Green Building in the Gulf, Session 2: Benchmarking
Green Building in the Gulf

March 9: ENERGY STAR Certification
June 8: Benchmarking
September 14: Enterprise Green Communities Certification
December 7: Green Resources
A holistic approach to building a green community

- Integrative Design
- Location + Neighborhood Fabric
- Site Improvements
- Energy Efficiency
- Water Conservation
- Materials
- Healthy Living Environment
- Operations, Maintenance + Resident Engagement

2015 ENTERPRISE GREEN COMMUNITIES CRITERIA
Utility Providers

Arizona Public Service Company
BGE
Black Hills Energy
City Treasurer of Tacoma
Columbia Gas of Massachusetts
Com Edision
Con Edision
Connecticut Natural Gas
Dominion Virginia Power
Duke Energy (NC, OH, SC)
Eversource Energy
Georgia Natural Gas
Georgia Power Company
Idaho Power
Intermountain Gas Company
LADWP
Liberty Utilities (CA, GA, MA, NH)
Metropolitan Utility District
National Grid
Nicol Gas
OPPD
Peoples Gas (IL)
PEPCO
PG&E
Piedmont Natural Gas
PSE&G
PSNC Energy
Puget Sound Energy
RG&E
San Diego Gas & Electric
SMUD
Snohomish County PUD
Southern California Edison
Southwest Gas Corporation
The Gas Company
UNITIL
Washington Gas
WE Energies
Xcel Energy
How to collect tenant data?

Customer authorization requirements
Data formatting nuances
Data release nuances

Does your company have a set procedure in place for property owners of multi-tenant buildings to request [tenant-level / aggregated whole-building] historical monthly utility billing data?

If yes, is the process documented?

Does your company accept custom utility data release / tenant authorization forms? Specifically the “example” release form?

Require other actions (fees, notarized, other proof of identification, proof of identification of property/manager)?

Hard copy / electronic / grouped?

Timing? How long considered valid?

Originals / copies?

Consumption data and/or cost data?

Format?

Portfolio Managers? Green Button?

Restrictions on use?

Other?
How to collect: The Database

Utility Data Collection Database

To Search By: Utility Provider, user will select from the drop-down list and then will be redirected to the appropriate database tab.

Search By:
Utility Providers: [National Grid]

To Search By: Program Name, user will select from the drop-down list, click 'Go To Program Tab' Button on right, and then will be redirected.

Search By:
Program Name: [Jurisdiction-New York, NY]

To Search all Utility Providers by one characteristic, use the Utility MATRIX tab.

To Search all Programs by one characteristic, use the Program MATRIX tab.

Disclaimer: The information contained within this database is accurate as of 2015. Utility providers and program administrators may make policy and procedure changes in the future that could override the information contained within this database.
How to collect: The Database

National Grid
300 Erie Boulevard West
Syracuse, NY 13202
www.nationalgridus.com

1-800-322-3223  Electric Customer Service
1-800-870-1664  Natural Gas Customer Service

Click Here for Universal Release Authorization*
Click Here for National Grid Request Letter

*Universal Release Authorization only accepted by this utility provider when box is checked

Method for Obtaining Tenant Utility Data:

Utility Request Email:
LocalLaw84@us.ngrid.com

Supervisor Name:
No Specific Supervisor Provided

Supervisor Email:
No Specific Supervisor Provided

Supervisor Phone Number:

Instructions:

- Preferred contact method is to email LocalLaw84@us.ngrid.com.

- For multiple units, submit the request in Excel format with a list of account numbers and their associated information.

- More specific directions can be found on these links:
  - Aggregated
  - Sample Letter
  - Law Summary

If method above is non-responsive, contact a National Grid Property Manager Link.
How to collect: The Database

Method for Obtaining Tenant Utility Data:

Utility Request Email:
LocalLaw84@us.ngrid.com

Supervisor Name:
No Specific Supervisor Provided

Supervisor Email:
No Specific Supervisor Provided

Supervisor Phone Number:
1-718-643-4050

Instructions:
- Preferred contact method is to email LocalLaw84@us.ngrid.com.
- For multiple units, submit the request in Excel format with a list of account numbers and their associated information.
- More specific directions can be found on these links: Aggregated, Sample Letter, Law Summary
- If method above is non-responsive, contact a National Grid Local Law 84 Representative at 1-718-643-4050.

Tenant Waiver Required

| YES | NO |

Any Associated Costs?

| NO |

Anticipated Difficulty

| 2 (1.5) |

Potential Roadblocks You May Encounter:
How to collect: The Database

- Utility provider point of contact
- Whether a tenant signed release form is required, and the specific processes and forms allowed
- If the utility provider offers automated benchmarking through ENERGY STAR Portfolio Manager web services
- Whether the utility provider offers aggregated whole-building data; how access regulations differ
- Any applicable out-of-pocket costs
- Anticipated difficulty rating
- Potential roadblocks
How to collect: The Findings

- Tenant-signed releases are required **100%***
- Utilities that provide only consumption data (not cost) **35%**
- Signed releases valid only once **19%**
- Billing histories provided as PDF or paper (not electronic) **31%**
- Ability to provide aggregated whole-building data **38%**
- Connect with Portfolio Manager web services for multifamily **31%**
- Direct costs associated with billing data reports **8%**
- Data management systems used by utilities are customized and unique
- Utilities bound by state public utility commissions on how information may be released
How to collect: The Database

Utility Data Collection Database

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Search By:
Utility Providers: National Grid

To Search By: Program Name, user will select from the drop-down list, click 'Go To Program Tab' Button on right, and then will be redirected.

Program Name: Jurisdiction-New York, NY

To Search all Utility Providers by one characteristic, use the Utility MATRIX tab.

To Search all Programs by one characteristic, use the Program MATRIX tab.

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How to collect: The Database

New York City's Local Law 84
(additional requirements in Local Laws 87 & 88)

Applicable Links:
- Explanation of Local Law 84
- Local Law 87; Audits & Retrocommissioning
- Local Law 88: Lighting Upgrades & Sub-metering
- PlaNYC
- NYC Energy Benchmarking Reporting Data
- Local Law 84 Covered Building List Webpage
- Frequently Asked Questions

Questions/Support:
- sustainability@building.nyc.gov

Utilities:
- Con Edion
- National Grid

Scope and Schedule:

<table>
<thead>
<tr>
<th>Building Types Affected</th>
<th>Size</th>
<th>Compliance Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public/Government</td>
<td>Greater Than or Equal To 10,000 Sq. Feet</td>
<td>5/1/2010</td>
</tr>
<tr>
<td>Non-Residential</td>
<td>Greater Than or Equal To 50,000 Sq. Feet</td>
<td>5/1/2011</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>Greater Than or Equal To 50,000 Sq. Feet</td>
<td>5/1/2011 and every May 1st thereafter</td>
</tr>
</tbody>
</table>

2014 Covered Buildings List:
### Step-by-Step Protocol and Sampling Calculator

#### Example Apartment - Unit Mix

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>-</td>
</tr>
<tr>
<td>1-bedrooms</td>
<td>-</td>
</tr>
<tr>
<td>2-bedrooms</td>
<td>-</td>
</tr>
<tr>
<td>3-bedrooms</td>
<td>-</td>
</tr>
<tr>
<td>4-bedrooms</td>
<td>-</td>
</tr>
<tr>
<td>&gt;4-bedrooms</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Date Unit Became Occupied

<table>
<thead>
<tr>
<th>Date</th>
<th>Unit #</th>
<th>BedRoom</th>
<th>Affordable Unit (LIHTC or</th>
<th>Signed Release</th>
<th>Customer Name</th>
<th>Customer Phone</th>
<th>Electric Account</th>
<th>Natural Gas Account</th>
<th>Other Account</th>
<th>Electric Meter</th>
</tr>
</thead>
</table>
Database with utility collection procedures and benchmarking program requirements

Step-by-Step Data Collection Protocol

Housing Unit Sampling Calculator

Revenue Potential

www.hudexchange.info/programs/utility-benchmarking
Multifamily Benchmarking and Energy Management: A How-To Guide
1989  Year Founded
44   Number of Employees
38   Average Age
5    Countries Represented
40   University Programs Represented
55%  LEED Accredited Professional Staff
53%  Licensed Professional Staff
26 / 18  Male / Female Staff Ratio
“Most architects date buildings, we marry them.”
BENCHMARKING EXPERIENCE
Tulane Masters of Sustainable Real Estate Program
- Benchmarking and Building Performance Course

Benchmark...
- One building
- A portfolio of buildings
- Whole cities
WHY BENCHMARKING?
Key to Energy Management

You can't manage what you don't measure.

-W. Edwards Deming
WHY BENCHMARKING?
Key to Understanding Maintenance Issues

- Improve Gas Mileage With Basic Car Maintenance

  - Replace dirty air filters to improve gas mileage by as much as 14%.\(^1\)
  - Replace dirty spark plugs, which can reduce gas mileage by two miles per gallon.\(^2\)
  - Change oil regularly and gain another mile per gallon.\(^2\)
  - Keep your car properly tuned to improve gas mileage by an average of 4%.\(^1\)
  - Keep tires properly inflated and improve gas mileage by 3%.\(^3\)
WHY BENCHMARKING?
Key to Understanding Maintenance Issues
WHY BENCHMARKING?

Unlocks Financial Benefits for Low Income Tax Credits and Utility Allowances

(http://h-m-g.com/multifamily/UtilityAllowanceOptionsforInvestmentsinEE-RG.pdf)
WHY BENCHMARKING?
Key to Meeting 3rd Party Certification Programs

Multifamily - all common spaces and 15% of tenant spaces must be benchmarked. Additional points for increasing % of tenant space.

EBOM - required for energy credits.

NC - sharing data required for NC, M&V credit.

Sliding scale of points awarded based on % of portfolio benchmarked
WHY BENCHMARKING?
Everyone Else is Doing It (sort of)
WHY BENCHMARKING?
City-wide benchmarking: New York City

Histogram of Multifamily EUIs

Median NYC EUI = 132.2

RECS 2005:
Northeast Region
EUI for Residential
Buildings with 5 or more units = 130
BENCHMARKING FUNDAMENTALS

Metrics

Energy Use Intensity (EUI (kBtu/sf-yr))

Miles Per Gallon (MPG)
BENCHMARKING FUNDAMENTALS

Calculating EUI

\[ \text{EUI} = \frac{\text{FUEL USE}}{\text{NORMALIZE SIZE OF BUILDING (SF)}} \]

- BLDG
- FUEL USE
- CONVERSION
- TIMEFRAME
- NORMALIZE

\[ \begin{align*}
\text{kWh} & \quad \text{therms/ccf} \\
kBtu & \quad \times 12 \text{ (1 year)}
\end{align*} \]
BENCHMARKING - PROCESS
Access to Data - Common Space vs. Tenant Space

930 Poydras Energy Use by Program

48% 52%

- Common Space
- Apartment Units + Commercial Tenants

[Diagram showing energy use by program]
BENCHMARKING - PROCESS
Access to Data (Tenants)

- physical/digital
- Online Accounts
- Green Button Program
- Utility Release Waivers
- Automated data aggregation
BENCHMARKING - PROCESS

The Right Tool

OVER TIME
UPGRADE HISTORIES
MULTIPLE PARTIES

INPUT
TRACK
ANALYZE

CENTRALIZE
ORGANIZE
AUTOMATE

COMPARE
SHARE
REPORT
BENCHMARKING - PROCESS
The Right Tool
BENCHMARKING - PROCESS
The Right Tool

Strengths
● Automated data management
● Good user interface
● Internal benchmarking database
● M&V Calculations

Weaknesses
● Costs money
● No weather normalization
● Lack of training materials
BENCHMARKING - PROCESS
The Right Tool

Strengths
- Free and easy to learn
- Comprehensive reporting features
- Internal benchmarking database
- Linked to Energy Star Certification
- Weather normalization

Weaknesses
- Less intuitive interface
- Slow to change
- Not automated (yet)
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Compare to Benchmarks

Empirical Energy Use Databases

- National
  - CBECS, DOE BPD
- Regional
  - Research, E-Star
  - Target Finder, Policy Reports
- Local
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?

Compare to Benchmarks
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?

Compare to Energy Models -- see that you meet or exceed expected performance

Apalachicola NERR Monthly Electrical Use: Predicted & Actual

- Code Min bldg same size
- Energy Model of design
- Actual 2010
- Actual 2011
- Actual 2012
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?

Compare to Historic Usage or Other Internal Benchmarks
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?

Compare to Benchmarks - Louisiana Schools Example
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Determine Corrective Action

STUDY FOR EXAMPLES & INSPIRATION
AUDITS + CAPITAL IMPROVEMENTS + 
AUDITS + CAPITAL IMPROVEMENTS + OPERATIONS TUNING
AUDITS + LOW TO NO COST SOLUTIONS

100-75%  75-50%  50-25%  25-0%

25%
ABOVE MEDIAN

USGBC LOUISIANA DATASET
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Prioritize Based on Performance

STUDY FOR EXAMPLES & INSPIRATION
AUDITS + CAPITAL IMPROVEMENTS + AUDITS + CAPITAL IMPROVEMENTS + OPERATIONS TUNING
AUDITS + LOW TO NO COST SOLUTIONS

USGBC LOUISIANA DATASET

EUI - kBtu/sf-yr

100-75%
75-50%
50-25%
25-0%

25%

ABOVE MEDIAN

0 10 20 30 40 50 60 70 80 90

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67

6/15/16

BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Prioritize Based on Performance

STUDY FOR EXAMPLES & INSPIRATION
AUDITS + CAPITAL IMPROVEMENTS + AUDITS + CAPITAL IMPROVEMENTS + OPERATIONS TUNING
AUDITS + LOW TO NO COST SOLUTIONS

USGBC LOUISIANA DATASET

EUI - kBtu/sf-yr

100-75%
75-50%
50-25%
25-0%

25%

ABOVE MEDIAN

0 10 20 30 40 50 60 70 80 90

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67

6/15/16
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Prioritize Based on Impact (Normalized and Absolute Metrics)
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Prioritize Based on Impact (Normalized and Absolute Metrics)
BENCHMARKING - I’VE GOT A NUMBER, NOW WHAT?
Prioritize Based on Submetering (http://energyiq.lbl.gov/EnergyIQ/benchmark.jsp)
BENCHMARKING - OCCUPANT ENGAGEMENT

We Must Be Geniuses!

Net EUI: 3 kBtu/SF/yr
Regional average: 42 kBtu/Sq.Ft.
BENCHMARKING - OCCUPANT ENGAGEMENT

We Must Be Idiots!

Net EUI: 61 kBtu/SF/yr
Regional average: 42 kBtu/Sq.Ft.
BENCHMARKING - OCCUPANT ENGAGEMENT

Occupant Variability

How good is the building?

How good are the occupants?

2003 Benchmark:
>large multifamily residential in Southeast US
BENCHMARKING - OCCUPANT ENGAGEMENT


- Operational Manuals
- Home Visits
- Competitions
- Handouts
- Posters
- Demos
- Orientation Events
- Goal Communications
- Dashboards
BENCHMARKING - OCCUPANT ENGAGEMENT

How to Engage the Occupant - DASHBOARDS
BENEFITS OF ENERGY MANAGEMENT

Who Gets the Benefit?

Lafitte projects - Enterprise Green Communities
Thanks!

Z Smith - Eskew+Dumez+Ripple
Principal, Director of Building Performance and Sustainability
jdunn@eskewdumezripple.com
504-561-8686

Jacob Dunn - Eskew+Dumez+Ripple
Sustainability Enabler
jdunn@eskewdumezripple.com
504-561-8686
Resources

Guidance, Case Studies & Tools:
www.hudexchange.info/programs/utility-benchmarking
www.buildingrating.org

Benchmarking Platforms:
portfoliomanager.energystar.gov
www.wegowise.com
www.energyscorecards.com
www.egauage.net
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