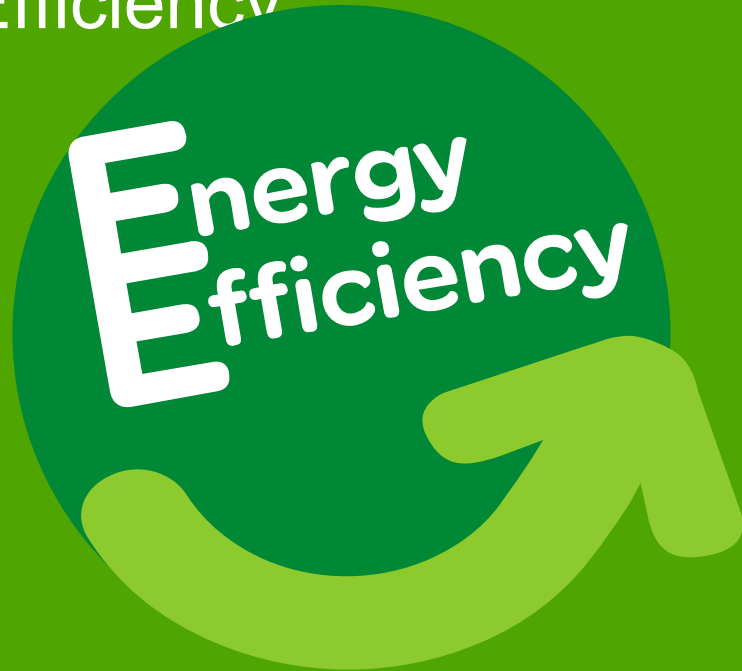


EnergySTEPTM (Sustainability Tiered Efficiency Program)

Our Approach to Energy
Efficiency



Schneider
Electric

Agenda

- > Our Vision and Mission
- > EnergySTEP, Our approach to Energy Efficiency
- > Capabilities
- > Case Study
- > Incentives
- > References

Who We Are



The global specialist in **Energy Management**

Our Vision



A world where we can all **achieve more** while **using less** of our common planet

Our Mission



We help **our customers** to do **the most** with their **Energy**

Energy Management

Global specialist in Energy Management

Energy production & transmission



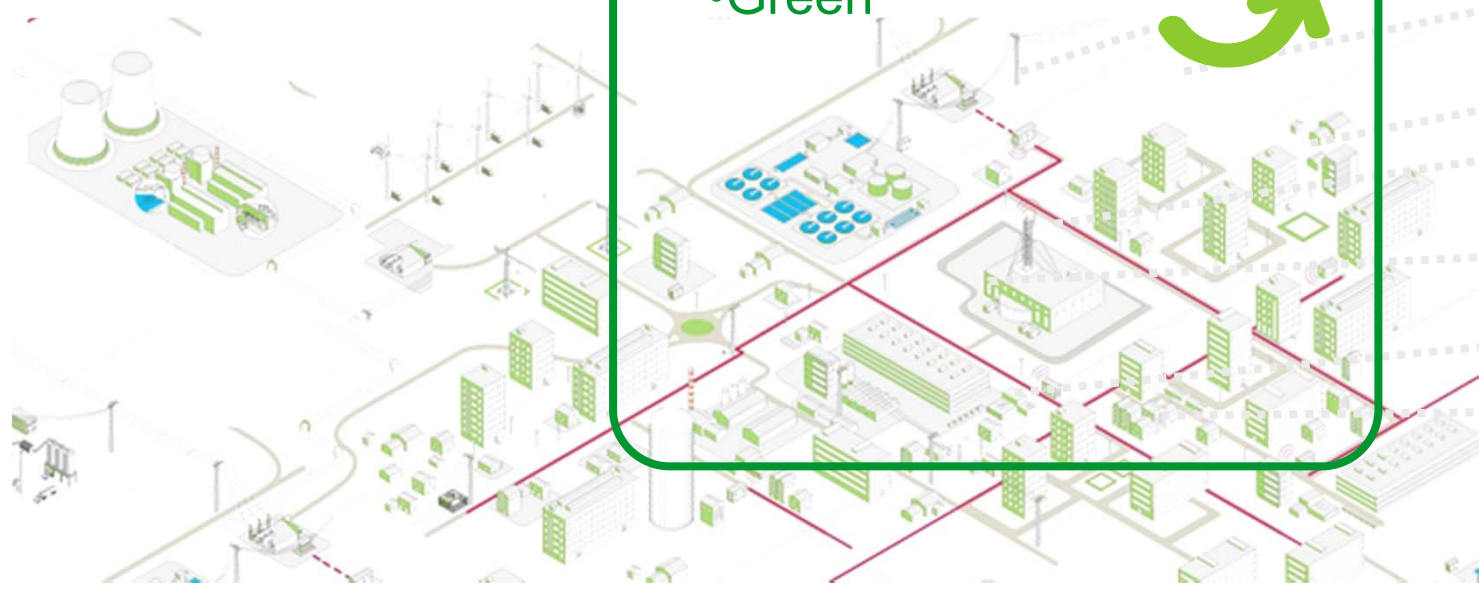
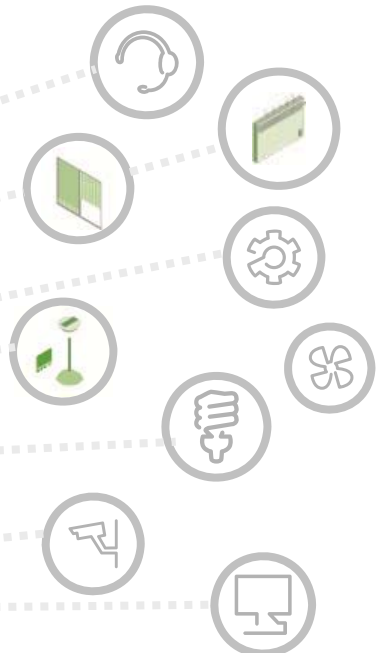
Making energy:

- Safe
- Reliable
- Efficient
- Productive
- Green

Covering **72%** World Energy consumption

up to **30%** energy saving

Energy usage



Global Specialist in Energy Management

Global specialist in
Energy Management

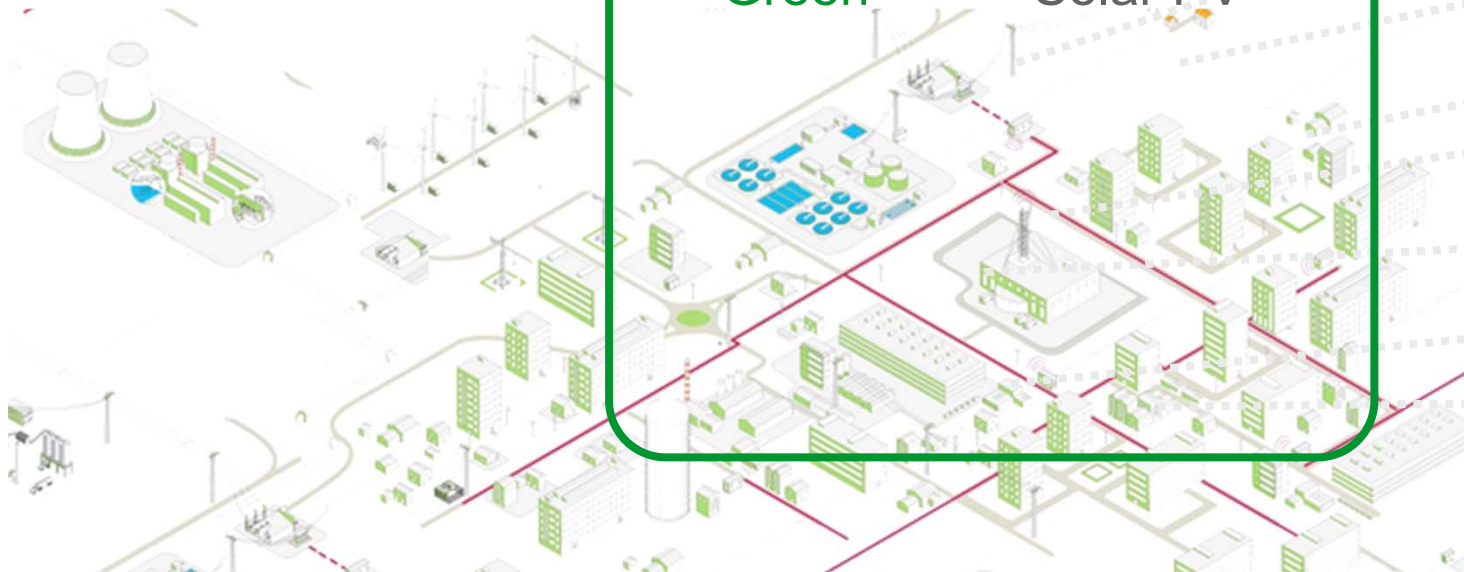
Energy production
& transmission



Making energy:

- Safe > MP4
- Reliable > MP4
- Efficient > Energy Step
- Productive > M2C
- Green > Solar PV

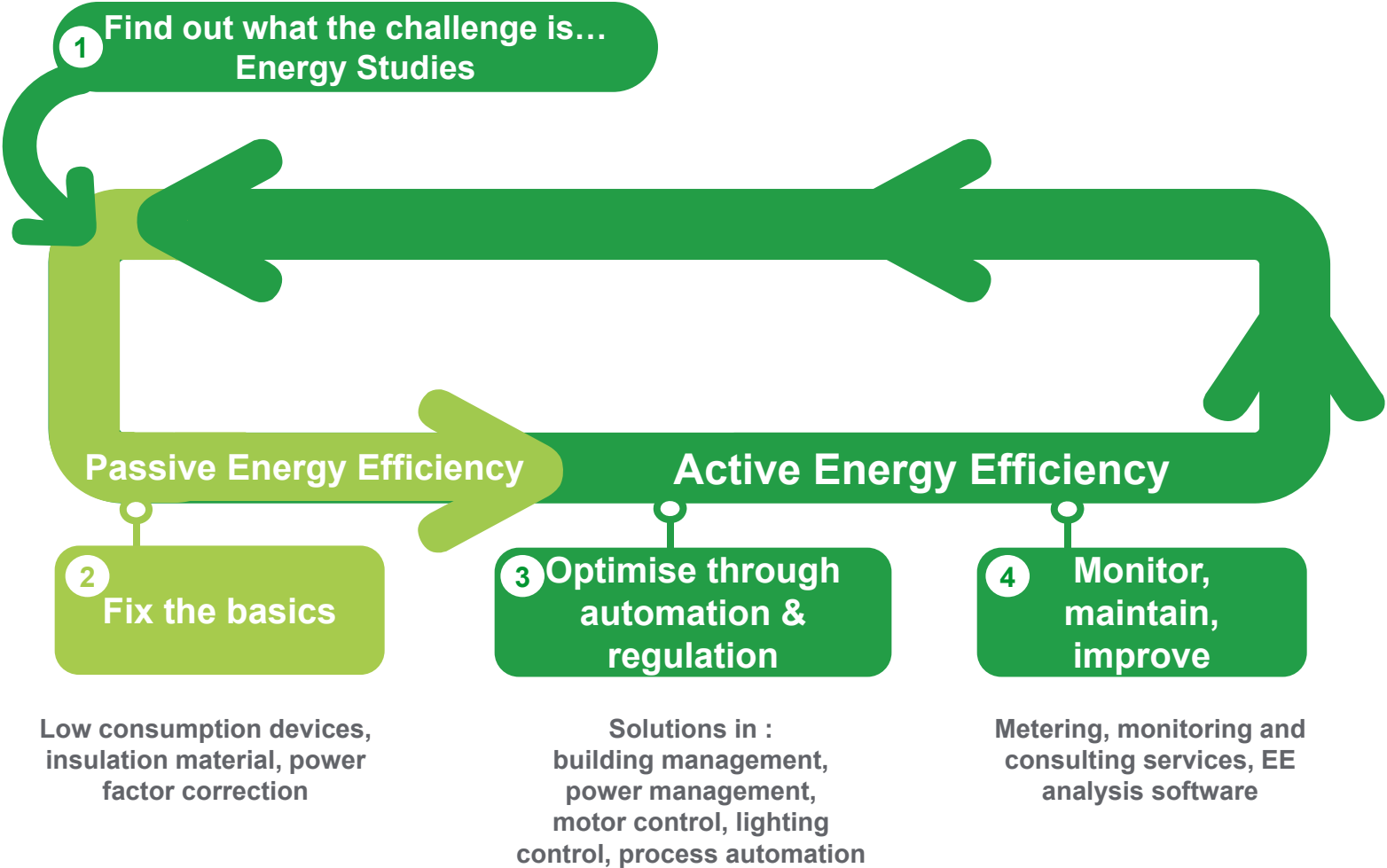
Energy usage



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Systematic Approach to Energy Efficiency



Setting the Stage

“An energy study identifies, analyzes and recommends cost-effective solutions to improve inefficient systems and increase the reliability and energy efficiency of facilities. After the energy study is complete, the report provides detailed suggestions for improvements, and data that can be used to make informed decisions.”

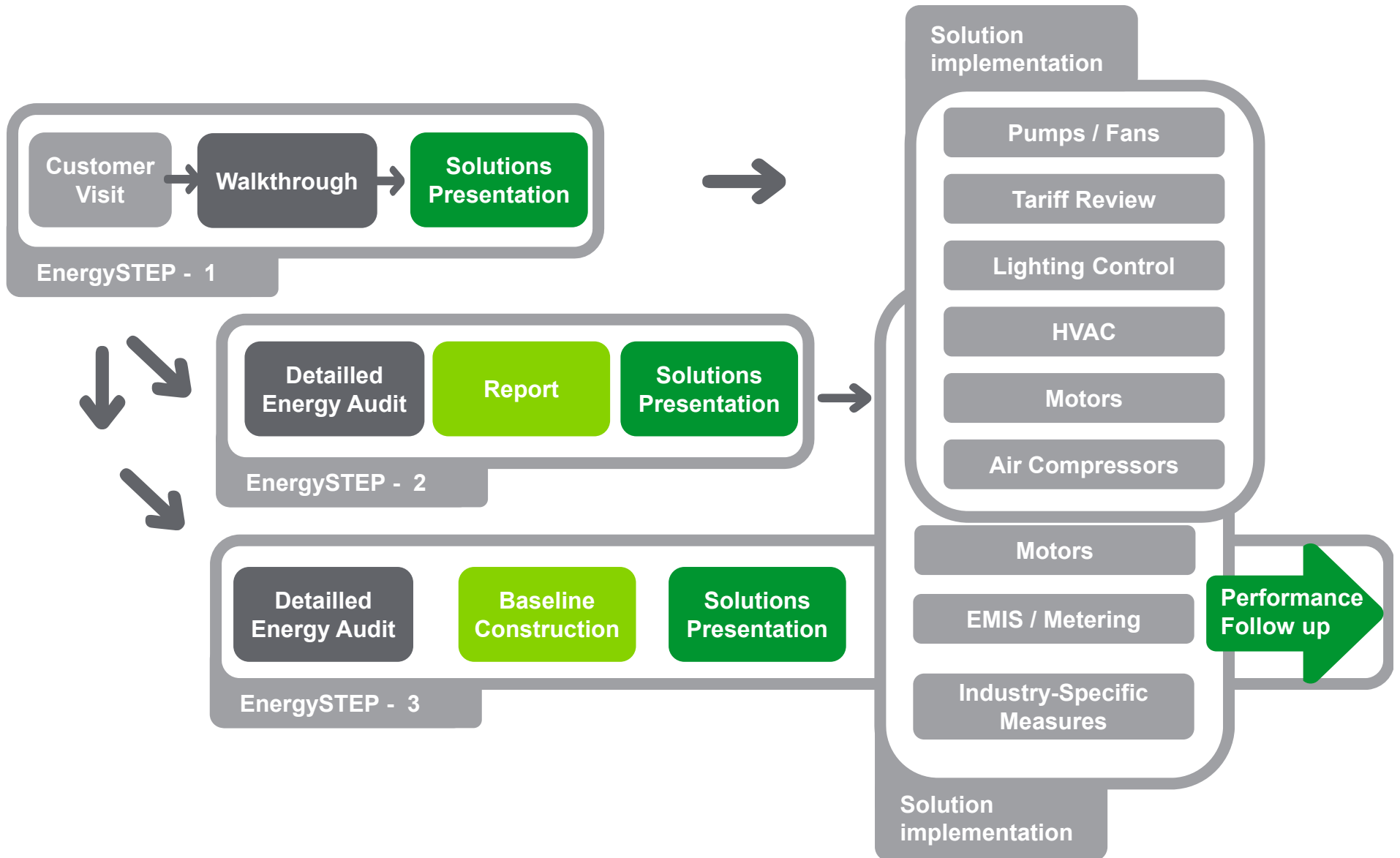
- Customer Perspective:
 - Need an actionable plan to manage the efficiency, reliability and safety of assets
 - Build a CAPEX, OPEX plan and take advantage of available Incentives
 - Reduce the Energy Bill

 Our answer **EnergySTEP**

EnergySTEPTM in a nutshell

- EnergySTEP is Schneider Electric's unified Energy Efficiency Consulting service for Buildings, Data Centers and Industrial Facilities
- It allows Schneider Electric to deliver up to 30% energy savings through an in-depth Active Energy Efficiency approach comprising:
 - Site studies,
 - Detailed Energy Efficiency analysis,
 - Recommendations and action plan,
 - Implementation of solutions.
- **Customer Benefits**
 - Increased visibility of energy consumption
 - List of Energy Savings opportunities, with ROI
 - Reduction in Energy Costs

EnergySTEP™ Global Offer



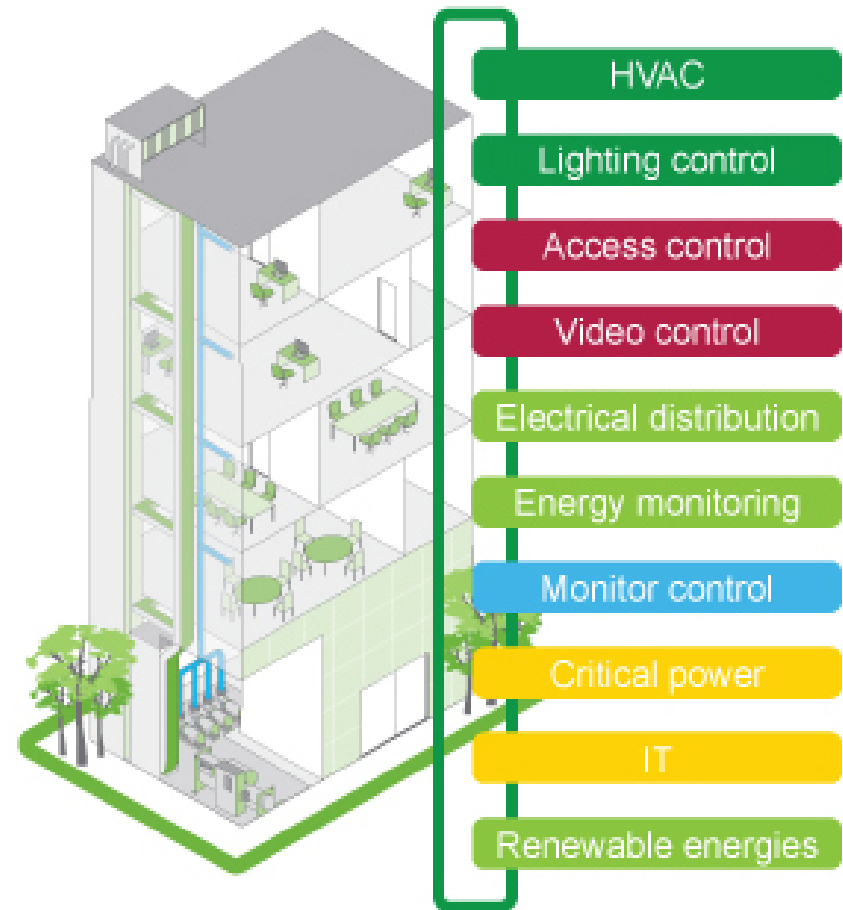
Scalable Energy Studies

... to match our customers changing needs and evolving energy goals

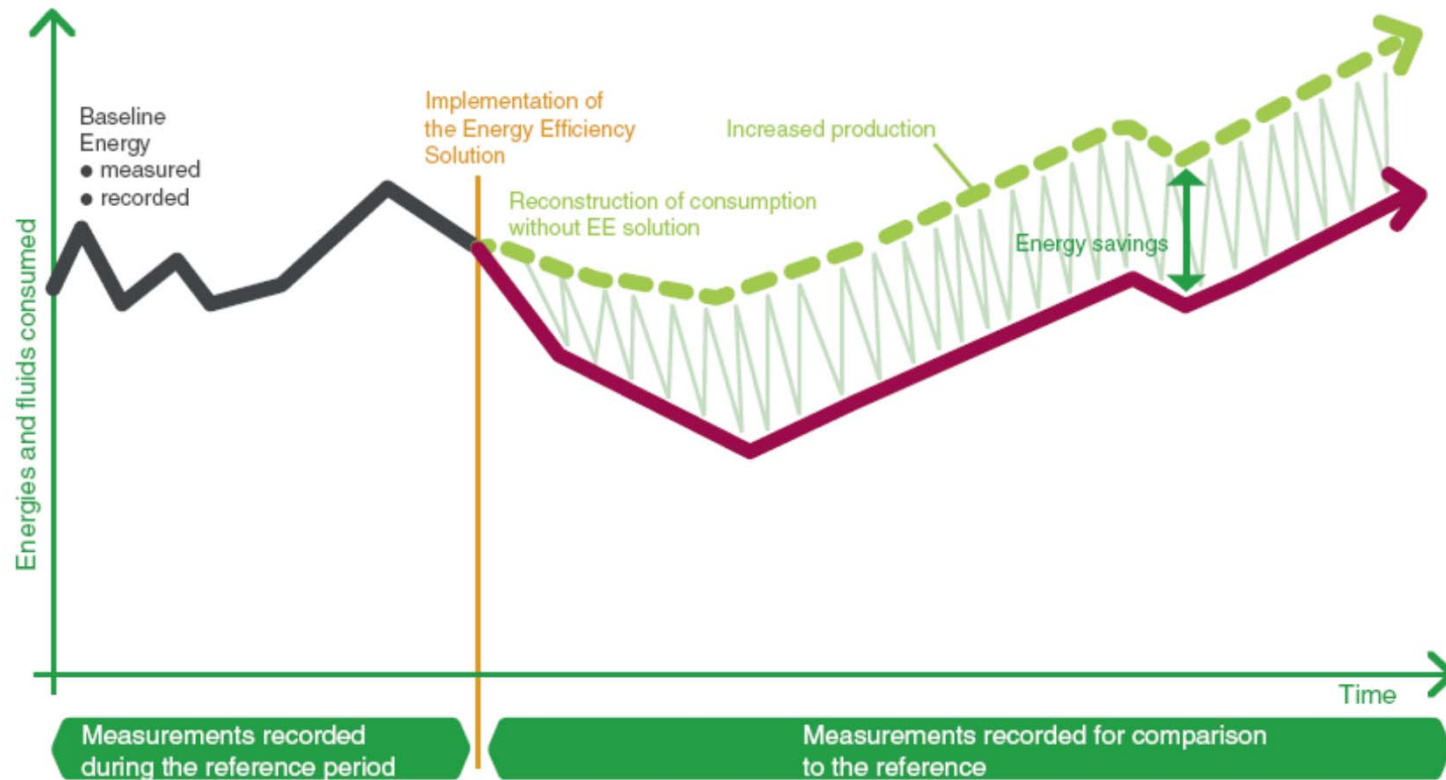
Offer Name	Definition	Characteristics
EnergySTEP 1	<p>Walk-through Audit : A high level analysis of Energy Conservation Measures (ECM's) opportunities at a site</p> <p>Simple solution implementation</p>	<ul style="list-style-type: none"> ● Understand how energy is being used ● Develop and Action plan with Quick wins and ECM's with quick ROI to start implementation ● Identification of ECM's to work on in the next steps ● ≈ ASHRAE Level 1
EnergySTEP 2	<p>Detailed Audit : A more in-depth analysis of energy use at a site</p> <p>Complex solution implementation</p>	<ul style="list-style-type: none"> ● Develop a clear and detailed picture of the site energy usage patterns ● ECM's identification with ponctual measurements and first level energy models ● Detailed Report with Action plan ● First step in the feasibility for implementation ● ≈ ASHRAE Level 2
EnergySTEP 3	<p>Comprehensive Project with Service : Baseline Construction and Performance follow up with a detailed audit included</p> <p>Complex solution implementation</p>	<ul style="list-style-type: none"> ● Energy Step2 Study ● Baseline Creation with Metering System ● Additional Services to verify savings ● Periodical analysis of data to maintain savings and unlock new ones

Energy Efficiency Solutions

- Power Factor Correction & Harmonics Filtering Solutions
- Energy Management Systems
- Lighting Control Solutions
- Motor Control Solutions:
- HVAC Control
- Building Automation



How to determine savings?



• Measure & Verification (M&V) Plan

- Document describing the methodology to Measure and then Verify the Energy Savings and Cost Savings which have been announced through an EE project.

➔ **IPMVP** = International Performance Measurement and Verification Protocol

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Capabilities

A team of:



- **Energy Efficiency Specialists with the following skill sets:**

- Plants assessment experience in data collection and analysis
- Delivered energy audits with procedure and quality in compliance with various industrial, government standards
- Reference data (operating parameters) of various types of equipment
- Familiar with characteristics and Analysis of rotating equipments like air compressors, pumps, fans and their systems
- Portable instruments Usage and appropriate performance parameters measuring points
- Analytical skills for circuit pressure drop, false air ingress, modulation of performance curves at different fan speeds etc.
- Familiar in analyzing heat recovery systems and their auxiliaries systems

- **Energy Management Application Engineers:**

- Certified Energy Manager (CEM), Professional Engineers (P.Eng)
- Implementation energy management and energy efficiency solutions at customer's facilities in line with customer requirement indicated during the consultancy and design phase

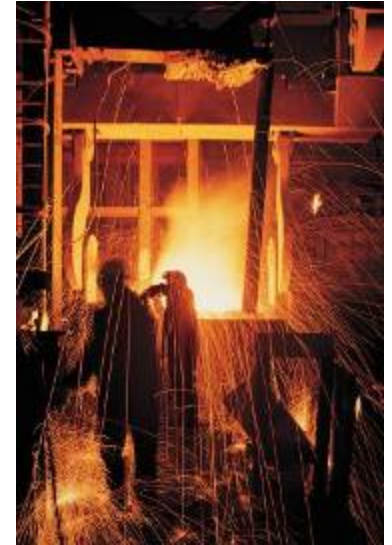
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Case Study:

Industry- Seamless Tubes Manufacturing

- Total Energy Consumption:
 - Electricity : 85 GWh (8.75 Million CAN\$)
 - Natural Gas : 441 GWh (8.5 Million CAN\$)
- Reduction in Energy Consumption:
 - Electrical energy: 16%
 - Natural Gas: 27%
- Total Energy Cost Savings:
 - Electrical Energy : 1.4 Million CAN\$
 - Natural Gas : 2.3 Million CAN\$
- Reduction in CO2 Emissions:
 - 24,072 Tons CO2eq (25%)



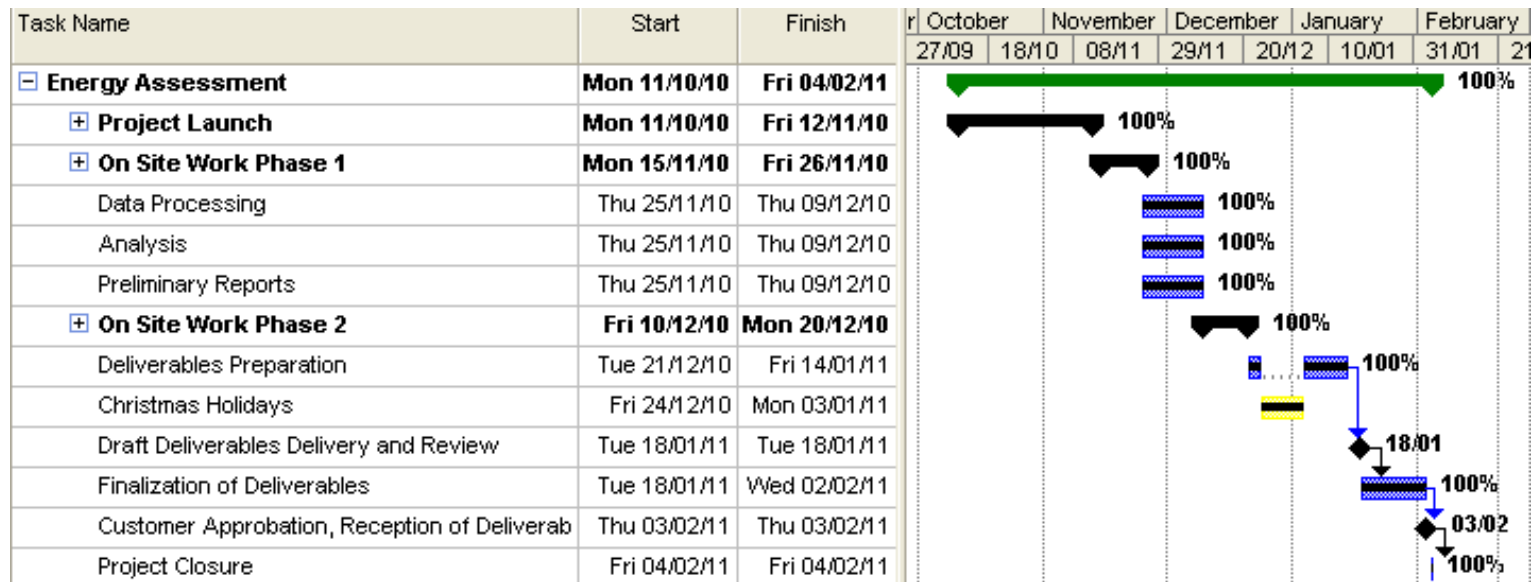
Project Organisation

- **Project Duration:**

- From Kick-off to Final delivery : **< 4 months**
- Execution Phase (On site work + Report) : **<3 months**

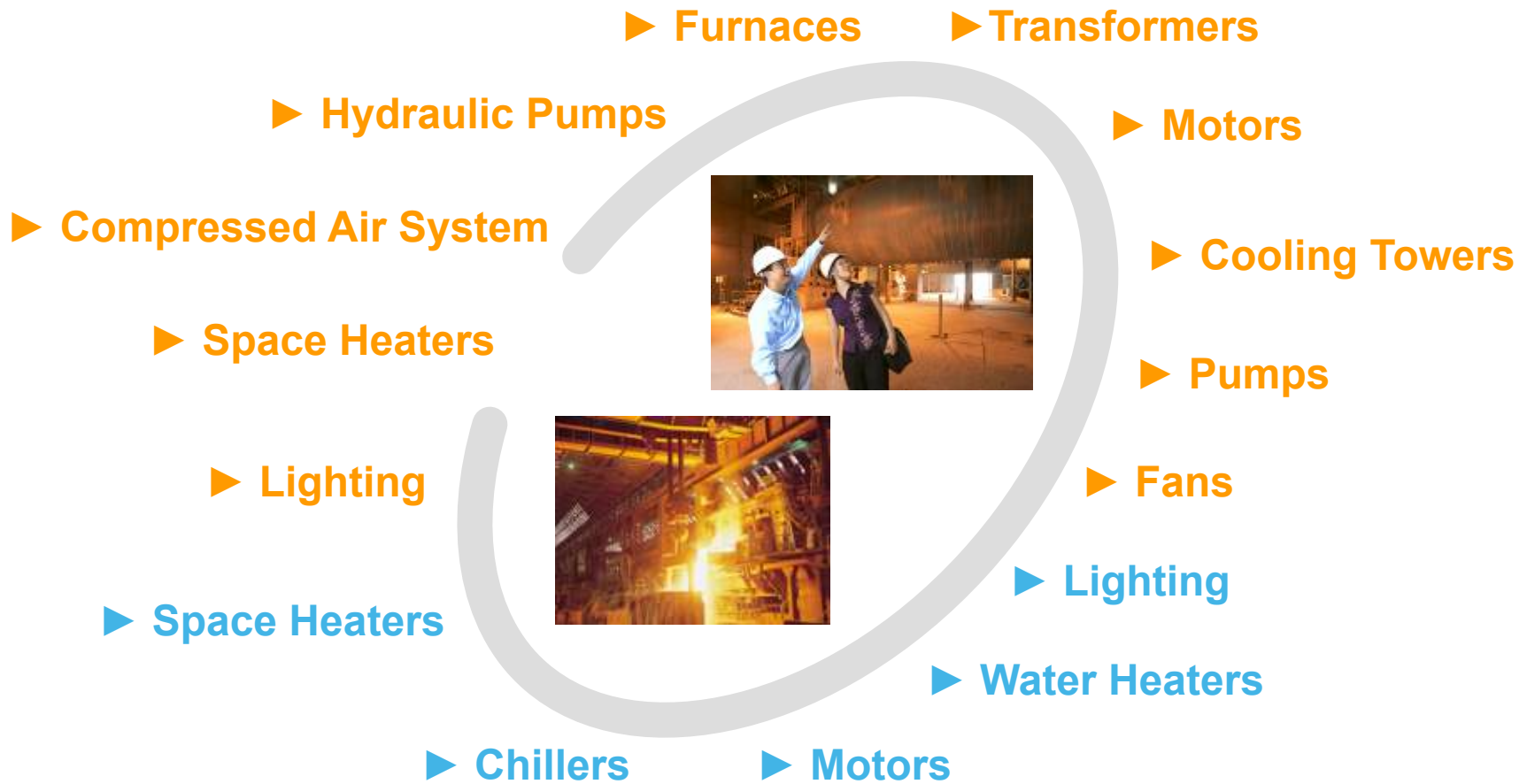
- **On site work:**

- **≈ 4 weeks**
- **Total of 6 Engineers/Consultants** involved (Mech, Electrical)



Areas Covered

- **Productions Areas and Buildings :**



Energy Assessment Methodology

- Pre-survey data collection:

- Design/rating data, Process and Single line diagrams
- Collection of specific energy consumption and output details

- Fieldwork:

- Understanding of installed system and operating practice
- Survey of existing SCADA for Energy Management parameters data, collection of available data
- Measurement of: Power consumption, Pressure, Temperature, Flow rate, Gas sampling
- Assessment of the Energy Management System

- Analysis and Gaps:

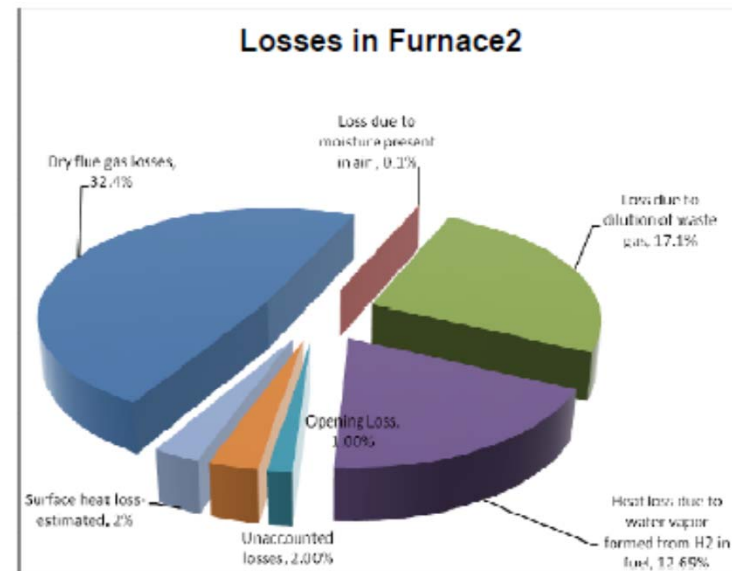
- Equipment Design Efficiencies assessment and comparison with best in class equipment efficiencies
- Equipment Current Operating Efficiencies assessment and remedial measures to fill in the gaps

Reporting the results

- Executive Summary
- Economics Comparison
- Summary of Energy Conservation Measures
- Investigation of possible solutions:
 - Savings, Investments, ROI
- Observations and Analysis details:
 - Process Diagrams
 - Calculation Details...

Parameter	Unit	Values
Unaccounted losses	%	2.00%
Furnace efficiency-Indirect Method	%	32.9%

Pie chart showing overall losses for the furnace is as follows.



- Gaps and energy conservation measures

The efficiency is around 33 % which is low. This is because of -

- Excess air in the system. (Optimum limit for oxygen in the flue gas is 5 %)
- No controls in burners based on production levels
- Idle operation of burners
- High temperature of exhaust gas and hence potential for waste heat recovery (optimum is 180 °C)

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References



Automotive



Health & Pharmaceutical



Food & Beverage



Mining, Minerals, Metal



Consumer Goods



Building - Infrastructure



Make the most of
your energy



Schneider
Electric