



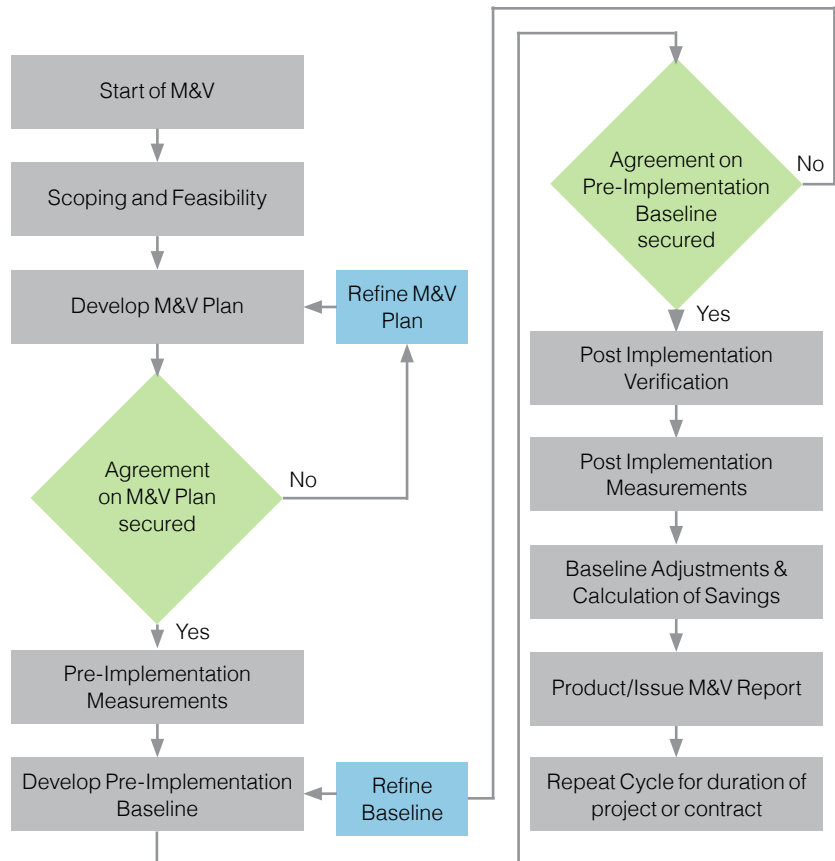
## Measurement and Verification of Energy Efficiency Savings and Productivity Improvements

Expert, accredited services to verify the energy savings and productivity increases from your improvement projects and initiatives - covering a broad range of mining, industrial and commercial operations.



### Why use ECS's M&V Services?

- Energy that is not used (saved) cannot be measured. Therefore, estimating energy savings requires proven methods to avoid costly mistakes or incorrect decisions. The ECS M&V services provide disciplined, reliable and standardised processes for estimating energy savings.
- M&V is a key financial and performance risk transfer tool. The ECS M&V services and related transparency provide effective energy saving insurance for project energy and productivity performance risk management.
- M&V is data and evidence driven. Not everything can be measured, but everything that needs to be measured is defined within the ECS M&V services package. The ECS M&V Team is expert at metering systems specification for energy, water, emissions and production performance verification.
- Understanding the benefits of technology exploitation and behavioural change can be exceedingly difficult or complex. The ECS M&V Team has the know-how to simplify this complexity and provide insight into the benefits of specific technology implementation.



Credit: GSEPEMWG M&V Task Force, 2014: Measurement & Verification Process for Calculating and Reporting on Energy and Demand Performance - General Guidance.

### Energy Efficiency and Productivity

ECS has the view that energy efficiency and productivity are intertwined. Our experience shows that verifying productivity improvements is as valuable as verifying energy efficiency improvements.

ECS is skilled and has deep experience in the verification of energy and productivity improvements.

## Specialist Application Areas

Together with well-known electrical energy efficiency verification, ECS has unique specialisation in plant and equipment using fuels for production and materials transportation. Examples of verification applications are:

**Heavy mining equipment:** Engine and operational fuel efficiency, payload productivity, cycle times, scheduling effectiveness and loading efficiency.

**Power generation:** Fuel and operational efficiency of power generating plants, and heat recovery.

**Steam generation:** Packaged and biomass boiler efficiency, heat recovery, process water and condensate recovery, and fuel switching.

**Furnaces:** The scheduling and firing control of sintering, melting, reduction and annealing plant.

**Road condition:** Road design, maintenance and traffic control impacts on fuel consumption and productivity.

**Road freight:** Transportation fuel efficiency – based on optimised routing, payload optimisation and scheduling.

**Fuel management systems:** The design and specification of fuel management and metering systems aligning with Measurement and Verification standards.

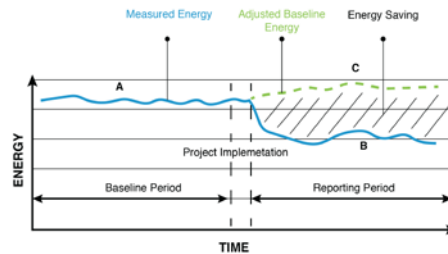
**Operator training:** The impacts related to operator training using baseline performance and adjusted baseline performance, by operator, to determine training effectiveness.

**Behavioural change:** Assessing the energy and productivity impacts related to programmes focused on people training and behaviour towards energy efficiency.

**Data acquisition systems:** Design, specification and implementation of energy and production metering systems and databases for measurement in complex production environments.

## Other Application Areas

The ECS M&V Team has experience in other energy efficiency application areas. Some examples of operations are: industrial services, plastics converting, paper converting, minerals beneficiation, pyrometallurgical processes, food production, and hospitals.



## M&V Based Energy Saving Estimation

Energy saving is not the difference between A and B. It is the difference between B and C, where B is the Measured Energy and C is the energy that would have been used if the project was not implemented.

## Measurement and Verification Services Options

ECS is able to provide its clients with a number of options for Measurement and Verification. These are:

**Tax incentive based M&V:** is an option offered when the client makes an application to participate in a tax incentive scheme. This option is highly regulated in terms of standards conformance and can only be done by SANAS-accredited M&V Inspection Bodies. ECS has the required accreditation and can provide clients with insight into the regulations – specifically 12I and 12L tax-based incentives.

**Vendor performance contract based M&V:** is an option offered when the client needs independent verification of vendor performance. This typically arises when an equipment, energy or services vendor contracts for energy and/or productivity improvements with pre-agreed/contracted performance acceptance levels. ECS provides independent verification of vendor performance commitment – which can be short or long-term verification.

**Pilot and research project M&V:** is an option offered when clients are developing process improvements and testing new technologies that result in improved energy efficiency, productivity and quality. Pilots or trials are typically conducted to quantify improvements and compare different technologies' performances – thereby enabling Risk Assessment of eventual project roll-out. ECS provides metering planning, test planning and performance verification of the pilot/trial.

**Automated M&V:** Measurement and Verification of performance should not only be a snapshot – done after a project. Rather, it should be embedded in your overall Performance Management system. ECS has the capability and

technologies to provide solutions for automated M&V. With this option, your Performance Management system takes a leap forward in enabling vastly improved insight into energy and productivity performance.

## About ECS

ECS is a SANAS-accredited Type A Inspection Body. The scope is for:

**The supply of services as an Inspection Body for the Measurement, Verification and Reporting of Energy Efficiency savings in Systems, Processes and Facilities.**



This accreditation is in accordance with the recognised International and National Standards ISO/IEC 17020:2012 and SANS 50010:2011.

ECS's M&V Team is comprised of dedicated and skilled staff with a range of technical, business and financial qualifications: Mechanical, Chemical and Electrical Engineering – together with Computer Science, Business Science and Financial Accounting. In addition, it includes members certified to CEM (Certified Energy Manager) and/or CMVP (Certified Measurement and Verification Professional)

ECS's services adopt the International Performance Measurement and Verification Protocol (IPMVP) as their basis – an internationally accepted Standard for quantifying the results of energy saving.



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