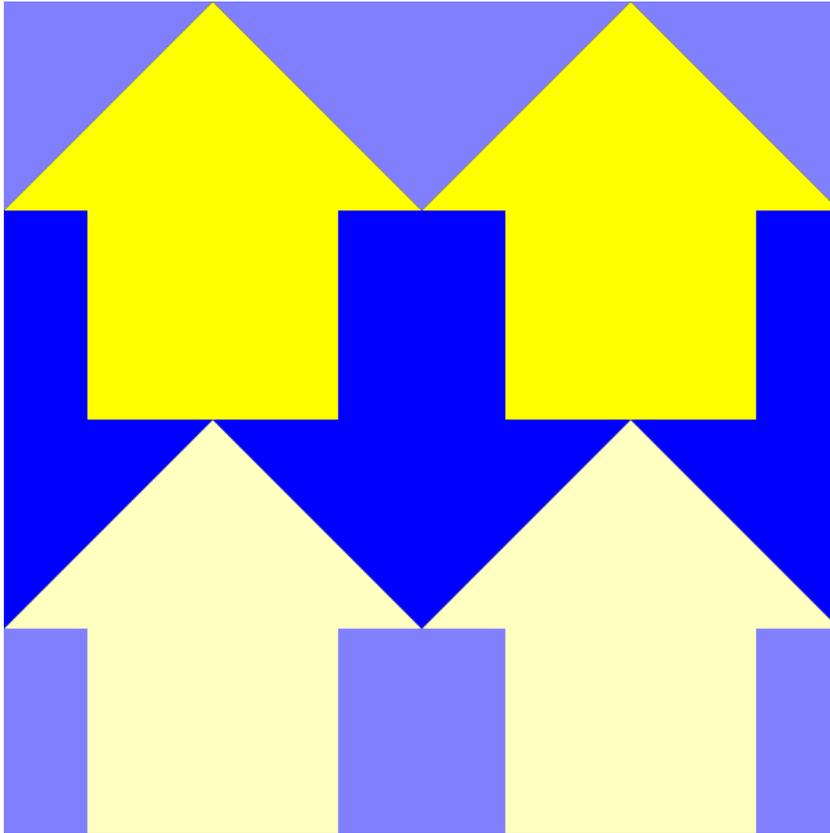


# Building Energy Data Exchange Specification (BEDES)

## Implementation Strategy (version 7) *Executive Summary*



Rick Diamond, Shankar Earni, Rob Hitchcock, Lindsay Holiday, John Mejia, Andrea Mercado, and Robin Mitchell, *Lawrence Berkeley National Laboratory*

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## Executive Summary

The *Building Energy Data Exchange Specification* (BEDES) was developed to facilitate the exchange of information on building characteristics and energy use in an inexpensive and unambiguous manner. The *BEDES Dictionary 1.0* was developed by DOE to support the analysis of the performance of buildings by providing a common set of terms and definitions for building characteristics, efficiency measures, and energy use. This *Implementation Plan* is a guide to how the *BEDES Dictionary* can be brought to market and provide the services for which it was designed. In addition to the *BEDES Dictionary* we envision the creation of “BEDES Compliant Exchange Formats,” which will be schemas and standardized import/export file formats developed from BEDES terms for various key use cases.

The “*BEDES Scoping Study*” (2013) and the stakeholder input from the *BEDES Strategic Working Group* identified seven issues for BEDES implementation. These issues include:

1. Goal for BEDES implementation
2. BEDES name and branding
3. Providing maintenance and user support, including exchange formats
4. Updating, designing future revisions and new functionality
5. Determining the best strategy for the organizational host
6. Promotion and market engagement
7. Adoption as a technical standard

## BEDES Components

BEDES is composed of several different components

- **BEDES Dictionary:** This is a dictionary of terms and definitions used to characterize a building
- **BEDES Exchange Schema:** While BEDES is a comprehensive dictionary, many stakeholders may want to use the same subset of data for specific use cases, such as transferring commercial building energy audit data. There will be a set of BEDES compliant/compatible implementation “exchange formats” whose schemas are documented and which have standardized input and output file formats, which can be used by anyone (software developers, public entities such as cities or states) needing to characterize buildings within that use case.
- **BEDES Community:** The group of stakeholders, which can be quite varied and include software developers, government entities (such as cities and states), energy consultants, energy providers (such as utilities). A strong BEDES community will be crucial to the success of BEDES for standardizing data exchange, both from a technical and implementation standpoint.

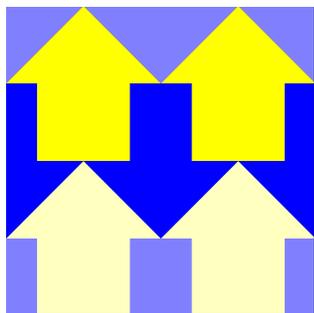
In addition to BEDES, the SEED (Standard Energy Efficiency Data) platform is one of the key elements to the successful implementation of BEDES. SEED is a database and accompanying user interface that DOE developed to help entities, such as cities and states, manage the energy performance data on large groups of buildings. The SEED interface helps users translate their data into the BEDES format, and then manage the data and share it with others. As the community of SEED users grows, they will be standardizing their data in BEDES compliant formats. In parallel, as various programs adopt BEDES compliant data practices, it will be easier to import into SEED. In addition, SEED will export data in standardized BEDES exchange formats, which will again strengthen the use of BEDES as a standard method of exchanging data. In the discussion below about SEED will be used as the data management platform for many of the pilot programs for BEDES, which will, by definition, be BEDES compliant.

## Recommendations

Below are our seven key recommendations for implementing BEDES:

1. **Lead by Example.** DOE's *Building Technology Office* is committed to using BEDES compliant tools wherever possible in its portfolio. The data tools developed by the Building Technology Office should be the first targets for BEDES deployment. Other DOE Offices, e.g., the Federal Energy Management Program (FEMP), have developed tools such as eProject Builder, which will be BEDES compatible. In addition, some programs such as the Weatherization and Intergovernmental Programs Office's (WIPO's) State Energy Program, or the Better Buildings Challenge, could use SEED directly to manage program data. BEDES is also designed to be compatible with tools across the federal sector, e.g., EnergyStar's Portfolio Manager. By using BEDES-compatible tools, DOE can lead by example in introducing BEDES to wider markets both in the public and private sector.
  - a. BEDES is already compatible or will be, with the following BTO tools: Building Performance Data Base (BPD), the Standard Energy Efficiency Data (SEED) Platform, Home Energy Score (HES), Audit Use Case (AUC), & the Commercial Asset Score Tool (CAST)
  - b. BEDES is also aligned with other federal tools such as EnergyStar Portfolio Manager and eProject Builder.
  - c. In the upcoming year, official mappings and import/export file formats will need to be published for all these tools.
  - d. Other federal tools that have overlapping use cases with BEDES can be mapped/aligned in the coming year, including COMcheck and REScheck, as well as others, which can be identified in early FY15. The BEDES team will develop materials to help engage Federal programs and inform them about the process and benefits of aligning with BEDES.

2. **Naming and Branding.** Our recommendation is that the name “BEDES” be kept for the overall activity, i.e., data exchange, and that individual components be referred to with “BEDES” as a descriptor.
- a. Examples include:
    - The *BEDES Dictionary 1.0*
    - The *BEDES Use Case Schemas*
    - The *BEDES User Forum*
  - b. BEDES branding should include the BEDES logo--one idea is proposed here:



- c. BEDES branding should include a tagline, e.g., “*BEDES—For faster, easier, and universal building energy data exchange*”
  - d. BEDES compliance allows use of the BEDES brand—see below (Section 3c) for compliance issues
3. **Pilot and Evaluate.** Several public and private entities have expressed an interest in being an early adopter of BEDES and potentially also using the SEED platform. These groups can serve as pilots that should be both supported and evaluated for making improvements to future updates to BEDES. The pilots can be used to determine if BEDES contains all the necessary terms and definitions to support the pilot implementation needs. The result will be a list of terms that need to be added to BEDES, which can then be incorporated into the SEED platform. The pilots will also be used to identify and develop necessary supporting documentation and guides so that users can successfully implement BEDES and communicate their schemas and exchange protocols to others. The long-term goal, and measure of the success of BEDES, is that the BEDES Dictionary, Use Case Schemas, and standardized import and export file formats meet the needs of and are widely implemented by the primary building energy performance evaluators. Current plans for launching pilots in FY 2015 include:
- a. **CEC & Schools.** Initial planning has started with the State of California Energy Commission for a pilot working with school data under AB 39. Specifying SEED/BEDES, for the reporting of energy data will facilitate the analysis and evaluation of the school energy retrofit projects.
  - b. **Other California pilots.** Both the City and County of Los Angeles are interested in specifying SEED/BEDES for energy disclosure,

benchmarking, and other applications such as building permitting. The County of Los Angeles is ready to evaluate SEED/BEDES for their immediate needs. This pilot could be used as the basis to develop audit data reporting formats for all of the cities with audit requirements.

- c. **Other early adopters**, The Vermont Energy Investment Corporation (VEIC), the U.S. Green Building Council (USGBC), the City of Berkeley, and others have expressed interest in piloting SEED/BEDES for their programs. These entities should be supported as resources allow.
- d. **Private Sector. Audit tools, Sparkfund, etc.**
- e. Others as proposed by the SWG and TWG

4. **Provide User Support.** The long-term vision is for a BEDES foundation that reviews, supports and promotes BEDES use. In the short term, there is a need for the BEDES implementation team to provide user support. Part of this effort will be to facilitate how the stakeholders show compliance with BEDES through the development of the mappings and export file formats that determine compliance. The current group of stakeholders will be recruited to participate in this effort, as discussed in 4b above. Methods for engaging users will potentially involve conference calls as well as continuing the use of the current DOE-supported BEDES user forum as venues for open discussion on user needs and recommendations. Other methods can also be employed, such as direct support, peer-to-peer, etc.

- a. Methods of user support should include:
  - i. Postings to the User Forum
  - ii. Direct support from BEDES Implementation team as well as the BEDES Community
  - iii. Peer-to-peer support
  - iv. Other:
- b. Other examples of needed user support include facilitating BEDES compliance, with the help of the BEDES Community, for stakeholders with an interest in non-federal implementations, e.g., HPXML, USGBC/LEED, Green Button, RESO, and the California Standards Data Dictionary (SDD). Verification of BEDES compliance is through a designated user group for that use case. (See Table 1 for the overall compliance process.) The third party, with help from BEDES Community Members will develop mappings to be reviewed by LBNL. In the long term, the BEDES/SEED non-profit will take over the task of reviewing mappings.

**Table 1. BEDES Compliance**

Criteria	Certified Mapping	Compliant Exchange Format
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<b>Application</b>	Any Implementation <sup>1</sup>	Software file formats
<b>Map to BEDES terms<sup>2</sup></b>	Yes	Yes
<b>BEDES Community/Host approves mapping</b>	Yes	Yes, unless developed using BEDES exclusively
<b>BEDES Community/Host approves file format<sup>3</sup></b>	No	Yes
<b>Public publishing</b>	Optional	Optional
<b>Use “BEDES” in it’s product marketing</b>	Optional	Optional
<b>Examples</b>	Mapping of: CEUS, CBECS, Portfolio Manager	<i>BEDES for Commercial Audits, BEDES for Residential Audits, BEDES for Energy Data</i>

<sup>1</sup> Implementation refers to any software application, database, survey, schema, etc.

<sup>2</sup> Not all BEDES terms have to be used, only those that apply. Additional fields that are out of BEDES scope are allowed.

<sup>3</sup> The exchange format does not apply to the database or internal schema, only to files meant to exchange data in or out of the software. May also include a schema, validation rules, etc.

5. **Provide Maintenance and Updates.** The long-term vision is for a BEDES foundation that reviews, supports and promotes BEDES use. In the short term, there is a need for the BEDES implementation team to provide updates, and maintenance.

a. Updates to the BEDES Dictionary and potentially use-case schemas and import/export file formats are currently envisioned on a twice a year schedule, to be evaluated as needed. Proposed updates are for March 2015 and September 2015. This schedule may be driven in part by results from the Pilot projects discussed in Section 3.

6. **Transition to a Non-Profit Foundation.** BEDES is currently supported by DOE and managed by Lawrence Berkeley National Laboratory (LBNL). The recommendation is that both BEDES and SEED move toward a self-supporting model, managed by a non-profit organization, which will determine the funding strategy (which can include, but is not limited to membership dues, fees for certifying mappings and compliance, paid technical support, etc). Examples of such models include the National Fenestration Rating Council, Green Button, and the Quali Foundation, where groups combine their resources for mutual benefit. During this expected 2-3 year transition, BEDES should continue to be supported by DOE and managed by the BEDES Implementation team. While DOE support and involvement may continue for a longer period, diverse funding sources are needed to achieve the full scale of the BEDES vision and ensure long-term financial viability. The BEDES Implementation team should actively

recruit, support and foster the BEDES Community, which will form the underpinnings of the BEDES effort in both the short and the long term.

- a. The current plan is to convene, in early FY 2015, a combined BEDES and SEED stakeholder group, which will work to form the proposed SEED non-profit foundation. The BEDES component of this group will identify the mission, objectives, and activities that are aligned with SEED but unique to BEDES.
  - b. Following the identification of the purpose for the SEED/BEDES Foundation, the group will draft the charter and bylaws, and identify and recruit prospective board members.
  - c. The group will also develop the financial model for supporting the foundation.
7. **Support BEDES becoming an industry standard.** The goal for BEDES is to become the *de facto* industry standard for building energy data exchange. The BEDES Strategic Working Group explored the issue of whether to pursue the adoption of BEDES as an *actual* industry standard, e.g., ASHRAE, ANSI-ASTM, or ISO, and determined that it should be postponed to a later time and that the short-term effort should be made to have it used widely and changed organically before being codified as a formal industry standard.

## Next Steps for BEDES Implementation in FY 2015

The following are the five tasks currently included in the BEDES implementation task for LBNL in FY 2015. They do not include all the recommended tasks presented above, and are included to serve as a guide to the initial work that will be done to advance BEDES implementation.

**BEDES Task 1. Develop BEDES website.** The BEDES implementation team will develop a basic website to host BEDES 1.0, including a searchable version of the BEDES dictionary so that users can find fields related to specific topics or used in specific schemas. The website will include links to interactive BEDES forum for topics. The website will also link to schemas that are BEDES compliant. The target date for the website is 3/31/2015.

**BEDES Task 2. Support Partner Implementations.** The BEDES implementation team will identify candidate partners with schemas and other implementations such as reporting requirements for inventive efficiency programs and building performance disclosure requirements. The team will assist in ensuring that partner implementations are BEDES compliant.

**BEDES Task 3. Support Initial Adopters (Pilots).** The BEDES implementation team will identify 1-2 initial users, e.g., the State of California, and provide

implementation support for their effort. Additional pilots will be included if co-funding or other sources are identified.

**BEDES Task 4. Provide Biannual Updates of the BEDES Dictionary 1.0.** To keep BEDES Dictionary 1.0 up-to-date with user needs, the BEDES implementation team will develop a schedule and process—using the stakeholder forum and in-person calls—for additions and updates to the BEDES terms and definitions. The target date for the updates is March 31, 2015 and September 30, 2015

**BEDES Task 5. Initiate Transition Strategy for Managing BEDES.** The BEDES implementation team will develop a schedule and process—using the stakeholder forum and in-person calls—to establish a non-profit “host” to support SEED and BEDES. The expectation is that this will be a 2-3 year process.

### **Stakeholders as Champions.**

In addition to the tasks identified for the BEDES Implementation Team, there are several tasks that could best be conducted by the stakeholder community. Stakeholders in the field of building energy performance evaluation are critical to the success of widespread adoption of BEDES. The BEDES Dictionary was developed with major input from a dedicated team of stakeholders, including representatives from state and local government, software developers, utilities, program implementers, and others. These individuals can form the basis of the BEDES Community and are natural champions for bringing BEDES to widespread use. They should be supported and encouraged wherever possible in their efforts to pilot and use BEDES for their work. In addition, they will be encouraged to form the core of the BEDES implementation team.

- a. [Note: Stakeholders will be invited at the 9/9/14 SWG meeting to share their current activities that could either directly or indirectly support BEDES implementation, and give their thoughts on future activities to support BEDES implementation.]
- b. As the implementers of BEDES, the stakeholders are the key players, and are the drivers of BEDES development over time.

**Short Term:** Stakeholders will be recruited to form Use Case sub-groups to develop the compliance documentation and verification methodologies for each use case. There may also be specific programs and products that wish to develop individual schemas.

**Long Term:** Stakeholders will be invited to participate in the implementation working group for the proposed “SEED/BEDES Foundation” that will manage SEED and BEDES in the long term (see Recommendation #6 below). As “charter members” of the foundation, these stakeholders should be offered membership benefits, e.g., reduced annual dues.