REAL-TIME SOLUTIONS

FOR LOCAL LAW 97

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After 22 years in the pharmaceutical industry holding multilevel managerial and executive positions, Jose Coello Sr. gained extensive knowledge in Sales, Marketing, Customer Service, Warehousing, and New Product Launches, and ventured out as an entrepreneur.

Jose Sr. set his sights on the expanding arena of building construction in New York City, developing strategies for MWBE contractors and workforce development.

A NEW SOLUTION

Start creating a long term plan to reducing energy waste in your building.

New York City Council passed their own "Green New Deal" in late April that includes a number of environmentally focused initiatives. The piece of the "deal" that impacts building owners most directly, Intro 1253, is a complex law that creates carbon emissions limits for most buildings over 25,000 square feet and alternative compliance paths for certain types of buildings.

On May 18th Intro 1253 was passed into law as Local Law 97 of 2019.

This law, the most ambitious in the world to tackle emissions from existing buildings, impacts over 57,000 buildings across the city with the goal of reducing building-based emissions 40% by 2030 from a 2005 baseline.

Jose Coello Sr.
President and CEO | JC Energy Group, Inc.

(Left to Right)
Jose Coello Sr., President and CEO, JC Energy Group Inc.; **Laurie Cumbo,** N.Y.C. Council Majority Leader.

(Left to Right)
Eric Adams, Brooklyn Borough President; **Jose Coello Sr.,** President and CEO, JC Energy Group Inc.

(Left to Right)
Dr. John Flateau, Professor, Medgar Evers College; **Mark Choice,** CEO, Choice Construction; **Hon. Roger L. Green,** N.Y.S. Assembly (Fmr); **Hon. Annette Robinson,** N.Y.S. Assembly (Fmr); **Jose Coello Sr.,** President and CEO, JC Energy Group Inc.; **LaRay Brown,** CEO, Interfaith Medical Ctr., One Bklyn Health System; **Latrice M. Walker Esq.,** N.Y.S. Assembly Chair, N.Y.S. Black, Latino and Asian Caucus; **Len Britton,** President, NYSAMC, New York State Association of Minority Contractors.

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Peter Jeter Esq. Peter J. Clarke Law; **Michael White,** President, MW Construction Group; **Jose Coello Sr.,** President and CEO, JC Energy Group Inc.; **Jose Coello Jr.,** COO, JC Energy Group Inc. **Hon. Roger L. Green,** N.Y.S. Assembly (Fmr).

LOCAL LAW 97
A SUMMARY

Why the law was enacted:

Buildings are responsible for a large portion of greenhouse gas (GHG) production in the United States due to their reliance on energy produced by fossil fuels. The burning of fossil fuels produces carbon dioxide (CO_2), one of the primary greenhouse gases; therefore, carbon dioxide and equivalents (CO_2e), a consequence of hydrocarbon fuels including fossil fuels, serve as the basis for measuring the impact of all GHG. In NYC, large commercial buildings account for 65% of the city's annual CO_2 emissions. The new law forces owners of existing buildings to take action now to reduce their property's carbon emissions.

Purpose of the law:

To reduce greenhouse gas emissions citywide. As the bill states: "There shall be, at minimum, a 40% reduction in citywide emissions by calendar year 2030, and an 80% reduction in citywide emissions by calendar year 2050, relative to such emissions for the base year for citywide emissions."

Who it applies to:

New and existing commercial buildings larger than 25,000 square feet must meet annual carbon intensity limits during each compliance period based on building type. (Groups of two or more buildings with a total area of more than 50,000 square feet are also required to comply if they are on the same tax lot or part of the same condominium project.) See the table below for the building classifications and emission limits. Some buildings are exempt from this law, such as city-owned buildings, buildings with one or more rent-regulated units, other types of affordable housing, and worship spaces.

Timeline:

The legislation sets out building limits through 2050 but takes an incremental approach to the reduction by setting periodic goals. The first two goals have been set: 2024-2029, and 2030-2034. (For years 2035 through 2050, emissions limits will be set by January 2023.) Starting in 2025, all buildings must submit an annual report certified by a registered design professional that the building is in compliance, by May 1 each year. Buildings that fail to comply will incur a fine of $268 per metric ton that their carbon footprint exceeds the limit annually.

NYC CO2 Emission Guidelines For Local Law 97
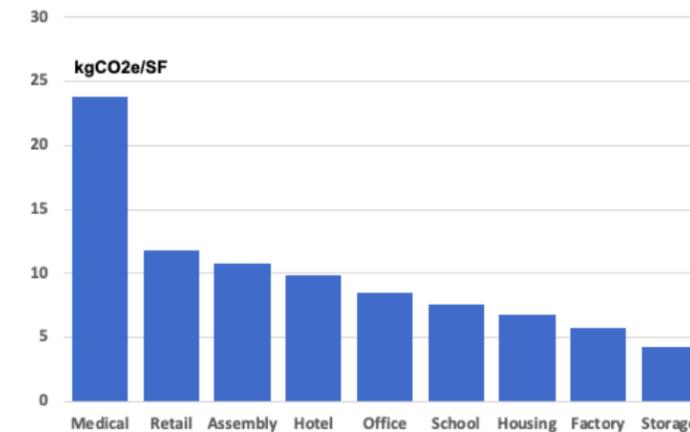
The above chart shows the proposed CO_2e (equivalent) emissions measured in kilograms per square foot of building space. These CO_2e guidelines represent what commercial buildings larger than 25,000 square feet should be trying to achieve by 2024.

To put these numbers in context, here's how the law's 2024 thresholds compare to what we estimate as the current CO_2e emissions levels. To derive the estimate of current CO_2e emission, we used the DOE national average energy intensity per square foot and the EPA's emissions calculations of kWh energy to kilograms of carbon dioxide. Below, the CO_2e emissions reductions are compared to the Local Law 97 guidelines by industry.

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Council Housing;
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President and CEO,
JC Energy Group
Inc.; **Jumaane
Williams,** N.Y.C.
Public Advocate.

LOCAL LAW 97
INTRO 1253

What does it require and when?

Local Law 97 sets detailed requirements for two initial compliance periods: 2024-2029 and 2030-2034 and requires the City to clarify the requirements for future periods through 2050. Buildings over 25,000 gross square feet must meet annual whole-building carbon intensity limits during each compliance period based on building type or prorated for mixed-use buildings. Certain building types including city-owned buildings, affordable housing, hospitals and houses of worship will have alternative compliance options if they cannot hit the carbon intensity limits. To comply, building owners must submit an emissions intensity report stamped by a registered design professional every year starting in 2025 or pay substantial fines.

Carbon Emissions Intensity Limits by Building/Space Type:

			Carbon Limit (kgCO2e/sf)	
	Occupancy Group	**Space Use**	**2024-2029**	**2030-2034**
B	Ambulatory Health	Medical Office	23.81	11.93
M	Mercantile	Retail	11.81	4.3
A	Assembly	Assembly	10.74	4.2
R1	Hotel	Hotel	9.87	5.26
B	Business	Office	8.46	4.53
E	Educational	School	7.58	3.44
R2	Residential	Multifamily	6.75	4.07
F	Factory	Factory	5.74	1.67
S	Storage	Storage/Warehouse	4.26	1.1

What happens if I don't comply?

The City has set steep fines for buildings that do not comply. Buildings must pay $268 per metric ton that their carbon footprint exceeds the limit, annually. There are also fines for not submitting a report and for submitting a false report.

How does my building emit carbon?

Carbon dioxide is emitted into the atmosphere during the production of the energy that is consumed by a building to heat, cool, light, and power the activities of its occupants. These emissions are typically the result of fuel combustion and can occur on-site as a result of an oil or gas boiler, or off-site at a power plant that burns natural gas to generate electricity.
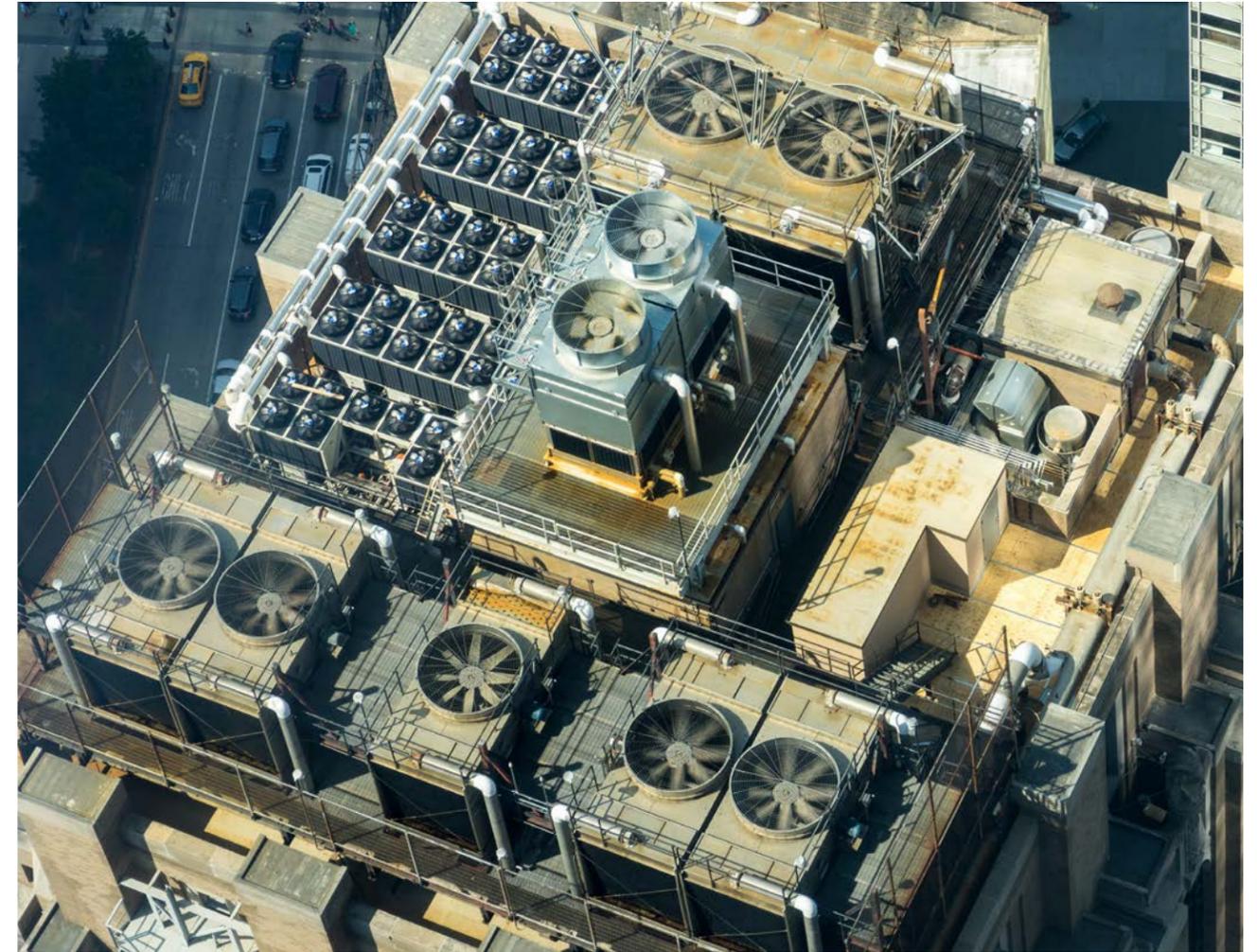
(Left to Right)
Jeff Cook, Foreman, Prismatic Construction; **Billy Kelly**, Superintendent, Prismatic Construction; **Letitia James**, N.Y.S. Attorney General; **Jose Coello Sr.**, President and CEO, JC Energy Group Inc.

MAKING SURE YOUR BUILDING IS COMPLIANT

How do I measure my building's carbon intensity and know if it's in compliance?

Carbon emissions, or the "carbon footprint" of a building is measured by totaling the carbon dioxide emitted into the atmosphere during the production of the energy consumed by a building to heat, cool, light, and power the activities of its occupants and systems. The calculation to establish the measure of CO_2 emissions begins with the US EPA's free Energy Star Portfolio Manager tool. This is a little more complicated than you might think.

All buildings over 25,000 square feet should have submitted their Energy Star Benchmarking data to the City by May 1, 2019 for Local Law 84 compliance. Energy Star Portfolio Manager, the tool required by the City for building owners to store and submit energy data for LL84, is able to convert a building's energy use into carbon emissions. However, it should be noted that the units of measurement in Energy Star is slightly different from how it will be measured by Local Law 97. Energy Star typically displays emissions in kilograms of carbon dioxide equivalent and the law lists the limits in metric tons of carbon dioxide equivalent.

Once you've found your total carbon emissions in Portfolio Manager, you'll need to calculate your carbon emissions limit to find out if you comply or not. To calculate your emissions limit, find your type of building in the table on the next page and multiply the limit by the gross square footage of your building. This is the carbon emissions limit for each compliance period. If your total is higher than the limit, you are not in compliance. To calculate your annual fine, first convert your building's carbon footprint from Kg to metric tons by dividing by 1,000, then multiply the difference between the limit and your actual carbon footprint by $268, or call us! (718) 825-6557

Estimate Of CO2 Emission Reductions To Comply With Local Law 97
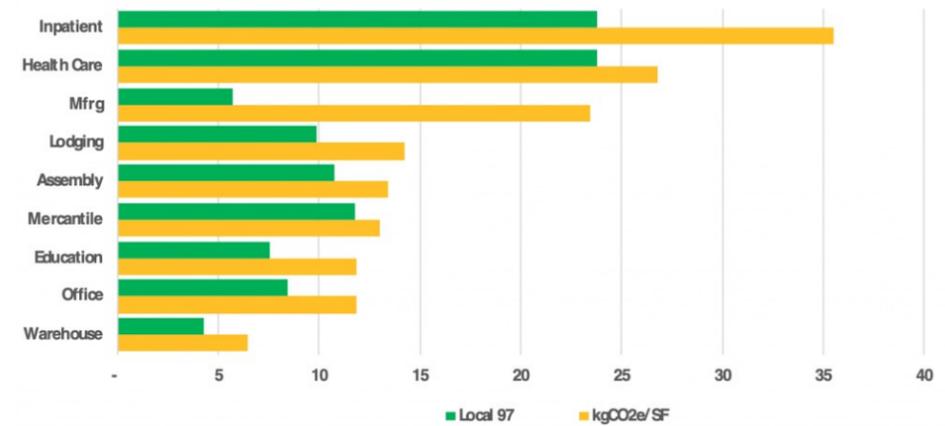
Given the extent of emission reductions by building occupancy type, the question for property owners is how to reduce their respective energy footprint in order to reduce CO2e emission levels. There are several energy conservation measures (ECM) that will reduce energy intensity and CO2e emissions. In addition, not only do ECM initiatives reduce CO2e emissions, they reduce building operating costs.

For building owners, the first step is measuring energy intensity using the EPA Energy Star framework and evaluate approaches to reduce the energy and GHG emission footprint.

Respondio™ monitoring for compliance

How does this impact a typical commercial building?

The 2024 and 2030 emissions intensity limits were set to impact the worst 20% and worst 75% of carbon emitters respectively, so statistically, an average building will meet the initial 2024 requirements, but will need to reduce emissions to meet the more stringent 2030 limits. But that doesn't mean that building owners can sit back and do nothing for ten years. Identifying and implementing energy upgrades is a multi-year process, and even if you plan to sell the building before 2030, buyers will start to bake in the costs associated with meeting the emissions limits, so building owners should start planning for compliance now.

The cost of noncompliance

In the case of Local Law 97, noncompliance is costly: Buildings that fail to comply will incur a fine of $268 per metric ton that their carbon footprint exceeds the limit annually. That translates into steep fines for just about every type of building. The cost of implementing various efficiency measures will vary, but the money you'll save over time as a result of those measures will exceed the cost of inaction. Plus, you'll have demonstrable proof of your efforts to become more environmentally sustainable, a characteristic that has business value in and of itself.
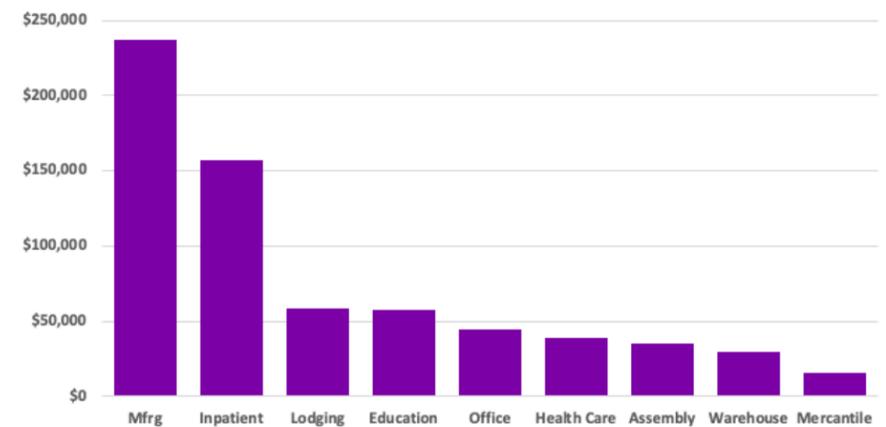
In Figure 3 the estimated cost of non-compliance is calculated using both DOE national average energy intensity per square foot and the EPA's emissions calculations. The following chart shows the potential impact by building occupancy category. The fine for non-compliance is currently $268 per metric ton.

Jose Coello Sr.,
President and CEO,
JC Energy Group
Inc.; **Senator Kevin
Parker,** Chair,
Senate Committee
Energy and
Telecomm.

How do I reduce my carbon emissions and prepare for compliance?

While there are still a number of details to be worked out within the law, all buildings should start developing long-term energy and carbon reduction strategies today to meet or exceed the emissions performance targets. This process takes time and to be successful, requires input from numerous stakeholders including internal and external experts, tenants, building operations, ownership and management.

A proper energy and carbon management plan should evaluate all potential energy and carbon reduction initiatives in the near, medium, and long term:

- Base building HVAC
- Common area lighting
- Sensors and controls
- Tenant lighting, plug loads and HVAC
- Retail and ground-floor tenants
- Operator and occupant training

If you are completing or recently completed your Local Law 87 energy audits, that can be a good place to start. If you haven't started Local Law 87 yet, ask your provider to consider longer-term energy savings strategies in their analysis even if it expands the scope or cost of the energy audit. It's worth it since your LL87 provider will already be analyzing your systems looking for energy saving opportunities.

What about my tenants? They represent at least 50% of my building's energy use?

Tenant energy consumption plays a big role in overall energy use and therefore also represents a huge opportunity for savings. Reducing your building's overall energy and carbon intensity will not be possible without collaboration with your tenants. Meet with tenants to discuss energy efficiency when they are moving in and building out their spaces. Also meet with existing tenants to discuss energy upgrades that can be performed mid-lease that could lower their energy bills. NYSERDA has an incentive program, the Commercial Tenant Program, that will pay for some or all of the cost of identifying energy reduction opportunities in new and existing tenants' spaces. JC Energy is an approved vendor for the CTP and we're happy to discuss providing these services to your tenants.

It seems like there are lots of details that still need to be worked out. Should I just wait until more info is released before doing anything?

Don't wait. Especially if you're above the 2024 limits. Building owners should get started now, at least with developing a plan. It is true that the City will be issuing rules and additional studies on their approach to carbon trading, peak demand, renewable energy credits and carbon offsets among other items, but none of these negate the value of reducing energy waste in your building. You don't need to undertake massive projects right away, but you should engage a professional and start creating a long-term plan. If you have a responsible long-term energy/carbon reduction plan you will be able to fold in the various rules and adjustments as they are issued by the City, but many of these issues won't be resolved until 2023, which is too long to wait if you need to make changes for 2024 compliance.
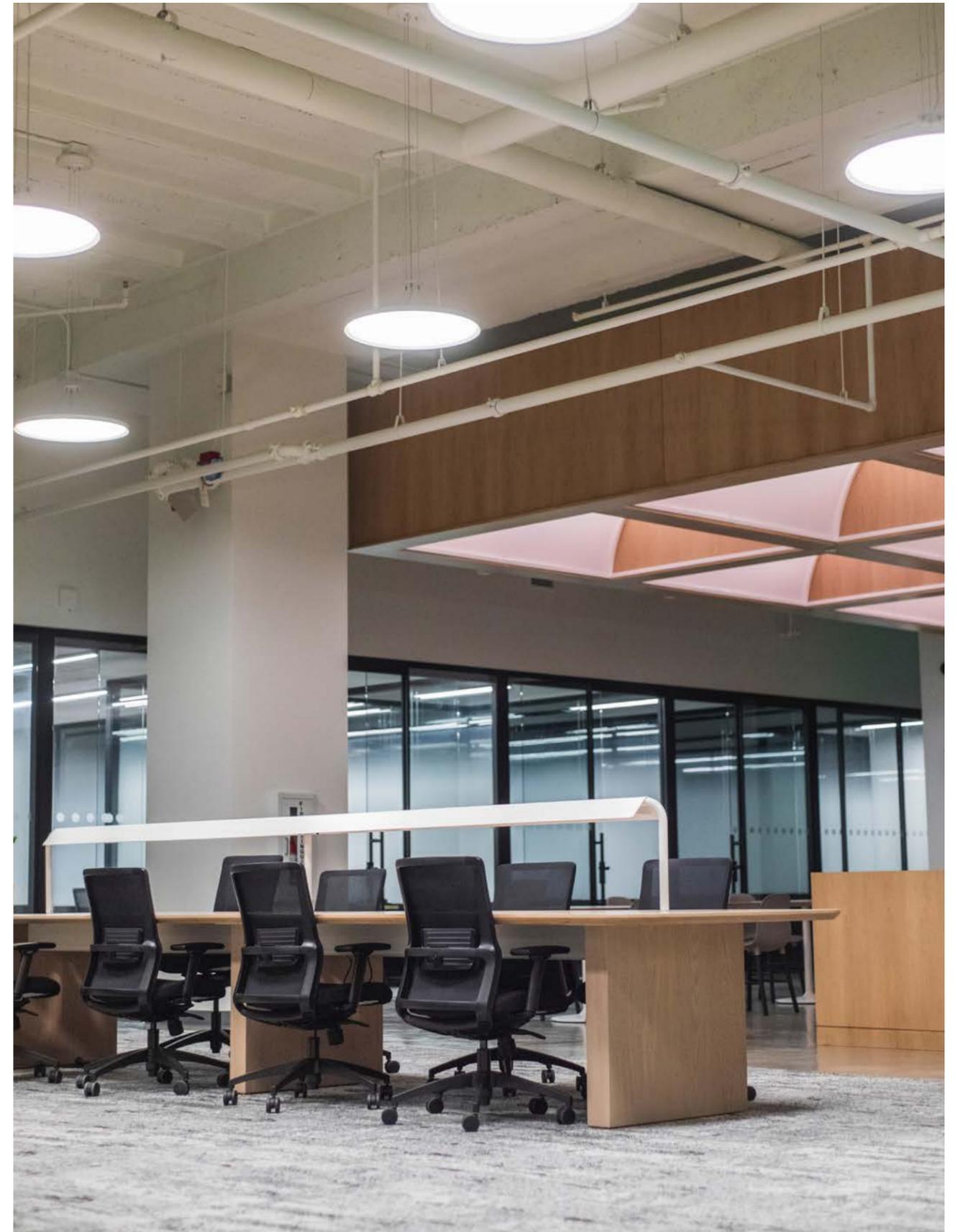
AN INTERNET OF THINGS APPROACH

There's no denying that reducing greenhouse gas emissions is the right thing to do for the environment. And with the increasing emphasis on business sustainability, there's also no doubt that companies with buildings located in New York City—whether they already have a governance policy that includes sustainability in place or not—will reap the benefits of embracing sustainable practices. But make no mistake: Building owners need to start coming up with a game plan now in order to significantly reduce their energy consumption over the next four years as required by Local Law 97.

According to some estimates, as much as 30% of the energy used in commercial buildings is wasted on inefficient machinery and equipment, which represents plenty of room for improvement. Building owners are fortunate that technology advancements have made it easier to pinpoint areas of waste, as well as design strategies for controlling and optimizing energy efficiency. The Internet of Things (IoT) is one of the newest technologies being applied in this area today. It underlies the "smart" building concept, which connects various building systems and considers them holistically. The whole-building energy optimization afforded by the IoT makes more advanced energy strategies (and therefore greater reductions) possible.

By some estimates, large commercial buildings using a collaborative IoT platform can cut energy use by 29% per year.

In many cases, employing the IoT can speed up the improvement process. Not only can you get up and running relatively quickly with IoT sensors, but the detailed information they produce about your building also helps you determine the most impactful strategies faster than with some other methods. In addition, IoT analytics platforms are capable of doing advanced calculations using a variety of data inputs, which produces a more sophisticated and effective strategy. (Read about some specific IoT-based energy efficiency strategies here.)

THE IOT MODEL OF ENERGY MANAGEMENT: 3 STEPS

Employing the IoT for energy management means taking a proactive approach about what measures will yield the best reduction in greenhouse gas emissions. The prescriptive IoT model follows these three steps:

1

Learn about your building's current energy profile.

Most building operators don't have deep visibility into where and how a facility's energy is consumed, nor do they understand or know the patterns of use. But before you can consider implementing any specific measures to gain control over your energy use, you need to understand how your building currently uses energy.

IoT sensors are capable of gathering detailed data about your facility, monitoring the energy use of individual machinery as well as every component of building operations (HVAC, lighting, ventilation, etc.). This "energy footprint" tells how and when your building uses energy, and serves as a baseline of your typical consumption pattern. By continuously monitoring those components, you can gain greater insight into your current energy consumption and building environment and make more targeted improvements.

2

Identify areas of opportunity.

Once you know which systems are primarily responsible for driving energy use, you can begin to identify areas of excess. You can also benchmark your energy usage against other buildings in your industry, which will help ferret out areas of unusually high consumption. Rather than shooting in the dark, you can then determine the best opportunities in your building for controlling and optimizing energy efficiency. IoT and analytics provide a framework to measure, in near real time, both energy consumption and emissions levels as well as identify areas to further reduce energy use, cut costs, optimize efficiency, and drive sustainability

3

Develop an energy management strategy.

Not all energy management strategies work the same. Armed with specific knowledge about your building's operations, you can begin to develop an energy efficiency strategy that will have the most impact. This includes not only ways to increase efficiency of operations and reduce energy demand, but also how to incorporate renewables into your energy portfolio in a way that makes the most sense for you.

Many IoT platforms have an advanced analytical component that's capable of bringing together a number of different data points to identify opportunities for energy optimization, everything from weather data to occupants' behavior to cyclical and seasonal factors. With the right data variables—collected, correlated, and analyzed by the IoT—it's possible to design your building's optimal approach to energy management for guaranteed greenhouse gas reductions

REAL-TIME MONITORING: CONTROL, ANALYTICS & INTERVAL REPORTING

Like living organisms, a building has: (1) a body, consisting of foundation, walls and roof; (2) organs, consisting of power and light circuits, heating and cooling systems, waste disposal, air and water supply; (3) sometimes a nervous system, consisting of energy/operation management system.

Like living organisms a building can have issues and illnesses if all its systems are not working optimally and in synchrony with each other. Prescriptions for fixing the body's ills are written by doctors in Latin. These prescriptions are the answers to the illnesses.

Etymology tells us that the word "answer" has its origins in the same Latin roots as the word "spondere", signifying to engage for, to assure". Other derivatives of the same roots are "respondedum" , "responsio", and in the language of building management systems: REspondIO™ .

Respondio is a cutting edge device, which connects a building's nervous system, (any year and manufacturer), to a virtual doctor. Respondio's solutions to a building's illness reside in an IoT cloud which contains historical databases of building/patient performance, anomaly detection, and analytics.

JC Energy has decades long experience with building construction and maintenance, from breaking ground to providing building services, everything INCLUDING the kitchen sink! JC Energy offers not only consultation, but also the "prescription" and even the "surgery". Our expertise includes installation and repair of boilers and steam/water/electric heat systems, along with diagnostics. We deliver a proper regimen for buildings to get better and a 24/7 monitoring of the building's vitals while simultaneously comparing any building to thousands of others in the only existing building performance database collected over the past twenty years.

The answer is: **Respondio™**

REspondIO™
an edge device.

PROCESSOR

QUAD-CORE CORTEX-472
(ARM v8) 64-bit SoC @ 1.5GHz

MEMORY

4GB
LPDDR4

SUPPORTED PROTOCOL

MODBUS	**METASYS**
BACnet	**MEPCO** PROPRIETARY
XML	**INTECH 21** PROPRIETARY

CUSTOM CONFIGURATIONS AVAILABLE
FROM YOUR LOCAL INTEGRATOR

MEET RESPONDIO™

The Respondio™ processor can be used as a standalone local server, an RS-485 to Ethernet communication converter, a communication buffer, a pulse counter for energy, gas, and water metering, as well as a digital I/O interface. Respondio™ also provides an interface from alarm sensors, boilers, and heating distribution controllers to the Local Server, and serves as a data concentrator unit for a wide variety of controllers, digital and analog sensors.

Respondio™ is a perfect solution to your connectivity for numerous applications:

- Advanced Meter Reading: Electricity, Water, Fuel
- Boiler and Heating Plant Control
- Alarms: Safety and Security
- Lighting Controls
- Cooling Systems and Units

All the above and many other applications are custom configurable for any process by using JC Energy and Intech 21 solutions for wireless, powerline carrier, or any form of wired applications.

In addition, JC Energy provides a host of building control and monitoring devices. You can inquire about a specific application or system from your local integrator.

SUPPORTED EQUIP.

TS-2100	**OPLC**
PM-2104	**HWHC**
DLCC-2104	**KW-2104**
ZVLC	**KW-2108**
MEPCO	**KYZ**

PREFERRED CONTROLLERS
HEAT TIMER CONTROLLERS
SIEMENS CONTROLLERS
AUTO-FLAME CONTROLLERS
SENSA-PHONE

PERIPHERALS

RS-485 PORT

2 USB

2 USB

USB-C CONNECTOR
FOR 5V/3A POWER

DUAL BAND 2.4/5GHz
WIRELESS LAN

GIGABIT ETHERNET

MICRO HDMI PORT

REspondIO™
Ver. 2107

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