



FORDHAM UNIVERSITY
THE JESUIT UNIVERSITY OF NEW YORK

Climate Action Plan: 2018 Annual Executive Update



Office of the Vice President for Facilities Management and Sustainability

Fordham University

441 E Fordham Road

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Annual Executive Update



A Note from the Office of the Vice President for Facilities Management and Sustainability

On behalf of the students, faculty, and employees of Fordham University, we would like to express our appreciation to the City of New York and the Mayor's Office of Sustainability. As part of the greater community of New York City and being a Jesuit University committed to the goals of sustainability, Fordham appreciates the efforts of the City to assist us in focusing our efforts on improving the environment of New York. We also appreciate the help of NYSERDA, Con Edison and the many energy consultants who have been part of our efforts to develop a Climate Action Plan that will enable Fordham to meet the goals of the City's emissions reduction strategy.

One New York: The Plan for a Strong and Just City (OneNYC)

On Earth Day 2015, New York City Mayor Bill de Blasio announced *One New York: The Plan for a Strong and Just City (OneNYC)*, a groundbreaking effort to address New York City's long-term challenges, including a population forecast of up to 9 million residents by 2040, changing climate conditions, an evolving economy, and aging infrastructure. *OneNYC* is the City's blueprint for a growing sustainable, resilient, and equitable city.

Recognizing the existential threat that climate change poses to New York City and the world, Mayor Bill de Blasio has set the ambitious goal to reduce citywide GHG emissions by 80% from 2005 levels by 2050. As part of the "80x50" goal, the City has set interim targets to reduce citywide GHG emissions by 40% by 2030 and building-based GHG emissions by 30% by 2025. With these commitments, New York City is continuing its longstanding leadership in addressing global climate change.

One City: Built to Last

The energy used in New York City's one million buildings accounts for 71% of citywide GHG emissions, and at least 80% of the buildings that exist today will still be here in 2050. This means that improving the energy efficiency of the city's existing building stock represents the greatest opportunity to reduce citywide GHG emissions. To put New York City on a pathway towards the 80x50 goal, the City released a 10-year plan called *One City: Built to Last—Transforming New York City's Buildings for a Low Carbon Future* to address the energy used in our buildings. The plan is comprised of 22 specific initiatives that are projected to achieve roughly a 30% reduction in building-based emissions by 2025.

One City: Built to Last builds on many of the City's previous efforts to improve the efficiency of its buildings. In 2009, the City enacted a package of legislation collectively known as the Greener, Greater Buildings Plan (GGBP). GGBP requires owners of all buildings greater than 50,000 square feet to measure their energy performance annually and conduct energy audits and retro-commission building systems once every ten years. The laws also require owners of non-residential buildings over 50,000 square feet to upgrade to more energy efficient lighting and provide all commercial tenants larger than 10,000 square feet with energy sub-meters by 2025. One of the key initiatives announced in *One City: Built to Last* is to bring the threshold of these laws down to 25,000 square feet in order to deliver the same benefits for the City's mid-sized buildings which will take effect in 2018.

1.5oC Aligning New York City with the Paris Climate Agreement

The Paris Climate Agreement (Paris Agreement), signed by nearly every country, commits signatories to limit global temperature rise to well below 2 degrees Celsius (3.6°F) and to aspire to limit global temperature rise to 1.5 degrees Celsius (2.7°F). New York City's Executive Order 26, signed by Mayor de Blasio on June 2, 2017, commits the City to develop a pathway to achieve the greenhouse gas (GHG) emissions reductions necessary to align with the principles of the Paris Agreement and a 1.5-degree Celsius outcome.

NYC's progress toward 80 x 50 continues: our air is cleaner, our energy is greener, and we are sending less waste to landfills. Meeting the global carbon budget to keep global temperature rise to 1.5 degrees Celsius requires that the City implement a priority subset of its 80 x 50 strategies by 2020 in order to accelerate GHG reductions. This plan clearly lays out the pace, scale, and impact of actions across the built environment that are necessary to bring NYC's actions in line with the Paris Agreement's 1.5-degree Celsius outcome — and commits the City to lead in the development of a global protocol for carbon neutrality.

The NYC Carbon Challenge

Started in 2007, the NYC Carbon Challenge is a voluntary leadership program for universities, hospitals, hotels, commercial offices, and multifamily buildings to reduce their building-based GHG emissions by 40% by 2030 or 50% by 2025. To date, New York City's 16 leading universities, 10 largest University organizations, 40 global companies, 22 residential management firms, and 18 hotels have pledged to achieve these goals. Together, these participants make up more than 390 million square feet of space and contribute roughly 9 percent of citywide building-based emissions. The program builds on a strong partnership between the City and the private and institutional sectors and will help pave the pathway towards New York City's 80x50 goal.

Building on the past successes of the Carbon Challenge, the City will expand the program by increasing the number of participants in the multifamily and commercial office sectors; add new sectors to the program; and continue to challenge universities, hospital, and commercial office participants to commit to an even greater goal of a 50% reduction in GHG emissions by 2025.

Fordham's Commitment to the Mayor's Carbon Challenge

Fordham University accepted the NYC Carbon Challenge in 2007 and committed to reduce its GHG emissions by 30% from 2005 levels by 2019. In the fall of 2017, Fordham extended their commitment to the Challenge by committing to a 40% reduction by 2030. This Climate Action Plan lays out Fordham's strategy to meet this goal and the progress it has made through 2017.

This Plan presents a framework to develop and implement strategies to meet this goal and allows the university to track its progress as it moves forward with the NYC Carbon Challenge.

Founded by the Catholic Diocese of New York in 1841, Fordham is the oldest Catholic university in the northeastern United States the third-oldest university in New York, and the only Jesuit university in New York City. Fordham enrolls approximately 15,500 students from more than 65 countries and is composed of ten constituent colleges, four of which are undergraduate and six of which are postgraduate, across three campuses in southern New York State: The Rose Hill campus in the Bronx, the Lincoln Center campus in Manhattan's Upper West Side, and the Westchester campus in West Harrison, New York. In addition to

these locations, the university maintains a study abroad center in London and field offices in Spain and South Africa. The university offers degrees in over 60 disciplines.

Rose Hill Campus:

The 85-acre Bronx campus features Collegiate Gothic architecture and tree-lined walkways. Buildings on this campus were constructed as early as the Cunliffe House in 1838 with the majority of the campus facilities established in the early 1900's. It has been a challenge for the Facilities Staff to improve the energy efficiency of these older buildings while maintaining the overall aesthetic beauty and comfort that they provide to the students and staff alike. However, significant savings have been achieved through improving lighting and HVAC installations; control of steam losses; and, a focus on building envelope improvements. The Rose Hill campus is home to over 6,000 undergraduate and graduate students as well as Fordham College at Rose Hill, the Gabelli School of Business, our Graduate School of Arts and Sciences, and Graduate School of Religion and Religious Studies.

Lincoln Center Campus:

The 8-acre Manhattan campus spans two city blocks, with a landscaped plaza where you can find a respite from the City without actually leaving it. It's home to over 7,000 undergraduate and graduate students as well as Fordham College at Lincoln Center, the Gabelli School of Business, our Graduate School of Arts and Sciences, Graduate School of Education, Graduate School of Social Service, and School of Law.

Westchester Campus:

Home to the Westchester branches of the Fordham School of Professional and Continuing Studies, Gabelli School of Business, Graduate School of Education, and the Graduate School of Social Service, we are also home to four institutes: The Beck Institute on Poverty and Religion, Children FIRST, National Center for Social Work Trauma Education, and the Ravazzin Center on Aging.

The Louis Calder Center:

The Louis Calder Center - Biological Field Station is located in southern New York state, near the village of Armonk, New York, in a hilly, wooded region of northern Westchester County. The 113-acre property was previously the estate of Louis Calder, chairman of the Perkins-Goodwin Paper Company. The current station encompasses 13 buildings used for laboratory and office space, classroom and student study areas, and residences. Research and educational programs are contained in six principal buildings. The station collects climate and other ecological data and maintains several long-term databases on the chemical and biological features of the station and its surroundings.

Below is a summary of the Fordham Facilities/Buildings across the Rose Hill and Lincoln Center Campuses.

Total Buildings	41
Total Area (Sq Ft.)	4,262,824

Bldg #	Property Name	Address	Owned vs. Leased	Floor Area (Gross sq. ft.)	Property Type (Primary Function)
ROSE HILL:					
1	Administration	441 East Fordham Rd	Owned	36,409	Office
2	Alpha House	441 East Fordham Rd	Owned	1,572	Classrooms
3	Alumni House	441 East Fordham Rd	Owned	2,050	Restaurant/ Cafeteria
4	Alumni Court North	441 East Fordham Rd	Owned	66,826	Residence Hall/ Dormitory
5	Alumni Court South	441 East Fordham Rd	Owned	69,590	Residence Hall/ Dormitory
6	Canisius	441 East Fordham Rd	Owned	8,060	Office
7	Collins Auditorium	441 East Fordham Rd	Owned	37,773	Theater/ Auditorium
8	Dealy Hall	441 East Fordham Rd	Owned	102,610	Classrooms
9	Duane Library	441 East Fordham Rd	Owned	32,292	Library
10	Faber Hall	441 East Fordham Rd	Owned	52,941	Classrooms
11	Faculty Memorial Hall	441 East Fordham Rd	Owned	91,614	Office
12	Finlay Hall	441 East Fordham Rd	Owned	45,409	Residence Hall/ Dormitory
13	Freeman Hall	441 East Fordham Rd	Owned	44,753	Mixed Academic
14	Gymnasium	441 East Fordham Rd	Owned	55,537	Recreation/Gymnasium
15	Hughes Hall	441 East Fordham Rd	Owned	50,000	Residence Hall/ Dormitory
16	Hughes Custodial	441 East Fordham Rd	Owned	2,755	Office
17	John Mulcahy Hall	441 East Fordham Rd	Owned	81,722	Mixed Academic
18	Keating Hall	441 East Fordham Rd	Owned	116,566	Mixed Use
19	Larkin Hall	441 East Fordham Rd	Owned	37,397	Mixed Academic
20	Lombardi Center	441 East Fordham Rd	Owned	90,445	Recreation/Gymnasium
21	Loyola Hall	441 East Fordham Rd	Owned	50,179	Residence Hall/ Dormitory
22	Martyrs Court	441 East Fordham Rd	Owned	99,725	Residence Hall/ Dormitory
23	McGinley Center	441 East Fordham Rd	Owned	127,966	Mixed Use
24	Queens Court	441 East Fordham Rd	Owned	46,896	Residence Hall/ Dormitory
25	Seismic Station	441 East Fordham Rd	Owned	1,187	Laboratories
26	Spellman Hall	441 East Fordham Rd	Owned	31,570	Residence Hall/ Dormitory
27	Tennis House	441 East Fordham Rd	Owned	2,868	Recreation/Gymnasium
28	Thebaud Hall/Annex	441 East Fordham Rd	Owned	28,200	Office
29	University Church	441 East Fordham Rd	Owned	15,670	Other
30	Walsh Hall	441 East Fordham Road	Owned	142,831	Residence Hall/ Dormitory
31	Salice-Connelly Hall	441 East Fordham Rd	Owned	80,000	Residence Hall/ Dormitory
32	Campbell Hall	441 East Fordham Rd	Owned	86,600	Residence Hall/ Dormitory
33	Coffee Sportplex	441 East Fordham Rd	Owned	232,391	Other
34	O'Hare Parking	685 East Fordham Rd	Owned	517,465	Parking/Garage
35	O'Hare Hall	671 East Fordham Rd	Owned	186,099	Residence Hall/ Dormitory
36	Tierney Hall	671 East Fordham Rd	Owned	41,317	Recreation/Gymnasium
37	Walsh Library	439 East Fordham Rd	Owned	239,113	Library
LINCOLN CENTER:					
38	Lowenstein Hall	113 W 60 St	Owned	386,575	Theater/ Auditorium
39	McKeon/New Law	150 W 62ND ST	Owned	478,305	Classrooms/Dorm
40	Mc Mahon Hall	155 W 60 St	Owned	282,506	Conference Room/Offices
41	140 W 62nd	140 W 62ND ST	Owned	159,040	Mixed Use

Fordham's Commitment to Sustainability

Fordham University is committed to sustainability as a central consideration in all aspects of its activities including its curriculum, student development and education, faculty and staff involvement, and physical plant operations. In keeping with the Jesuit traditions of the pursuit of wisdom and learning, education of the whole person and respect for the environment, the University recognizes the value of minimizing its environmental impact and endeavors to pursue best practices throughout all aspects of its activities.

The University endeavors to design, construct and maintain its buildings, infrastructure and grounds in a manner that ensures environmental sustainability. Reaching beyond compliance in areas of environmental concern, Fordham will pursue sustainability best practices in a broad range of areas:

Energy

Cost-effective energy reduction initiatives will be implemented to reduce our impact by minimizing energy waste. We will pursue alternative energy strategies, including new technologies as they become more available.

The University completed two strategic LED relamping initiatives on both the Rose Hill and Lincoln Center Campuses in 2015 which will help the University conserve annually 712,000 kWh of energy.

Continual upgrades in lighting initiatives are underway with 11 buildings at Rose Hill seeing upgrades by the end of 2018.

Waste, Recycling, and Minimization

A uniform recycling program has been established across both campuses for both campus and construction debris. In 2015, over 208,000 lbs. of paper, cardboard, plastic, glass and metal was recycled and diverted from the University's waste stream and over 90,000 lbs. of construction related debris collected from the renovation of Hughes Hall was recycled in 2012.

Additionally, toner cartridges at the print shop and individual printers: and, used furniture have been recycled or donated to local charities. Instructional recycling announcements and signs help educate students, faculty and staff about the guidelines while increases program visibility. Ongoing educational efforts involving students, faculty and staff as well as more and revised placement of recycling bins throughout all campus buildings, both residential and academic have improved this initiative.

Buildings

All new buildings will be designed from an energy standpoint, to achieve the U.S. Green Building Council's "Leadership in Energy and Environmental Design's New Construction" (USGBC LEED NC) Silver rating, ensuring all new properties are environmentally responsible.

The University dedicated Campbell, Salice & Conley Hall, the first green building to be built on the historic Rose Hill campus. This new residence hall was awarded LEED Gold Certification and comprises more than 172,255 square feet.

The new Law Building and McKeon residential tower are Fordham's newest LEED certified buildings. The new facilities have added over 415,000 square feet of residential and academic space to the Lincoln Center Campus.

Transportation

Fordham's Department of University Transportation has converted it's 38-vehicle fleet of "Ram Vans" to biodiesel-capable vehicles. This transition from gasoline to bio-diesel will reduce annual

CO2 emissions for the department by 31% (314,228 lbs.) per year. The department continues to explore sustainable modifications to its fleet and is seeking to replace its current fleet of gasoline golf carts with newer, high-capacity electric vehicles.

Education

Fordham University will advance understanding of environmental change through its curriculum and academic programs.

- Fordham’s Gabelli School of Business is making the case that sustainability is good for the environment—and business. “Leading Toward a Finer Future”, a four-day intensive master class aims to prepare graduate and undergraduate students for leadership in the sustainable business field. The new course is led by sustainable development pioneer L. Hunter Lovins, president and founder of Natural Capitalism Solutions.
- Environmental Studies – A Science and Humanities Major Program, has been offered at Fordham since 2002. Within this major, students tackle the most pressing issues of our times: Climate change. Habitat loss. Mass species extinction. Natural capital degradation. Environmental health. Environmental justice. Building sustainable societies. Course work provides a study of both science and humanities with a focus on policy solutions.

Coordination

The University will work with local institutions and City agencies such as the Bronx Zoo, the New York Botanical Gardens, the City of New York, and others to coordinate our sustainability efforts, enhancing our impact through strategic partnerships and programs.

Progress Towards 40% by 2030 Goal

Fordham University joined the New York City Carbon Challenge in 2007 and committed to reduce its greenhouse gas emissions¹ by 30% from 2005 levels by 2017. Since accepting the NYC Carbon Challenge, Fordham University has reduced its carbon emissions intensity, measured in pounds of carbon dioxide equivalent per square foot, by 24.60% and its energy use intensity measured in kilo-British thermal unit (kBtu’s) per square foot by 14.80% from its 2005 base year levels. The new goal of 40% reduction by 2030 means that we will reduce our carbon emissions per square foot to 12.19 pounds of CO₂e/ft² from 21.53 pounds of CO₂e/ft². In order to ensure that institutions are not limited in growing their facilities and meeting the goal, greenhouse gas emissions are normalized by the institution’s area. Therefore, we use the metric of pounds of emissions per square foot. More details about the Carbon Emissions Inventory methodology that is used for Carbon Challenge reporting can be found in Appendix A. This Climate Action Plan lays out Fordham University’s strategy to meet this goal and includes the following

- Background information about Fordham and its facilities;
- A description of Fordham’s additional commitments to environmental sustainability;
- Energy use benchmarking information and energy audit & retro-commissioning for all Fordham’s New York City-based properties over 25,000 square feet, as required by LL84 and LL87;
- An inventory of annual GHG emissions from all of Fordham’s New York City properties using the NYC Carbon Challenge reporting methodology;

¹ Note: For purposes of the NYC Carbon Challenge, greenhouse gas emissions are measured in terms of carbon dioxide equivalent (CO₂e) per square foot. Please see the explanation of standard units further in this report for more information.

- A description of completed projects and strategies the university has undertaken to reduce its energy use and emissions;
 - Highlights of Fordham's's innovative projects;
 - An explanation of the strategy moving forward that will enable Fordham to meet its 40% emissions reduction goal by 2030.

Since accepting the NYC Carbon Challenge, Fordham University has reduced its carbon emissions intensity by 24.6% and its energy consumption by 14.80% from its 2005 base year levels.

Basic Information		Base Year Inventory		2017 Inventory	
Name	Fordham University	Square Feet	3,180,320	Square Feet	4,252,009
Normalization	Square Feet	Emissions (Metric Tons of CO2e)	29,305	Emissions (Metric Tons of CO2e)	29,540
Base Year	2005	Energy Use (MMBtu)	575,895	Energy Use (MMBtu)	656,019
End Year	2030	Carbon Intensity (lbs CO2e / sq. ft.)	20.31	Carbon Intensity (lbs CO2e / sq. ft.)	15.32
Submission Year	2017	Energy Use Intensity (Kbtu / sq. ft.)	181.08	Energy Use Intensity (Kbtu / sq. ft.)	154.28
Challenge Goal	40%	40% Challenge Goal (lbs CO2e / sq. ft.)	12.19	Carbon Reduction	-24.60%
				% Change from Base Year	
				Energy Use Reduction	-14.80%
				% Change from Base Year	

Energy Use Intensity and Emissions Reduction

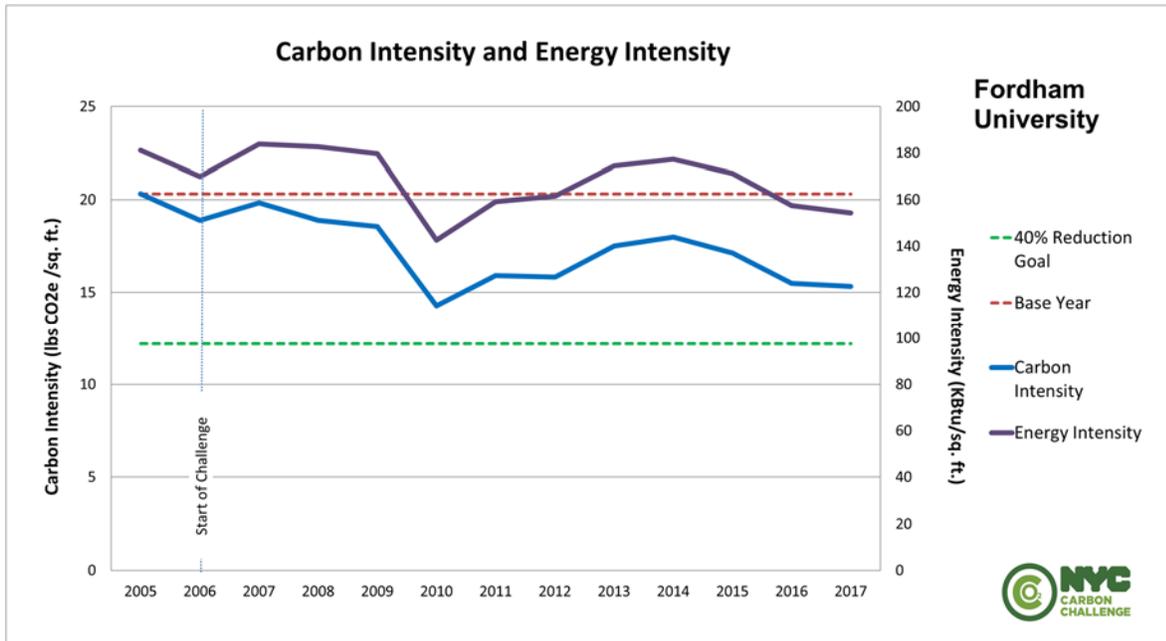
	Carbon Intensity (lbs CO2e/sq. ft.)	Energy Use Intensity (Kbtu/sq. ft.)
2005 (Base)	20.31	181.08
2017 (Current)	15.32	154.28
Reduction	-24.60%	-14.80%

Emissions Comparison: Base Year and Submission Year

	2005	2017	Change
Total Emissions (tCO2e)	29,305	29,540	0.80%
Square Feet	3,180,320	4,252,009	33.70%
Carbon Intensity (lbs CO2e/sq. ft.)	20.31	15.32	-24.60%

Energy Use Comparison: Base Year and Submission Year

	2005	2017	Change
Total Energy Use (MMBtu)	575,895	656,019	13.91%
Square Feet	3,180,320	4,252,009	33.70%
Energy Use Intensity (Kbtu/sq. ft.)	181.08	154.28	-14.80%



Fordham’s energy usage in 2017 and the prospective energy projects planned for the near future indicate that Fordham’s twenty five-year reduction is on track to achieve reach the goal of 40% reduction.

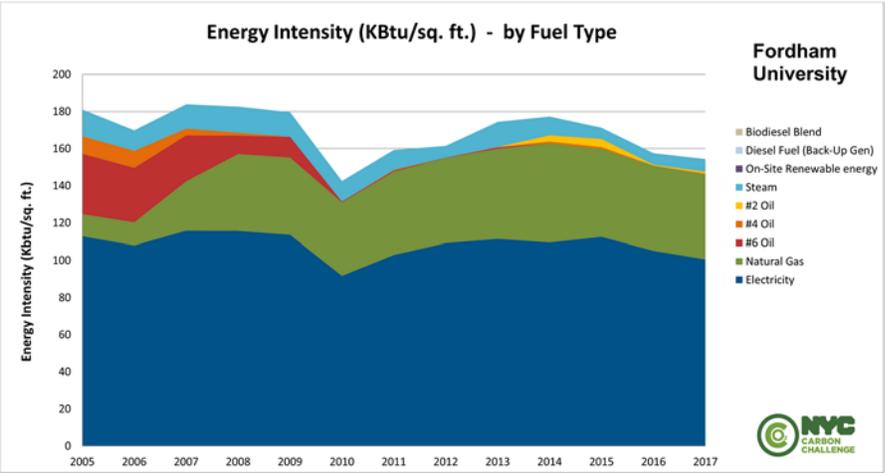
Roadmap to Achieve 40% Emissions Reduction by 2030 Goal

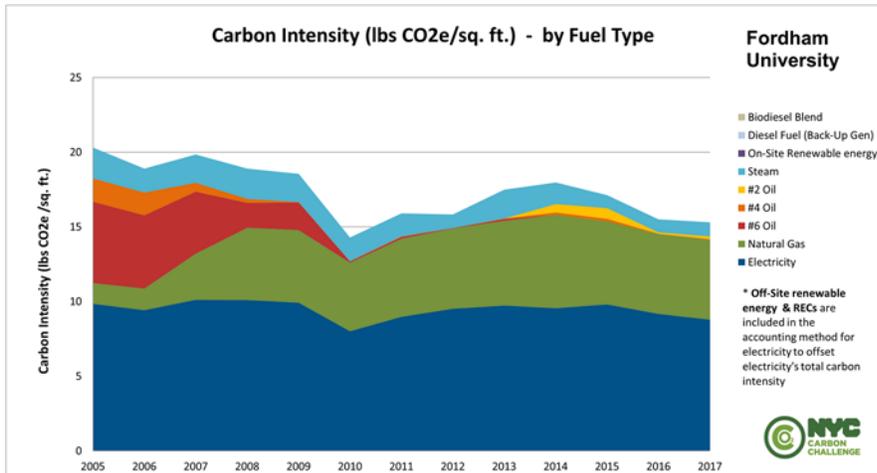
Fordham began its plan to reduce greenhouse gas emissions in 2008 when it commissioned a master plan. The plan involved energy audits of the major facilities as well as identifying strategies, through fuel switching, which could reduce greenhouse gases. A number of energy conservation and retro commissioning measures, as described below, were identified.

As you can see from the chart below, there has been a consistent decrease in Carbon Intensity across the combined campuses since 2005. The largest impact occurred in 2010, when the boilers at Rose Hill were converted to natural gas which is about 50% cleaner. Until the winters of 2013-14 and 2014-15, when extremely cold winters resulted in 16 separate gas interruptions, very little oil was used. When oil was used again, a cleaner, #2 or #4 oil was used.

ACHIEVED REDUCTIONS (lbs CO2e/sq.ft.)	
Carbon Intensity in 2005	20.31
Carbon Intensity in 2006	18.89
Carbon Intensity in 2007	19.84
Carbon Intensity in 2008	18.90
Carbon Intensity in 2009	18.56
Carbon Intensity in 2010	14.28
Carbon Intensity in 2011	15.91
Carbon Intensity in 2012	15.83
Carbon Intensity in 2013	17.50
Carbon Intensity in 2014	17.98
Carbon Intensity in 2015	17.13
Carbon Intensity in 2016	15.50
Carbon Intensity in 2017	15.32

In 2012, Fordham was well on its way to meeting its goal but this progress was somewhat reversed in 2013-15 due to the extreme cold. Con Ed called 16 separate Gas interruptions over this two winter seasons increasing the fuel oil used during that period. However; by 2017, we have nearly eliminated the use of all fuel oil on both campuses and completed some major ECM's thus bringing us back in line with meeting the future goal set.





Demand Response

Fordham University has enrolled in Con Edison's Demand Response incentive program. By doing so, Fordham has committed to reduce its energy demand during peak load events caused by higher than average temperatures, while also receiving incentives each kWh reduced during such peak load events. These demand response incentives are then added to the University's fund for use in Energy Efficiency strategies and projects.

Renewable Energy Credits

Fordham University has also purchased 4,200,000 kWh in Renewable Energy Credits (RECs) over the Calendar years 2016 and 2017. The purchase of these RECs from off-site energy production may be used to offset consumption of electricity from the grid.

Fordham University's carbon intensity allowed to be offset by RECs in 2017

0.91 (lbs CO₂e/sq. ft.)

In addition to the conversion of the boilers, Fordham implemented several major projects:

- The design and construction of Campbell, Salise and Connelly residences to achieve LEED Gold
- The installation of a photovoltaic energy generation system (solar panels) at Walsh Family Library.
- The conversion of the fleet to biofuel or electric vehicles
- The conversion of lighting in the Rose Hill parking garage to LEDs (Light Emitting Diodes)
- A retro commissioning survey and implementation for all buildings greater than 50,000 square feet
- New energy audits on all buildings greater than 50,000 square feet
- The redevelopment of the Gabelli School of Business (Rose Hill) and the new Gabelli School of Business at Lincoln center as well as the construction of a new Law School and residence complex at Lincoln Center Law School at LEED Silver standards

Fordham continues to retrofit and design buildings to meet energy conservation and greenhouse gas reductions. A number of energy conservation measures are planned which will enable us to achieve this goal by 2030.

The following chart depicts both current projects underway with progress towards meeting the 40% by 2030 emissions reduction goal based on implementation of these energy conservation measures.

Energy Conservation Measure (ECM)	Measure Name	Project Description	Est. Carbon Reduction (Mg CO ₂ e/yr)	% of Reduction against Baseline
On/Off_Site_Generation	Solar Roof	Install 1 MW solar roof on garage	716.5	
Total On-Site Generation			716.5	2.1%
Envelope	Windows Rose Hill	Replace old single pane windows with high efficiency windows.	1,281.0	
Total Envelope			1,281.0	3.8%
Cooling_System	Chiller Replacement	Replace 550 Ton Steam Absorption Chiller at John Mulcahy Hall with efficient unit.	41.0	
Total Cooling			41.0	0.1%
Lighting	Lincoln Center	LED Upgrade at Lowenstein and Old Law School.	259.9	
Lighting	Rose Hill	Retrofit existing fixtures or replace fixtures with LED or inductions lamps or fixtures in Academic Rose Hill campus	1,042.2	
Total Lighting			1,302.1	3.8%
Heating_System	PTAC Installation	PTACS at McMahan Hall. Lincoln Center	364.0	
Heating_System	Boiler Upgrade	3 Rose Hill Boilers from 500 HP to 700 HP	18,750.3	
Heating_System	Steam Traps	Steam Trap upgrades	17,341.3	
Total Heating			36,455.6	107.4%
Total ECM's Currently in progress			39,796.2	117.2%

Projected Reductions	
Energy Conservation Measure (ECM)	Reduction Target (% of current emissions)
Behavior Change	-3.0%
Operations & Maintenance	-7.0%
Conveying Systems	0.0%
Cooling System	-2.0%
Data Centers and Server Rooms	0.0%
Distribution System	0.0%
Domestic Hot Water	-3.0%
Energy Management System	-2.0%
Envelope	-5.0%
Fuel Switching	0.0%
Heating System	-2.0%
HVAC Controls and Sensors	-1.0%
Lighting	-4.0%
Motors	0.0%
On/Off Site Generation	0.0%
Process and Plug Loads	-5.0%
Space	0.0%
Submetering	0.0%
Ventilation	0.0%
Other	0.0%
Total Projected Reductions from 2017	-34%
Carbon Intensity in 2017	15.32
Projected Carbon Intensity in 2030 with BAU	12.22
Projected Carbon Intensity in 2030 without BAU	10.10
Total Projected Reduction from 2005	-50%

In addition, among the more prominent projects being planned are:

- Window replacements at both Lincoln Center and Rose Hill Campuses
- LED upgrades. Next phase will include athletic facilities
- Geothermal installation currently being studied at 10 buildings, Rose Hill
- Fuel Cell implementation – 2.5 MW being considered at Rose Hill
- McGinley expansion – LEED Certification anticipated
- Construction of a new science – LEED Certification anticipated

Additional Commitments

In addition to its commitment to the NYC Carbon Challenge, Fordham University has made other internal and external commitments to reduce its global environmental footprint and increase the sustainability of its operations.

Student Sustainability Committee

The Student Sustainability Committee is a permanent external subcommittee of the United Student Government. It also serves as the student partner to the University Sustainability Council which brings

together administrators, faculty members, and both undergraduate and graduate students from within the University community.

Members of the committee work in collaboration and seek to promote sustainable living by engaging their undergraduate peers.

The core mission of the Student Committee is focused on achieving the following goals.

1. Find new opportunities to help increase campus sustainability
2. Create and foster a culture of sustainability among the student body. We work with administrators and student organizations to further these goals.

Accomplishments include:

- Organizing a student led sustainability week on campus.
- Worked in collaboration with the Department of Campus Operations to distribute plastic bag recycling stations in each of the undergraduate residence halls on the Rose Hill Campus.
- Also, in collaboration with Campus Operations, the committee was able to provide recycling bins in for each student dorm room and apartment on the Rose Hill Campus.

Current Projects include:

- Developing a comprehensive sustainability education outreach program.
- Initiate an eco-reps program for residence halls on both the Rose Hill and Lincoln Center Campuses.
- We are also seeking trying to organize a student led on-campus composting program.

NYDEP Water Challenge

Fordham's Lincoln Center campus has signed on to the DEP's 2018 Water Challenge to New York City universities. The effort is part of an overall strategy by the New York City Department of Environmental Protection (DEP) to reduce the city's water consumption by 20 million gallons by 2022.

The Lincoln Center campus has been selected for this challenge since the facilities are currently connected to the DEP through the Automatic Meter Read (AMR) system. Even though only the Lincoln Center campus will officially participate, student challenges as well as operational improvements that are implemented will also be conducted at Rose Hill. According to the DEP, universities can make a big dent in citywide water demand, as New York is home to more university students than any other city in the nation. The goal will be to reduce water consumption by at least 5 percent by 2020. Water use in residence halls, dining halls, and irrigation of green spaces will all be targeted.

The challenge lasts two years, from August 1, 2018 through July 31, 2020. As a participant, Fordham will be provided with technical assistance from the City to complement an already robust sustainability program.

Environmental Stewardship

Fordham University has been honored by the Arbor Day Foundation as a Tree Campus USA. The University earned the distinction by meeting five core standards for a sustainable campus: Establishment of a tree advisory committee, a campus tree-care plan, dedicated annual expenditures for its campus tree program, an Arbor Day observance, and the sponsorship of student service-learning projects.

UN PRME

Fordham is one of 29 Champion schools within the UN Principles of Responsible Management Education (PRME) network. The PRME initiative is a relationship between the United Nations and business schools across the globe to transform management education. In addition to creating a learning environment that promotes awareness of the United Nations' Sustainable Development Goals, Fordham is committed to providing students the platform to create innovative solutions to the environmental, social, and economic challenges of today's business landscape.

Fordham's role as a Champion school allows the university to engage with other management programs through collaborative projects and research. These efforts seek to implement sustainability principles within academic curricula and co-curricular activities. In both contributing to and taking part in game-changing projects that address the social responsibility of the business sector, Fordham is developing future leaders who see business as a force for good.

Fordham students are currently engaged in the "Breakthrough Innovation Challenge," an example of one of these PRME projects. This year-long initiative led by the UN Global Compact offers students the opportunity to solve real world sustainability challenges in collaboration with managers from multinational companies. Eight companies have created cases specific to their firm that invite students to evaluate sustainable business models and make final recommendations to the companies. The process will allow students to engage with disruptive technologies and, ultimately, provide each company the means to effectively address the UN Sustainable Development Goals through their business operations.

Sustainable Food

- St Rose's Garden: Eight raised bed with 20 yards of soil were installed by the Fordham Community to establish St. Rose's Garden. St. Rose's serves as a social space, living laboratory, and classroom right on Fordham's 85-acre urban campus. The raised beds are used to grow a variety of produce, including: kale, collard greens, cabbage, tomatoes, peppers, broccoli, more. St. Rose's also offers local, organic seasonal CSA shares for purchase to all members of the Fordham community. The Fordham Social Innovation Collaboratory has supported St. Rose's in a variety of capacities, including the financing of extended growing season initiatives and an on-campus farmers market.
- The Sustainable Food Practicum: A small committee of self-motivated students who are working to improve the sustainability of on-campus dining services on Fordham University's Rose Hill campus. The students operate as sustainability representatives between Fordham's administration, Aramark, the student body, and Fordham's sustainability consultant. They are working to increase communication between these parties to achieve measurable environmental and student health impacts
- Food Impact Investing Practicum: This Practicum focuses on collaboration as a process for financing better and more sustainable food systems. In partnership with SlowMoney NYC and other champions from the food sustainability arena, students in this practicum learn how food impact investing entrepreneurs strategically unlock resources by connecting investors and entrepreneurs. Project highlights include developing a Local Impact Rating System for the Hudson Valley foodshed as a shared platform for entrepreneurs and investors for whom the non-financial returns of food system ventures are an important value.

Sustainable Clothing

- The Fashion Sustainability Practicum is dedicated to improving efforts towards sustainability in the fashion industry. The fashion industry is the 2nd most polluting industry in the world-just behind the oil industry-with problems focused on the supply chain and the environment. In today's culture of fast fashion and high trend turnover, the industry uses between 1.5 trillion gallons of water per year, 70-100 million trees to create wood-based fibers, and 25% of all chemicals produced worldwide. Through the Social Innovation Collaboratory, the Fashion Sustainability's goal is to partner with brands as well as lead on campus initiatives to promote and improve sustainability efforts as well as spread awareness.

BMW i3

- Fordham University Social Innovation Collaboratory partnered with BMW in order to create a new strategy to sell the BMW i3, an all-electric and 100% sustainably built car. Students split up into teams in order to research various topics, such as how to better market the i3 series to environmentally and socially conscious consumers, corporate vehicle discount programs, the corporate fleet landscape, and to identify pre-existing BMW company partnerships that would be optimal targets for BMW's marketing efforts.

Conclusion

In the ten years since Fordham University accepted the Mayor's Carbon Challenge, we have already achieved significant progress toward realizing our new 40% emissions reduction goal, realizing a 24.6% reduction in emissions from the 2005 baseline to date. Fordham will continue to evaluate its current list of potential projects and to identify new projects in order to achieve this goal by 2030. Fordham's decisions regarding which projects to implement will be based on our capital budget and the payback of the project investments.

In keeping with the Jesuit traditions of the pursuit of wisdom and learning, education of the whole person, and respect for the environment, the University recognizes the value of minimizing its environmental impact and endeavors to pursue best practices throughout all aspects of its activities. Fordham University is committed to sustainability as a central consideration in not only its physical plant operations but also its student development and education, faculty and staff involvement, and curriculum.

Appendix A

Carbon Emissions Inventory Methodology

Fordham tracks its carbon emissions according to the methodology of the Mayor’s Carbon Challenge. Under this methodology, all energy use in buildings is categorized by fuel type and aggregated together for all facilities for every year of the Challenge, beginning in the baseline year and ending in the end year. The annual energy consumption for each fuel type is entered into a Carbon Emissions Inventory calculator tool, provided by the NYC Mayor’s Office of Long-Term Planning and Sustainability, which multiplies energy consumption by a “carbon coefficient” to find the associated level of carbon dioxide equivalent (CO₂e).

All carbon coefficients for the Mayor’s Carbon Challenge were developed by the NYC Mayor’s Office of Long-Term Planning and Sustainability and are in compliance with the 2009 Local Government Operations Protocol (LGOP). The Mayor’s Carbon Challenge uses New York City’s carbon coefficients for electricity and steam, which are based on power plant data. All emissions coefficients for natural gas, propane, and heating fuel oils No. 2, 4, and 6 were developed by the U.S. EPA.

For purposes of the Challenge, however, the carbon coefficients for electricity and steam are fixed at their 2005 baseline year levels because the coefficients for these fuel types can vary significantly between years. Improvements in New York City’s electricity supply, for example, provide an advantage to Challenge participants who depend primarily on electricity, regardless of whether they make any energy conservation investments. Fixing the carbon coefficients at 2005 levels therefore serves to standardize the competition across all Challenge participants. Please see the complete list of the carbon coefficients below.

Fordham has also chosen to measure the carbon emissions from our solid waste stream in our future inventories. Mayor’s Carbon Challenge participants will complete a waste characterization study to determine the baseline volume and composition of their municipal solid waste and conduct annual waste studies to track changes to this baseline. Note that both the methodology and the carbon coefficients for waste are still under development and will be incorporated into our Carbon Emissions Inventory next year.

Emissions Coefficients for Buildings

	Electricity (kwh)	Natural Gas (therms)	#2 Fuel Oil (gallons)	#4 Fuel Oil (gallons)	#6 Fuel Oil (gallons)	Propane (gallons)	Steam (Mlbs)
MTCO ₂ e per unit energy	0.000422704	0.0053156	0.010264026	0.011016722	0.01132755	0.012413804	0.089414631
MIMBtu per unit energy	0.0095346	0.1	0.138	0.146	0.15	0.091	1.33015

Appendix B

Benchmarking Results CY 2017

Building Name	Address	BIN	BBL	Site EUI (kBtu/ft2)	Source EUI (kBtu/ft2)	ENERGY STAR Score	Reported Gross Sq. Ft.	LL87 Compliance Year
Rose Hill: Main Campus	441 E. Fordham Rd.	MULTIPLE	2032730001	108.5	189.5	NA	2,336,504	2021
Rose Hill: Walsh Library	439 E Fordham Rd	2102052	2032730001	99.9	169.3	NA	239,113	2021
Rose Hill: O'Hare Hall	671 E. Fordham Rd	2102056; 2016244	2032730001	67.2	102.9	86	227,416	2021
Rose Hill: O'Hare Parking	685 E. Fordham Rd	2097321	2032730075	15.5	48.5	NA	517,465	2015
Rose Hill: Coffey Sportplex	463 E. Fordham Rd	2102048	2032730001	18.6	58.3	NA	232,391	2021
Rose Hill: Campbell/Connelly/Salice Halls	441 E Fordham Rd	2102047; 2102046	2032730001	80	162	61	166,600	2021
Rose Hill: Faculty Memorial Hall	655 E Fordham Rd	2016244	2032730209	110.3	191.6	66	91,614	2019
Lincoln Center: Main Campus	113 W 60th St	1028830; 1085404	1011320020	80.1	175	NA	1,147,386	2020
Lincoln Center: 140 W 62 St	140 W 62 St	1028829	1011320001	100.4	223.5	NA	159040	2021