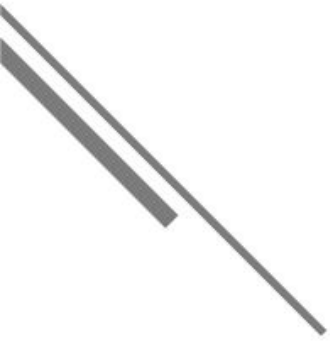




CONSOLIDATED ENERGY &
ECONOMIC ENGINEERING
المتحدون للطاقة والهندسة الإقتصادية



About Us



Holding Group



C3E Co.

- Energy Solutions - EPC
- Energy Auditing
- International activities
- Biofuel

Green Energy Market

- HELUKABEL
- ECOLight
- Sole Thermal Solar
- Energy saver (ES)
- Solar PV modules
- Structure Aluminum
- Solar inverters
- Power Quality

Efficiency Control Center ECC

- Automation- ABB
- Robotics- ABB/EFACEC
- Technical team designers.
- Security and Control

O&M Renewable

- ABB system integrator.
- ABB system services.
- O&M PV contracts

Al-Nakhil Contracting

ON hold, only for special projects with the private sector.

Tax Free Co.

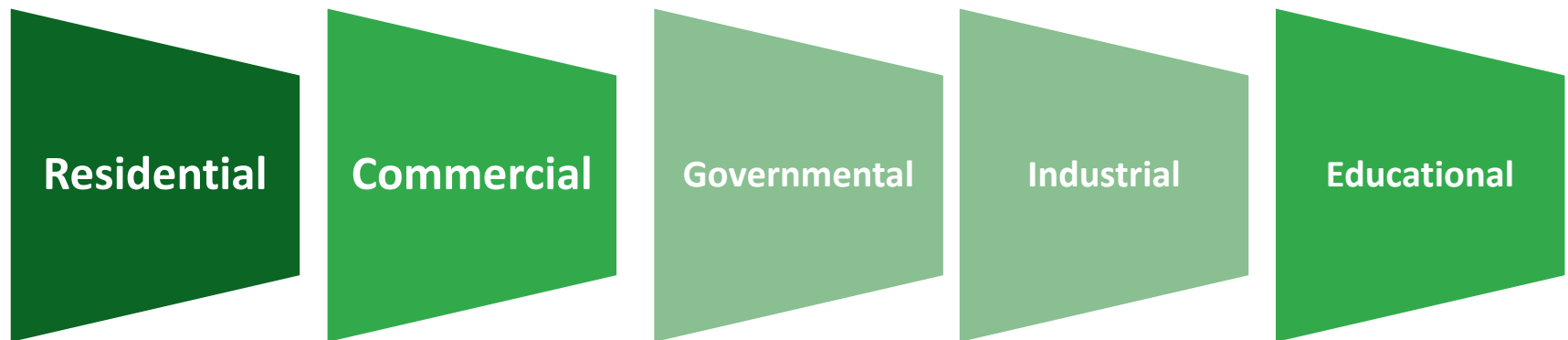
International:
Egypt: Msaderna Co.
Palestine
GCC



Background



- CthreeE is a limited liability company that specializes in providing economic Energy & Engineering solutions to the residential, commercial, governmental and industrial sectors.
- Founded in 1991 as an electromechanical company. Today, C3E consists of highly experienced individuals with diverse engineering backgrounds; this has modeled the company into a unique entity.
- C3E is a limited liability company that specializes in providing Economic Engineering solutions to:



Geographic Location

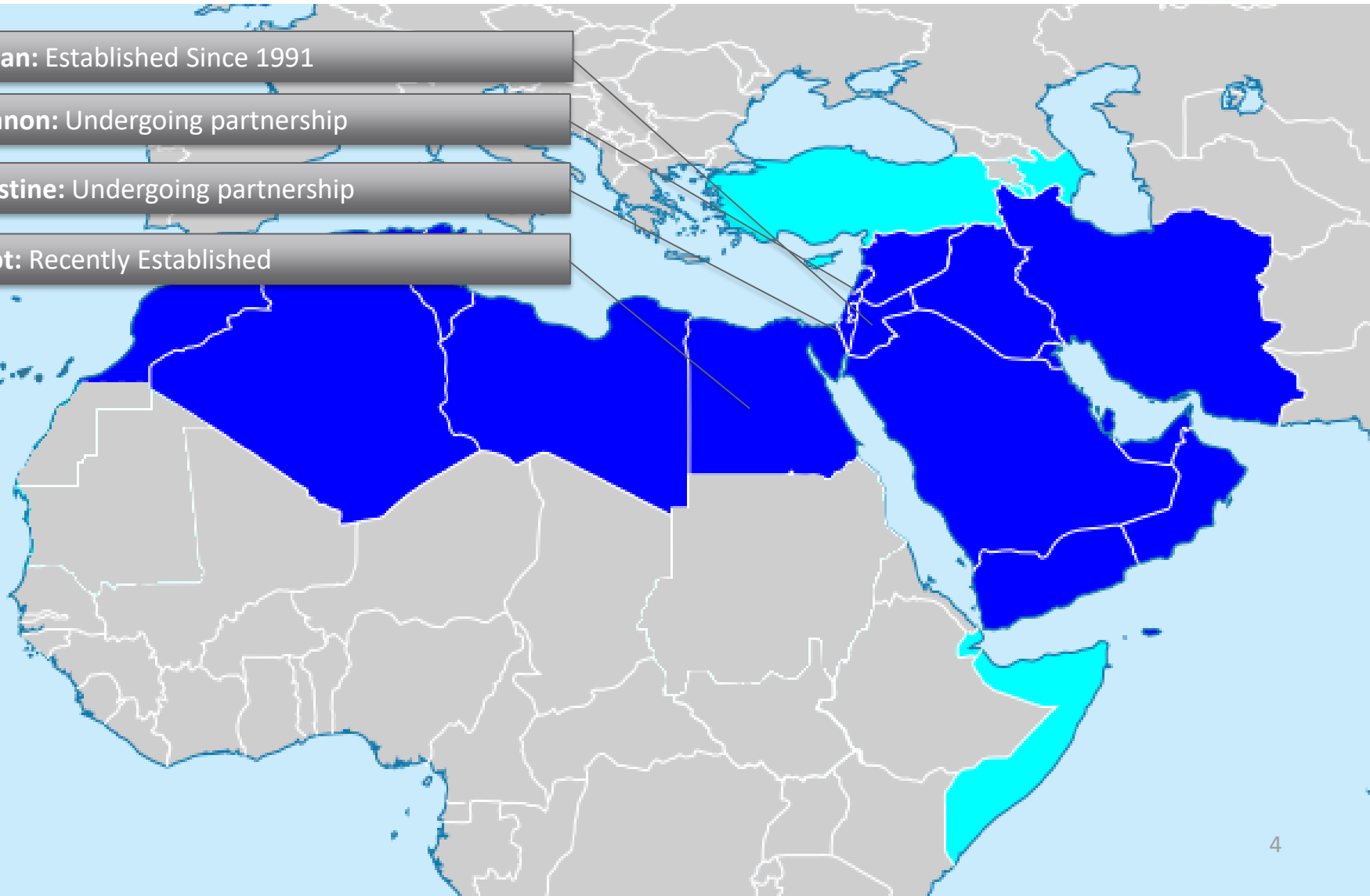


Jordan: Established Since 1991

Lebanon: Undergoing partnership

Palestine: Undergoing partnership

Egypt: Recently Established



Products & Services



- We aim to be leaders in what we do



**ENERGY
EFFICIENCY**



**RENEWABLE
ENERGY**



**POWER QUALITY
EQUIPMENT**



**ENERGY
AUDITING**



**ENVIRONMENTAL
SERVICES**



**TELEMETRY AND
REMOTE MANAGEMENT**



Our Impact



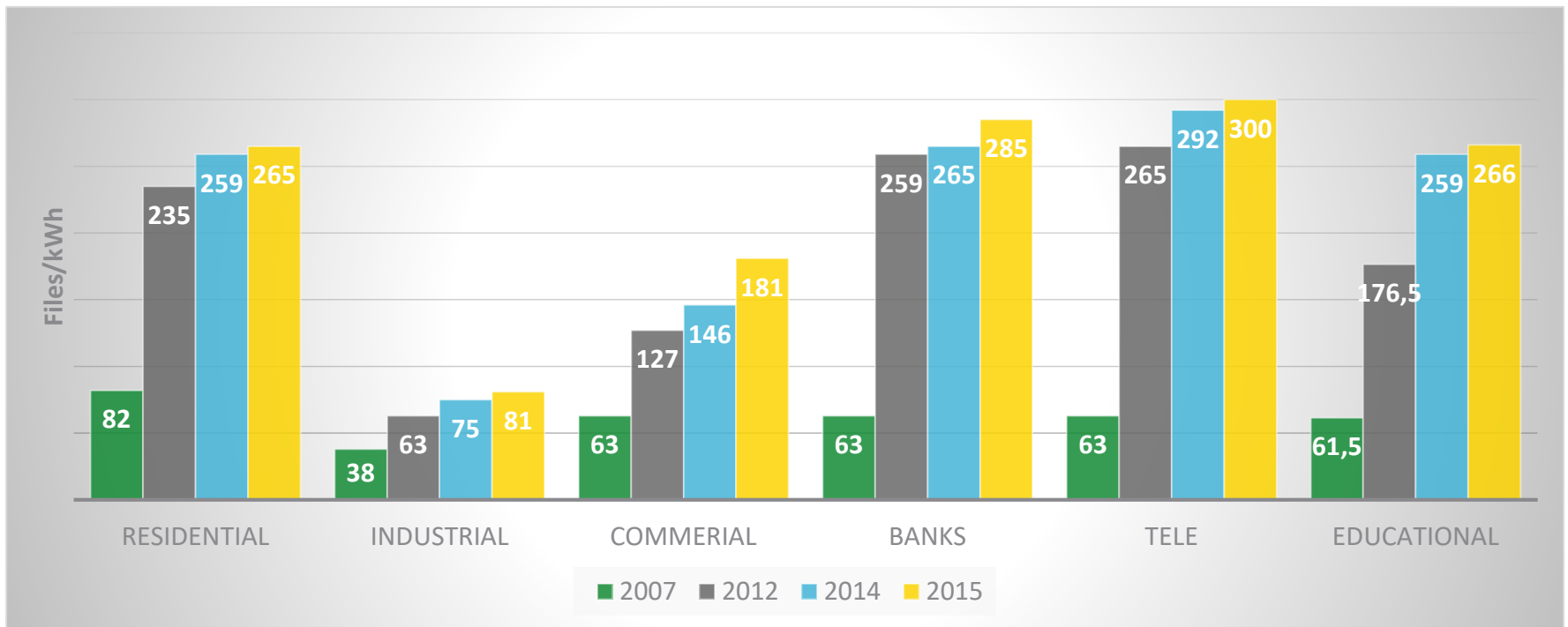
- C3E offers a wide range of solutions that can practically cover all the needs of the client, our services include:
 - Energy saving equipment
 - Solar Energy
 - Telemetry & Remote Management
 - Power Quality Equipment
- The company also supports funding and some of our products are included in grants.
- Further to the energy auditing carried by C3E since 2007; C3E has implemented many energy saving measures including the following solutions/ products:



Energy in Jordan



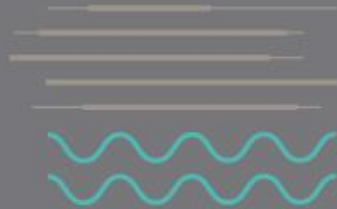
- Energy prices have been going up rapidly the last few years. Additional 15% will be imposed on an annual basis until 2017
- The following figure shows the increase in tariff between 2007-2016(current) in multiple sectors.



Activities



EARTH



WATER



FIRE



AIR

Activities



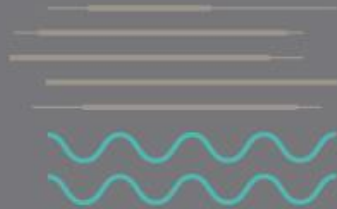
1. LED – Intelligent Lighting Fixtures with DALI application; occupancy and daylight sensors.
2. Variable Frequency Devices from ABB
3. ES~25 energy saver – voltage optimizer.
4. Solar Thermal systems
5. HVAC and PUMPS system energy savings solutions.
6. Condensing Gas Boilers
7. Insulation
8. Glazing with NANO Technology (3M), alternatively Glass/Glass PV see through PV panels..
9. Renewable energy: PV Solar- C3E executed a total of more than 6-MWp PV Solar projects.
10. No Cost Low Cost solutions (i.e. air curtains, sensors, ...)



Partners



EARTH



WATER



FIRE



AIR

Partners



- C3E is partner with the following companies as manufacturers/suppliers and technical support/supervision :
 - INEGI: <http://www.inegi.pt/inicial.asp?k=z&LN=EN>
 - EFACEC: http://www.efacec.pt/presentationLayer/efacec_home_00.aspx?idioma=2
 - SOLE: <http://www.sole.gr/>
 - ECOLight: <http://www.ecolight-lights.co.uk/>
 - INCBIO: <http://incbio.com/index.html>
 - SOLITEK: <http://www.solitek.eu/en/>
 - Sunbird : <http://www.sunbirdled.com/>
 - RENESOLA, and other.



Energy Saving Equipment



ENERGY EFFICIENCY

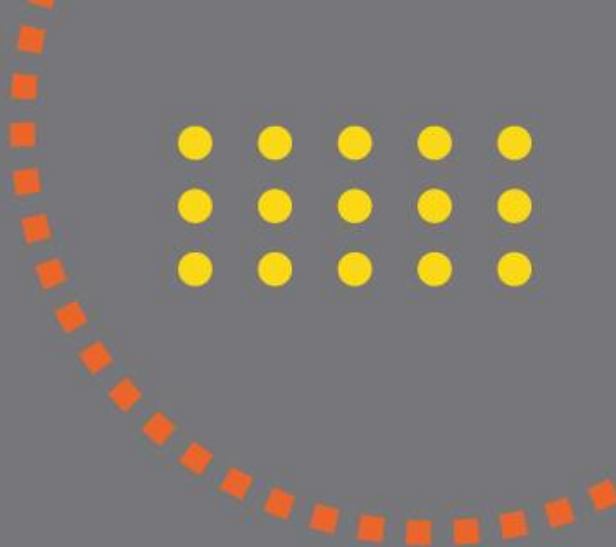
Energy Saving Equipment



- The main reduction in current energy consumption can be done through the Energy Saving Equipment.
- Easy to install
- Save energy on the demand instantaneously.
- The following are the main recommended types:
 - LED – Intelligent Lighting Fixtures with DALI application; occupancy and daylight sensors.
 - Variable Frequency Devices from ABB
 - ES~25 energy saver – voltage optimizer.



LED Lighting Systems



LED Lighting Systems



Professional LED Lights and Energy Saving Lighting Solution Provider

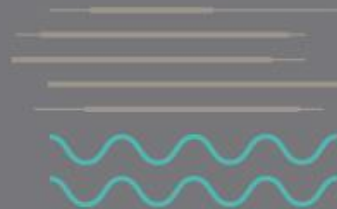
- Thermal Protection
- Freezing protection
- Custom made design
- Competitive Prices



LED special for Poultry application



EARTH



WATER



FIRE



AIR

10W LED Luminaire



- To prove that the SunbirdLED Poultry light can withstand pretty much anything, we drove over it with a car. Definitely more than what would be thrown at it inside your chicken house/shed.

[SunbirdLED Poultry Light Torture test 2](#)

- A brief demonstration to show that the Sunbird LED poultry light is not affected by water and with its 48V DC current, it does not short circuit, and poses no danger to humans or animals.

[SunbirdLED Poultry light. Torture test 1](#)



Benefits



- **Energy Savings (160lm/W efficacy)**

The 10W SUNBIRD luminaire is up to 90% more energy efficient compared to conventional incandescent lamps, offering huge energy savings and reducing the carbon footprint of poultry lighting.

- **Quick & Easy Installation**

Ease of install was a top priority in the development of the SUNBIRD System. The lamp attaches directly onto a round 50mm Junction box (customization of base plate is available) or can be suspended.



Benefits



- **IP69K & Chemical Protection**

Offering user peace of mind after installation, all SUNBIRD Luminaires have undergone rigorous testing to assure perfect protection against dust and water as well as chemicals (pH1-13)

- **Surge & Voltage Protection**

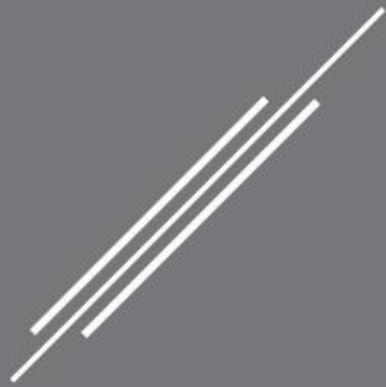
The industrial 48V power supply offers protection from overload, over voltage and short circuits

- **Built to Last (>54 000 hours)**

SUNBIRD Luminaires are backed by a 5 Year manufacturers guarantee with a minimum 54 000 hour rated lifespan (Lumen output 70% @ 54khrs)



Variable Frequency Drive



Variable Frequency Drive



- VFD is a device used in a drive system consisting of an AC motor, main driver controller assembly, and driver operator interface.
- Simulators Motor and A/Cs loads (70% from JATS loads).
- Give savings from 10-15% in motor application.



ES ⚡ 25 Voltage Optimizer

ES ⚡ 25 Voltage Optimizer



- ▶ ES-25 is an energy saving equipment that operates by the concept of Auto transformer and does not include any capacitors*.

Features include:

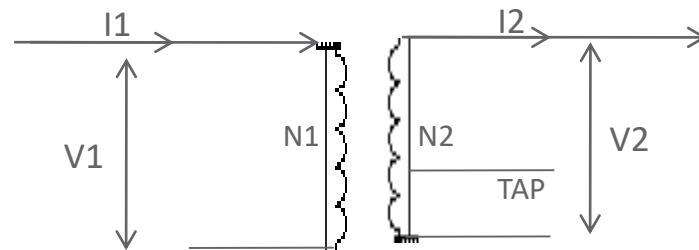
- Prolongs equipment's life time
- Efficiencies of more than 99%
- 20+ years life time
- Maintenance free
- Acts as a voltage controller and improves power factor
- Minimum ROI



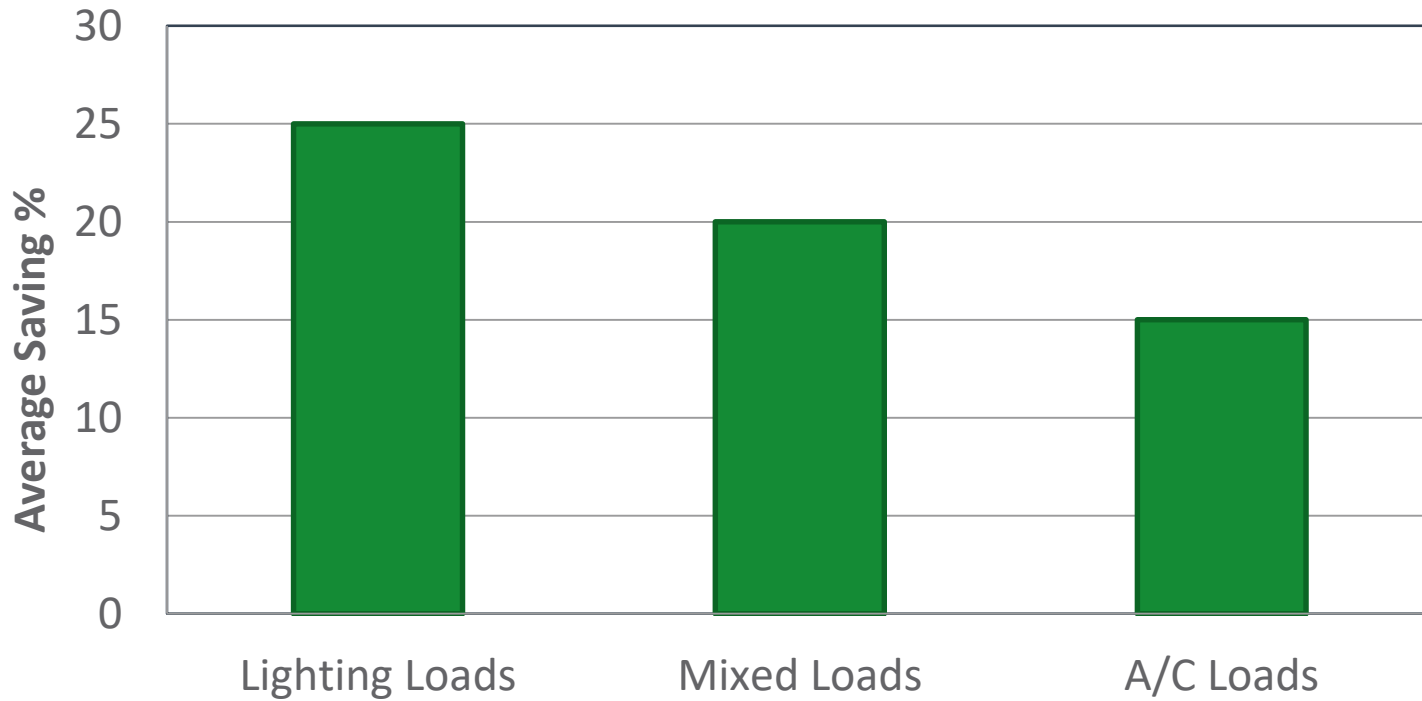
Energy Saving Equipment



- ES-25 Concept:
- $I_1/I_2 = N_2/N_1$ (1)
- $k = I_2/N_1$ (2)
- $I_1 = k*N_2$ (3)



ES ⚡ 25 Voltage Optimizer



Certificates



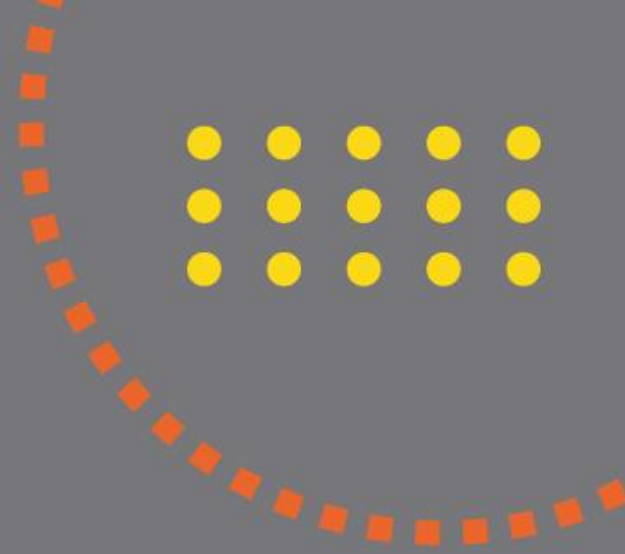
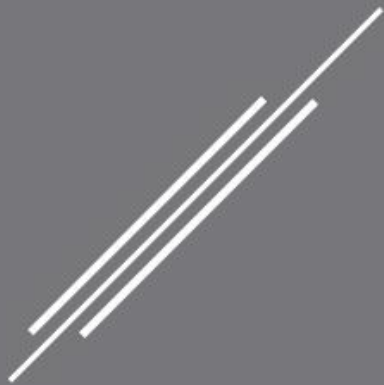
- ES-25 has well known local and international certificates that includes:
 - National Energy Research Center- Jordan (NERC)
 - Jordan Institution for Standards & Metrology
 - Southern Regional Electricity Board (SREB)
 - Karnataka Electricity Board (KEB)





RENEWABLE ENERGY

PV Solar system



Renewable energy generation



- Generates free energy from the sun
- minimal maintenance required due to the absence of moving parts
- Photovoltaic (PV) cells are modular i.e. you can start with a small system and expand as your needs increase
- The Solar Panels will work for a guaranteed 25 years, the expected lifetime is 40 years
- Grid-Tie systems allows you to sell excess electricity back to the utility
- Can be installed and operated anywhere
- PV cells make no noise and give off no exhaust thus reduces emissions
- Have electrical power during blackouts



Solar PV system



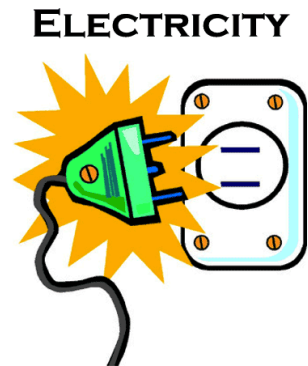
PV Array



Inverter



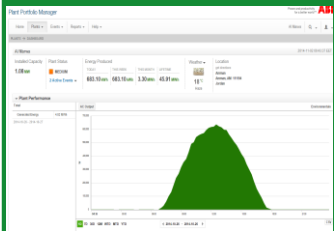
Load



Main Component for PV



Monitoring



Structure



(AC Side)



(DC side)





Big Renewable Projects

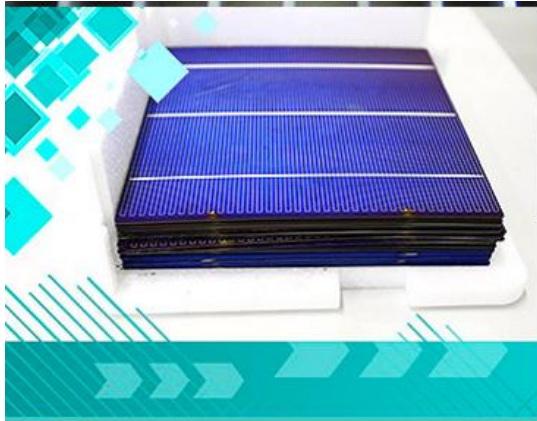
Big Renewable projects – Partner



- The activities cover key-in-hand engineering systems that include the basic project, detail, procurement, assembly, and testing.
- These engineering activities also cover R & D (research and development) responsible for advanced development of software and hardware.
 - Production of energy
 - Power Transmission and Distribution
 - Industrial systems



SoliTek



PV CELLS



PV MODULES



BIPV



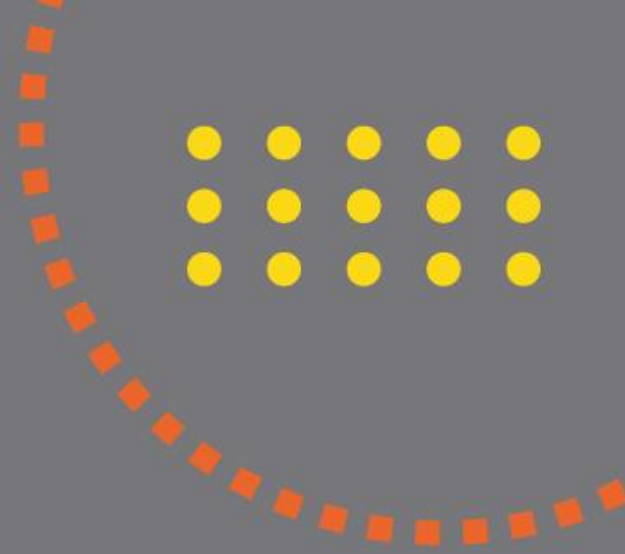
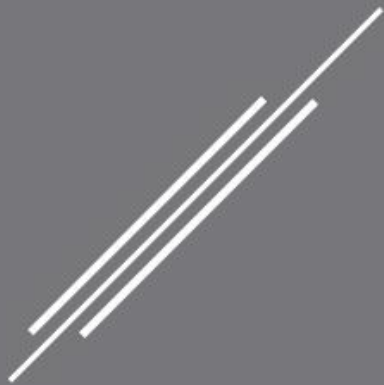
BIPV



SoliTek supplies the Glass/Glass modules for bespoke BIPV projects for domestic, commercial and governmental buildings. According to the request we can design and manage the project until installation. We cooperate with developers, contractors, architects, installers and other subcontractors. Building Integrated PV systems will become an everyday choice in the construction industry within a few years.



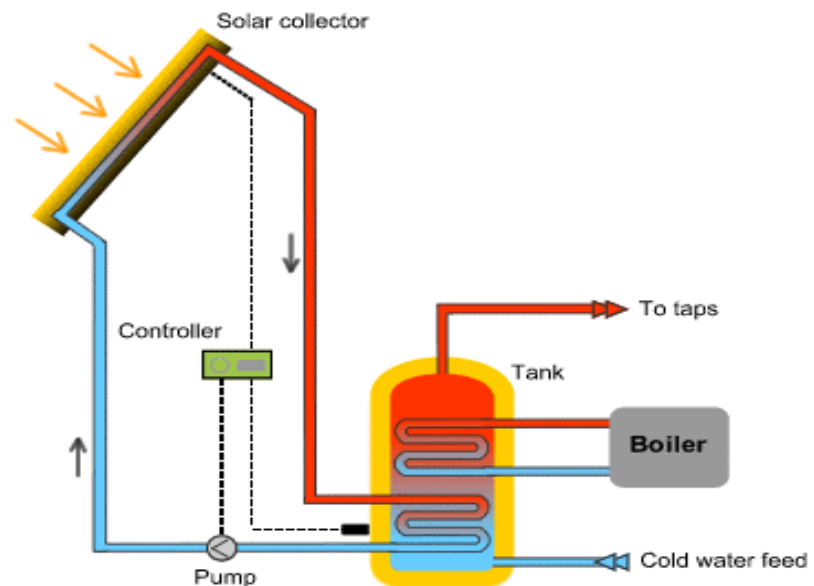
Heating Solar Thermal



Solar Thermal



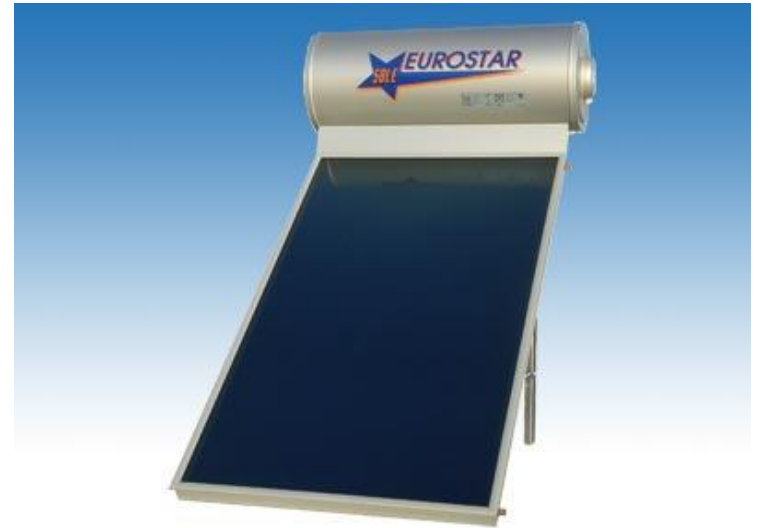
- Solar thermal is a very simple and efficient system to grab energy from the sun and use it to heat the building water
- In general, solar thermal systems heating domestic water consist of solar collectors containing a heat transfer fluid such as water or antifreeze, plus a pump, its control unit, connecting pipes, and a backup heat source such as gas, oil, electric immersion heater.
- Simple Diagram of solar thermal system



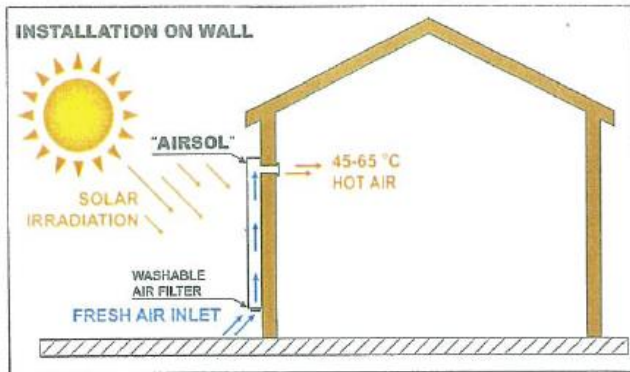
Solar Thermal



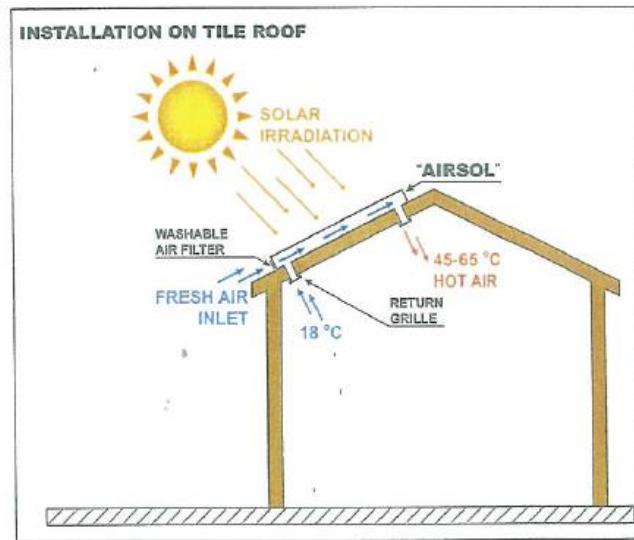
- Solar collectors:



Solar Heating – Air Conditioning



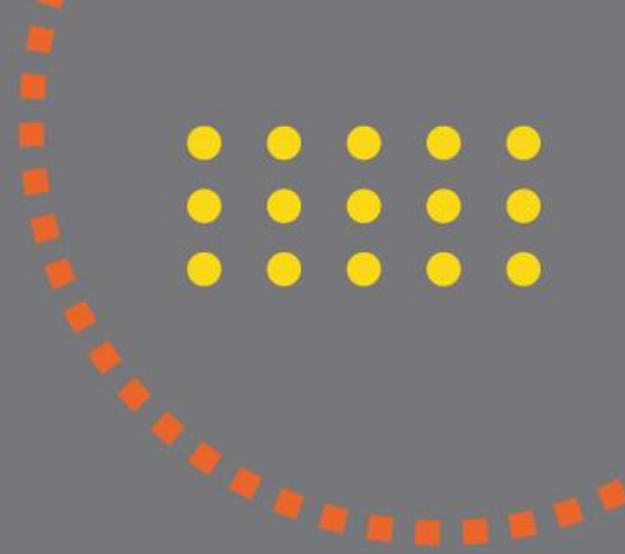
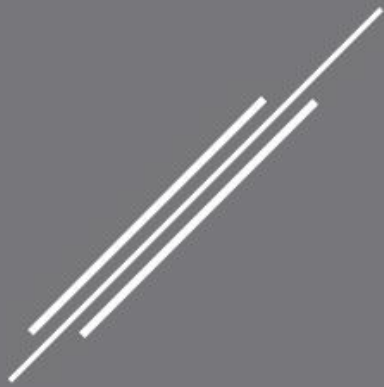
Easy installation on south, southeast and south west walls



C3E is the sole agent for SOLE in Jordan



Heat Pumps



Heat pumps



- Reverse refrigeration cycle
- Mature technology (more than 20years in Europe)
- Standard types are:
- Air to water
- Water to water
- Geothermal
- High efficiency
- Coefficient Of Performance $> 2,5 - 3$
- Efficiency certified by EUROVENT



Heat pump applications



- Hot water production (up to 60-65oC)
- Swimming pool heating
- Space heating (HVAC)
- Cogeneration of heating and cooling
- Ideal for hotels and industry
- Excellent R.O.I. especially in hybrid schemes with solar thermal systems



ISA Systems

TELEMETRY AND
REMOTE MANAGEMENT



Telemetry & Remote Management



- Effectively Manage Energy with



Oil & Gas



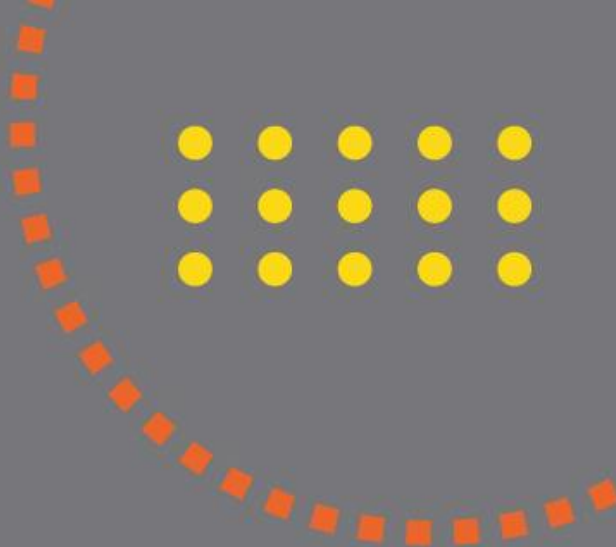
Energy



Intellicare



Energy Management



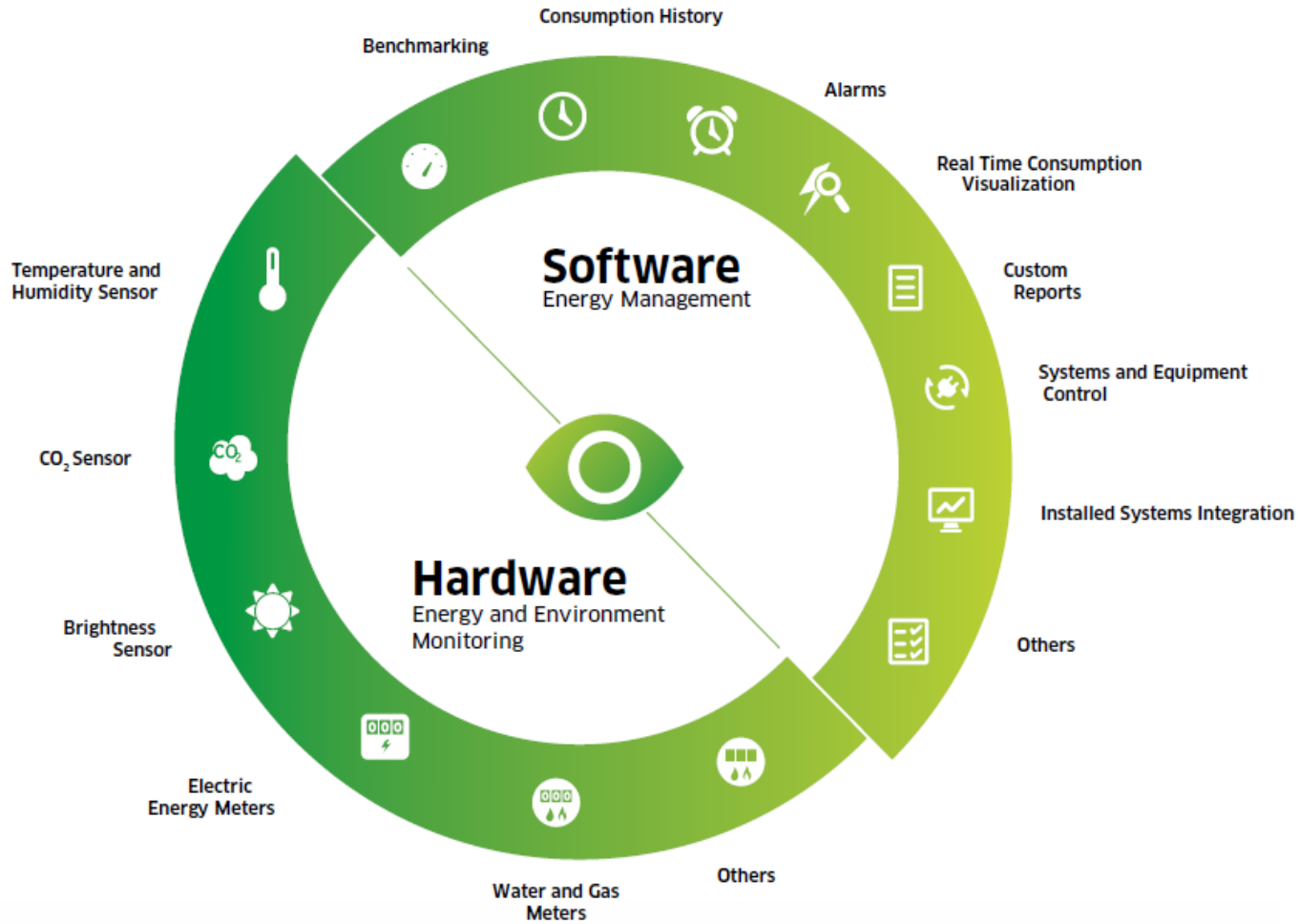
Effectively Manage Energy



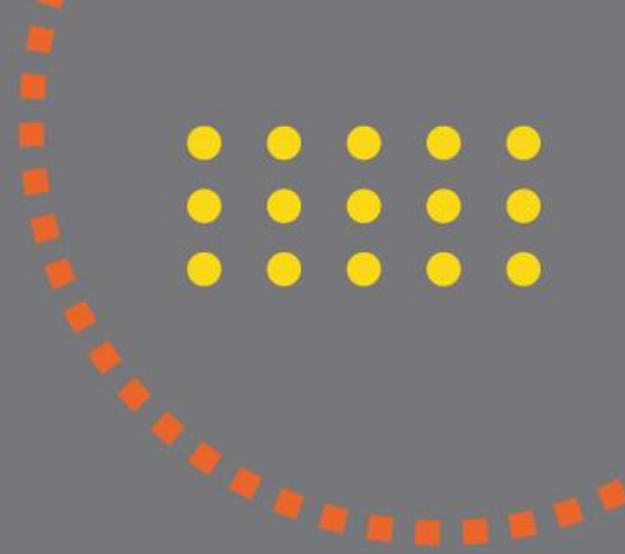
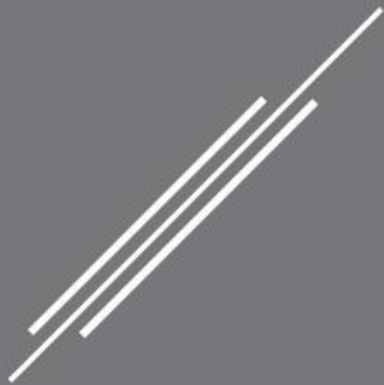
- Saving energy, optimizing resources and making facilities and infrastructures more efficient requires a continuous process.
- ISA Energy guarantees the complete management of the process that defines, implements and manages energy efficiency policies, which may include the following areas:
 - Structural behavior of the buildings at an energetic level – Improvement Report
 - Equipment and installed systems optimization and redefinition
 - Behavioral changes
 - Equipment substitution
 - Energy production (renewable energies)



Effectively Manage Energy



Water Management



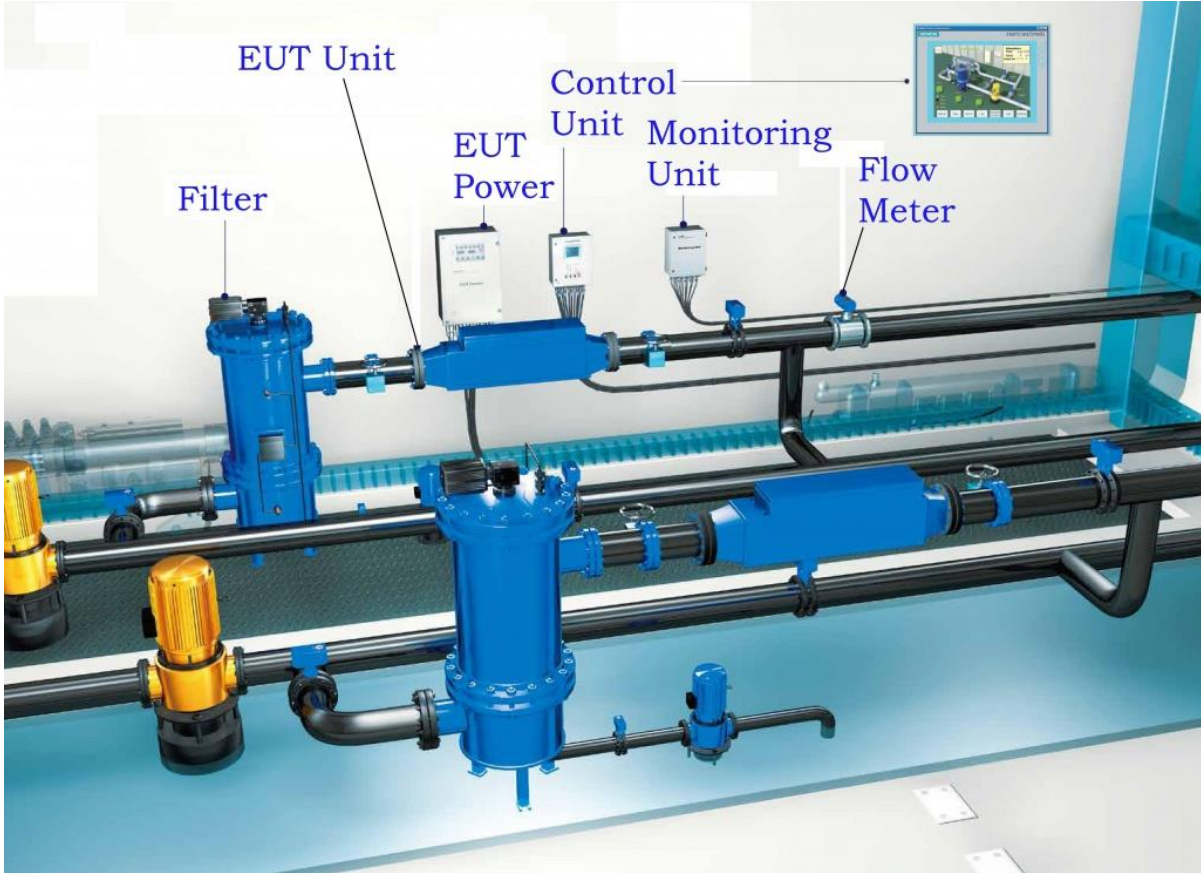


- Water Management System enables you to accurately monitor and control your water usage.
- It enables you to identify and solve water related problems and minimal your water usage.
- The data is centralized. It can generate reports, alarms, data logging and schedule your process.
- All systems can be controlled and monitored as shown in the next slides.



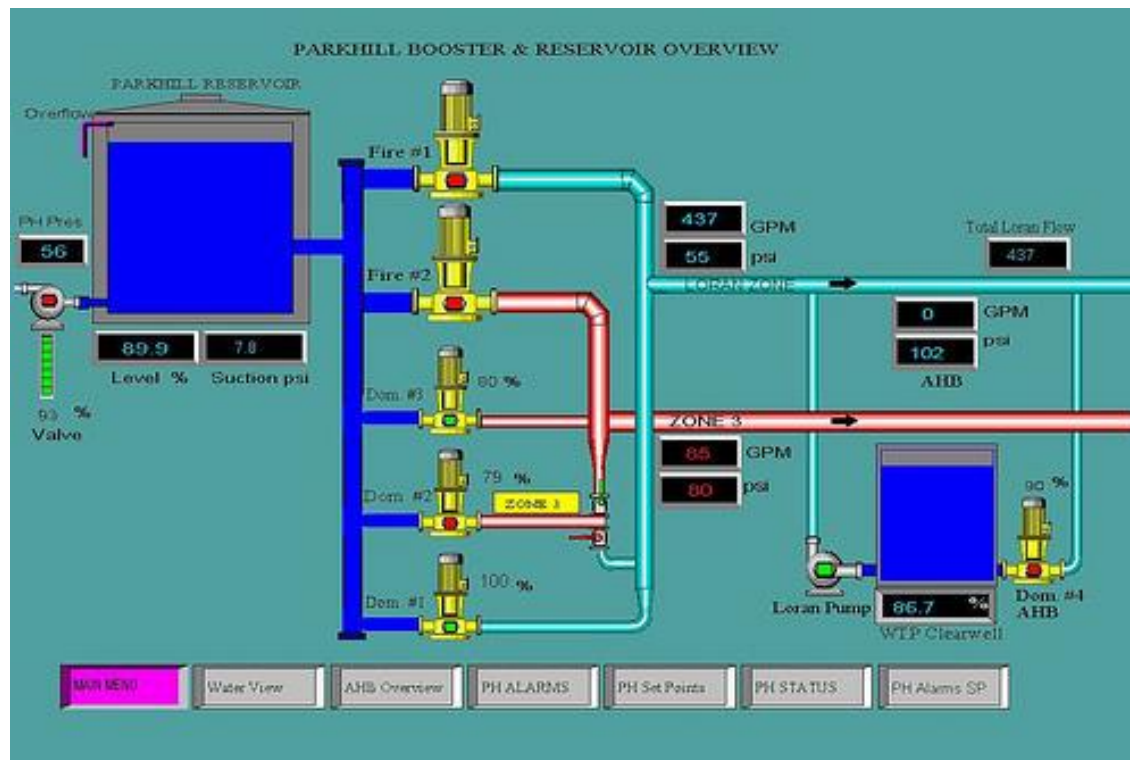


Control and monitoring of filter systems.



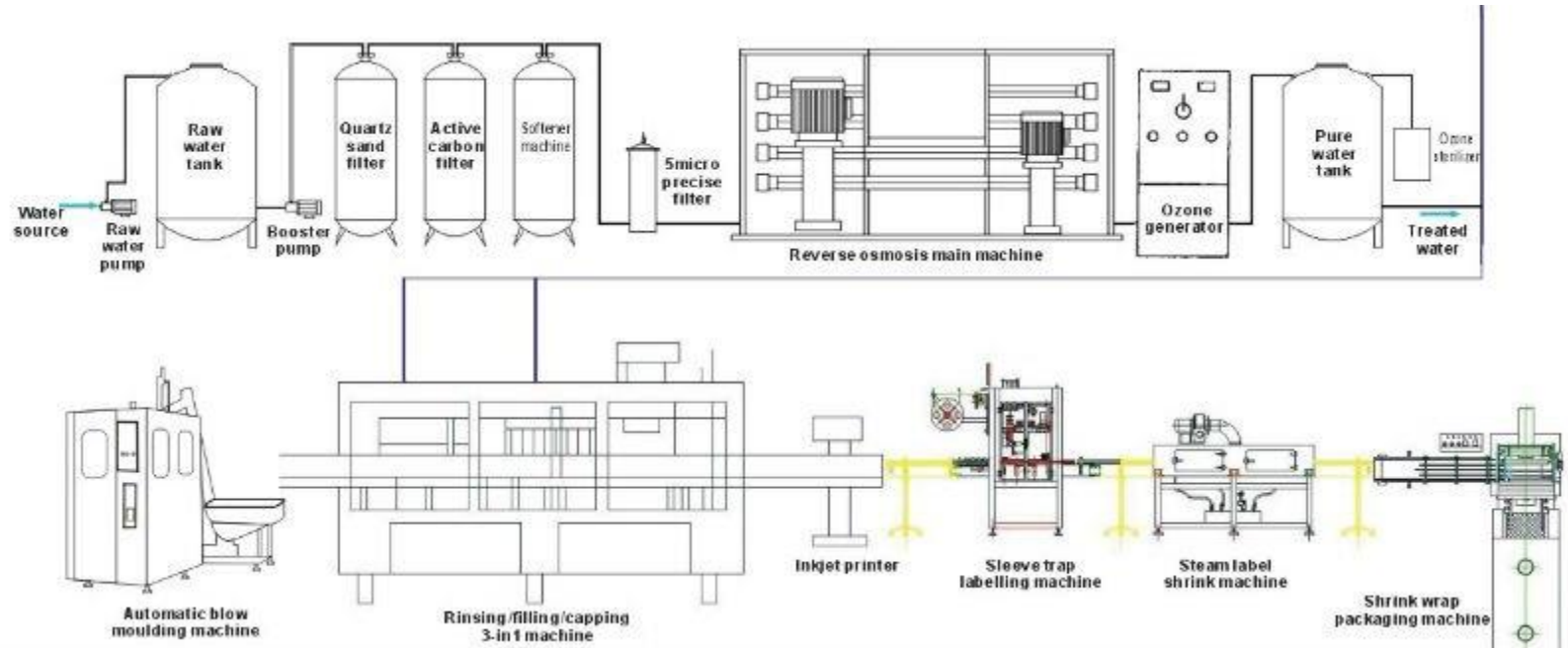


- Control and monitoring of reservoirs and pumps.

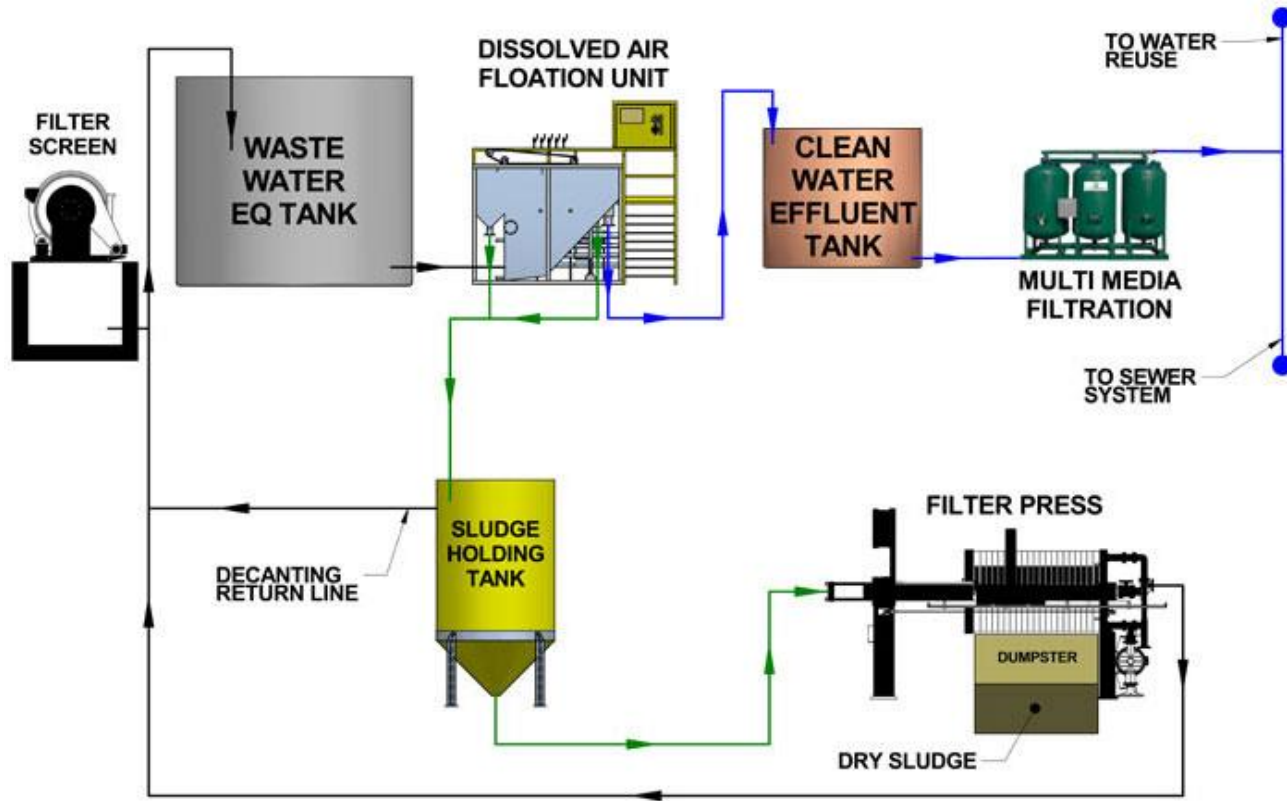




Control and Monitor all your production lines water usage.



Control and Monitor your waste water.

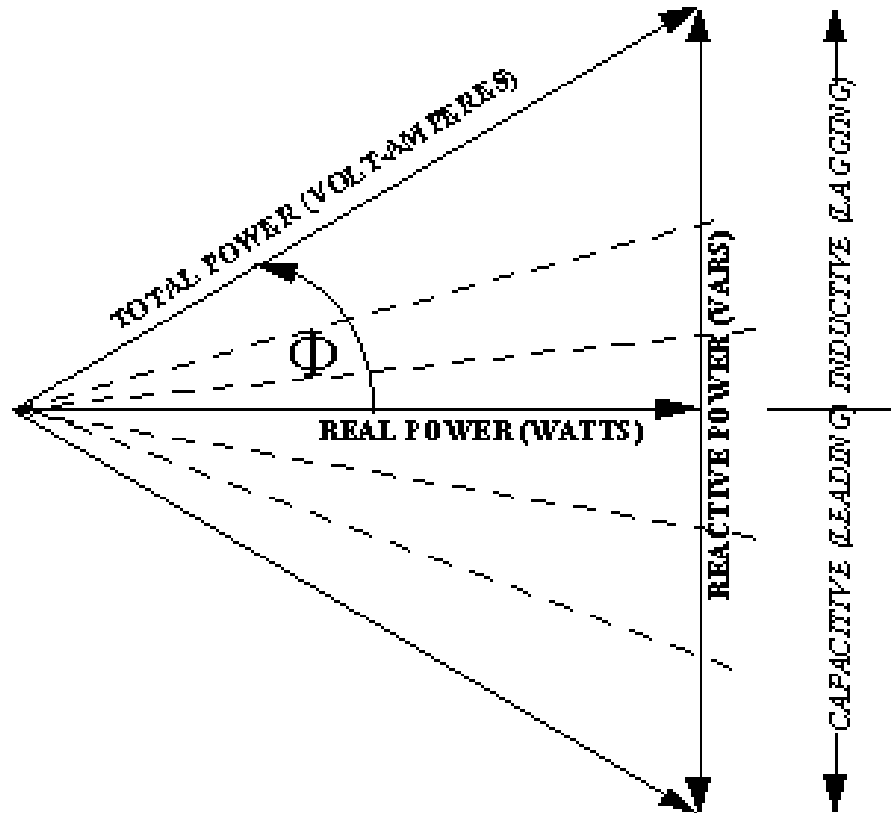


POWER QUALITY
EQUIPMENT



Power Quality Equipment

- Power Factor Correctors



Power Quality Equipment



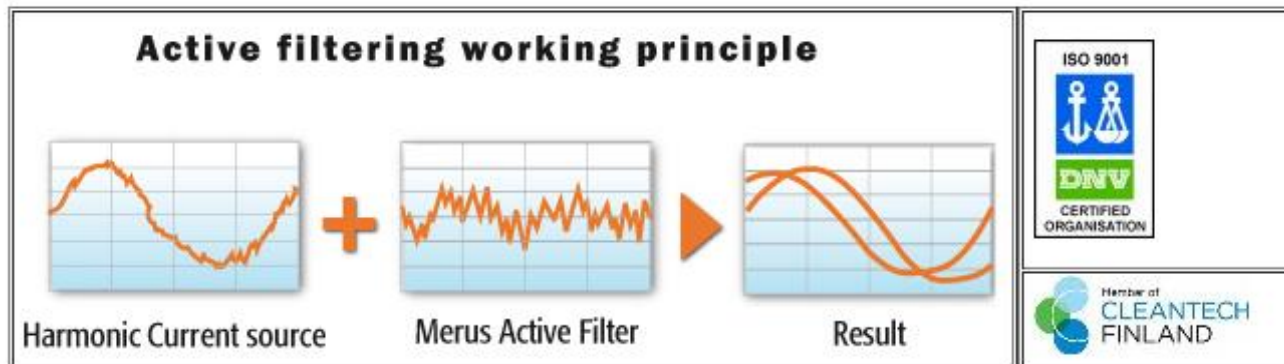
- Power Quality Improvement Equipment:
 - Power Factor Correction
 - Harmonics Active Filters



Power Quality Equipment



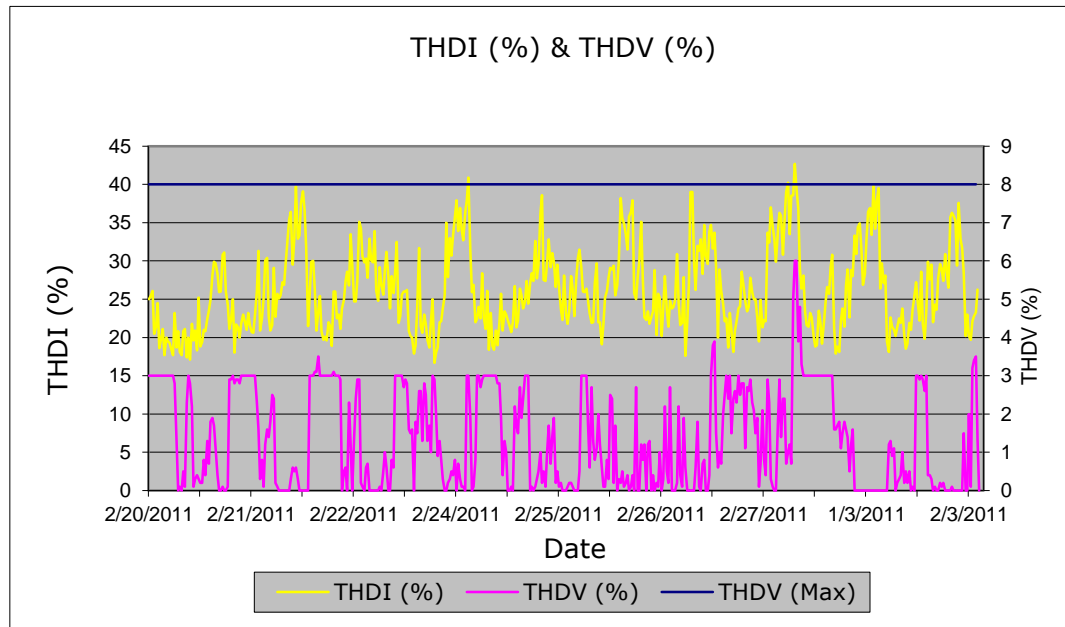
- What is Harmonics?
- Harmonic currents are generated by non-linear loads connected to the network. The typical non-linear loads are all semiconductor based equipment such as personal computers, UPSs, variable speed drives, DC converters, etc.



Power Quality Equipment



- Harmonics Filters: It is essential to note that the harmonics are too high from records



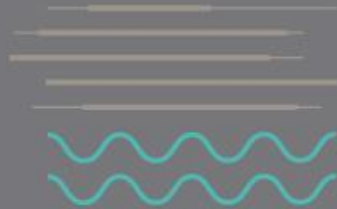
ENERGY AUDITING



Methodology



EARTH



WATER

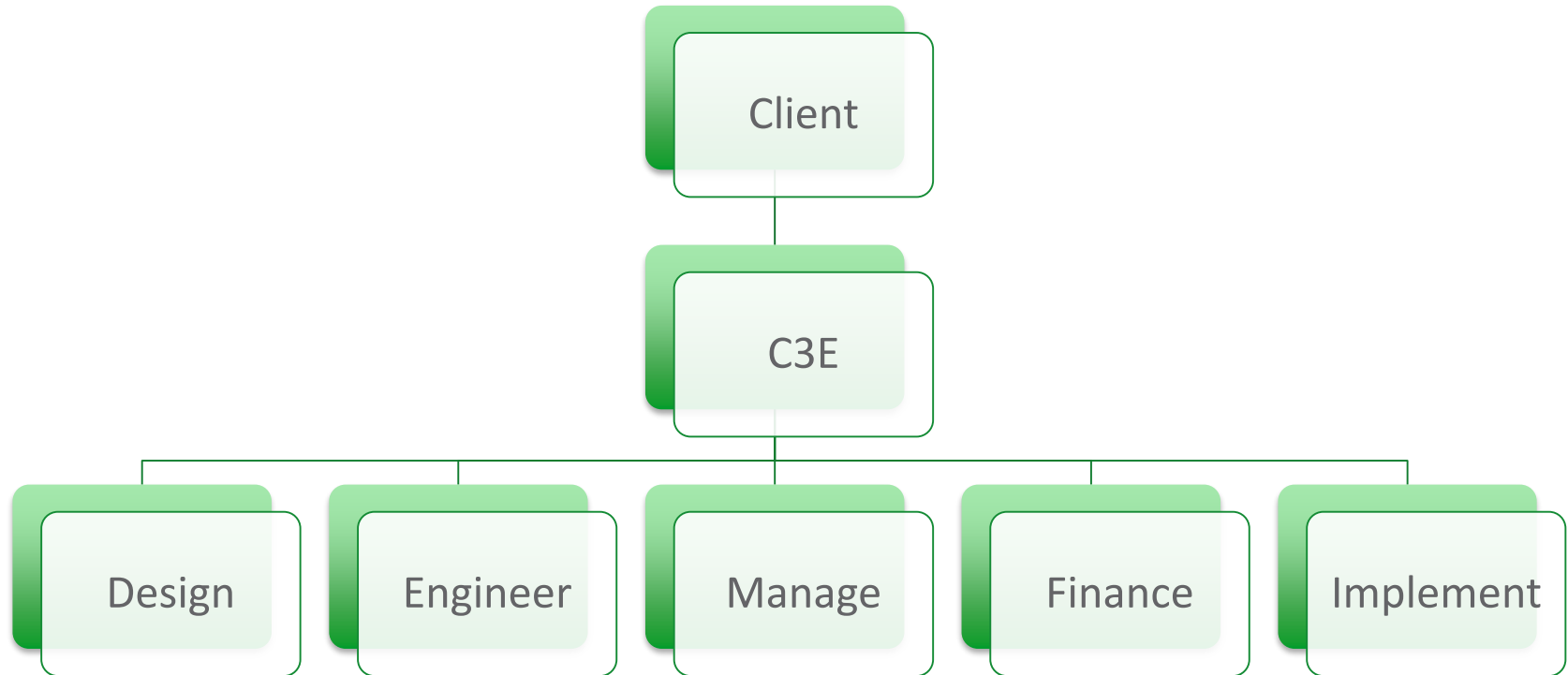


FIRE

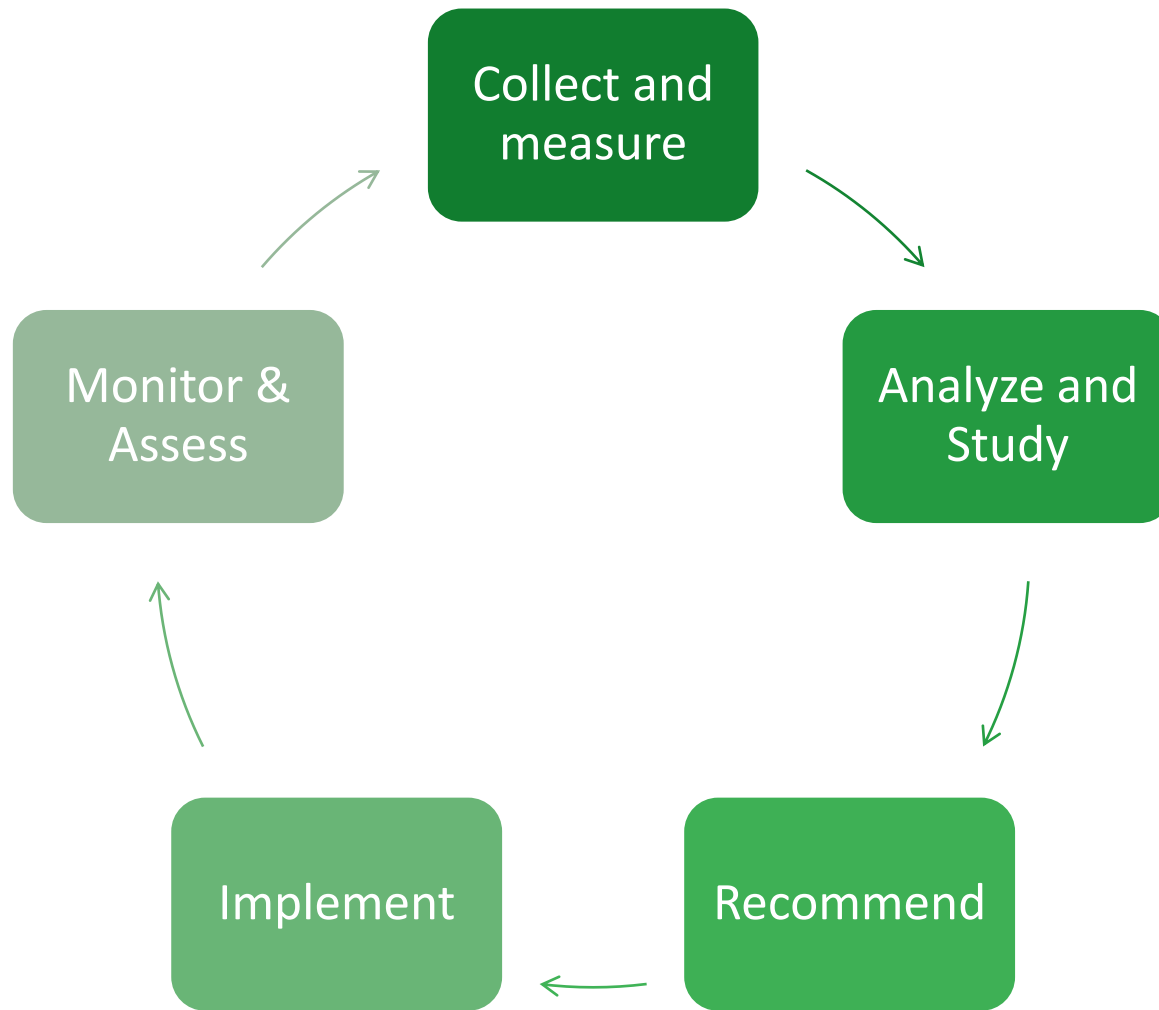


AIR

What C3E Can do for You?



How do we do it?





How do we do it?

- A Presentation is made to introduce the client to the products and services of our company.
- After an initial agreement a team of engineers will conduct a study at the location/s for a nominal fee.
- The client is required to introduce electrical diesel and if possible water invoices for 12 months along with civil and electrical plans of the site
- After which an offer will be made that satisfies the client's need's



ENVIRONMENTAL
SERVICES



Bio Fuel and Sonic Cavitation System



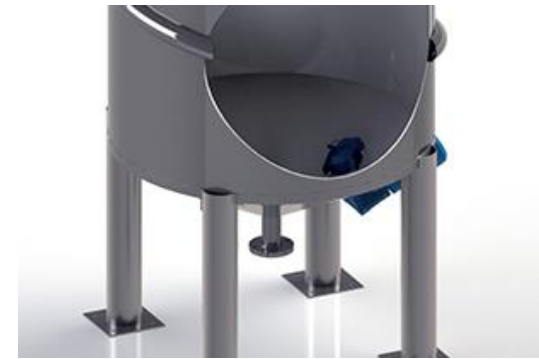
Engineering
Services

With a continuous investment in R&D, We with our partners aim to be pioneers, developing innovative systems and methods.



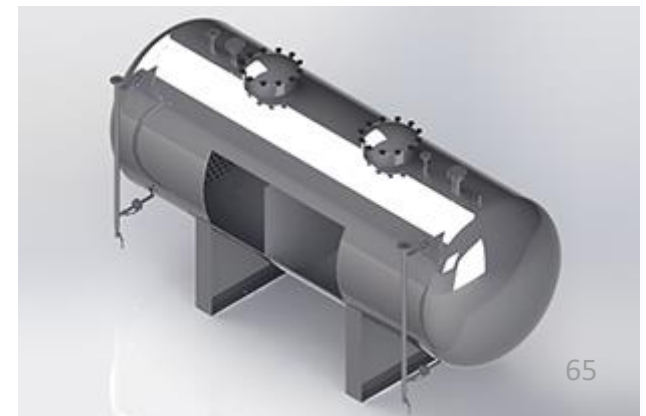
Biodiesel

We with our partners are at the forefront of this industry, offering the most advanced fully flexible Biodiesel plants in the market.

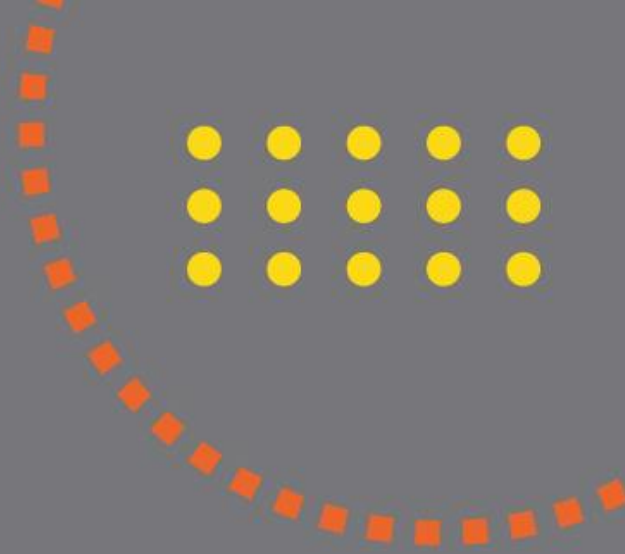
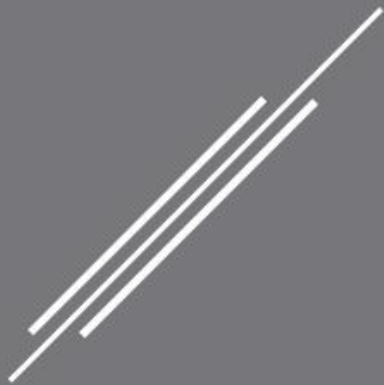


Biodiesel and Glycerine
Distillation

We with our partners focuses on providing biodiesel and glycerine refinement equipment, reaching the highest market standards.



Major projects



Major projects



1.1 MWp



811.2 kWp



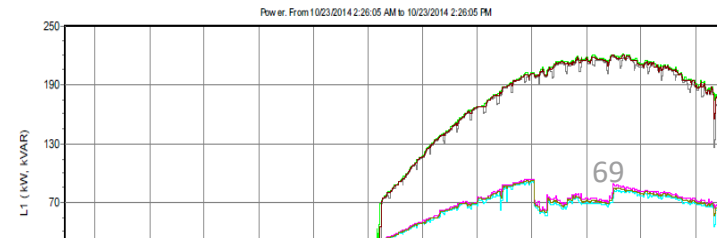
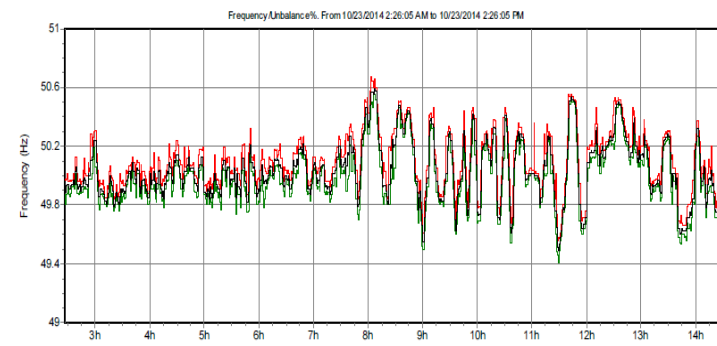
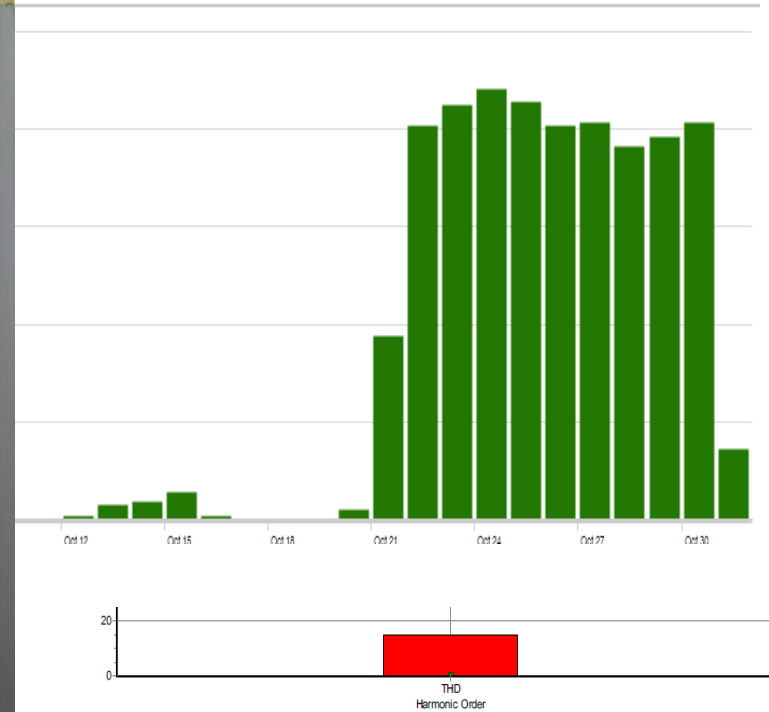
134 kWp



400 kWp

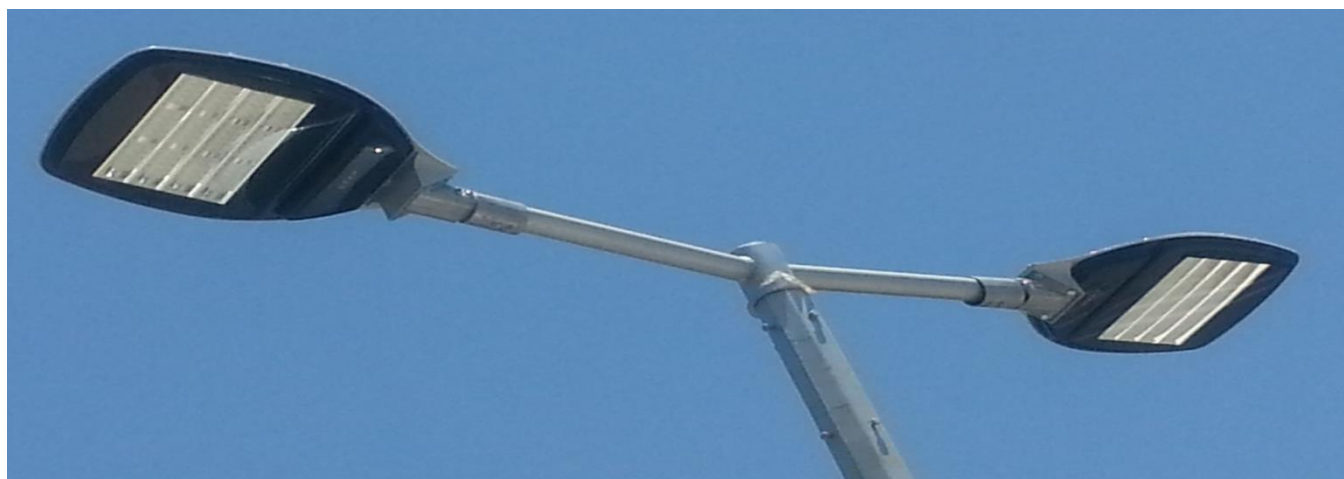






- Fluke power analyzer
- Power vision program from ABB





Why C3E?



High Quality

- We deliver the **best systems**, NOT the cheapest! But in the long run our systems will be the cheapest, due to it's high performance and long lifetime.

Reliability

- Our **high efficiency** technology allows the client to use the equipment in various conditions

No Risk

- Appropriate warranties are given.





THANK
YOU

