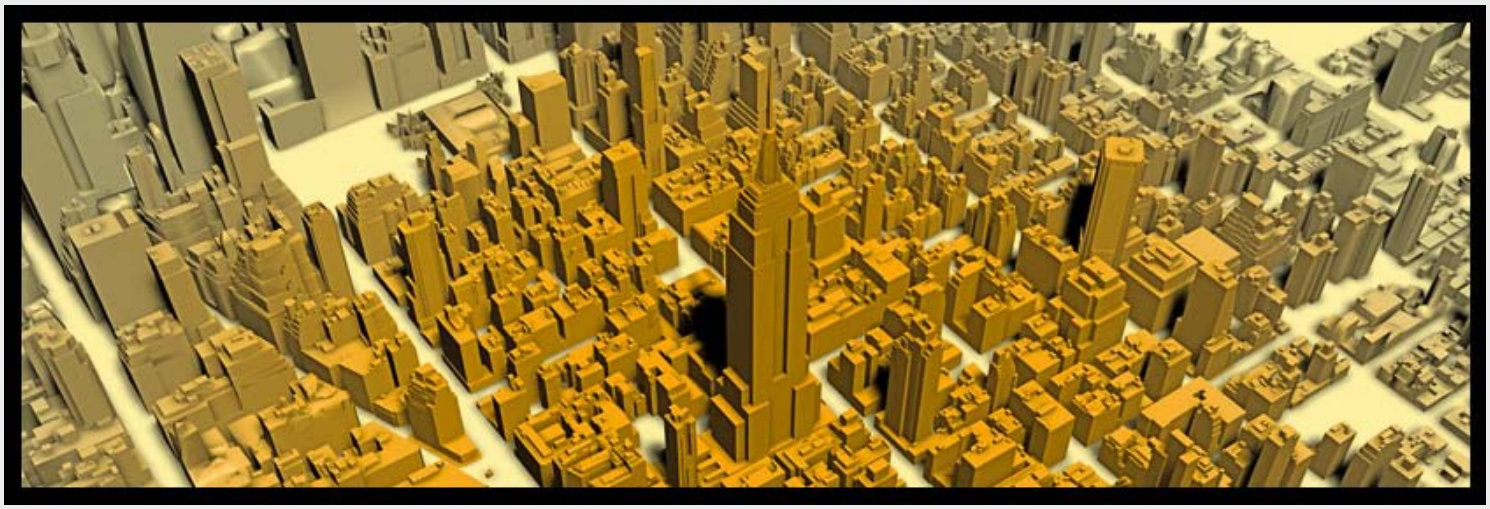
EMPIRE STATE BUILDING

SUSTAINABILITY EXHIBIT



Since its completion in 1931, the Empire State Building has been the world's most famous office building. Rising 102 stories from the middle of New York City, our Art Deco skyscraper has always been known for leadership and innovation. The Empire State Building is America's favorite architectural icon and the single largest New York City landmark. Now, eight decades after its completion, a team from the Clinton Climate Initiative, Johnson Controls, Jones Lang LaSalle, and the Rocky Mountain Institute joined with Empire State Building Company to transform our building into a modern icon of energy efficiency and sustainability from which the entire world can learn and benefit. Welcome to the Empire State Building. We hope you learn from and enjoy your visit.

Energy Consumption and the Built Environment:

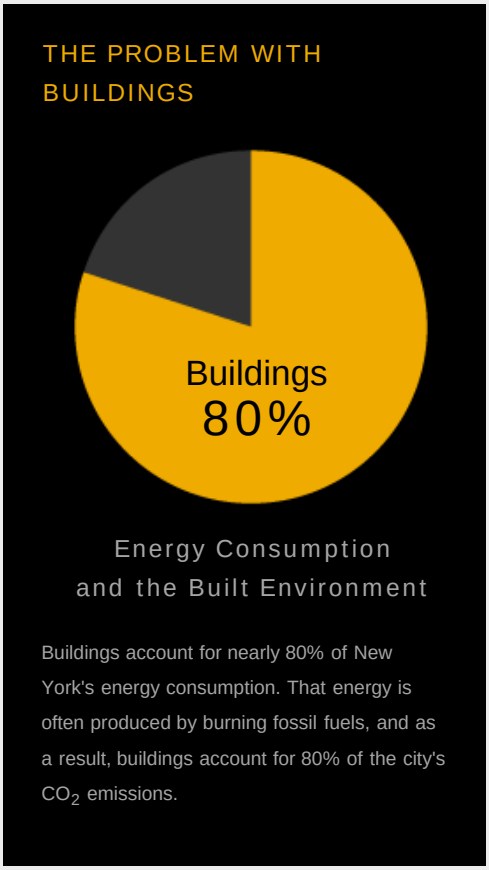
Did you know that the built environment consumes 80% of all the energy used in New York City? The existing built environment accounts for 80% of the city's CO_2 emissions. The Empire State Building alone consumes enough energy in an hour to keep an average light bulb burning for over 100 years. Around the world, buildings account for over 70% of the energy used in our cities. As our population grows, so does our thirst for energy. It is not enough to construct new buildings to be more efficient. 90% of all the buildings which will be here in 2035 are here now. We need to implement energy efficiency in the existing built environment, and we need to do it now.

The Empire State Building Sustainability Retrofit

With the help of our team of global leaders, the Empire State Building is undergoing an unprecedented, building-wide, sustainability retrofit.

- Reducing our consumption of watts and BTUs by a guaranteed 38.4%
- Cutting our carbon footprint by 105,000 metric tons over the next 15 years
- Equivalent to taking over 20,000 cars off the road

The biggest barrier preventing building owners from making their buildings more efficient is the lack of definition of the costs and returns to be achieved from investment in energy efficiency retrofits. The Empire State Building team developed a replicable, transparent, non-proprietary, open-source process that proves sustainability is a smart business decision. The Empire State Building invested millions of dollars in becoming more energy efficient, but the improvements will save the building $4.4 million every year in energy costs, meaning that investment will pay for itself in just 3 years!



A Gift to the World

The Empire State Building team spent over 2 years crafting a retrofit plan that will serve as a template for other buildings around the world, giving them a proven road map to becoming more energy efficient without losing money or sacrificing comfort. You are now walking through a state-of-the-art example of how practice can help inform policy and business decisions.

Explore this site to learn more about what's happening at the Empire State Building and how the team here is paving the way for other buildings around the world to follow in our footsteps. See it for yourself – come visit us and experience our multi-million dollar Sustainability Exhibit on the 2nd floor when you make your visit to our Observatories.

CONTINUE TO STEP 1: TRANSFORMING THE EMPIRE STATE BUILDING

Step 1: Transforming the Empire State Building

Typically, when large buildings undertake retrofits, they deploy the "silo" process: they will pick one or two systems to invest in for energy efficiency. The Empire State Building shows the enhanced benefits of making integrated changes involving numerous building systems. By planning and taking the right steps in the right order to make individual upgrades that interact with others, we create a much greater overall result.

The right steps in the right order: Why upgrade your heating and cooling systems before you've addressed inefficient windows and walls that let heating and cooling just seep out through the building's exterior? As an example, we dramatically improved the efficiency of the building's exterior by refurbishing our existing windows on-site and installing insulation, which then allowed us to realize even greater savings in other areas.

As part of our $550 million Empire State ReBuilding program, the building's 4 electric chillers were due to be replaced with larger units. As a result of the improvements we made to the windows and walls, we dramatically reduced the building's overall demand for heating and cooling, meaning that we could retrofit the existing chillers instead of replacing them with new ones, saving over $17 million! And we did all the work on-site, creating local, green jobs.

WHY RETROFITS MATTER

90% of existing buildings will still be here in 25 years. Tearing them down and starting over is not an option: it creates tremendous waste and destroys architectural and historical icons.

Retrofit Advantages

- Reuses materials instead of sending them to a landfill
- Saves money by not replacing existing systems that still have life in them
- Reduces carbon emissions by not manufacturing and transporting new materials

Window Refurbishment

Energy and money were literally flying out of the Empire State Building's double-paned windows: heat was seeping out of the windows in the winter (and cool air in the summer). Replacing the windows would have been extremely costly, and would have created a mountain of wasted materials.

The Empire State Building team devised a program to refurbish each of the 6,514 windows in a custom on-site processing center, reusing more than 96% of existing window glass and making the windows up to 4 times more efficient at keeping heat and air conditioning inside.

REFURBISHMENT PROCESS

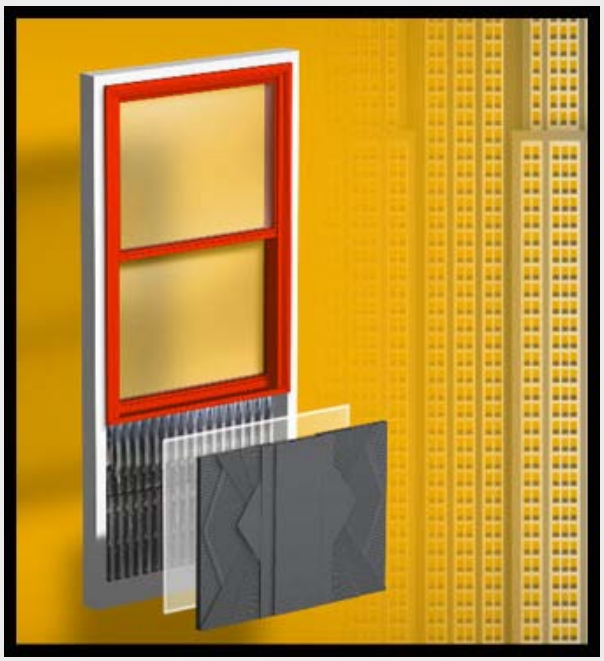
Windows are brought to the Processing Center on the 5th floor, saving money and reducing carbon emissions by not transporting them off-site. They are disassembled and cleaned in a 3-step process to ensure no dust or dirt will be sealed inside.

A spacer is inserted, and a layer of heat reflective film is installed between the panes of glass.

Windows are filled with an insulating mixture of gases: the exact ratio of krypton and argon gasses varies based on where the windows are on the building and their level of sun exposure.

The work crew processes 50-75 windows per day, so the work in tenant spaces is performed literally overnight with no disruption or construction debris.

Refurbishment makes the windows up to 4 times more efficient, rendering them nearly as effective as triple paned windows at a fraction of the price (r-factor increase from 2 to 8), and will add an additional 25 years to their life.



Insulated Radiative Barriers

Beneath each of the 6,514 windows are 6,514 radiators. Like virtually every building with perimeter heating/cooling, no insulation was ever specified or installed between the radiators and the masonry walls behind them. When the radiators were on, much of the heat they generated was literally heating the outside of the building.

Not all energy efficient solutions are high-tech. We also removed each radiator and installed an inexpensive insulating barrier that reflects 24% more heat back into the building. Not only is heat reflected into the tenant occupied spaces, in summer cool air does not seep through the masonry walls, thereby reducing the cooling load.

Additionally, every radiator is connected to a digital control system to make sure that steam consumption is only as much as is needed, allowing us to monitor the performance and function of every piece of equipment.

CONTINUE TO STEP 2: A SMARTER BUILDING, A MORE EFFICIENT BUILDING

A massive circulatory system of pipes, valves, ducts and wires.

Step 2: A Smarter Building, A More Efficient Building

Improving the efficiency of the building's exterior (Step 1) reduced our demand for heating, ventilation and air conditioning systems. Next, we looked inside the building for opportunities to become more efficient. A massive circulatory system of pipes, valves, ducts and wires works behind the scenes to supply heat, light, air and air conditioning to tenants and visitors. These systems in many buildings share a common flaw: they are on or off with no way to adjust output, which wastes energy and creates hot and cold spots.

You wouldn't drive a car that only went full speed or not at all. You need a gas pedal and a speedometer – a way to adjust the car's velocity and monitor its speed. Step 1 is upgrading to equipment that can run at variable speeds, and Step 2 is providing a mechanism to monitor and control it.

Chiller Plant

The chiller plant is the building's air conditioning unit. Four massive chillers cool thousands of gallons of water. That water is piped through the building to fan units that force air past the

Retrofitting the chillers involved installing new variable speed drives and improved controls (our "gas pedal" and "speedometers"), allowing them to continuously adjust their

chilled water to cool the building.

output to meet the building's needs without running unnecessarily. The result is a 5% reduction in the building's overall energy consumption.

Air Handling Units

Air Handling Units on every floor cycle fresh air in and out, cooling and ventilating the building. Different parts of the building have different heating and cooling needs: some sides get more sun than others, and higher floors are exposed to colder air and higher wind. The old units, like the chillers, were either on or off, resulting in wasted energy. The new units use Variable Air Volume (VAV) technology to constantly fine tune their output to match the cooling and ventilation demands of different building spaces, as sensed by the building's central control network. VAV technology is another "gas pedal," allowing units to run only when needed.

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Wireless Control Network

Now that we have the right equipment in place, we need a way to accurately monitor and control it – we can't have an army of technicians walking around turning knobs. As part of the retrofit, the Empire State Building invested in the largest wireless network ever installed in a building. Every Air Handler, Chiller, Radiator, Valve and Louver has been equipped with sensors that allow us to monitor and control every piece of equipment in the building in real-time. If the corner of an office is too cold, that doesn't mean every radiator in the office needs to get turned up, or every area needs to be cooled less.

The massive network is a brain for the building's systems, making sure they are all doing their job efficiently, and helping us find new ways to save money and resources. The network addresses the #1 complaint from office workers around the world: "I'm too hot/I'm too cold."

CONTINUE TO STEP 3: MULTIPLYING THE POWER OF CHANGE

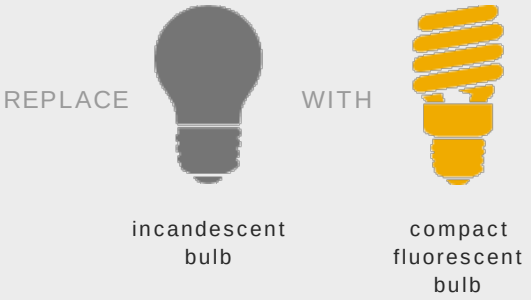
Step 3: Multiplying the Power of Change

We've reduced energy demand by making the building's exterior more efficient (Step 1). We've improved building systems, ensuring they're smarter about how they use and distribute energy (Step 2). The final step in making the Empire State Building a beacon of energy efficiency is to involve the people inside – over 20,000 people work here every day and over 3.5 million people visit every year. Transforming the way we consume energy doesn't just mean other buildings need to follow this model; we need individuals around the world to recognize that they can have efficiency without compromise, and that they can contribute to this broader sustainability effort.

Skanska, our tenant on the 32nd floor, will realize over $20,000 in energy savings annually in their new, energy efficient office space. Many of these ideas can be applied to even small homes or apartments, saving you money and improving your quality of life. We need you to spread the word and help multiply the change.

Efficient Lighting & Plugs

Compact Fluorescent Lamps (CFLs) consume only 25% as much energy as traditional incandescent bulbs and last up to 15 times longer. The Empire State Building is encouraging all of our tenants to use these more efficient bulbs.



If you replace just one typical (60 Watt) incandescent bulb in your house with a CFL, you could save $15 a year.

If each of our 3.5 million visitors replaced one bulb, we could save $53 million a year.

If each of the over 100 million American households replaced just one bulb, we would save enough money to power a city of over 1.5 million people for a year.

Day-Lighting

Like most buildings of its time, the Empire State Building was designed to maximize natural lighting. Sunlight pours in through over 6,514 oversized windows, providing an abundant source of light for much of the day, and creating opportunities for us to save energy and money.

Task-specific lights instead of overhead lights: "Task-specific" lights can be turned on and off as they are needed, meaning that the whole office doesn't need to be lit with electric lights all the time.

Office layouts: Many offices install walls to sub-divide the space, often blocking access to windows with office walls. This means that interior spaces must rely on electric light. By opening up office layouts, we can take better advantage of the sunlight.

Turning the lights off: Many of us forget to turn off the lights, even when we don't need them. We are encouraging tenants to install light sensors that are able to sense ambient light levels and turn lights down or off when not needed.

Tenant Energy Management

Traditionally, tenants have had very little control over how the energy within their offices is allocated. The Empire State Building wanted to put the power in the tenants' hands.

We are providing tenants with a web-based digital control system that allows them to monitor the way energy is being used in their spaces. An online dashboard gives them full transparency into their energy consumption and helps them analyze the data to find ways to be more efficient.

Finally, every new office suite in excess of 2,500 square feet is individually metered, so tenants can save money through their own actions. Everyone can take a more active role in managing their own energy consumption. Find out when you're using the most energy and look for ways to avoid using lights or temperature control systems when they are not needed.

LEARN MORE ABOUT OUR TEAM AND OUR VISION

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Our Team, Our Vision

The vision of this project goes beyond just retrofitting the Empire State Building. We all know that our energy model needs to change; we need to find alternative sources of energy, so we can stop depleting fossil fuels and stop engaging in conflicts over them.

Did you know that energy efficiency is three to five times less expensive per watt than alternative energy sources... that energy efficiency is, in fact, the cheapest source of alternative energy out there? Buildings consume over 50% of the world's energy. Making them more efficient will have a greater impact than any alternative energy source. Investing in energy savings not only creates jobs, but saves money over time, allowing for greater competitiveness, productivity, and ultimately profits.

The vision of the project team of Clinton Climate Initiative, Johnson Controls, Jones Lang LaSalle, and the Rocky Mountain Institute was to set an example the world could follow - to create a case study that proves energy efficiency retrofits, when done right, can and will save money. As Empire State Building Company principal Anthony Malkin said: "If we only succeed at the Empire State Building, we have failed."

By looking at the whole building, we were able to multiply the savings we might have achieved through incremental change. This project is proving that sustainability does not have to be a compromise: we are reducing our energy costs by a guaranteed 38.4%, and that means we will repay our investment in just 3 years. Our process is already being used in several large buildings to achieve the same outstanding results.

The Building

The Empire State Building is leading the movement towards energy efficient buildings. We are proving that sustainability retrofits are smart investments and creating a template for others to follow in our footsteps.

20,000

cars off the road

This project will reduce the Empire State Building's carbon footprint by 105,000 metric tons over the next 15 years, equivalent to taking 20,000 cars off the road.

The City

Over 90% of the buildings in New York City will still be here in 25 years. Fossil fuels are getting scarcer, and our population continues to swell. We need to radically change the way we consume energy.

43 million

barrels of oil saved

80% of all energy consumed in New York City is consumed by buildings. 20% of those buildings consume 80% of that energy. If only the top 20% of buildings in New York City became 38.4% more energy efficient, we would reduce our total energy consumption in New York City by

The World

The environment is not a place we visit; it's where we live and work. This is about reducing the impact of economic growth, and creating the opportunity for growth with reduced impact around the world.

8 billion

acres of trees

8,000,000,000 acres of trees: If every country in the world became 10% more energy efficient, we would cut our CO_2 emissions by 3 billion metric tons – more carbon than a forest 3 times the size of the United States could filter in a year.