DOTS Sustainability Services

DOTS
DO THINGS SMARTER

www.dotstechsystems.com

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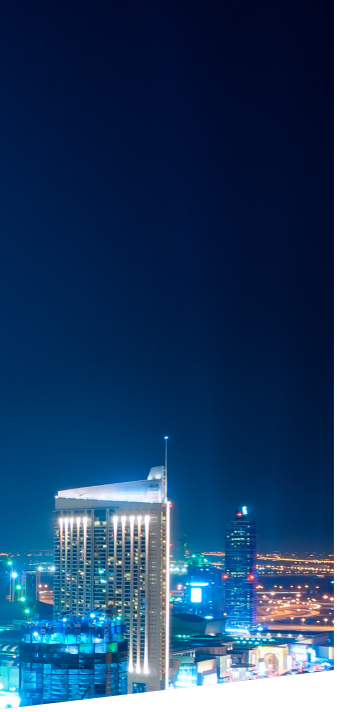


ABOUT DOTS

Formed in 2015, under the GWB group, DOTS engineers its solutions in diversified business interests globally & has shown huge interests in emerging market, technology & business. Energy services offering building retrofits and implementation of energy efficiency projects after identifying energy saving opportunities & potential through energy audit of existing facilities, financing or assist clients in arranging finances for energy efficiency projects by guaranteeing savings & managing risks in the implementation along with M&V activities to quantify energy savings with minimal uncertainity post implementation of Energy conservation measures.

Our certified & experienced professionals survey, identify, design and implement energy efficient solutions across verticals viz., government, manufacturing, telecom, healthcare, retail, logistics, education, airports, buildings, transportation and data centers etc.

We enable the design, engineering and implementation of IoT solutions across industry verticals. Government, Manufacturers, Telecom, Healthcare, Retail, Logistics, Education, Airports, Buildings, Transportation and Data Centers, represent a few of our customer categories where rapid delivery of our services ecosystem has demonstrated profound impact.

Mission

To promote internationally accepted policies & regulatory support for use of guaranteed performance based solutions to implement energy efficiency, renewable energy and infrastructure renewal initiatives

Vision

To combat climate change & depleting natural resources by delivering performance based solutions for infrastructure & energy accountable for environmental & economic outcomes.

Objective

To construct, advocate & ratify the local & global policies, regulations & programs that enhance the role of performance based solutions in attaining climate change, renewable energy & infrastructural initiatives.

SMART ENERGY SERVICES (SES)

ABOUT INTEL IOT ALLIANCE

The Smart Energy Services(SES) is a result of the Intel IoT alliance which is an ecosystem of 500+ leading global and regional IoT companies using Intel and its partner's technologies to build innovative IoT solutions. The SES program brings together Intel, Dell and DOTS with their technologies and experience for delivering the SES program.

Intel is a technology leader focused on unleashing the potential of data to unlock value for people, business and society on a global scale. Intel creates world changing technology that enriches the life of every person on earth. With Intel, companies can connect the unconnected, harness 5G, drive convergence, and deploy intelligence from edge to cloud, transforming their business.

Intel helps you discover new ways to harness your data by bringing artificial intelligence (AI) closer to where the data originates—in network edge devices, on premise servers and gateways, and smart and connected endpoints—to increase efficiency, improve decision-making, and add value for customers and employees. It allows you to take advantage of the power of inference at the edge to resolve latency issues, reduce network costs and congestion, and improve data privacy. It helps collecting data from Industrial Internet of Things (IIoT) devices that can improve reliability and uptime, drive new services, enhance productivity, improve real-time decision-making, and solve critical problems. Intel's scalable hardware and software solutions are designed to seamlessly integrate into your existing energy infrastructure

Dell Technologies is one of the few companies that has hardware and software solutions that play at every level of Edge and IoT computing infrastructure implementation, from the edge to the core, to the cloud. Dell Technologies provides a scalable, secure, manageable and open infrastructure – spanning edge to cloud – so customers and partners can realize value today and build a foundation to support these workloads and case studies in the future

DOTS is an accredited ESCO headquartered in Dubai, United Arab Emirates and deploying the latest in technology and expertise to enable organizations to go green. DOTS provides energy management and reduction of the energy bills by using the minimal investment required to start with so that everyone can participate and derive the benefits. Organizations with serious intent and massive saving opportunities are advised accordingly and enabled to maximize the opportunity to benefit.

Energy management is widely acknowledged as the best solution for direct and immediate reduction of energy consumption and provides the following benefits;

- Reduces operating & maintenance costs
- Reduces carbon emissions
- Improve equipment life and productivity

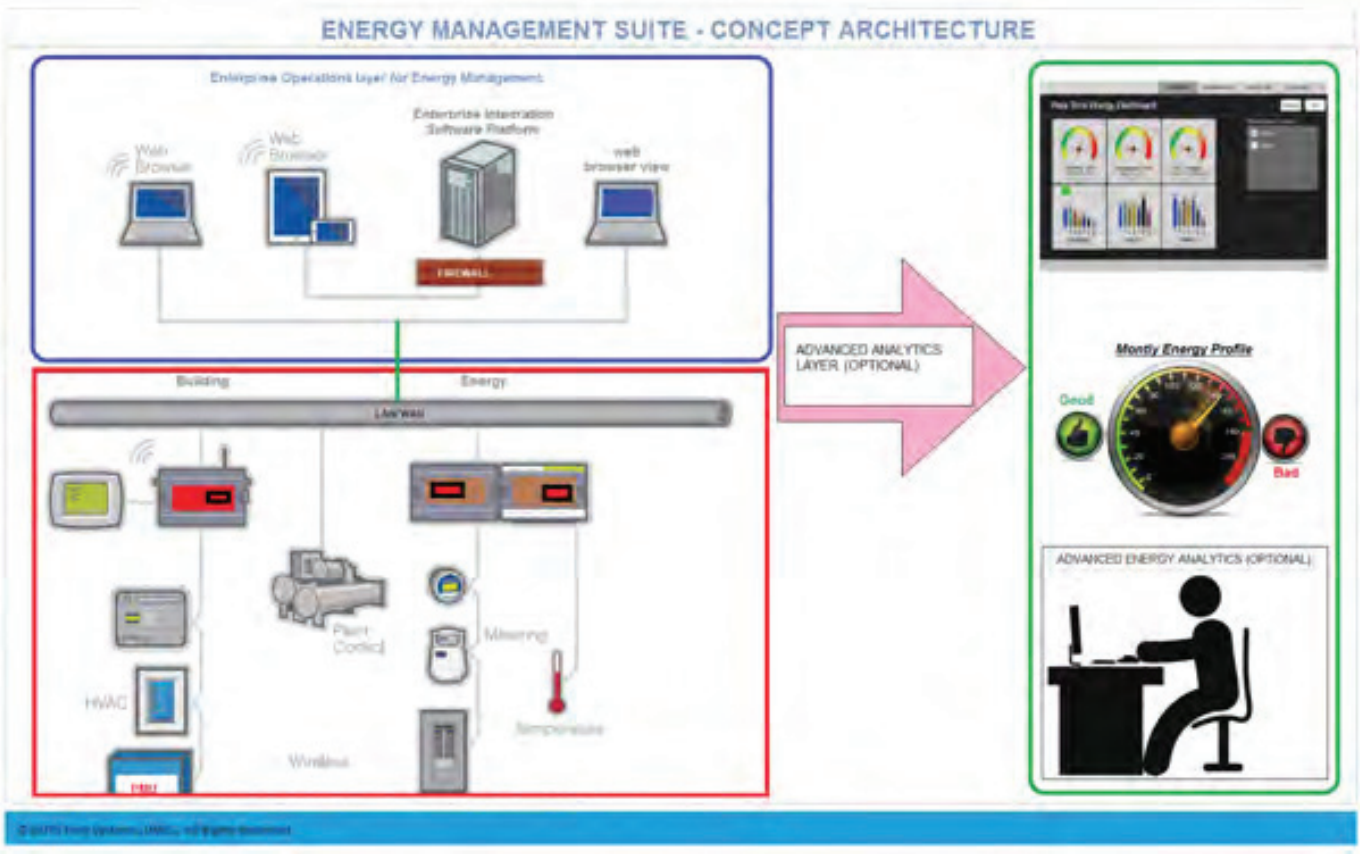
The energy savings based on real time monitoring and trends of usage in Buildings, Homes and Industrial infrastructures can contribute not only for Corporate Social Responsibility and Smart Technologies but adding values to existing assets for better Economies. DOTS with state-of-the-art technology, provides end to end solution in the following services:

SMART ENERGY SERVICES (SES) PROGRAM

Managing and reducing energy consumption not only saves money but also helps in mitigating climate change and enhancing corporate reputation. The primary objective of energy management is to achieve and maintain optimum energy procurement and utilization, throughout the organization which may help in minimizing energy costs and mitigating environmental effects. In fact, energy management is widely acknowledged as the best solution for direct and immediate reduction of energy consumption.

Why SES?

- Reduces operating & maintenance costs
- Reduces carbon emissions
- Improve equipment life and productivity



The energy savings based on real time monitoring and trends of usage in Buildings, Homes and Industrial infrastructures can contribute not only for CSR and Smart Technologies but adding values to existing assets for better Economies. DOTS with state-of-the-art technology, provides end to end services in

SES Offered

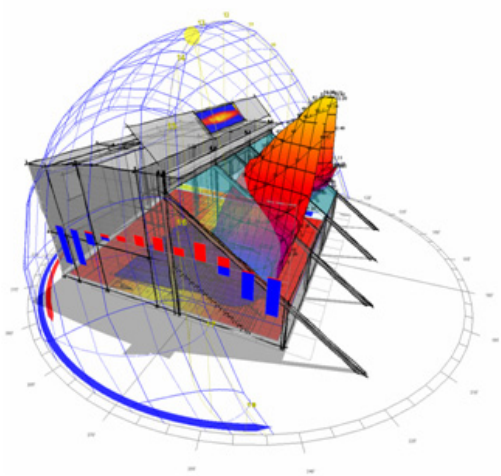
The energy savings based on real time monitoring and trends of usage in Buildings, Homes and Industrial infrastructures can contribute not only for CSR and Smart Technologies but adding values to existing assets for better Economies. DOTS with state-of-the-art technology, provides end to end services in
Energy management is widely acknowledged as the best solution for direct and immediate reduction of energy consumption and provides the following benefits;

- Energy Analysis
- Energy Benchmarking
- Energy dashboards comply with global energy consultants
- CO2 Emissions Reporting and CO2 activity data tracking.
- Financial Analysis
- Contract Bid Management
- Supplier Contract Analysis
- 24x7 Alarm Management and
- Exception Reporting
- Failure Reports
- Equipment (Asset) Management
- Preventive Maintenance & Work Order Creation

To reduce the operational cost, risk and carbon emission, DOTS is delivering the smart energy services to all building owner, real estate and owner association to be part of this Green Initiative. Building owners gain in running their HVAC systems efficiently and in improving the sustainability of their facility. Cooling generally constitutes about 60% of the total energy load of the building, so tracking the chilled water system and managing its efficiency pays off and brings large savings with little investment. They can keep equipment running at peak efficiency and eliminate failures.

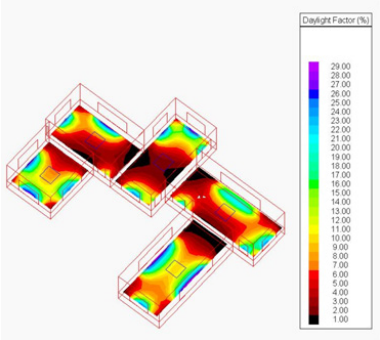
BUILDING LOAD ANALYSIS & ENERGY MODELLING

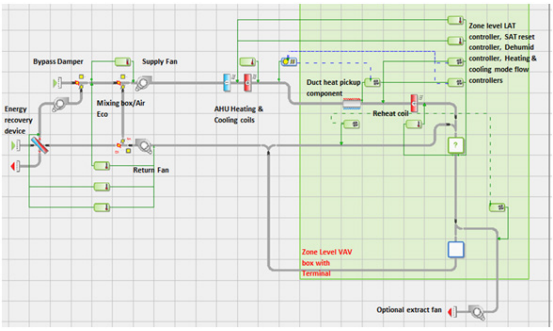
Building energy modeling (BEM), a subset of building information modeling (BIM), integrates energy analysis into the design, construction, and operation and maintenance of buildings. As there are various existing BEM tools available, there is a need to evaluate the utility of these tools in various phases of the building lifecycle. The goal of this research was to develop guidelines for evaluation and selection of BEM tools to be used in particular building lifecycle phases. The objectives of this research were to



- Evaluate existing BEM tools
- Illustrate the application of the three BEM tools
- Re-evaluate the three BEM tools
- Develop guidelines for evaluation, selection and application of BEM tools in the design, construction and operation/ maintenance phases of buildings.

A technique which builds computer models for analysis & focuses on energy consumption, life cycle analysis of energy related equipment/systems and the absolute cooling/heating loads. It takes into consideration of building architecture, orientation (sun path analysis), shading from adjacent structures, systems/equipment, automation & controls along with exact operation philosophy





ENERGY EFFICIENCY/RETROFIT PROGRAM

Energy Efficiency Program

Evaluating a building's performance & efficiency is preliminary step towards discovering quick-win solutions. Audit team analyses utility supplier invoices, studies as-is condition of system, operating philosophy, maintenance strategies, identification of losses & savings potential, designing of Energy conservation Measures & Cost benefit analyses.

Retrofit Program

Energy retrofit is reinstating/recondition/replacement which results in enhanced efficiency of building systems, minimizing losses in equipment and building envelope, thereby reducing operational cost and improved indoor environment, occupant comfort and building asset life.

M & V and Reporting Services

M&V Services: We offer IPMVP services which allows energy consultant, client, stakeholders or investors to make informed future energy efficiency plans based on accurate and proven data. Employment client friendly investment models by building the proper design framework for M&V process and performing a calculated review of the performance contract. Being an M&V consultant and an ESCO, we offer the client with an achievable energy cost savings to pay for during the contractual term.

BMS & Control System Consultancy

Advisory on Automation & Controls: Design, Supply, Installation, Testing & Commissioning & Consultancy services for smart homes, hotel, industrial, healthcare, educational facilities.

ENERGY PERFORMANCE CONTRACT (EPC)

EPC is a process for organizing energy efficiency financing which involves guaranteed energy savings. Our remuneration depends on the energy savings generated involving us in continual M&V and performance reporting during the agreed reporting period.

ANALYSIS
Collection of Data & Evaluation of savings potential

ECM DESIGN
Effective & Efficient solutions for energy conservation

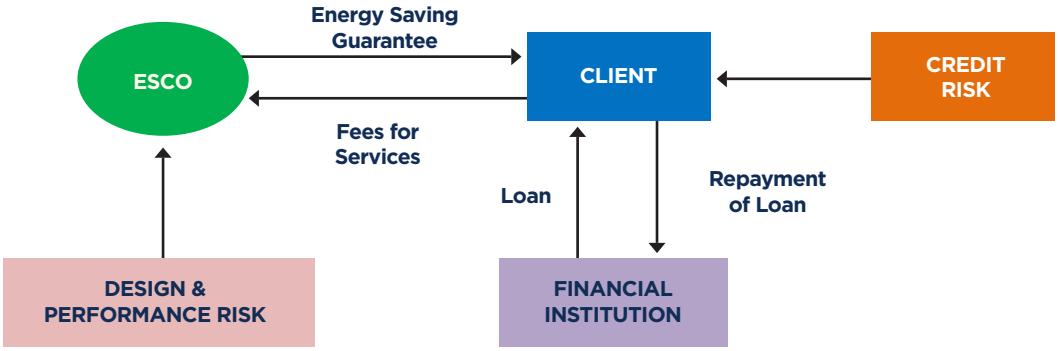
IMPLEMENTATION
Execution of measures & savings verification

FINANCE
Management of investments

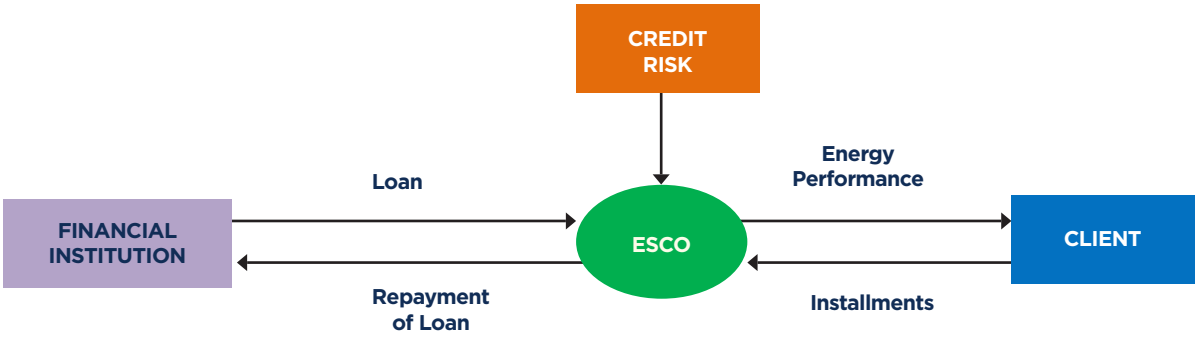
MANAGEMENT
Continuous Energy monitoring & Targeting deviation

MAINTENANCE
Comprehensive maintenance to ensure optimum system performance

Guaranteed Savings Contract



Shared Savings Contract



GREEN BUILDING CONSULTANCY

At DOTS we are committed to green building and sustainability. Green building consultancy is one among the diversified business interests. We have shown tremendous interest in emerging business markets to cater to sustainable construction & optimized operation practices. With certified professionals like LEED AP & Estidama PQP, we aim at constructing new buildings & making existing buildings ideal in in social, environmental & economic fronts.

Green buildings are inherently designed to make the best use of natural resources. A green building is much more friendly to the environment than a normal building.

The overall cost of Green Building is less as compared to a normal building becuase it uses less resources like energy & water. It also increases the asset value .

Green buildings are very good for the health for the health of entire eco-system that occupy it. They also decreases the load on local infrastructure .

We offer comprehensive services Our services include

- On-site Construction Supervision
- Material Tracking and Verification
- Training and Development
- Energy, Water & Waste Management
- IAQ Management

We provide green building certification advisory for the following green building rating systems:

- LEED BD+C (New Construction, Core and Shell, Schools, Retail, Healthcare)
- LEED ID+C (Interior Design & Construction)
- LEED O&M (Operations & Maintenance)
- LEED for Home Design & Construction (Homes)
- LEED ID+C (Interiors)
- Estidama Community Rating System
- Estidama Realm Rating System
- Estidama Buildings Rating System
- Estidama Villa Rating System

SOLUTION IMPLEMENTATION

ECM CONTRACTING

Complete turnkey implementation of proposed energy conservation measures which spans across air, water, controls viz chiller & chilled water systems, HVAC, lighting, plumbing, building envelope, automation system etc.,

DETAILED ENGINEERING WITH CAPEX & ROI

Exclusive segment of an Investment grade audit (IGA) considering detailed account of energy use, including a quantitative study of the implementation with detailed investments, operational and maintenance costs and an analysis of the finance model.

Our certified professionals will conduct an extensive & rigorous study by calibrated simulation on 3D models to analyze the existing condition. This not only helps with detailed engineering on the redesign but also assists in arriving on the exactness of capital investment required, determination of savings with high confidence level, lesser uncertainty, & ROI.

PROCUREMENT, TESTING & COMMISSIONING

Overall project management, including design & consultancy, planning, procurement, construction & installation, documentation, performance & cost estimation, selection of sub-contractor (in few cases), testing, commissioning along with operational verification of the retrofitted systems as per ECM intent.

ENERGY EFFICIENT PRODUCTS

ENERGY EFFICIENT PRODUCTS

Energy Efficient Cooling Solutions like Dual-Inverter Air conditioner units for Residential and Light commercial range and Solar Hybrid Air conditioner units. These units are 5-Star rated by ESMA, G-mark and T3 certified. Made to address the pain points of middle east market to give maximum performance with minimum energy consumption even at higher temperatures.

ROOFTOP PV SYSTEMS

Energy Efficient Cooling Solutions like Dual-Inverter Air conditioner units for Residential and Light commercial range and Solar Hybrid Air conditioner units. These units are 5-Star rated by ESMA, G-mark and T3 certified. Made to address the pain points of middle east market to give maximum performance with minimum energy consumption even at higher temperatures.

POWEREGION

Poweregion solar air conditioner utilizes solar energy as the power source and is an environmentally friendly and energy saving product. It can help people enjoy cooling freely and economically in areas where there is a shortage of power supply or there is a problem of high electricity rates.

TECHNICAL FEATURES

Poweregion solar air conditioner adopts the Full DC (6 DC components) and inverter technology, which greatly improves the reliability and efficiency of the solar air conditioner.

- Low power consumption and high energy saving efficiency
- Variable speed air compressor to achieve soft starting and quick cooling / heating
- Wider working frequency and voltage range
- Silent operation with low noise level
- Booster and MPPT controller are integrated in the solar air conditioner controller
- Safety protection arrangements included

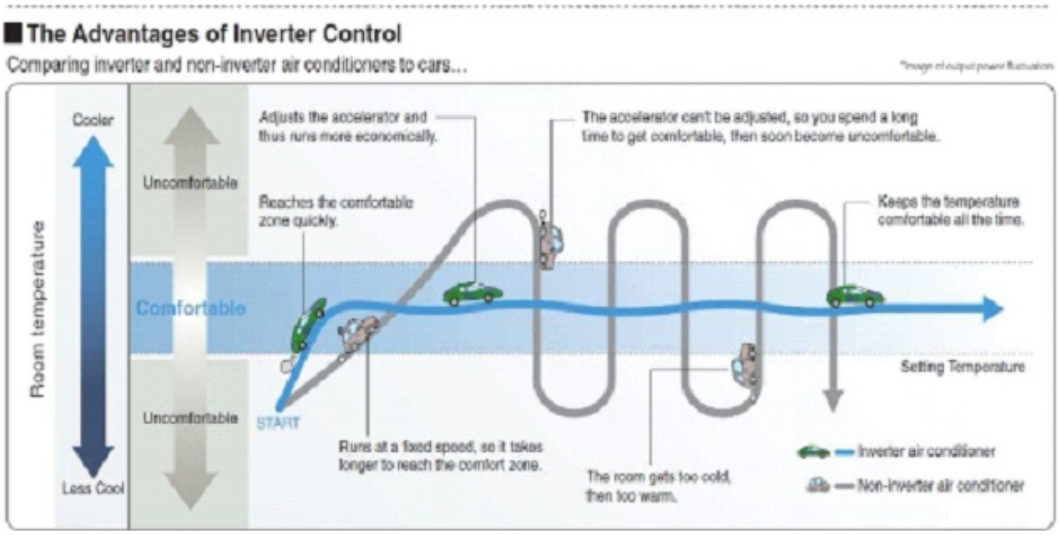
SPLIT INVERTER AIR CONDITIONER

POWEREGION split inverter air conditioner adopts the ACDC auto balance of power and inverter technology, which greatly improves the reliability and efficiency of the air conditioner.

- PRSAC-12K
- PRSAC-18K
- PRSAC-24K
- PRSAC-30K
- PRSAC-36K

DC Inverter Aircon has two distinct advantages over non-inverter AC

- **Fast cooling & heating to reach the desired temperature quickly.**
- **Steadily maintain operating temperature with minimal fluctuation**



DUCTED TYPE SPLIT INVERTER AIR CONDITIONER

POWEREGION Light commercial duct type inverter units are designed and manufactured to meet the requirements of the home, office, hotel and others public occasion use.

- PRDAC-18K
- PRDAC-24K
- PRDAC-36K
- PRDAC-48K
- PRDAC-60K

HYBRID SOLAR AIR CONDITIONER SYSTEM

In hybrid solar air conditioner system, the air conditioner is powered by solar energy and grid power is used as the backup power. In the daytime, the system draws power from the solar panels as the preference and when the solar power is not sufficient to satisfy the needs of the air conditioner, the grid power complements. At night, the system is driven by grid.

POWEREGION solar air conditioner utilizes solar energy as the power source and is an environmentally friendly and energy saving product. It can help people enjoy cooling and heating freely and economically in areas where there is a shortage of power supply or there is a problem of high electricity rates.

- PRSAC-12K
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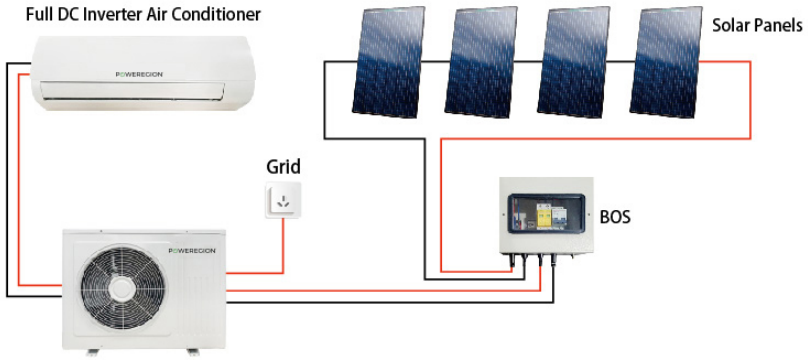
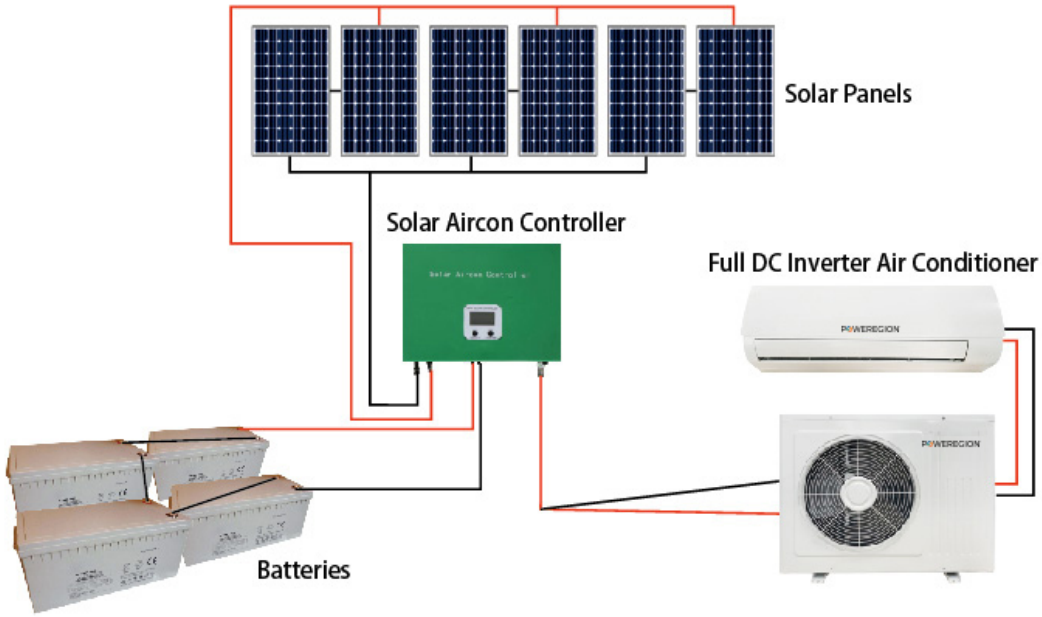


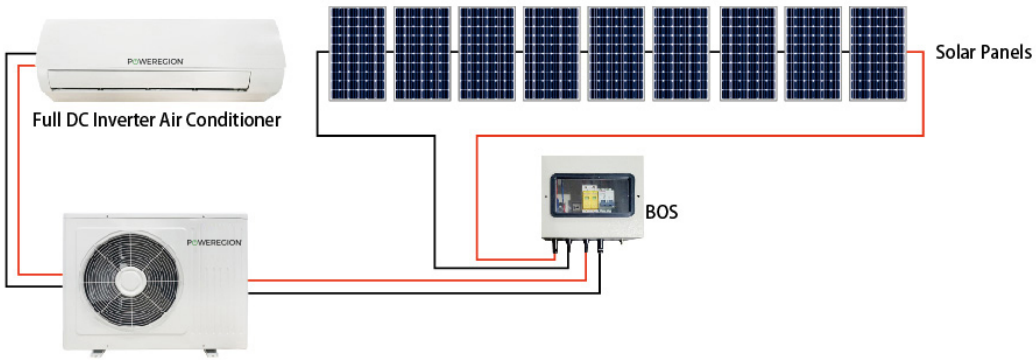
OFF GRID SOLAR AIR CONDITIONER SYSTEM

In off grid solar air conditioner system, the power generated from the solar panels drives the solar air conditioner and charges the battery bank for backup at the same time. The MPPT controller serves the purpose of both controlling and boosting 48V voltage of the battery to 310V DC for the DC inverter air conditioner. The power stored in the battery bank is used for the solar air conditioner at night.



PURE SOLAR AIR CONDITIONER SYSTEM

In pure solar air conditioner system, the air conditioner is powered by the solar panel array when solar radiation is strong enough, which should generally be higher than 750W/M2. When solar radiation is lower than 700W/M2, the solar air conditioner switches off Fan mode and changes to Cooling mode automatically when the solar radiation becomes strong enough.



SOLAR PUMPS

In pure solar air conditioner system, the air conditioner is powered by the solar panel array when solar radiation is strong enough, which should generally be higher than 750W/M2. When solar radiation is lower than 700W/M2, the solar air conditioner switches off Fan mode and changes to Cooling mode automatically when the solar radiation becomes strong enough.

Advantages

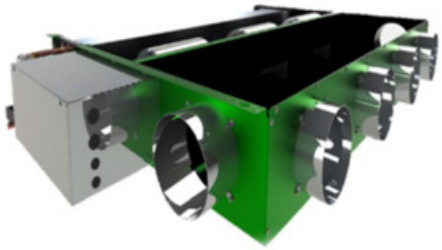
- Full stainless-steel impeller centrifugal pump for big flow and full stainless-steel helical rotor pump for high lift. Longer operation life.
- Highly efficient DC brushless motor requires less solar array. Rich social benefits.
- Highly efficient semiconductor device used in main circuit. High reliability. Up to 98% conversion efficiency of inverter.
- Independent intellectual property of dynamic VI maximum power point tracking (MPPT) algorithm. Fast response and good stability. 99% MPPT efficiency.
- Fully automatic operation. Complete protection functions. Integrated with water level monitor to prevent overflow and dry running.
- Full aluminum alloy case. IP52 protection grade. Ambient temperature: -20 / +60°C

MPPT HYBRID CONTROLLER

Features

- High efficiency MPPT control algorithm, MPPT efficiency ≥99.5%, whole machine, conversion efficiency up-to 98%;
- Input PV voltage: 90-340Voc
- MPPT range: 80-320Voc
- Output voltage range: 280-360VDC
- Digital display like: model No., PV input voltage, PV input current, output DC voltage, output DC current, working status and so on.

EC / BLDC / DC MOTOR & FAN



In the region, we all know that more than two thirds of total energy consumed by a facility is by HVAC in buildings. As utility costs continue to rise, todays building owners are looking for ways to conserve energy without compromising on Indoor air quality into their buildings

Generally, HVAC air distribution is achieved through use typically of external alternating current motors, linked to a fan to provide air movement & ventilation.

EC/BLDC/DC (electronically commutated/brushless direct current/direct current) fans offer the use of the latest brushless motor technologies, benefitting from minimal motor losses which power the latest aero foil designed fans. With the fan capable of providing fully variable 0-100% or 0-10V air flows to match that required for cooling, as opposed to current summer peak constant volumes irrespective of cooling demands.

Coalescence of motor, fan and controls offering significant improvements in energy consumption to distribute air with longer life cycles and lower maintenance. Additionally, with smaller multiple fans, provides improved distribution, higher efficiency in unit cooling and redundancy level in the event of fan failure with great improvements in noise levels. The value is being able to retrofit worn components (fans) into existing AHU/FCU units and achieving the higher efficiencies and reduced energy consumptions without need, disruption and cost of replacing the complete unit.

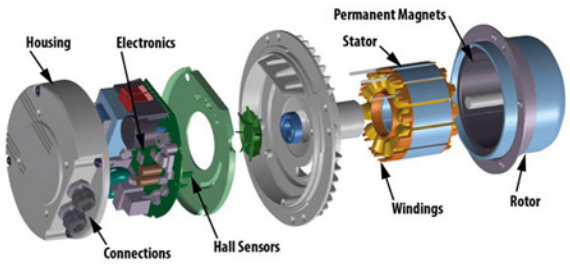
Salient Features

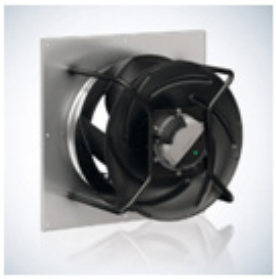
- ECDC Motor Technology
- Adaptor Fan Deck plate to ensure easy installation
- ERP Directive Compliant
- Low Specific Fan Power
- Infinite Fan Speed Control
- Performance at System Pressures Up To 50 Pa
- Independently Established Performance Data
- Lifetime ‘ECO’ filter

Principle

With an EC motor the electronic circuitry stands in lieu of the traditional mechanical commutation meaning the right amount is being supplied in the right direction at exactly the right time providing precise motor control.

- Permanent-magnet brushless DC motor within the rotor
- The stator is driven by electronic switches (which replace the Carbon brushes), controlled by a microcontroller
- Electronic system (hall effect sensor or software is used to recognize the rotor position)
- AC operated (230Volts Single phase or 380/480Volts 3phase, 50/60Hz)





Contemporary Fan Grid System for uniform flow distribution redundant fan system compact & light weight plug & play system.

Benefits

- Energy savings: Minimum power consumption & better efficiency than AC equivalent
- Control: 100% speed controllable, not frequency dependent
- Low motor temperature: for longer lifetime than AC equivalent
- Simplicity: Electronic & power transformation are completely integrated within the motor
- High performance: Speed can be driven up to 3600rpm, one EC fan replace multiple type of motors (2, 4 and 6 pole)
- Easy connection: No complicated wiring and set-up.

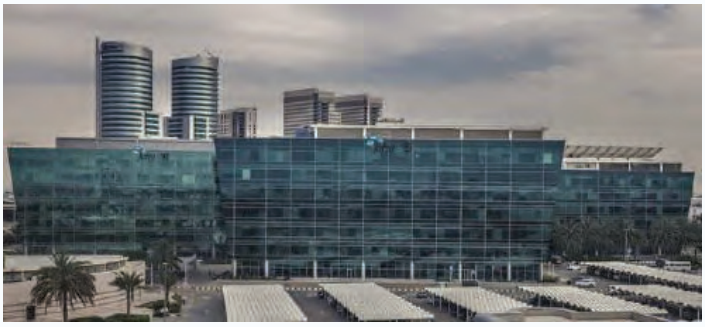
Efficiency

EC technology motors have a near flat efficiency curve which barely varies across the speed range. A range of which is not limited by synchronous speeds or susceptible to voltage variations like its AC counterpart.
Its AC equivalent will operate at a precise point on the curve which equates to its maximum efficiency, either side of this point and the efficiency diminishes.
Typical AC motors have losses in terms of power consumption (copper + iron losses), slippage and frictional losses (mechanical power). EC motor have no slippage losses, reducing losses and increasing efficiency.

CASE STUDIES | DOTS Energy Services

DP WORLD

DP World curbs emissions by 20% by employing diverse measures



Energy performance of DP World was below par when benchmarked with internationally accepted standards. Alarmed authorities appointed ESCO to perform a detailed energy audit which revealed substantial quantum of energy savings potential.

The crucial challenges faced by ESCO during identification & designing of ECMs were the frequent unlikely renovations undertaken by client within the facility which proved to be technically demanding.

Both energy audit & solution implementation was to be carried out without disturbing the facility operations. Project also included supply, installation, testing, commissioning along with operational verification of the BMS with energy management dashboards.

THE SOLUTION

Performing instantaneous measurements, logging activities, understanding operational philosophy, maintenance strategies and occupant feedback gathered during the survey assissted the ESCO to formulate below measures

- Implementation of Integrated BMS
- Optimisation of chilled water pump operation
- Installation of Chiller Plant Manager for demand based auto operations
- Replacement of in-efficient lighting to more efficient LED luminaires with occupancy/motion based operations
- Shifting from manual to automated operations with appropriate setpoints, operating schedule & night set back modes for FAHU, AHU & FCUs
- Installation of PMU (Phasor measurement) for continous Energy Management for monitoring & targeting
- Training & awareness Program (CSR Initiative)

BACKGROUND

The facility located in JAFZA was commissioned in 2010. The office has dynamically changed over the years with internal renovations being executed. The main energy guzzler being the chiller plant had inappropriate controls which led to in-efficient operations. Load side equipment also performed in-efficiently & in manual mode.

BUILDING SPECIFICATIONS

Typology	Office
Location	JAFZA, Dubai, UAE
Age	9 Years
Building Configuration(m^2)	G+6+Roof (~3500)
Major Equipment/System	Air cooled chiller Constant Primary+variable secondary CHW pumps FAHU AHUs with VAV FCU Lighting

THE RESULTS

Building retrofit concluded in 2018. Performance of facility in the first reporting period was deemed to be satisfactory with 20% avoidance of cost & energy.

Estimated Energy Avoidance: 8415 MWh
Estimated Cost Avoidance: 3.7 Mn AED
Estimated Annual Savings: 20%
Estimated Carbon Reduction: 5470 Tons

Solution implementation saves the below equivalent GHG emissions from

Greenhouse gas omissions from

1,263	14,549,329
Passenger vehicles driven for one year	Miles driven by an average passenger vehicle

CO_2 emissions from

669,593	584,546	1,038	32.5
Gallons of gasoline consumed	Gallons of diesel consumed	Homes' electricity use for one year	Railcar's worth of coal bured

CASE STUDIES | DOTS Energy Services

Energy Retrofit Program promises EMPOST a handsome 15% of annual savings

THE CHALLENGE

EMPOST was concerned with high energy bills & the management wanted to operate & maintain the facility in a more sustainable manner. All the system/equipment operated manually irrespective of the demand. Our team conducted a detailed survey and came up with the most technically feasible & economically viable solutions with prime objective to not disturb the operations, indoor environmental quality & occupant comfort. Project was to be deployed with latest IOT & Central retrofit methods.

THE SOLUTION

A performance evaluation along with a survey of the system/equipment was carried out which lead to the design of ECMs listed below.

- Installation of Demand control ventiallation for AHUs
- Implementation of BMS
- Installation of Chiller Plant Manager for demand based auto operations
- Replacement of 3 way to 2 way CHW Valves
- Installation of VFDs on Chilled water pumps with index point DP sensor
- Installation motion/occupancy based sensors for lighting
- Installation of CO sensors for car park ventilation fan operation
- Shifting from manual to automated operations with appropriate setpoints, operating schedule & night set back modes for various equipment/system
- Digital metering for continous energy management for monitoring & targeting
- Training & awareness Program (CSR Initiative)

BACKGROUND

A typical office located in Al Ramool with varied operating hours. BMS retrofit was undertaken as a part of the client's sustainability policy. The ultimate goal was to have an optimized performance of all the equipment in the facility with automatic operation based on the demand variation.

BUILDING SPECIFICATIONS

Typology	Offices
Location	Al Ramool, Dubai, UAE
Age	10 Years
Building Configuration(m^2)	B2+B1+G+3F+Roof (3672)
Major Equipment/System	Air cooled chiller Constant Primary+variable secondary CHW pum AHUs with VAV Ventilation fans Transfer & Booster pumps

THE RESULTS

The solutions implementations was carried out by us which concluded in July 2019. An estimated 15% savings was the outcome based on baseline period condition. Operational verfication was performed by a reknowned Sustainability consultant and ensures that the reqiurement was met.

Estimated Energy Avoidance: 1563 MWh
Estimated Cost Avoidance: 690,000 AED
Estimated Annual Savings: 15%
Estimated Carbon Reduction: 1016 Tons

Solution implementation saves the below equivalent GHG emissions from

Greenhouse gas omissions from

235	2,701,704
Passenger vehicles driven for one year	Miles driven by an average passenger vehicle

CO_2 emissions from

124,339	108,546	193	6
Gallons of gasoline consumed	Gallons of diesel consumed	Homes' electricity use for one year	Railcar's worth of coal bured

CASE STUDIES | DOTS Energy Services

كلّيـــات التقنيـــة العليـــا
HIGHER COLLEGES OF TECHNOLOGY

Al Ain Colleges reduce energy consumption by upto 50% by IOT enabled optimised operations

THE CHALLENGE

With unreasonably high energy consumption and unusual operational practices, measures were to be designed. The major challenge was that ECMs are to be incorporated without disturbing the college routine operations.
Project comprised of Installation, testing & commissioning of a fully functional EMS (Energy Management System).

THE SOLUTION

After conducting a performance evalutaion on the controls systems, our team identified the best cost-effective solutions that could be implemented with least time & cost implications

- Installation of energy meters for energy management
- Replacement of standalone thermostats with communicating type
- Implementation of new Building Management System
- Fully automated operations with operation schedule & extensive setpoints (based on application/activity levels) for AC units with night setback mode
- Customised operating schedule for AC units during Ramadan & other national holidays
- Training & awareness Program (CSR Initiative)

BACKGROUND

The facilities located in Al Ain which are aged over 2 decades underperformed with annual energy consumption for both HCT for Men & Women being exorbitantly high with non-operational BMS and diverged operational philosophy and maintenance strategies

BUILDING SPECIFICATIONS

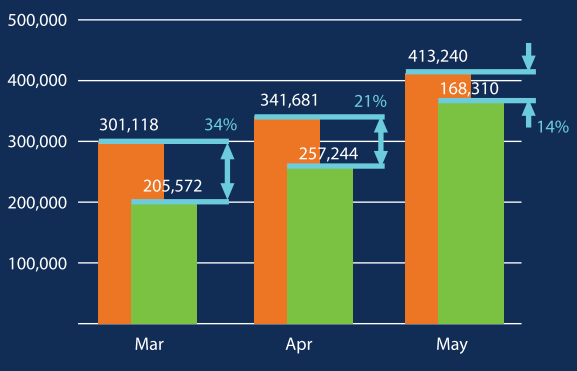
Typology	Education
Location	Al Ain, UAE
Age	22 Years
Building Configuration(m^2)	G+3F+Roof
Major Equipment/System	MDB-6 nos. Package units DX Units Ventialtion fans Window DX BMS Tridium Niagara

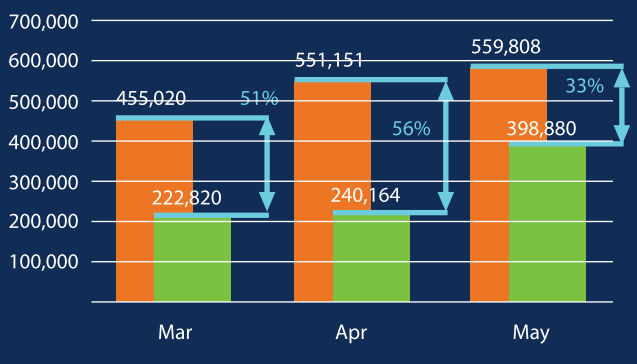
THE RESULTS

After the EMS was installed & commissioned as per project requirement, a month on month kWh comparison of baseline & reporting period was carried out to understand the performance, as illustrated.

Annual Energy Savings : 35% (Avg)
Annual CO2 Reduction : 2884 Tons (Avg)

Solution implementation saves the below equivalent GHG emissions from





CASE STUDIES | DOTS Energy Services

IFFCO gets rid of utility expenses by 35% with a new Centralised Control & Monitoring System

THE CHALLENGE

Industrial energy efficiency program is one of the biggest challenges as downtime incurs immense amounts of monetary loss.
A detailed energy audit revealed significant oppurtunities for energy savings as all the AC units operated as stand alone units without any appropriate setpoint & operating schedule. Introducing a centralised system for control of AC units would not only result in electrical savings (fan power) but also chilled water consumption eventually reducing the load on the variable speed compressors and condensers. Introducing apt setpoints & a time program resulted in optimising the demand without compromising on indoor environmental quality, occupant comfort & materials & processes

THE SOLUTION

Replacement of all stand alone FCU/AHU controllers with communicating type which connects to the centralised system.

- Overhauling of in-efficient compressors & damaged condenser coils replacement
- Installation of VAV system for Air handlers
- Installation of Building Management System
- Installation of programmable thermostats in all the areas with lock feature to prevent override of BMS command
- Increasing temperature setpoints from unusally low to optimum range based on activity/zone/utility
- Shifting operations from manual to auto in all areas with night set back modes for unoccupied areas
- Installation of Digital Energy meters for performance monitoring & targeting
- Training & awareness Program (CSR Initiative)

BACKGROUND

A food processing industry with typical non-stop operations with major loads such as ammonia based industrial refrigeration system with variable speed compressors, for cold storage & space airconditioning with FCUs & AHUs on the load side were not operated in an energy efficient manner.

BUILDING SPECIFICATIONS

Typology	Industry (Food Processing)
Location	Industrial Area#1, Sharjah, UAE
Age	16 Years
Building Configuration(m^2)	G+M+1
Major Equipment/System	Fan Coil Units Air Handling Units Ammonia Compressors (Industrial refrigeration & Air conditioning)

THE RESULTS

An analysis was carried out considering the benefits with associated costs and the best fit solutions were implemented which yielded the below.

Estimated Energy Avoidance: 545 MWh
Estimated Cost Avoidance: 240,000 AED
Estimated Annual Savings: 35%
Estimated Carbon Reduction: 355 Tons

Solution implementation saves the below equivalent GHG emissions from

Greenhouse gas omissions from

81.8	942,292
Passenger vehicles driven for one year	Miles driven by an average passenger vehicle

CO_2 emissions from

43,366	37,858	67.2	2.1
Gallons of gasoline consumed	Gallons of diesel consumed	Homes' electricity use for one year	Railcar's worth of coal bured

PROJECT REFERENCES

RTA CENTRAL BUILDING MANAGEMENT SYSTEM

The project was done under for integrating the IBMS for multiple RTA buildings to one common platform and provide remote monitoring and controlling options for the individual buildings from a single location. Project has gone to next level of development with capabilities such as critical assets monitoring and data analytics using some of advance solution build over a period of time.

BEEAH – SMART WASTE MANAGEMENT

The project was done with Beeah – SHARJAH ENVIRONMENTAL MANAGEMENT for their fleet of massive mobile assets. The project involved implementation of the latest M2M technologies to provide the user with onboard diagnostics data, critical alarms and runtime summary of all their mobile assets on a single web based platform and android/iOS platforms. The critical alerts were also escalated by SMS and emails to the end user.

SEALED AIR – CHEMICAL PLANTS

The project was done with Sealed Air team for remote monitoring and history logging of their chemical plants. The project involved installation of sensors and interfacing with the controllers to make available to the user the real time data and view critical alarms. The system also provided the user with escalations for alarms, the logging for history data and reports.

PROJECT REFERENCES

ENGINEER'S OFFICE – CRITICAL ASSETS REMOTE MONITORING & REPORTING SERVICES

The project scope consisted of Supply, configuration, testing and maintenance of the Interfacing, remote monitoring for critical equipment's especially HVAC and backup systems, lighting etc. We deployed a real-time critical asset monitoring system to help giving notification to drive business continuity efficiencies within its portfolio of various assets.

DP WORLD - ENERGY MANAGEMENT SERVICES

The project scope consisted of Supply, configuration, testing and maintenance of the Interfacing, Energy Management and remote monitoring and control systems for Building equipment's especially HVAC and Lighting. The project consisted of using of a variety of platforms and industry standard protocols like BACnet, Modbus RTU/TCP, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT. The system was also able to provide data for monthly reports and manage and control energy consumption.

ENGINEER'S OFFICE – CRITICAL ASSETS REMOTE MONITORING & REPORTING SERVICES

The project scope consisted of Supply of Energy Platform, configuration, testing and maintenance of the Interfacing, Energy Management and remote monitoring and control systems for Building equipment's especially HVAC and Lighting. The project consisted of using of a variety of platforms and industry standard protocols like BACnet, Modbus RTU/TCP, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT. The system was also able to provide data for monthly reports and manage and locally control unnecessary energy consumption.

PROJECT REFERENCES

EMAAR PROPERTIES – SMART LIVING AND HOME AUTOMATION SERVICES

The project included the installation and maintenance of Smart Home and Alert Management systems for multiple villas in the upscale Arabian Ranches community. The smart home systems provided the users with a luxurious lifestyle while the alert management systems allowed the user to remotely view and control the equipment in the house from anywhere in the world and also receive alerts for any security breach or any alert events.

AL BARARI – SMART LIVING AND HOME AUTOMATION SERVICES

The project included the installation and maintenance of Smart Home and Alert Management systems for multiple villas in the upscale Al Barari community. The smart home systems provided the users with a luxurious lifestyle while the alert management systems allowed the user to remotely view and control the equipment in the house from anywhere in the world and also receive alerts for any security breach or any alert events.

AL FAJER PROPERTIES – INTEGRATED BUILDING OPERATIONS AND ENERGY SERVICES

The project scope consisted of Supply of smart integration Platform, configuration, testing and maintenance of the Interfaces, Asset sequence management and control systems for Building equipment's especially HVAC, CCTV, Access control, Gate Barrier, Extract Fans, and Lighting Controls. The project consisted of a central soft layer and industry standard protocols used such as BACnet, Modbus RTU/TCP, CCN, SNMP, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT. The system was also able to provide data for monthly reports and manage and locally control for optimum operations strategy.

PROJECT REFERENCES

UNION NATIONAL BANK – SMART SECURITY SYSTEMS

The project scope consisted of Supply of smart access control platform, configuration, testing and maintenance of the Interfaces. The project consisted of using of a variety of platforms which integrated to a central soft layer for optimum operations strategy & control.

MACE MACRO – SMART SECURITY SYSTEMS

The project scope consisted of Supply of smart integration Platform, configuration, testing and maintenance of the Interfaces, Asset sequence management and control systems for Building equipment's especially HVAC, CCTV, Access control, Gate Barrier, Extract Fans, and Lighting Controls. The project consisted of a central soft layer and industry standard protocols used such as BACnet, Modbus RTU/TCP, CCN, SNMP, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT. The system was also able to provide data for monthly reports and manage and locally control for optimum operations strategy.

EQUIPMENT SYSTEMS MANUFACTURE PLANT, UNITED KINGDOM (UK) - SMART FACTORY AUTOMATION

The project was done for an Equipment Systems Manufacture Plant. The project scope consisted of Supply, configuration, testing and maintenance of the Interfacing and remote monitoring and control systems for industrial machines. The project consisted of using of a variety of platforms and industry standard protocols like PLC SCADA SYSTEMS, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT, OPC and BACnet.

PROJECT REFERENCES

DUBAI AIRPORT, T3 : SMART AIRPORTS

The project is ongoing with Dubai airport to have a better data analytics platform towards their green airport initiate. The project scope consisted of Supply, configuration, testing and maintenance of the Interfacing and data analytics. The project consisted of using of a variety of platforms and industry standard protocols like PLC SCADA SYSTEMS, CUSTOMIZED DRIVERS AND INTERFACE DEVELOPMENT, OPC and BACnet.

COMPAIR (OEM) – SMART MACHINES AND DATA ANALYTICS

The project was done with Garden Denver team for remote monitoring and history logging of their industrial compressor plants. The project involved installation of sensors and interfacing with the controllers using industrial standard protocols like Modbus to make available to the user the real time data and view critical alarms. The system also provided the user with escalations for alarms, the logging, data analytics for hsitory record and reports.

WATERFRONT, DUBAI MARINA – SMART LIVING AND HOME AUTOMATION WITH INTEGRATED BMS

The Waterfront is a premier development at Dubai Marina. This super-luxury 20-storey apartment tower ranks as the world's first fully e-Enabled residential tower due to its engineering architecture, wherein the automation is made up from the grassroots level. All the 71 residential units installed with the e-Enabled Home Automation Systems are integrated with the Building Management System (BMS) creating a „Total Transparent Building". DOTS community-based B2C Portal will provide virtual shopping for all requirements of the home like procurement of food, milk, grocery, pay bills etc.

PROJECT REFERENCES

AL AIN ROTANA HOTEL – SMART HOTEL AND GUEST ROOM AUTOMATION SYSTEM

DOTS state-of-the-art Guest Room Automation System for Al Ain Rotana hotel consisting of smart bed side consoles from where guests can operate all the lights in the room, switch the air-conditioning on or off, increase or decrease the temperature set point, select the fan speed, view the temperature in the room, set wake up call, call the butler and other room services. The bed side console also provides a master switch to switch off all the lights with a touch.

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