

Right Sizing for the Energy Transition - Why Metering & Monitoring Matters!

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Monthly bills cannot reveal the operating patterns, peak demands, or equipment performance variations necessary to right-size energy systems for the transition. Interval data - typically 30-minute or 5-minute resolution - shows when consumption occurs, identifies Significant Energy Users, and detects anomalies that indicate maintenance or efficiency opportunities. This granularity is essential for measurement and verification of savings claims, heat pump modelling, and baseline establishment under schemes like NSW ESS. Without interval data, feasibility studies and investment cases rest on estimates rather than evidence, and funding pathways requiring verified savings become unavailable.

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By Phil Woodward, Engineering Manager, Northmore Gordon Do more with less. That's how we help clients get electrification projects over the line without gold-plating or risking plant uptime. Metering & Monitoring (M&M;) is the discipline that makes this possible. Before you size a heat pump, specify a boiler replacement, or map a site wide electrification roadmap, you need defensible data on electricity, gas, steam, water and compressed air. Without it, many teams fall back to a like-for-like thermal capacity swap that ignores the real loads, the real temperatures, and the true diversity of demand over time.

Oversizing wastes capital and drags on payback; undersizing jeopardises throughput and growth. Metering & Monitoring gives you the truth so you can right size today, and plan with confidence for tomorrow. That's our "do more with less" philosophy in action.

Why Metering & Monitoring first (especially before a heat pump)

Heat pumps aren't boilers; they're happiest at lower temperatures and steady loads. One of the biggest efficiency levers is supply/return temperature. NSW's Heat Pump Feasibility Grant template is explicit: Don't recommend like for like boiler to heat pump swaps, and every 1 degrees C you can lower heating hot water temperature improves heat pump efficiency by ~2-3% . That single insight can transform a business case.

With a robust M&M; foundation you can:

Capture real load profiles (not just monthly bills) so capacities and storage are sized to measured peaks and diversity, not worst case guesses;

Confirm true supply/return temperatures and deltaT, unlocking lower setpoints (and therefore higher COPs) and broader technology options;

Quantify recoverable waste heat (e.g., from compressors and refrigeration) so you can right size the heat pump and slash running costs;

Stress test future scenarios - new shifts, product mixes, seasonal swings - to avoid locking in a spec that won't age well.

NSW's Electricity Metering & Monitoring Guide and Gas Measurement & Monitoring Guide are aligned with this approach: measure what matters, automate the flow of data, and turn it into actionable insight. What we mean by Metering & Monitoring in an industrial plant

Metering & Monitoring is a structured program that measures the utilities that drive your process and turns that data into decisions. In practice this means instrumenting and integrating WAGES (Water, Air, Gas, Electricity, Steam):

- Electricity : site NMIs plus sub-metering for major consumers (refrigeration, compressed air, large drives) and MCCs/boards where it helps track end uses.
- Gas & thermal fuels : incoming gas flow at the main, plus downstream metering (boilers, hot water heaters), with stack and feedwater temperatures so you can calculate thermal efficiency.
- Steam & hot water : flow, pressure and temperature at main headers and large users, plus condensate return percentage.
- Water (town, process, recycled): supply meters and high use processes (cooling, CIP, washdown) - and temperature where it influences heat recovery.
- Compressed air : per compressor flow and pressure, ring main flow, and afterhours baselines to quantify leaks and standby losses.

That's exactly how we stage metering plans. In our recent Metering & Monitoring Plan work, we roll out in four tiers: (1) Site level boundary meters (2) Generation/services (boilers, refrigeration, compressed air) (3) System/department boundaries (4) End use equipment . Then we pipe everything into a historian and a fit for purpose energy platform with dashboards, alarms and Energy Performance Indicators (EnPIs).

At Northmore Gordon, we will walk you through the plans and implementation approaches we have taken when deploying strong metering and monitoring (including Energy Performance Indicators EnPI) for our commercial & industrial clients.

Why rightsizing beats like for like every time

Rightsizing is about matching capacities and temperatures to what is needed, when it's needed. With good Metering & Monitoring you:

- Avoid oversizing → lower capex; smaller electrical connection; less floor space; better part load efficiency.
- Avoid undersizing → protect throughput and quality; verify with measured peaks and duty cycles rather than assumptions.
- Optimise temperature → measured supply/return data enables safe setpoint reduction, improving heat pump COP and cutting energy use (remember the ~2-3% per degrees C rule of thumb noted above).
- Validate business cases → interval data builds confidence in savings and supports funding and certificate claims.

NSW funding Metering & Monitoring and Heat pump Feasibility

NSW is actively co-funding M&M; because right sizing depends on quality data:

- Metering & Monitoring Planning - funding of up to \$15,000 per plan (paid to the service provider) to assess gaps and produce a costed plan for complex sites.

- Metering Plan Implementation - up to \$100,000 per site, co-funding 50% of priority meters and the monitoring system recommended in your plan. Whilst Round 1 has closed we expect further rounds.

- Heat Pump Feasibility Grant - up to \$30,000, covering up to 75% of consultant costs to produce a high confidence feasibility study; the grant framework explicitly requires a metering & barriers assessment up front.

These programs exist for exactly the reason outlined in this article: better data leads to better sized, better performing projects.

Build a strong Metering & Monitoring plan: a practical checklist

From our work across food & beverage, manufacturing and resources, here's what "good" looks like:

- Start with decisions, not devices. Define what you must know to size the project (loads, temperatures, duty cycles, tariff windows). Then pick meters.

- Use the four stage rollout: boundary → generation/services → systems/areas → end use equipment.

- Target Energy Performance Indicators (EnPIs). Tie energy to "work done" (e.g., GJ /tonne, kWh/kg) so improvements are visible and persistent; automate weekly reporting and alarms.

- Log at the right resolution. For major loads capture 5-15 minute data, and, where practical, at least 12 months to cover seasonality and production changes. The Heat Pump Milestone 1 template lists 12 month interval data for gas, key heat sources/sinks and 5 minute site electricity as best practice inputs.

- Connect to a central historian & energy platform. Automate data collection, reports and alarms so the numbers get used - not filed.

- Plan integration. SCADA/PLC tags, OPC/Modbus gateways, simple exports to finance/BI.

- Design for data quality. Specify calibration, pulse scaling, CT ratios and comms; validate with spot checks during commissioning.

What to meter first (E, G, S, W, Air)

Prioritise the meters that unlock design confidence and quick wins:

- Electricity: site NMIs, refrigeration plant(s) kW, air compressor kW/flow, major MCCs/boards that aggregate SEUs, significant chiller/pump power.

- Gas/thermal: boiler and hot water heater fuel flow, feed water make up and stack temperature to calculate efficiency.

- Steam/hot water: main header flow/pressure, large user flow, supply/return temperatures, condensate return %.

- Water: site supply, major cooling/process users, recycled loops; include temperature where it affects heat recovery.

- Compressed air: per compressor flow & pressure, ring main flow, and afterhours baseline to quantify leaks.

Real world Case Study: Bulla Dairy Foods

Bulla implemented a comprehensive but targeted Metering & Monitoring system at its Colac site to improve visibility of energy and water. The project connected 35 existing meters to a new platform and installed 27 new meters across electricity, gas, steam, hot/chilled water, cogeneration and compressed

air. The outcome was a robust data set to manage costs, streamline environmental reporting and track savings over time - the foundations required to right size future upgrades.

Common pitfalls we see (so you can avoid them)

- Relying on bills : monthly totals hide peaks and process diversity; they are not a design basis for electrification.
- No temperature data : without accurate supply/return and deltaT, heat pump modelling is guesswork. (This is why Milestone 1 emphasises temperature testing and not recommending like for like swaps.)
- Metering what's easy, not what matters : start with Significant Energy Users (SEUs) and end uses tied to the project boundary.
- Skipping commissioning : unscaled pulses and swapped CTs lead to bad decisions; schedule validation and sign-off.
- Treating Metering & Monitoring as 'one and done' : build weekly rhythms - exception reports, alarms, short stand-ups - so data drives action (see reporting and alarms sections in the plan).

How Northmore Gordon helps

We've authored government guides on metering and monitoring and delivered many site-specific plans and feasibility studies. (The NSW Gas Measurement & Monitoring Guide credits Northmore Gordon for content development.) Our expert services means you get senior engineers who design your metering scope, integrate with SCADA, and deliver analytics your team will actually use - quickly. It's how we help clients do more with less : less capex, less energy, less stress.

Next steps

- If you're NSW based , check your eligibility and secure planning and implementation funding before you buy equipment.
- If you're planning a heat pump , run Milestone 1 properly - close the metering gaps, confirm temperatures and develop multiple concepts before you set a capacity.
- If you want help , talk to us about a metering plan or an electrification feasibility. We'll right size the solution with you.

Let's have that conversation. Call or email Craig Morgan or submit your interest here today.

Sources (web)

- NSW Climate and Energy Action - Metering plan implementation grants (up to \$100,000 / 50%): energy.nsw.gov.au
- NSW Climate and Energy Action - Metering & monitoring planning (up to \$15,000): energy.nsw.gov.au
- NSW Climate and Energy Action - Supporting your business to decarbonise (Heat Pump Feasibility Grant up to \$30,000 / up to 75%): energy.nsw.gov.au
- NSW Electricity Metering & Monitoring Guide (2019): energy.nsw.gov.au
- NSW Gas Measurement & Monitoring Guide (2016): energy.nsw.gov.au
- Northmore Gordon - Creating a gas M&M; plan : Northmore Gordon
- Northmore Gordon Case Study - Bulla Dairy Foods : Northmore Gordon

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.

Why is interval data essential for energy transition planning, rather than relying on monthly billing information?

Monthly bills cannot reveal the operating patterns, peak demands, or equipment performance variations necessary to right-size energy systems for the transition. Interval data—typically 30-minute or 5-minute resolution—shows when consumption occurs, identifies Significant Energy Users, and detects anomalies that indicate maintenance or efficiency opportunities. This granularity is essential for measurement and verification of savings claims, heat pump modelling, and baseline establishment under schemes like NSW ESS. Without interval data, feasibility studies and investment cases rest on estimates rather than evidence, and funding pathways requiring verified savings become unavailable.

What is the WAGES framework, and why does Northmore Gordon apply it to metering planning?

WAGES stands for Water, Air, Gas, Electricity, and Steam—the utilities that industrial and commercial sites must instrument and integrate for comprehensive energy management. By addressing all five utility streams rather than electricity alone, a WAGES-informed metering plan captures interdependencies between systems: steam demand drives fuel consumption, compressed air losses affect electrical load, chilled water generation affects both gas and electricity use. This integrated view prevents optimising one utility at the expense of others and supports rightsizing decisions by revealing true operational profiles, thermal loads, and interactions that a single-utility approach would miss.

What four-tier metering rollout approach does Northmore Gordon recommend, and how does it support rightsizing?

We describe a four-tier approach: (1) site-level boundary meters for total consumption accounting, (2) generation and services equipment (boilers, refrigeration, compressed air), (3) system and department boundaries to allocate consumption, and (4) end-use equipment for detailed performance tracking. This tiered structure allows sites to start with essential boundary data and progressively add detail where investment decisions or operational control changes require it. Each tier supports rightsizing: boundary data validates total load forecasts, service-level metering reveals which equipment is oversized or underutilised, and end-use data identifies where temperature reduction or demand-side changes can improve efficiency before selecting new capacity.

How does the Heat Pump Feasibility Grant framework in NSW require metering and monitoring planning, and what does it exclude?

The NSW Heat Pump Feasibility Grant offers up to \$30,000 (covering up to 75% of consultant costs) but explicitly requires a metering and barriers assessment as a prerequisite. The grant framework does not recommend like-for-like boiler-to-heat-pump swaps; instead, it assumes rightsizing based on measured demand profiles, seasonal variation, and actual temperature requirements. Best-practice inputs include 12 months of gas interval data and 5-minute site electricity data to account for seasonality and production changes. This requirement ensures that feasibility studies rest on actual operating evidence rather than design assumptions, increasing the credibility of savings claims and supporting subsequent funding applications under ESS or other pathways.

What five common metering pitfalls does Northmore Gordon warn against, and what risks do they create?

The five pitfalls are: (1) relying on monthly bills instead of interval data, which obscures load patterns and peaks; (2) lacking temperature data for heat pump modelling, preventing accurate COP calculations; (3) metering what is easy rather than Significant Energy Users, resulting in unactionable data; (4) skipping commissioning and validation, leaving quality issues undetected; and (5) treating metering as a one-off exercise rather than building ongoing weekly reporting rhythms. Each pitfall undermines different decision pathways: insufficient data delays feasibility studies, poor data quality invalidates measurement and verification claims, and lack of ongoing review prevents responsive energy management. We emphasise that metering is a foundation for both energy transition investment cases and long-term operational control.

How does rightsizing differ from like-for-like equipment replacement, and what evidence does metering provide to support it?

Like-for-like replacement maintains existing capacity without questioning whether that capacity matches actual demand; rightsizing uses measured data to select optimal capacity and operating conditions. Interval metering reveals actual peak loads, duty cycles, and operating profiles; temperature data shows current setpoints and whether reductions are feasible; and seasonal analysis prevents oversizing for peak days that occur rarely. Rightsizing benefits include lower capital expenditure, reduced electrical connection size, improved part-load efficiency, and optimised heat pump COP through safe temperature reduction. Measured evidence strengthens investment cases by removing sizing assumptions, supports funding and certificate claims by establishing baselines and verifiable savings, and protects throughput and quality by ensuring capacity meets actual demand rather than design estimates.

What data resolution and period does Northmore Gordon recommend for metering systems that will support transition feasibility studies?

For heat pump and renewable heat feasibility, we align with NSW government guidance recommending 12 months of interval gas and key heat source/sink data, plus 5-minute site electricity data. This 12-month minimum covers seasonal variation in heating demand, production changes throughout the year, and multiple operational cycles of major equipment. Five-minute electricity resolution captures peak demand and load patterns necessary for heat pump modelling, electrical network constraint analysis, and demand-side flexibility assessment. Shorter periods or lower resolution miss seasonal effects and operating extremes, making feasibility estimates unreliable and funding eligibility questionable under schemes that require measurement and verification or baseline establishment.

What NSW government funding is available for metering and monitoring planning, implementation, and heat pump feasibility, and what are the key conditions?

NSW offers three complementary funding streams: metering plan development (up to \$15,000 per plan, paid to service provider, covering gap assessment and costed rollout); metering implementation (up to \$100,000 per site, co-funding 50% of priority meters and monitoring systems recommended in the plan); and heat pump feasibility (up to \$30,000, covering up to 75% of consultant costs). Key conditions include: planning funding requires a gap and scoping assessment; implementation requires an approved plan; and heat pump feasibility requires a metering and barriers assessment upfront and explicitly excludes like-for-like boiler swaps. These programs are designed to work sequentially, with each stage building on measured evidence from the previous one to reduce risk and improve investment confidence.

How does the Bulla Dairy Foods case study illustrate the practical benefits of comprehensive metering and monitoring?

Bulla Dairy Foods implemented a Metering & Monitoring system at its Colac site by connecting 35 existing meters to a central platform and installing 27 new meters across electricity, gas, steam, hot water, chilled water, cogeneration, and compressed air. This comprehensive data set provided a robust foundation to manage operating costs, streamline environmental reporting compliance, and track energy savings over time. The project demonstrates how a four-tier rollout—from boundary to end-use—creates visibility across the full WAGES utility portfolio, reveals equipment interactions (such as cogeneration offsetting steam demand, or cooling load affecting overall electricity consumption), and builds the evidence base necessary for both operational decision-making and funding claim substantiation under schemes like NSW ESS or measurement and verification pathways.

Why does the NSW Gas Measurement & Monitoring Guide credit Northmore Gordon, and what role does this play in the energy transition?

We authored government guidance on metering and monitoring and have delivered numerous site-specific plans and feasibility studies; NSW credits the company for content development in our Gas Measurement & Monitoring Guide. This involvement reflects our depth in designing practical metering systems that support both operational energy management and transition planning. Government endorsement indicates that the frameworks and tiered approaches described in our work meet scheme and policy requirements for evidence quality, baseline establishment, and measurement and verification. For organisations undertaking transition planning, this credentials Northmore Gordon as a provider aligned with government standards and funding pathway requirements, reducing risk that a metering plan will be rejected for non-compliance or lack of scheme recognition.