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GLOBAL ENGINEERING &
INTEGRATED DESIGN SERVICES

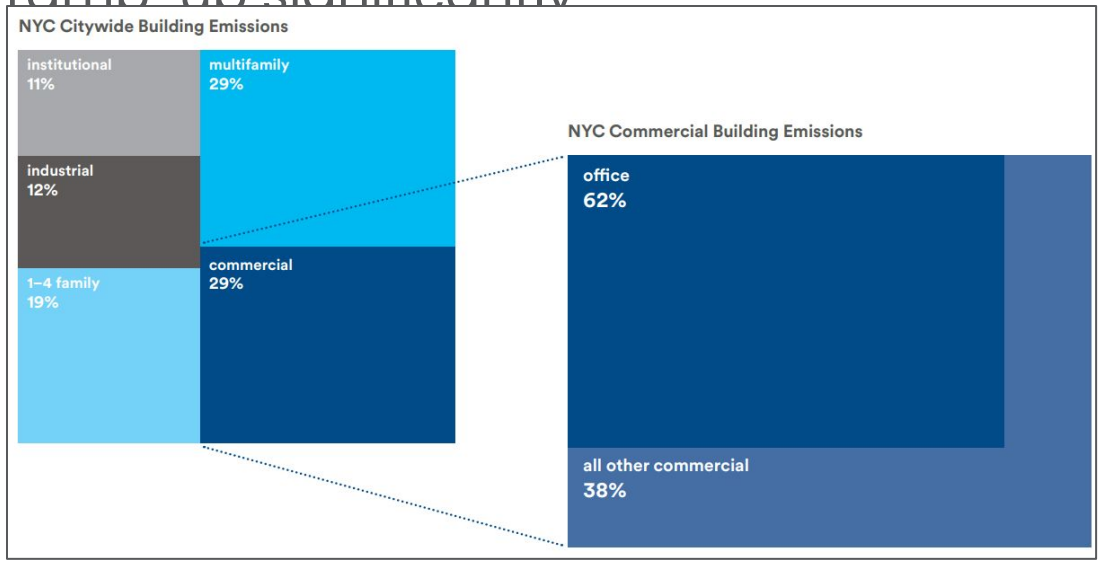
AEG Net-Zero Building Summit

Building Challenge – Heat Pump Deployment

4/20/2023

CHALLENGE FRAMING

- The implementation of electrification strategies in the Class A and B commercial office building market needs to ramp-up significantly



Source: BEEX "Turning Data into Action Office Buildings" (2023)

CHALLENGE FRAMING

- The “NYC Carbon Neutral Roadmap Report” identified 18,700 buildings/year (best case scenario) need to electrify annually between 2020 – 2050 to achieve 80x50.
- Within those 18,7000 buildings commercial office buildings account for 1 Billion Square Feet.

TABLE 4: KEY BUILDINGS AND INDUSTRIAL SECTOR FINDINGS FROM THE PATHWAYS MODELING

	Electrification	Low Carbon Fuels	Diversified
The scale and pace of energy efficiency and electrification retrofits is high.			
Proportion of buildings electrifying space heating and hot water systems by 2050 (percentage of gross square footage)	59%	31%	62%
Average number of buildings electrifying each year (2020-2050)	18,700	10,700	19,800
Number of buildings electrifying by 2050	607,000	340,000	642,000
Percentage of buildings adopting at least Tier 1 energy efficiency upgrades by 2050	87%	88%	92%
Average number of buildings implementing only Tier 1 energy efficiency upgrades each year (2020-2050)	11,700	16,200	10,500
Average number of buildings implementing Tier 1 + more significant energy efficiency upgrades each year (2020-2050)	27,500	27,400	28,900
Number of buildings implementing energy efficiency measures by 2050	909,000	910,000	958,000

Source: NYC Carbon Neutral Roadmap Report (2021)

CHALLENGE FRAMING

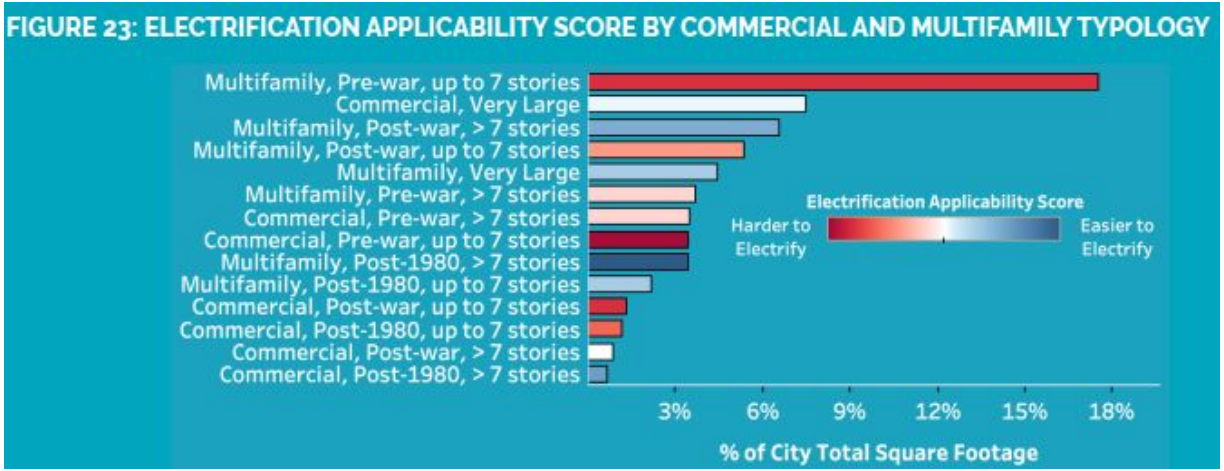
- Class A Commercial office buildings owners are still in the early phases of reviewing decarbonization plans.
- Class B is further behind

	Office Building Type	# Buildings	% Total Buildings Count	% Total Office Gross Floor Area	% Total Office GHG Emissions
1	Central Chiller Systems with District Steam Heating	313	15%	26%	33%
2	Packaged Cooling Systems with Steam Heating	799	39%	30%	34%
3	Decentralized Cooling Systems with Hot Water Heating	102	5%	3%	4%
4	Decentralized Cooling Systems with Steam Heating	467	23%	12%	13%
	Unassigned Office (not in one of the above 4 typologies)	366	18%	29%	16%

Source: BEEX "Turning Data into Action Office Buildings" (2023)

OBSTACLES

- Its not easy to integrate electrification strategies.
- Its costly and is not easily adoptable as a capital improvement.



Source: NYC Carbon Neutral Roadmap Report

CLOSING STATEMENT

- Regarding building decarbonization and electrification, to achieve New York's Climate, Health and Equity goals, a critical obstacle to collectively overcome in 12 months is improved market intelligence to identify buildings with highest potential for heat pump integration.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