Dynamic Baseline Meters

FUNCTIONAL SPECIFICATION

KEY FEATURES, CONSENSUS OF FINANCE PARTIES, DEVELOPERS, ENERGY TENANTS
We present the EE Meter feature set that we as investors, developers, and customers need in order to be able to participate in long-term MEETS/EEaaS transactions.

This feature set brings customer, developer, and finance confidence, and supports diligence, transaction, and aggregation/securitization rigor over a project life.

Separately we’ve identified features we think the grid/utilities/planners should consider. Fortunately we think they integrate with what we need.
1) **Measures as-delivered EE yield to transactable accuracy**, on a whole-building basis, or any larger aggregate (facility, campus, circuit, fleet....).

2) **Familiar**
   a) **Is and feels like a meter:** Acts like a meter in the system in all respects. Even if formally it is specified by agreement and run by a third party - it should sit in the system as a “utility’s meter.”
   b) **Delivers functionality of a meter:** APIs to Utility, can generate “billing” statements of energy yield, **so our investors and customers see that efficiency energy = energy**, and that it follows well understood patterns.
3) Trustworthy
   a) **Unbiased**: Service from third party or utility, so our investors know there’s no thumb on the scale.
   b) **Auditable**: Audit trail of all calibrations/normalization is preserved, so the answer can be reviewed.
   c) **Transparent**: Coefficients, readings accessible in read-only to all whose transaction is being measured), so all transaction parties can have confidence.
   d) **Checkable**: Calibration verification (“meter challenge”) protocol exists as with any meter, so people know they have recourse if they need it.
Dynamic Baseline Meters Specifications Transaction Parties Need

4) Reliable
   a) **Stays Calibrated**: Clear and timely calibration protocol means baseline stays current to building use, so we keep the promise that we’re harvesting energy.
   b) **Consistent Support Environment**: We need mathematically consistent analytical, design support, commissioning, and performance monitoring tools, so we know what meter reading our projects will and should produce.
   c) **Field Tested and Vetted**: We need the root analytical function and method to have been transparently tested by third parties, and to see the meter tech we use has functioned as an EE meter in field tests, and shown to work, so we are getting validated capability.
   d) **Change process controlled**: Baseline once established stays locked except through agreed calibration protocol and challenge protocol, so customers know it is safe.
Dynamic Baseline Meters
Specifications Transaction Parties Need

5) **Usable**

a) **Fast, Low-cost:** We need the baselining process to work from historical data rapidly, using existing data, ideally as an outcome of the standard support environment, so it’s fast, reasonable cost, and practical.

b) **Automated:** We want to see the detection, analysis, and calibration as automated as possible. No time consuming, costly, subjective “engineering adjustments” to abstract models that have generated such contention historically, so cost can stay reasonable and confidence stays high.

c) **Easy Install:** No field hardware, remote management and maintenance, so use is fast and low cost.

d) **Multiple Fuels:** The meter needs to analyze a multiple-fuels baseline so it applies to real buildings. (EEaaS/MEETS is fuel switching. We may switch from electricity, gas, steam, or other, to efficiency).

e) **Robust:** Infrastructure grade code and user interfaces, not excel spreadsheets, so it is a production environment.
Dynamic Baseline Meters
Additional Specifications We Think Reinforce Meter Usefulness

1) **Plus for Load management applicability** (location-specific reliability for grid management, fractal reliability, eg if it’s a circuit measurement, the sum of the constituent building measurements, adjusted for line losses, match).
   a) Supports ISO load planning – matches grid energy & capacity expectations, so an EE MWH equals and offsets a generation MWH. Fungible units, at baseline.

2) **Plus for Multiple Baseline Support**
   a) *Core is existing conditions baseline (MEETS/EEaaS transaction).*  
      *It’s fungible with other energy.*
   b) Because other systems (notably the legacy incentive systems) have program specific baselines, the ability to define and calibrate a program-specific baseline is of potential value.
      a) Code baseline (incorporating current code/ new buildings).
      b) Load planning baseline (incorporating expectation of “absent this program, what happens anyway” logic defined by program designers).
      c) Demand response baselines – short term (last week or yesterday vs. five years ago) – easily calculated and easily trackable.
Dynamic Baseline Meters
Additional specifications we think reinforce meter usefulness

3) Plus for Plug Compatible to Utility Billing systems
   APIs should support direct provision of billing data – it’s just another meter on the system.

4) Plus for Time of Day Support
   Enables better integration with value of load shape.
A Note on Options C and D.

The International Performance Measurement and Verification Protocol (IPMVP) long ago established two “options” for whole building baselining, “Option C” and “Option D.”

And then building science evolved.

Today we have regression analysis (fast) to physical thermodynamic energy flows equations (physically true).
That combination is ideal, but is it “Option C with Option D analytical and calibration capability,” or is it “Option D with Option C ease of use?”

We don’t care. Call it what you want.

We just want that kind of solution:
Regression-derivable from existing energy data, so it’s fast and reasonable cost, and that delivers us calibrate-able (physical reality) coefficients, so we can keep our baselines up to date and understand our buildings well.
For More Information

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