# Energy Baseline Analytics Training Course: Load Forecasting, Waste Detection and Savings Ranking

14 – 18 March 2027
Amman

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## Programme Summary

Energy baseline analytics is the subject of this one-week training course for energy managers, sustainability engineers and plant and facilities leaders, ending in a savings ranking pack for one site. Savings claims are weak when no one can show what consumption would have been without the measure. The programme moves from baselines to load forecasts, waste detection, measure ranking and a joined review, using metered data from industrial and utility settings. Mars Training Centre UK delivers this programme on energy baseline analytics to mixed-organisation cohorts.

## The Business Case

Energy cost and emissions are often managed from monthly bills, which hide the hours and equipment where waste occurs. Teams that build a normalised baseline from metered data can forecast load, see drift early and judge each measure against a fair reference. Engineers keep approval of every conclusion, and the limits of meter coverage and data quality are stated openly.

- Energy Cost: Falls when waste is found in specific loads and measures are ranked by expected saving.
- Emissions Reporting Quality: Improves when consumption data rests on a documented baseline.
- Investment Decision Speed: Rises when savings estimates are tested against a common reference before funding.

## Principles and Evidence Base

- ISO 50001: Requirements for energy management systems, applied in Sessions 1 and 5 to frame the review of energy performance.
- ISO 50006: Guidance on energy baselines and energy performance indicators, applied in Sessions 1 and 2 to build and test the baseline.
- ISO 14064-1: Quantification and reporting of greenhouse gas emissions at organisation level, applied in Session 4 to link savings to reported emissions.

## Intended Participants

- Energy managers who answer for consumption, targets and reporting across sites.
- Sustainability engineers who convert energy data into emissions and reduction plans.
- Plant and facilities engineers who run the equipment where energy is used.
- Operations leaders who approve savings measures and release the funding for them.

Typical settings include manufacturing, utilities, district cooling and large commercial estates.

## Learning Outcomes

1. Participants will be able to construct a normalised energy baseline with a defined set of performance indicators.
2. Participants will be able to evaluate a load forecast against recorded consumption using stated error measures.
3. Participants will be able to diagnose energy waste by comparing expected and actual consumption.
4. Participants will be able to prioritise savings measures with a cost and payback ranking matrix.
5. Participants will be able to justify a measurement and verification plan for a chosen measure.
6. Participants will be able to construct a savings ranking pack for one site, with engineer approval retained.

## Programme Structure

## Day 1: Energy Baseline Analytics Foundations

What must a baseline hold before it can be used to judge energy savings?

- Energy Baseline Definition
- Energy Performance Indicator Set
- Metered Data Inventory
- Meter Coverage and Data Quality Check
- Engineer Approval Rule for Model Output

## Day 2: Normalised Baselines and Load Forecasting

How closely can a model reproduce past consumption and predict the next load?

- Relevant Variable Selection
- Regression Baseline Model
- Weather and Production Normalisation
- Short-Term Load Forecast
- Forecast Error Measures

## Day 3: Waste Detection and Anomaly Flags

Where does consumption drift from its expected pattern, and why?

- Expected Versus Actual Consumption Plot
- Anomaly Flag Thresholds
- Idle Load and Standby Review
- Equipment Efficiency Comparison
- Waste Case Log

## Day 4: Savings Measures Ranking and Verification

Which measures deserve funding first, and how are their results confirmed?

- Measure Long List
- Savings Estimate from Baseline Shift
- Cost and Payback Ranking Matrix
- Measurement and Verification Plan
- Emissions Reporting Link to ISO 14064-1

## Day 5: Savings Ranking Pack for One Site

Do the earlier analyses join into a pack that an energy review board can act on?

- Applying the Session 2 Baseline Model
- Reviewing the Session 3 Waste Case Log
- Testing the Session 4 Ranking Matrix
- Preparing the Funding Recommendation
- Completing the Savings Ranking Pack

## Methodology

The programme is a data workshop built on prepared meter records from a manufacturing plant and a utility facility. Participants build baselines, test forecasts against held-back months, flag drift in consumption and defend a ranking of measures to peers acting as an energy review board.

- Suggested activity: Building a regression baseline from a year of metered data and reading its error.
- Suggested activity: Marking anomaly flags on a load profile and naming the likely cause of each.
- Suggested activity: Ranking six measures by saving and payback and arguing which two to fund.

## Capstone Output

Each participant completes a savings ranking pack for one site. It holds a normalised baseline, a load forecast with its error, a waste case log, a ranked list of measures and a verification plan. At work it is presented to the energy review board and sets the routine for judging later savings claims.

## Frequently Asked Questions

### Is energy baseline analytics training suitable for engineers new to machine learning?

Yes. Energy baseline analytics is taught through prepared meter records and templates. You need responsibility for energy, plant or sustainability work, but no programming or statistics background.

## Which standards does energy baseline analytics rest on in this programme?

Energy baseline analytics rests on ISO 50001 for energy management systems, ISO 50006 for baselines and performance indicators, and ISO 14064-1 for organisation-level greenhouse gas reporting.

## How is the pack from energy baseline analytics training used at work?

You present the savings ranking pack to your energy review board, use it to choose which measures to fund, and keep its baseline as the reference for later savings claims.

## How does energy baseline analytics differ from a programme on energy management systems?

Energy baseline analytics concentrates on models, forecasts, waste detection and measure ranking, while an energy management systems programme concentrates on policy, audits and management review.