Climate Mobilization Act Series: All-Electric NYC Buildings

Join us for a discussion of New York City's latest advancements towards decarbonization, mandating all-electric new construction buildings, how these changes fold into state-level initiatives and building compliance pathways, and the implications of this leap in the city's decarbonization efforts for environmental justice, indoor air quality, and public health.

Opening Remarks Emily Dean, Director of Housing Decarbonization, NYSERDA

Moderator Sara Neff, Head of ESG, Lendlease

Speakers

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Jared Della Valle, Chief Executive Officer, Founder, Alloy Development Amie Gross, President, Amie Gross Architects Benjamin Rodney, Vice President of Construction, Hines

April 5, 2022 | 12 to 1:30 pm | 1.5 AIA LU|HSW Building Energy Exchange | be-exchange.org













100 Flatbush

is 100% all-electric with no gas connection.

Decarbonization





100 Flatbush Avenue All-Electric Skyscraper



Today gas is 37% less CO2 intensive than grid electricity*

100 Flatbush is already **20%** cleaner per btu of heat delivered to a space

By 2030, NYC and NY States grids will be interconnected and electric will be 200% cleaner than gas



Image courtesy Thorton Thomasetti

Alloy is investing an additional \$7MM to achieve carbon neutrality.

Costs To Pursue Carbon Neutral Performance

HARD COSTS	
Increased Electrical Vault	\$ 800,000
Increased Switchgear Capacity	300,000
Electric Boiler Premium	300,000
Facade Premium	2,200,000
ERV Premium	800,000
Lighting Control Premium	100,000
Induction Cooktop Premium	200,000
<u>6</u>	\$ 4,700,000
SOFT COSTS	
Architectural	\$ 500,000
Energy Modeling	300,000
Engineering	200,000
Commissioning	50,000
	\$ 1,050,000

Unique Operating Costs to Pursue Carbon Neutral Performance

Year	Нуы	rid Gas & Electric Utility Expenses	All-Electric Utility Expenses	All-Electric Premium
2024	\$	388,000	\$ 502,000	\$ 114,000
2025		418,000	540,000	122,000
2026		449,000	580,000	131,000
2027		483,000	623,000	140,000
2028		519,000	670,000	151,000
2029		558,000	721,000	163,000
2030		600,000	775,000	175,000
2031		645,000	833,000	188,000
2032		693,000	895,000	202,000
2033		745,000	962,000	217,000
2034		801,000	1,034,000	233,000
2035		861,000	1,112,000	251,000
10 Year NPV	\$	4,759,000	\$ 6,146,000	\$ 1,387,000

Investing \$5.8MM up front to lose \$1.4MM per year makes no sense.

Costs To Pursue Carbon Neutral Performance

1	\$ 4,700,000	\$1,600,000
Induction Cooktop Premium	200,000	
Lighting Control Premium	 100,000	
ERV Premium	800,000	
Facade Premium	2,200,000	
Electric Boiler Premium	300,000	
Increased Switchgear Capacity	300,000	
Increased Electrical Vault	\$ 800,000	
HARD COSTS		

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SOFT COSTS

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Engineering	000.000
	200,000
Commissioning	50,000

True Up Front Cost of Carbon Neutral Performance

Unique Operating Costs to Pursue Carbon Neutral Performance				Operating Co	Operating Costs inclusive of LL97 incentives		
Year	Hybr	id Gas & Electric Utility Expenses		All-Electric Utility Expenses	LL97 (Inclus	All-Electric Utility Expenses Incentive Credit ive of Incentive)	
2024	\$	388,000	\$	502,000	\$	204,000	
2025		418,000		540,000		242,000	
2026		449,000		580,000		282,000	
2027		483,000		623,000		325,000	
2028		519,000		670,0 0 0		372,000	
2029		558,000		721,000		423,000	
2030		600,000		775000		477,000	
2031		645,000		831,000		595,000	
2032		693,000		895,000		657,000	
2033		745,000		9 <mark>62,000</mark>		724,000	
2034		801,000		1034,000		796,000	
2035		861,000		1,112,000		874,000	
10 Year NPV	\$	4,759,000	\$	6,146,000	\$	3,816,000	\$94 3,000

Operating Costs inclusive of LL97 Incentives*

*Key Assumptions

Utility rates escalate 2X faster for gas than electric 2030 LL97 Greenhouse Gas Coefficient (the 'Source to Site' factor) reflects a 15% carbon efficiency improvement in the grid per year

Investing \$1.6MM up front to save \$900M per year makes sense.

"Sustainable, inclusive residences are the future of New York City, and we are proud to invest in the Alloy Block's allelectric, mixed-income, mixed-use tower that will become the new model for environmentally-conscious urban living,"

- Alfred Trivilino, Managing Director, Related Fund Management

"This project underscores Ares' commitment to corporate sustainability by investing in public-private partnership opportunities that generate positive environmental and social impact. We are excited to be part of this great project as we work to realize the important benefits for all stakeholders involved."

- Andrew Holm, Partner in the Ares Real Estate Group



HUDSON HILL



BRIGHT POWER

AN LOSS

HUDSON HILL









SUSTAINABILITY DIAGRAM







ROOF PHOTOVOLTAICPLAN









EAST-WEST BUILDING SECTION



EXISTING GRADE





A M I E G R O S S A R C H I T E C T S

SECTION DETAILS

A M I E G R O S S A R C H I T E C T S









HUDSON SQUARE PROPERTIES

April 5, 2022

Hudson Square

Sustainable Development

Climate Mobilization Act Series:

All Electric NYC Buildings

Building Energy Exchange



TEAM





How do we marry a new development up to an existing 1930's building?

555 Greenwich New Development







345 Hudson | 900k SF | 17 Floors | 1930's Vintage

345 FEATURES



Natural Gas Boilers



Steam Heating



Floor Level Packaged Units

555 FEATURES







THE CLIMATE PROBLEM STATEMENT

Follow the science and bend the curve, the science is ever increasing in certainty





REAL ESTATE'S RESPONSIBILITY

Real estate has one of the highest global footprints alongside transportation, oil and gas



WASTED ENERGY

Indicative of other parts of the world, US Energy waste is as high as 67%

Estimated U.S. Energy Consumption in 2019: 100.2 Quads



GLOBAL COLLABORATION

Without global collaboration we will fall short of our goals by 40 years. Hines has taken a position to collaborate with sustainability leaders in the industry to pave the path forward for real estate.

GLOBAL ENERGY-RELATED CO_2 EMISSIONS



EU TECHBRIDGE

Urban Tech Sweden









Sources : IEA, Net Zero by 2050, July 2021

555G PROCESS DEVELOPMENT/COLLABORATION



- Iterative approach
- Started with developing a new building. Connection to 345 Hudson came later
- Existing constraints helped drive solutions and open doors to different ideas

SECTOR COLLABORATION

We must also collaborate across sectors in a triple helix model



HSP DECARBONIZATION PLAN

Process for decarbonization of new and existing assets



555 GREENWICH STREET, NYC

A low carbon approach can deliver strong financial returns

GEOTHERMAL PILES

Existing constraints helped drive the ultimate solutions





THERMALLY ACTIVE BUILDING

ELECTRIFICATION



Up to 6x more efficient

25% reduction

in electrical

consumption



heating + cooling

800,000

gallons of water

saved per year



Better indoor air quality

No fossil fuels burning / air pollution at site



45% carbon reduction from NYC

 $16^{0}/_{0}$ greater thermal

2030 targets





OPEX (15 years)

IRR on additional investment:

15.4%



C L I M A T E С \mathbb{R} 0

*Past performance does not guarantee future results. There is no guarantee future projects will achieve the same sustainability results.

555 GREENWICH STREET, NYC

A circular systems approach, keep the waste energy within the building





Radiant Short-Term Storage

Hot Water Chilled Water Same Energy Source Energy Transport CLIMATE MOBILIZATION NYC BUILDINGS

ΑCΤ ΒΕΕΣ

SERIE

ALL ELECTRIC 5,2022

Maximize energy recycling

345 HUDSON CIRCULAR SYSTEM APPROACH

Electrify heating, eliminate economizer and move to hydronic based systems Energy Arbitrage Loop



Remove fossil fuels and steam distribution and use the natural diversity and thermal storage within a building



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СВ

345 HUDSON SYSTEM BOUNDARIES

Electrify heating, eliminate economizer and move to hydronic based systems

HEATING ENERGY REDUCTION	71%	84%
COOLING ENERGY REDUCTION	30%	65%
COOLING LOAD REDUCTION	14%	69%
SYSTEM EFFICIENCY	300-400%	500-600%



Eliminating fossil fuels

immediately reduces demand, by moving towards hydronic based systems we can reduce heating and cooling energy by

60% - 80%

345 Deployment Plan

NOT EVERYTHING MUST BE DONE AT ONCE. COMPLETE IN NATURAL PROGRESSION OF TENANT TURNOVER



THE DEPLOYMENT PLAN

SYSTEM BOUNDARIES

CURRENT BUILDING ENERGY INFRASTRUCTURE



PIONEERING THE FUTURE: CARBON NEUTRALITY ROADMAP | 12

System Boundary 1 (SB1):

This includes the energy distribution to the space which is fully under tenant control. The landlord will incentivize this initiative through initial investments designed to meet tenants needs. Examples of typical equipment in this boundary include radiators, radiant panels, Variable Air Volume (VAV) boxes, Fan Coil Units (FCUs), chilled beams etc.

System Boundary 2 (SB2):

This includes the equipment which supplies energy to the tenant space (SB1). It is comprised of equipment on each floor and is supported by the building infrastructure. SB2 is commonly supplied & installed by the landlord. Examples of typical equipment in this boundary include Packaged Terminal Air Conditioner (PTAC), Air Handling Units (AHUs), Dedicated Outdoor Air system (DOAS), Hot water boiler etc.

System boundary 3 (SB3):

This is the building infrastructure, which the backbone of the entire energy supply. This is included in core & shell developments and fully under the landlord's control. Examples of typical equipment in this boundary include water cooled chillers, cooling towers, boiler plants, electrical substation, primary AHU, etc.

POTENTIAL TENANT OPTIONS IN PORTFOLIO

standard.



active beams that works

with high temperature

cooling

perimeter radiator to work with relative low temperatures

LIKELY OUTCOME FOR 345

SCIENTIFIC BASED OUTCOME 345 Hudson



CLCPA Met

(Existing stranded 2042 on 1.5 degree. Electrification net zero 2050)



(Existing stranded 2028 on 1.5 degree. Electrification stranded 2042)

Key Takeaways

- Maximizing each unit of energy before exporting to atmosphere will reduce the overall energy required
- Entire building must be thought of as the 'system' (Thermally active structures)
- Repeatable, scalable, flexible and cost-effective solutions (especially for existing buildings) are critical
- No one right answer to meet scientific targets
- Carbon reduction and implementation roadmaps for existing buildings are critical. Implementation can take place over several years or decades but must be generally thought out at the start

building energy exchange

Bank of Aniarius

discuss.

Submit questions via Zoom Q+A

Moderator Sara Neff, Head of ESG, Lendlease

Speakers Jared Della Valle, Chief Executive Officer, Founder, Alloy Development

Amie Gross, President, Amie Gross Architects

Benjamin Rodney, Vice President of Construction, Hines

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thank you.