

ASHP - Northmore Gordon

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Details:

Home › Glossary › ASHP

ASHP

An air source heat pump (ASHP) is a type of heat pump that absorbs heat from a colder place and releases it into a warmer place, using the same vapor-compression refrigeration process and the same external heat exchanger with a fan as used by air conditioners. ASHPs are evaluated as part of energy-improvement feasibility assessments to reduce reliance on gas heating in temperature-sensitive operations. The technology moves thermal energy from a source to a destination, subject to site-specific performance conditions.

Related guidance

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Government schemes

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Measurement and verification

What is an air source heat pump (ASHP)?

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How does an ASHP differ from traditional gas heating systems?

An ASHP uses electricity and the vapor-compression refrigeration cycle to transfer heat rather than burning gas to generate it. This shift from gas heating to electrical heat transfer is evaluated during feasibility assessments to determine whether it can meet required heat duties while reducing energy costs and carbon emissions. The choice between ASHP and gas heating depends on temperature requirements, electrical supply constraints, operating schedules, and financial assumptions. We assess these trade-offs within a broader renewable heat and electrification feasibility framework.

What assessment framework should guide ASHP feasibility?

A complete ASHP assessment should compare six components: useful duty (what temperatures, flow rates and operating hours must be maintained), existing performance (measured versus inferred), heat recovery opportunities, electrification requirements, reliability and redundancy strategy, and economics with consistent cost assumptions. This framework ensures the assessment addresses the full operating service before selecting equipment. Site-specific conditions such as available waste heat, thermal

storage potential, and electricity supply constraints must be documented before equipment selection. We structure feasibility assessments using this comparison method.

What information is needed before an ASHP feasibility assessment?

Prepare a heat balance defining required temperatures, flow rates and operating hours; an operating schedule showing when heat is needed; current fuel consumption data; and a description of potential waste-heat sources. For electrification feasibility, document electrical supply capacity, any constraints on demand charges, and integration requirements with existing systems. This information allows proper scoping of the feasibility assessment and identification of measurements required before selecting equipment. MainStream Aquaculture's published feasibility project illustrates these assessment elements for a temperature-sensitive aquaculture facility.

How does heat source availability affect ASHP viability?

An ASHP's performance depends on whether the heat source is available when heat is needed. Assessment questions must address temporal matching: can the proposed heat source reliably supply required conditions throughout the operating cycle? For facilities with variable demand or seasonal operations, thermal storage, backup systems and control strategy require explicit evaluation. Redundancy and maintenance implications affect reliability and operating cost. These availability and timing considerations are as critical as the equipment's nominal efficiency rating in determining whether an ASHP investment makes commercial and operational sense.

What role do electrical constraints play in ASHP feasibility?

Renewable heat and electrification feasibility assessments require electrical constraints as a key input alongside temperature requirements, process profiles and fuel-use information. The site's available electrical capacity, demand-charge structure and connection limitations may restrict ASHP operating hours, size or economic viability. Changes to electricity supply, demand charges or maintenance arrangements need pricing consideration in the investment case. These electrical considerations must be evaluated alongside the heating duty and available waste-heat sources to determine whether electrification is technically and commercially feasible.

What makes an ASHP forecast different from a verified operating result?

A feasibility forecast shows projected energy-bill savings under specified operating conditions, energy prices and capital scope. MainStream Aquaculture's published case reports forecast energy-bill savings of approximately \$113,000 annually—a projected outcome from assessment, not measured operating savings. A forecast depends on its assumptions remaining valid: if production changes, energy prices shift, or operating hours differ from the model, actual results will vary. Verified outcomes require post-installation measurement and verification against a defined baseline. Keep feasibility forecasts clearly labelled and traceable to their assumptions.

How should an ASHP project be structured with other energy improvements?

If an ASHP affects both a cooling system and heating system—or overlaps with waste-heat recovery, insulation, or other measures—agree how the combined result will be evaluated and measured. Avoid adding individually estimated savings if multiple measures affect the same load; this can overstate the combined effect. Document the sequence and boundary used for each estimate. For food and beverage or animal-processing facilities where cooling and heating can potentially be assessed together, heat integration opportunities should be identified before equipment selection. We structure assessments to address these interconnections explicitly.

What environmental or funding schemes might apply to an ASHP project?

Eligible ASHP installations may create energy-efficiency certificates or environmental credits depending on jurisdiction, implementation date and applicable scheme rules. Victorian Energy Upgrades and NSW

Energy Savings Scheme have specific activity requirements and evidence standards. Historical success with gas equipment does not confirm eligibility for a new electrification project; each proposal requires assessment against current scheme rules. Certificate value, timing, and evidence responsibilities must be established before implementation. We assess funding-pathway eligibility and support project registration and certificate creation.