

Taking Advantage of a District Energy System to Expand Development Potential



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Value Propositions

1. Space & Design Value

2. Environmental Value

3. Technology Value

Space & Design Value

Residential Super-scrapers

- Current buildings are tall and with innovative designs
- Structural constraints
- Operating cost typically not a concern for this market segment.



Market Drivers

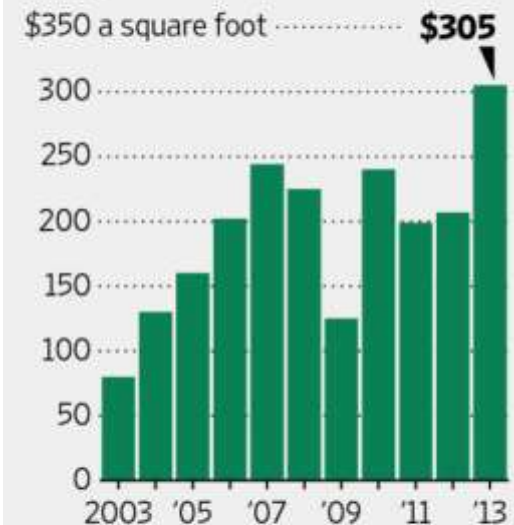
Residential Super-scrappers

Limited lot size / foot print / views

- Lightweight concrete/structures require less equipment weight
- Luxury Condominium Market Price Trends:
 - 2008 – \$2,700 / Sq.Ft.
 - 2012 - \$8,000 / Sq.Ft.
 - 2013 - \$13,000 / Sq.Ft.
- Floor/Area Ratio (FAR) limits only the total building surface area:
 - FAR average prices rose 47% in 2013 (\$300/ Sq. Ft.)
 - Does not apply to volume
 - Average ceiling heights for super-scrappers (> 15 ft.)

Hot Air

Average price paid for air rights in Manhattan



Note: 2013 average excludes one outlier deal in which rights were priced at almost thirteen times the average.

Source: Tenantwise

The Wall Street Journal

Space Case Study 1

- “The slenderest tower in the world”
- 1,428 ft. tall – 80 story
- ~ 390,000 sq. ft.
- 60 apartments – 20 ft. ceilings
- Building tapered at the top
 - Top floor only 2,000 sq. ft.
- Limited space for amenities
- Base of building is landmarked



Space Case Study 2

- 1,396 ft. – 96 floors
- 104 residences
- Space for amenities
- Mechanical equipment at ground level



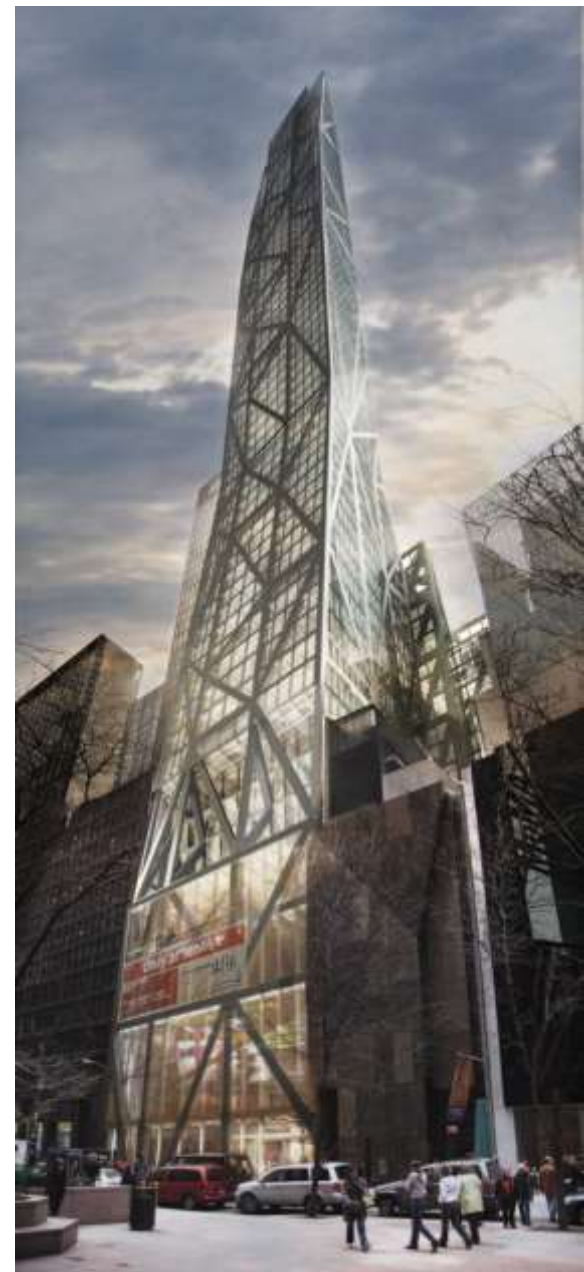
Design Case Study 1

- 821 ft. – 60 floors
- Highly innovative design
- Floor plates are offset
- Minimized core mechanical space
- Top of building – top \$/sq. ft.

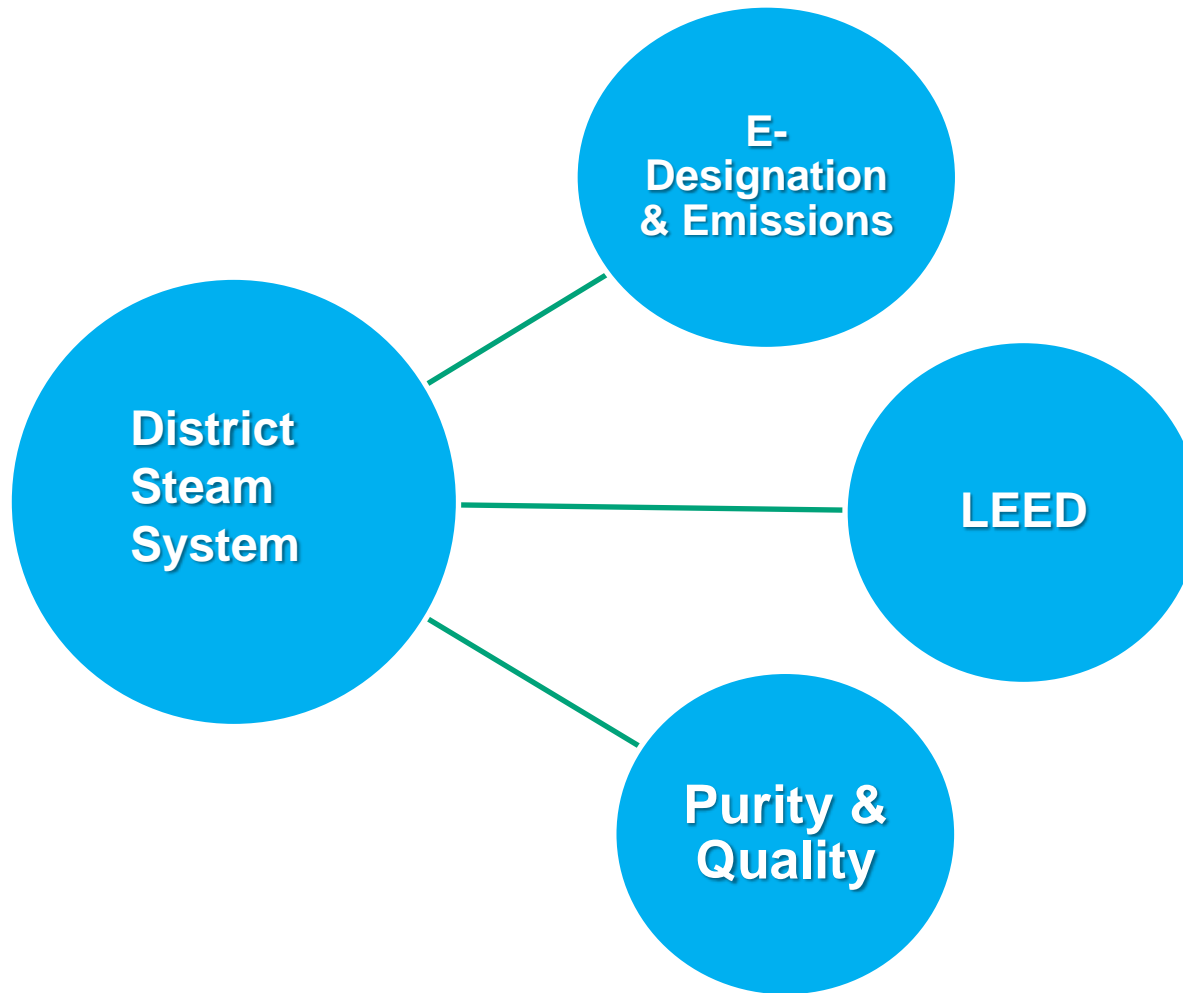


Design Case Study 2

- 1,050 ft. – 82 floors – 139 condos
- Structure on the outside
 - No space for traditional structural core
- Space allocated for museum space
- Steam service maximizes space and steam quality maintains museum strict standards



Environmental Value



What is an E-Designation?

- ✓ Provides a notice of a presence of an environmental requirement pertaining to potential hazardous materials contamination, high ambient noise levels or air emissions concerns on a particular tax lot.
- ✓ Are governed by zoning resolutions and established in connection with a change in zoning or action pursuant to a provision.
- ✓ Established by the City Environmental Quality Review



Emissions

- ✓ No on-site emissions; steam is delivered directly to the building
- ✓ No smoke-stack needed; more space
- ✓ Con Edison has Co-Generation plants; these produce steam and electricity simultaneously making the plants more energy efficient and less polluting



**Con Edison Steam
Operations
2014 carbon
footprint:
127 lb CO₂ / Mlb of
steam produced and
delivered to
customers**

LEED District Energy Guide

Created in 2008 in collaboration among:



Provides a framework to properly account for the impact of the DES within the LEED program:

- *Treatment of District or Campus Thermal Energy in LEED V2 and LEED 2009 – Design & Construction Version 2*
- *Treatment of District or Campus Thermal Energy in LEED for Existing Buildings: Operations and Maintenance Version 1.0*

www.usgbc.org

LEED Points

District Energy Guide

- ✓ For New Construction and Existing Buildings
- ✓ All points available via the Energy & Atmosphere Category
- ✓ Main opportunity is through Optimizing Energy performance to gain up to 19 points.



Steam Purity and Quality

- ✓ Con Edison steam is produced in boilers that utilize purified New York City water and boiler treatment chemicals that are in accordance with the FDA
- ✓ Con Edison continuously monitors steam conductivity for purity in each steam main leaving each power plant. In addition, there are regular samples taken and tested from points on the distribution system
- ✓ Reports are sent to NYS Public Service Commission along with corrective actions taken when needed
- ✓ Makes steam ideal for Hospitals and Restaurants

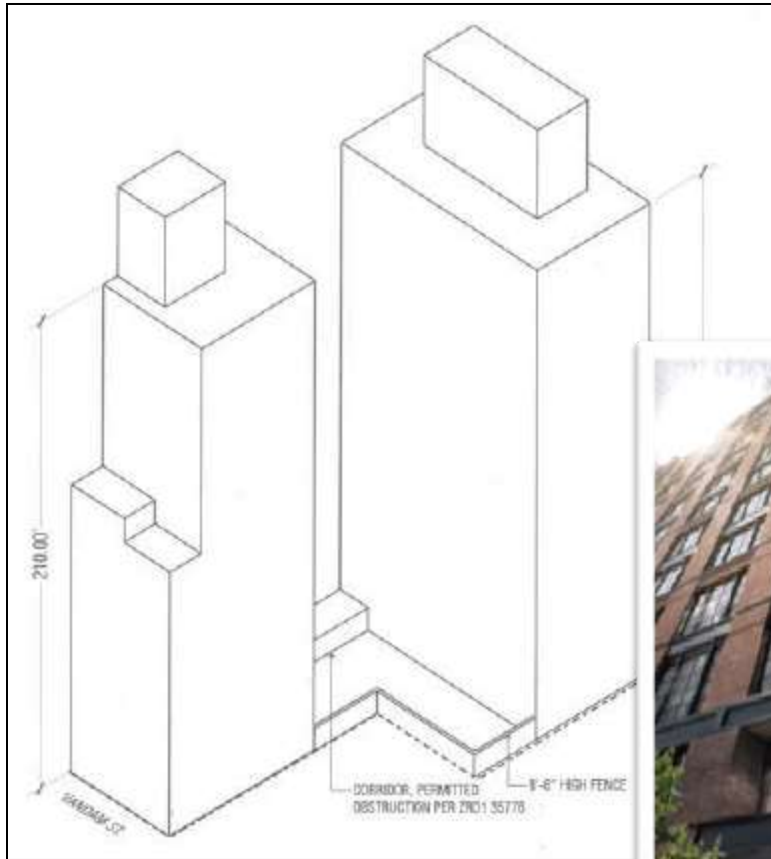


Environmental Case 1



- 3.5 million sq. ft. development
- Close proximity to our steam generating facility
 - Plant upgraded to natural gas
- Community opposition to additional emission impacts from on-site boilers
- Under construction ~ 2019 completion

Environmental Case 2



- Two 21-story buildings
- 116 unit condominium
- 215,000 sq. ft. total
- Steam used for heat & hot water
- Area has "(E) designation"
- District steam required due to high air emission concerns



Environmental Case 3

- 15 floors. 158,571 sf.
- The property benefits from the **stable reduced rates** offered by Con Edison Steam Services
- **Cleaner air on their rooftop** by eliminating the need for a boiler exhaust stack
- Added amenities in the free space

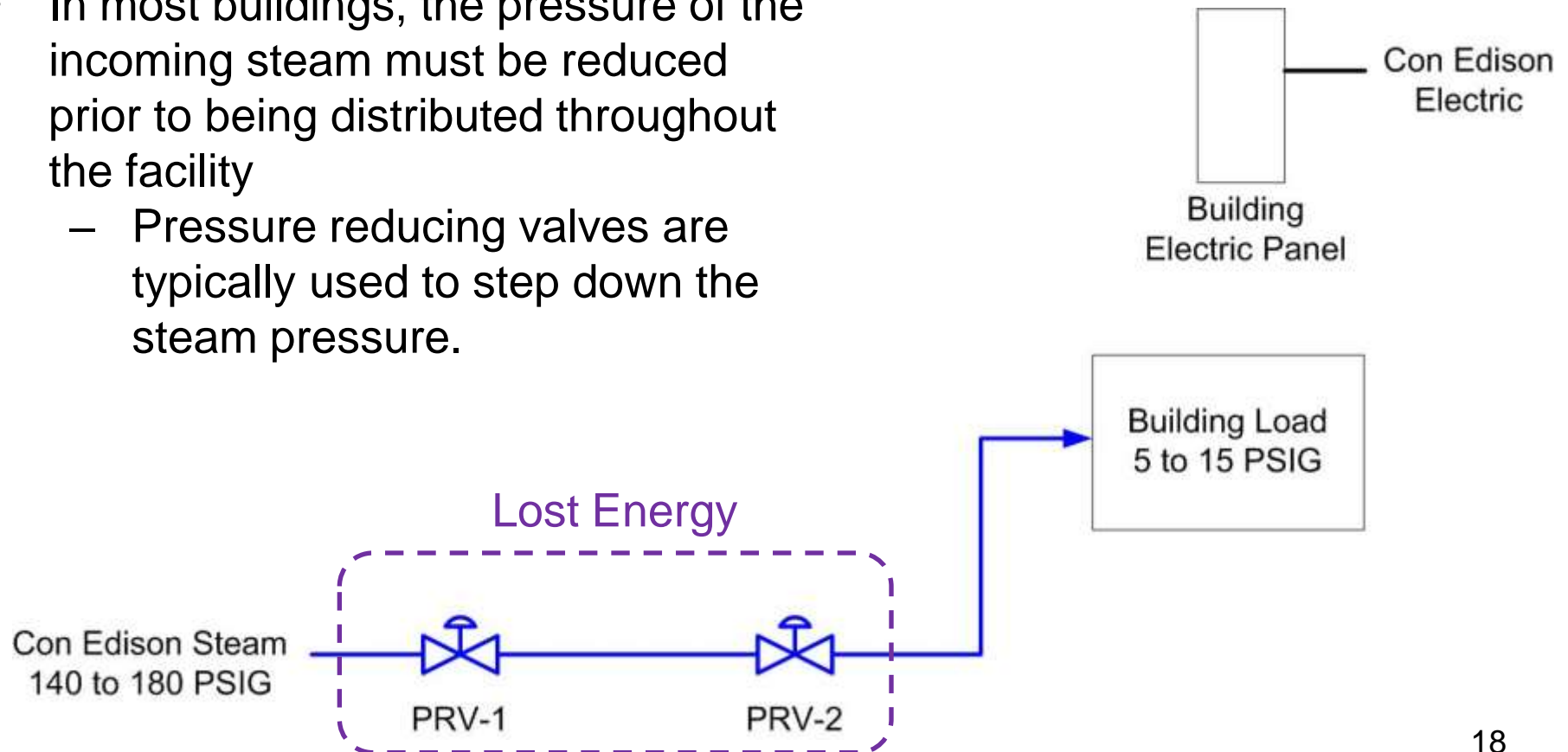


Technological Value

Electric Generation

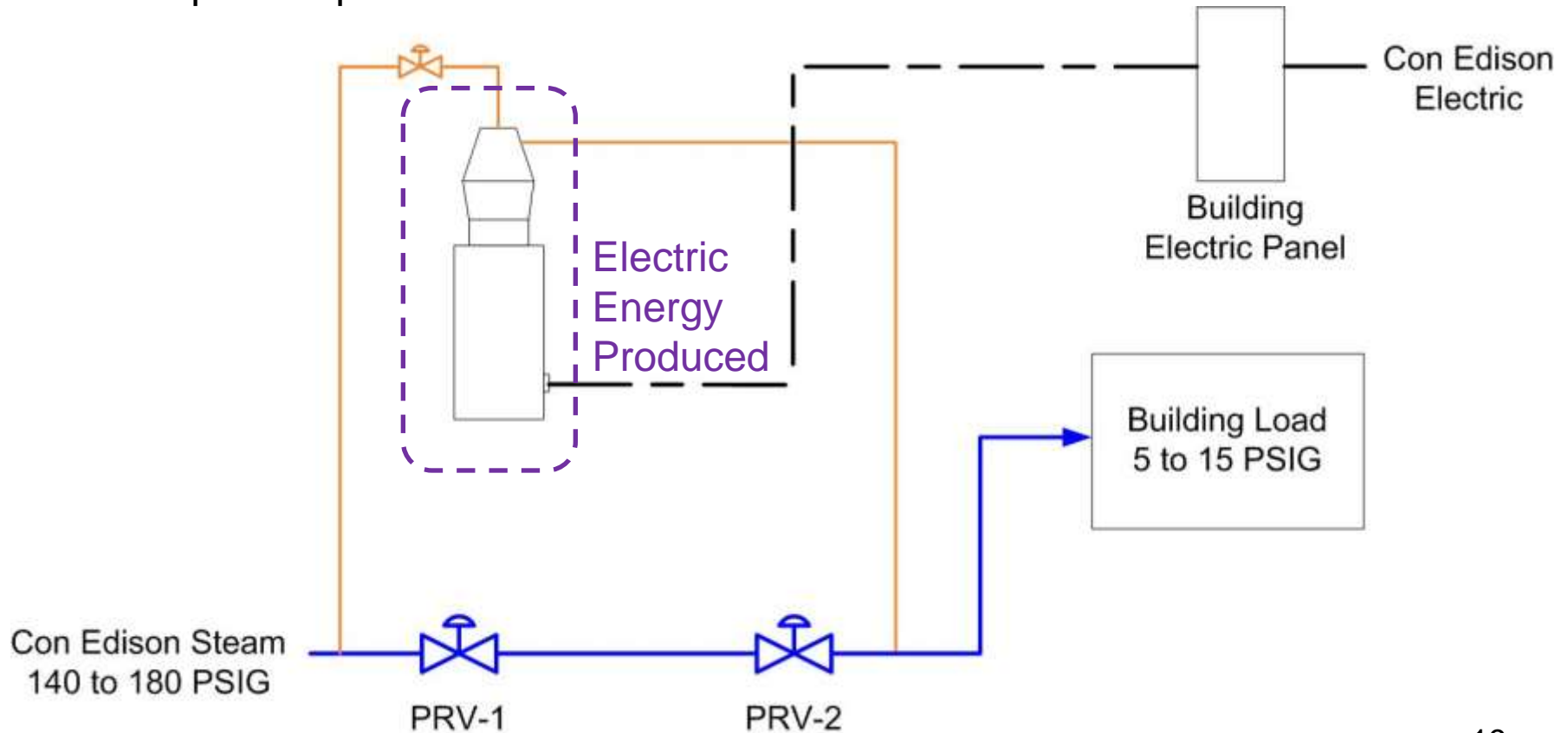
Typical Customer Configuration with Heating, Hot Water, and/or Low Pressure Steam AC

- In most buildings, the pressure of the incoming steam must be reduced prior to being distributed throughout the facility
 - Pressure reducing valves are typically used to step down the steam pressure.



Technological Value – Electric Generation

- Commercially available devices can be utilized for steam pressure reduction in parallel with pressure reduction valves
 - These units use incoming high-pressure steam to produce electricity and output low-pressure steam



Technological Value – Electric Generation

Energent Corporation

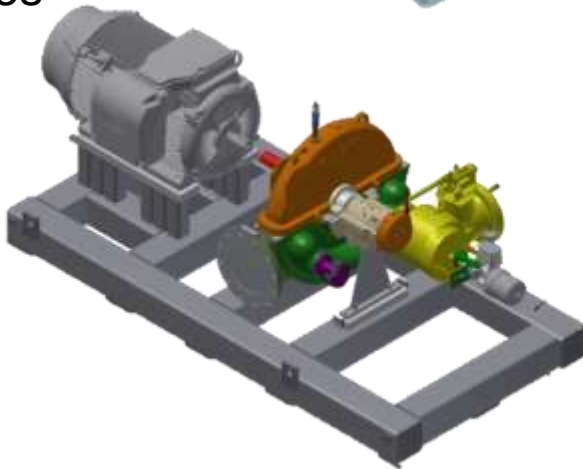
- MicroSteam
- NanoSteam



Heliex Power & Continuum Energy



Elliott Turbines



ElectraTherm: Green Machine



Technology Case

- 1,005 ft. – 90 floors
Mixed use building:
 - 92 Luxury condominiums
 - Hyatt Hotel
- Steam Uses: Heat, Hot Water, Laundry Service
- MicroSteam Turbine



Opportunity with District Steam System

Increase valuable space

- ✓ No need to allocate space for large boilers and equipment since steam is delivered directly to the building. **More space for amenities—Creativeness!**

Save money

- ✓ Steam cooling costs less than electricity on the hottest days of the year. **More cost efficient.**
- ✓ You avoid the costs of buying, operating, and maintaining boilers and equipment. **Cost can be allocated to other building sub-projects.**

Practice sustainable Development—improve the environment

- ✓ Improve your Energy Star rating
- ✓ Earn points towards LEED Certification
- ✓ Reduce air pollution
- ✓ Shrink your carbon footprint





IDEA2015 | Inspiring the Next
Generation

106th Annual Conference & Trade Show | Boston, MA | June 28 – July 1

THANK YOU

District Steam Enabling Innovation

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