

EnergyNest Thermal Energy Storage



There is no energy problem.

The problem is making this energy available when and where we need it.

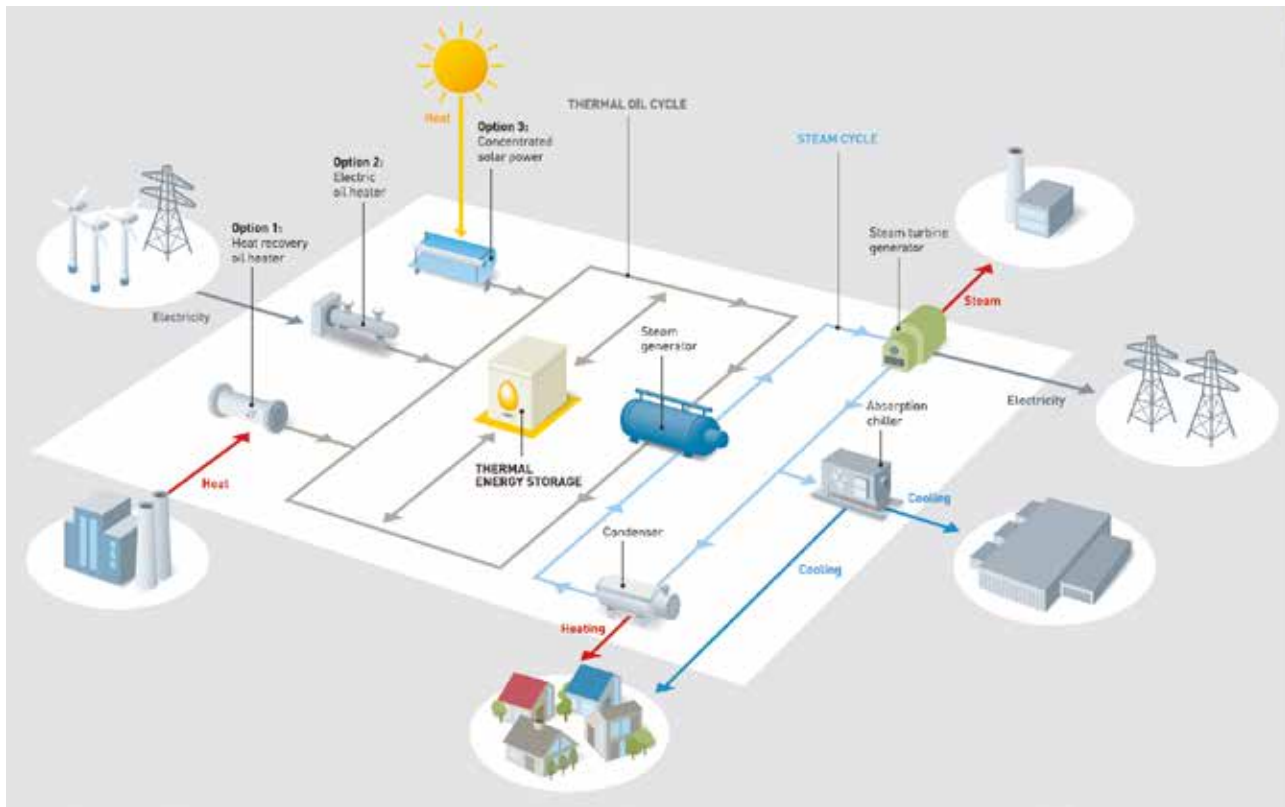


There is an abundance of renewable energy on our planet - solar, wind & hydro power.

The problem is making this energy available when and where we need it.

EnergyNest has developed a revolutionary thermal energy storage solution which is the missing link that enables the harvesting of renewable energies.

Windsor is the exclusive NZ representative for EnergyNest systems, talk to us about solving your energy problems.



EnergyNest can deliver 4 combined or independent energy streams with >90% round trip energy efficiency utilising solid state heat exchanger tubes located in the thermal energy storage system.

The EnergyNest technology is applicable to multiple areas in energy and power grid systems. It is based on, and designed around, standard turbomachinery, so it can be easily combined with standard equipment.

The EnergyNest Thermal Energy Storage can be charged with electricity and/or be heated directly by industrial or solar sources.

The system is simple, robust, and comprises field-proven equipment:

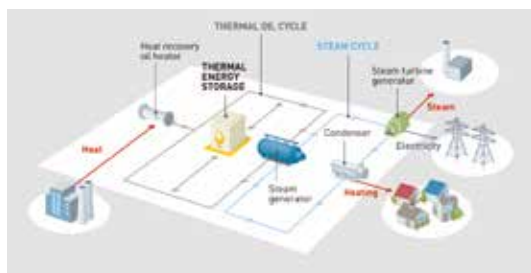
Electric oil heater (or heat recovery oil heater, or concentrated solar power).

EnergyNest Thermal Energy Storage (TES).

Steam island – consisting of:

- Steam generator.
- Steam turbine.
- Option for steam extraction.
- Condenser with district heating supply.
- Absorption chiller.

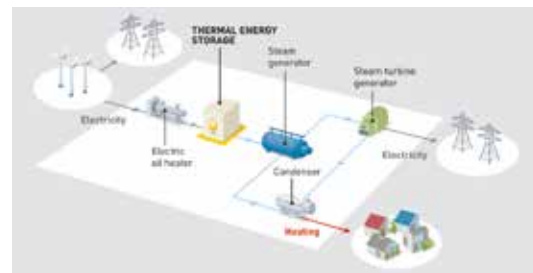
Industrial / steam energy model



Making use of waste heat is only one way that EnergyNest helps to maximize energy output without increasing resource input. The stored energy can be discharged to cover demand peaks, satisfy backup requirements, and balance cyclic variations in energy consumption. The storage can also take advantage of affordable off-peak grid power to store thermal energy for processes, or store excess heat for power production during peak tariff periods.

An EnergyNest system also eliminates the need for external loops between different heat-transfer fluids, as well as costly electrical heat tracing and heaters, thus further reducing complexity.

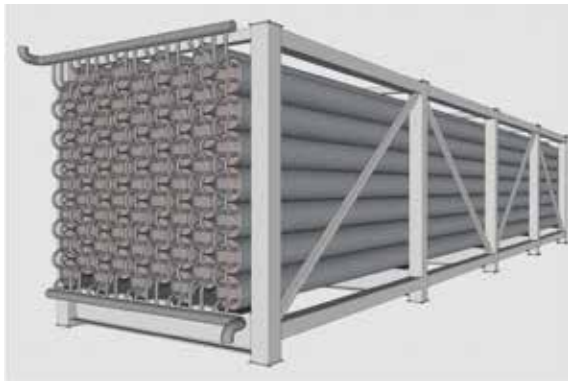
Wind farm energy model



With EnergyNest, industrial facilities optimize their energy production and consumption by storing thermal energy and making it available on demand. At the same time, they can reduce their carbon footprint.

The high-temperature steam storage jointly developed by EnergyNest and Aalborg CSP avoids intermediary heat-transfer fluids and is charged and discharged directly with steam.

EnergyNest Modules - flexible & scaleable



Durable components combined with clever engineering result in a highly robust, flexible system that is easy to assemble.

Since the two main materials – concrete and steel – are broadly available and fully recyclable, the technology can be deployed in any geographical area and location.

Our unique modular design enables a “LEGO-like” feature: The number of modules stacked inside the steel structure like building blocks is determined by the required storage capacity and duration.

EnergyNest is custom-made to fit your needs and can be scaled from a few MWhth into the GWh range – simply by adding more modules. As such, it can be configured and adapted to a variety of storage applications and requirements.

Thanks to pre-fabricated piping and easy on-site assembly, EnergyNest already saves time and energy in the installation phase. It is also suited for containerized logistics – one module fits into a standard 40-foot container – making multi-module shipping easy.

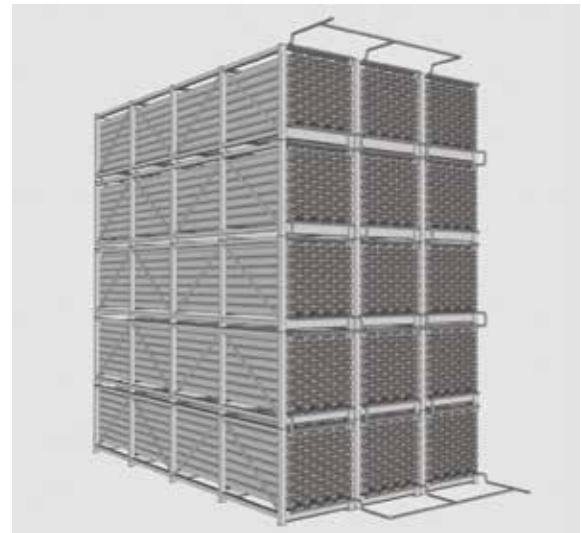


More flexibility and less cost

Electrochemical batteries, such as lithium-ion and lead acid, need electricity to charge, whereas the EnergyNest Thermal Battery charges with heat.

This means that the Thermal Battery can be used for applications (such as combined heat and power) which are not physically possible with electrochemical batteries.

Moreover, the Thermal Battery has a significantly longer lifetime, near-zero performance degradation, in addition to being made of fully recyclable materials. These materials primarily consist of steel and concrete, which are cheap and globally available commodity materials. This is why the system comes at a significantly lower cost than batteries.



The EnergyNest technology allows excess heat produced during peak-heat batch cycles to be stored, and later fed back into the steel production process.

Hours of peak production with extreme heat on the one hand and longer cycles of lower heat on the other – the steel industry is characterized by high intermittency. To balance this out, EnergyNest stores the excess heat (i.e. from flue gases) and makes it available for less energy-intensive applications in the steel mill.

Solid state construction



At the core of EnergyNest’s technology are heat exchanger tubes integrated into our unique solid-state storage medium: HEATCRETE®.

Due to its smart, simple design, EnergyNest technology is proving to have clear advantages when it comes to stationary, large-scale energy storage solutions – not only for one but multiple applications. Our Thermal Energy Storage system is made up of a large number of individual elements, connected in series and parallel.

An integral part of the modules is HEATCRETE®, the innovative high-performance concrete core. The HEATCRETE® formula has been developed in cooperation with HeidelbergCement, since 2012. HEATCRETE® is a cutting-edge material tested and verified by independent third-party laboratories.



Maintenance & Servicing



The Windsor Energy Service Division provides full-life service and maintenance support to customers throughout New Zealand.

The dedicated service team provides installation, commissioning, routine maintenance, emergency cover and engineered upgrade work for all thermal energy applications and works with customers from all industry sectors.

Services offered include:

- Full routine service and maintenance packages for all aspects of boilers and thermal energy plants
- Support for a range of burners including Weishaupt, Dreizler, Fives NAMCO and Zeeco
- Plant commissioning
- Combustion tuning and optimisation
- Safety inspections
- Control system and plant upgrades, including unattended operation
- Efficiency studies and enhancements
- Condition and ageing assessments
- System troubleshooting and optimisation
- Servicing, upgrade and repair of industrial air heaters
- Hire boilers
- Emergency standby boilers and relief boiler operators
- Boiler re-tubing
- Valve servicing
- Piping and ducting systems
- Operator and management training
- Condenser cleaning
- Fitting and welding

Windsor technicians are fully trained to support a wide range of industry-leading products from some of the world's best manufacturers of burners, valves, control systems and other thermal energy products.

The team prides itself on its depth and breadth of experience and competencies in maintaining and upgrading solid, liquid and gas fired boiler and other thermal applications.

Service centres and technicians are located throughout New Zealand with the main offices and workshops being in Auckland, Napier, Dannevirke, Wellington, Christchurch and Dunedin. The Service Division is supported by its own dedicated Products team who source the full range of spares and consumables required for all aspects of the team's work.



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