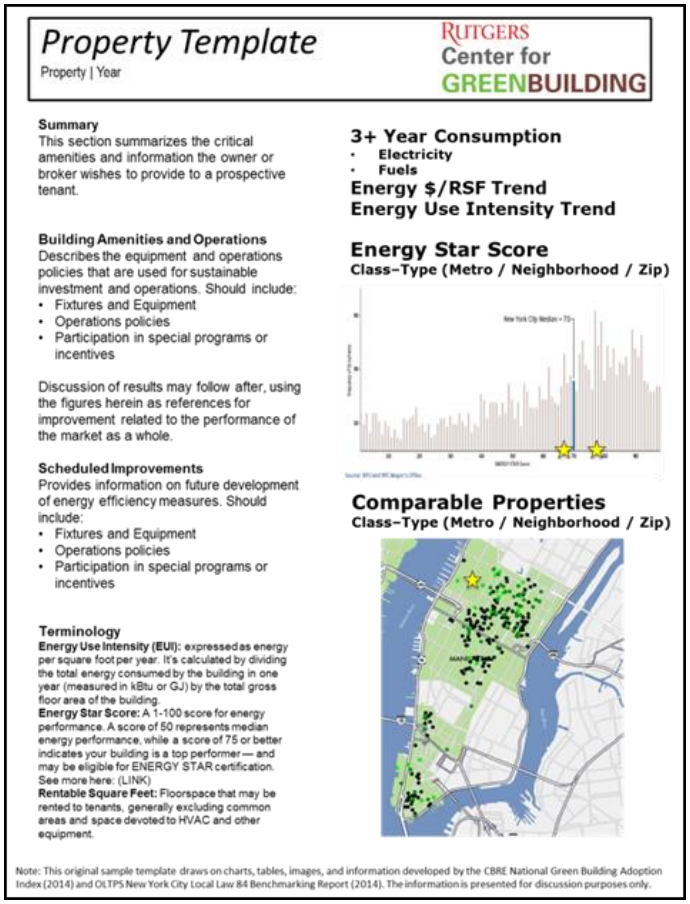
CBEI Localized Benchmarking: Users and Analytics

2015 Building Technologies Office Peer Review

CBEI-Rutgers, CBEI-UPenn



Property Template

Property | Year

RUTGERS Center for GREENBUILDING

Summary
This section summarizes the critical amenities and information the owner or broker wishes to provide to a prospective tenant.

Building Amenities and Operations
Describes the equipment and operations policies that are used for sustainable investment and operations. Should include:
- Fixtures and Equipment
- Operations policies
- Participation in special programs or incentives

Discussion of results may follow after, using the figures herein as references for improvement related to the performance of the market as a whole.

Scheduled Improvements
Provides information on future development of energy efficiency measures. Should include:
- Fixtures and Equipment
- Operations policies
- Participation in special programs or incentives

Terminology
Energy Use Intensity (EUI): expressed as energy per square foot per year. It's calculated by dividing the total energy consumed by the building in one year (measured in kBtu or GJ) by the total gross floor area of the building.
Energy Star Score: A 1-100 score for energy performance. A score of 50 represents median energy performance, while a score of 75 or better indicates your building is a top performer — and may be eligible for ENERGY STAR certification. See more here: (LINK)
Rentable Square Feet: Floorspace that may be rented to tenants, generally excluding common areas and space devoted to HVAC and other equipment.

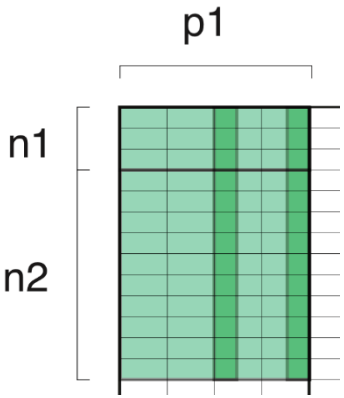
3+ Year Consumption
- Electricity
- Fuels

Energy $/RSF Trend
Energy Use Intensity Trend

Energy Star Score
Class-Type (Metro / Neighborhood / Zip)

Comparable Properties
Class-Type (Metro / Neighborhood / Zip)

Note: This original sample template draws on charts, tables, images, and information developed by the CBRE National Green Building Adoption Index (2014) and OLTPS New York City Local Law 84 Benchmarking Report (2014). The information is presented for discussion purposes only.



RUTGERS Center for GREENBUILDING

IMT INSTITUTE FOR MARKET TRANSFORMATION

CBEI CONSORTIUM for BUILDING ENERGY INNOVATION

University of Pennsylvania

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Clinton Andrews, cja1@rutgers.edu
Rutgers University
April 15, 2015

Project Summary

Timeline:

Start date: 5/1/14

Planned end date: 4/30/16

Key Milestones

1. RU/IMT: Develop use-case summaries (9/14)
2. RU/IMT: Test in 2 cities (12/14)
3. UPenn: Develop and test algorithm (12/14)
4. UPenn: Integrate into score cards (4/15)

Budget:

Total DOE $ to date: $633,000

Total future DOE $: $75,000

Target Market/Audience:

Real estate market actors: brokers, building owners, service providers, tenants, investors, consultants, industry analysts, policymakers in New York City and Philadelphia

Key Partners:

CBEI in partnership with	CBEI - Rutgers Center for Green Building (RU)
	Inst. for Market Transformation (IMT)
	CBEI - University of Pennsylvania (UPenn)
	Cities of New York and Philadelphia
	Members of Private Real Estate Market
	EPA Energy Star

Project Goal:

Make benchmarking data more useful & relevant for multiple stakeholders at the local, regional & national scale. In addition, this project engages stakeholders to identify benchmark data use & reporting needs, as well as to inform marketing approaches that encourage the use of energy benchmarking data in transactional decision-making (*PMP Objective*)

CBEI CONSORTIUM for BUILDING ENERGY INNOVATION

Vision:

By 2030, deep energy retrofits that reduce energy use by 50% in existing SMSCB, which are less than 250,000 sq ft

Mission:

Develop, demonstrate and deploy technology systems and market pathways that permit early progress (20-30% energy use reductions) in Small and Medium Sized Commercial Buildings

Our Goals:

- **Enable deep energy retrofits** in small to medium sized commercial buildings
- **Demonstrate energy efficient systems** tailored for SMSCBs in occupied buildings – living labs
- **Develop effective market pathways** for energy efficiency with utilities and other commercial stakeholders: brokers, finance, service providers.
- **Provide analytical tools** to link state and local policies with utility efficiency programs

CBEI Partners

Industry

Bayer MaterialScience

United Technologies Research Center

Economic Development Organizations

DVIRC

PIDC

Driving growth to every corner of Philadelphia

Ben Franklin Technology PArtners

Universities

PENNSTATE 1855

NJIT

Penn University of Pennsylvania

Drexel University

Carnegie Mellon University

VirginiaTech 1872 Invent the Future

PURDUE UNIVERSITY

MORGAN STATE UNIVERSITY Gateway to Opportunity Stairway to Excellence

RUTGERS

Purpose and Objectives

Problem Statement: Market is segmented according to property types, location and transaction type, hence need to make benchmarking data useful to distinct real estate market actors, relevant to transactions within specific sectors and tailored to local contexts. Firms in the sector vary in their energy literacy. Detailed energy information is often seen as inconsequential to real estate transactions. Encouraging the use of energy benchmarking data in transaction decisions (e.g., acquisition, leasing, disposition) requires the production of local information that complements national-level Portfolio Manager, is easily understood, and well integrated into existing organizational protocols.

Target Market and Audience: Regional and local brokers, owners, institutional investors, building occupants, professional organizations, service providers, energy efficiency consultants, policymakers

Impact of Project: Improved uptake of energy info in institutional practices of different local, regional, and national real estate sectors; improved usability and dissemination of energy disclosure data; uptick of energy efficient retrofits.

Endpoints/Products: Analytics to support localized benchmarking and info templates tailored to specific use cases.

Impact Paths: Disseminate to relevant user groups and data producers, present to Philadelphia MOS (near –term). Measure uptake in transactional processes and data offerings; present to Energy Star Portfolio Manager; academic publications; measure respective uptake of ideas(3+ years).

Approach

Approach:

1. Interviews and focus groups in New York City and Philadelphia to characterize use of energy data in transactions by sector, assess usability of visual tools, provide feedback on energy info templates and improve public disclosure tools.
2. Statistical analysis of Portfolio Manager and New York City benchmarking data to identify most relevant data fields, implement "statistical learning" for localized analysis.

Key Issues:

- Energy costs inconsequential in transactions, actors' roles and data needs vary across transactions, occupancy and cost are critical performance measures.
- Simplify methods used for feature selection, interaction selection, & peer group comparisons *x* buildings & cities.

Distinctive Characteristics:

- Identifies disclosure tool features most relevant to data use by sectors at different building life cycle stages.
- Using Portfolio Manager, identifies other variables that improve prediction of local building energy consumption.

Progress and Accomplishments

Lessons Learned:

- All sectors seek reliable, independent property level info (not just data); energy info is relevant at *several points in a building's lifecycle;* info useful *when defined in real estate terms.*
- Data cleaning and treatment require specialized cleaning script, but once done *protocol can be applied to other cities easily*

Stakeholders suggest that self-selection of properties for direct comparison to peers is an important function

Accomplishments:

- Identified where energy information fits into market transactions; engaged market partners in on-going collaboration on usability; broad dissemination via report and webinar; market feedback on Philadelphia Tool.
- Identified significant variables for New York City buildings.

Market Impact:

- Engaged 21+ organizations from different local, regional, and national real estate sectors to improve uptake of energy info in institutional practices; continued engagement is improving usability and dissemination of energy disclosure data; this informs uptick of energy efficient retrofits.
- Ranking and grouping methods to be included in Philadelphia's communications with building owners; EPA more willing to talk about need to improve Portfolio Manager

Awards/Recognition: Article published in *Energy*

Project Integration and Collaboration

Project Integration:

- Project staff include members with private market backgrounds
- Examples of local benchmarking methods exchanged
- Demonstrations of energy information integration in templates to which market partners relate and respond
- Enhanced methods of dissemination through regional stakeholder engagement

Partners, Subcontractors, and Collaborators:

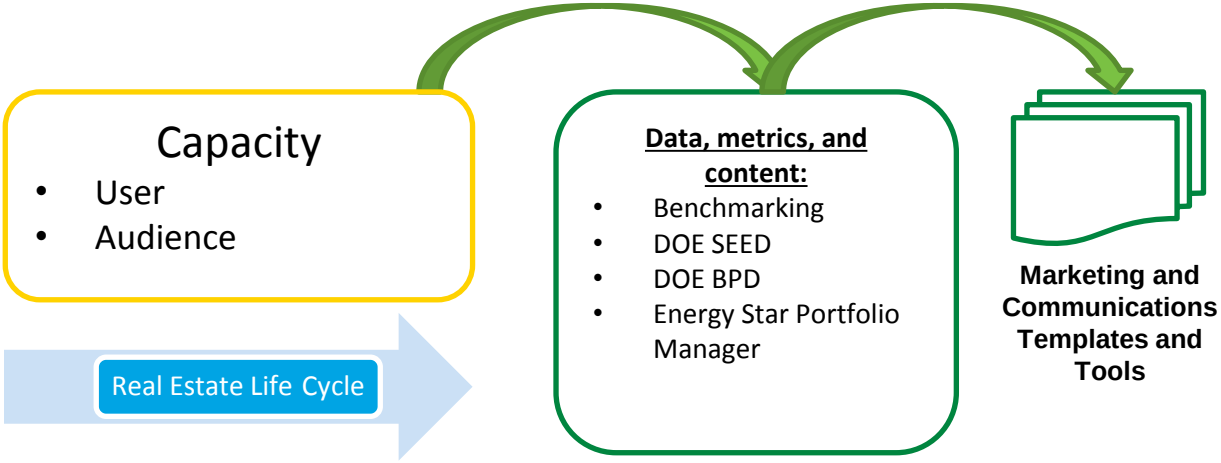
- Project partners include Institute for Market Transformation to facilitate dissemination of energy information strategies through private market
- Cities of New York and Philadelphia

Communications:

- Benchmarking and Energy Retrofit workshop at CBEI 3/26/15
- Webinar conducted with representatives of IMT/NRDC 10 Cities project, 4/16
- White Paper distributed across regions as a resource for energy advocates 4/15
- ACSP conference presentation, 10/14
- Rutgers NSF workshop, 10/14
- EPA regarding Energy Star, 1/15

Next Steps and Future Plans

1. Integrate findings into complete report with recommendations to CBEI, DOE
2. Continue diffusion of report findings and recommendations to market partners through a user-friendly version of primary report for potential follow-up and application to diverse market regions
3. Distribute White Paper and Webinar materials to Accelerator Program to include as resource for city partners
   - Lessons learned can be used to assist other entities in developing similar tools, along with justification and leading practices for encouraging market engagement.
4. Develop specialized reporting methods for improvement to overall building populations and their peer groups.



REFERENCE SLIDES

Project Budget

Project Budget: RU/IMT is a new project proposed to CBEI; UPenn project is a continuation of work with New York City, Seattle and Philadelphia from BP2 and BP3.
Variances: None.
Cost to Date (as of 2/28/15): RU/IMT: 86% ($215,000); UPenn: 70% ($172,000)
Additional Funding: None.

Budget History

CBEI BP3 (past) 2/1/2013 – 4/30/2014		CBEI BP4 (current) 5/1/2014 – 4/30/2015		CBEI BP5 (planned) 5/1/2015 – 4/30/2016	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
133,000	0	500,000	0	75,000	0

CBEI – Consortium for Building Energy Innovation (formerly EEB Hub)
BP – Budget Period

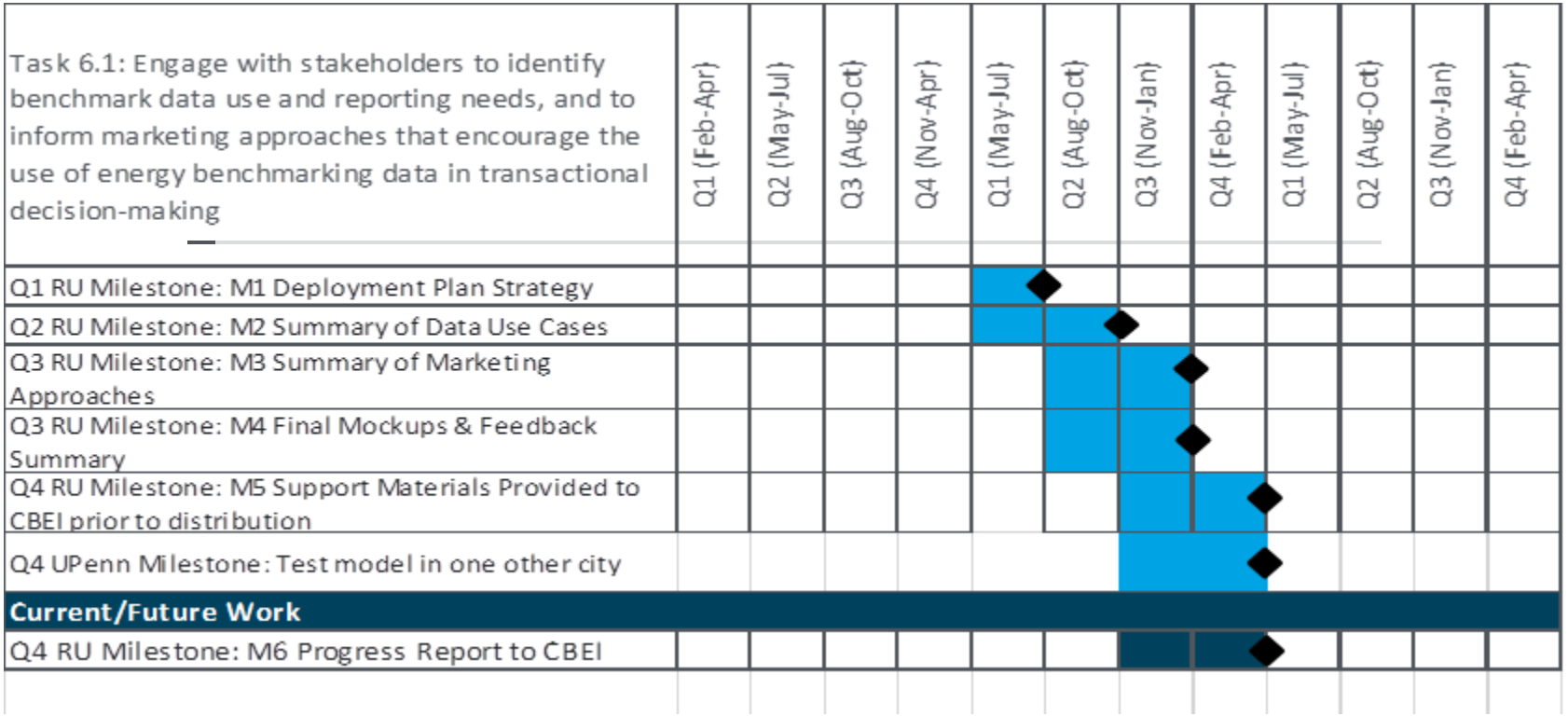
Project Plan and Schedule

RU/IMT:

- Begin: 5/1/14; End: 4/30/15
- Project on schedule and all milestones met on time.
- GNG: 12/17/14 - TAG review; 2/17/15 – DOE review
- Work status: Complete dissemination of white paper and webinar; share user-friendly final report

UPenn:

- Begin: 5/1/14; End: 4/30/15
- Project on schedule and all milestones met on time.
- GNG: 2/4/15 - TAG review; 2/17/15 – DOE review
- Work status: Complete Philadelphia model, report



BP – Budget Period for Consortium for Building Energy Innovation (formerly EEB Hub)