

NYSERDA's Commercial Tenant Program

Energy Modeling for Commercial Tenant Space

By Jack Jenkins

In the summer of 2016 NYSERDA launched a \$5.75 million incentive program for tenant space in New York. The Commercial Tenant Program pays between 50% and 100% of the cost of energy modeling, to cut energy costs in Tenant spaces.



At rde we are well versed on this program and how tenants can make it work for them. We did the energy modeling for three of the five pilot projects NYSERDA ran while developing it. We are also experts in cutting energy use for tenants in multi-tenant commercial buildings.

In this article we share some of our insights on what tenant projects stand to gain from participating in the program, along with the criteria projects need to meet to qualify. We also share some of the energy saving ideas that we analyzed during the pilot projects.

First up: why do energy modeling for a build-out of tenant space?

WHY DO ENERGY MODELING?

The simple answer is: “because it saves the tenant money”. It also reduces the tenant’s environmental impact.

Applying powerful building simulation tools to a project allows the team to test out and see how much energy an idea is likely to save before committing to it. The project can then focus on the ideas that will have the biggest impact.

Having this information during the build-out and move-in period allows ideas to be implemented at a time when they will not only achieve the biggest savings, but also be both easier for end-users to accept, and cost less to implement.

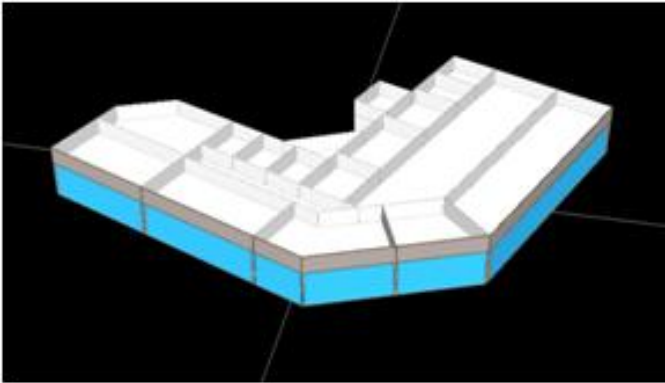


Image from rde energy model for a part floor fit-out

Even when project teams already know the best way to save energy, modeling results can make the difference between having a good idea, and actually turning this idea into savings. A robust estimate of the costs to be saved makes for a powerful business case: helping decision makers to see and trust the benefits of proposed changes.

ENERGY SAVING IDEA:

A recent project used energy modeling results to justify setting up controls to turn lighting off when there are no people in the area it serves.

The control devices were already required by code. Our analysis looked at the impact of changing the settings to make the lights turn off more quickly. We found that doing this will cut the tenant's energy costs by more than 5% at no additional cost; making the case to do it.

Each year, this will also reduce the tenant's greenhouse gas emissions by an amount equivalent to driving a Hummer H2 around the world almost seven times.

CAN ENERGY MODELING BE USED FOR TENANT BUILD-OUTS?

Tenant build-outs can be a challenging application for energy models. Modelers are often more familiar with whole buildings than with the specific challenges of part-floor build-outs. Also, detailed modeling can often seem slow, whereas fast paced build-out projects need answers quickly if they are to affect design decisions.

However in our experience, when done right, energy modeling can work well for tenant projects - providing substantial benefits.

The key is to do energy modeling in a way that is both suited to the fast pace of tenant projects, and that is focused on the tenant: allowing their cost savings to be broken out separately from those of the building.

Our Three-Step Approach

1 – Idea Generation / Preliminary Model

Pre-Design

2 – Interim Modeling

Schematic
Design

Design
Development

3 – Final Model

Construction
Documents



At rde we do this by following a simple three step approach to modeling of tenant space:

- 1) **Idea Generation:** agreeing a list of energy saving ideas for the project. Focusing on the tenant space: its design, its operation and the building systems supporting it.
- 2) **Interim Modeling:** providing initial results early in the design process; to assist in making key design decisions.
- 3) **Final Modeling:** revisiting the interim analysis in light of the final project details and design decisions. We also use our own proprietary analytical tools to break out cost savings for the tenant separately from those of the building.

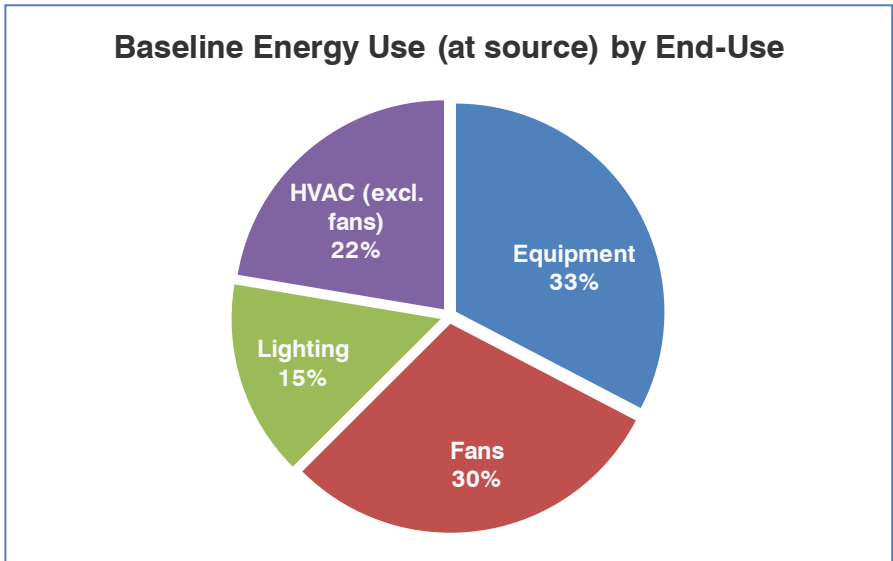
The result is a process that takes the best that energy modeling has to offer and applies it in a way that works for tenant projects: giving both tenants and buildings an understanding of what they individually stand to gain from the energy saving ideas that are on the table.

BUT CAN TENANTS ACTUALLY DO MUCH TO SAVE ENERGY?

In NYC, it is common for buildings to provide (and pay for) some or all of the heating for tenant space, with many buildings also providing ventilation and cooling. This can create an illusion that there is little tenant projects can do to save energy - beyond perhaps upgrading the lighting.

Our experience contradicts this. In recent projects we have found new tenants to be directly responsible for between 40% and 90% of the total cost of energy used in serving their new space.

Lighting is part of this, and in some cases energy use by tenant-side HVAC systems is significant. But often the biggest portion of tenant energy costs will be in running computers, appliances and other plug load devices (we looked at three ways to tackle this in the first issue of *Energy Saving Ideas*, in July 2016).



Modeled building end-use breakdown for build-out of law office space in a large commercial office building in Midtown Manhattan



This has two important consequences when looking to cut energy costs. Firstly it means that the tenant can actually save energy in ways building owners and energy codes cannot. Secondly, a lot of that potential requires thinking about more than just physical changes to things like lighting and HVAC.

To help do this, on our projects at rde we break-out the opportunity to reduce energy costs into three different types of energy saving idea:

- More efficient plant and equipment;
- Improved processes and controls; and
- Changes to workplace culture.

It is in improving processes and controls, and doing things to change the way people use the space that tenants can usually make big reductions in their energy use, often at little or no cost.

However, achieving these types of savings is not easy and does not happen without effort. A business case backed up by an energy model can often be just what is needed to show that this effort will be worth it.




Robert Director
Energy & Sustainability

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ENERGY SAVING IDEAS FOR TENANT OFFICE SPACE

ENERGY SAVING IDEA:



A recent client used our results to make the case for changing the way their lawyers work; grouping after-hours users together so HVAC and lighting could be shut off in other parts of their space.

This alone will cut their energy costs by 9%. Over the 20 year lease term, it will also reduce their greenhouse gas emissions by enough CO₂ to fill the Empire State Building, more than twice.



IS ENERGY MODELING A GOOD IDEA FOR YOUR PROJECT?

For energy modeling to make sense, there needs to be a chance that energy saving ideas will be implemented in the space. Even at 50% off, energy modeling will be a waste of time and money if no one involved has any interest in doing things to cut the tenant's energy costs.

Beyond an interest in energy savings: the benefit from the savings also needs to outweigh the cost of the modeling. The NYSEDA Commercial Tenant Program helps by halving or eliminating the cost. But to know if it is worthwhile you also need to consider the benefits to the tenant; both environmental benefits and energy cost savings.

Environmental Benefits

For some tenants the environmental benefit alone will be enough to make energy modeling worthwhile; especially as it provides quantified savings: a valuable item in reporting efforts to reduce environmental impact.

Energy Cost Savings

Many other tenants will only find energy modeling worthwhile if it allows them to save more on their energy bills than it cost to do the modeling.

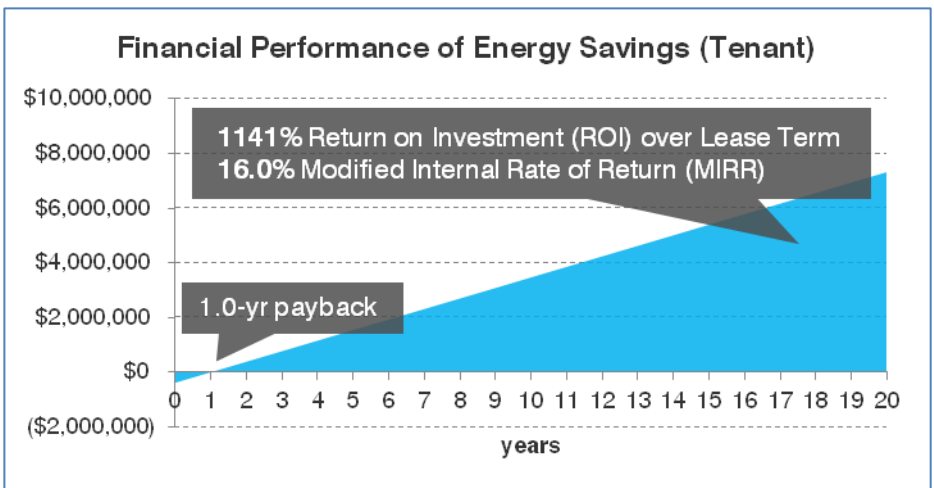
For the best chance of big savings it pays to start energy modeling early in the design process, so it can help inform key decisions. The incremental cost of implementing ideas is also typically lower if they are integrated into the design early on. The other key factors will usually be: the extent of cost savings that can be achieved, the cost of implementing these savings, and the size of the project.

On our recent projects we have found that tenants could typically cut their energy costs by at least 30%; with much of this achievable at little or no cost.

Payback Costs Within 2 years

On this basis, even without the new NYSERDA incentive, a 20,000 rentable square foot build-out should pay back the cost (of both energy modeling and of implementing savings measures) within about 2.5 to 3 years. With a 50% NYSERDA cost-share this drops to about 2 years.

Bigger projects see an even quicker return on investment.





Robert Derector
Energy & Sustainability

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ENERGY SAVING IDEAS FOR TENANT OFFICE SPACE

ENERGY SAVING IDEA:

During a recent project we looked at replacing standard workstation IT equipment with a combination of: efficient monitors, low power laptops; and 'cloud' based processing power located in a remote data center.

We found that this would cut our client's energy costs by a substantial 17%; due to both reduced overall energy use, and lower utility prices at their remote data center location.

The client (who will achieve more than 30% in savings from other ideas) did not to make this change during the build-out. But can now use our results to inform future discussions of their business-wide IT strategy.

HOW DO PROJECTS QUALIFY FOR THE 50% COST SHARE?

The NYSERDA Commercial Tenant Program provides cost-share incentives for both: tenants building-out a leased space; and for owners or managers looking to develop a generic package of energy savings applicable to standard tenant spaces in a building. In this article we are focused on tenant projects.

To qualify for the 50% cost-share, a tenant-specific project needs to meet the following criteria:

- 1) The **space** must:
 - ✓ be a commercial office space in an existing building;
 - ✓ be located in New York State; and
 - ✓ not have been renovated within the last year.
- 2) The **electricity utility**, serving either the tenant or the facility in which the space is located, must pay into the System Benefits Charge (SBC).
Note: ConEdison electricity customers in NYC usually meet this requirement.
- 3) The **energy modeler** must meet NYSERDA's criteria for modeling experience and capability.

Tenants are not required to implement any of the ideas analyzed under the program. However, the analysis must include measures that exceed energy code for at least two of the following five building systems: Lighting, HVAC, Water Heating, Plug and Process Loads, and Building Envelope.

How Do Projects Qualify For The 100% Cost-Share?

Projects that implement one or more of the ideas will usually qualify for an additional incentive; boosting the total cost-share up to a maximum of 100%.

In these cases, NYSERDA will also undertake free Monitoring and Verification (M&V), to verify the actual energy savings achieved in the space. This is for information only. The cost-share incentive is not affected by the result.

TENANT ENERGY MODELING AND LEED v4 ID+C

Tenant projects pursuing LEED v4 certification can use energy modeling to gain additional points.

In LEED v4 for Interior Design and Construction (ID+C), projects must achieve at least 60 of the 110 available points to attain LEED Gold certification (80 points for LEED Platinum). Energy modeling can be used to achieve up to 28 points. Of these, 11 points are only available with energy modeling.

Many commercial interior projects leave these points on the table (along with all the other benefits of energy modeling). Lack of experience with modeling of tenant space in existing buildings, along with confusion over how the LEED energy modeling requirements apply to this type of space, have led many LEED ID+C projects to avoid considering energy modeling at all.

However this is starting to change: as experts in energy modeling of tenant space, rde is seeing an increasing number of projects pursue the energy modeling route in LEED v4 ID+C. These projects are achieving additional energy savings as a result.

They are showing not only that the challenges of energy modeling for tenant space can be overcome, but also that in doing so, the tenant, the building, and the environment all stand to benefit.



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Jack leads rde, the energy and sustainability group at Robert Derector Associates. He is a keen advocate for a greener economy, and has spent over 10 years providing independent analysis to help organizations both become more sustainable and cut their energy costs.

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Robert Derector Energy & Sustainability

Robert Derector Energy & Sustainability, rde, provides independent analysis for commercial tenants, data centers and building owners. We work to understand how our clients use energy and what they can do to use less.

Our approach is to distill clear and pragmatic advice from technical detail: helping decision makers to quickly see both the strength of a business case, and whether specific measures make sense for their situation.

Our services include:

- Energy Modeling
- Energy Auditing
- Retro-commissioning
- Engineering Design
- Corporate Energy Strategy

We are the energy and sustainability division of consulting engineers Robert Derector Associates (RDA).

Certifications:

RDA is licensed to provide professional engineering services in 27 states. We also hold the following energy related certifications:

Certified Energy Auditor (CEA)
Existing Building Commissioning Professional (EBCP)
LEED Accredited Professional Building Design and Construction (LEED AP BD+C)
LEED Accredited Professional Interior Design and Construction (LEED AP ID+C)
LEED Accredited Professional Operations and Maintenance (LEED AP O+M)
LEED Green Associate

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