New Developments

September 7, 2017

Outline

1. About BEDES
2. Version 2.1 overview
3. BEDES adoption update
4. Adopter highlights
   - CPUC Multi-family programs
   - energyOrbit
   - Maalka
   - San Francisco city data
5. Opportunities to get engaged

Please use the chat feature for questions

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

Motivation for BEDES

Problem

- Ambiguity of data definitions (e.g. gross floor area).
- High transaction costs of sharing and aggregating data.

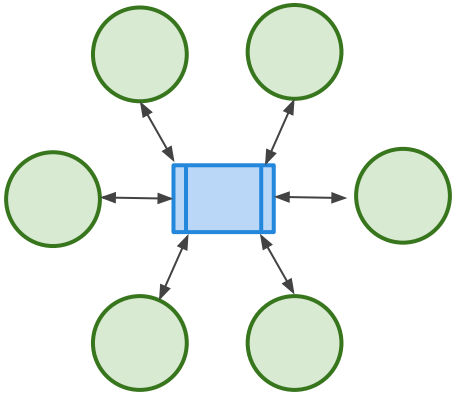
Solution

- Provide common terms and definitions to enable exchange, comparison, and combination of data.
- Reduce costs in the building efficiency sector.
- Facilitate software development and interoperability.

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

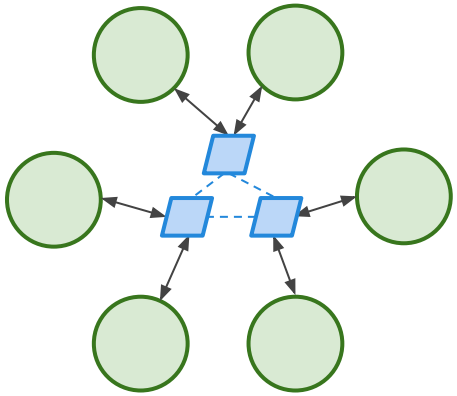
Think big, Start small, Act now...

Perfect world…



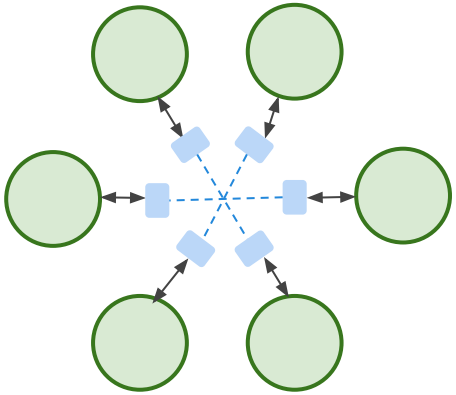
A single universal exchange schema

Almost perfect world...



A set of standard exchange schemas for different use cases

Somewhat less perfect world....



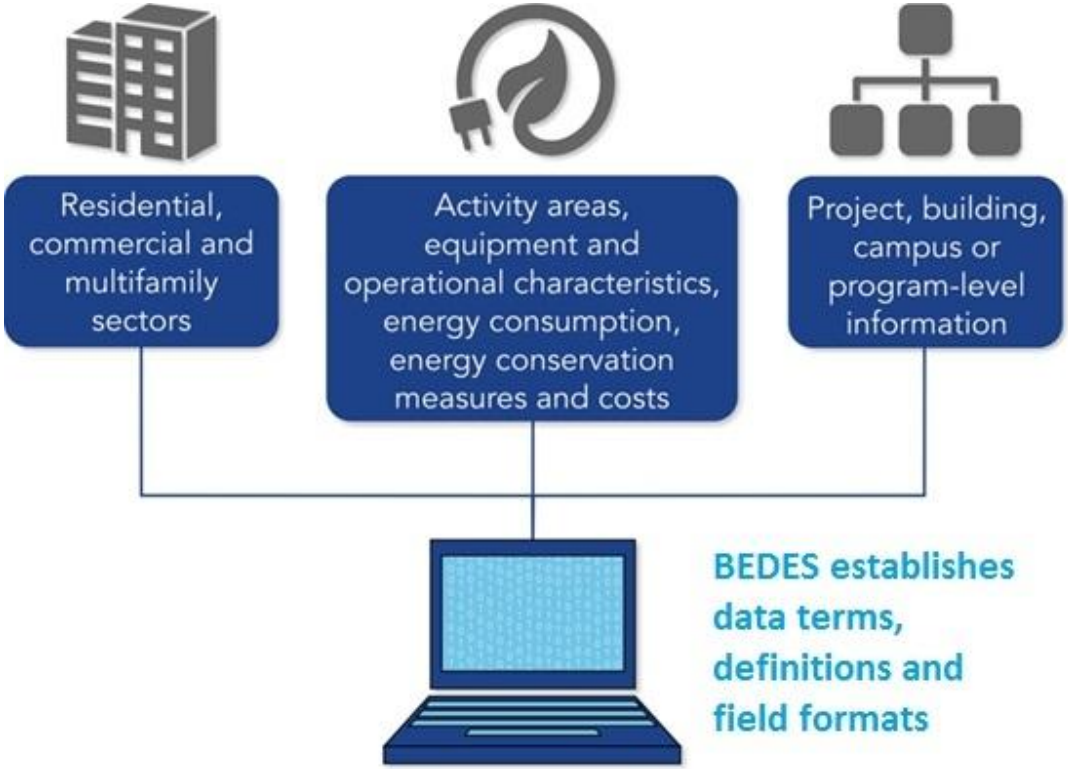
Standard terms and definitions

utopia ⟷ **reality**

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

What is BEDES?

BEDES is a collection of terms and definitions *to facilitate the sharing of building characteristics and energy data among data collection and analysis applications more easily, consistently, and at lower cost.*



BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

Scope of BEDES

- 600 terms covering general building characteristics, system features, energy use and cost, financing.
- Based on review of over 40 related standards and applications

BEDES Is

- Data Terms
- Term Definitions
- Units of Measure
- Data Types

BEDES Is Not

- Database
- Data Schema
- File format

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

BEDES Applicability

ENERGY EFFICIENCY INVESTMENT DECISION-MAKING

Owners and managers use building energy performance information to assess capital and operational opportunities in individual buildings, develop energy strategies across portfolios, and identify trends in local real estate markets.

BUILDING PERFORMANCE TRACKING

The implementation of disclosure policies for public or private buildings requires public officials to collect, clean and analyze massive amounts of data, then share portions of it with the public.

EFFICIENCY PROGRAM IMPLEMENTATION EVALUATION

Energy efficiency programs often provide incentives or technical assistance to support owners' data collection and analysis activities. They also use data to conduct program design and outreach, track project performance, and evaluate programs.

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BUILDING ENERGY DATA EXCHANGE SPECIFICATION

BEDES Development History

Motivated by desire to improve interoperability of DOE's software tools and data collection efforts

DOE scoping study in 2013 confirmed that BEDES would be useful to stakeholders outside DOE

Lawrence Berkeley National Lab leads working group process to develop BEDES

BEDES 1.0 released October 2014
BEDES V1.2 released October 2015
BEDES 2.0 released October 2016
BEDES 2.1 released Sep 2017

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

BEDES Version 2.1

What's new in Version 2.1

- Enhancements to meet Adopter needs
  - 5 new terms
  - 125 new constrained list enumerations/qualifiers
  - Revised definitions
- Updates and corrections to existing fields
  - Revised definitions
- 18 Review comments

We welcome your continued feedback!

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

BEDES Adoption

Long-term Goal:
BEDES is widely used as a de-facto standard dictionary for data exchange

Challenge:
Near term costs vs. long term benefits
for transitioning to BEDES

Near-term adoption strategy

- Socialize BEDES terms
  - Show mapping to BEDES terms
  - Support for BEDES' long terms goals

- Use BEDES to help with new data exchange/integration efforts
  - Direct near term benefits for applications

What other ideas do you have to increase adoption in the near term?

Should we work with standards organizations in the near term?

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

What makes you BEDES-compliant?

- Publish a mapping between your terms and BEDES terms
  - Can be used as 'Rosetta stone' for cross reference
- Use BEDES terms in your data export/import templates/formats
  - Can be as synonyms for your current terms
- Use BEDES terms for data exchange in multi-application scenario

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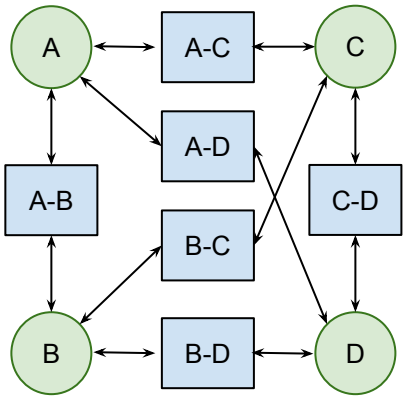
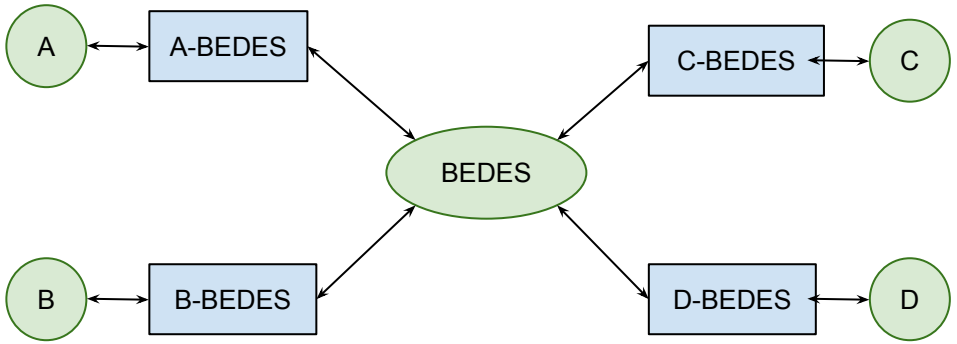
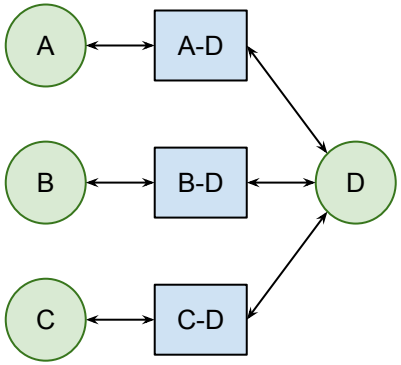
= application data = transformation

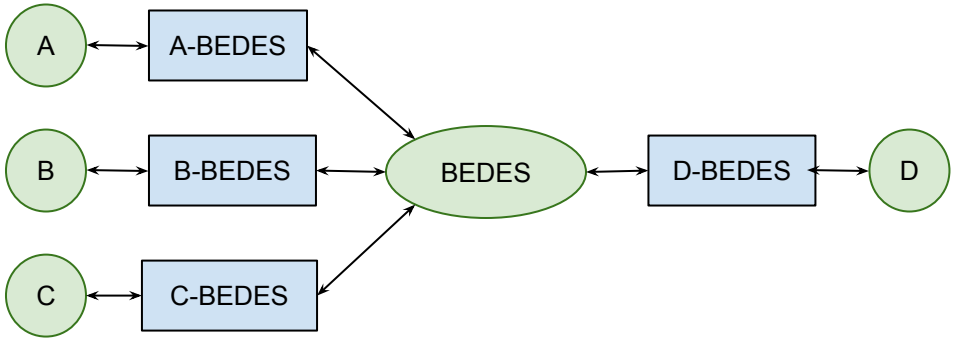
Many to Many





Many to One





BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

BEDES Adoption

Organizations with BEDES applications completed or initiated

Alert Energy

BEDES Adoper Highlights

CPUC Multifamily Programs

- 8 Multifamily Program Administrators
  - Different data collection, analysis, verification processes
  - Different data storage and reporting systems

- Goal: “Democratize” Program Data
  - Standardize export with BEDES
  - Building characteristics, measures, costs, savings
  - Support cross-program analysis by broad array of stakeholders to enhance program design and targeting

Types and quantities of measures by location, age, size, systems, ...
Savings/$rebate, payback, $/unit
Implementation time, completion rate
Trends over time
etc...

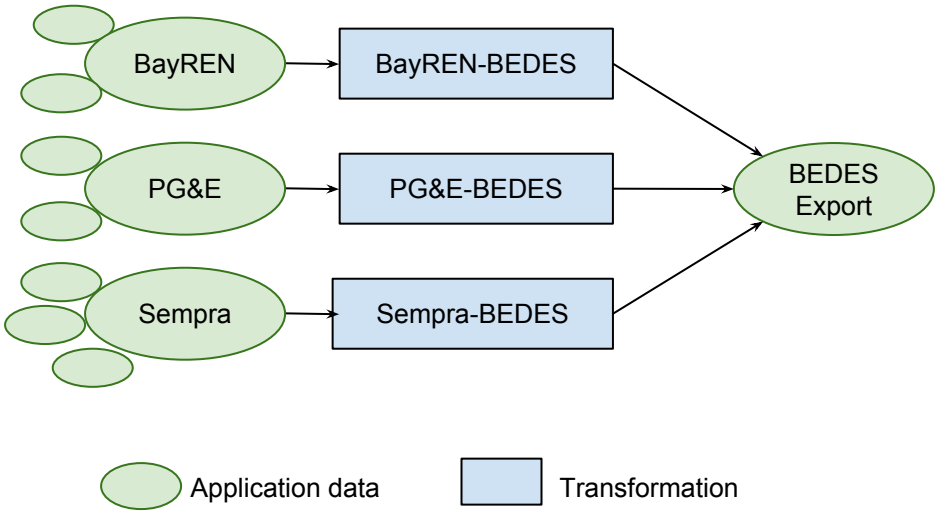
BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

CPUC Multifamily Programs

Pilot with 3 programs

BayREN PG&E Sempra

- Cross-walk lists of data fields within each system
- Develop target list of common fields
- Map each program data fields to BEDES terms
- Implement BEDES data transformations from each program dataset to common BEDES-compliant dataset

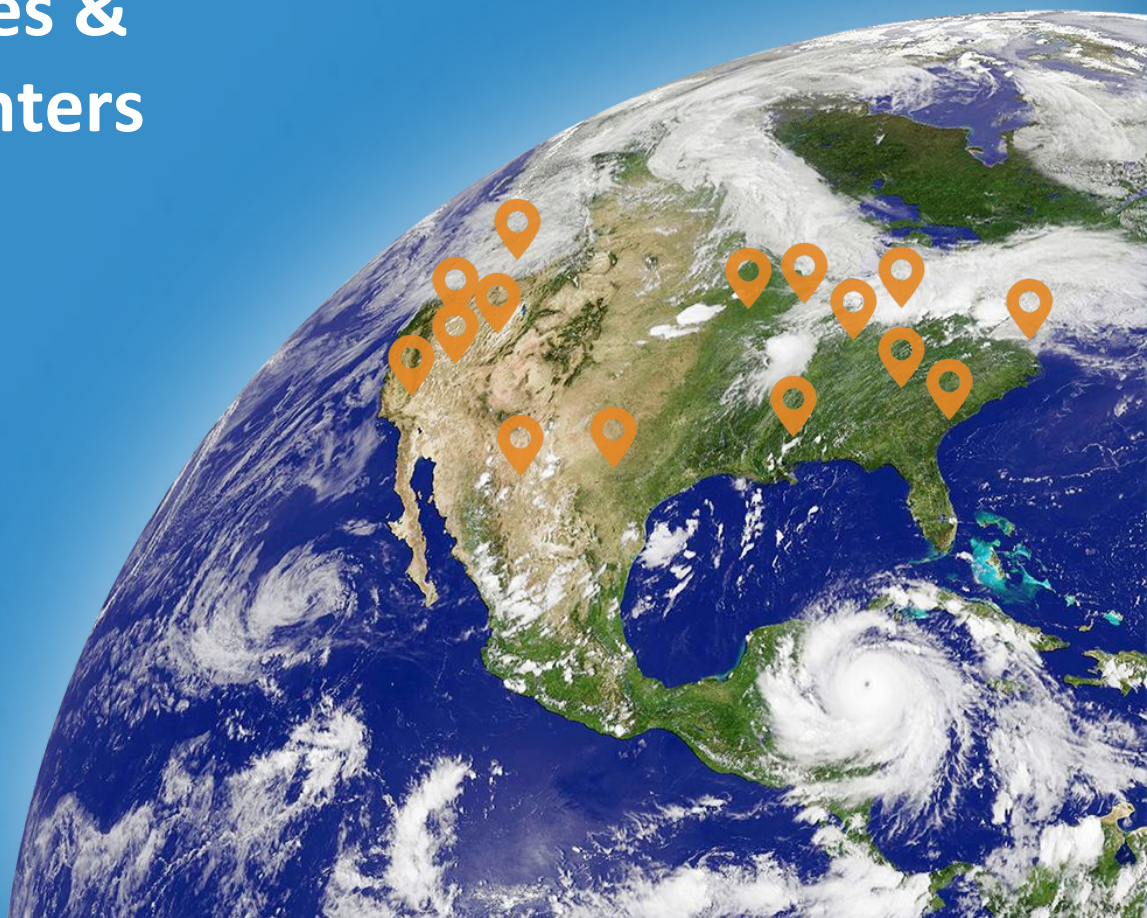


energyOrbit™

The Leading DSM Operations Platform for Utilities & 3rd-Party Implementers

BEDES Updates Webinar
September 7, 2017

Alex Zeltser
CTO, energyOrbit
azeltser@energy-orbit.com



energyOrbit™ at a Glance

Company

- Over 9 years exclusive focus on DSM operations

Solution

Cloud-based DSM operations and collaboration platform

- Deep functionality, based on multi-year experience supporting top-tier utilities and 3rd-party implementers – 100s of EE programs
- Experience in integration with back office systems
- Continuously-evolving product & platform

Benefits

- Improve productivity, collaboration, visibility, and customer success
- Empower DSM managers and IT staff

Deployment Footprint

energyOrbit
Track, Manage & Achieve Your Conservation Goals™

Challenges

- Develop and maintain measure libraries for our customers:
  - Formulas
  - Assumptions
  - Data points
- Time to market and implementation accuracy of paramount importance
- Lack of consistency in terminology increases:
  - Analysis time (TRMs, etc.)
  - Likelihood of errors
- … and reduces our ability to leverage past efforts and standardize across deployments

Standards To the Rescue

- energyOrbit's development and deployment methodology has always embraced the data-driven approach
  - No 'hard-coding' of values/assumptions
  - No 'black box'/'voodoo' components
  - 'Teach customers to fish'...
- But lack of consistency in terminology still a 'problem child'
- Emergence of standards such as BEDES and HPXML gets us closer to getting customers to market as quickly (and robustly!) as possible
  - Support HPXML exports; imports on roadmap
  - Moving measure library data dictionaries to BEDES

Real-world Usage

- Missouri River Energy Services
  - Not-for-profit joint-action agency
  - Serves 60 member communities in Iowa, Minnesota, North Dakota, and South Dakota
- Selected energyOrbit to streamline their processes, improve reporting and data quality
- Recognized the near- and long-term benefits of adopting industry standards
- Leveraged BEDES in their energyOrbit deployment
  - Adopted BEDES terminology for 50-60 terms used in measure definitions
  - Standardizes their reporting and future data exchange processes with trade allies and market partners

Future Is Bright…

- Steering product measure libraries to use BEDES whenever possible

- Hoping to expand our use of the BEDES dictionary in upcoming projects
  - Large utility in the Northeast
  - Other upcoming projects

BEDES Integration

Sept 7, 2017

John Teeter

John.teeter@maalka.com

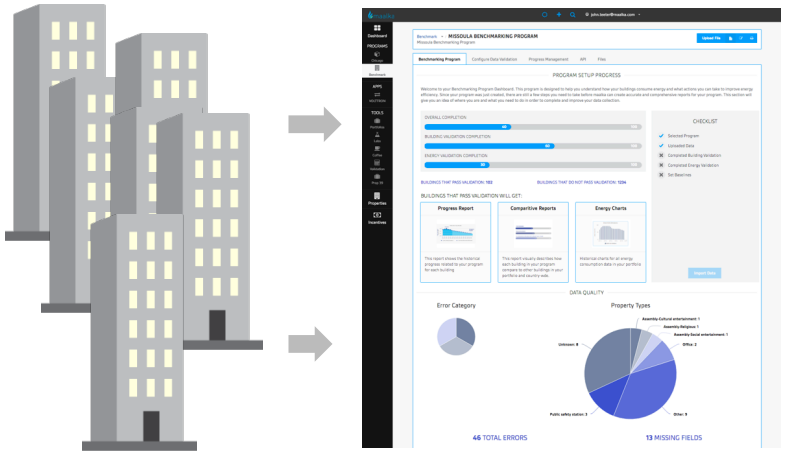
maalka

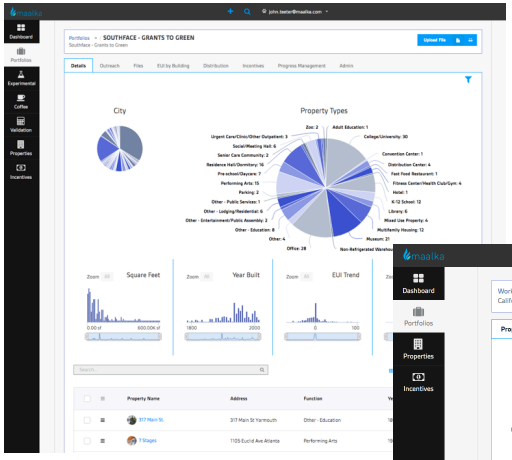
The Problem | Too Much DATA

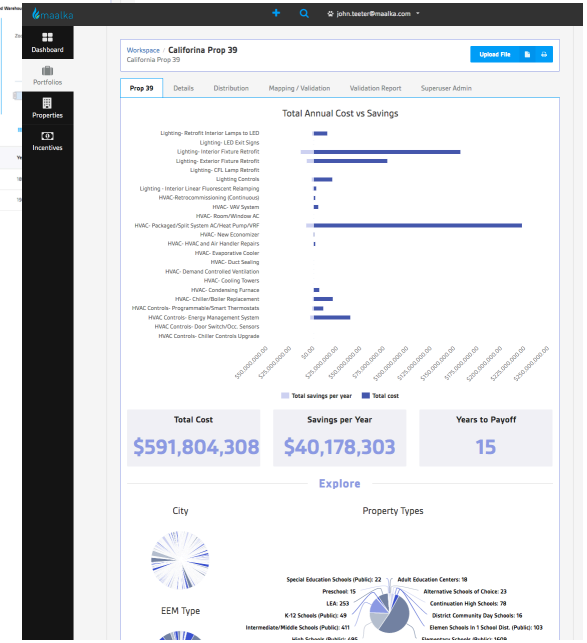
From too Many Places

Maalka | Portfolio Level Data Aggregation

Program Management and Tracking







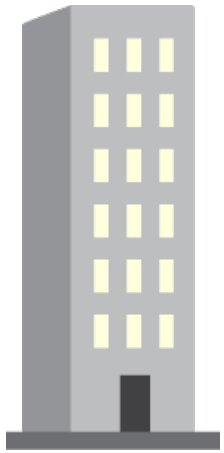
Yearly & Year-2-Date Reports

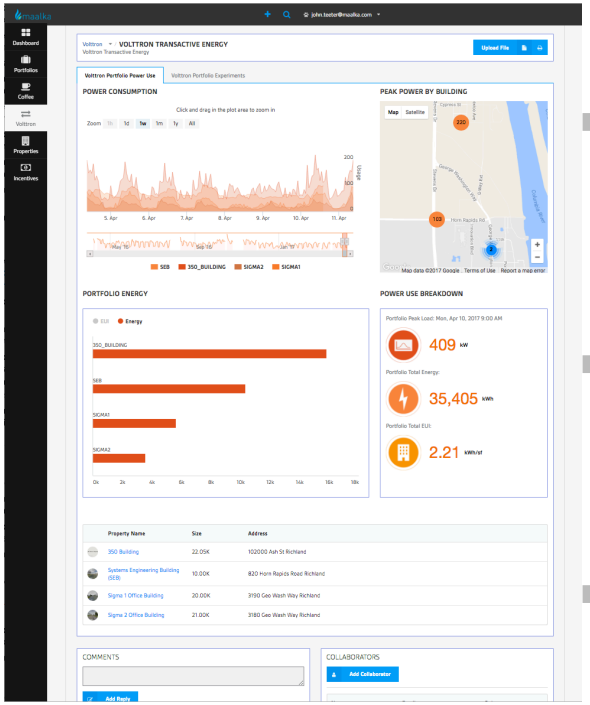
Maalka | BEDES IS INVOLVED IN EVERY IMPORT AND EXPORT

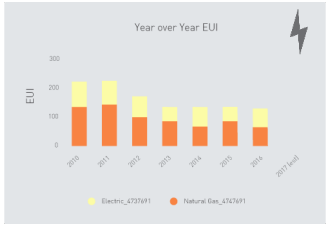
REAL-TIME

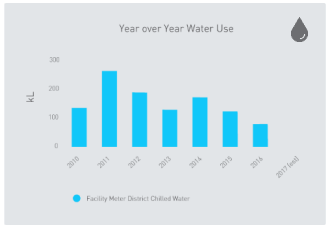
Weekly/Monthly

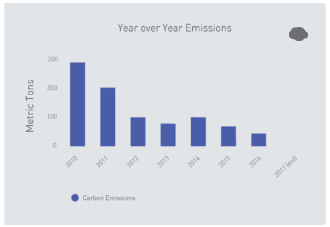
YEARLY

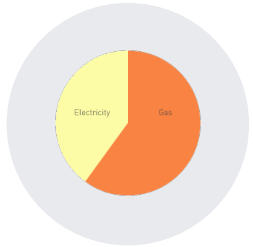


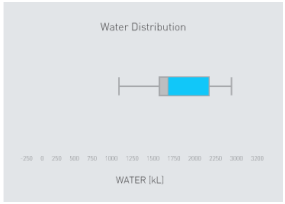








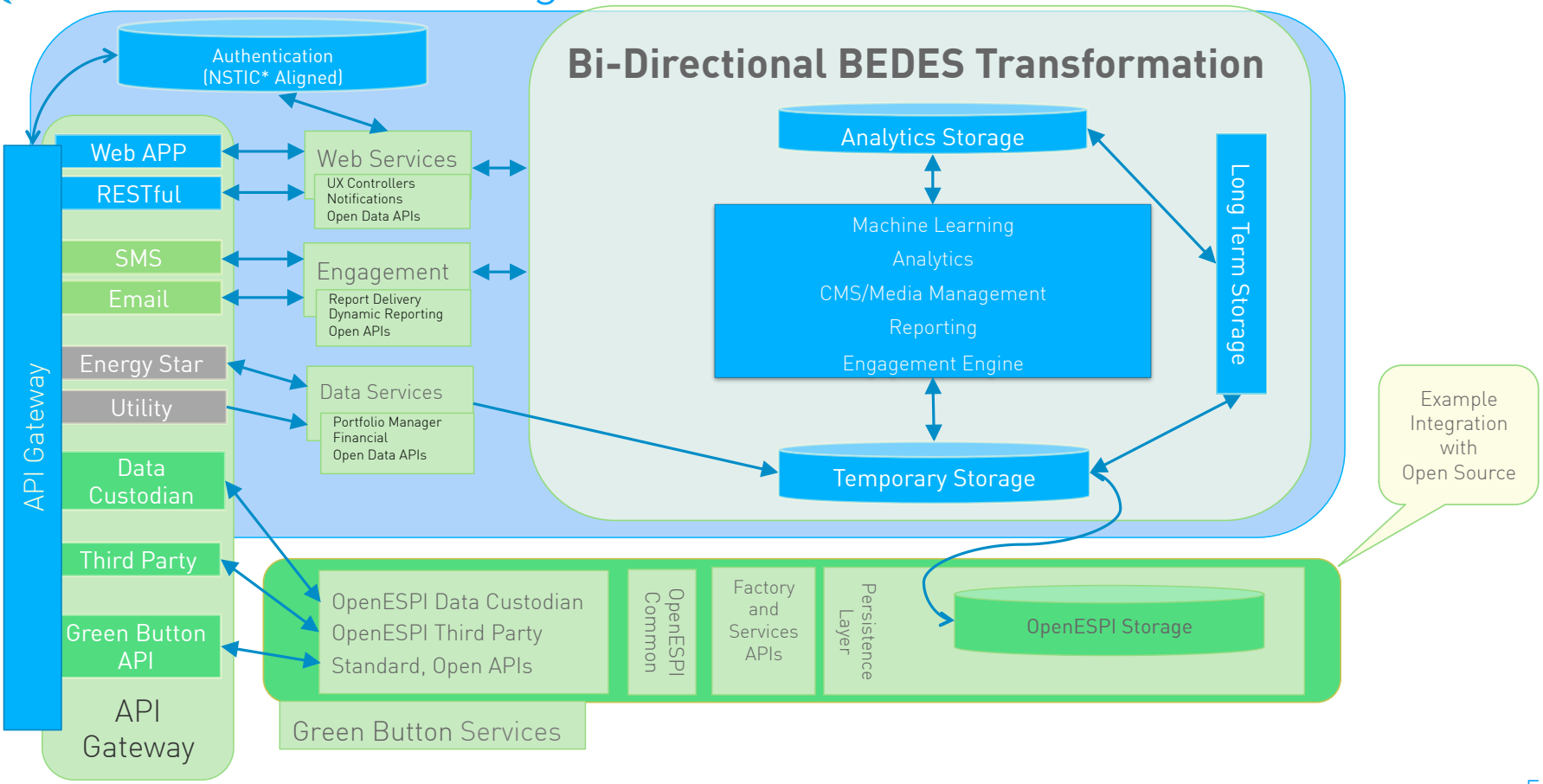




Total GHG Emissions:

1,956 METRIC TONS C02e

Maalka BEDES Integration



Maalka | Open Standards and Platforms

The Role of Standards

- Facilitate Business Expansion
- Accelerate Innovation
- Simplify Analysis, Compliance, and Operational Reporting
- Reduce Risk

THE SMART CITY STANDARD ISO 37120

FIBO Financial Industry Business Ontology

Green Button Connect My Data

ASHRAE

G R E S B

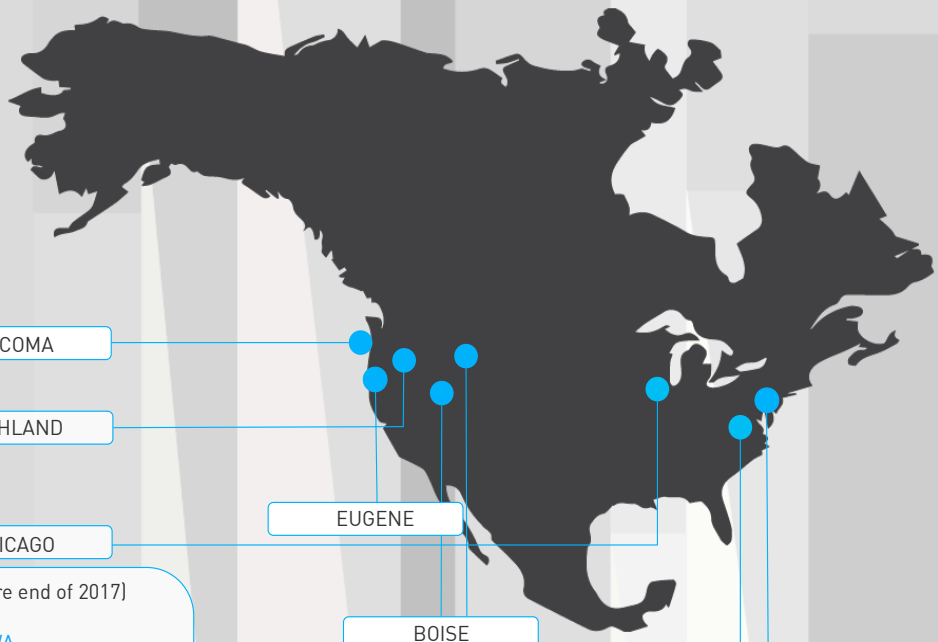
LEED CERTIFIED LEED SILVER LEED GOLD LEED PLATINUM

energy ENERGY STAR

Maalka | BRINGING BEDES TO MARKET

BEDES Transforms:
- NEEA Better Built Homes
- Retrofit Chicago
- CBR/FirstView
- EnergyPlus Studio
- Portfolio Manager
- Volttron/Transactive Energy

BEDES Futures:
- Management Tools
- Initiative Alignment
- Open Source
- Tools Integrations
- …



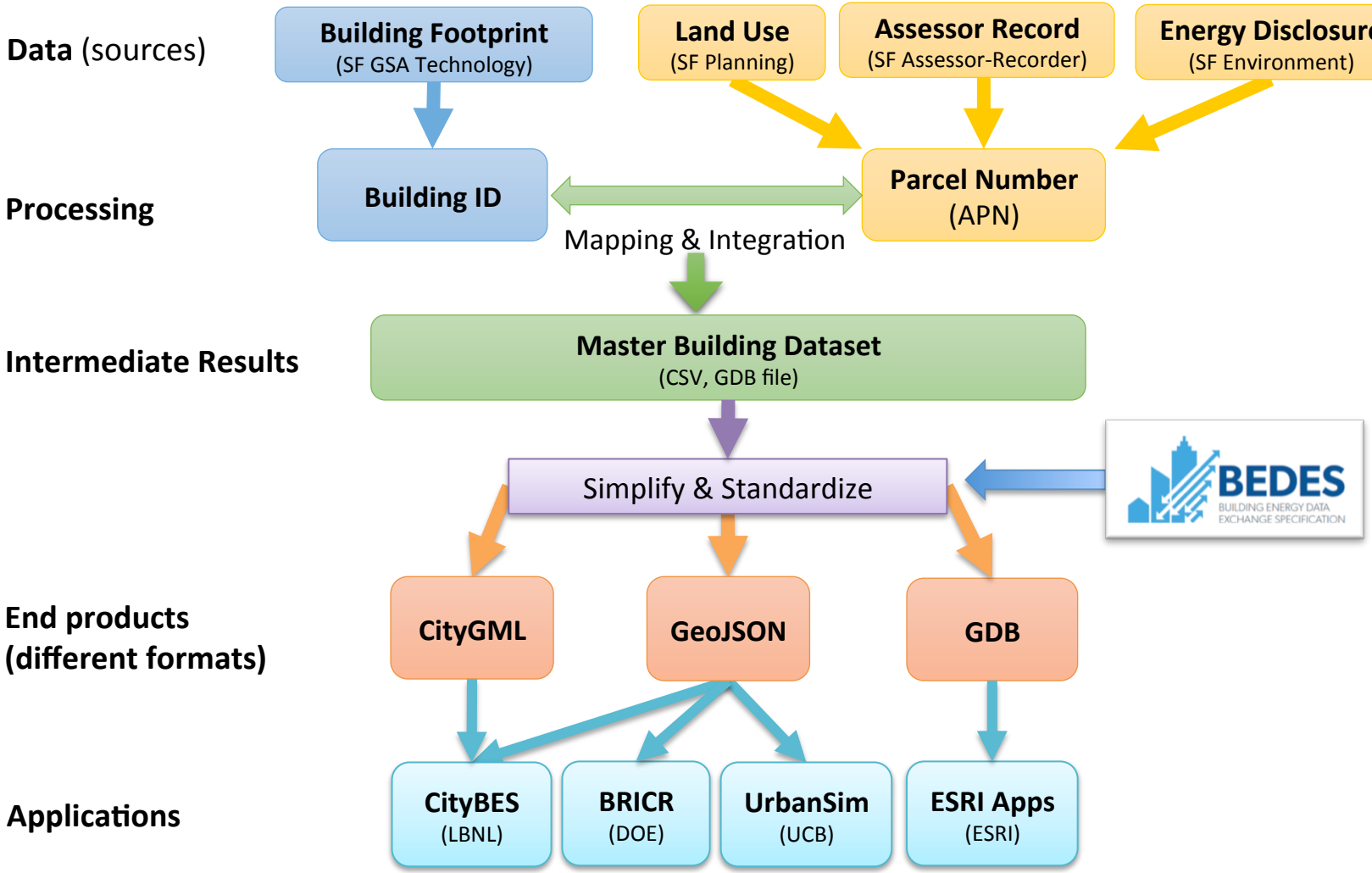
US Expansion (before end of 2017)
- New York City
- Pierce County, WA
- Richmond, CA
- NEEA / State of Washington

US Expansion (before end of 2017)
- Goldman Sachs

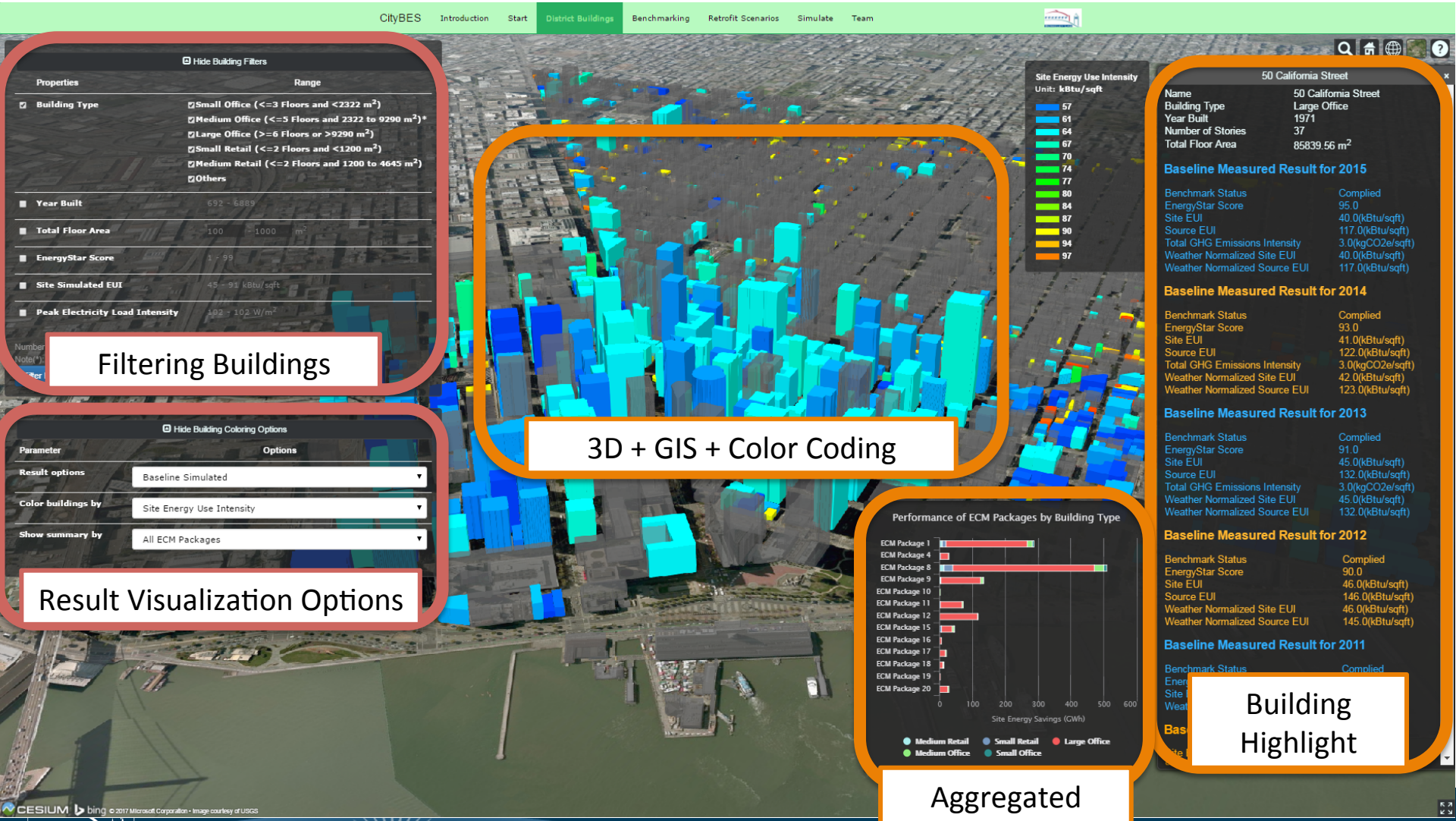
Global Expansion
- Cushman & Wakefield EU
- US DoC NTIS Joint Venture Partner

Commercial and Corporate Real Estate
- 200 Committed Major US Corporations
  e.g. Walgreens, CBRE, JLL

San Francisco Data Processing and Integration



San Francisco Urban Building Energy Models in CityBES



Opportunities for Adopters

Adopter Support

What DOE/LBNL Provides:

- Strategic planning for data standardization
- Mapping assistance
- Help developing data transformations for BEDES terms
  - Allows users to create BEDES-compliant files for their applications
- Training to maintain transformation

What Adopter Commits to:

- Documentation of their application terms and definitions
- Working with the BEDES team to create mappings and transformations
- Use of mapping and transformation for real business purpose
- Publicizing and promoting their BEDES collaboration

Contact: bedes-support@lbl.gov

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BUILDING ENERGY DATA EXCHANGE SPECIFICATION

Optimal Applications

- Require data exchange/integration across *multiple* applications
- Have not yet "baked in" data exchange terms

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

Get Involved!

- Develop BEDES-Compliant applications – we can help!
- Become an Endorser
- Tell us how you're using BEDES
- Develop terms & definitions for new areas
- Spread the word!

bedes@ee.doe.gov (general inquiries)
bedes-support@lbl.gov (tech support)
buildings.energy.gov/bedes

BEDES
BUILDING ENERGY DATA EXCHANGE SPECIFICATION

Questions?

Please use the chat feature for questions and suggestions