



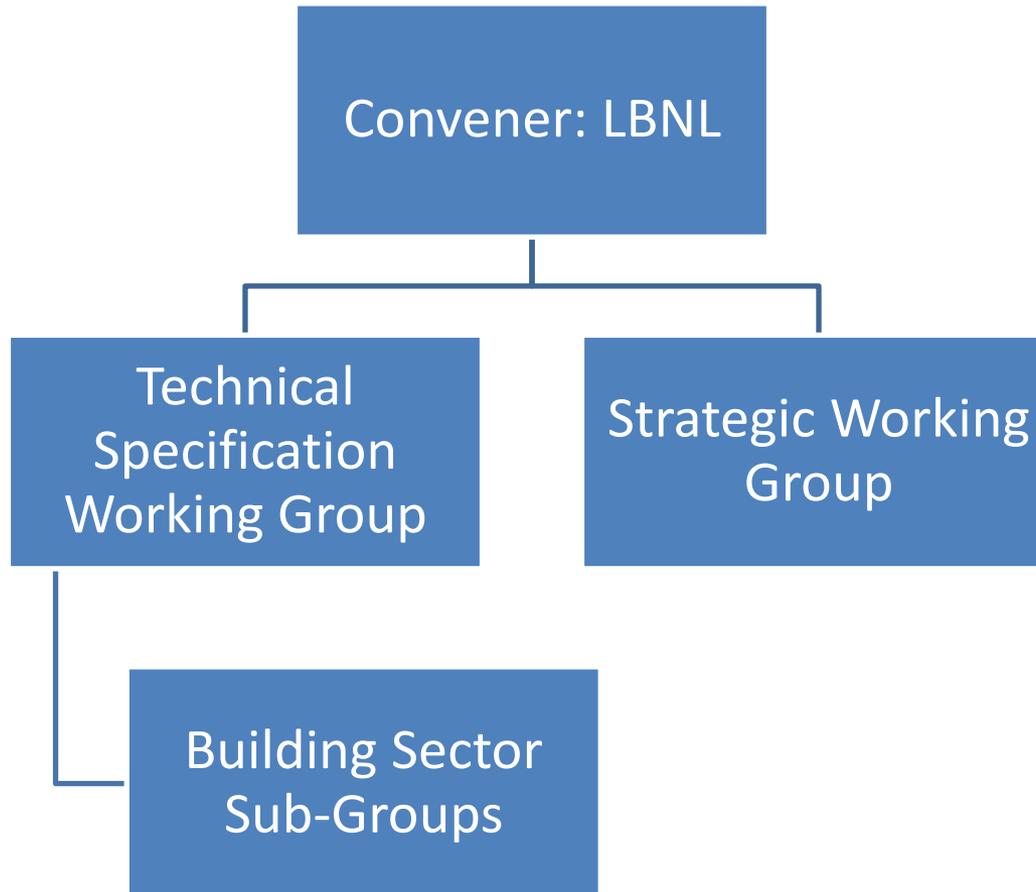
Environmental Energy Technologies Division Lawrence Berkeley National Laboratory

BEDES Technical Working Group: Working Group Process

Dr. Jonathan Raab, Raab Associates, Ltd.
December 12, 2013
Washington, D.C.

- LBNL has been tasked by U.S. DOE to develop BEDES, and to consult with stakeholders along the way
- Purpose of the stakeholder process is to provide both strategic and technical advice to LBNL
- Stakeholder process serves in advisory, sounding board capacity to LBNL (seeking consensus or convergence among stakeholders as much as possible)
- LBNL is responsible for making final BEDES-related recommendations to DOE

1. Owners	Building Owners & Managers
2. Implementers	Energy Auditors, A/E & Project Contractors
3. Administrators	Utility & State Efficiency Programs
4. Public Entities	Federal, State and Local Agencies
5. Financiers	Lenders & Investors
6. Researchers	Evaluators and Academics
7. Developers/Standardizers	Software Developers & Standards Entities

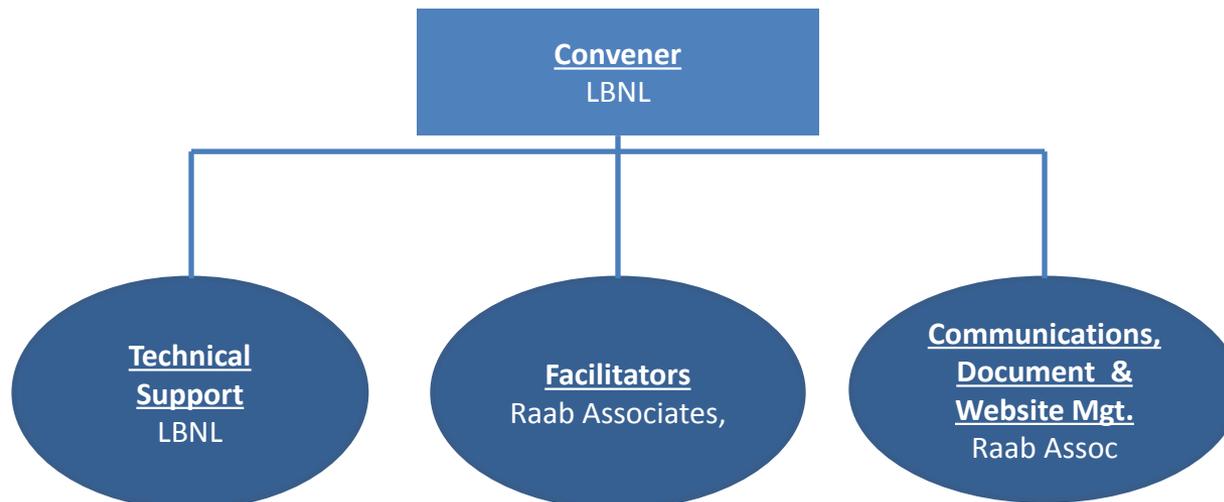


LBNL

- Convener (organizer of the stakeholder process and responsible for the final report on BEDES)
- Technical Support

Raab Associates, Ltd.

- Facilitator for Strategic and Technical Working Groups, and Sector Sub-Groups
- Communications, website, and documents management



- **Purpose:** Provide input on the detailed BEDES specification, covering:
- **Tasks:**
 - **Module I: Facility Level Data** (Building Staff & Tenants; Building Characteristics and Uses; and Whole Building & Tenant Energy Consumption), and
 - **Module II: Equipment Level Data** (Contractor Information; Project Structure & Financials; Equipment and ECM Characteristics; and Equipment and ECM-Level Energy Consumption)
- **Meetings:** The TWG will meet for four in-person meetings and up to three web-enabled conference calls, as needed.
- **Sub-Group Oversight/Integration:** The TWG will also direct the work of two sub-groups reporting back to them—one focused on residential buildings and the other focusing on buildings. Certain aspects of multi-family buildings will likely be covered in the commercial sub-group and other aspects in the residential sub-group.

- **Purpose:** Review and provide detailed feedback on BEDES:
- **Approach:**
 - Two Modules: Facility & Equipment Level Data
 - Two Sub-Groups for each module with one focusing on residential issues and the other focusing on commercial issues—for four total sub-groups. Certain aspects of multi-family buildings will likely be covered in the commercial sub-group and other aspects in the residential sub-group.
 - Each Sub-Group is expected to meet three-to-four times for each module via web-enabled conference calls
 - The Sub-Groups will report back to TWG

LBNL/BEDES Working Group Process Schedule

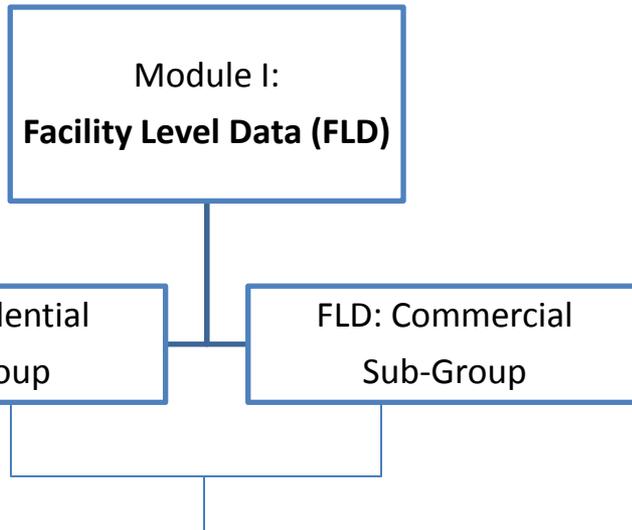
	Summer / Fall 2013	Dec	Jan 2014	Feb	Mar	Apr	May	June	Summer 2014
Finalize Stakeholder Design, Recruit Stakeholders									
Kick-Off Summit	→	●							
Strategic Working Group (SWG)		1		2		3		4	
Technical Working Group (TWG)		1	2	3	4	5	6	7	
Residential & Commercial Sector Sub-Groups (of the TWG)		Module I: Building-level data			Module II: Equipment-level data				
Final Summit (TBD)									

Detailed TWG Workplan--Dates

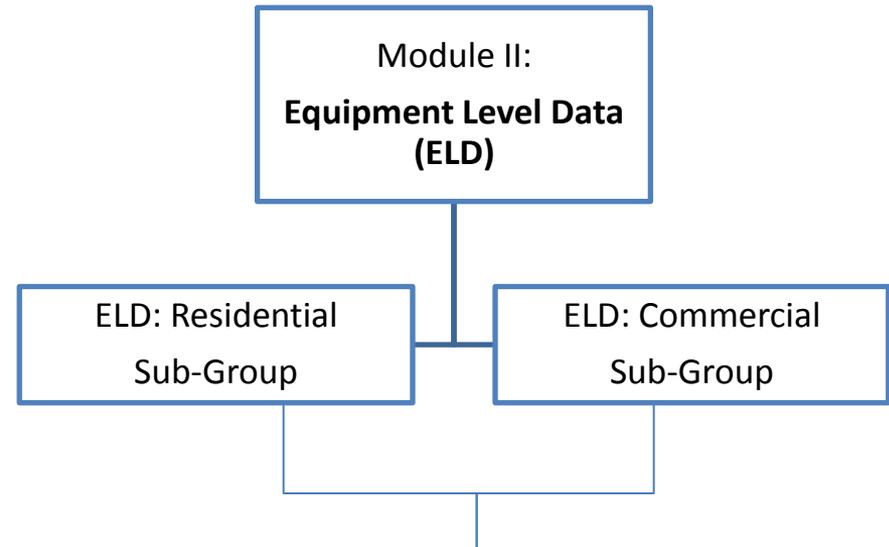
Meeting #	Date	Location	Time
1	December 12	Washington, D.C.	1:30-5:00
2	January 22	NYC plus Phone/Web	1:30-4:30
3	Feb 25	LBL, Berkeley, CA	9:00-4:00
4	March 25	Phone/Web	1:30-4:30
5	April 23	Washington, D.C.	9:00-4:00
6	May 20	Phone/Web	1:30 -4:30
7	June 17	LBL, Berkeley, CA	9:00- 4:00

1. Review use case specifications
 2. Develop guidelines/criteria for inclusion/exclusion of fields
 3. Develop guidelines for enumerated lists (e.g. HVAC types) - hierarchical structure, multiple classification schemes, etc.
 4. Develop grouping structure for all fields
 5. Develop prioritization guidelines for fields
 6. Determine sub group work plan Integrate and reconcile work across sub groups and resolve issues that may arise
 7. Review, refine and finalize recommendations received from sub groups provide feedback/direction to SWG
 8. Other (TBD)
- **SEE hand-out for detailed workplan**

January-February



March-June



BEDES sections:

- Building Staff & Tenants
- Building Characteristics and Uses
- Whole Building & Tenant Energy Consumption

BEDES sections:

- Contractor Info, Project Structure & Financials
- Equipment and ECM Characteristics
- Equipment and ECM-Level Energy Consumption

Sub-Group Module 1 Meetings Facility Level Data

Topics	Commercial Sub-Group	Residential Sub-Group
Site, Facility	January 7	January 9
Energy, Admin, & PII	January 28	January 27
Enumerations	February 11	February 13
<i>Note: All meetings via phone</i>	<i>1:00-3:30 EDT</i>	

Sub-Group Module 2 Meetings Equipment Level Data

Topics—Draft (subject to change)	Commercial Sub-Group	Residential Sub-Group
HVAC, Controls, Opps	March 11	March 13
Lighting & Envelope	April 7	April 9
Internal & Process Loads	May 6	NA
Plugs, DHW, & Appliance Loads	NA	May 8
Energy Generation, Storage & Other	June 3	June 5
<i>Note: All meetings via phone</i>	<i>1:00-3:30 EDT</i>	

- Participants will make every attempt to attend all applicable meetings, to be on-time, and to review all documents disseminated prior to the meeting
- If a participant (or his\her alternate) cannot attend a meeting, they should let the Facilitator know prior to the meeting (by telephone or e-mail)
- Participants are charged with participating in a constructive forum where diverse points of view are voiced and examined in a professional and balanced way. Personal attacks are not permitted
- Participants agree to act in good faith in the discussions. ‘Good faith’ means that they will be forthright and communicative about the interests and preferences of their organization and will actively seek agreement wherever possible—endeavoring to offer alternatives if they can’t support an option under discussion
- Let facilitator know if anything is not going well or can be improved (in confidence)

- Goal: Seek as much agreement as possible on both technical and strategic matters among participants
- Will strive for consensus where feasible within time constraints and given the range of opinion on a particular issue
- Consensus is defined as unanimity among participants at a given meeting (either in person or on the phone) whereby an option is considered acceptable (even if it may not be a participant's first choice)
- Where consensus is not reached, will note two or more options (in the meeting summary) and the level of support for each option
 - For those participating phone, will devise an efficient polling mechanism either in real-time thru ReadyTalk or other means, or post-meeting through survey monkey or other means

- The Commercial and Residential Sub-Groups for both Module 1 (Facility-Level Data) and Module 2 (Equipment-Level Data) will be providing feedback and recommendations through the TWG
- As such, any Sub-Group feedback and recommendations to LBNL will not be considered final until reviewed and supported by the TWG
- As a practical matter, TWG will likely simply support any consensus items from Sub-Groups and attempt to resolve any matters where Sub-Groups couldn't reach a consensus

- The Facilitator & LBNL Team will help design and manage productive and well-informed meetings. The Team will also be responsible for recording points of agreement and disagreement
- The Team will prepare draft agendas and meeting summaries in a timely fashion for distribution to the members
- The Facilitator will impartially, and in a non-partisan manner, (not favoring any participant over another), facilitate all meetings
- All documents will be posted on a web site maintained by the Facilitator for the duration of the process, and will provide email notice when new documents are posted on the website
- Facilitator will hold confidential conversations with working group members in confidence

- For face-to-face meetings, endeavor to participate in person (rather than on phone) if possible
- For phone/ReadyTalk (webinar) participation
 - Announce yourself during roll-call, and provide name when logging onto ReadyTalk (webinar)
 - Repeat your name before you speak each time
 - Be succinct in your comments
 - Mute your phone when not speaking
 - Participate in any preference polling in a timely manner
 - Encouraged to use Raise Hand or Chat for their questions or requests to speak



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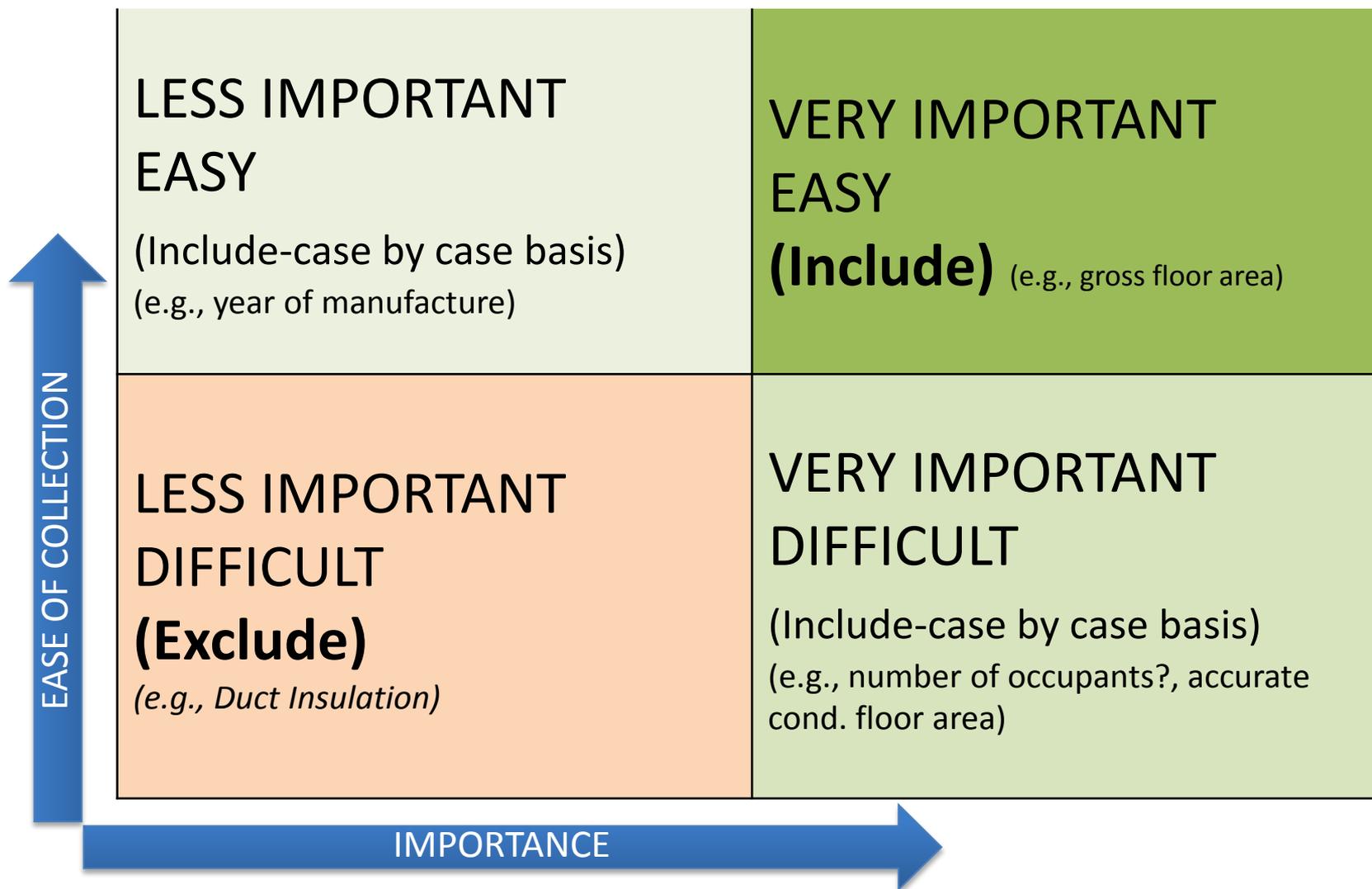
BEDES-Guidelines for Inclusion/Exclusion of Fields

- Helps to establish boundaries on key data fields to include, based on the use cases
- Helps to focus on key important fields that are not too difficult to collect

- Importance (use case dependent)
 - Financing terms important for financed projects
- Ease of collection
 - Hard to collect –
 - e.g., plug load intensity
- Accuracy?
- Independent vs. Derived
 - E.g., Site EUI can be derived given the site energy usage and conditioned floor area
 - Payback

Inclusion/Exclusion Guidelines

Two axes of general data considerations



- Should all of these factors be considered regarding inclusion in BEDES, and which are most important?
 - Importance
 - Ease of Collection
 - Accuracy
 - Independent vs. Derived
- What other important factors, if any, should be considered regarding inclusion in BEDES?



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BEDES-Guidelines for Data Field Types

- We need to format data fields
 - Examples: Categorical lists, absolute values, unit definitions, binary, etc.
- Free form text will be unwieldy to manage and analyze
- Helps to develop enumerations for key data fields that can be applicable for a range of configurations
- Helps to focus on key important enumerations that are common



Very generic enumerations- can be applicable to wide range of scenarios, small list, less meaningful analysis results

Highly detailed Enumerations spend lot of time to understand configurations, big list, better analysis results with enough data

Activity Area

Activity Type **A space or area within a building designated for a particular activity**

Vacant
Commercial - Uncategorized
Office - Uncategorized
Office - Administrative/professional
Office - Bank/other financial
Office - Government
Office - Medical non diagnostic
Office - Mixed use
Office - Other
Laboratory
Warehouse - Uncategorized
Warehouse - Refrigerated
Warehouse - Non-refrigerated
Warehouse - Distribution/Shipping center
Warehouse - Self-storage

Option 1 (Flat)

- Warehouse
 - Unrefrigerated
 - Refrigerated
 - Self Storage
 - Distribution/Shipping Center

Option 2

- Warehouse
 - Self Storage
 - Distribution/Shipping Center

Option 3

- Warehouse
 - Non-refrigerated
 - Refrigerated

Option 4

- Warehouse
 - Unrefrigerated
 - Self Storage
 - Distribution/Shipping Center
 - Refrigerated
 - Self Storage
 - Distribution/Shipping Center

Cooling Type **Type of cooling equipment. This generally refers to central cooling equipment. Zonal cooling is recorded in a separate data field. Use of fans or blowers by themselves without chilled air or water is not included in this definition of air conditioning.**

- Central Air Conditioning
- Split AC System
- Heat Pump - Uncategorized
- Heat Pump - Ground Source
- Heat Pump - Air Source
- Heat Pump - Water Loop
- Heat Pump - Geothermal
- District Chilled Water
- Chiller - Uncategorized
- Chiller - Absorption
- Chiller - High Pressure Absorption
- Chiller - Low Pressure Absorption
- Chiller - Turbine Driven
- Chiller - Engine Driven
- Chiller - Modular
- Evaporative Cooler
- Cooling Tower - Uncategorized
- Cooling Tower - Open
- Cooling Tower - Closed
- Condenser
- PTAC
- Packaged Direct Expansion
- No cooling
- Other / Combination
- Unknown

Option 1

- Cooling Type
 - ...
 - Chiller-Uncategorized
 - Chiller-Absorption
 - Chiller-HP Absorption
 - Chiller-LP Absorption
 - ..
 - Evaporative Cooler
 - Cooling Tower-
Uncategorized
 - Cooling Tower- Open
 - Cooling Tower- Closed
 - Condenser
 - Other

Option 2

- Cooling Type
 - ...
 - Chiller-Uncategorized
 - Cooling Tower- Uncategorized
 - Cooling Tower- Open
 - Cooling Tower- Closed
 - Condenser
 - Other
 - Chiller-Absorption
 - ...
 - ...
 - Chiller-HP Absorption
 - Chiller-LP Absorption
 - ..
 - Evaporative Cooler

- How do we accommodate multiple classification approaches?
 - Flat structure, with options for multi-select, where appropriate (Option 1)
 - Generalized categories, subset of multi-select (Option 2 and 3)
 - Hierarchical (Option 4)
- How do we accommodate multiple levels of aggregation?
- How do we choose which type of enumerations to use?
 - Qualitative/Quantitative
 - Tightness (Excellent...Very Poor)/cfm per sft

Please send all BEDES related communications to:
BEDES@RaabAssociates.org and it will be routed to the
appropriate party

If you are participating in a Working Group, please sign-up online
so that we might send relevant notices:

RaabAssociates.org/WebComponents/Forms/Form_BEDES.asp



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BEDES Technical Working Group: Next Steps

Detailed TWG Workplan--Dates

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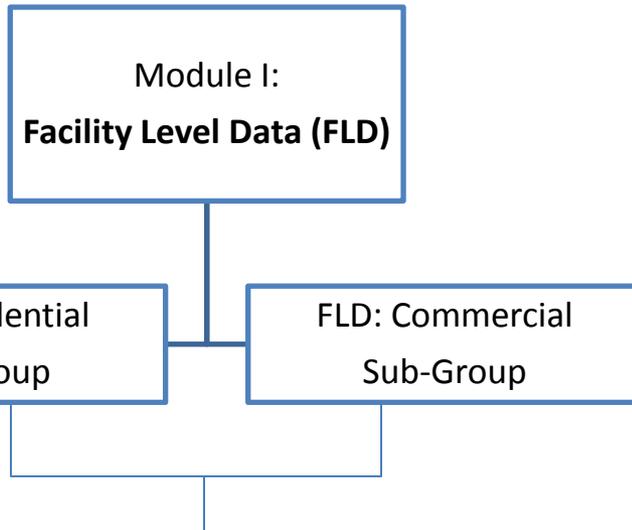
Task	January Meeting Activity
Develop high level categories for all fields	Review current version and revise structure for module 1.
Develop prioritization guidelines/criteria for inclusion/exclusion of fields	Review inclusions/exclusion examples and develop prioritization guidelines
Determine sub group work plan	Review and revise module 1 workplan as needed
Integrate and reconcile work across sub groups and resolve issues that may arise	Review and resolve items from sub groups
Provide feedback/direction to SWG	Implications of strategy for linking BEDES to key specs; & feedback to SWG on use cases

- Key Questions to think about before next meeting
 - Are the existing high level categories adequate?
 - Do we need more subcategories like already exists with Systems?
 - Do measures need to be more integrated with their corresponding systems?
 - Is the Time Series category extensible enough to accommodate energy readings and system control schedules?
- Preparation
 - LBNL: Will provide preliminary category options to TWG Members ahead of Meeting 2 (1/23/14)
 - TWG Members: Will review material and come prepared to discuss in Meeting 2

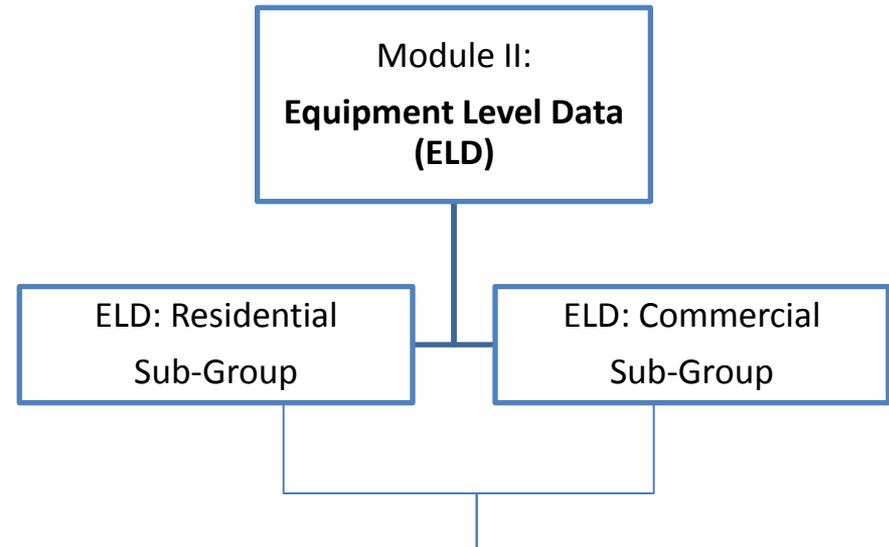
- Key Questions to think about before next meeting
 - Are all of these factors applicable regarding inclusion?
 - Importance
 - Ease of Collection
 - Accuracy
 - Independent vs. Derived
 - Any new factors?
 - How do we reconcile use cases which impose contradictory prioritizations?
- Preparation
 - LBNL: Will provide revised prioritizations along with some examples for a use case to TWG Members ahead of Meeting 2 (1/23/14)
 - TWG Members: Will review material and come prepared to discuss in Meeting 2

- Key Questions to think about before next meeting
 - Do we need to go through the entire Specification line-by-line?
 - What is the best process for identifying line items needing attention versus those to skip?
 - What is a fair process for arriving to a consensus on controversial line items?
 - Based on the experience of the C1 (1/7/14) and R1 (1/9/14) meetings, should the Workplan be adjusted?
- Preparation
 - LBNL: Will provide a copy of the module 1 Sub-Group Workplan to TWG Members ahead of Meeting 2 (1/23/14)
 - TWG Members: Will review material and come prepared to discuss in Meeting 2

January-February



March-June



BEDES sections:

- Building Staff & Tenants
- Building Characteristics and Uses
- Whole Building & Tenant Energy Consumption

BEDES sections:

- Contractor Info, Project Structure & Financials
- Equipment and ECM Characteristics
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Sub-Group Module 1 Meetings Facility Level Data

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- Site Review
 - Key Questions:
 - Any missing fields?
 - Are these climate zones adequate?
 - Are the field names currently being use correct?
 - Any other issues or suggestions improvements for Site?
 - Preparation:
 - LBNL: Will provide the Site sections of BEDES to C1 Members ahead of C1 Meeting (1/7/14)
 - Sub-Group Members: Will review material and come prepared to discuss in C1 Meeting

- Facility Type
 - Key Questions:
 - Any missing facility types?
 - Are the field names currently being use correct?
 - Is a different data field enumerations and naming hierarchy needed? Is the structure extensible and able to adapt and grow over time?
 - Any other issues or suggestions improvements for Commercial Facility Type?
 - Preparation:
 - LBNL: Will provide the Commercial Facility Type Site sections of BEDES to C1 Members ahead of C1 Meeting (1/7/14)
 - Sub-Group Members: Will review material and come prepared to discuss in C1 Meeting

- Site Review
 - Key Questions:
 - Any missing fields?
 - Are these climate zones adequate?
 - Are the field names currently being use correct?
 - Any other issues or suggestions improvements for Site?
 - Preparation:
 - LBNL: Will provide the Site sections of BEDES to R1 Members ahead of R1 Meeting (1/9/14)
 - Sub-Group Members: Will review material and come prepared to discuss in R1 Meeting

- Facility Type
 - Key Questions:
 - Any missing facility types?
 - Are the field names currently being use correct?
 - Is a different data field enumerations and naming hierarchy needed? Is the structure extensible and able to adapt and grow over time?
 - Any other issues or suggestions improvements for Residential Facility Type?
 - Preparation:
 - LBNL: Will provide the Residential Facility Type Site sections of BEDES to R1 Members ahead of R1 Meeting (1/9/14)
 - Sub-Group Members: Will review material and come prepared to discuss in R1 Meeting

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