

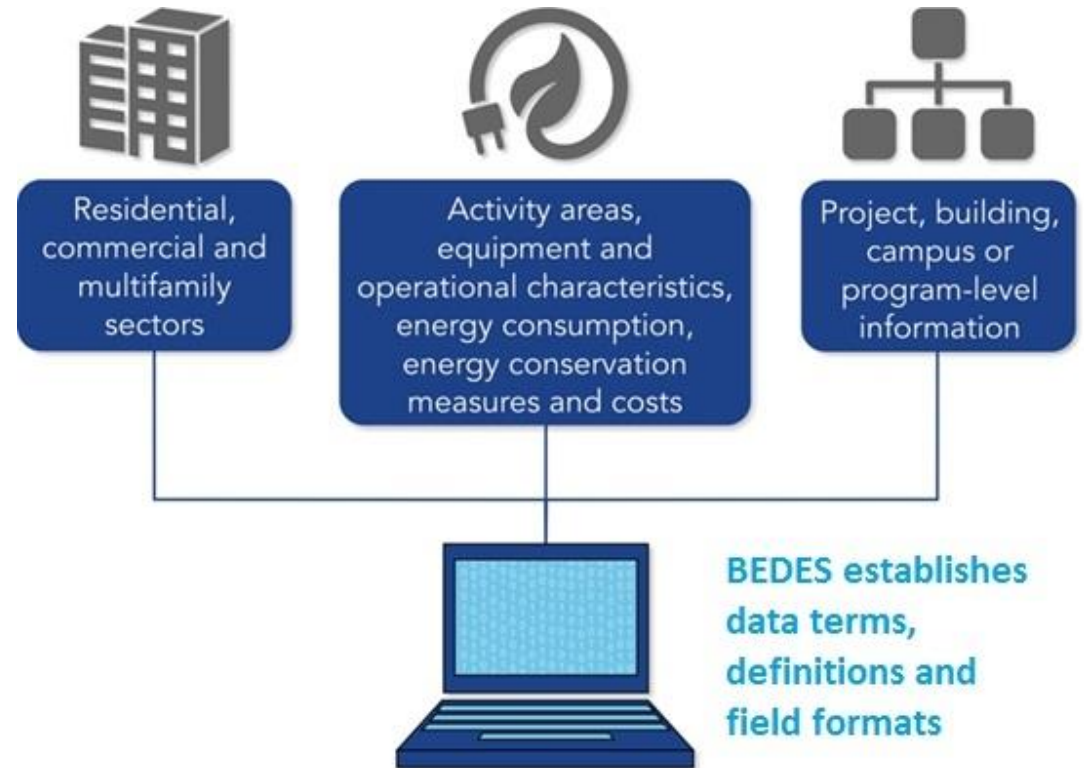


# Building Energy Data Exchange Specification BEDES - An Overview

Robert J. Hitchcock, PhD  
Hitchcock Consulting  
Lawrence Berkeley National Laboratory

# What Is BEDES?

- BEDES is a Data Dictionary
  - Designed to facilitate the use and sharing of empirical **building characteristics** and **energy performance data** among software tools, and data collection and analysis activities, more easily, consistently, and at lower cost
  - Information used to:
    - track building performance
    - implement energy efficient policies and programs
    - make energy-related investment decisions
  - Provides a common set of
    - Data Terms
    - Term Definitions
    - Data Types
    - Units of Measure
- BEDES is NOT
  - Schema
  - Database



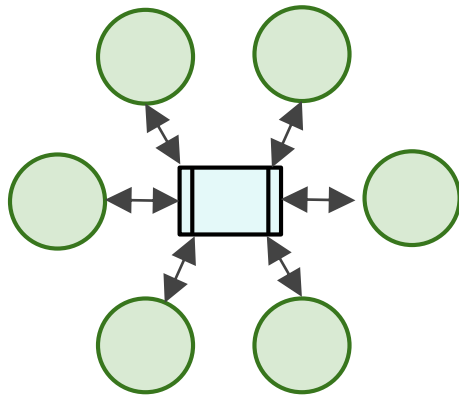


# Motivation For BEDES

- Problem
  - Ambiguity of data definitions
    - What do you mean by “floor area”?
    - What fields uniquely designate your facility?
  - High transaction costs for sharing and aggregating data
- Solution
  - Provide common terms and definitions for data
  - Map diverse data sets to common terms
  - Facilitate exchange, comparison and aggregation of data
  - Incrementally move industry toward information exchange standardization

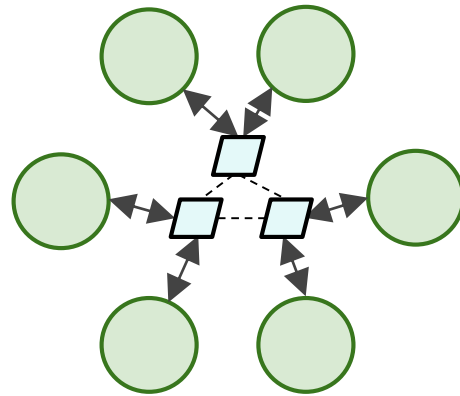
# Think Big, Start Small, Act Now

Perfect world...



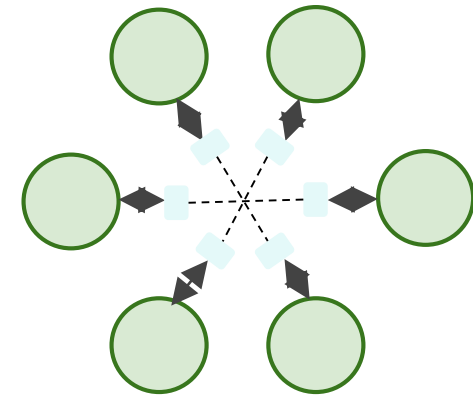
*A single universal exchange schema*

Almost perfect world...



*A set of standard exchange schemas for different use cases*

Somewhat less perfect world....



*Standard terms and definitions*

utopia



reality



# History Of BEDES

- Originally developed to improve interoperability of US DOE's software tools and data collection efforts
  - BEDES v0.9 was an XML Schema (XSD)
- DOE scoping study confirmed that BEDES would be useful to stakeholders outside DOE
  - Stakeholders indicated yet another schema was not desirable
- Lawrence Berkeley National Lab led a technical working group process to develop BEDES Data Dictionary
- BEDES v1.0 released October 2014, BEDES v1.1 released April 2015
- BEDES v1.2 to be released October 2015

# BEDES Dictionary: Spreadsheet, PDF, & [bedes.lbl.gov](https://bedes.lbl.gov)



SEARCH



HOME BEDES ONLINE RESOURCES COLLABORATION EVENTS ABOUT CONTACT US

Search

## BEDES Online Dictionary

### Filter Options

#### Category

Select All

- Contact
- Controls and Operations
- Emissions
- Envelope
- Generation and Storage Equipment
- Global Terms
- HVAC
- Loads
- Measures
- Metadata
- Premises

To use this BEDES online dictionary, you can search for a particular term in the Search box, and you can also filter by selecting from the Category, Application and Sector filter options on the left. The Category filter option allows you to filter by major term category, such as HVAC or Envelope. The Applications filter option allows you to filter BEDES terms that are relevant to that application. (Note that these are not necessarily the native terms used by the application.) The Sector filter allows you to filter by either Residential, Commercial or Multi-family.

### Envelope

Term	Term Definition	Lists	Unit of Measure
<a href="#">Air Infiltration Blower Door Test</a>	Type of blower door test	<a href="#">View</a>	N/A
<a href="#">Air Infiltration Description</a>	Description of the infiltration characteristics for an opaque surface, fenestration unit, a thermal zone.	<a href="#">View</a>	N/A
<a href="#">Air Infiltration Test</a>	Type of air infiltration test performed on the premises	<a href="#">View</a>	N/A
<a href="#">Air Infiltration Value</a>	The measured value from the Air Infiltration test.		N/A
<a href="#">Air Infiltration Value Units</a>	The units of measure for the Air Infiltration Value field.	<a href="#">View</a>	N/A



# Current Work On BEDES

- Encourage adoption of BEDES terminology
  - Support 8-10 key early adopters by helping them document BEDES mappings
  - Provide technical support to more adopters as budget allows
  - Publish BEDES mapping documents
- Evolve BEDES
  - Publish major updates to BEDES with the support of BEDES WG
  - Ongoing refinement from mapping experience
  - Ongoing error correction

# Current Use Of BEDES – Data Mappings

- BEDES Mappings document relationship between an implementation's field names and BEDES Terms
  - Multiple BEDES Terms may be required for an implementation field mapping

Implementation Table Name	Implementation Field	Implementation Value	Implementation Units	BEDES Term	BEDES Mapping	BEDES Unit	Unit Conversion
Building Info	Gross Floor Area (ft2)	[value]	ft2	Gross Floor Area	Floor Area Qualifier = "Gross" Area = [value]	ft2	=[value]
	Building Type	Hopital	n/a	Occupancy Classification	Occupancy Classification = "Inpatient hospital"		
		Office			Occupancy Classification = "Office"		
		School			Occupancy Classification = "Education"		
		Supermarket			Occupancy Classification = "Grocery store"		
		Restaurant			Occupancy Classification = "Food Service"		
	Number of Employees	[value]	people	Occupant Quantity	Occupant Quantity Type = "Workers on main shift" Quantity = [value]	people	=[value]
Number of Floors Above Grade	[value]	floors	Above Grade Floors Quantity	Location = "Above grade" Spatial Unit Type = "Floors" Quantity = [value]	floors	=[value]	
Owner	[value]	n/a	Owner Full Name	Contact Label = "Owner" Full Name = [value]	n/a		
Energy Use	Site EUI (MJ/ft2)	[value]	MJ/ft2	Annual Site Energy Resource Intensity	Interval Frequency = "Annual"		
					Resource Boundary = "Site"		
					Resource = "Energy" Resource Intensity = [value]	kBtu/ft2	=[value]*0.94781712
	Annual Electricity (renewable)	[value]	kWh	Annual Renewable Electricity Value	Interval Frequency = "Annual" Resource Generation = "Renewable" Resource = "Electricity" Resource Value = [value]	kWh	=[value]





# Current Use Of BEDES Early Adopter Mappings

- BuildingSync – building audit schema
- EcoPros – building audit data
- EnergySavvy – utility data
- ENERGY STAR Portfolio Manager – energy benchmarking
- eProjectBuilder – Energy Services Companies (ESCO) data
- First Service Residential – property management data
- Global Real Estate Sustainability Benchmark (GRESB) – real estate sustainability performance
- Home Performance XML (HPXML)
- RESO – Real Estate Standards Organization

# Get Involved

- Develop **BEDES** mappings

- We can help

- Become an **Endorser**

- [bedes.lbl.gov/endorsers](https://bedes.lbl.gov/endorsers)



- Share your thoughts on the **BEDES Forum**

- [bedes.lbl.gov/forum](https://bedes.lbl.gov/forum)

- Join the **BEDES Working Group**

- [bedes.lbl.gov/working-group](https://bedes.lbl.gov/working-group)

- Spread the word!