinance (and sporadically in real estate databases) and would spread the benefits to properties that are much smaller than the existing 50,000 sqft building size.

The Non-PII information could include:

- Rooftop solar potential (kW and kWh)
- Space heating and water heating fuel
- Presence of existing AC
- Heating, cooling, and overall energy benchmark scores
- Electrification measures that are customized for each residential property (single and multifamily)
- Tenant or master-metered (multifamily)
- Best contact information (multifamily)

Again, most of this information is already in the public domain for large buildings and other data are located in some county assessor or real estate vendor databases. Outreach and education must be done by CBOs, local governments, and other community stakeholders through community-based social marketing. Social marketing is more effective and cost efficient than traditional statewide program approaches.

Resilience: Property-level analytics allow for the inclusion of resilience measures in DSM programs; including adding AC when none previously existed. For properties that add AC, the reduction of the emissions of greenhouse gases can likely be achieved with the addition of rooftop solar PV and improved envelope measures to reduce outside smoke infiltration. For example, Res-Intel's Benchmark.AI tool can identify high energy users that are candidates for Net Zero retrofits with efficiency upgrades and solar PV. Our 2023 Benchmark.AI will include an indicator of existing building envelope efficiency to target upgrades to reduce wildfire smoke infiltration.

Timely Feedback and Impact Evaluation: Res-Intel's ebase tool can provide population level insights on DSM program performance in near real-time. By integrating DSM program installation data with utility meter data and property information, normalized metered energy consumption (NMEC) tools can be used to identify flawed installations, faulty measures, and data quality problems as they arise rather than at the end of a 5 year program cycle plus a 2 year evaluation period.



In summary, the CEC's Energy Modernization and Analytics efforts need to include high quality property aggregation and utility meter matching to enable the calculation of energy-use intensity at the property level. Only with property-level energy analytics can the state begin to meet its energy, environmental, and equity program goals.