

STEPS TO M&V Development

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**FUNDED BY THE CANADIAN INTERNATIONAL
DEVELOPMENT AGENCY**



WHAT ???

- **MEASURE IT AND MANAGE IT !!!!**
 - CONTROL AND MANAGEMENT
 - MONITORING ON A REGULAR BASIS
 - TARGETING YOUR SAVINGS OBJECTIVES
 - REPORTING THE RESULTS
 - KNOW:
 - What information is needed for Monitoring and Targeting
 - How to interpret energy consumption data
 - What management information needs to be generated to effectively manage energy

WHY ???

- **M & V IS A RISK MANAGEMENT TOOL**
- **M & V DEMONSTRATES:**
 - RESULTS BASED RISK MANAGEMENT
- **M & V INCREASES:**
 - CLIENT CONFIDENCE
- **M & V INCREASES:**
 - LENDER COMFORT

WHEN ?????

- **M & V STARTS WITH THE AUDIT:**
 - DISCOVER OPPORTUNITY
 - ESTIMATE COST
 - ESTIMATE SAVINGS
 - CALCULATE SAVINGS
 - PHYSICAL MEASUREMENT
 - ENGINEERING
 - OTHER

HOW ???

- INTEGRATE M & V PLAN INTO DIAGNOSTIC
 - M & V PLAN IMPORTANT TO:
 - CUSTOMER- HOW TO VERIFY SAVINGS
 - FINANCIAL INSTITUTION- VERIFIED SAVINGS
 - ENERGY SERVICES PROVIDER- STATUS OF GUARANTY-RISK MANAGEMENT
 - INSTALLATION SUB-CONTRACTORS: EQUIPMENT INSTALLATION PERFORMANCE EQUIPMENT OPERATORS- EFFICIENT OPERATING PROCEDURES
 - MAINTENANCE PERSONNEL – MAINTENANCE EFFICIENCY TO ASSURE QUALITY AND QUANTITY OF SAVINGS STREAM

THE PLAN !!!

- TECHNICAL DIAGNOSTIC
 - IDENTIFIES MEASURES
 - IDENTIFIES INSTALLATION COST
 - IDENTIFIES ALL SAVINGS STREAMS
 - IDENTIFIES OPERATING CONDITIONS
 - SCHEDULING-OVER-RIDE PERMISSION
 - MAINTENANCE
 - TYPES OF APPLICABLE MEASUREMENT

MEASUREMENT

- CHOICES:
 - ENGINEERING CALCULATION
 - LIGHTING
 - PUMPING
 - OTHER
 - PHYSICAL MEASUREMENT
 - PUMPING
 - PROCESS
 - OTHER

BASELINE METHOD

- ESTABLISH UTILITY BASELINE
 - SOUTH OF BRAZIL SEASONAL VARIANCE
 - NORTH OF BRAZIL, NEGLIBLE TEMPERATURE VARIANCE
- INSTALL INSIDE THE METER DATA TRANSMISSION TO CENTRAL LOCATION

NEXT STEPS

- EACH MONTH:
 - COLLECT AND ANALYSE DATA
 - COMPARE SAMPLE AGAINST DIAGNOSTIC BASE LINE CALCULATION
 - ALLOW FOR ENGINEERING CALCULATIONS AND/OR DIRECT MEASUREMENT

THE REPORT !!!

- PREPARE & SUBMIT REPORT TO CLIENT:
 - Who needs the information
 - What information
 - Report structure
 - On target/over target/under target
- RECOMMEND ACTION WHERE NECESSARY TO PROTECT SAVINGS STREAM

COMMISSIONING

- FOR EACH MEASURE:
 - TRAIN THE OPERATOR WHEN PUTTING THE MEASURE INTO SERVICE
 - TRANSFER MANUALS, AND M & V PROTOCOL TO OPERATING STAFF
 - INFORM PLANT STAFF AS TO MEASURE AND BENEFITS TO THE COMPANY, BENEFITS TO THEM AS EMPLOYEES

Muito Obrigado