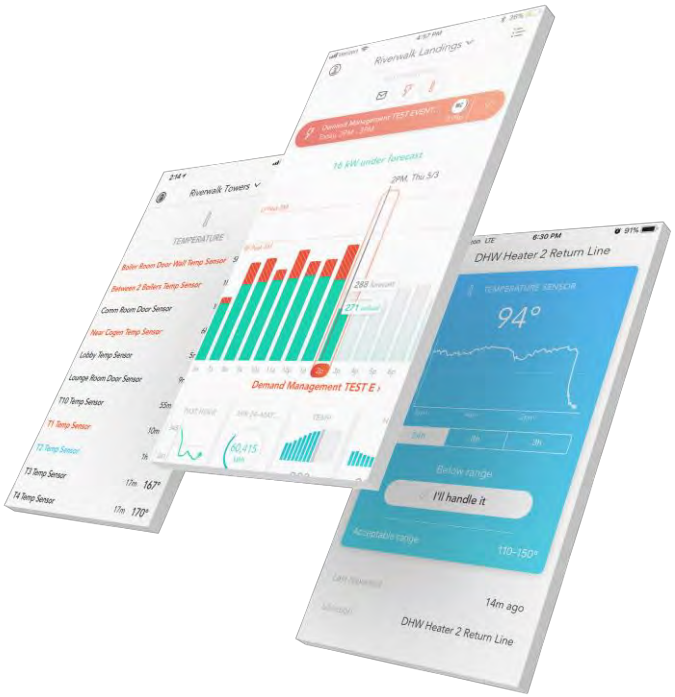
LOGICAL BUILDINGS

Who Me, a High Energy User? A Deep Dive into Tenant Energy Use in Multifamily Buildings



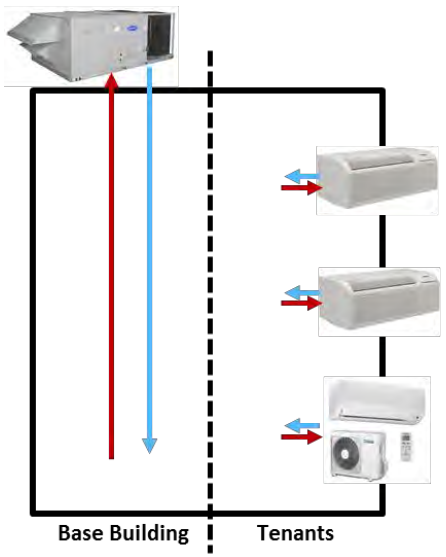
Building Energy NYC
October 4, 2018

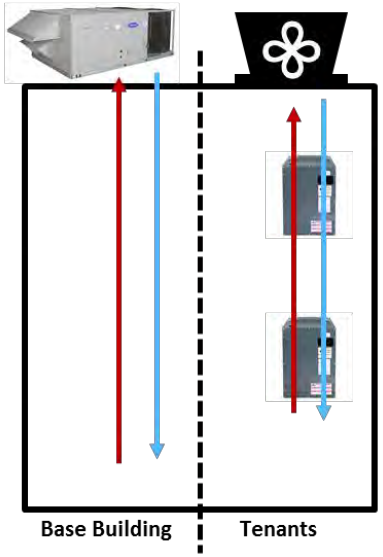
Goal: Understand the Electricity Usage Split Between **"Base Building"** and **"Tenants"** in Multifamily Building Types

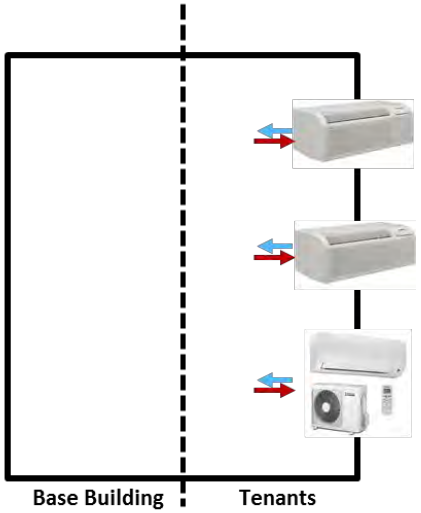
Data Set:

- 22 large Multifamily buildings throughout New York City
- Varying building systems, size, age, and demographics
- All direct metered to tenants
- All market rate rentals
- 2017 Calendar year

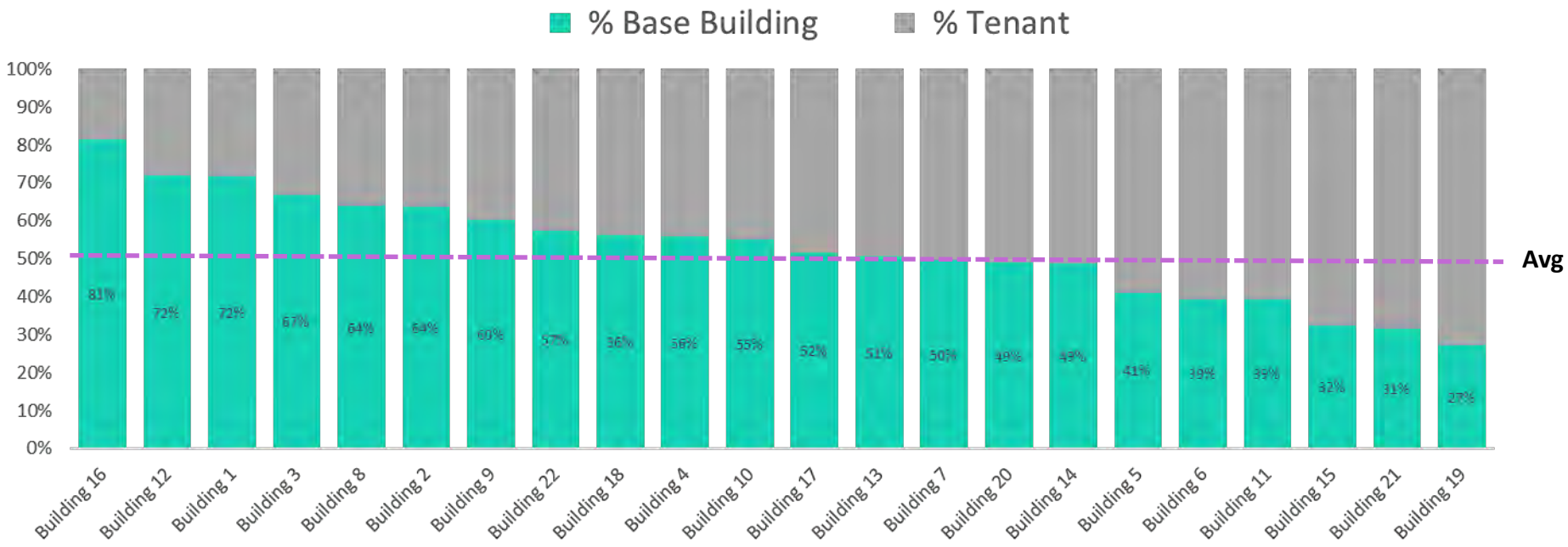
	Building Type 1	Building Type 2	Building Type 3
	"Central Cooling + Splits/PTACs"	"Central Cooling + Heat Pump /Cooling Tower"	"No Central Cooling + Splits/PTACs"
Hallway HVAC	RTU's	RTU's	None
Tenant / Amenity HVAC	Splits/PTAC	Heat Pump/Cooling Tower	Splits/PTAC
# of Buildings	14	6	2
Avg Size (sqft)	440,000	470,000	370,000





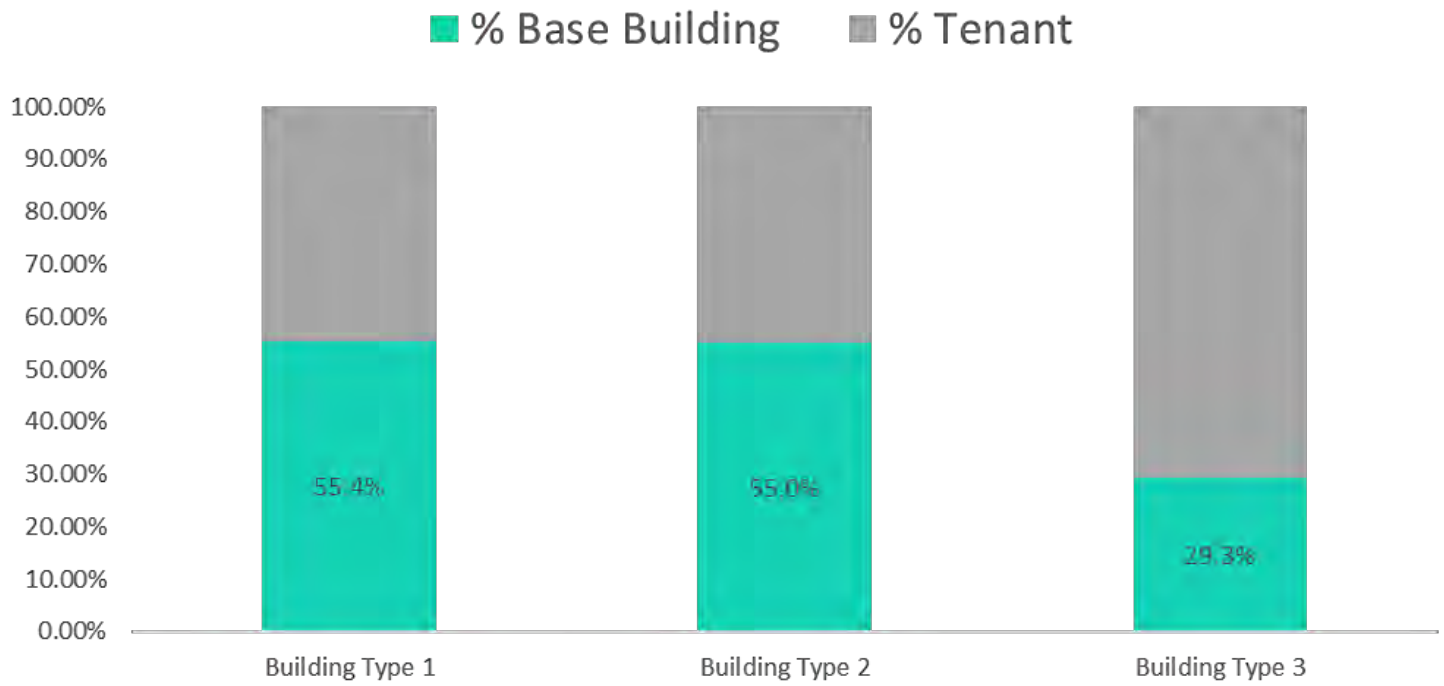


Base Building to Tenant Electricity Usage in Multifamily Buildings is ~50% to 50%



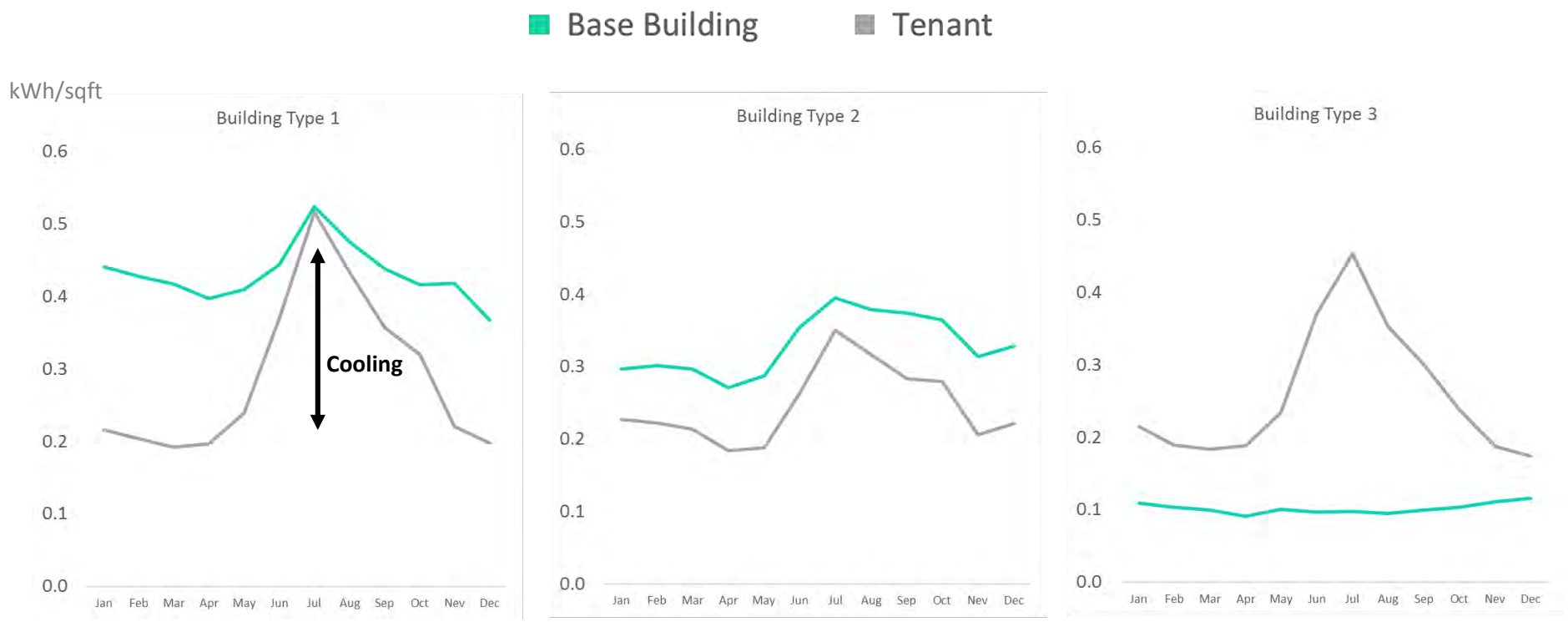
- "Base Building" represents all of equipment that is measured on the house meter (elevator, pumps, common area HVAC, etc.) and is classified as Con Edison **Service Class 9 "SC9"**
- "Tenant" represents all residential usage (anything that the tenant is metered for and pays for directly) and is classified under Con Edison **Service Class 1 "SC1"**

In Buildings with Central Cooling Systems, the Base Building Uses ~55% of the Entire **Building's** Electricity Usage, vs just ~29% for Buildings without Central Cooling



Building Type	Hallway HVAC	Tenant / Amenity HVAC	# of Buildings
1	RTU's	Splits/PTAC	14
2	RTU's	Heat Pump/Cooling Tower	6
3	None	Splits/PTAC	2

Seasonal Electricity Usage Profiles of Various Building Types (kWh/sqft)



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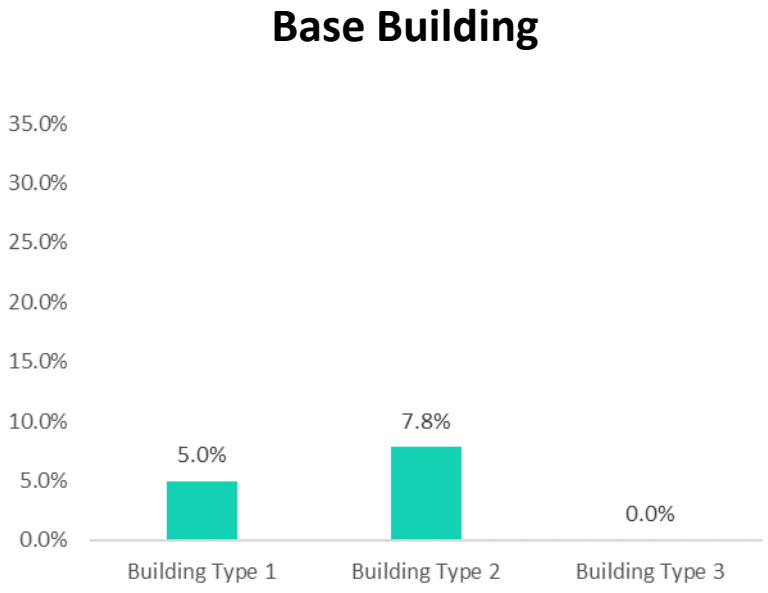
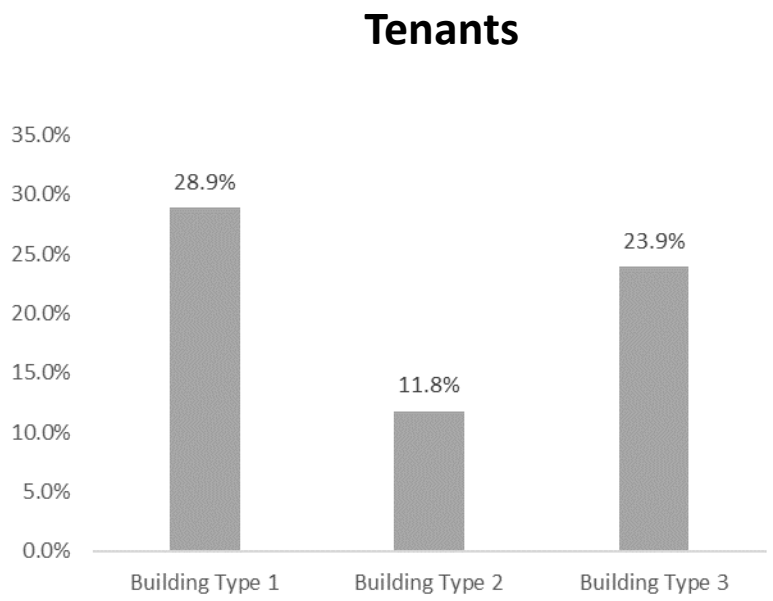
Cooling Electricity Usage as a Percent of Total Electricity Usage (Base Building vs Tenant)





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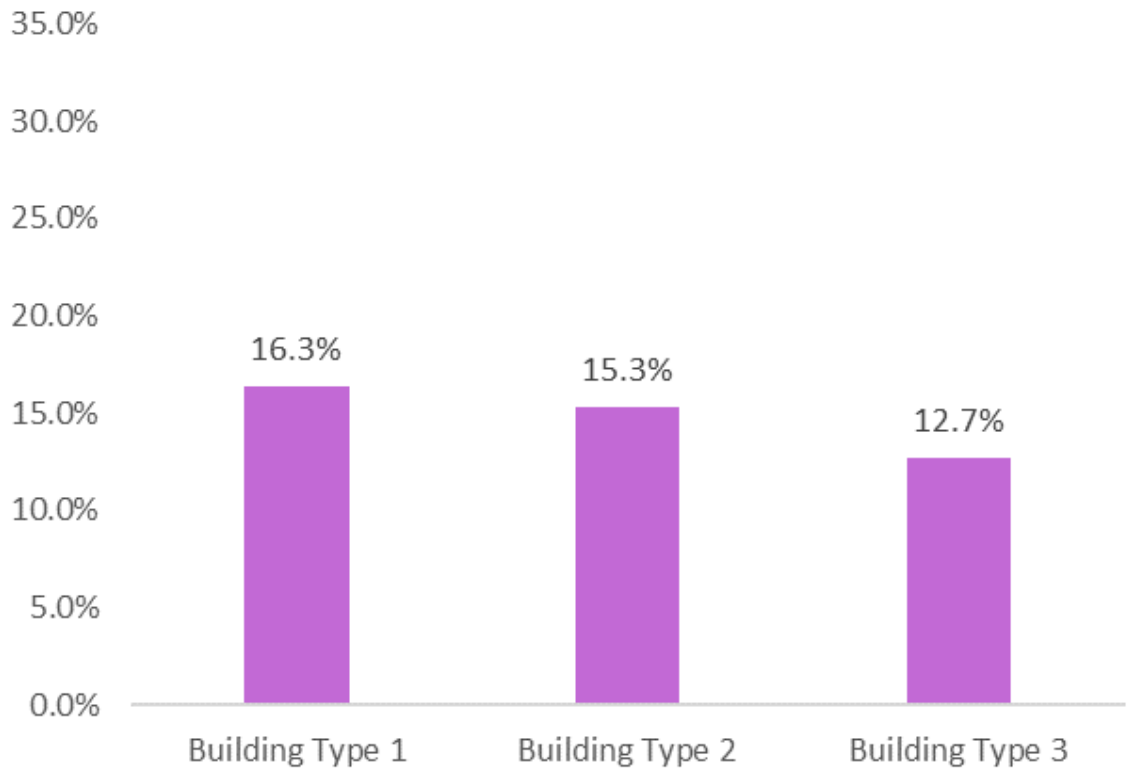
Cooling Electricity Usage as a Percent of Total Electricity Usage (Whole Buildings)



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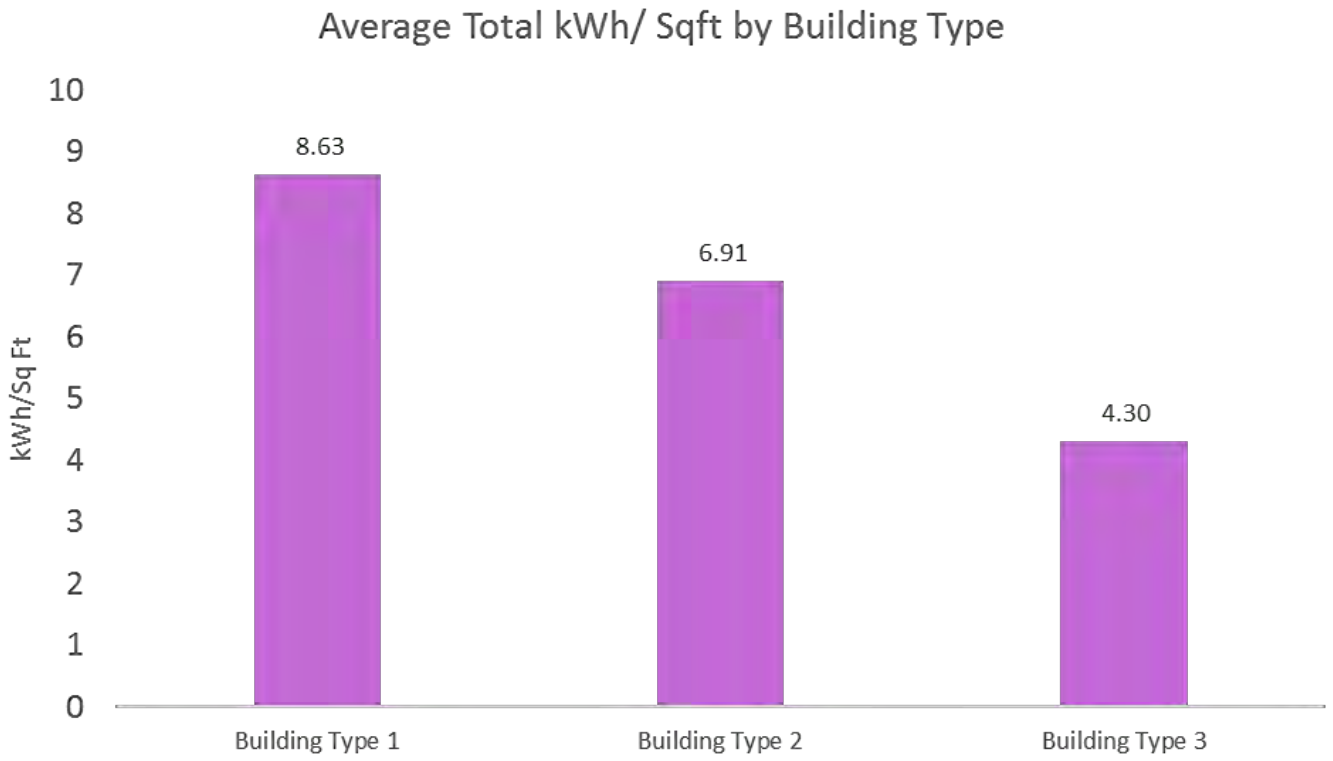
Buildings With Heat Pumps/Cooling Towers Are More Electrically Efficient Than Buildings With Splits/PTAC



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Takeaways

1. Base building to tenant electricity usage in multifamily buildings is ~50% to 50% (~55% in buildings with central cooling, ~30% for building without central cooling)
2. Centralized water-sourced heat pump / cooling tower configurations are more efficient than isolated tenant PTACs for cooling
3. Cooling accounts for ~15% of electricity usage in multifamily buildings
4. There is significant opportunity to implement Energy Conservation Measures in multifamily buildings

Questions

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