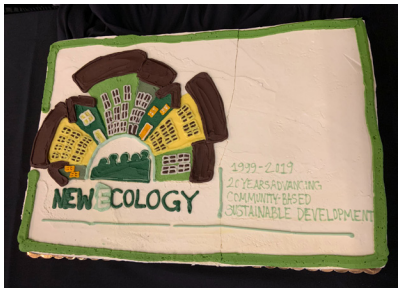
NEW ECOLOGY NEWSLETTER

Winter 2019-20

BuildingWell



NEI's anniversary cake.

WHO WE ARE

Founded in 1999, New Ecology, Inc. (NEI), is an innovative, mission-driven non-profit. We are nationally known for our community-focused work advancing sustainable practices, reducing fossil fuel use, creating clean energy, eliminating pollution, promoting resiliency and enduring healthy environments in which to live, work, and thrive.

New Ecology Celebrates 20 Years

On September 19, 2019, New Ecology board members, staff, partners, clients, and friends gathered to celebrate 20 years of community-based sustainable development. The highlight of the night was a series of provocative "TED Talks," each of which delved deeply into a single topic in the energy efficiency and green building fields. Presentations included: humidity and moisture control and resiliency planning for affordable homes in the Mid-Atlantic, resilience planning in new and existing construction, the current and future state of green-rating systems, energy modeling and its future, and the unique qualities that puts NEI in a special place to do the important work that we continue to do. Plenty of good food, drinks, and conversation followed. We want to thank all of our Sponsors and attendees for making the night a smashing success, as well as all of our friends for your continued support which allowed us to reach 20 years. Cheers!

NEI panelists Ching-Wen Hsiao, Joshua Galloway, Tom Chase, and Ashley Wisse (not pictured: Jonah DeCola, Neil Donnelly).

WHAT'S COMING UP?

New Ecology has been very busy! We have secured grant funding to expand our Remote Monitoring and Optimization (ReMO) service. The Massachusetts Department of Energy Resources (DOER) is making subsidies available to save energy and improve operations through ReMO. There are two exciting opportunities:

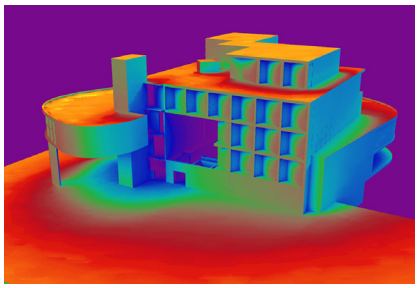
- For low-income multi-family residential buildings, MA DOER is offering up to a $3,375 rebate on our ReMO service, and additional funding for monitoring enhancements and repairs;
- For non-profit buildings, MA DOER is offering a no-cost documentation of central systems and equipment (a $2,000 value) AND $3,000 off the total cost of the NEI ReMO service.

Additional incentives may be available through Mass Save rebate programs.

If you are interested in learning more, watch this!
Contact us for more information at ReMO@newecology.org or 855-888-6468

The Current and Future State of Energy Modeling

BY CHING-WEN HSIAO, ENERGY MODELER



Above: Modern simulation model of the Carpenter Center. Right: Modern simulation model of the Carpenter Center.

The Swiss-French architect Le Corbusier designed Harvard's Carpenter Center for the Visual Arts in the 1960's. The building is regarded as a textbook architectural masterpiece, equipped with one of Le Corbusier's famous passive design inventions called "Brise-Soleil." The term "Brise-Soleil" means sun- blocker, which refers to the concrete shading structures around the windows, developed to prevent excessive solar gains.

A modern simulation model of the building, however, proved disappointing. The shading devices did little to decrease the energy use of the building. With all the good intentions, the design failed because the ideas were not verified nor optimized using simulation tools to model the building.

Unlike in Le Corbusier's time, today's simulation tools have a wide range of applications. Energy simulation results are now required by many energy code agencies and green building programs to demonstrate savings, and can also offer benefits beyond code compliance. These tools provide quantitative results which enable a design team to compare all kinds of design features. At New Ecology, simulation results are used to study shading and building orientations, optimize HVAC design, assess indoor comfort, study envelope assemblies, predict energy consumption, and complete life cycle analyses.

The advent of simulation software does not come without challenges. There are hundreds of simulation tools and dozens of rating programs on the market. The NEI engineering team often has to create multiple models using different softwares for a single project. One of the biggest challenges is speed—modelers simply are not fast enough. Architects and design teams throughout the industry frequently express frustration that modeling cannot be completed faster.

How do we overcome these challenges? What will the future be for simulation and modeling? Automation is key to aggressively trimming down modeling time. Increasing speed may be possible if modelers start to operate more like software programmers. With the help of Visual Basic and Python, NEI's engineering team is gradually building up a reservoir of scripts and Excel macros to increase work efficiency. As simulation tools and computer technology continue to improve, the hope is that modelers will soon be able to perform real-time simulations employing a simple user interface, allowing architects to instantly understand the energy implications of their designs.

A final note: according to the energy model, annual energy consumption of Le Corbusier's Carpenter Center will be reduced by 36% if the current single-pane windows are replaced with double-pane Low-E windows!

THANK YOU

To all of the sponsors of our 20th Anniversary Symposium and Celebration. Your partnership made the event a massive success!

NEW ECOLOGY PROJECTS IN THE NEWS

- Old Colony was mentioned in a recent article from WGBH about indoor air pollution and its effects on health, especially in children. New Ecology worked on many facets of the Old Colony redevelopment with Beacon Communities, LLC.

  https://www.wgbh.org/news/local-news/2019/09/23/dangerous-air-pollution-is-getting-into-schools-and-homes-near-highways-research-shows

- New Ecology's Senior Project Manager Tom Chase contributed to this report on why climate resilience planning and adaptation is paramount for lenders and owners of multifamily affordable housing.

  https://sahlln.energyefficiencyforall.org/sahlln/sahlln-resources/why-multifamily-affordable-housing-lenders-must-manage-climate-risks-and-how

- Finch Cambridge (formerly Concord Highlands) was recently mentioned in the American Association for the Advancement of Science Climate Adaptation newsletter. The newsletter focuses on the City of Cambridge's Climate Preparedness plan, using the development of an example of resilient building. New Ecology is working with HRI on the project, which is expected to be completed in January 2020.

  https://howwerespond.aaas.org/community-spotlight/starting-small-and-scaling-up-cambridge-sets-its-climate-adaptation-plan-in-motion/

- Finch Cambridge (formerly Concord Highlands) was also featured on the radio and in an accompanying article from WBUR which goes into detail on what a passive building is and how the passive features will benefit the residents of the first affordable, multifamily Passive House in Massachusetts.

  https://amp.wbur.org/earthwhile/2019/12/13/finch-cambridge-energy-efficient-affordable-housing

Humidity Impacts

BY JUSTIN IOVENITTI, ENERGY ENGINEER

Poor moisture management is a big problem in many buildings throughout the US. Excessively high or low indoor relative humidity (RH) can lead to occupant discomfort, asthma flare ups, and respiratory infections. Buildings in humid climates, such as the mid-Atlantic, are especially troublesome, as mold can thrive if indoor RH is not controlled.

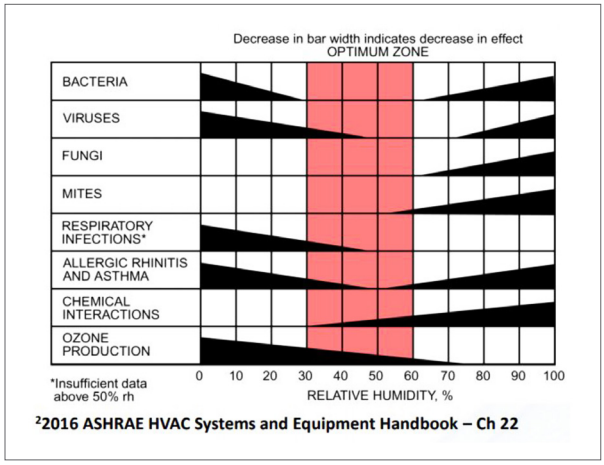
Low RH

In winter, a leaky building will allow very cold, dry outside air to infiltrate the enclosure. As this already dry air is warmed by the heating system, it becomes even drier, since the moisture-holding capacity of warm air is much greater than that of cold air. This results in uncomfortably dry indoor air.

Fortunately, there is a straightforward solution to this problem which requires no additional HVAC equipment or sophistication. Introducing or adding air sealing to leaky buildings to ensure air barrier continuity will raise the indoor RH levels to a comfortable range (generally 30-40% minimum RH). Reducing excessive mechanical ventilation rates and adding energy recovery on outside air systems also help to prevent dry indoor air in winter.

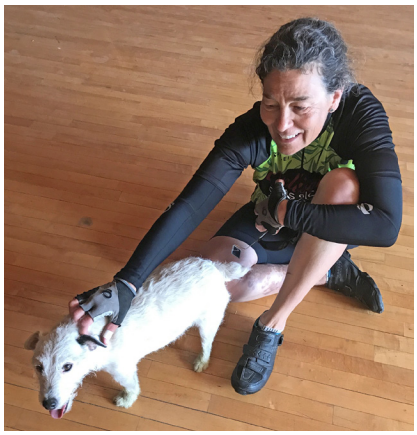
High RH

In summer, the first step to solve a high indoor RH problem is to manage moisture through passive means, including improving site drainage, installing vapor retarders, correcting plumbing leaks, and reducing air leakage; however, it is rarely possible to maintain indoor humidity at the recommended maximum of 60% without some means of active control. The operation of mechanical cooling systems will help dehumidify interior air by wringing out moisture with a cold coil.



https://www.hvacrschool.com/how-to-reduce-indoor-humidity/?print=print

Critically, some projects may tick off all the requisite moisture management boxes and still experience high indoor humidity. This can even be true of high performance and Passive House buildings, where drastically reduced cooling loads reduce the runtime and drying capabilities of cooling systems. In response, New Ecology recommends that multifamily projects should provide standalone dehumidifiers (or rough-ins to facilitate future installation) in each dwelling unit. In fact, some states, including Delaware, have started to require standalone dehumidifiers for all projects seeking low income housing tax credits. The added first cost of a basic ENERGY STAR dehumidifier is minimal when compared with the financial impact of remediating a potential mold problem.



Marty meets Dennis, the "mayor" of Hardman, Oregon.

LET'S TALK

New Ecology is eager to work with partners who are interested in learning more about our work and how we can help you to achieve your project's goals. We have worked on hundreds of projects for owners in market sectors including housing, office, retail, education, healthcare, government, arts, and nonprofit.

Our passion and commitment is best demonstrated by the fact that we have been at the leading edge of community-based sustainable development since 1999.

At the same time, our reach, approach and successful model have helped us attract and retain a talented staff known for its desire to make advances in a new and growing field.

Interested in learning more? Contact info@newecology.org or call 617-557-1700.

NEW ECOLOGY
Community-Based Sustainable Development

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Staff Profile

Name: Marty Davey
Title: Director of Product and Service Development
At NEI since: 2012, but worked as a consultant since 2008

What does your job entail? I mainly work with New Ecology staff to bring products and services to market that we think will benefit our clients and allow them to achieve their energy, operations, and sustainability goals. Additionally, I seek funding, build relationships, and work with our clients to bring it all together.

What is the most inspiring/interesting part of your job? I continue to be inspired by the passion, foresight, creativity, intelligence, and vision (can I keep listing positive adjectives?) displayed by all of my coworkers on a daily basis. They have huge enthusiasm for what we do, and also the vision and skills to get it done. They are incredibly smart, and a lot of fun too!

What is a challenge that people in this industry face that you would like to solve? We are really focused on trying to make sure that existing buildings are operated better, and that energy savings are sustained in the long haul. A challenge I often face is: how do we keep up with energy savings we have achieved in the face of individual or environmental behaviors to the contrary?

Cathedral Rocks in Camp Sherman, Oregon

What do you like to do outside of work? I am an avid biker. My other hobbies include gardening, reading, swimming, and volunteering. In June, I finished a week-long bicycle trip in Eastern Oregon. There was beautiful and diverse scenery, and I was living outside for a week, camping under the stars with a bunch of fun people. The hills were challenging for a flat lander like me, but it was worth it!

Favorite movie/ TV show? Movie: *To Kill A Mockingbird*

What is advice you would give to somebody looking to start in this industry? I typically advise people to attend free events for the exposure and to make contacts, and selectively listen in on free webinars. There are a lot of them nowadays, and it can help you direct where your interests lie. Volunteering at energy efficiency conferences is also a great way to get a taste of the industry, as you can network, view sessions, and often see new ideas or products.