



Evolving Evaluation – Evaluator's Perspective

Midwest Energy Efficiency Alliance
Midwest Energy Solutions Conference

February 18, 2021

1. The Challenge

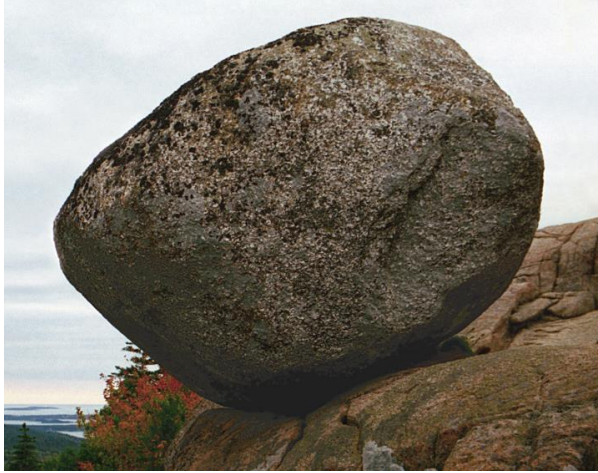
2. Solution – Program Design

3. Solution – Speed

4. Solution – Improved TRM

5. Demand Response

The Challenge



Regulations



Implementation Contractor



Program Design

Your
Friendly Evaluator



Utility Needs

The Challenge

Speed up evaluation, keep it relevant

- The TRM puts bounds around what the program can claim and what the evaluator can do.
 - How can evaluators take that restriction and speed up and improve evaluation?
- The utility wants to minimize their evaluation risk and maximize claimable energy savings at the best cost.
 - How can evaluators help minimize evaluation risk?
- The Implementation Contractor wants to convince the utility that their approach is flawless and a winner
 - How can evaluators support innovation without compromising independence and objectivity?
- The program designs sometimes limit the ability to design creative tests with control groups.



The Solution

Support new program designs

- Programs using analysis of AMI data to target and serve customers
- Programs that are designed as randomized control trials

Evaluation:

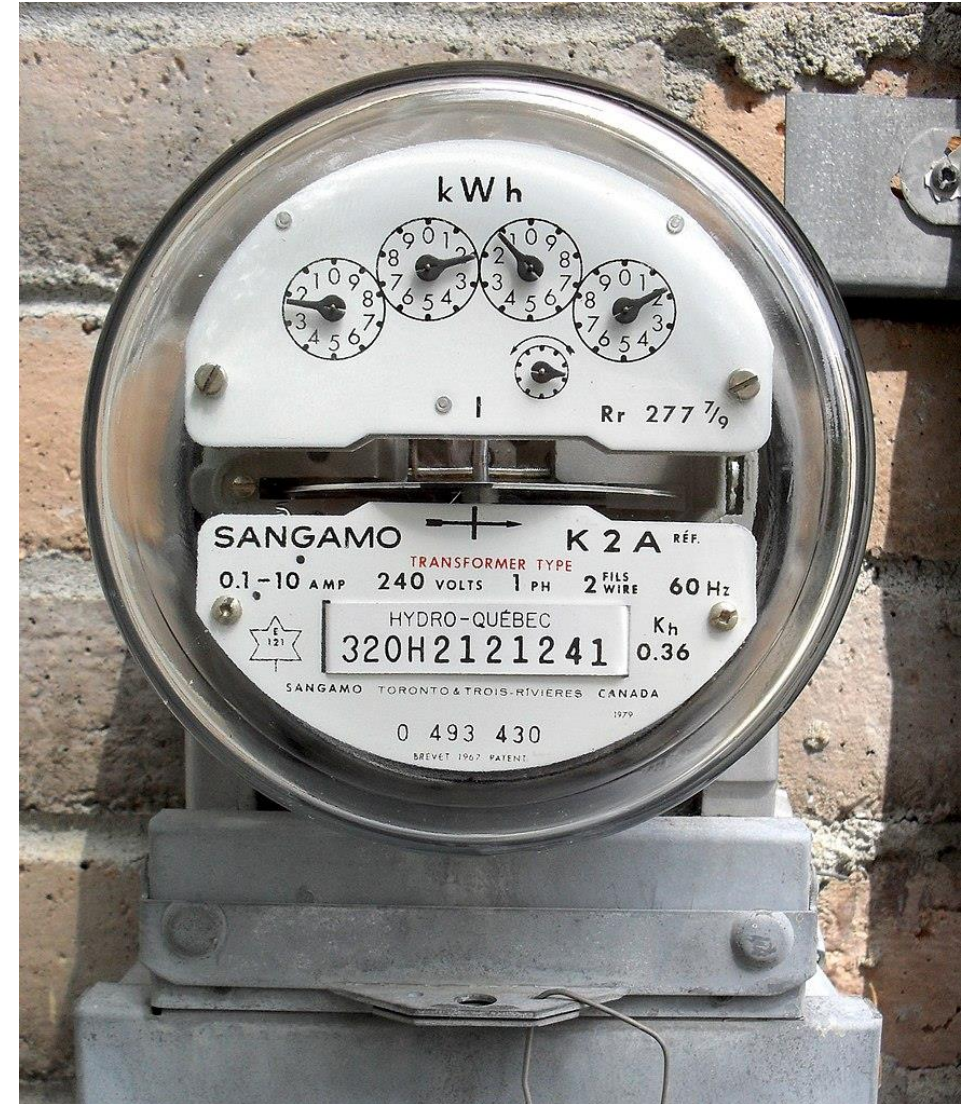
- validates the design,
- supervises sampling,
- checks statistical models,
- and otherwise looks over the shoulder of the implementation contractor to give the utility an independent view of the rigor of the methods.



The Solution

Support new program designs

- Example: Normalized Metered Energy Consumption (NMEC)
- Involve evaluation early
 - Agree on cleaning steps ahead of time
 - Validation of models
 - IC and EM&V results should align



The Solution

Make Existing Methods Faster

- Create code-driven evaluations to speed up evaluation TRM-Driven programs
- Schedule evaluation research throughout the year instead of waiting until the program year is done.
- Choose a schedule that fits the program design and adjustment schedule

```
def convert_to_cells(line):
    line[j] == " ":
        new_cell = Air()
    elif line[j] == "*":
        new_cell = Wall()
    elif line[j] == "X":
        new_cell = Start()
        check_start += 1
    elif line[j] == "Y":
        new_cell = End()
        check_end += 1
    elif line[j] == "F":
        new_cell = Fire()
    elif line[j] == "W":
        new_cell = Water()
    elif not line[j].isdigit() or line[j] == "0":
        raise ValueError("Bad letter in configuration file")
    elif line[j].isdigit():
        new_cell = Teleport(str(line[j]))
        check_end += 1
```

The Solution

Improve the TRM

- TRMs are relatively static and based on engineering calculations.
- Use consumption data analysis and results from new program designs to create adjustments to TRM algorithms

$$HOU * \Delta V * AF$$

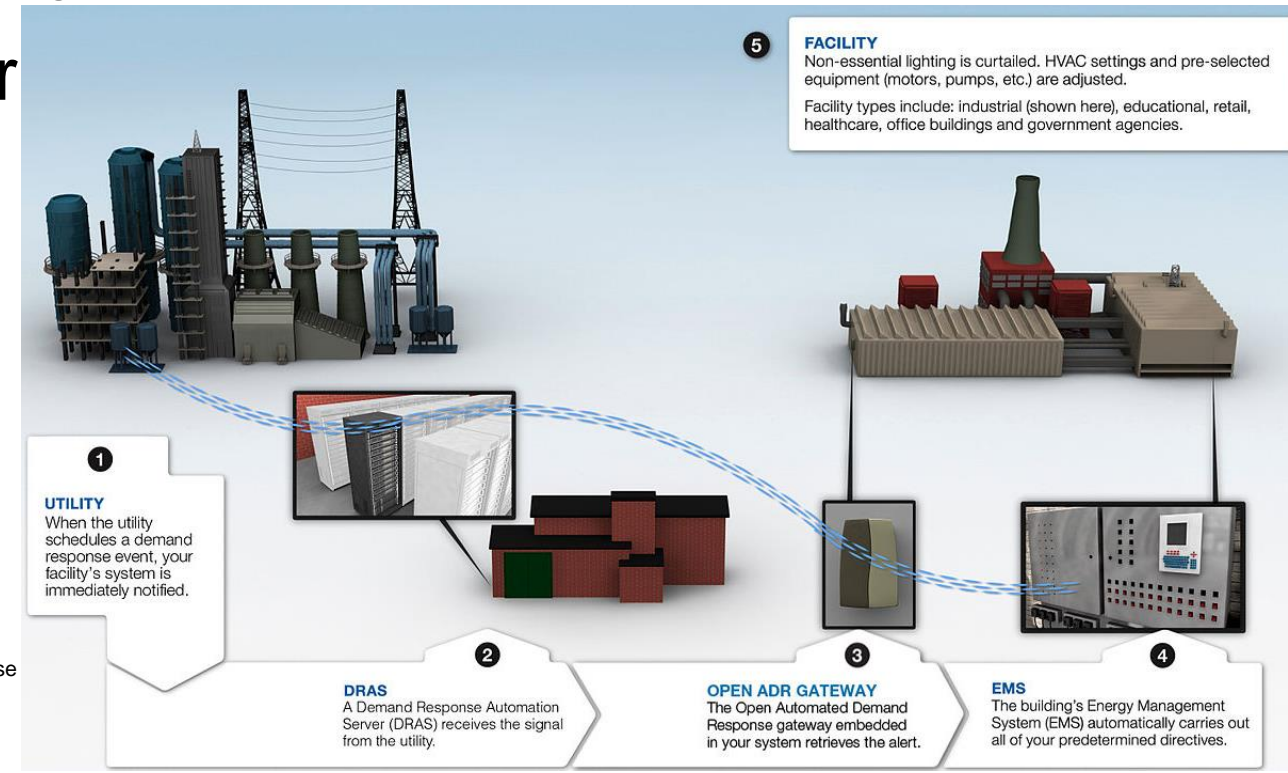
Where

- HOU = Hours of Use
- ΔV = Change in volts
- AF = Adjustment Factor

The Other Side

Evaluation of Demand Response and Load Shifting Programs

- For DR, the case for claiming that a pre-post design using customers as their own controls is a robust means for estimating accurate savings is quite strong.
 - AMI data at a frequent time interval
 - Compare event days with similar non-event days
- Example: APS Fast Feedback Demand Response



Contact

Jeff Erickson

Director

jeff.erickson@guidehouse.com

608-206-6011



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