Somewhere along the curve of recent history, the word *green* moved from being the word that means *the color of leaves*, to the word that means *the liberation of leaves*. The Oxford English Corpus* confirms it—today more green *belts*, green *spaces*, green *fuels*, and green *revolutions* pass the lips of English speakers than green *salads*, *foliage*, and *pastures*. But the ordinary person probably doesn't need a linguistic study to know something has shifted. We can all feel it. Green has changed us. We are, as a species of thinkers, buyers and doers, different now than we were even 365 days ago.

Resource consumption is no longer something you think about only if you live in a modified school bus or have ever gone to San Francisco wearing flowers in your hair. In 2007, water crises plagued not only the places where cacti grow, but those that support Spanish moss as well. This year the U.S. drafted, revised, and re-revised the nation's most significant energy bill in decades. (It's a start.) But perhaps most impressive is that conservation has become not only a governmental endeavor, but one that is swiftly rising—from the bottom up. Wal-Mart, the largest retailer in the U.S., began to carry its own line of organic produce in 2007. The Home Depot also started selling thousands of green-certified products. And the word *sustainability* entered the English lexicon with force—then milled around and promptly lost much of its definition as it was co-opted by nearly every company making products, everywhere. But regardless of what it's termed, most of us get the point now. Green has gone global, and we are ubiquitously tuned to a pressing need to alter our consumptive behaviors.

Fortunately, beyond the bandwagoneering, real efforts are being made to curb energy consumption—or, at the very least, to mitigate its most damaging effects. The city of Chicago has decided to retrofit more than 2000 miles of alleyways with recycled substrate that will cut heating and cooling costs in neighboring buildings and return filtered water to Lake Michigan. Abu Dhabi (capital of the United Arab Emirates, the world's fourth largest oil producer) dedicated hundreds of millions of dollars toward sun, wind, and hydrogen technology—and a stake in the possible post peak-oil marketplace. And on May 16, 2007, Airtricity, an Irish wind turbine manufacturer, announced the construction of its largest project to date—a 209MW, 30,000 acre wind farm that will place hundreds of turbines into sweeping, whooshing motion over one American state's rolling farmland. That state—Texas. Oil-producing, greenhouse-gas-emitting, every-thing's-bigger-in-Texas, Texas.

Consumption may be the topic of our daily chatter, but innovation is everywhere. In this section of the magazine we look into the eye of the energy quandary; into our cities, where old buildings gain new lives after green makeovers; into the past, where long-forgotten building methods could breed new sustainable technologies; inward and upward, where our skies may soon be full of foods that won't drain oil reserves through their journeys to our plates; and importantly, within our own walls at Cooper Carry and on our project sites, where green-minded change happens every day.

*The Oxford English Corpus is a living dictionary—a 2-billion word collection of text from novels, textbooks, parliamentary proceedings, blogs, chats, emails, and journalistic articles compiled by the Oxford University Press's Language Research Programme to quantify ever-changing patterns of word usage in everyday English.

ONE TIMES SQUARE, 2007: EXTERIOR: 6 mil. KWh / 10.6 mil. lbs carbon emissions | INTERIOR: 3.66 mil. KWh / 19.7 mil. lbs carbon emissions—if occupied

ONE TIMES SQUARE ONE TIMES SQUARE ONE TIMES SQUARE ONE TIMES SQUARE

REINVENTING AN ICON

The island of Manhattan is a conservationist's nightmare. Thousands of generations-old buildings conceived in the era of abundant, cheap resources line the skies, sucking Megawatts of power from the Con Edison grid, leaching water from corroded pipes, blasting valuable heat into alleys, side-streets and the stratosphere. These are the monoliths of pre-sustainable architecture, buildings hurtling down an energy-strewn path that has long since evaporated, consuming for decades as if it were the dawn of the Rockefeller era. And they're not alone. Cities the world over share the burden of similar elderly urban buildings, and, because the structures are still useful, beautiful, and iconic, they're not going away.

In November of 2007, Cooper Carry New York took on the task of re-thinking the energy efficiency of one of these icons—One Times Square. Home to the New Year's Eve Ball Drop and year-round host to 20-story illuminated billboards, a 14,000 lamp news ticker and a "jumbo-tron" television, the 103-year old tower proved a perfect model for an exemplary greening of older buildings everywhere. What is a more fitting metaphor for the ever-loudening green dialogue than the transformation of one of our nation's most recognizable icons of consumption?

In collaboration with Cosentini Associates Engineers, Cooper Carry architects researched the historic building in detail, conducted walk-throughs of the abandoned interior space, took photos, participated in an office-wide charette, and ultimately came up with a transformative plan centered around the integration of seven revolutionary sustainable technologies. The result of their labor is part past and part prophesy—truly a new year for an emblematic old building.

CC'S RE-INVENTED ONE TIMES SQUARE: EXTERIOR: 3 mil. KWh / 5.3 mil. lbs carbon emissions | INTERIOR: 2.4 mil. KWh / as little as 1.4 mil. lbs carbon emissions

THEN

Built in 1904 as headquarters for the New York Times, One Times Square has undergone radical transformation a number of times over its century on the New York skyline. The newspaper occupied the space for only nine years before moving down the street to 229 West 43rd. The building saw its first New Year's ball-drop ceremony in 1907 (a tradition broken only twice since—in the early 1940s for wartime black-outs and, of all things, energy conservation efforts). The first news ticker crawled across One Times' facade in 1928. But perhaps the most radical renovation to take place at the site was the one that brought the property to its current state: the addition of advertising billboards in the early 1960s. During the initial renovation (overseen by owner Allied Chemical) the building's original granite and terracotta façade was removed, replaced with marble facing and concrete paneling, and then eventually covered over by 26 flashing, scrolling, full-color billboards.

In 1996, the building was ruled unfit for inhabitance without a major mechanical overhaul. Today the structure, much of its interior views obscured by signage, remains vacant save for a few short-term tenants that have occupied the ground and 16th floors.

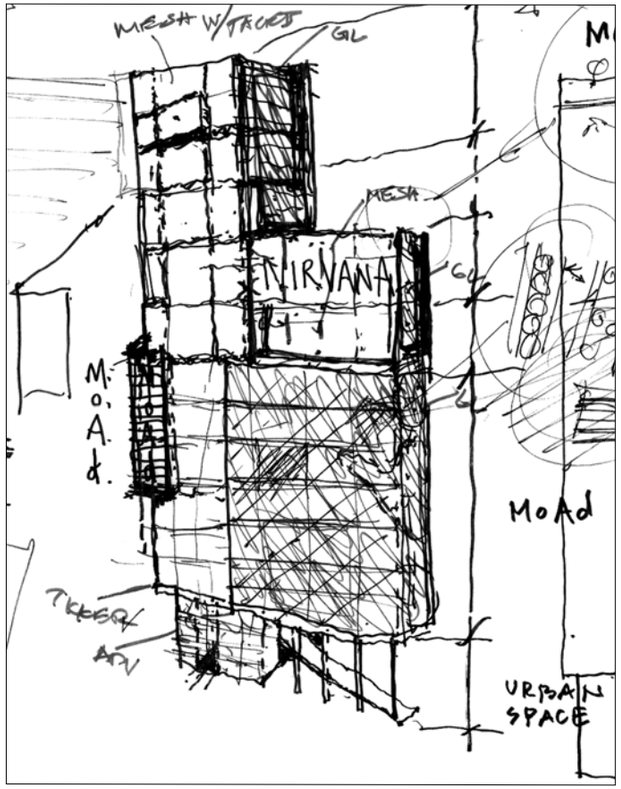
NOW

To the architects at Cooper Carry, the re-thinking of this structure was a sustainable coup—a collaborative, creative effort that harnessed the power of a premier building and location to push an energy-saving plan that will hopefully benefit the similar retrofit of other buildings throughout the city—and the world. In the case of One Times Square, the team addressed energy efficiency in three basic ways: land use, architecture and building systems.

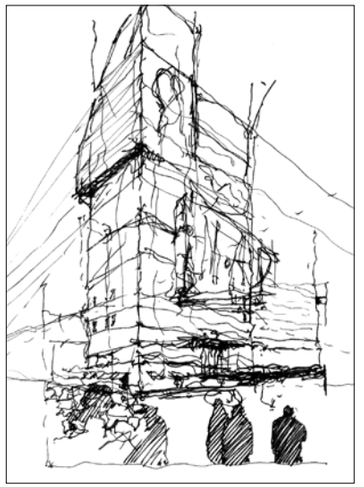
First, because wasted space is not sustainable space, we suggested reoccupying the building, aiming for a mix of office, retail and entertainment, to take advantage of the building's location and breathtaking vistas. Then, we decided to re-clad the exterior with energy efficient glazing and upgrade to state of the art mechanical systems and smart, semi-transparent LED signs. We calculate that these initiatives alone will cut the building's energy consumption by 35 percent and reduce its overall carbon footprint by 6.9 million pounds.

Secondly, we decided to bring energy production on-site using co-generation technologies and fuel cells. Efficient mechanical systems such as geothermal cooling and heating, ice storage, energy recovery and radiant ceiling systems will also reduce the new One Times Square's space conditioning energy usage.

Finally, we conceived further green upgrades to the interior space, including utilizing an energy-generating dance floor in the revitalized Nirvana nightclub, helping our re-imagined building not just live lightly upon the existing grid, but give back to it.



Conceptual sketch



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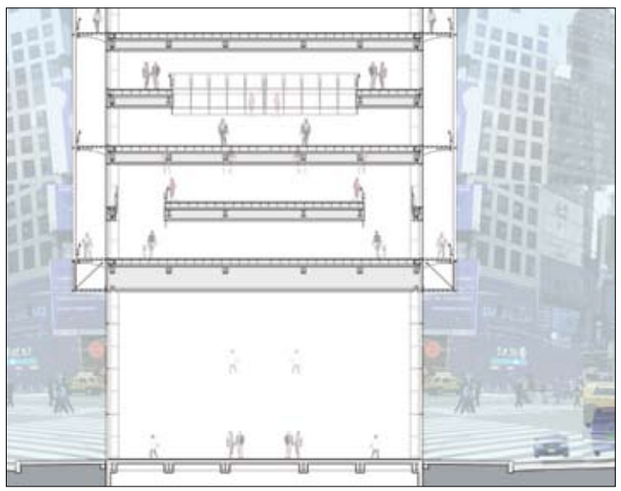
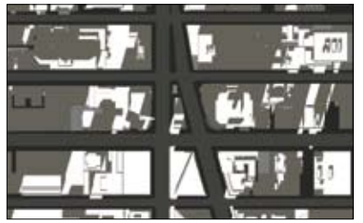


Building section showing new facade systems

Solar studies of Times Square area



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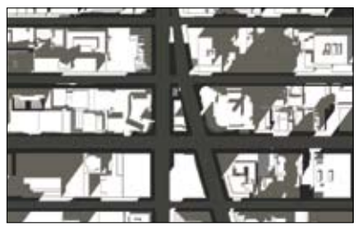

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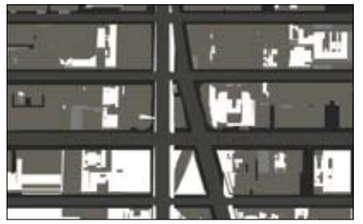

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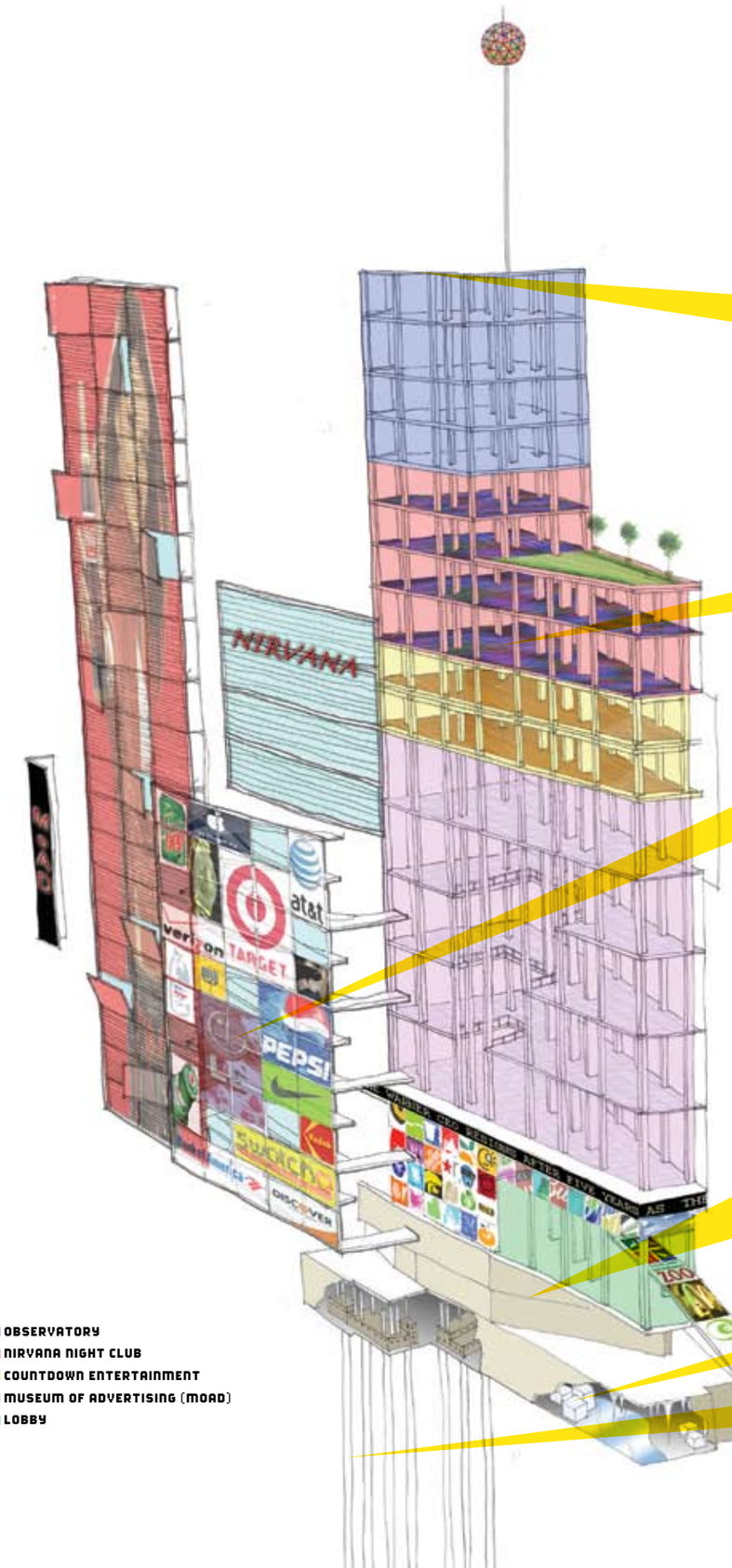
Norway declares that by 2050, it will become 100 percent greenhouse gas emission-free through offsetting.



At Cooper Carry, our goal for the re-imagination of One Times Square is that it will serve as a green beacon for thousands of our city's (and our nation's) older structures. All told, our ideas could potentially save the city more than 5.3 million KWh of power, reduce New York's carbon footprint by 23.7 million pounds, and produce a building that operates at 70-80 percent efficiency. *This is how we would do it.*

1. ENERGY RECOVERY

Located on the roof of the building, a recovery system would capture thermal energy from One Times Square's exhausted air and recycle it back into the building's climate control system. Performing both sensible and latent transfer of heat, it would help control interior humidity and temperature and recover 40 to 50 percent of energy typically exhausted out of the building.

2. ENERGY-GENERATING DANCE FLOOR

With the building now inhabitable, we envision the reestablishment of Nirvana, the infamous dance club once located on the upper floors of One Times Square. In its new life, Nirvana would have a dance floor (already in development by Dutch research groups) where floorboards absorb the energy generated by patrons' footwork and transform it into electricity.

3. LED SIGNAGE

In addition to saving 50 percent on One Times Square's power bill, outfitting the façade with fully-programmable LED screening would provide solar shading and quick, cost-effective billboard changes. But more than that, we believe that this type of lighting opens up an entirely new source of income for the building—tenants—as those inside would be able to peer through the screen to the site's amazing vistas.

4. ON-SITE ELECTRICITY PRODUCTION

Electricity and heat will be produced efficiently in the basement of the building by a mix-and-match combination of gas turbine engine co-generation and fuel cells. Local co-generation has a 70-80 percent efficiency compared to a 33 percent efficiency from standard methods, and would pay for itself in eight years of the building's occupation. As well, fuel cells could be housed in the basement of the building to produce power at 80 percent efficiency and with extremely low carbon emissions.

5. RADIANT COOLING AND HEATING DISTRIBUTION

Distribution of cooling and heating to the space's occupants could be accomplished with a radiant ceiling system, with heat transferred to metal ceiling panels from water pipes. The use of water instead of air as a medium to transport heat greatly reduces energy usage in the distribution of cooling and heating.

6. ICE STORAGE

Timing is important to saving energy at One Times Square. During summer nights (when cooler temperatures and off-peak hours make for lower demand on the city's grid), sub-basement chillers would generate ice. During the day, water would be run through the ice tanks, melting the cold stuff, and cooling water for energy-efficient air conditioning.

7. GEOTHERMAL HEAT

Geothermal energy savings are created by burying pipes deep into the earth below a structure's basement and using a heat pump to transfer heat into the ground in the summer and extract heat from the ground in the winter. This "free" (and very green) energy would further lower the building's utility costs and carbon footprint.

New Jersey announces that it will replace 1,300 public service utility bucket trucks and cars with hybrid and biodiesel vehicles over the next decade.