


# A Gap Analysis of the Literature on Energy-Saving Behaviours in the Commercial Sector

Matt Chester  
[mchester@seechangeinstitute.com](mailto:mchester@seechangeinstitute.com)



A composite image showing the Earth from space, with the International Space Station (ISS) visible on the right side. The station's complex structure, including solar panels and modules, is clearly visible against the dark background of space. The Earth's surface shows a mix of blue oceans, green landmasses, and white clouds. The text is overlaid in the center, providing a message about the role of research.

We believe the role of research is  
not only to better understand the  
world but also to improve it.

# Our Clients and Partners





# Study Authors



**Matt Chester**



**Dr. Beth Karlin**



**Dr. Sea Rotmann**

Full study available on request  
[bkarlin@seechangeinstitute.com](mailto:bkarlin@seechangeinstitute.com)



# Study Goals

BC Hydro and Fortis BC engaged See Change Institute with the goals to:



1. Assess needs / opportunities for enhancing energy efficiency in commercial sector
2. Develop an energy savings tip library for utility program and commercial energy managers.



# Study Goals

BC Hydro and Fortis BC engaged See Change Institute with the goals to:



- 1. Assess needs / opportunities for enhancing energy efficiency in commercial sector*
2. Develop energy savings tip library for utility program and commercial energy managers.



# Research Question

*Assess needs / opportunities for enhancing energy efficiency  
in commercial sector*



Research Question: Why are there fewer resources & studies promoting commercial efficiency behaviors? What's needed to fix that?

# Methodology

## Literature Review

- Keyword searches
- Academic backward/forward searches
- Direct expert outreach

Commercial Sub-Sector	# of Documents
General Commercial Sector	40
Office Environment	16
Lodging & Hospitality	8
Restaurants	8
Hospitals	8
Schools	8
Retail	6
Warehouses	3



[illegible]

Behaviour	Fuel source		Renter vs. owner				
	Gas	Electricity	Renter	Owner	Education	Food sales	Food service
Maintain boiler steam traps by checking for leaks and making repairs, as needed							
Clean both the fire side and the water side of boiler tubes							
Periodically check the air-fuel ratio to identify inefficiencies in the combustion process							
Periodically reset the boiler pressure to the minimum necessary pressure							
Assess feedwater and blowdown rates to help remove dissolved solids that might otherwise damage equipment and waste energy.							
Remove scale from the boiler heat-exchange surfaces							
Install a combustion monitoring and control system for your boiler							
Install temperature/pressure reset controls to reset the temperature/pressure in your boiler based on outdoor temperature.							
Install controls to set back supply temperature during unoccupied hours							
Install an automatic blowdown control system to help remove dissolved solids that can damage equipment							

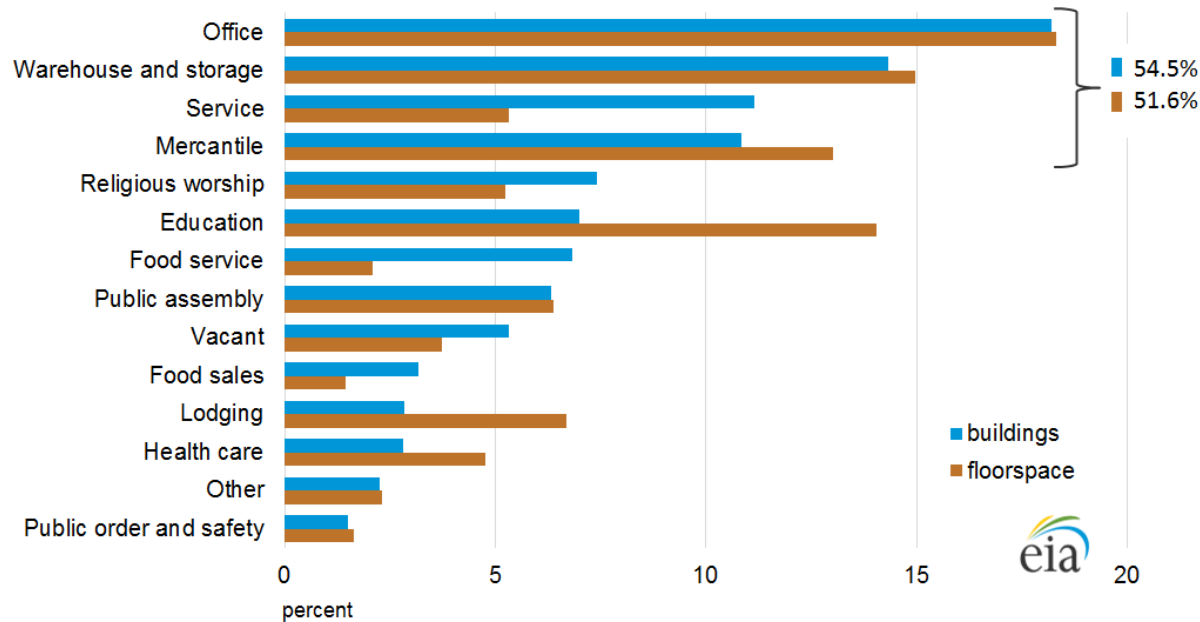
# Key Findings

1. Overgeneralization of commercial building sector
2. Overrepresentation of research on office buildings
3. Focus on technology, lack of behavioral actions



# Overgeneralization of Commercial Building Sector

Figure 10. Office, warehouse and storage, service, and mercantile buildings are the most prevalent building types, accounting for more than half of the total buildings and the total commercial floorspace

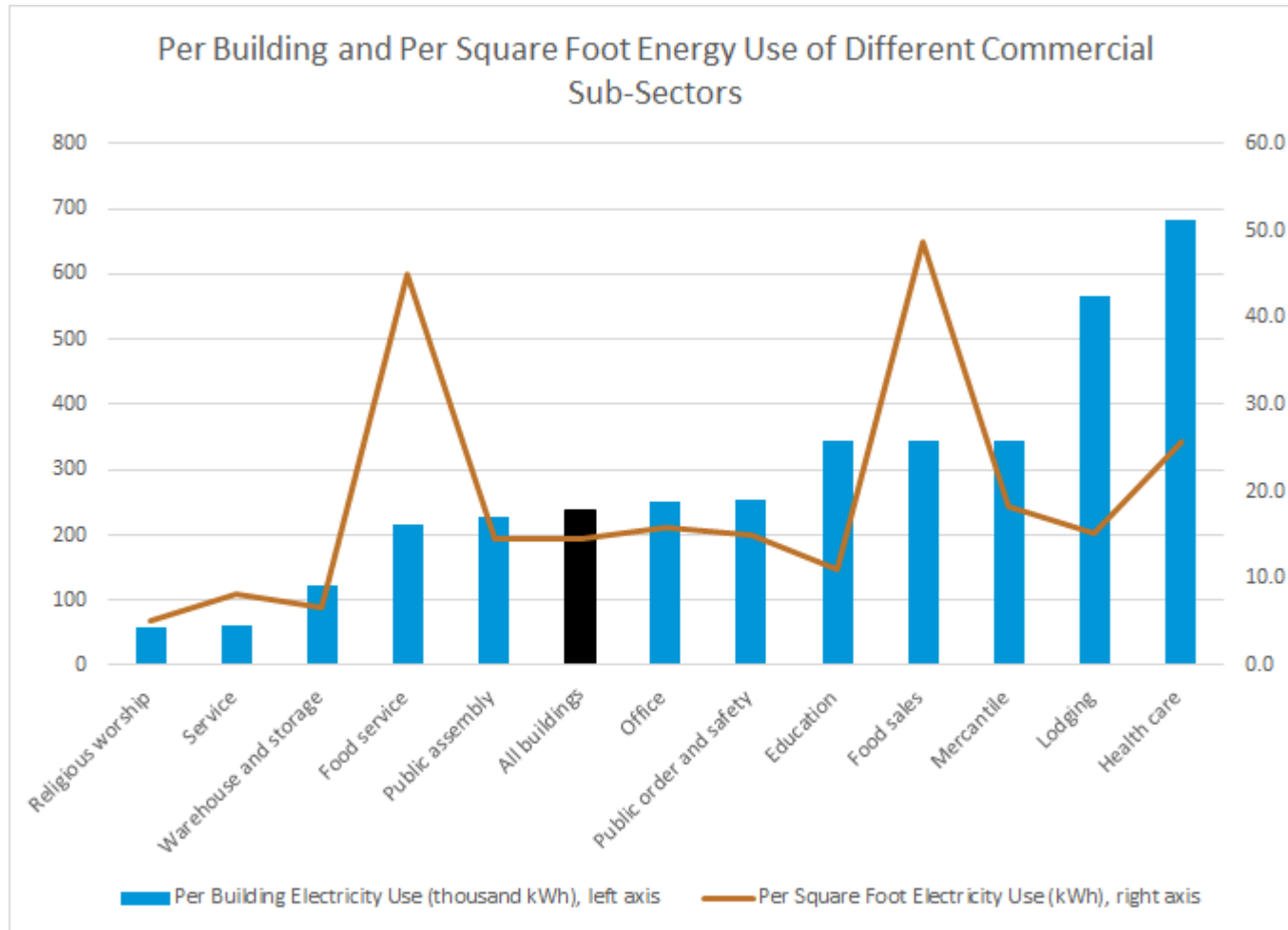


Source: U.S. Energy Information Administration, 2012 Commercial Buildings Energy Consumption Survey

*“One evident trend was the tendency to treat the commercial sector as a single, homogeneous entity. The diversity of the commercial sector and even the sub-sectors (e.g., fine dining will have different opportunities than fast food) makes it difficult to touch on all commercial building types at once.”*

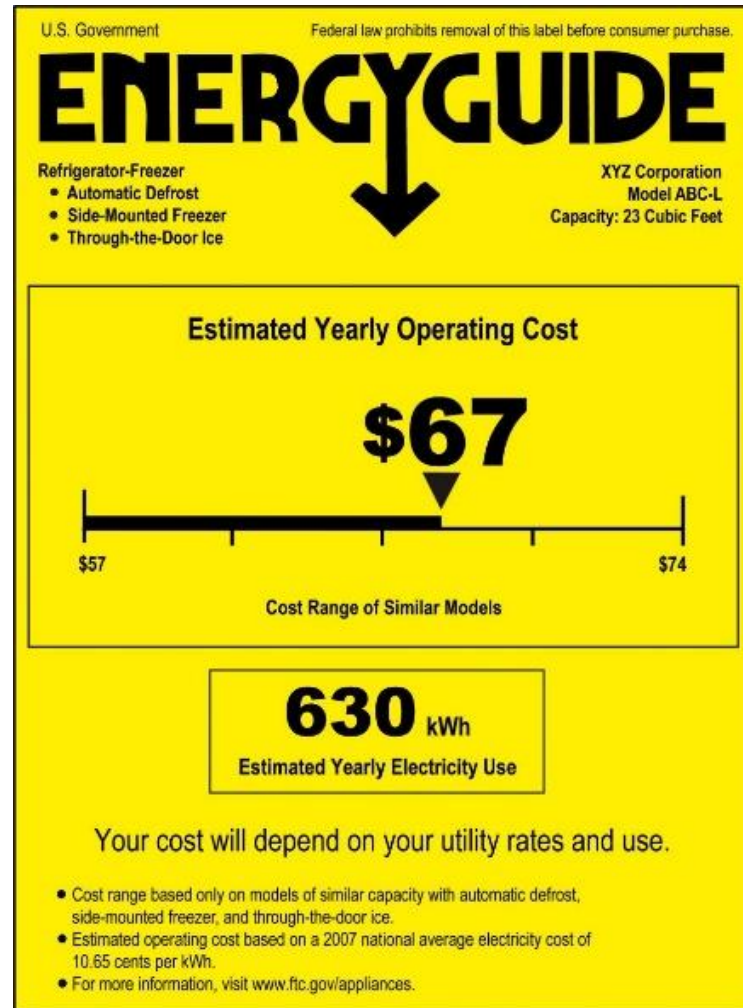


# Overrepresentation of Research on Office Buildings



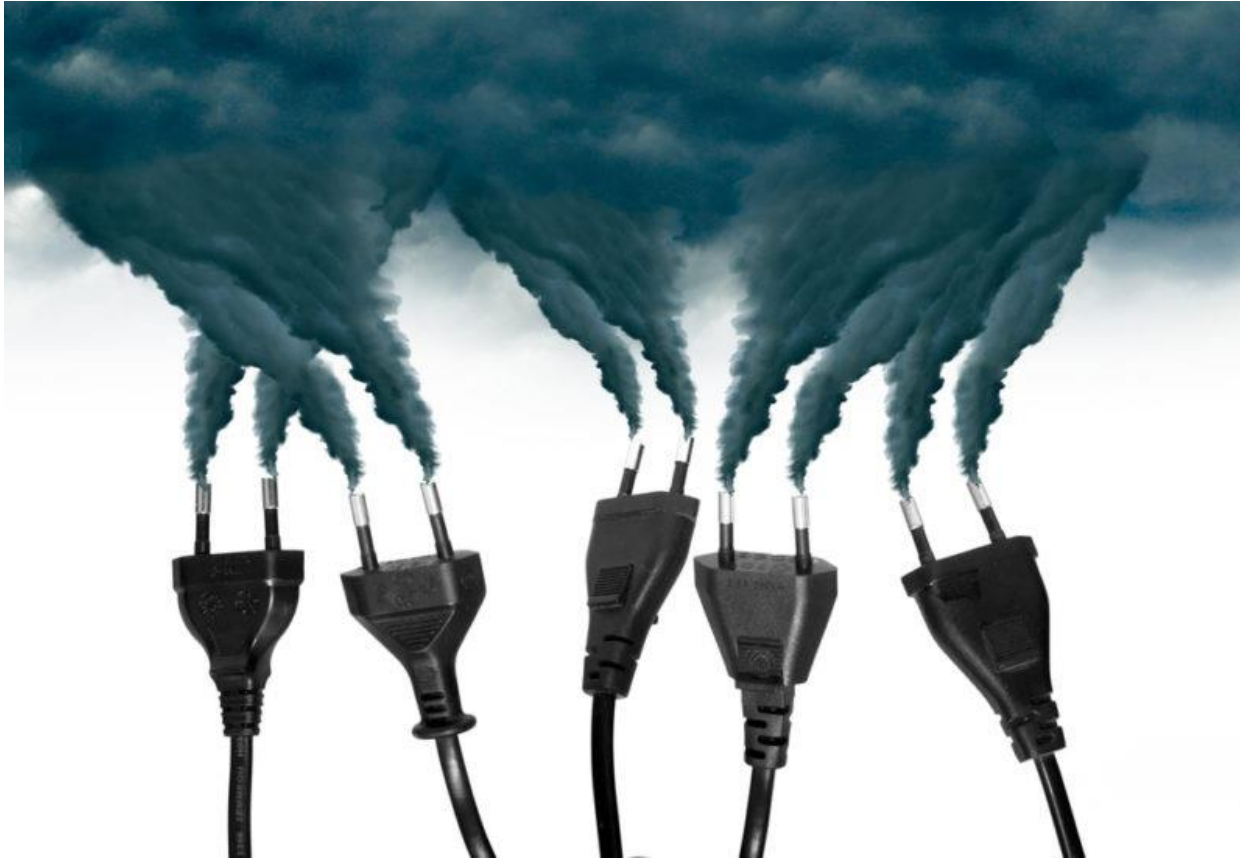
*“When available literature did drill down into specifics, most papers focused solely on office buildings. While office buildings are ubiquitous and have many opportunities for energy-saving interventions, this focus overshadows significant opportunities that can be achieved in other commercial sub-sectors.”*

# Focus on Technology, Lack of Behavioral Actions



*“When discussing specific ESBs, available literature tended to focus on upgrading or retrofitting equipment and didn’t dive into less obvious but just-as-critical energy-saving opportunities. The literature tended to overlook the opportunity for maintenance and curtailment behaviours, which are much less capital-intensive and can be implemented in between purchasing cycles”*

# Implications of These Shortcomings



- Low-hanging fruit being missed
- Inefficient allocation of energy and costs
- Research into commercial sector behaviors remains underfunded

# Our Recommendations



Additional research to fill in the gaps we've identified



Investment in sub-sector specific research



Encourage information-sharing among energy managers in these spaces



Target specific behaviors, not just generalised technologies or energy services



Don't delay



# Thank You!

Full study available on request - [bkarlin@seechangeinstitute.com](mailto:bkarlin@seechangeinstitute.com)

Matt Chester  
[mchester@seechangeinstitute.com](mailto:mchester@seechangeinstitute.com)