FIRSTFUEL
BUILDING ENERGY ANALYTICS

Informal Comments of FirstFuel Software
February 10, 2016

California Public Utilities Commission
Energy Division
505 Van Ness Ave
San Francisco, CA 94102

RE: FirstFuel's Informal Comments on AB 802 Workshops

1. Introduction

FirstFuel Software (FirstFuel) is pleased to submit the following informal comments in response to the AB 802 workshops – Day 1 and Day 2 that took place on January 26 - 27, 2016. FirstFuel appreciates all the work by Energy Division to scope and inform future policy and implementation guidance to move High Opportunity Programs or Projects (HOPPs) forward within the truncated time frame dictated in the AB 802 legislation.

FirstFuel Software is a customer intelligence company that transforms utilities into trusted advisors to their business customers. Our platform provides accurate intelligence at a customer level that helps utilities and implementers assess and monitor energy performance. FirstFuel focuses on providing utilities and implementers with the customer intelligence platform to enable and ensure accuracy and persistence of savings. FirstFuel's platform is being used as an innovative tool to increase program optimization, and productivity through the DSM sales cycle. FirstFuel is not an implementer, rather a software as a service (SaaS) company that provides:

- Upfront intelligence and screening to streamline and improve effectiveness of customer outreach/engagement (segmentation, propensity scoring etc.)
- Analytics to allow identification and sizing of customer-specific energy conservation measures.
- Intelligence to enable targeted onsite engagement by utilities and implementers.
- Monitoring usage data to track persistence and help building managers/owners maintain operational changes (and allow for performance-based payments by meter).

FirstFuel's informal comments focus on a variety of questions posed in the agenda for **Day 2: Operationalizing Directives in Assembly Bill 802 and Assembly Bill 793**

2. ***Panel 1: State of Current Research*** *and current applications of normalized metered energy consumption*

a. *How has the analysis method been used in program development (customer, sector, etc.)?*

N/A

b. *What is new now?*

N/A

c. *Are there new opportunities that make this project level approach to M&V scalable for programs (i.e. multiple customers)?*

N/A

d. *Key challenges and opportunities:*

i. *How are time series challenges like how long to measure and collection of pre and post data handled?*

N/A

ii. *How are persistence of the savings identified and accounted for multiyear effects?*

FirstFuel's platform can track the persistence of savings indefinitely from year to year if there are no changes (i.e. multiyear effects) within the building. However, changes are commonplace, and FirstFuel's methodology has incorporated several innovative components in our post-baseline analysis to alert and account for changes in building energy consumption. One of the most important components is our building-specific approach and its ability to detect a change event has occurred. FirstFuel's technology and core principles allow us to understand that most changes within an individual building have nothing to do with an energy conservation measure (ECM). The ability to detect and attribute exogenous changes, to tenants moving out and not as a result of an ECM intervention, is one of many challenges our platform has over come. Tenants moving out are a non-routine event, and having a model that is robust enough to alert this reduction in occupancy is important to the impact of savings within the each individual building. Continuous monitoring and a proper baseline analysis can support the persistence of savings and provide insight into changes in consumption over multiple years.

iii. *How are savings accounting structures set up to capture annual and cumulative effects?*

N/A

iv. *Routine and non-routine adjustments how are they handled? Do they matter? Why or why not? How is maintenance handled? (routine or non-routine?)*

N/A

v. *How does the method deal with detecting small interventions versus big interventions?*

FirstFuel's advanced energy analytics trains sophisticated models to ensure the best possible baseline fit, which is then used to detect small vs. big interventions in the post-baseline period. Small interventions have a smaller effect on energy use, and are more difficult to verify. However, determining the magnitude of the intervention shouldn't be the main concern. Instead of focusing on the size of the intervention, FirstFuel recommends focusing on the method for detecting the intervention, measuring the persistence, explaining the change, and doing all of this with high confidence. All of these efforts will allow the model to understand and improve the signal-to-noise ratio for individual buildings. Detecting small interventions versus big interventions becomes a less concerning distinction if you have interval meter data and a sophisticated model that can utilize machine-learning algorithms to understand the internal drivers of a building and predict these over time.

vi. *Which meter is appropriate to use? What are the tradeoffs of a whole building meter or sub-meter for orienting the information to customers, settlement with a vendor, and grid planning?*

FirstFuel utilizes meter data (monthly, hourly, 15-30 min) for all program deployments, internal facing portals, and customer engagement portals. For more detail on sub-meter vs. electric meter see below question f).

vii. *Are proprietary models or methods required and how does it relate to the need for transparency to ensure a level playing field for market actors as well as confidence in the results?*

FirstFuel's methodology is proprietary, but along with that comes highly predictive accuracy for commercial applications. The fundamental issues regarding proprietary models should revolve around accuracy, scalability, and usefulness of information that is presented. An inherent bias should not preclude proprietary models from supporting a larger mandate. For reference, the FICO credit score is a proprietary algorithm that has been used for decades in the financial lending markets. Also, while proprietary tools are backed through commercial means, it's important to note that Open source tools are not free. Open source tools still require continuous resources for development and must be updated regularly to be effective. **Most importantly, proprietary models can be evaluated while protecting the developer's intellectual property, if the predictive accuracy of a model is evaluated and not the specific model.** One general way to compare accuracy is to have a public training data set, and a test data set from the same building known only to the test administrator. The training data set is used to build a model, and the test data set is used to verify it. The test cannot be gamed because the test data (answers) are withheld from the implementer/software provider. A similar vetting process was instituted for selection of software providers in PG&E's Commercial Whole Building Program, for which FirstFuel is an active participant.

FirstFuel recommends that the CPUC collaborate with LBNL to come up with a set of metrics to evaluate proprietary models, so that we can build confidence in the capacity of these models to accurately predict savings within high confidence bounds.

viii. ***Additional: Experimental Design or Randomized Control Trials*** *was adopted by the Commission for quantifying savings for behavior programs. This method may have broader application under the normalized metered framework.*

FirstFuel supports Randomized Control Trials (RCT) for measuring efficacy at the population level. However, setting up a large scale, longitudinal study to represent the heterogeneous environment of all commercial and industrial classes can be exceptionally difficult and expensive. Also, the RCT methodology will not decipher the savings gains achieved at a per-building level. Alternative techniques like FirstFuel's automated, accurate base lining, plus avoided use calculations, can be carried out for **every** building, and it would avoid the need for scoping a massive population level RCT study. FirstFuel's building-by-building savings approach and an RCT can be complementary, but it will depend on the goal of the program. At the workshop staff iterated that RCT methodology was a best practice utilized by EPA, and FirstFuel recommends figuring out the goal of the program (i.e. population or building level savings), and applying the best technique to match the desired outcome. For example FirstFuel's per-building analysis, because of its scalability and cost-effectiveness, can be performed in a bottoms-up fashion on a very large population of buildings and the expected savings accumulated to the population level. This provides both population level metrics as well as building level granularity of where the savings may be occurring.

3. ***Panel 2: Potential program designs*** *may be enabled by this legislation but do not yet represent a significant share of the portfolio. Potential vendors can help focus the conversation on potential the program design hang ups – incentive models, persistence, re-reporting, getting incremental savings, and cost effectiveness to inform regulatory guidance.*

a. *What customers or market segments will most benefit from your programs? (i.e. what does it supplant in the existing portfolio?)*

FirstFuel analytic tools incorporate normalized metered consumption data and assist utilities and implementers with portfolio screening, targeting, engagement and tracking of whole building savings for all commercial customer classes. Software as a Service is a cloud-based tool that can be utilized for program implementation, optimization, and productivity and it can be categorized in various programmatic category budgets, as dictated by the functionality within a given program. Common applications are marketing, engagement, and customer services.

b. *What strategies or past experience are you exploring for investing in upfront costs, providing incentives and balancing against savings that are quantified after the intervention?*

N/A

c. *How are you ensuring persistence of savings? How do you value (or not) persistence in the context of your service offerings? How do regulations support or hinder persistence?*

FirstFuel's analytics platform ensures persistence of savings through continuous monitoring and near-real time alerting with actionable intelligence for whole building projects drift from predicted savings. Providing pre and post measure consumption in one portal, allows for a transparent comparison of a baseline model before and after a measure (s) are installed or if an event occurs. This is particularly important with RCx programs, where prior evaluation have found failed measure installations, poor realization rates and documentation. Additionally, the customer, implementer, utility and/or future evaluator can have the ability to extract the actual and baseline consumption data from the portal if they choose for their analysis needs.

Currently there are no requirements to continuously monitor program/portfolio level savings and RCx/operational measures are determined through a custom and/or deemed measure based approach, which rely on pre-determined savings estimates. A few challenges exist with this savings approach and these programs:

- First, economizers, which lend themselves to interval data to calculate operational savings, do not fit nicely with in the custom program approach.
- Second, switching a calculation from custom to deemed post project submission can be very problematic.
- Third, RCx programs can lack standardization for program documentation; some use BOA/C-BOA tools while others use custom calculations.

Continuous monitoring of normalized meter-based consumption can help increase the confidence around operational savings and RCx measures, which links directly to the intent of AB 802.

d. *What reporting protocols are you typically using in program implementation and tracking, how is tracking and reporting part of your business practice?*

N/A

e. *For behavior, retro-commissioning and operations effects, how are you ensuring the activity is related to your intervention to demonstrate value to the customer and justify the cost?*

FirstFuel's analytics platform can ensure activity related to RCx or operational recommendations, by giving users of the platform the ability to record important dates of interventions and eventual actions. The entire engagement process is well documented and tracked from the presentation of audit recommendations and payback, to the actual logging of measures from a customer into their energy plan, and finally, to the monitoring of savings over time.

f. *What cost effectiveness barriers or opportunities come from embedding savings quantification – normalized metered energy consumption – in your service offerings?*

Incorporating AMI data, inverse modeling, and data analytics can be a cost-effective method to remotely monitor all buildings within a utility or implementer portfolio. The traditional approach can be idiosyncratic, expensive, and not scalable across hundreds of thousands of locations and business customers. FirstFuel is already providing this capability at the whole building level for many projects and programs. A sub-meter/hardware approach may be more appropriate for a larger building retrofit when one is trying to determine individual measure level impacts. Software analytics will be the most cost-effective approach for monitoring whole building saving across an entire portfolio.

g. *What would be the impacts of tying incentive payment to performance? Perceived adverse impacts to participants?*

   N/A

h. *What consumer protections are in place in a pay-for-performance approach? What if the savings are not realized?*

   N/A

FirstFuel Software appreciates the opportunity to comment. We look forward to supporting the CPUC on draft guidelines for HOPPs, and other key stakeholders in CA in developing, incorporating, and deploying customer intelligence platforms to increase customer engagement, scale energy efficiency, and reduce the cost to serve commercial customer classes in California.

Respectfully Submitted,

/s/ Jordana Cammarata
Regulatory Affairs Manager
FirstFuel Software, Inc.
535 Mission St, 16th Floor
San Francisco, CA 94105
(415) 992-6317
jcammarata@firstfuel.com