“2030 District”

BOMA-VICTORIA LUNCHEON

OCTOBER 27, 2016

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Outline

- → What is a “2030 District”?
- → Research Initiative (Tom Berkhout, MEM)
- → Value Proposition
- → Key Components
- → Case Studies of Building Retrofits
- → Linking to BOMA BESt
- → Options for BOMA to Move Forward

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What is a 2030 District?

→ "Designated urban areas committed to meeting the energy, water, and transportation emissions reduction targets of the 2030 Challenge for Planning"

→ Voluntary leadership initiative

→ Driven by commercial property owners and managers

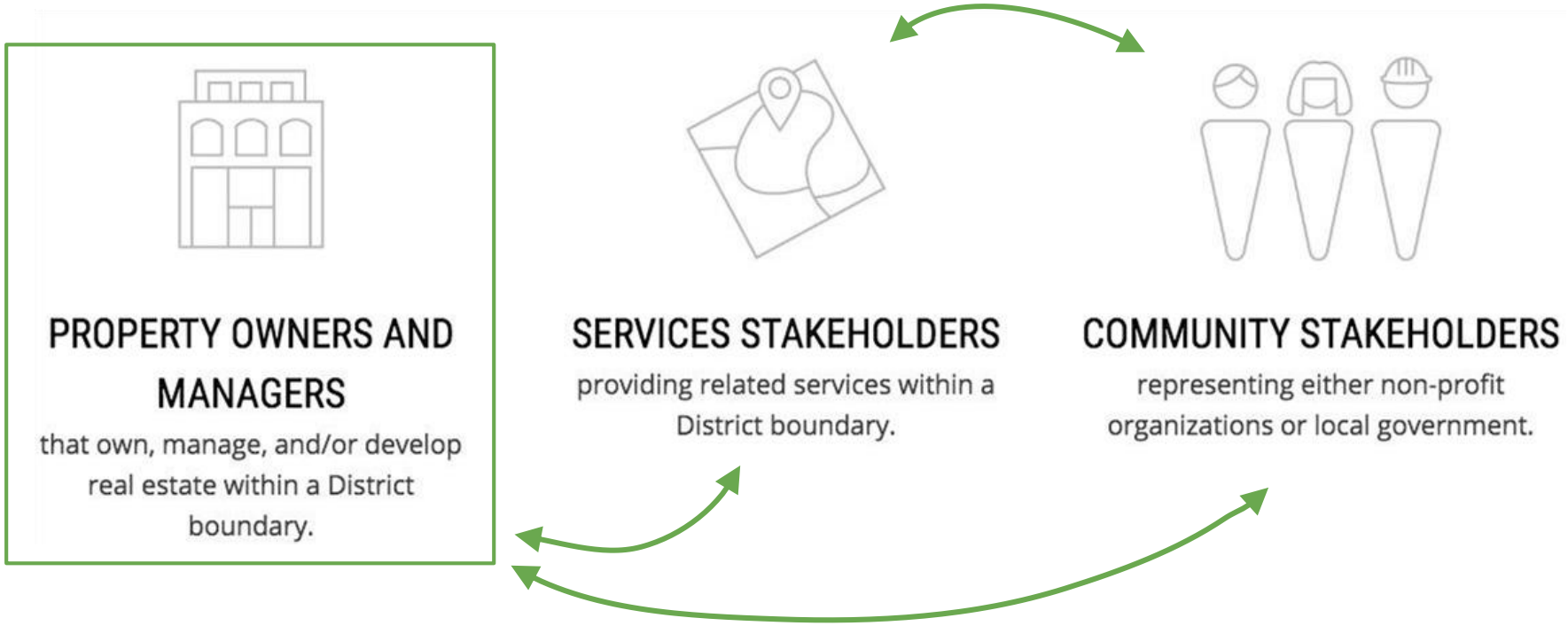
→ Boundaries defined by participants

→ Established targets for existing and new buildings

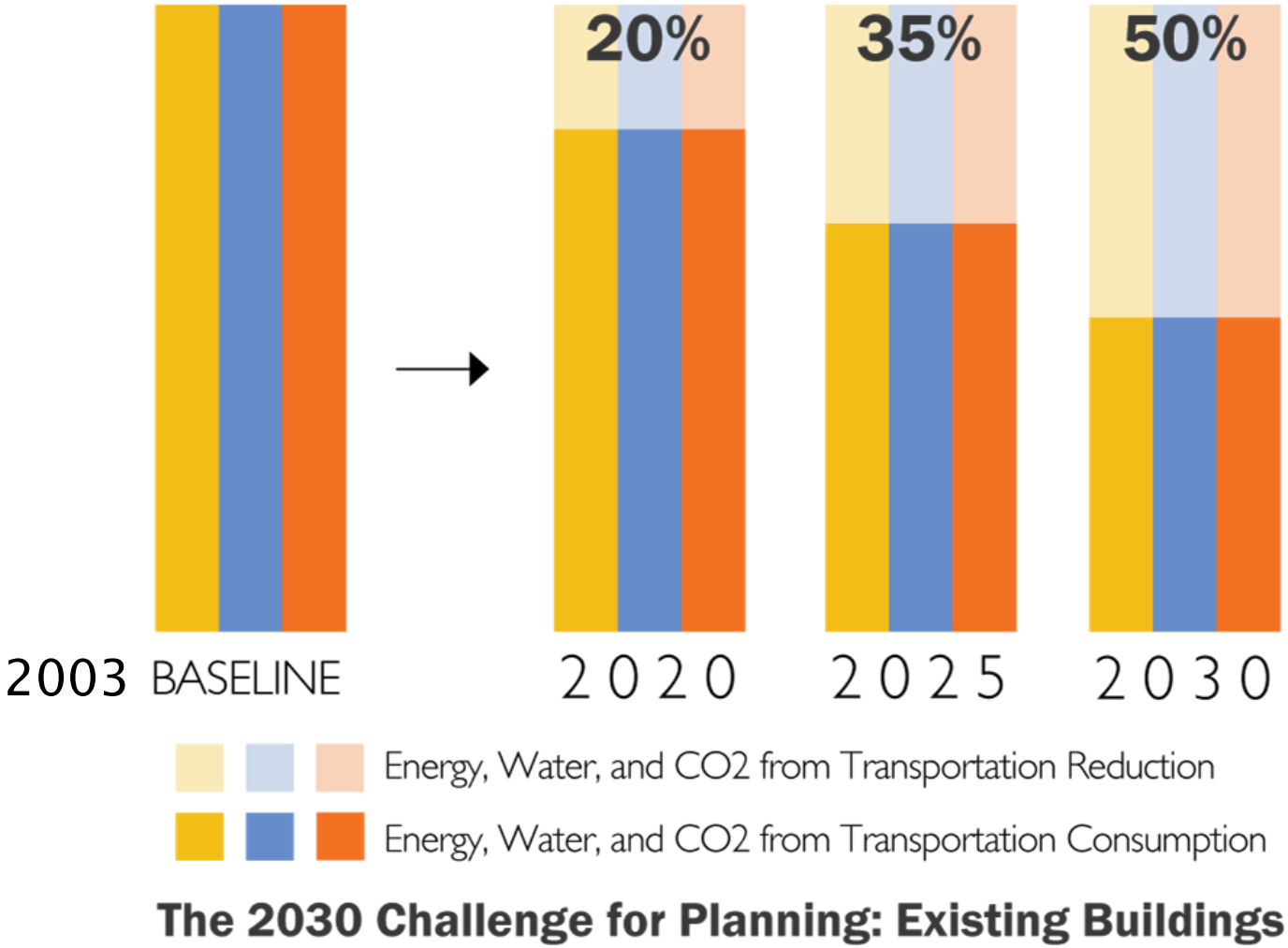
→ Consistent across North America

A Successful 2030 District

→ Is a PRIVATE-PUBLIC PARTNERSHIP, comprised of:



2030 District Targets for Existing Buildings



The 2030 Challenge for Planning: Existing Buildings

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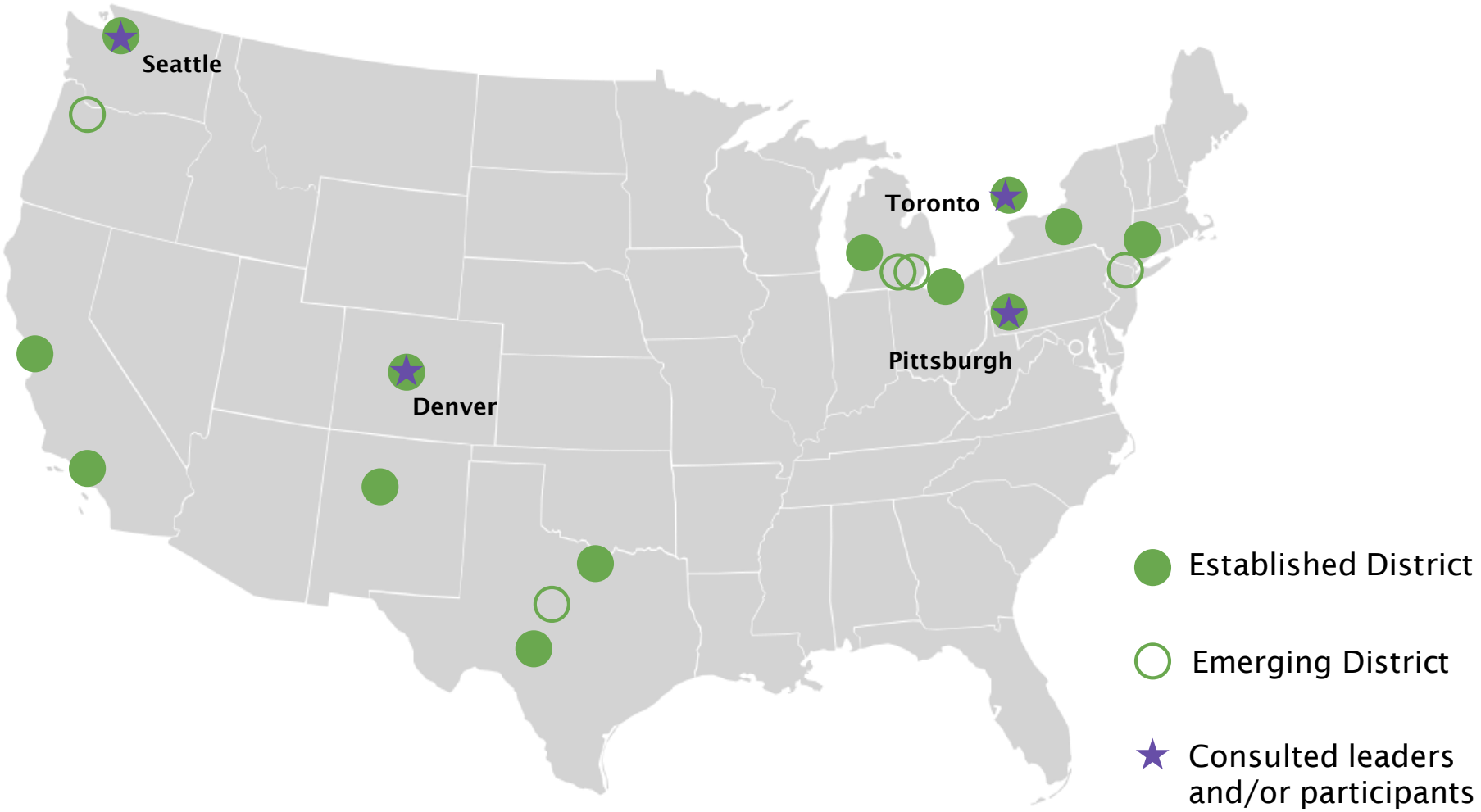
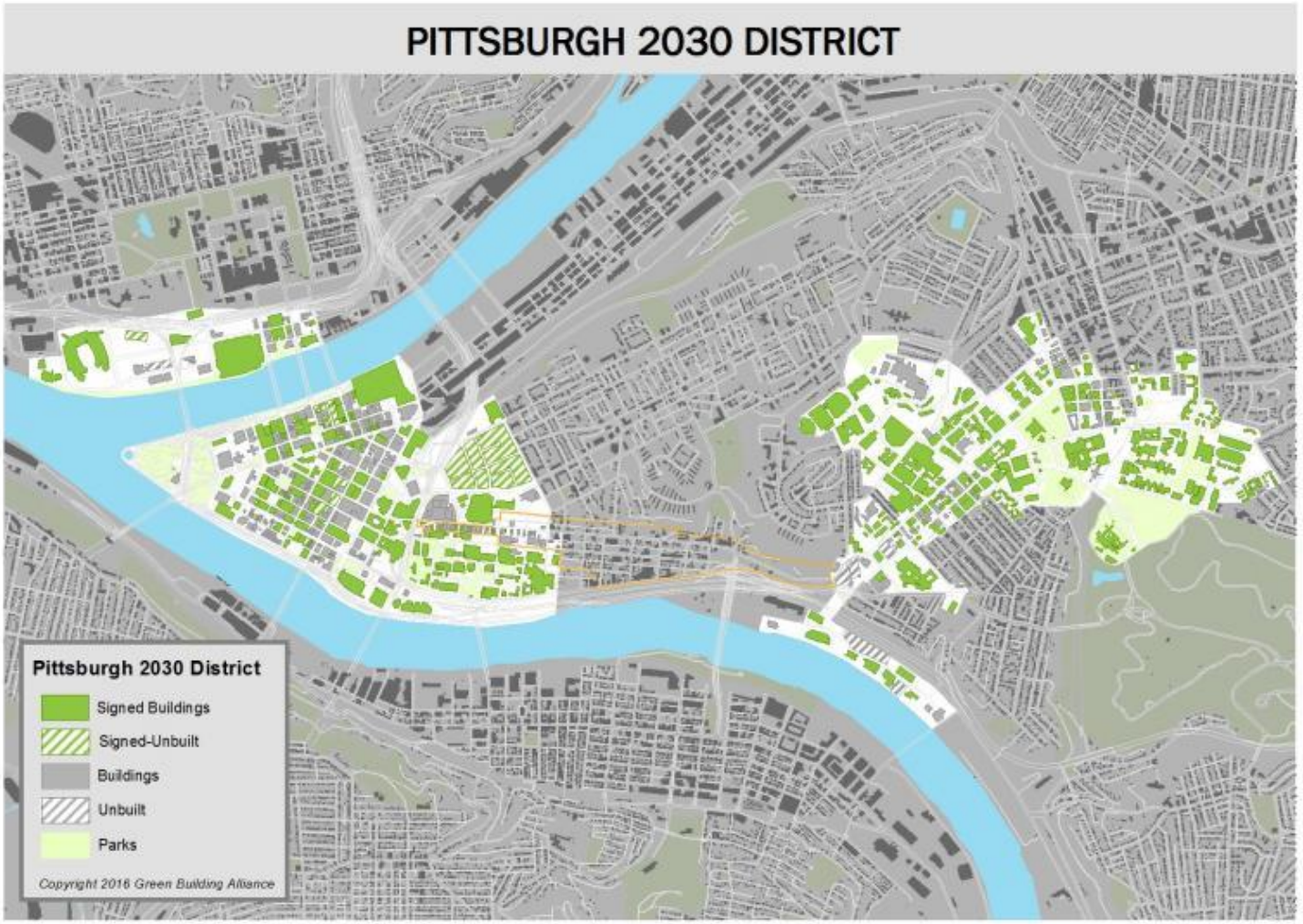
Thirteen 2030 Districts



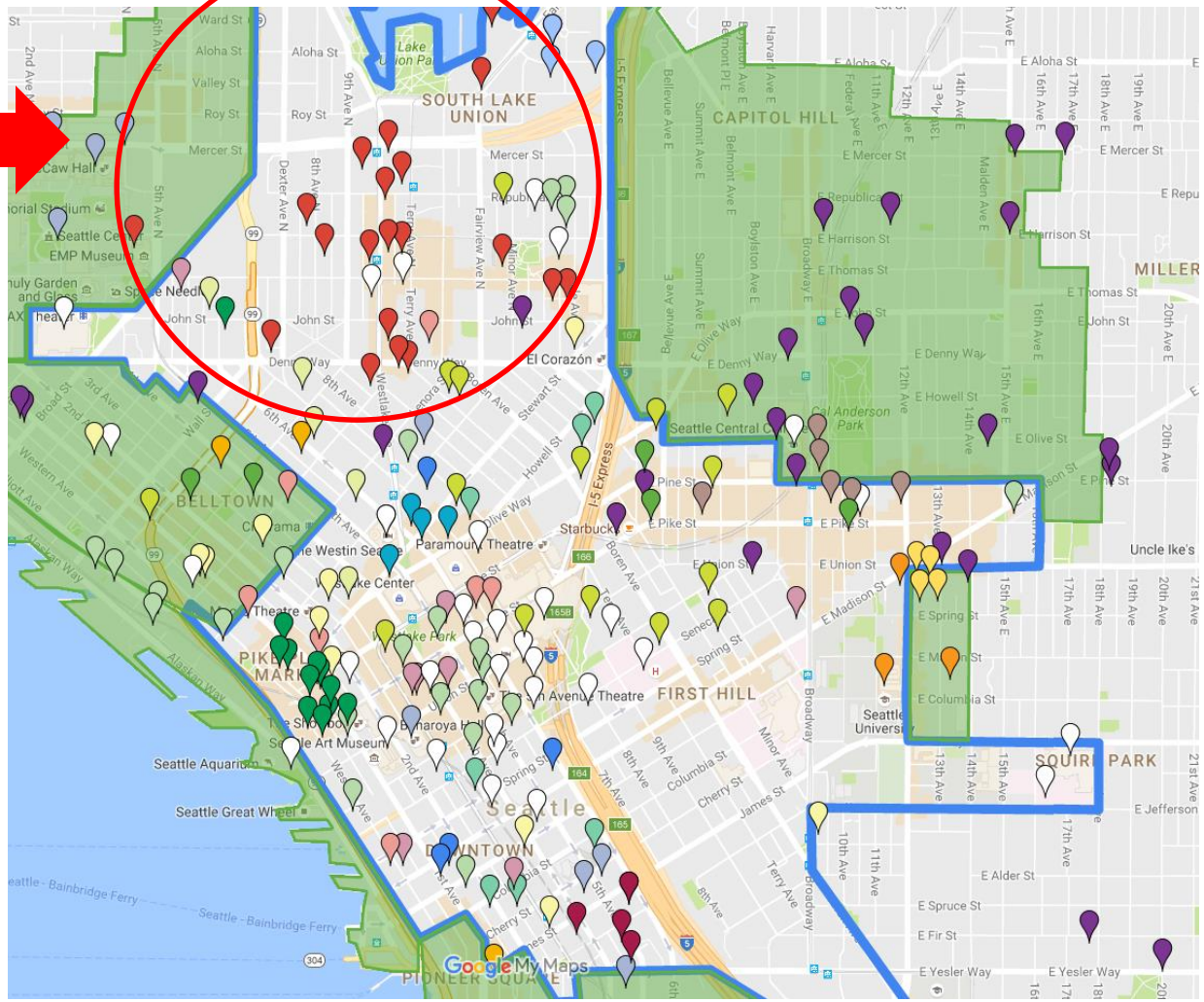
Source: *Ministry of Energy and Mines Report*

Districts – Pittsburgh (4 clusters)



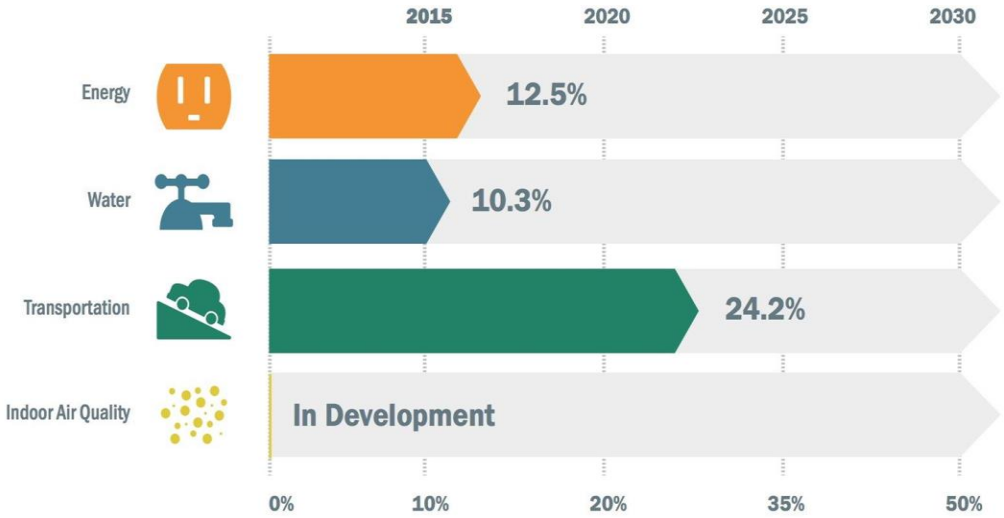
Districts – Seattle

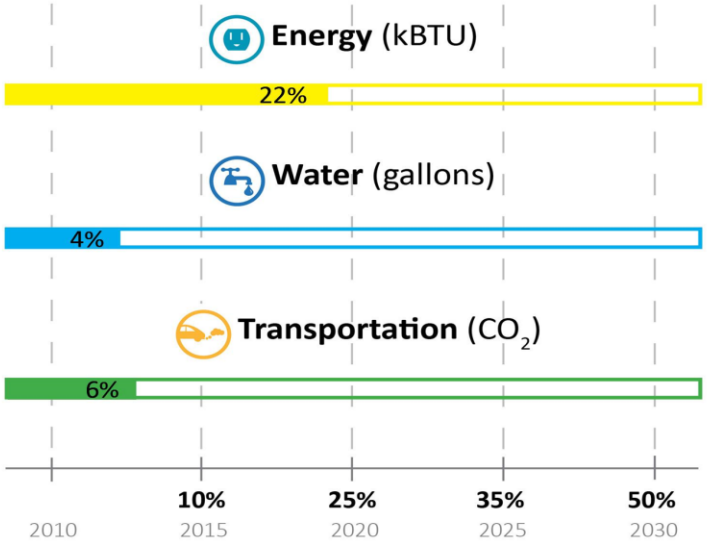
- Capitol Hill Housing
- Unico Properties, LLC
- Vulcan Real Estate
- Bellwether Housing
- Pike Place Market
- Plymouth Housing Group
- City of Seattle
- Kidder Mathews
- CBRE
- JSH Properties
- Clise Properties
- Hunters Capital
- King County
- Solomon Building
- Fred Hutchinson Cancer Research Center
- Seattle Acaemy
- US General Services Administration
- Vance Corp
- #N/A
- Seattle University
- Other / No data



http://www.2030districts.org/seattle/members

2030 District Achievements – 2015 Reports





Pittsburgh

76 million ft^2 committed

Seattle

45 million ft^2 committed

Seattle 2030 District

→ https://youtu.be/dhgwGTvBLqE (2:11)

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UBC Research Initiative

→ Report available

Establishing 2030 DISTRICTS In BC

Summer 2016 Research

Fiona Jones, UBC

Tom Berkhout, MEM

Brendan McEwen, Richmond

Benefits of a 2030 District

Value for building owners & operators includes the opportunity to:

1. Participate in a program by and for commercial property owners/managers
2. Share with and learn from peers in District forums
3. Implement initiatives with ongoing District support and resources
4. Distinguish buildings and advertise accomplishments
5. Commit to focused goals that are compatible with other initiatives and past efficiency efforts
6. Participate in a group small enough to be venturesome and responsive, large enough to create impact
7. Take advantage of a strategic boundary and geographical area of influence

Source: *UBC Report*

Clarification to unknown or misunderstood information about 2030 Districts

1. Building performance is reported anonymously to peer participants and as aggregated data to the public, and there are no repercussions for not meeting reductions targets. This helps to create a low-risk, non-punitive environment in which building managers and owners can undertake performance initiatives. This can also help encourage the operators of inefficient properties to take initial steps towards performance improvement.

2. Districts are operated autonomously by local staff and stakeholder leaders, who access the resources and support of Architecture 2030 and its District Network. Districts operate at a scale that makes them small enough to take risks and be responsive, but large enough to create impact—both locally and collectively.

3. All current and past efficiency efforts undertaken by participating managers and owners count towards District goals. Property members count all efforts to improve performance in their data reporting, regardless of when they joined their District.

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Source: *UBC Report*

Capital Region Mapping Option

Source: *UBC Report*

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Value Proposition to BOMA Members

→ Extend BOMA BESt to a leadership "District"

- → Branding of a high performance and sustainability zone
- → "Keep up" with continental market transformation
- → "Get ahead" of government sustainability initiatives

→ Competitive advantage

- → Define boundaries to reflect current leadership and momentum
- → Select buildings that are ready
- → Differentiate investments through district branding
- → Attract new tenants that are seeking branding

Value Proposition to BOMA Members

- → District-wide benefits
  - → Financing
  - → Specific incentive programs
  - → Potential for purchasing power to procure equipment and services
  - → Develop cost-effective energy supply options
  - → Reduced cost meeting government sustainability goals
- → Building-specific benefits
  - → Energy bill reductions and avoided carbon tax
  - → Net benefit over and above capital costs
  - → Increase comfort, resilience, acoustics
  - → Accessing specialized expertise
  - → Forum for learning – avoid repeating mistakes

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Key Components

→ Benchmarking performance

→ Guidance, training & ongoing support (regional and national)

→ Connection to tools and services: http://www.2030districts.org/toolkits

→ Forum to organize district energy, other regional sustainability initiatives

→ "Brain Trust"

→ No fees to property owners and managers

Creating a 2030 District

Phase 1: Prospective 2030 District

- → Establish exploratory committee to support implementation
- → Reach out to property owners, managers and developers
- → Support assessment of properties and map potential boundaries
- → Enable access to consultation services from Architecture 2030 staff & marketing materials

Creating a 2030 District

Phase 2: Emerging 2030 District

→ Requires active participation from a minimum of 3 different property owners, managers, and developers

→ Access to additional resources to help with administration and collaboration

→ City-specific website & account with 2030 Districts

Creating a 2030 District

Phase 3: Established 2030 District

- → A signed commitment from a minimum of 5 property owners, managers, and developers
- → Established host or new NGO to manage the District and a Board of Directors
- → Signed 2030 District Charter
- → Access to additional technical & fundraising support from Architecture 2030
- → Use of 2030 District branding
- → Access to national partners

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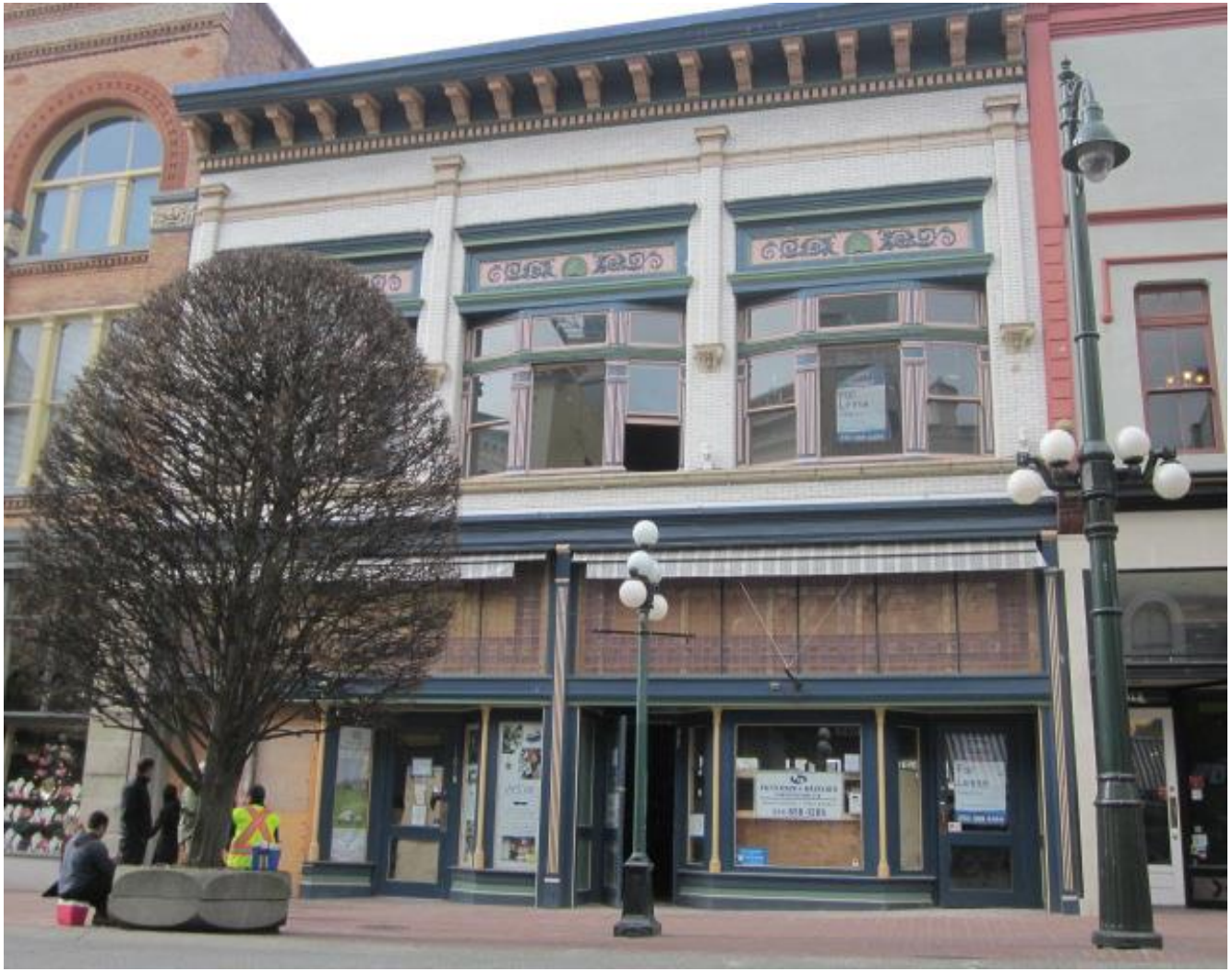
Case Study 1 – Heritage Office Building



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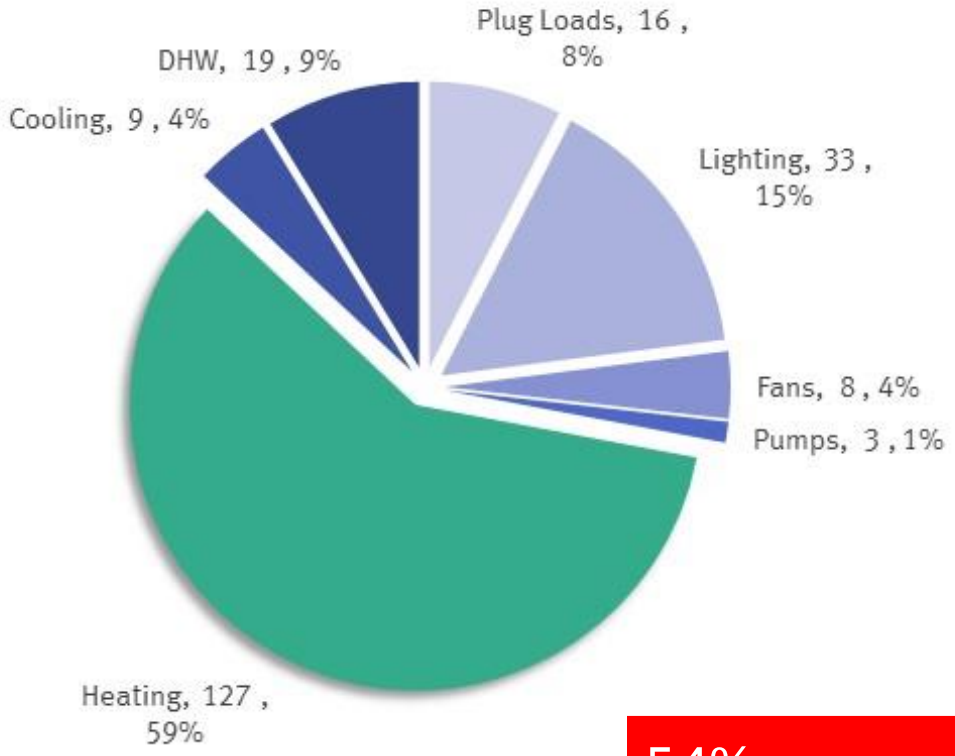

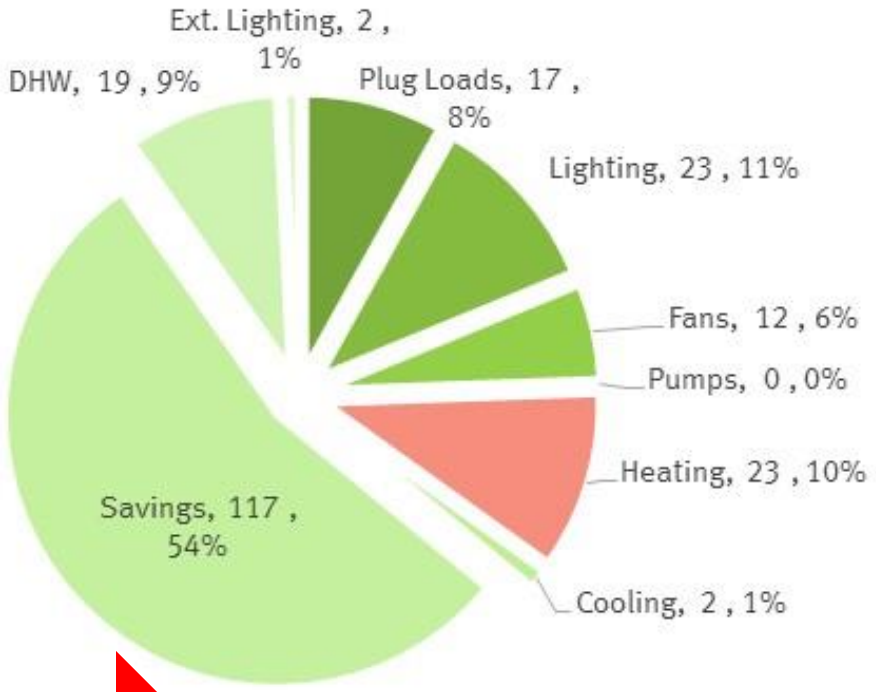

54% energy reduction

Distribution of energy consumption by end-use for baseline (left) and business as usual (right) scenarios, kWh/m^2 and percent of total.

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Case Study 1 – Heritage Building

System	Implemented	"Best" Scenario	NPV$*
Envelope	R-9.3	+ R10 below grade	$183,000
	R-1.7	+ R20 interior walls	
	R-22	+ R40 roof	
		Air sealing	
	Single, wood	Storm windows	
Mechanical	VRF heating and cooling	VRF heating and cooling	$94,000
	Heat recovery ventilation	Heat recovery ventilation	
	Electric water	Low-flow fixtures	
Electrical	LED (30% reduction)	30% lower lighting power density	$10,000
	Occupancy sensors	Occupancy and daylight sensors	

* costs and benefits compared to "good" over a 20 year timeframe

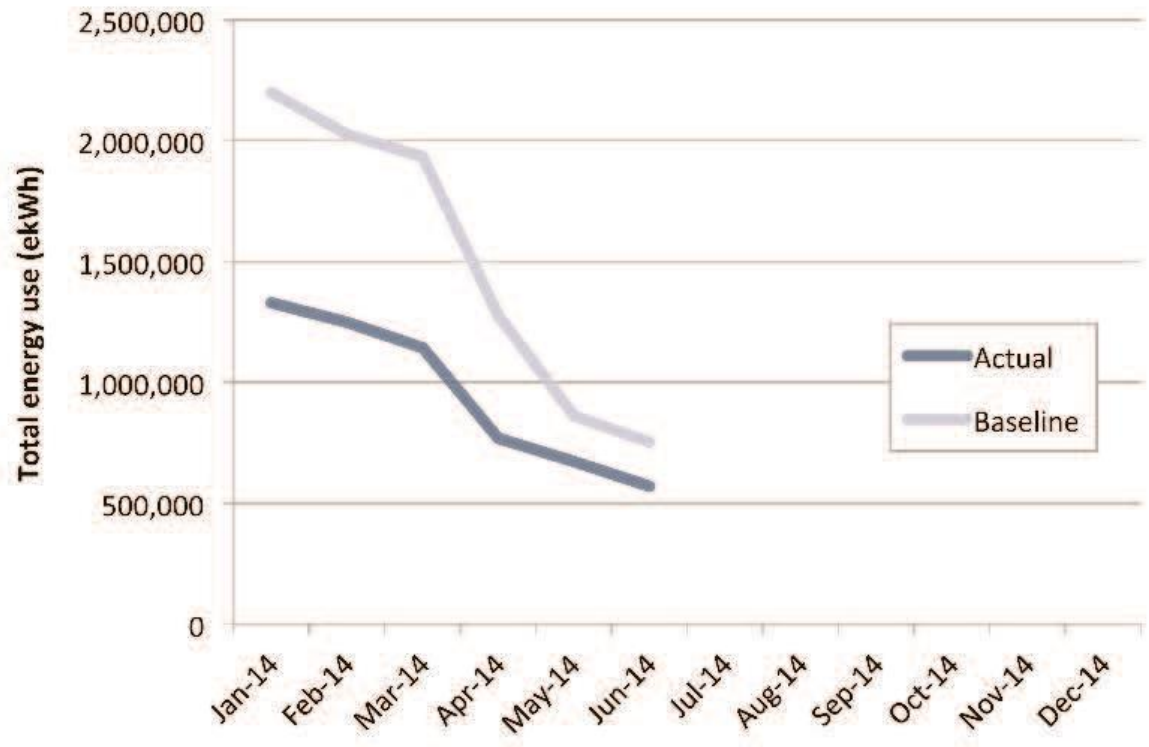
Case Study 2 – Large Office

Case Study 2 – Benefits

- → New asset class (B to A)
- → Increased leasable floor area
- → Aesthetics and comfort
- → 36% energy reduction
- → $0.5M savings per year
- → LEED gold
- → Award winning

By the numbers

The chart below, applied to the building at 77 Bloor Street West in Toronto, examines energy savings. Essentially, the Baseline (light blue) shows how much energy the building would have used, the Actual (dark blue) shows how much it did use after a retrofit. The improvement (and the savings) are the difference in between.



Source: Ledcor Renew

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Case Study 2 – Upgrades

→Mechanical upgrades

- → Variable air volume + controls
- → Saved (“repatriated”) floor space

→Windows: single to double low-E

→Lighting

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Case Study 2 - Economics

→ Target rate of return (IRR 9%)

  → They have achieved better

→ Ledcor provided “energy guarantee” for 10 years to address risk to owner

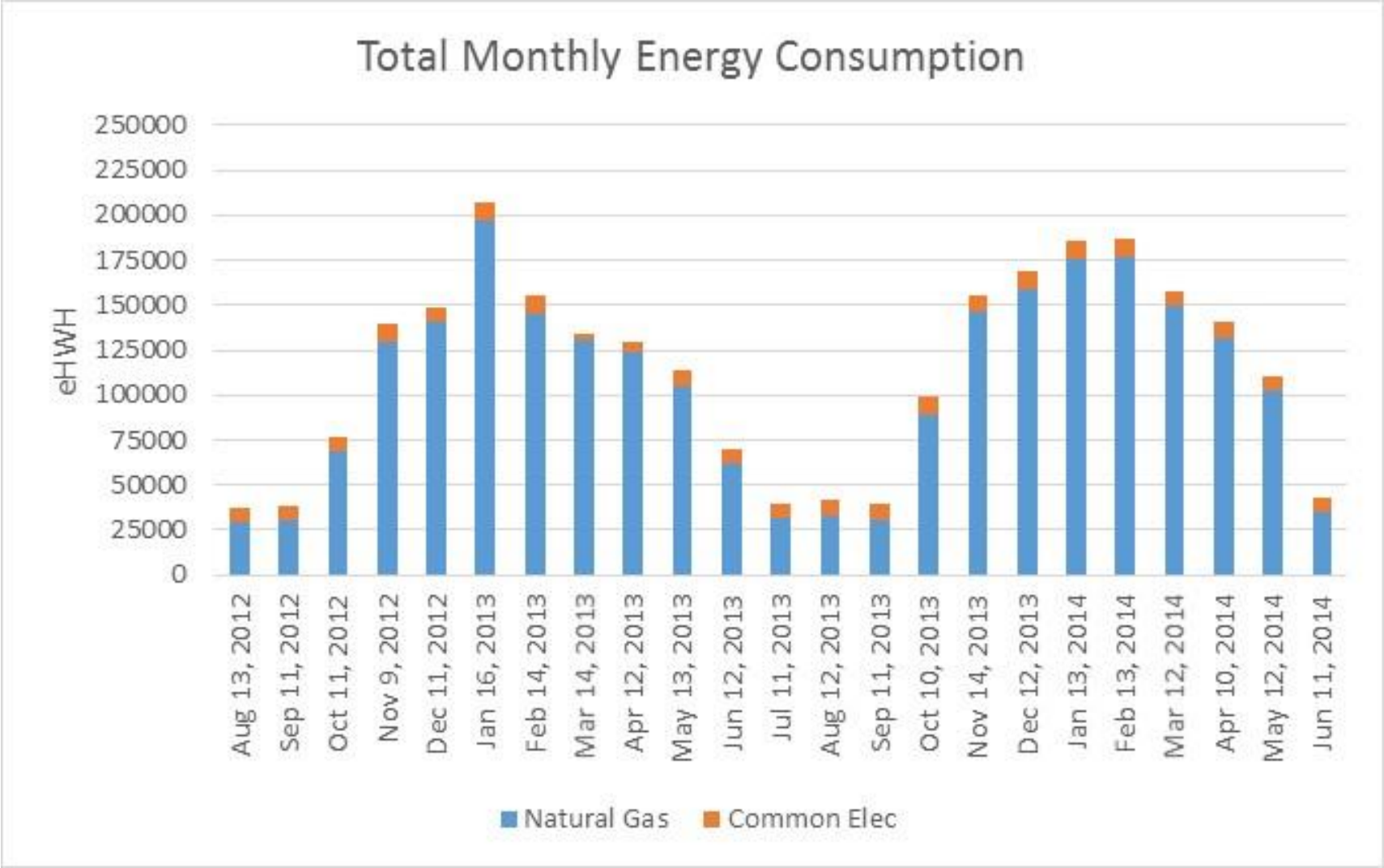
→ Accessed regular capital sources

→ Calibrated energy modelling

→ Measurement and verification (IPMVP Option C)

Case Study 3 – Rental Apartment

Case Study 3 – Rental Apartment



Average 300 kWh/m2; $78,000 per year

Case Study 3 – Rental Apartment: Upgrades

	Pre-Retrofit		Nominal		Improved		Intensive	
	Description	R-value	Description	R-value	Description	R-value	Description	R-value
Above Grade Walls	Concealed stucco, 2" FG Batt	6	Concealed stucco, 2" FG Batt	11	R13 + 2" mineral fibre continuous insulation	17.6	R13 Split with 4" MFI ci	25.2
Windows	Single-pane aluminum (ASHRAE ID 1)	0.8	Double IGU in Vinyl (ASHRAE ID 17)	2.4	Double glazed, low-E, argon (ASHRAE ID 23)	3.2	Triple glazed (ASHRAE ID 43)	4.6
Roof	3.5" Batt between joists	14	No Improvement	14	2" EPS + 2" of mineral fibre	38	4" PIC + 2" avg tapered PIC	50

→ New boilers

→ Updated ventilation system

Case Study 3 – Rental Apartment: Economics

	Baseline		Savings			
	Annual gas consumption, ekWh	Annual gas cost, $	Annual $ savings	Annual % gas cost savings	Total incremental cost	ROI on total increment
Baseline	1,227,926	$66,632				
Essential Upgrade (windows, walls, roof)			$24,476	36.7%	-	
Option 1 Package (Essential + 2" continuous wall insulation)			$26,640	40.0%	$138,089	1.6%
Option 2 Package (Essential + 2" continuous wall insulation, + 2" roof insulation)			$28,167	42.3%	$202,089	1.8%
Boiler Upgrade			$9,995	15.0%	$73,200	13.7%
~~Option 1 Package + Boiler~~			~~$36,634~~	~~55.0%~~	~~$211,289~~	~~5.8%~~
Option 2 Package + Boiler			$38,162	57.3%	$275,289	5.0%

→ Post-retrofit performance to be confirmed via CMHC sponsored measurement and verification study

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Linking to BOMA BESt®

BOMA BESt V3	2030 District Components
Accessing energy bills (uTrack)	Same as BOMA BESt
Energy benchmarking in software	ENERGY STAR
BOMA BESt audit	Opportunity Assessment
Online registration	
Scoring	Targeted energy reductions
Third party certification	Not required

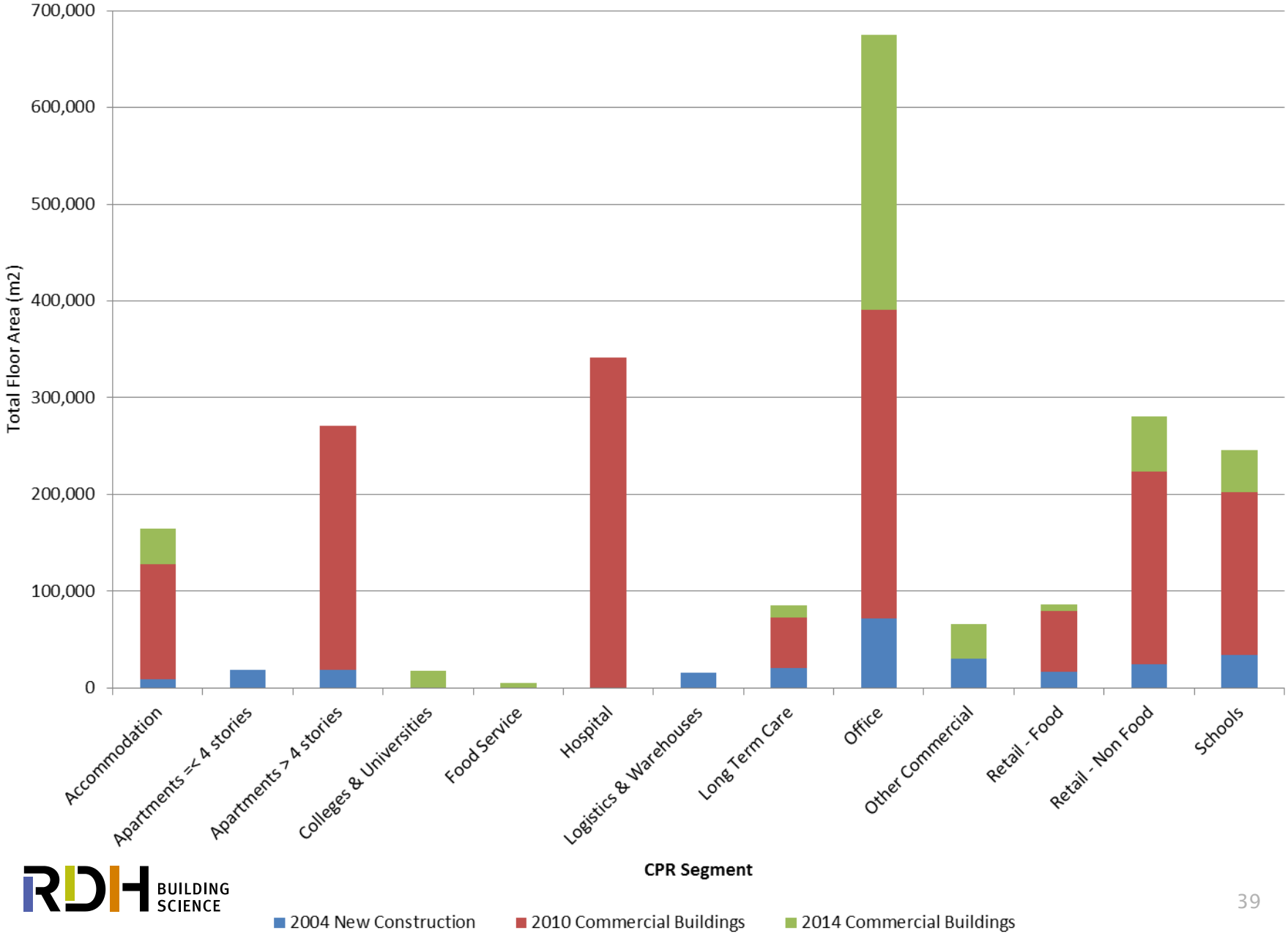
BOMA BESt® results

Type	Provincial Average EUI	20% reduction	BOMA BESt Average*
Office	370	296	269
Retail	356	285	257
Retail (food)	1,196	957	890**
Other commercial	643	541	N/A
Apartment (> 4 storeys)	242	194	149
Apartment (≤ 4 storeys)	467	374	N/A
Accommodation	411	329	N/A

* from 2015 BOMA BESt® National Green Building Report for British Columbia (and project source)

** open air retail

Provincial Average Buildings Source



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Options

→ Review internal alignment of BOMA BESt buildings with 2030 District

→ 3+ Property owners and managers to volunteer

→ Launch District Phase 2

→ Identify appropriate buildings

→ Define 2030 District boundary

→ Seek alignment with relevant local governments

→ Capital region as pilot project for BOMA-BC provincial effort

Discussion + Questions

FOR FURTHER INFORMATION PLEASE VISIT

→ www.rdh.com

→ www.buildingsciencelabs.com

OR CONTACT US AT

→ apapesalmon@rdh.com

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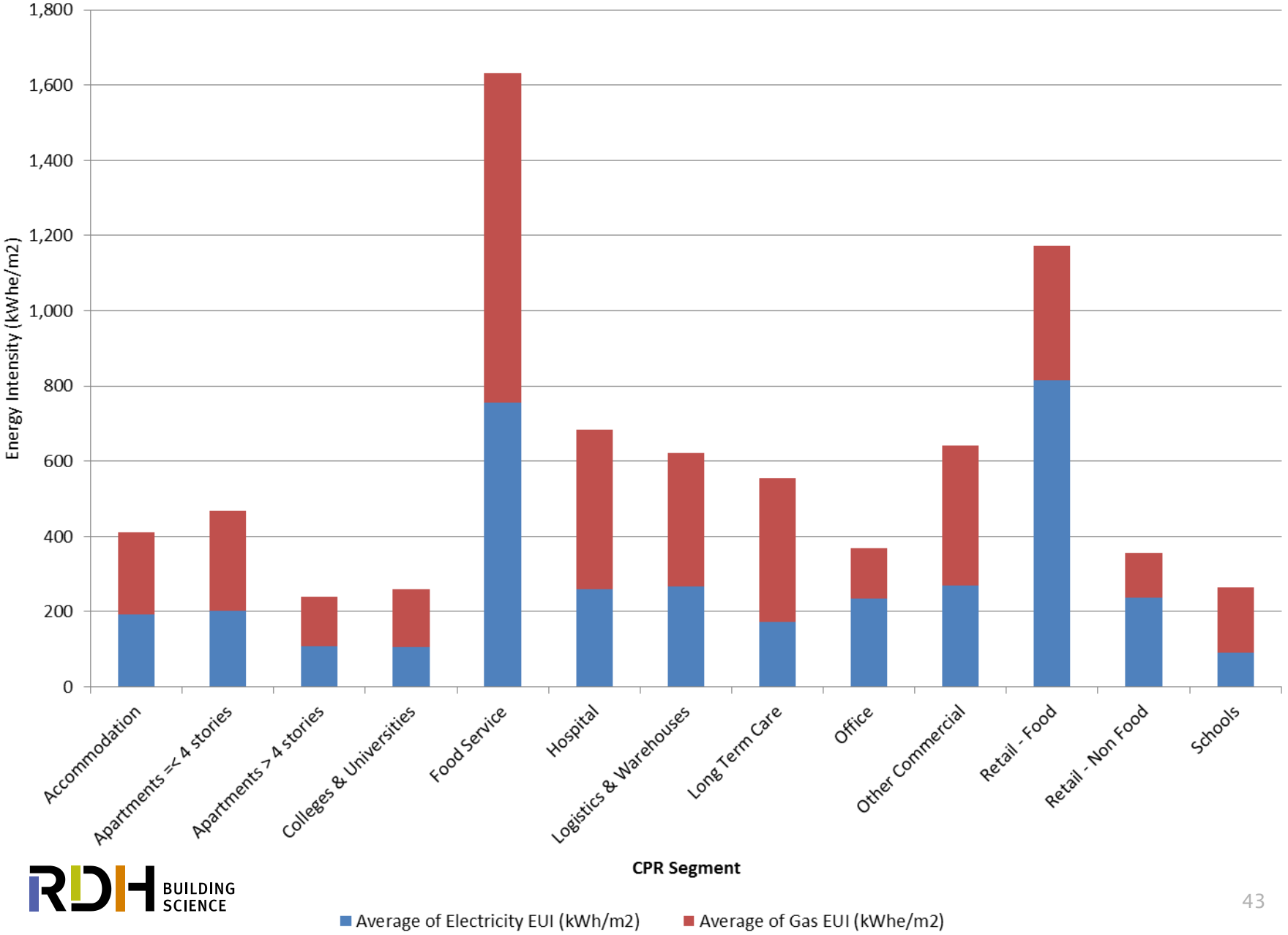
BC Average Consumption



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Average Base Consumption (kWh/m^2)

Type	Median EUI	Average EUI	# of blds
Office	318	370	140
Retail	284	356	63
Retail (food)	942	1,196	43
Other commercial	475	643	81
Apartment (> 4 storeys)	218	242	21
Apartment (≤ 5 storeys)	471	467	7
Accommodation	424	411	53