M&V for 12L Demystified. No Dark Arts Required.

SANEDI 12L Tax Incentive Roadshow

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Shocking Misconceptions

• M&V can be done internally. A SANAS accredited M&V entity is only required to sign off on the findings.

• M&V is a tax related service and requires tax specialists.

• M&V is about installing a meter and verifying that the meter is there and working.

• M&V is a stand-alone system and the stakeholders have no say in the matter.

• M&V is a money making scheme.

• M&V increases risk of failure, loss, non-compliance.

• M&V is the dark arts of finding the savings within a failed project.
Definition of Measurement & Verification

Measurement & Verification (M&V) is the process of using measurements while following a defined protocol, to reliably determine actual impacts created within an individual facility by an energy management program.
Key Concept

- Baseline Energy
- Increased Production
- ECM Installation
- Reporting Period:
  - Measured Energy
  - Adjusted Baseline Energy

Savings, or Avoided Energy Use
M&V Interaction

• M&V Stakeholders:
  – Bank
  – ESCo
  – Client

• Task of impact assessment and quantification need to be performed by an impartial party outside the group of principal project stakeholders.

• M&V team is active on all the levels between the various project stakeholders.

How much have been saved and are the savings being sustained?
When to incorporate M&V?

- M&V should be incorporate while energy conservation measures (ECMs) are being designed in order to:
  - Include cost of M&V when deciding project economics, and
  - Record baseline data and methodology for savings calculations before any savings happen.

- Complete the design of any metering equipment when the ECM design is being completed.
M&V Planning

• How?
• Where?
• Who?
• What?
• Why?
• When?
• Design Issues:
  – What is included?
  – How much data is needed?
  – Where to find the information?
  – What analysis routines are suited?
  – What metering equipment & procedures?
  – Balancing M&V Cost and Uncertainty.
Typical Energy Management and M&V Interaction
Requirements of Stakeholders

• Contractual requirements.
  – Who is affected by what outcome and how?
  – Performance Contracting.
  – 12L, 12i, internal funding, other funding requirements.

• Full inclusion of M&V in EM programme process.

• Other projects / programmes running, planned that might influence or be influenced by this EM programme.

• Register project at SANEDI.

• Active participation in M&V process.
Project Uncertainty

- **Metering**
  - Ensuring the metering error is defined and its acceptability investigated.
  - Calibration, validation, verification.
- **Data system.**
  - Handling and the security of data.
  - Validation, verification.
- **Project Information**
  - Verification, inspection.
- **Contractor input / effect.**
  - Qualifications, skills, authority.
  - Interpretation, justification.
  - Performance.
M&V Uncertainty

- IPMVP forms base
- GSEP Guide on data quality
- Aim to get better than 7.5% - 10% error with 80% confidence level.
M&V Cost

Depends On:
• Selected Option (method)
• Amount of data needed
• Length of M&V period
• Difficulty of getting good data
• Type and number of new meters
• Installation/maintenance of new meters
• Amount of data analysis needed
• Reporting format and frequency
Case Studies
Declaration

• The aim of these case studies is to present the success of the 12L tax incentive system.

• All case studies in this presentation are based on real projects.
  – Full Non-Disclosures are in place and enforceable.
  – Names, project-specific and any sensitive information are censored.
  – These case studies carry the permission of the relevant stakeholders for this presentation.
Case 1: Health Care Sector

- Various EE implementations in 2 buildings.

- Building 1
  - Type: Hospital
  - Location: Gauteng
  - EE Measures: Chiller replacement, waste heat recovery, energy awareness campaigns

- Building 2
  - Type: Hospital & administration
  - Location: Free-State
  - EE Measures: Chiller replacement, energy awareness campaigns
M&V Methodology

- Negotiated M&V contract with client and got appointment.
- Client registered project on SANEDI-tax website.
- Defined energy characterisation baseline.
  - Identified ambient temperature as major energy governing factor.
  - Developed baseline from main incomer data & SAWS local weather station data.
  - Got agreement from stakeholders on baseline acceptance.
- SANEDI accepted baseline
- 12 months after project start, 12L performance assessment done. PA period = fin year of client.
- SANEDI accepted PA and issued 12L tax certificate.
- Clients submits 12L tax certificate along with standard tax returns through normal tax system.
Baseline Accuracy

- **Building 1**
  - 2.02% Uncertainty
  - @ 80% confidence

- **Building 2**
  - 1.78% Uncertainty
  - @ 80% confidence
Savings Results

November electricity consumption

December electricity consumption
Savings Results

• Building 1

12L Energy Efficiency Tax Certificate

Deduction in Respect of Energy Efficiency Savings

This Certificate reflects the required information to accurately complete your income tax return.

Applicant Contact Person/Address: [Redacted]

SANEDI reference number: [Redacted]

Applicant company registration number: [Redacted]

Date of Certificate: 2016-09-09

12L Energy Efficiency Tax Incentive Savings

Total Energy Savings claimed: 681766 kWh

Monetary Value of Tax Allowance to be claimed, (@ .95c/ kWh): R 647677.7
Savings Results

- Building 2

12L Energy Efficiency Tax Certificate

Deduction in Respect of Energy Efficiency Savings

This Certificate reflects the required information to accurately complete your income tax return.

Applicant Contact Person/Address: [Redacted]
SANEDI reference number: [Redacted]
Applicant company registration number: [Redacted]

Date of Certificate: 2016-09-09

12L Energy Efficiency Tax Incentive Savings
Total Energy Savings claimed: 128680 kWh

Monetary Value of Tax Allowance to be claimed, (@ .95c/ kWh): R 122246
Case 2: Water System Optimisation

- Client possesses a number of pump stations supplying water to various service points.

- Optimisations includes:
  - Improved flow management.
  - Improved pump management.
  - Water use optimisation.

- Implementation and optimisation is continuous.

- Expected 12L benefit is in the order of R50 000 000.
M&V Methodology

• Negotiated M&V contract with client and got appointment.
• Client registered project on SANEDI-tax website.
• Defined interactive multi-variable baseline.
  – SANS 50 010:2011 – Retrofit isolation with key-parameter measurement.
  – Water flow is largest key energy governing factor.
  – Used client’s own metering system – acceptable credibility.
  – Integrated Performance contracting requirements between stakeholders.
  – Got agreement from stakeholders on baseline acceptance.

• SANEDI accepted baseline.
• PA period falls within financial year of client – not completed yet.
• Inter-stakeholder assessments done according to Performance Contract agreement.
• Other EE potentials ID for more 12L tax incentives in round 2.
Baseline

- Client has own metering system
  - Credibility analyses show data is usable and acceptable for contractual, SANAS and 12L requirements.
  - An number of energy characterisations developed (over 15).
  - Stakeholders need time of use impact, thus profile definitions are required.
- Baseline model accuracies range between 0.4% to 30% error range based on 80% confidence level.
  - Majority is less than 7%.
Performance Assessment

• Performance Contracting requires periodic performance assessment to define performance invoices.
  – Q1: Energy Impact = 2 300 MWh
  – Q2: Energy Impact = 10 700 MWh
    • Total to date = 13 000 MWh
    • 12L possibility = R10 000 000
  – Q3: Energy Impact = 20 700 MWh
    • Total to date = 33 800 MWh
    • 12L possibility = R30 000 000
  – Q4: Energy Impact = Who knows?
    • Total to date = Who knows?
    • 12L possibility = R60 000 000 +?
Discussions and Questions

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Measurement, Verification and Assurance

Veritek
Who We Are and What We Do

• We provide Measurement, Verification and Assurance services.

• We are a SANAS Accredited M&V body (for 12i & 12L M&V reporting).
  – SANAS accreditation number EEMV0001.

• Quality management, inspection and adherence to latest standards include:
  – ISO 9001
  – ISO 17 020
  – SANS 50 010
  – IPMVP 2012
  – ISO 50 015

• Specialist metering and data gathering services

• Highly experienced team (active in energy industry since 1998) - evaluated more than 430 energy projects to date.
Our Value Proposition

• Professional M&V Solutions
  – SANAS accredited.
  – ISO 9001 certified.
  – MVCSA registered.
  – GHG and Carbon offsetting (CDM & voluntary markets)
  – Client focussed.

• Flexible Metering Solutions.
  – Robust, redundant and low-cost data communication.
  – Basic to advanced data logging solutions.
  – Critical alert and notification functionality.

• ISO Made Easy:
  – We offer end-to-end, on-line QMS (Quality Management Solutions) currently applicable to ISO 50 001, 9001 and 17 020 standards.
  – On-line system design, application and maintenance.

• Experienced Software Team.
  – Software development for M&V, Metering & QMS.
  – Addressing client and project-specific requirements.
Industry Involvement

• Measurement and Verification Council in Southern Africa (MVCSA)
• SAEE (Southern African Association for Energy Efficiency)
• International Organisation for Standardisation (ISO)
• Efficiency Valuation Organisation (EVO)
• South African Bureau of Standards (SABS)
• South African National Accreditation System (SANAS)
• South African National Energy Development Institute (SANEDI)
How do We Fit within EOH?

• We are 100% owned by EOH
  – JSE listed company.
  – BBBEE level 2

• We are part of the Industrial Technologies Business Area:
  – Smart Grid and Metering Solutions
  – Energy Management & Optimisation
  – Energy Consulting, Services & Audits
  – Measurement & Verification
  – Energy Infrastructure
  – Backup Power & Quality Management
  – Renewable Energy
  – Sub-station Infrastructure
  – Energy Training
# EOH Offering Model

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![Design Build Operate Diagram](image-url)
Customers and industries
We enable sustained performance