

Electro-Mechanical Installations

Energy Savings Solutions

Background

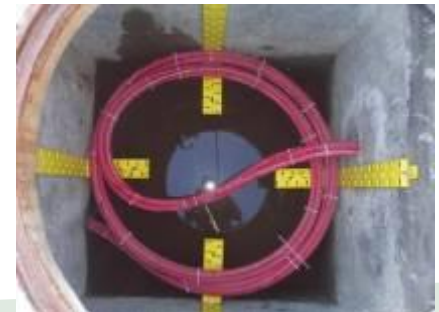
MCE was founded back in 1985 and has been providing electro-mechanical Installations and Energy Savings Solutions to the Industry and Service businesses in Mexico and California.

Most of the projects performed have been made for the Industry and Commercial buildings.



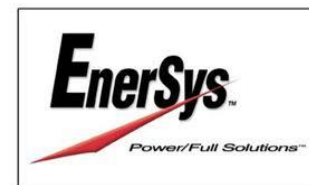
Services Provided

- Power Electric Projects
- **Energy Savings projects** thru Power Factor Correction, AC energy reduction, Pump and Compressor energy reduction, Lighting projects, sensors, Lighting Controllers, Cogeneration, Power load design and balance for an entire facility for optimum electricity consumption, etc.
- High and low tension Power installation, including Main Transformer, main control panels, secondary transformers, general electrical and mechanical installations and maintenance to existing installations
- Fiber optics Lighting.
- Control
- Machine tear down, move, installation and hook up
- Mechanical installations, water, compressed air, hydraulic systems, etc.
- Harmonics detection and correction thru filters
- Grounding Systems





Some of our customers



Some examples of Projects Developed

- Fevisa, Installation of a new line for Budweiser bottles including low tension installations, electrical controls, etc.
- La Estancia Gas Station, all electrical installations including pump controls
- Thomson Displays, High and low tension installation, including transformers, control panels, machine hook up, etc.
- Paragon Mabesa, all electrical installations and machine tear down, move and hook ups.
- Aromat Mexicana, whole High and low tension installation including machine hook ups.



MCE Main Objectives: Safety and Quality Installations

Safety is the most important factor for MCE when performing an installation

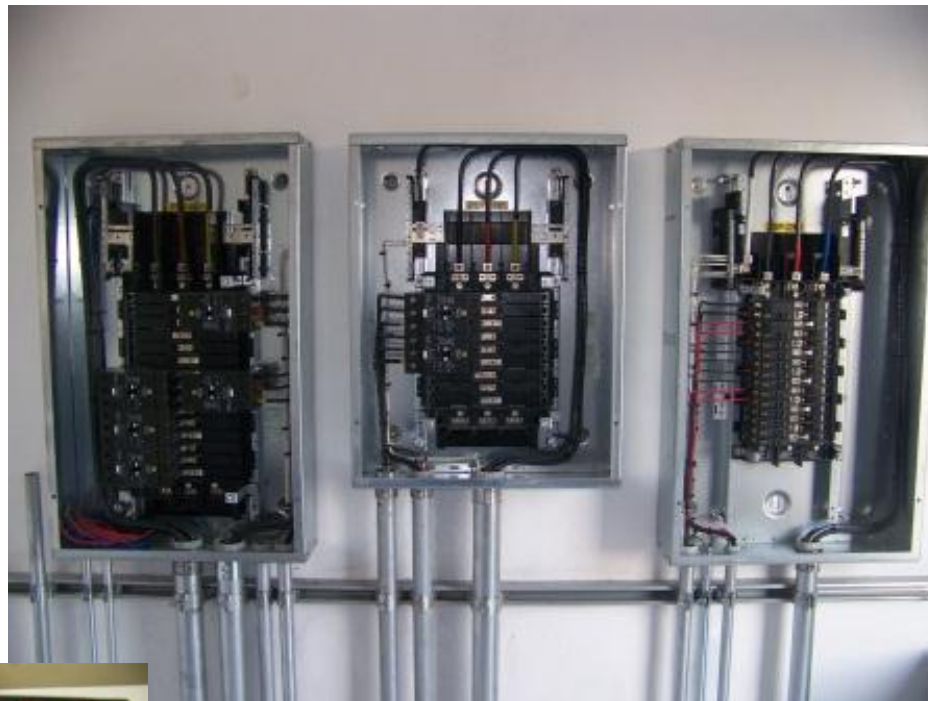


MCE Main Objectives: Safety and Quality Installations



MCE is recognized by the customers due to High Quality and trouble free Installations

Others



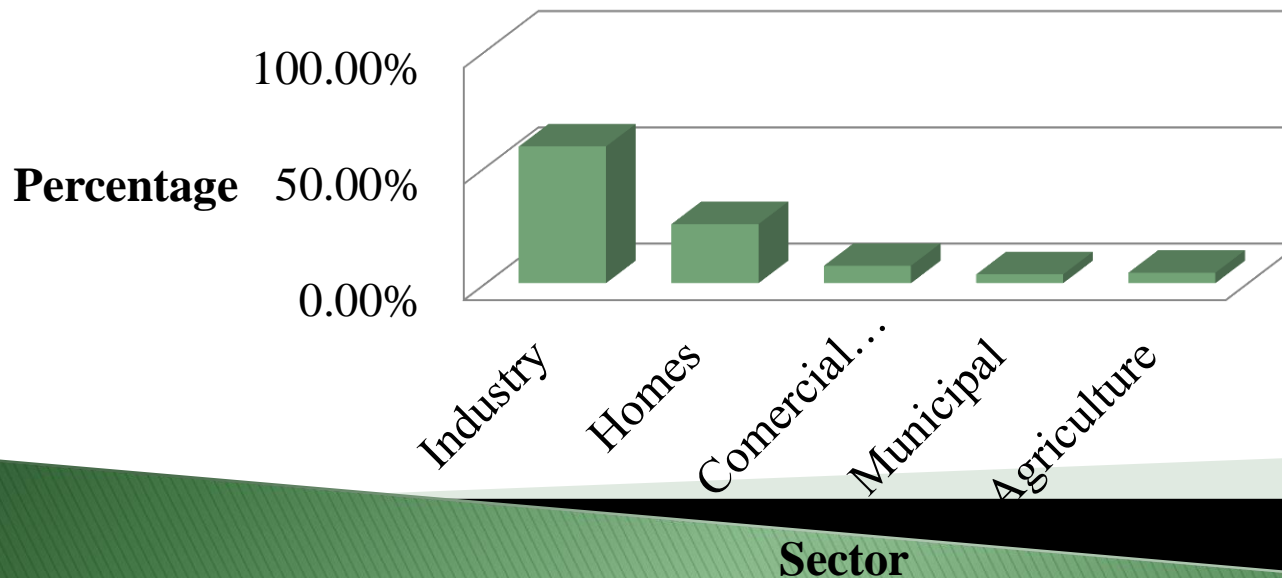
MCE Quality



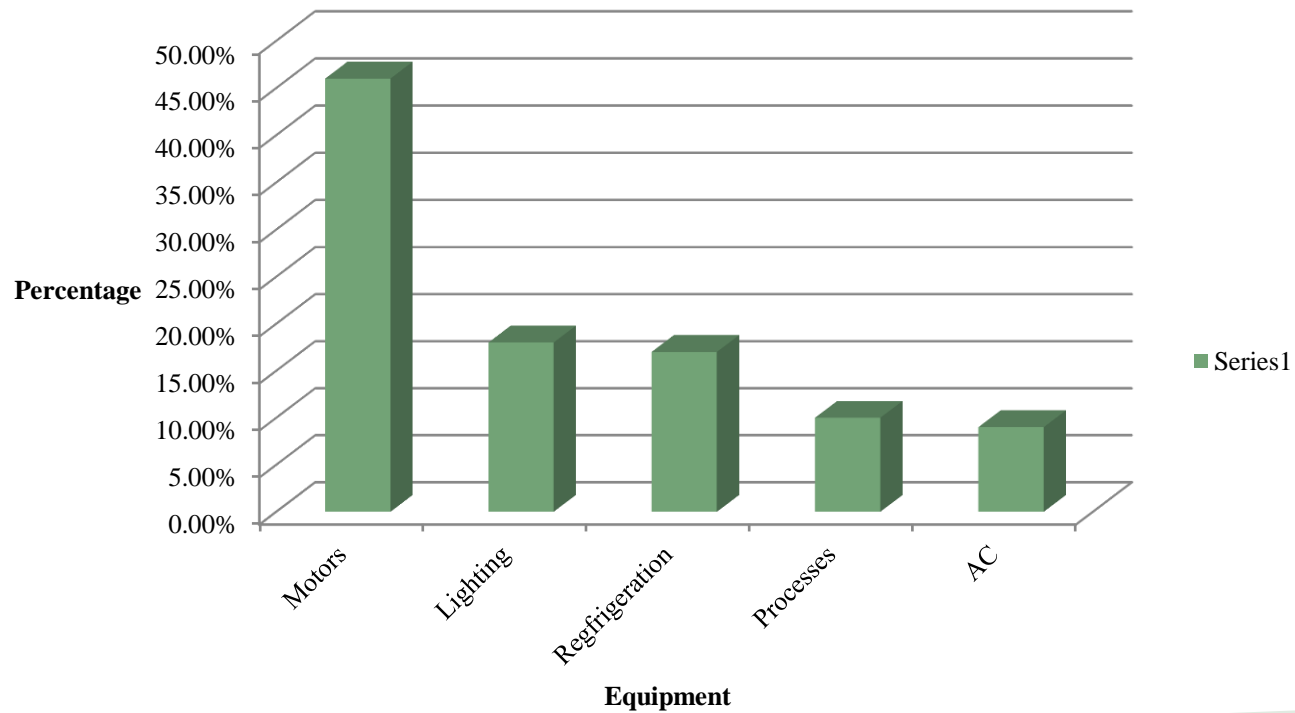
Energy Savings Projects

One of the most important business plans for MCE is the Energy Savings where all customers are enjoying the real benefits. Based on a complete analysis of the electricity usage, different and proved techniques are applied on different areas as described on the following slides.

Energy Usage by Sector in Mexico

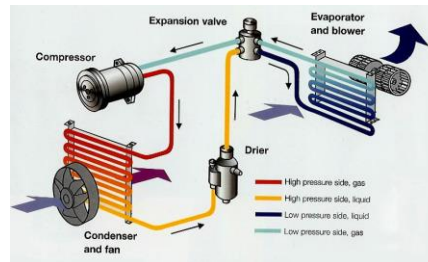


Usage by type of Equipment



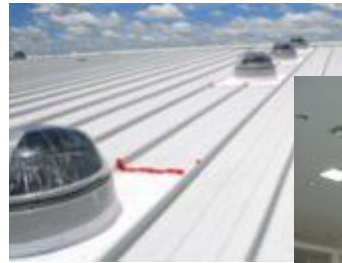
Air Conditioning

- MCE is a distributor for an ecologic AC refrigerant (Ecofreeze) which replaces the Freon 22. This substitution helps by reducing the energy 20 - 40 % depending on the type of equipment
- Installing a demand control system and some other alternatives, an additional 6 to 10 % savings is expected



Lighting

- Daylighting systems where no electricity is used during daytime, 100 % savings
- Induction lighting, savings up to 55 %





Lighting Automation

- Illumination Controllers / Sensors / Photocells. MCE Electric has been certified by different companies on project development and execution for computerized Controller, sensors, photocells, and all peripheral equipment related to Lighting Management



Motors

- Variable Frequency Driver, Demand control and Power Factor Correction devices installed to reduce 30 % to 50 % of the electricity usage



Power factor correction

- Eliminating CFE penalties, achieve bonuses and reduce KW usage



Compressors and Controllers

MCE has an strategic alliance with Kaeser to develop Energy Savings Projects for compressors. Including Kaeser ADA (Air Demand Analysis), the development of a proposal, projected savings and ROI.



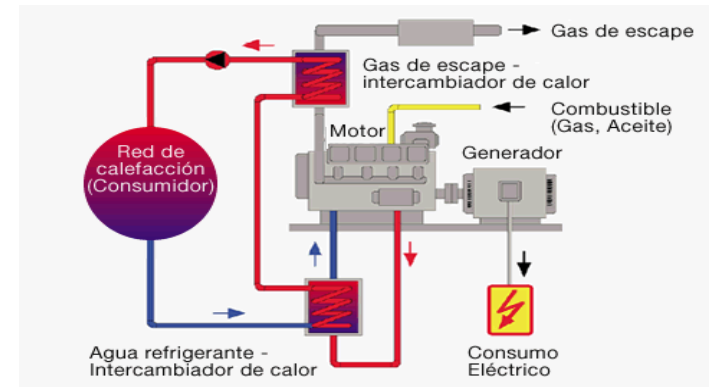
Oxygen and Nitrogen Generators

MCE represent Gas generation Solutions Corp. and if the customer uses any of these gases we evaluate the possibility of using one of these equipments and be able to save on the purchase of those gases.



Cogeneration

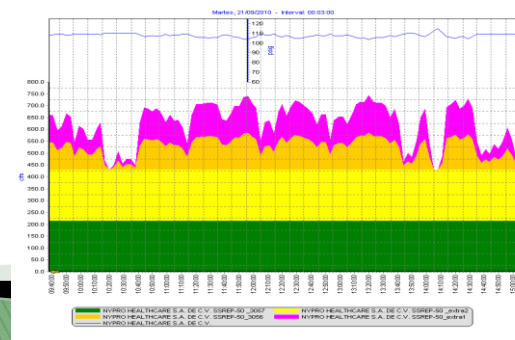
- Electricity generators installation. A way of reducing the electricity cost by at least 50 %.
- In addition to the reduction on Kwh cost, the heat produced in the generator is used to produce and deliver process heat and also to produce cold water thru an ORC chiller and be able to deliver either process cold water or Air Conditioning to the building.
- Electricity generators thru the use of heat coming from processes and which will eventually be wasted



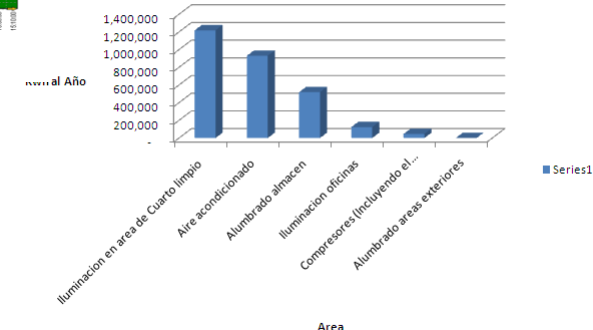
Energy Savings Analysis

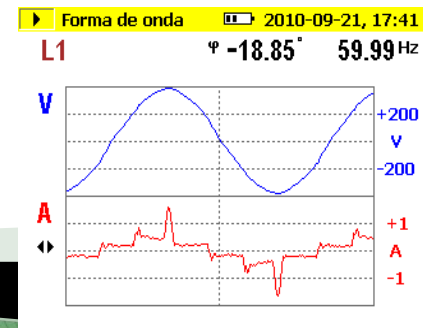
MCE performs complete energy analysis for the site and present Energy Savings options on the following areas:

- Lighting
 - Re-lamping, redesigning the lighting using an special software based on required lighting levels for each application
 - Sensors
 - Lighting computerized automation
- Air conditioning
- Air compressors analysis and improvement options including controllers and equipment substitution
- Power Factor including harmonics
- Motors
- Co-generation
- Renewable Energies



Pareto de Consumos





Energy Savings Project Example

Area	Current Kwh	Kwh Proposal	Invetment	Estimated Savings	Savings percentage	ROI (Years)	CFE reduction	Notes
Clean Room Lighting automation	1,147,596	459,038	139,528.00	85,059.83	60.00%	1.6	13.46%	Eco System
Compressors room (Inlcuding a 100 % capacity increase)	754,459	663,922	42,279.00	11,831.00	12.00%	3.6	1.87%	Considering a 100 % capacity increase
Warehouse re-lamping and automation	518,603	86,344	42,655.00	48,236.67	83.35%	0.9	7.63%	Eco System
AC	443,898	370,351	23,722.00	8,335.00	16.57%	2.8	1.32%	
Administration offices re-lamping and automation	186,251	49,279	31,943.00	14,244.96	73.54%	2.2	2.25%	
Tool Room, Maintenance, etc. re-lamping and automation	130,374.00	12,176.00	29,003.60	12,860.16	90.66%	2.3	2.04%	
Power Factor			33,846.00	26,064.00		1.3	4.13%	
Totals			342,976.60	206,631.62		1.66	32.70%	
Totals for FIDE financing			266,475.60	132,330.95			20.94%	
Estimated savings on CFE invoice							32.70%	

Annual consumption and costs	
Kwh	6,772,269
Cost (DlIs)	631,809

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