REBNY 2022 PropTech Challenge – Getting to Carbon Net Zero Finalists

Category 1: Carbon Measurement, Verification, Reporting, & Accounting

The ability to accurately measure, validate, and report on carbon emissions associated with energy use is integral to a building owner's ability to achieve net zero and prove it. This problem set explores PropTech solutions that can help accurately measure buildings' carbon emissions profiles, develop actionable insights into strategies to reduce those emissions, and track the effectiveness of these carbon reduction programs with high quality verifiable metrics.

- How does your product help measure, predict, analyze and or model, energy use and associated carbon emissions?
- How does your solution measure and verify greenhouse gas reduction?
- How does your technology allow for customers to verify the origins and any possible renewable attributes of delivered electrons?
- What carbon accounting standards are utilized and how does this help prove a decrease in greenhouse gas emissions?
- How does your technology support platforms or marketplaces for carbon trading?

Finalists

Cleartrace

Cleartrace is an energy data and carbon accounting platform providing companies with the digital infrastructure to enable decision making to mitigate environmental risk, prove their climate achievements and create new market opportunities within the evolving energy landscape. Through an advanced software platform developed by experts in the energy, data and banking sectors, Cleartrace delivers 100% traceable and verifiable energy and carbon records for its clients.

Cleartrace provides the actionable data companies need to proactively decarbonize their operations. By illuminating previously unseen energy data, companies can see and manage the upstream production and downstream consumption of their energy, every hour of the day. Cleartrace helps real estate owners understand their building's energy usage and align their renewable purchasing strategy with their consumption to meet tenants' expectations and often local governments' requirements to provide accurate, transparent energy and carbon impact data. Additionally, Cleartrace's platform can assist real estate owners and energy suppliers by performing scenario analysis on future energy purchasing to assess the carbon benefits and hourly load matching potential of future purchasing.

Measurabl

Measurabl is the ESG platform built for commercial real estate, empowering customers to measure, manage, and report ESG data. Measurabl is the most widely adopted ESG data management solution, empowering customers to measure, manage, and report ESG data on over 12 billion square feet of commercial real estate in more than 90 countries. Measurabl helps the industry's most innovative companies optimize their ESG performance, assess exposure to physical climate risk, act on decarbonization and sustainable finance opportunities, and monitor compliance with local ordinances such as Local Law 97. This is accomplished through automated data capture, on-demand reporting capabilities, and verified service providers.

Category 2: Building & Tenant - Energy Management & Optimization

Robust energy management programs are an important way for both building owners and tenants to reduce energy consumption and associated emissions. This problem set explores strategies to help reduce energy consumption through the deployment of energy management systems or other products/technologies.

- How does your solution help building owners use less energy to heat and cool buildings?
- How does your solution help building owners and/or tenants manage and reduce plug load?
- How does your solution mitigate energy loss/gain and minimize energy use needed to maintain prescribed indoor environmental conditions? Potential solutions could explore innovations in smart windows, shading technologies, insulation materials, energy recovery and ventilation, etc
- How does your solution help engage or empower tenants to make optimal energy use decisions

Finalists

BrainBox AI

BrainBox AI is a fully autonomous advanced artificial intelligent solution that optimizes commercial HVAC systems. It requires no human intervention and with the power of AI, turns HVAC systems from reactive to pre-emptive. The SaaS solution, requiring no retrofitting or sensor installation, is deployable around the world with virtual set up in less than three hours, making buildings smarter, leaner, and greener. With up to 25% savings in HVAC energy, up to 40% reduction in carbon footprint, an improvement of up to 60% in occupant comfort, and an extension in equipment life up to 50%, there is constant value being offered.

Making buildings smarter, greener, and more efficient. BrainBox AI enhances your building's HVAC system for maximum energy reduction and simpler operations with autonomous AI technology. The solution reduces the carbon footprint of buildings worldwide. By making sustainability financially and operationally beneficial and accessible, BrainBox AI redefines its role in our global ecosystem and empowers our clients to do the same.

Hatch Data

Hatch Data is a decarbonization platform for real estate that streamlines sustainability reporting and drives performance improvements at portfolio scale. The platform collects and certifies disparate data—from utilities, meters, sub-meters, equipment, and IoT sensors—and provides analytics and tools to help real estate teams report, manage, and improve building performance, faster.

Hatch Data solutions include:

- **Benchmark:** Centralizes utility data to help report, benchmark, and identify anomalies
- **Monitor:** Collects utility interval meter or equipment submeter data to support real-time monitoring, automated reporting and analysis to improve building performance
- **Optimize**: Provides real-time monitoring, reporting, and analysis of connected building systems data to drive continuous improvement

IBIS Power

PowerNEST is the first wind and solar combined solution generating 10x more energy on medium to high-rise building roofs. A breakthrough for building sustainability and smart cities. Renewable energy never looked so good!

PowerNEST is a wind and solar energy combined integrated rooftop generating up to 10x more energy than conventional roof solar. It is the key solution meeting new legislation for sustainable buildings with limited roof space for local energy production providing all energy needs for electrification of buildings including heating and cooling. PowerNEST is modular and can be placed on any flat roof of 5 levels or higher of new and existing buildings generating all-year available power at a fraction of the grid cost. PowerNEST is named crown-on-the-building by renowned architects and is adopted as the future solution of sustainable cities.

Prescriptive Data

Prescriptive Data is the creator of Nantum OS, an award-winning platform optimizing buildings' operational performance while saving energy, reducing carbon emissions, and lowering costs without sacrificing occupant health or comfort. Combining historical data with predictive analysis and real time occupancy, Nantum OS enables buildings to hit their ESG goals.

Nantum OS is a full-stack energy and carbon emission reduction solution for both owners and tenants. What Prescriptive Data's Natum OS does:

- **Measure** - Allows both owners and tenants to visualize real-time plug load, energy consumption, carbon emissions, renewable generation, renewable procurement, and Local Law 97 management.
- **Automate** - Nantum OS uses artificial intelligence and real-time / predictive occupancy to operate buildings and tenant spaces, automated energy, and carbon emission reduction while solving for the maximum amount of indoor air quality and comfort.
- **Tenant Engagement** - Nantum OS allows owners to arm their tenants with the tools they need to reduce their energy consumption and meet their ESG and sustainability goals.

Learn more here.

Radiator Labs

Radiator Labs' mission is to decarbonize the world's legacy buildings. The company's strategy is twofold. First, Radiator Labs deploys proprietary technology, The Cozy, a smart, thermostatic radiator enclosure that is networked to central heating controls, to achieve a NYSERDA-verified 25.5% increase in heating efficiency. Second, Radiator Labs deploys its Hybrid Electrification platform, which pairs The Cozy with commodity heat pumps to achieve up to 80% building decarbonization for 20% of the cost of traditional electrification. Hybrid Electrification converts legacy properties into smart, resilient buildings that can flex fuel sources, achieving a vastly reduced carbon footprint at a fraction of the cost of traditional electrification.

Category 3: Energy Storage

Energy storage systems offer the potential to provide numerous benefits to building owners ranging from increased resiliency, better energy management, and emissions reductions. This problem set seeks to identify energy storage systems that are effective, resilient, safe, and primed to be an important component of building's energy plans.

- How does your technology enable building owners to safely install and use energy storage technology to reduce emissions inside the property?
- How does your technology increase capacity, resilience, and or safety standards of energy storage systems?
- How does your technology improve the ability to manage a building's electrical and/or thermal load and adapt for demand response?

Finalists

Brightcore Energy

Brightcore is pleased to introduce our specialized Ground Source Heat Pump (GSHP) and Borehole Thermal Energy Storage (BTES) system called UrbanGeo. Originally developed and deployed in Sweden by its partners, LKAB Wassara, UrbanGeo is an innovative HVAC solution specifically designed for applications in densely populated, urban areas such as NYC. Unlike air-source heat pumps with efficiencies ~200% or conventional fossil fuel HVAC systems that have efficiencies ~85%, GSHPs have efficiencies that exceed 400%. When configured and used as an energy storage solution, UrbanGeo can reduce peak cooling loads resulting in an additional 10%-15% decrease in peak cooling loads.

Borehole Thermal Energy Storage (BTES) systems provide seasonal energy storage that can reduce a building's baseline energy load while also reducing peak demand by cooling a building's HVAC loop temperatures during peak load hours. UrbanGeo™ does this through Geothermal Borefield Optimization. These systems allow for seasonal temperature optimization by directing condenser or evaporator water seasonally to pre-charge the ground with energy

Trane

Trane has installed 530 MW (3,422 MWH) of Thermal Battery cooling in the U.S. (2020) in densely populated urban centers with the strictest legislative policies, giving building owners an opportunity to benefit from energy storage systems without waiting for policy makers to codify storage systems design and installation standards. Thermal energy storage systems are one third of the cost of chemical battery systems and last 2-4x longer with no degradation in storage capacity over a thermal battery's 40 year useful life. Trane has now developed applications for thermal storage during heating season for all year benefit to building owners.

Recently, with the trend towards electrification of heating, Trane has introduced our newest innovation around thermal storage systems: Storage Source Heat Pump. These groundbreaking systems, published as a technical feature in ASHRAE 2020, are a simple and more sustainable way to store and recover the building's waste energy to deliver heating in the winter as well as cooling all year round.

Zinc8 Energy Solutions

Zinc8 Energy Solutions has developed innovative battery technology that uses zinc and air as fuel. The company's technology resolves the intermittent and unpredictable nature of renewable energy sources such as wind and solar. With a cost-effective solution for energy storage, clean energy is made reliable and available as and when required.

The Zinc8 ESS is a modular Energy Storage System designed to deliver power in the range 20kW - 50MW with capacity of 8 hours of storage duration or higher. With the advantage of rechargeable zinc-air flow battery technology, the system can be configured to support a wide range of long-duration applications for microgrids and utilities. Since the energy storage capacity of the system is determined only by the size of the zinc storage tank, a very cost-effective and scalable solution now exists as an alternative to the fixed power/energy ratio of the lithium-ion battery.

Category 4: Embodied Carbon & Carbon Capture

There is growing attention and need to measure beyond scope 1 and 2 emissions and address more comprehensively the emissions impact of buildings. This includes taking into account impacts of refrigerants as well as carbon emissions tied to buildings' materials, construction and end of life processes. This problem set is focused on improving owner's ability to understand, measure, and take steps to reduce embodied carbon, defined as the environmental impacts associated with producing, shipping, maintaining, and managing end of life requirements for materials.

- How does your solution help building owners monitor, measure, analyze, and report on the environmental impacts and especially carbon dioxide equivalent emissions that result from the construction, maintenance, and end of life processes of a building?
- How does your technology assist owners with tracking the embodied carbon and refrigerants associated with the materials they use in their properties?
- How does your solution help owners reduce the level of embodied carbon and refrigerants in the sourcing and maintenance of materials used in the development process?
- How does your solution help owners control building level emissions using carbon capture technology in a way that is safe, economically sustainable, and results in very long-term or permanent sequestration?

Finalists

CarbonQuest

The CarbonQuest onsite, modular Building Carbon Capture™ system (BCCS) captures CO2 during normal operations of the building that uses natural gas (or fuel oil). In cities, buildings contribute 70% of emissions, and large buildings make up 60% or higher of the emissions profile. CarbonQuest's goal is to provide a pathway for large buildings and facilities to immediately reduce CO2 cost-effectively and without disruption to tenants and building operations. The captured CO2 is liquified onsite. We sell the CO2 to utilizers who create low embodied carbon materials with the CO2 by mineralizing it into "green concrete." In all cases, the team takes into account the CO2 offtaker's process to ensure CO2 is not re-emitted into the atmosphere. Properties of interest are those where > 45% emissions come from natural gas and can be multi-family, hospitals, universities, city buildings, commercial and light industrial facilities.

Construction Carbon

Construction Carbon is a platform to make net zero accessible for anyone doing a construction project. The company provides an upfront carbon scoring and net zero verification process that provides credible, standardized comparison of all your assets' embodied carbon, coupled with guidance for reduction and simple, transparent offsetting. Construction Carbon's 4 stage process involves an initial assessment, followed by the suggestion of reduction strategies for the embodied carbon in the project. This is then neutralized through the purchase of offsets (held and verified by Construction Carbon), before being reported on a project website.

Soletair Power

Soletair Power captures carbon dioxide from the air utilizing Direct Air Capture technology in buildings' ventilation systems – converting buildings into atmospheric-CO2 capturing machines. The solution results in reduced emissions, more productivity for the people indoors, alternative energy sources, and climate benefits.

The modular solutions can easily be placed in commercial spaces or be retrofitted with buildings' HVAC systems. The HVAC-CO2-Capture integration achieves up to a 50% reduction in CO2 emissions and improves productivity by at least 20% while the captured CO2 can be stored or reused as a non-fossil-based resource in a wide array of applications (i.e. in making aggregates, concrete, polymers, methanol, fuel, food, diamonds, or it can be stored or transported). The cyclic use thus effectively rewinds the pathway of CO2. In 2021, together with Wärtsilä, Soletair Power demonstrated making fuel from thin air at the Expo 2020 Dubai.