



DISCOVER A
SUSTAINABLE
WORLD

Data Validation and Quality Control

DEFINITIONS

Validators allow you to set rules in order to check the quality of your program data. Each program has a set of validators that you can customize and you can visualize the errors at each building or across the portfolio. If a building passes the validators, then it will be included in program analysis, visualization, and reporting.

FIELD DATA VALIDATORS

A field validator is for any field that isn't expected to change very often, such as your building size, gross floor area, and number of occupants. Although field values can change over time, field validators allow you to check against the most current value of the field so you have an understanding of what the correct value should look like.

Exists: Check if a field exists

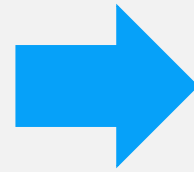
Type: Check if a field is in the correct generic input format - like a number, text, or true/false [e.g. PostalCode is a number]

Units: Check if a field has a correct unit type associated with it [e.g. Annual Electricity-Use has energy units (kWh, kBTU, Joules, etc...)]

Text Length: Check if a text field is equal (=), less than (<), or greater than (>) a given number in length [e.g. Length(PostalCode) == 6]

Number Range: Check if a number field is equal (=), less than (<), or greater than (>) a given number [e.g. Gross Floor Area > 0]

Part of List: Check if a field value is contained within a list of acceptable values [e.g. State is part of List("CA, AL, IL, MT")] – user can paste list into single column spreadsheet



Field	Value	Status
Completed Construction Status Date	1950	✓ Within Range
Gross Floor Area	75000	✓ Within Range
Observed Primary Occupancy Classification	Observed Primary Occupancy Classification	✓ Exists
Portfolio Manager Property Identifier	5907882	✓ Exists
Premises Address Line 1	321 Education Way	✓ Exists ✓ Optional
Premises City	Phoenix	✓ Exists
Premises Country	US	✓ Exists
Premises Name Identifier	Sample K-12 School (US)	✓ Exists
Premises State	Premises State	✓ Exists
Premises ZIP Code	85005	✓ Length
Delivered Electricity Resource Value	Edit Data	✓ Start Time Before End Time ✓ Exists For Each Month ✓ Jump From Last Year ✓ Data Gap



Set Custom Validation Rules

Data Validators

Delivered Electricity Resource Value	<input type="button" value="X"/> Start Time Before End Time ▾			
	<input type="button" value="X"/> Exists For Each Month ▾			
	<input type="button" value="X"/> Jump From Last Year ▾	months: <input type="text" value="3"/>	threshold: <input type="text" value="50"/>	<input type="button" value="X"/>
	<input type="button" value="X"/> Data Gap ▾			
	<input type="button" value="New Validator"/> ▾			
Natural Gas Resource Value	<input type="button" value="X"/> Start Time Before End Time ▾			
	<input type="button" value="X"/> Exists For Each Month ▾			
	<input type="button" value="X"/> Jump From Last Year ▾	months: <input type="text" value="3"/>	threshold: <input type="text" value="50"/>	<input type="button" value="X"/>
	<input type="button" value="X"/> Data Gap ▾			
	<input type="button" value="New Validator"/> ▾			
Enter New Field:		<input type="text" value="New Field"/>		

Discard Changes

Save



Life Cycle Tracking - New Program Integration

ENERGY EFFICIENCY MEASURES SUMMARY

Energy Expenditure Plan (EEP) ID #: 534

Total Project Cost: \$375,804.00

Total Annual Cost Savings: \$47,199.00

Total Rebates And Funds: \$110,885.00

ENERGY EFFICIENCY MEASURES

0%

COMPLETED

Energy Efficiency Measures

El Capitan High: In Progress

Estimated Measure Cost: \$88,527.00
Estimated Annual Savings: \$14,928.00
Estimated Payoff: 6 years



EEM CATEGORY:
Lighting

El Capitan High: In Progress

Estimated Measure Cost: \$31,794.00
Estimated Annual Savings: \$9,232.00
Estimated Payoff: 3 years



EEM CATEGORY:
Lighting

El Capitan High: In Progress

Estimated Measure Cost: \$600.00
Estimated Annual Savings: \$252.00
Estimated Payoff: 2 years



EEM CATEGORY:
Plug Loads

El Capitan High: In Progress

Estimated Measure Cost: \$24,315.00
Estimated Annual Savings: \$4,556.00
Estimated Payoff: 5 years



EEM CATEGORY:
Lighting

El Capitan High: In Progress

Estimated Measure Cost: \$223,968.00
Estimated Annual Savings: \$17,259.00
Estimated Payoff: 13 years



EEM CATEGORY:
Lighting

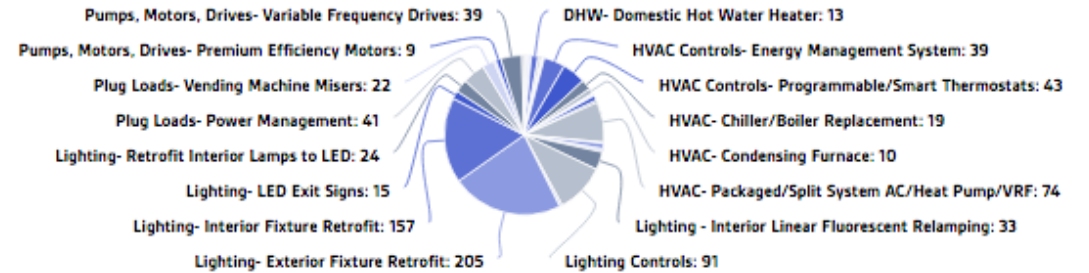
El Capitan High: In Progress

Estimated Measure Cost: \$6,600.00
Estimated Annual Savings: \$972.00
Estimated Payoff: 7 years



EEM CATEGORY:
HVAC Controls

EEM Type



MILESTONES



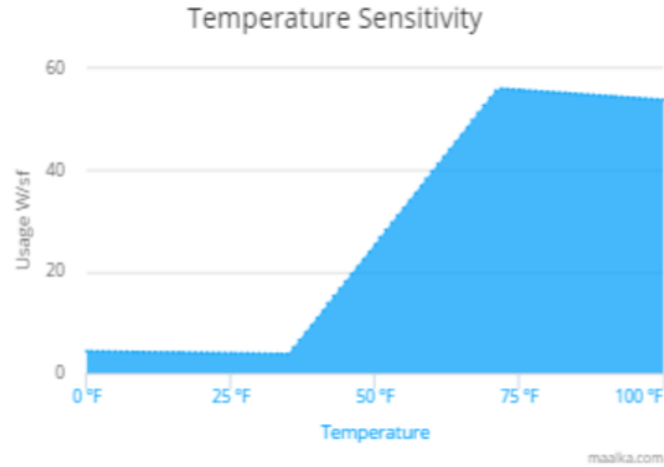
Track EEMs at each building over time, estimated costs, and projects across the portfolio

DATA QUALITY

Boathouse	✗	✓	✓	✗	✓
CLM/Woodshop	✗	✓	✗	✗	✓
Firestation 1	✓	✓	✓	✗	✓
Firestation 2	✗	✓	✗	✗	✓
Firestation 3	✗	✓	✓	✓	✓
Rec Storage	✗	✓	✗	✗	✓

[url: dataquality.maalka.com](http://dataquality.maalka.com)

TEMPERATURE SENSIVITY



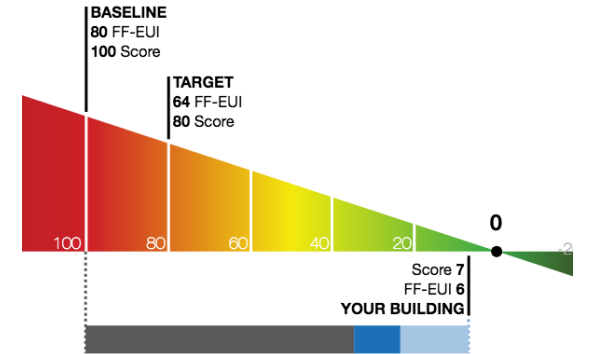
$$y_{\text{hat}} (\text{when Temperature} \leq 35.10868418) = 4.331422046165927 + -0.015379430214565655 * \text{Temperature}$$

$$y_{\text{hat}} (\text{when } 35.108684 < \text{Temperature} < 71.33582854) = 3.79147 + 1.44432481 * (\text{Temperature} - 35.1086)$$

$$y_{\text{hat}} (\text{when Temperature} > 71.33582854486302) = 56.11523 + -0.0783881368 * (\text{Temperature} - 71.33582854)$$

[url: sensitivity.maalka.com](http://sensitivity.maalka.com)

ZEPI



■ energy efficiency ■ on-site renewable energy ■ green power purchase

BUILDING SUMMARY

LOCATION	60190, IL	60190
USES	Office	123,123 sq.ft (100.0)%

RESULTS	BASELINE	TARGET	Your Building
EUI % Reduction from Baseline	0%	20%	93%
Score	100	80	7
Site FF-EUI* KBtu/ft²/yr	80	64	6
Source FF-EUI KBtu/ft²/yr	249	200	19
Site Energy Use KBtu/yr	9,756,724	7,805,379	706,585

[url: zerotool.org](http://zerotool.org)



maalka | Next Steps in Development

- Incorporate City Data Validators
- Add NBI FirstView Reports



August 2017

- Develop EEM Life Cycle Widget
- Track EEMs across Portfolio



November 2017

- Additional Program Overlays
- Explore Benchmarking Expansion



Adoption of External Programs

