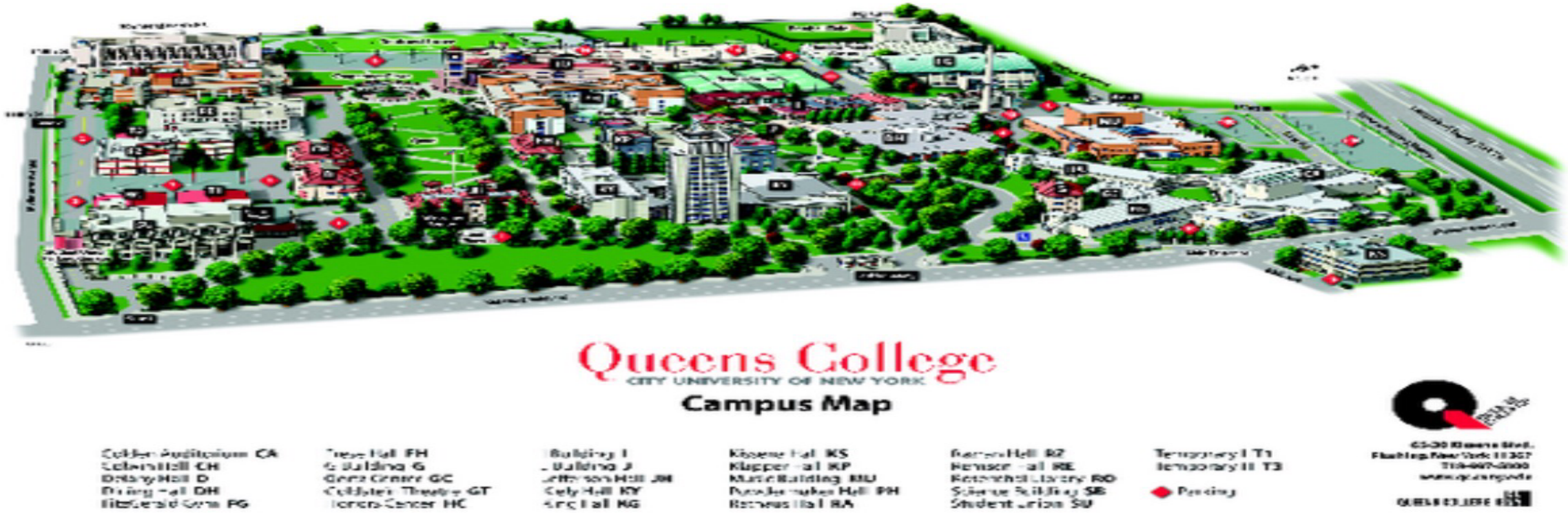
Energy Sustainability in Queens College

Corides Gonzalez

buildings account for an average of 41% of the world’s energy use.

CO_2 emissions from buildings are projected to grow faster than any other sector (in the USA), with emissions from commercial buildings projected to grow the fastest—1.8% a year through 2030

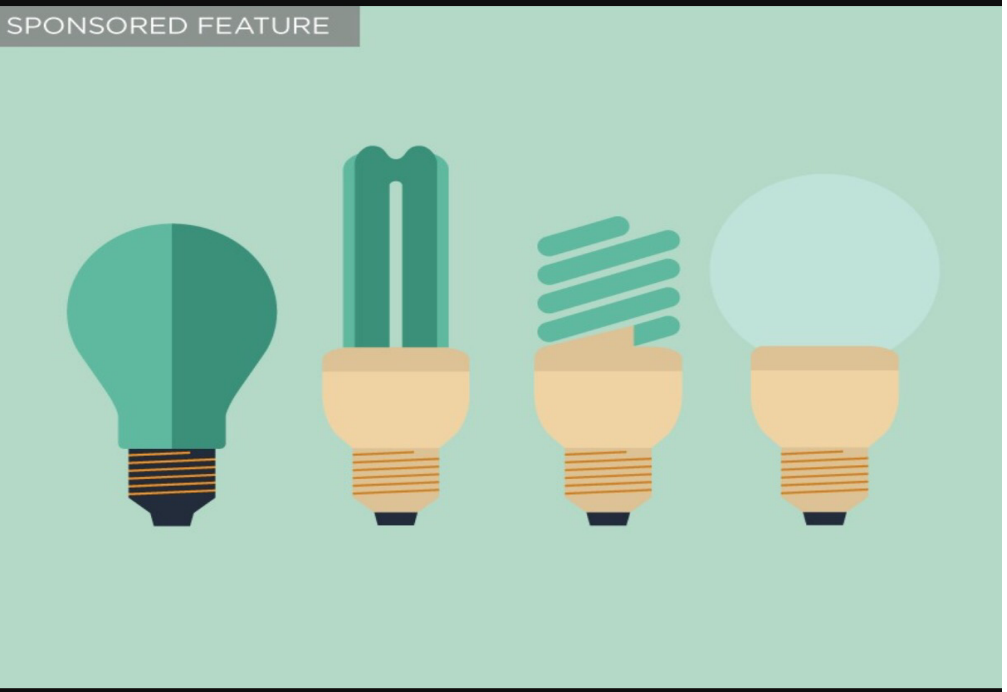


Queens College occupies 84 acres of land.

More then 25 buildings .

Influencing factors on total energy use in buildings


THE EASIEST WAY TO IMPROVE BUILDING ENERGY EFFICIENCY
Buildings account for 40% of total national energy usage.
That's more than the transportation or industrial sectors.(1)
Lighting
Heating
Cooling
Computers
Monitors
Printers
Lifts
Appliances
TOWN HALL



Changing out bulbs for better energy efficient fixtures.

CFL and LED

close the door

against energy waste

WE ALL PAY FOR OPEN DOORS

This is the true cost of keeping just one door open while running the air conditioning. Consider the savings.

NEGATIVE IMPACT: ONE STORE, ONE OPEN DOOR

Wastes **3,850** kilowatt hours of electricity*

Pays about **$500** more for electricity this summer, or $125 a month**

Releases more than **610 kg** of unnecessary carbon dioxide***

Based on a 10,000 square foot business that leaves one door open for 8 hours a day, 5 days a week, from June to September, while running the air conditioner.

POSITIVE IMPACT: 1,000 STORES, CLOSED DOORS

3.85 million

Saves **3.85 million** kilowatt hours of electricity

$500 thousand

Saves **$500,000** on summer electric bills

Prevents 610 tonnes of CO_2 from being released (equal to **110** fewer cars or 1,400 barrels of oil saved)

TORONTO HYDRO

The Importance of data

-temperatures, CO2, Humidi
Running motors, air flow

MEASURE CO2 TO IMPROVE VENTILATION/IAQ

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2a}	DEFAULT OCCUPANT DENSITY #/1000 FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}
Correctional facilities				
Cells without plumbing fixtures	5	0.12	25	—
Cells with plumbing fixtures[g]	5	0.12	25	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	5	0.06	15	—
Day room	5	0.06	30	—
Booking/waiting	7.5	0.06	50	—
Dry cleaners, laundries				
Coin-operated dry cleaner	15	—	20	—
Coin-operated laundries	7.5	0.06	20	—
Commercial dry cleaner[i]	30	—	30	—
Commercial laundry	25	—	10	—
Storage, pick up	7.5	0.12	30	—
Education				
Auditoriums	5	0.06	150	—
Corridors (see public spaces)	—	—	—	—
Media center	10	0.12	25	—
Sports locker rooms[g]	—	—	—	0.5
Music/theater/dance	10	0.06	35	—
Smoking lounges[b]	60	—	70	—
Day care (through age 4)	10	0.18	25	—
Classrooms (ages 5-8)	10	0.12	25	—
Classrooms (age 9 plus)	10	0.12	35	—
Lecture classroom	7.5	0.06	65	—
Lecture hall (fixed seats)	7.5	0.06	150	—
Art classroom	10	0.18	20	0.7
Science laboratories[g, k]	10	0.18	25	1.0
Wood/metal shops[g]	10	0.18	20	0.5
Computer lab	10	0.12	25	—
Multiuse assembly	7.5	0.06	100	—
Locker/dressing rooms[g]	—	—	—	0.25
Food and beverage service				
Bars, cocktail lounges	7.5	0.18	100	—
Cafeteria, fast food	7.5	0.18	100	—
Dining rooms	7.5	0.18	70	—
Kitchens (cooking)[b]	—	—	—	0.7
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]	—	—	—	0.5
Medical procedure rooms	15	—	20	—
Operating rooms	30	—	20	—
Patient rooms	25	—	10	—
Physical therapy	15	—	20	—
Recovery and ICU	15	—	20	—
Hotels, motels, resorts and dormitories				
Multipurpose assembly	5	0.06	120	—
Bathrooms/toilet—private[g]	—	—	—	25/50[f]
Bedroom/living room	5	0.06	10	—
Conference/meeting	5	0.06	50	—
Dormitory sleeping areas	5	0.06	20	—
Gambling casinos	7.5	0.18	120	—
Lobbies/prefunction	7.5	0.06	30	—
Laboratories[j]				
Biological	—	1.0	—	1.0
Chemical	—	1.0	—	1.0
Industrial and nonteaching	—	1.0	—	1.0
Nonproduction chemical labs	—	1.0	—	1.0
Offices				
Conference rooms	5	0.06	50	—
Office spaces	5	0.06	5	—
Reception areas	5	0.06	30	—
Telephone/data entry	5	0.06	60	—
Main entry lobbies	5	0.06	10	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Garages, separate for each dwelling[b]	—	—	—	100 cfm per car
Kitchens[b]	—	—	—	25/100[f]
Living areas[c,i]	0.35 ACH but not less than 15 cfm/person	—	Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	—
Toilet rooms and bathrooms[g]	—	—	—	20/50[f]
Public spaces				
Corridors	—	0.06	—	—
Elevator car	—	—	—	1.0
Shower room (per shower head)[g]	—	—	—	50/20[f]
Smoking lounges[b]	60	—	70	—
Toilet rooms – public[g]	—	—	—	50/70[e]
Places of religious worship	5	0.06	120	—
Courtrooms	5	0.06	70	—
Legislative chambers	5	0.06	50	—
Libraries	5	0.12	10	—
Museums (children's)	7.5	0.12	40	—
Museums/galleries	7.5	0.06	40	—
Retail stores, sales floors and showroom floors				
Sales (except as below)	7.5	0.12	15	—
Dressing rooms	—	—	—	0.25
Mall common areas	7.5	0.06	40	—
Shipping and receiving	—	0.12	—	—
Smoking lounges[b]	60	—	70	—
Storage rooms	—	0.12	—	—
Warehouses (see storage)	—	—	—	—
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	7.5	0.06	25	0.5
Beauty and nail salons[b, h]	20	0.12	25	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	7.5	0.18	10	0.9
Supermarkets	7.5	0.06	8	—
Sports and amusement				
Disco/dance floors	20	0.06	100	—
Bowling alleys (seating areas)	10	0.12	40	—
Game arcades	7.5	0.18	20	—
Ice arenas without combustion engines	—	0.30	—	0.5
Gym, stadium, arena (play area)	—	0.30	—	—
Spectator areas	7.5	0.06	150	—
Swimming pools (pool and deck area)	—	0.48	—	—
Health club/aerobics room	20	0.06	40	—
Health club/weight room	20	0.06	10	—
Storage				
Repair garages, enclosed parking garages[h, d]	—	—	—	0.75
Warehouses	—	0.06	—	—
Theaters				
Auditoriums (see education)	—	—	—	—
Lobbies	5	0.06	150	—
Stages, studios	10	0.06	70	—
Ticket booths	5	0.06	60	—
Transportation				
Platforms	7.5	0.06	100	—
Transportation waiting	7.5	0.06	100	—
Workrooms				
Bank vaults/safe deposit	5	0.06	5	—
Darkrooms	—	—	—	1.0
Copy, printing rooms	5	0.06	4	0.5
Meat processing[c]	15	—	10	—
Pharmacy (prep. area)	5	0.18	10	—
Photo studios	5	0.12	10	—
Computer (without printing)	5	0.06	4	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508$m^3/(s\ m^2)$,
°C = ((°F) -32) /1.8, 1 square foot = 0.0929 m^2.

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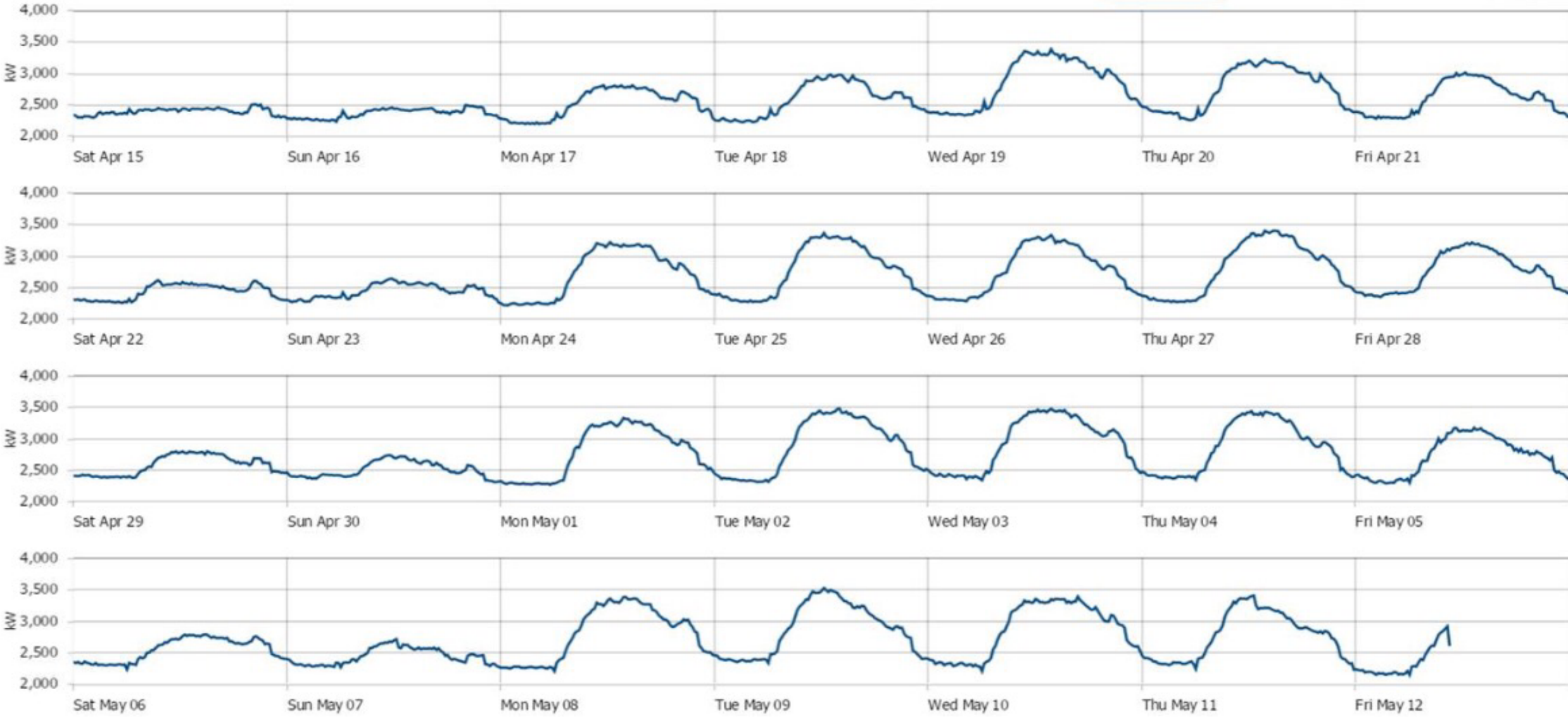

CUNY Queens College - 290118057400003 - New Science Building - E31 - 8094976, Queens E33 - 8094985

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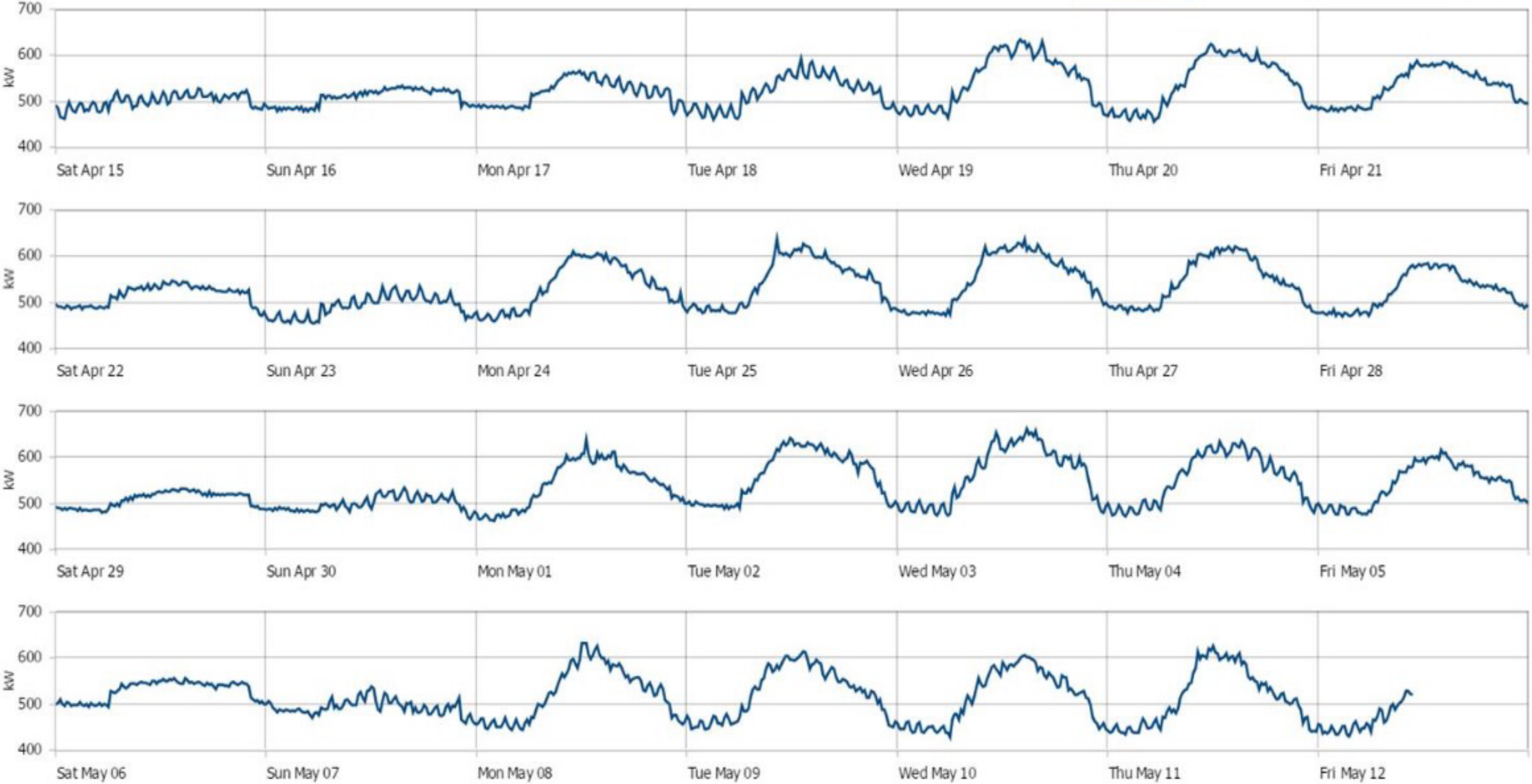

Science Building

- At any given time the Science Building represents about 20 to 25% of Queens College electrical consumption. This is because the building must bring in outdoor ventilation air to maintain indoor air quality.

Maintenance

- Lifespan of equipments last longer
- Better performance
- Safer health conditions

The average efficiency of air conditioners unit sold tends to increase gradually over time, so replacing old units can reduce energy consumption , more comfortable and very less harmful to the environment as well as to our health.

- *Charging Stations*

Students and faculty will always need stations to charge devices and use them.

Not our biggest source of energy consumption (heating/cooling bigger threat) but can make a difference.

What changes would you make?

QUEENS
COLLEGE

1. Do you have any problem with temperature management on campus? If so, please describe where on campus have you felt discomfort.

2. What are some changes or improvement that you would like to see on campus?

3. Communication is key to success! How can we improve communications for students to interact with Buildings and Grounds on campus?