NYSERDA Research and Development

Helping innovative technologies in the **Buildings Sector** come to life.

Single family home constructed in Tupper Lake, New York, contains ICF foundation and walls with 12" SIP roof, heating provided by small boiler with radiant floor heat. Whole house ventilation serves the IAQ, occupant energy usage after two years is 65% below average consumption.

According to the United States Department of Energy, the building sector is the largest consumer of energy—40% of the energy and 60% of the electricity in New York State—more than any other industry. Buildings include single and multiple family residences, large and small commercial buildings, and industrial properties. In New York State, 80% of those buildings were built before the first oil embargo; they were not designed to be energy efficient, and retrofitting with new technologies can be a challenge.

Creating energy efficient buildings, in fact, presents many unique challenges. The lifecycle of a building is long, about 100 years. For owners of older structures, energy efficiency improvements and retrofits may be initially more expensive than dealing with the current energy bill. Builders of new construction may be interested in offering energy efficient and sustainable options, but they don't have the time to sort through all the diverse technologies that are available, from lighting, HVAC systems, and controls, to new building materials and construction practices.

Advanced Buildings

NYSERDA's Buildings Programs can help builders and building owners offer these and other energy efficiency options to their customers, giving them a competitive advantage. For example, Advanced Residential Buildings focuses on the development and demonstration of high-performance residential buildings that support both discrete components such as energy controls, and integrated whole buildings. Other programs support the exploration of many exciting new technologies such as mobile communication to manage building power and security, next generation heating and cooling technologies, self-powered sensors, and dynamic windows designed to maximize light and minimize glare.

NYSERDA funds research and development capabilities of component and material suppliers, facilitates communications between the design and construction industries, and promotes the availability of information and price signals to increase the adoption of innovative technology.

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Energy. Innovation. Solutions.

Featured Examples

Renovations with Constructive Results

There are substantial opportunities to improve the energy efficiency of low-income homes. NYSERDA's Deep Retrofit program has provided significant **training for contractors**, led to the deep energy retrofits of existing homes and provided the intelligence to launch the next phase of the Deep Retrofit program. This work will promote comprehensive insulating, air sealing, and cladding products to integrate into the retrofit market.

Big on Biomass Boilers

ACT Bioenergy equipment at The W!ld Center in Tupper Lake, New York.

In rural parts of New York State, many homeowners and businesses rely on wood to heat their buildings. ACT Bioenergy, with support from NYSERDA, installed an energy efficient gasification-type biomass pellet boiler at The W!ld Center—The Natural History Museum of the Adirondacks, replacing two propane boilers. The biomass pellet boiler features controls that can monitor the Center's heat demands and then modulate the boiler's operation accordingly, **reducing fuel costs by approximately 38%** and **reducing carbon emissions by 300 tons per year**.

Clearing the Air

HEPAiRX window-mounted air conditioner and purifier

Making a building energy efficient means sealing up cracks and leaks in HVAC systems, windows, and doors, but making a house or building airtight can present issues with air quality for occupants. Furniture, carpets, and plastics used for electronics can off-gas compounds that cause allergic reactions and heating and cooling systems can introduce contaminants in recirculated air. With funding from NYSERDA, North Syracuse-based Air Innovations developed and tested the HEPAiRX, a window-mounted ventilating room air conditioner and purifier that **reduces the indoor pollutants that can cause asthma, allergies, and other respiratory illnesses**. The HEPAiRx system is weather resistant and durable, and provides an energy efficient way to circulate fresh air into a building, showing promise as a clean energy technology.

Learn more at nyserda.ny.gov

NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce their reliance on fossil fuels. NYSERDA professionals work to protect our environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York since 1975.

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