

Renewable Heat Pathways: Where Does eTES fit?

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eTES (Electrical Thermal Energy Storage) stores electricity as heat, enabling flexible use of renewable power and supply of high-temperature heat. It provides load-shifting benefits by charging during periods of lower electricity cost or higher renewable availability, then discharging heat when needed. However, eTES generally requires access to alternative tariffs - such as time-of-use or demand-response schemes - to be cost-competitive against standard electricity pricing. Success depends on matching the system's charge/discharge cycle to the site's actual heat and power profile.

Publication context: This article reflects its publication date. Market prices, program rules, reporting duties and deadlines may have changed. Confirm current official guidance before making a decision.

Decarbonising industrial heat is now a strategic priority. Businesses are considering renewable heat options such as biomass and biogas, certified green gas, high-temperature heat pumps, electric boilers, and Electrical Thermal Energy Storage (eTES). Each pathway has a role to play - but none offers a universal solution.

Technology Options eTES - Stores electricity as heat, enabling flexible use of renewable power and supply of high-temperature heat - Provides load-shifting benefits but generally requires access to alternative tariffs to be cost-competitive

Electric Boilers - Straightforward replacement for gas-fired boilers - Simple to install but can increase operating costs under standard tariffs - Emissions improvements depend on renewable electricity supply, which in most of Australia is not yet guaranteed

Heat Pumps - Highly efficient for low- to medium-temperature applications - Use cases are growing in high-temperature industrial processes, often relying on a consistent waste heat source for efficiency

Biomass and Biogas - Well-established technologies for continuous heat supply - Depend on reliable, sustainable fuel chains or onsite biogas production capacity

Certified Green Gas - Biomethane supplied through the gas network under certification - Requires no change to site infrastructure - Typically higher operating costs due to current supply constraints

Heat/Energy-as-a-Service - Third party owns and operates the renewable heat system - Delivered as a service with limited or no CAPEX required - Attractive for organisations seeking off-balance sheet solutions

When Does eTES Work Best?

Success with eTES depends on three key factors: - Heat and Power Use: The system must be sized and operated to match your load profile and allow effective charging and discharging - Infrastructure Readiness: Electrical and thermal systems need to integrate with eTES without costly upgrades - Certificates and Incentives: Access to environmental certificates or tariffs is often essential to achieve

favourable financial outcomes

Choosing the Right Pathway

The optimal renewable heat solution depends entirely on-site context, including: - Heat demand profile and temperature requirements - Existing boiler and electrical infrastructure - Availability of renewable electricity or alternative fuels - Suitability for certificates, grants, and incentive schemes

In many cases, a hybrid approach delivers the best balance of cost, emissions reduction, and reliability.

How Northmore Gordon Helps

We provide independent, technology-neutral advice across all renewable heat options. Our services include: - Comparative modelling of performance, cost, and emissions - Infrastructure assessments to highlight integration requirements early - Certificate and incentive mapping to maximise financial returns

Don't Start with Vendor Quote Collecting quotes from individual vendors in isolation often leads to poor comparisons and mismatched systems. A strategic review should come first - clarifying which pathway, or combination of pathways, makes sense for your business.

If renewable heat is on your agenda, talk to Northmore Gordon first. We'll help you review the options, model the economics, and move forward with confidence. For more information: Contact Grant Raja, Principal Consultant

Scheme and certificate context

Before using a certificate or grant figure, confirm the current scheme method, eligible activity, effective date, evidence requirements, price date and registration or application process.

Related guidance

Certificate services

Government schemes

Contact us

Read the original article for the source publication and its full context.

What is eTES and how does it work?

eTES (Electrical Thermal Energy Storage) stores electricity as heat, enabling flexible use of renewable power and supply of high-temperature heat. It provides load-shifting benefits by charging during periods of lower electricity cost or higher renewable availability, then discharging heat when needed. However, eTES generally requires access to alternative tariffs—such as time-of-use or demand-response schemes—to be cost-competitive against standard electricity pricing. Success depends on matching the system's charge/discharge cycle to the site's actual heat and power profile.

What renewable heat technology options does the article discuss besides eTES?

The article examines Electric Boilers, Heat Pumps, Biomass and Biogas, Certified Green Gas, and Heat/Energy-as-a-Service as renewable heat pathways. Electric boilers offer straightforward gas-boiler replacement but can increase operating costs under standard tariffs. Heat pumps excel at low- to medium-temperature applications and are increasingly viable for high-temperature industrial processes when waste heat is available. Biomass, biogas, and certified green gas provide continuous heat supply but depend on reliable fuel chains or onsite production capacity.

What three factors determine whether eTES will work well at a site?

Success with eTES depends on: Heat and Power Use—the system must be sized and operated to match the load profile and allow effective charging and discharging cycles. Infrastructure Readiness—electrical and thermal systems need to integrate with eTES without costly upgrades to switchboards, pipework or controls. Certificates and Incentives—access to environmental certificates, alternative tariffs, or grant schemes is often essential for achieving favourable financial outcomes. A feasibility assessment should evaluate all three before progressing to procurement.

Why does the article recommend a strategic review before collecting vendor quotes?

Collecting quotes from individual vendors in isolation often leads to poor comparisons and mismatched systems because each vendor advocates their own technology without considering site context. A strategic review should first clarify which renewable heat pathway, or combination of pathways, makes sense for the business given its heat demand profile, temperature requirements, existing infrastructure, available fuels or renewable electricity, and eligibility for incentive schemes. This approach prevents costly vendor-led decisions and identifies hybrid solutions that balance cost, emissions and reliability.

What makes Heat/Energy-as-a-Service an attractive renewable heat option?

Heat/Energy-as-a-Service is a model where a third party owns and operates the renewable heat system, delivering thermal energy as a service with limited or no upfront capital expenditure required from the site operator. This approach is particularly attractive for organisations seeking off-balance-sheet solutions, avoiding the capital burden and operational risk of owning renewable heat equipment. The service provider assumes responsibility for performance, maintenance and asset management, allowing the site to focus on core operations while achieving renewable heat and emissions reduction objectives.

How do electrical constraints and tariff structures affect renewable heat pathway selection?

Electrical constraints limit the feasibility of electrified heating solutions such as eTES and electric boilers. If switchboard capacity is insufficient or network upgrades are required, installation costs rise significantly. Tariff structures are equally critical: standard flat-rate tariffs make electric heating expensive, whereas alternative structures—such as time-of-use, demand-response, or off-peak rates—can make eTES and electric boilers cost-competitive. Assessing both electrical infrastructure capacity and available tariff options early prevents mismatched technology selection and hidden costs.

What role do environmental certificates play in renewable heat project viability?

Environmental certificates—such as Victorian Energy Efficiency Certificates (VEECs), NSW Energy Savings Certificates (ESCs), or ACCU projects—can provide revenue streams that improve project economics. However, certificate eligibility depends on the specific technology, scheme rules, and project stage; a technically sound renewable heat project is not automatically eligible. The article emphasises assessing scheme eligibility and certificate timing early in the feasibility process. We can evaluate pathway suitability, missing evidence, and conditions that remain unresolved before final investment decisions.

When are heat pumps most effective for industrial renewable heat applications?

Heat pumps are highly efficient for low- to medium-temperature applications, typically below 60°C. Their effectiveness in higher-temperature industrial processes is growing but generally requires a consistent waste heat source to operate efficiently. In sites with available rejected heat from refrigeration, compressed air, or cooling systems, heat pumps can capture and upgrade that waste for use elsewhere on site, improving overall energy efficiency. A heat balance and waste heat inventory should be completed before evaluating heat pump feasibility and sizing.

What factors should determine the optimal renewable heat pathway for a business?

The optimal solution depends entirely on site context: heat demand profile and temperature requirements; existing boiler and electrical infrastructure; availability of renewable electricity, waste heat, or alternative fuels; and suitability for certificates, grants, and incentive schemes. In many cases, a hybrid approach—combining two or more pathways—delivers the best balance of cost, emissions reduction, and operational reliability. A structured feasibility assessment comparing complete project options, including electrification, heat recovery, thermal storage, and service models, supports robust decision-making.

How should organisations approach measurement and evidence planning for renewable heat projects?

Measurement planning should begin during feasibility, not after installation. Establish the project boundary, baseline energy consumption, applicable scheme requirements, and what data must be gathered before equipment changes. Record the existing operating conditions, installation dates, commissioning evidence, and any changes to production or operating patterns during implementation. This preserves eligibility for environmental certificates and enables verification of performance outcomes. Our measurement and verification services help define appropriate boundaries and ensure evidence is available when needed for scheme submissions or investment reviews.