

To NYSERDA and DPS staff and IEDR stakeholders,

Uplight, Inc. is pleased to provide this input to the State of New York and the IEDR stakeholder community to inform IEDR use case development and prioritization. Uplight envisions that the IEDR will become an invaluable feature of New York's energy system by aggregating and democratizing both data and insights for the purpose of propelling forward achievement of the state's clean energy targets.

Uplight is the leading provider of comprehensive customer-centric technology dedicated solely to accelerating the clean energy ecosystem. Uplight's software solutions connect energy customers to the decarbonization goals of energy providers while helping customers save energy and lower costs, engendering a more sustainable future for all. Uplight solutions span home and business energy management, energy analytics, marketplaces, personalization, and demand-side management. Combined, these products form a unified, end-to-end customer energy experience system proven at enterprise scale, while layering on next generation innovations.

Through Uplight's work across the energy ecosystem, we bring applied experience in designing and delivering solutions that relate directly to many of the use cases identified for IEDR applications. Uplight provides energy efficiency, DER, and e-mobility programs to utilities across North America. These programs are built on comprehensive energy customer databases and artificial intelligence / machine learning analytics to generate insight for customer segmentation and marketing, clean energy offers personalized to individual customers, smart energy device control and other DER services that align customer and grid value. Uplight's input to IEDR use cases is informed by this broad, deep understanding of customer energy data in relation to clean energy solutions' delivery.

Most use cases will rely on highly related if not identical underlying data. Thus, while their final applications may differ, for example between DER customer identification and solution delivery versus regulatory review and even academic or media research, the same datasets and user functions should be leveraged to serve many of these outcomes.

With this mindset, these comments focus on a shortlist of use cases that Uplight has direct experience building and delivering. Our experience supports identification of critical data components and features to quickly generate greater functionality, as well as to avoid known pitfalls in their use. Successful delivery of these in Phase 1 of IEDR development will create near-term market and multistakeholder value, while establishing a foundation on which additional data and functionality can be quickly and effectively integrated over time.

Needs that IEDR should address. In Phase 1, the IEDR should focus on building a functional data structure and user interface that generates near-term stakeholder value by accelerating product development and solution delivery for energy efficiency investments, building electrification, DER development, and EV market growth.

Market democratization is foundational to curating a competitive landscape necessary for accelerated clean energy measure uptake. The IEDR platform will achieve market democratization early by making accessible sophisticated data analytics that support translating data into information and insights in Phase 1. Analysis can take countless formats and approaches, which the IEDR platform itself cannot not be expected to fully anticipate or deliver. On the other hand, attention to analytics and information sharing in Phase 1 of IEDR development will support clarification of what data relationships need to be created in the platform to support stakeholder analyses most effectively over time. Furthermore, the market democratization effect of the IEDR will be enhanced by flexible architecture accommodating more than data aggregation and access. The platform should include a layer of sophisticated data models and energy insights to position less established stakeholders to compete with entrenched stakeholders.

Criteria for initial use case prioritization, and suggested use cases. It is important that NYSERDA, DPS and the IEDR Program Manager focus Phase 1 on a set of use cases that balance key criteria for economic or market potential, GHG reduction potential, availability of data, and development feasibility.

Here we have identified these down to the sub-category level. In practice many use cases are highly related within and even between categories, and thus a focus on one use case will likely spur functionality and value generation for other use cases. Based on our consideration of the above criteria, Uplight describes the following use cases in these comments.

1. DER Development and Use
 - a. identifying, evaluating, and engaging potential DER customers
 - b. designing, implementing, and operating DER aggregations
 - c. monitoring and evaluating the deployment and use of DERs
2. Energy Efficiency
 - a. identifying, evaluating, and engaging potential EE customers

Although we don't provide comments on other use cases in this submission, we note that others are also valuable, and in some cases will be supported by data and design approaches like the above set, e.g., other energy efficiency cases, as well as building and transportation electrification. We also recognize the importance of other categories of use cases, especially those listed under "Utility Functions" including market enablement and system operations, for the purpose of reducing administrative costs for settlements and measurement and verification purposes.

In practice, a focus on these use cases will not rule out applications and opportunities for other use cases not explicitly included on this list. For example, by creating a functional data structure and user interface to support the use case for "*identifying, evaluating and engaging potential DER locations*", other uses that are not explicitly included here will be made more accessible (e.g., "*preparing and optimizing DER development plans*").

While these represent high-value use cases for attention in IEDR platform design, New York should also consider the feasibility of achieving each with respect to the availability of necessary data. Further work is needed to understand what data sources, down to use case-specific inputs, can be directly ingested into the IEDR platform, at what frequency, and how those variables relate to other datasets in order to make them useful. The IEDR white paper by DPS staff provides a helpful inventory of desired data, categorized by Phase 1 versus Phase 2 priority, however more attention is needed to understand the availability and format within which some of these sources would be made available. That effort is beyond the immediate scope of these comments, and should be considered further before NYSERDA makes firm commitments to, or solicitations for, specific use cases.

The remainder of these comments provide use case input in the template format prescribed by NYSERDA. Of note, where the template suggests that use case input be provided from a first-person perspective (e.g., How would Uplight use or benefit from a particular use case), we have instead attempted to provide answers from stakeholder or user perspectives who we serve. That is, Uplight may not be the end user of the IEDR for most or all applications that we describe here. Our input within this submission is informed by our experience supporting a diverse array of clean energy ecosystem stakeholders. Today, through Uplight's comprehensive energy customer data and analytics platform, Uplight improves customer outcomes and accelerates uptake of stakeholder programs and technologies.

Sincerely,

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Use Case 1: Democratizing Customer Data for DERs

Energy customers acting on DER use is the ultimate necessity to achieving an at scale clean energy ecosystem. Through a central clearinghouse for customer energy data combined with data on premise and neighborhood characteristics, and DER program information (rates, rebates, etc.), solution providers will be able to quickly and accurately identify the highest potential DER customers by segment and position customized offers for them. This will animate the DER market in New York, allowing DER uptake to scale through new product innovation better tailored to customers' personalized needs. Uplight has direct experience with this use case through our Connect product line, which ingests customer data siloed in a variety of systems into a unified data lake, with a sophisticated insights engine layered above, and developer and business intelligence tools for utilities and ecosystem partners. Quick and functional delivery of this use case would be the foundation for many other use cases previously identified through the IEDR process, both within the DER category and in other categories such as Energy Efficiency, Building Electrification, and more. Thus, while Uplight identifies this under the sub-category of *"identifying, evaluating, and engaging potential DER customers"*, in fact we would imagine building this data structure to enable many other applications, including the *"selecting DER locations"* use case and others.

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2) Use Case Category

DER Development and Use

3) Use Case Sub-Category

Identifying, evaluating, and engaging potential DER customers

4) What Question(s) Does the Stakeholder Seek to Answer with This Use Case?

- Which residential energy users already have DERs such as smart thermostats, solar systems, battery storage, EV chargers, etc.? Are the DERs currently or previously enrolled in a DR program?
- Which residential energy users and premises have the highest propensity for becoming a smart thermostat, solar system, battery storage, EV charger customer?
- Which residential energy users have the highest propensity for enrolling in DR programs and what DR programs are available in their geography?
- What are the demographics, premise characteristics, utility provider(s), and fuel(s) used of energy users by geography?

5) What Information Should the Use Case Produce for the Stakeholder?

- End-use detection analysis to determine whether energy users already have DERs such as smart thermostats, solar systems, battery storage, EV chargers, etc.
- Information on which energy users are already enrolled in what DR program(s).
- Propensity analysis to determine which energy users have what level of propensity for becoming a DER owner / customer.
- Propensity analysis for the previous user analysis, *and* propensity for enrolling in what available DR program(s).
- Demographic, premise characteristics, utility provider(s) / fuel(s) used of energy users by geography.

(a) How Will the Stakeholder Use the Information Produced by This Use Case?

- End-use detection analysis to be used to avoid offering DERs to energy users who likely already have DERs and / or offer upgraded DERs and related services to those who already have DERs.
- Information on what energy users are already enrolled in what DR program(s) to study DR effectiveness, develop new DR programs and / or offer competitive DR program alternatives to energy users.

- Propensity analysis to determine with what DER / DR offer to approach energy users by segment and individually.
- Demographic, premise characteristics, utility provider / fuel used, energy use and cost, historical weather of energy users by geography to analyze energy users by segment and individually to create personalized DER / DR offers.

(b) What are the Minimum Necessary Attributes for Each Type of Information Produced?

- Propensity by DER type with confidence interval, segmented at a minimum by Low, Medium, High.
- Presence of existing DER by type, with confidence interval, segmented at a minimum by "Confirmed via OEM", "Detected by disaggregation with high confidence", "Detected by disaggregation with medium confidence", "not present or "low confidence detection".
- Reported by customer (privileged information), and heatmap by zipcode+4.
- Daily accuracy of program enrollments and rate code.

6) How Should the IEDR User Interface Present the Information Produced by the Use Case?

Numerous presentation choices of the data should be made available, such as from a map (heatmap by zipcode+4 and individual customer for privileged data), to readable table, list via csv on standard website link, and json via api.

7) What Type(s) of Data Does the IEDR Need to Analyze for This Use Case?

Key data includes customer ZIP code, energy use (15min AMI), fuel type, energy billing, demographic, historical weather, and DSM (including DR) program enrollment or exclusions.

(a) What are the Minimum Necessary Data Attributes for Each Type of Data Collected and Analyzed?

- AMI 15min, day after and 12-month historic.
- Daily update of all fields for any changes.

8) What Data Relationships Does the IEDR Need to Analyze for This Use Case?

- DER type compatible with a DR program available within a utility territory.
- Rate code by customer and associated conditions of rate including exclusions.

9) What Data Analysis Function(s) Does the IEDR Need for This Use Case?

- Propensity score grouped to be Low/Medium/High segment based on score ranges.
- DER type / make / model, demographic averages / max / min, premise type by zipcode+4.

(a) What are the Minimum Necessary User Input Variables Needed to Enable a Useful Analysis?

- equal to, contains, is blank, matches "x" attribute.

10) How Often Does the Stakeholder Expect to Employ This Use Case?

Stakeholders will likely employ this use case with high frequency to inform frequent and recurring business activities (i.e., Daily, weekly, monthly, quarterly, semi-annually, annually).

11) How Does This Use Case Benefit the Stakeholder?

Providing analytics such as DER detection and propensity to use DERs will democratize the raw data within the IEDR. Otherwise, only organizations with technology and the staff to do the analyses will make use of this data in a reasonable amount of time and financial investment.

12) Why Should This Use Case Be Prioritized From the Perspective of i) the Industry and ii) the Citizens of New York State?

Without understanding energy users in relation to DER use, no amount, ingenuity, or quality of DER technology will achieve accelerated mass adoption and cultural normalization.

Use Case 2: Unlocking and Operating Flexible DR Programs at Scale

This use case is an important extension on the previous case for identifying DER customers. It empowers the step after contacting and enrolling new customers which is activating and orchestrating DER systems at scale. Accordingly, it will rely on many similar database features and datasets, but different questions may be asked of it and different insights provided. Considering this overlap, we have identified where IEDR features for the previous case are applicable here as well, using grey text, while additional useful data, functions, or new components of the use case are shown in black text. Uplight has deep expertise and in-market experience ingesting and using data to deliver features of this use case, in New York and across the country, including our Activate product line and with our current Smart Home Rate pilot being managed on behalf of ConEd.

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2) Use Case Category

DER Development and Use

3) Use Case Sub-Category

Designing, implementing, and operating DER aggregations

4) What Question(s) Does the Stakeholder Seek to Answer with This Use Case?

In practice, there is overlap of questions answered by this use case with those in our Use Case 1, especially those we identify in grey text below. New questions answered, or revised versions of Use Case 1 questions are shown here in black.

- Which residential energy users already have DERs such as smart thermostats, solar systems, battery storage, EV chargers, etc.? Are the DERs enrolled or previously enrolled in a DR program?
- Which residential energy users have the highest propensity for enrolling in DR programs and what DR programs are available in their geography?
- What are the demographics, premise characteristics, utility provider(s), and fuel(s) used of energy users by geography?
- What geographies have energy billing rates such as TOU, CPP and other rates compatible with DR programs?
- Which energy users are enrolled in what rates and what rates would be optimal when combined with available DR programs?

5) What Information Should the Use Case Produce for the Stakeholder?

- Residential energy users who have DERs such as smart thermostats, solar systems, battery storage, EV chargers, etc.
- Energy users with DERs enrolled in a DR program.
- Residential energy users who have the highest propensity for enrolling in DR programs and what DR programs are available in their geography.
- The demographics, premise characteristics, utility provider(s) / fuel(s) used of energy users by geography.
- Energy billing rates such as TOU, CPP and other rates compatible with DR programs by utility.
- What energy users are enrolled in what rates and what rates would be optimal when combined with available DR programs.

(a) How Will the Stakeholder Use the Information Produced by This Use Case?

- Residential energy users who have DERs such as smart thermostats, solar systems, battery storage, EV chargers - used to design DR programs and enroll participants.
- Energy users with DERs enrolled in a DR program - used to understand scale and approach with other DR program offers.

- Residential energy users who have the highest propensity for enrolling in DR programs and what DR programs are available in their geography - used to combine DER purchase with applicable DR program(s).
- The demographics, premise characteristics, utility provider(s) / fuel(s) used of energy users by geography - used in DR program design combined with DER sales.
- Energy billing rates such as TOU, CPP and other rates compatible with DR programs by utility - used in DR program design.
- What energy users are enrolled in what rates and what rates would be optimal when combined with available DR programs - used to sell DERs combined with DR enrollment at scale.

(b) What are the Minimum Necessary Attributes for Each Type of Information Produced?

The data attributes are very similar for this use case as for Use Case 1, and hence are displayed in grey text to reflect their redundancy with our input on that use case.

- Propensity by DER type with confidence interval, segmented at a minimum by Low, Medium, High.
- Presence of existing DER by type, with confidence interval, segmented at a minimum by "Confirmed via OEM", "Detected by disaggregation with high confidence", "Detected by disaggregation with medium confidence", "not present or low confidence detection".
- Reported by customer (privileged information), and heatmap by zipcode+4.
- Daily accuracy of program enrollments and rate code.

6) How Should the IEDR User Interface Present the Information Produced by the Use Case?

The user interface attributes are very similar for this use case as for Use Case 1, and hence are displayed in grey text.

map (heatmap by zipcode+4 and individual customer for privileged data), readable table, list via csv on standard website link, and json via api.

7) What Type(s) of Data Does the IEDR Need to Analyze for This Use Case?

Key data includes (grey text indicates where data is repeated from Use Case 1): customer ZIP code, energy use (AMI at 15min), fuel type, energy billing, demographic, historical weather, DSM (including DR) program enrollment and exclusions, available rates, enrolled rates, and currently available DSM (including DR) programs.

(a) What are the Minimum Necessary Data Attributes for Each Type of Data Collected and Analyzed?

- AMI 15min, day after and 12-month historic.
- Daily update of all fields for any changes.

8) What Data Relationships Does the IEDR Need to Analyze for This Use Case?

- DER type compatible with a DR program available within a utility territory.
- Rate code by customer and associated conditions of rate including exclusions.

9) What Data Analysis Function(s) Does the IEDR Need for This Use Case?

- Propensity score grouped to be Low/Medium/High segment based on score ranges.
- DER type / make / model, demographic averages / max / min, premise type by zipcode+4.

(a) What are the Minimum Necessary User Input Variables Needed to Enable a Useful Analysis?

- equal to, contains, is blank, matches "x" attribute.

10) How Often Does the Stakeholder Expect to Employ This Use Case?

Stakeholders will likely employ this use case with high frequency to inform frequent and recurring business activities (i.e., Daily, weekly, monthly, quarterly, semi-annually, annually).

11) How Does This Use Case Benefit the Stakeholder?

Visibility into DER proliferation and program enrollments allows for quick and less burdensome DR study across all NY utilities. Providing analytics on what rates are ideally suited for what DERs and related DR programs accelerates DER adoption at scale, rates adoption and rate-optimized DR.

12) Why Should This Use Case Be Prioritized From the Perspective of i) the Industry and ii) the Citizens of New York State?

The key to scaling and normalizing DR is to combine DER sales with DR program enrollments and this will only be successful through access to information that links DERs with DR enrollment and rates that can be optimized by DR.

Use Case 3: Performance Evaluation of DERs

Where the previous two use cases address needs for identifying and engaging potential DER customs then operating DER assets, this use case provides for *ex post* monitoring and reporting on performance following events. This will allow greater transparency and accountability to the performance of DERs and of DER operators, as well as support continued innovation to make DER services more efficient and reliable. It would build upon the data and database structures of the previous two use cases, although with critical additional data needs for event performance and other system conditions that can explain performance.

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2) Use Case Category

DER Development and Use

3) Use Case Sub-Category

Monitoring and evaluating the deployment and use of DERs

4) What Question(s) Does the Stakeholder Seek to Answer with This Use Case?

How well are DERs performing, including:

- How are DERs affecting geographies with load constraints?
- How are DERs used in conjunction with rate optimization?
- What is the effect on energy costs of DER use?
- How well did DERs perform during load shedding or other grid events?
- What is the average and range of customer opt-out and override rates by DER type for participation in events?

5) What Information Should the Use Case Produce for the Stakeholder?

- Peak load shift / reduction by DER.
- DER effect on individual users' TOU and other dynamic billing rates.

(a) How Will the Stakeholder Use the Information Produced by This Use Case?

Information will be used to inform program evaluation, reporting and improvement, including:

- DR program adjustments
- Rate design adjustments
- DER configuration improvements
- Case studies to generate more DER and rate adoption

(b) What are the Minimum Necessary Attributes for Each Type of Information Produced?

Seasonal peak kW and kWh impact potential and estimated dollar impact (rate code specific) by DER device type and individual customer.

6) How Should the IEDR User Interface Present the Information Produced by the Use Case?

Information should be presented in similar formats as Use Cases 1 and 2 and should be produced annually to include hourly device data reports, event reports, and aggregated program reports.

7) What Type(s) of Data Does the IEDR Need to Analyze for This Use Case?

- Runtime data from participating DERs by device by customer
- Event conditions - date, time, duration, dispatch instruction, participation instructions, weather conditions
- AMI data (15min where available)
- Opt-out and over-rides per event per device type

(a) What are the Minimum Necessary Data Attributes for Each Type of Data Collected and Analyzed?

- AMI 15min, day after and 12-month historic.
- 15min device data where available, hour frequency minimum per event.

8) What Data Relationships Does the IEDR Need to Analyze for This Use Case?

- Device ID and telemetry to customer ID
- Program enrollments to customer ID
- Customer ID to opt-out data

9) What Data Analysis Function(s) Does the IEDR Need for This Use Case?

- Baseline based on treatment and control groups and/or matched days, by DER device type and individual customer per event.
- Evaluation of per hour per event performance of max., average, and minimum aggregate population segment load shift per DER device type.

(a) What are the Minimum Necessary User Input Variables Needed to Enable a Useful Analysis?

- DER type equal to
- Season equal to

10) How Often Does the Stakeholder Expect to Employ This Use Case?

- Per season

11) How Does This Use Case Benefit the Stakeholder?

This use case has broad application for program monitoring and market/grid performance. In addition, transparent DER performance information will reduce risk in DER use and accelerate innovation across DER OEMs and load constraint plans. Related peak demand and rates outcomes correlated to DER use will accelerate DER capabilities to resolve load constraints and save energy users money.

12) Why Should This Use Case Be Prioritized From the Perspective of i) the Industry and ii) the Citizens of New York State?

DER use presents the best opportunity to resolve load constraint issues resultant from population growth and energy generation emissions reduction / clean energy generation growth. Democratized, transparent, readily accessible information on the performance of DERs is necessary to support DER innovation and DER performance predictability.

Use Case 4: Democratizing Customer Data for Energy Efficiency

Like DER customer identification and engagement (Use Case 1), the IEDR should prioritize enabling the expansion of New York's energy efficiency market size and reach. Fortunately, much of the same data and database functions for Use Case 1 will naturally support the same applications for identifying and enrolling customers in EE programs and implementing EE measures. As such, this use case represents an incremental build on the previously described use cases, while unlocking much greater market potential. As we have above, our responses to this use case include grey text to indicate where the same data and features are the same or would be achieved by building other use cases, while black text emphasizes the new features or considerations for this foundational energy efficiency use case.

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2) Use Case Category

Energy Efficiency (EE)

3) Use Case Sub-Category

identifying, evaluating, and engaging potential EE customers

4) What Question(s) Does the Stakeholder Seek to Answer with This Use Case?

In addition to those questions that Use Case 1 answers (), which are also relevant to this use case, additional questions include:

- What is customer energy usage (kWh and / or therms) over months or days, in comparison to averages or target levels for a comparably sized, comparable year-built premise?
- Which customers have and have not participated in known EE programs and have and have not implemented known EE measures?

5) What Information Should the Use Case Produce for the Stakeholder?

- Energy use and cost data by fuel type and related similar efficient premise comparison analytics.
- Utility customer program participation analysis to determine whether energy users already have participated in EE programs, rebates, and incentives.
- Information on what energy users have interacted with EE program, rebate, and incentive information.
- Propensity analysis to determine what energy users have what level of propensity for participating in specific EE programs.
- Demographic, premise characteristics, utility provider(s) and fuel(s) used of energy users by geography.

(a) How Will the Stakeholder Use the Information Produced by This Use Case?

- Focus customer outreach for EE programs, rebates and incentives offers, and education based on personalized recommendations specific to individual energy use and cost data, demographic context, and available programs.
- This supports a step change from early-stage EE measures like building envelope and insulation improvement to later state measures like smart thermostats and furnace upgrades.

(b) What are the Minimum Necessary Attributes for Each Type of Information Produced?

- AMI data aggregated by season and by fuel type.
- Daily accuracy on program participation history, current participation.
- Propensity by DER type with confidence interval, segmented at a minimum by Low, Medium, High.

Presence of existing technology by type, with confidence interval, segmented at a minimum by "Confirmed via OEM", "Detected by disaggregation with high

- confidence", "Detected by disaggregation with medium confidence", "not present or low confidence detection" Reported by customer (privileged information), and heatmap by zipcode+4.

6) How Should the IEDR User Interface Present the Information Produced by the Use Case?

The user interface attributes are very similar for this use case as for Use Cases 1 and 2, and hence are displayed in grey text.

map (heatmap by zipcode+4 and individual customer for privileged data), readable table, list via csv on standard website link, and json via api.

7) What Type(s) of Data Does the IEDR Need to Analyze for This Use Case?

Key data includes many items also included in use cases 1 and 2 (show in in grey text), as well as additional data for EE program participation: customer ZIP code, energy use (15min AMI), fuel type, energy billing, demographic, historical weather, EE program enrollment or exclusions.

(a) What are the Minimum Necessary Data Attributes for Each Type of Data Collected and Analyzed?

- AMI 15min, day after and 12-month historic.
- Daily update of all fields for any changes.

8) What Data Relationships Does the IEDR Need to Analyze for This Use Case?

- Customer and technology type compatible with an EE program available within a utility territory.
- Rate code by customer and associated conditions of rate including exclusions.

9) What Data Analysis Function(s) Does the IEDR Need for This Use Case?

- Propensity score grouped to be Low/Medium/High segment based on score ranges.
- DER type / make / model, demographic averages / max / min, premise type by zipcode+4.

(b) What are the Minimum Necessary User Input Variables Needed to Enable a Useful Analysis?

- equal to, contains, is blank, matches "x" attribute.

10) How Often Does the Stakeholder Expect to Employ This Use Case?

Stakeholders will likely employ this use case with high frequency to inform frequent and recurring business activities (i.e., Daily, weekly, monthly, quarterly, semi-annually, annually).

11) How Does This Use Case Benefit the Stakeholder?

Providing analytics such as customer EE program participation / EE measure implementation history and propensity to enroll in EE programs and implement EE measures will democratize the raw data within the IEDR. Otherwise, only organizations with technology and the staff to do the analyses will make use of this data in a reasonable amount of time and financial investment.

12) Why Should This Use Case Be Prioritized From the Perspective of i) the Industry and ii) the Citizens of New York State?

Without understanding energy users in relation to historical EE participation and propensity for future EE participation no amount, ingenuity, or quality of EE technology will achieve accelerated mass adoption and cultural normalization.