



ENERGY EFFICIENCY STUDY

of

Government Buildings in Saint Vincent and the Grenadines

2nd Caribbean Sustainable Energy Forum (CSEF-2)



*June 21st – 25th, 2010
Rose Hall Resort & Spa
Montego Bay
Jamaica*



Presented by: Leonard Deane
Director, Energy Unit
Prime Minister's Office



Purpose of Presentation

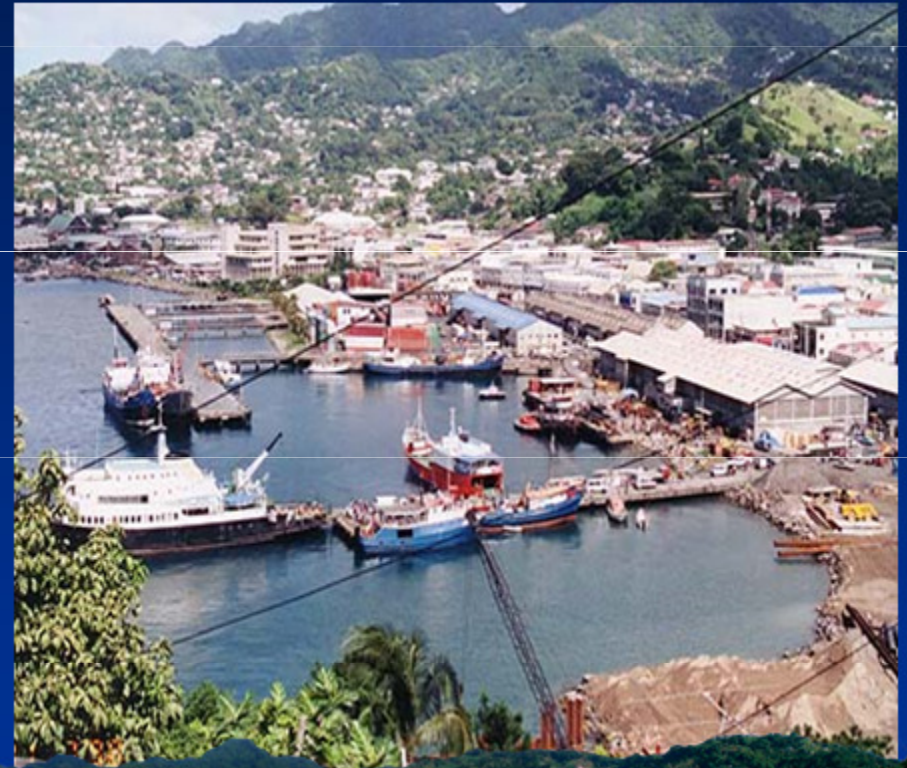
To highlight the context of the energy efficiency study of Government/Public buildings being implemented in St. Vincent & the Grenadines (SVG) and to share the preliminary findings and experiences of the project to date.





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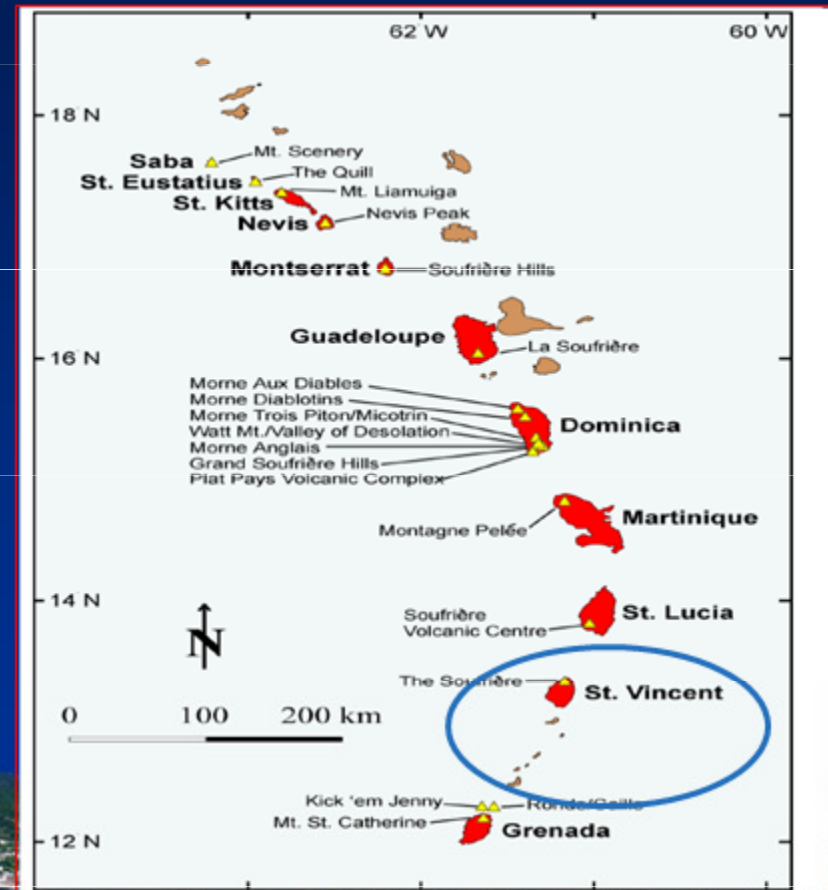
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Country Background

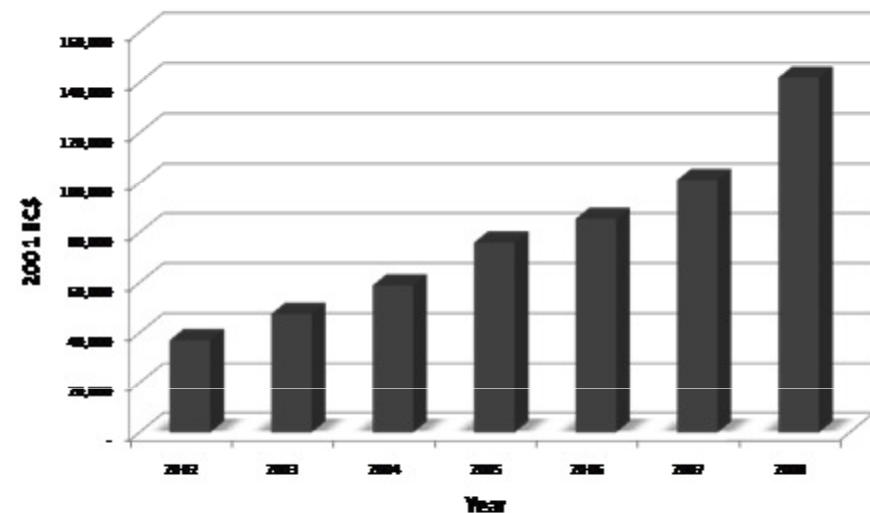
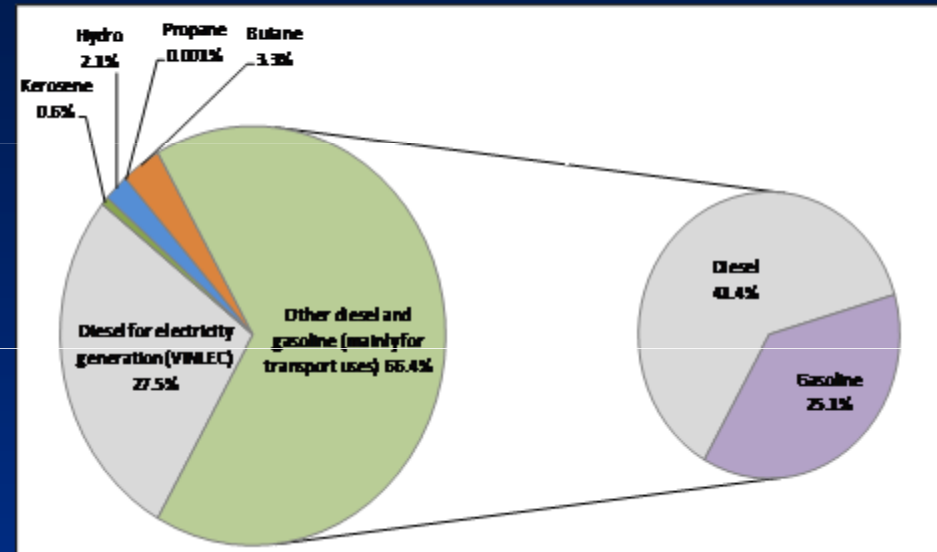
- St Vincent & the Grenadines (SVG) is a multi-island nation located within the southern part of the Lesser Antilles island arc
- SVG is about 160 km west of Barbados, 110 km north of Grenada & about 300 km north of Trinidad
- St. Vincent is the largest of the 32 islands and cays that make up the multi-island nation of SVG





Current Energy Situation

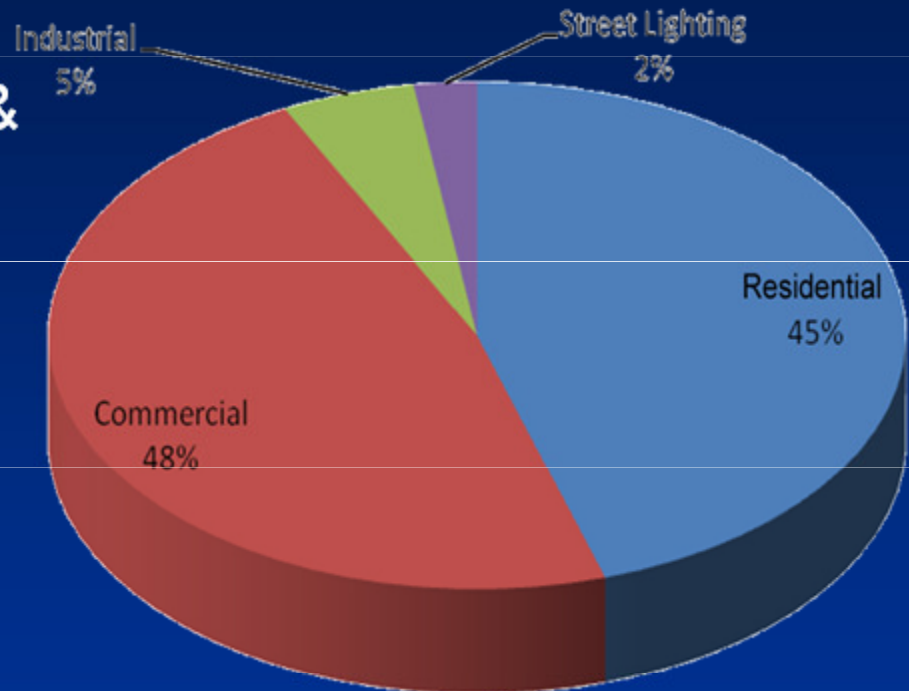
- SVG is heavily dependent on imported petroleum products for electricity, transportation, cooking & other energy needs
- SVGs energy mix is about 96% petroleum base and about 3% hydro power
- All islands except St.V depend entirely on diesel generation for their electricity supply.
- On St.V 80% of electricity produced from diesel & remaining 20% from hydro generation





Current Energy Situation

- Electricity consumption is dominated by the domestic & commercial sectors (incl. Government buildings)
- Domestic consumers represent 88% of the consumer base while commercial & industrial are 11% & <1% resp.
- Commercial & industrial together consume about 53% of electricity



Energy Consumption by Sector





Project Rationale

- The GoSVG in response to high energy prices adopted a National Energy Policy & an Energy Action Plan (EAP) which elaborate strategies, *inter alia*, to reduce the country's dependence on imported oil
- The energy efficiency policy goal of the EAP is to reduce projected electricity generation by 5% by 2015 & by 15% by 2020
- EAP identifies 9 actions to achieve this goal including energy efficiency improvements in public buildings





Project Rationale

- Gov't buildings on average consume US\$4 M per annum in electricity. In 2008, this figure skyrocketed to US\$5 M!
- Gov't operates more than 100 buildings that consume energy mainly for space cooling & lighting





Project Rationale

- Gov't because they spend significant tax revenue for energy have a particular responsibility to minimize energy use
- Accordingly, the EE study seeks to identify strategies to reduce energy consumption in public buildings





Energy Efficiency Study of Government Buildings
Saint Vincent and the Grenadines



Project Overview

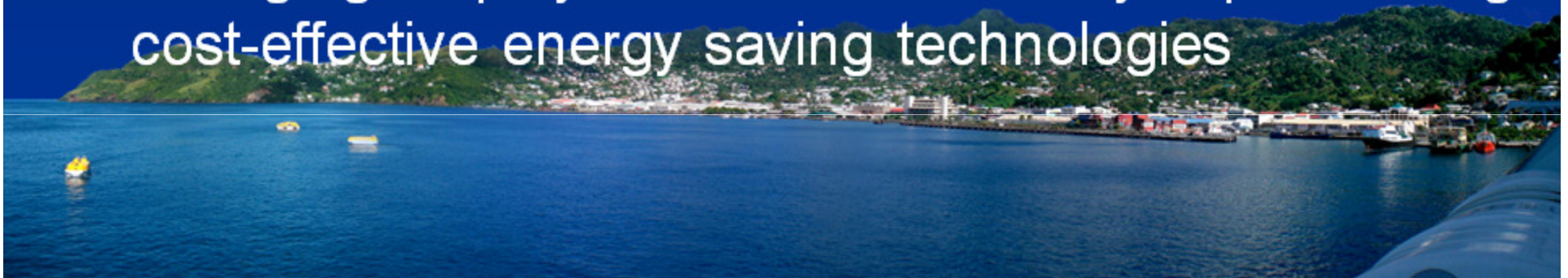
- Funded by the European Union Special Framework of Assistance (SFA) – 2006, €300 K
- Contract awarded to Egis Bceom International of France in December 2009
- Study commenced in February 2010 and is scheduled for completion by October 2010
- Scope of works includes energy assessments of 75 of the highest energy consuming public buildings located throughout SVG





Specific Objectives

- Demonstrate benefits of energy-saving technologies & practices in the Gov't buildings among decision makers responsible for energy related issues
- Provide Gov't employees with information & awareness of energy use in the workplace and how their actions can influence consumption
- Reduce energy consumption in buildings by changing employees' attitudes and by implementing cost-effective energy saving technologies





Specific Objectives

- Reduce energy dependence of Gov't buildings by integrating renewable energy supply options as far as possible
- Provide specifications & estimated costs for the installation of solar photovoltaic systems to generate electricity on Government/Public buildings
- Contribute to the implementation of energy efficiency policy goals and objectives elaborated in the National Energy Policy of the Government of Saint Vincent and the Grenadines





Main Expected Outcomes

- An Energy Conservation Education and Awareness Programme for Gov't employees developed
- Energy Management Action Plans (EMAPs) established for Gov't buildings. EMAPs will detail systematic strategy for first reducing & then controlling buildings' energy consumption pattern
- Energy Audits (data) of each Gov't building upon which EMAPs are based. Energy audits also looking at energy security considerations, emergency preparedness and standby power needs





Main Expected Outcomes

- Assessment of energy supply options for each Gov't building completed with specific emphasis on incorporating energy supplied from on-grid and/or stand-alone RE sources mainly solar (photovoltaic and thermal for water heating) and possibly small wind turbines where applicable.
- A 10-year energy consumption forecast, with & without energy saving devices and RE technologies for each building audited.



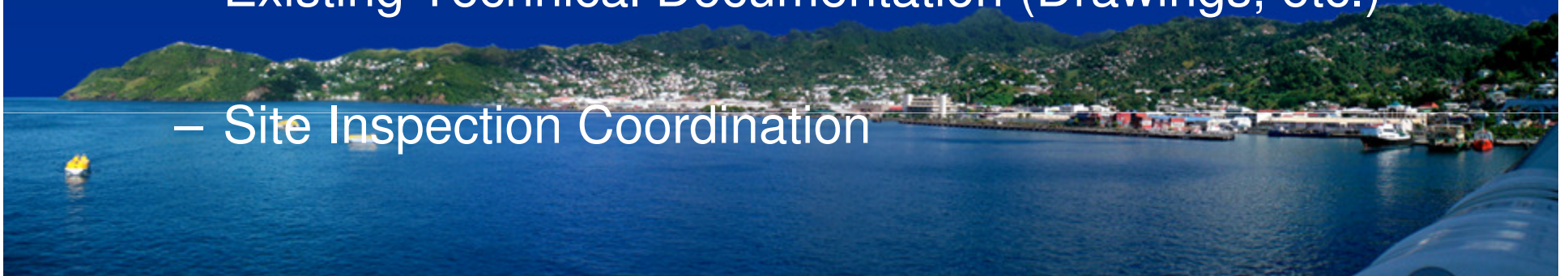


Findings & Experience

(Preliminary)

Client's Responsibilities:

- Building Name/Location Identification
- Historic Energy Consumption Data
- Energy Meter/Account Reconciliation
- Existing Technical Documentation (Drawings, etc.)
- Site Inspection Coordination





Findings & Experience

(Preliminary)

Presented by: Mr. Eaton Haughton
Key Expert Team Leader
Egis Bceom International

EATON H. HAUGHTON, P. E. is the Managing Director of Econergy Engineering Services Ltd., Jamaica's first "Energy Services Company". This company is a multifaceted regional leader in maintenance engineering, energy conservation and alternative energy, from which Caribbean ESCo Ltd. has evolved.

He obtained a U.N.D.P./I.L.O. Fellowship at the International Centre for Advanced Technical and Vocational Training in Italy, where he received a Diploma in Energy Resource Management and Energy Savings.

He is an accepted Member of Engineering Associations such as the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), the Institute of Plant Engineers (Britain), the Association of Energy Engineers (AEE) and also the Jamaica Solar Energy Association, as Charter President.

He has worked as an energy consultant throughout the Caribbean Region for over twenty five years.





Findings & Experience

(Preliminary)

- Breakdown of Government Owned Facilities Visited.
 - Commercial Buildings
 - Hospitals and Clinics
 - Airports
 - Correctional Facilities
 - Food and Fish Processing Plants
 - Schools and Colleges
 - The Prime Minister's Residence





Findings & Experience

(Preliminary)

- Annual (kWh) Energy Consumption
 - Large facilities 180,000 kWh – 2,000,000 kWh
 - Small facilities annual 12,000 kWh – 180,000 kWh

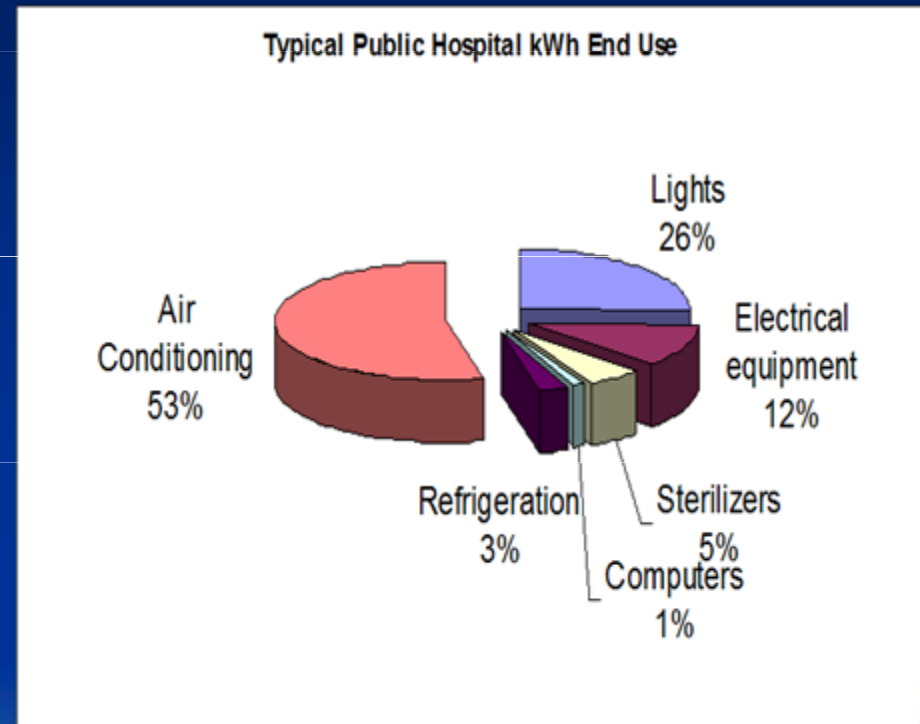




Findings & Experience

(Preliminary)

- Estimated kWh Breakdown of Major Energy End Users
 - Air conditioners 45% - 60%
 - Commercial Facility Refrigeration 60% - 70%
 - Domestic Refrigeration Equipment 15% - 25%
 - Fluorescent Lights 20% - 60%



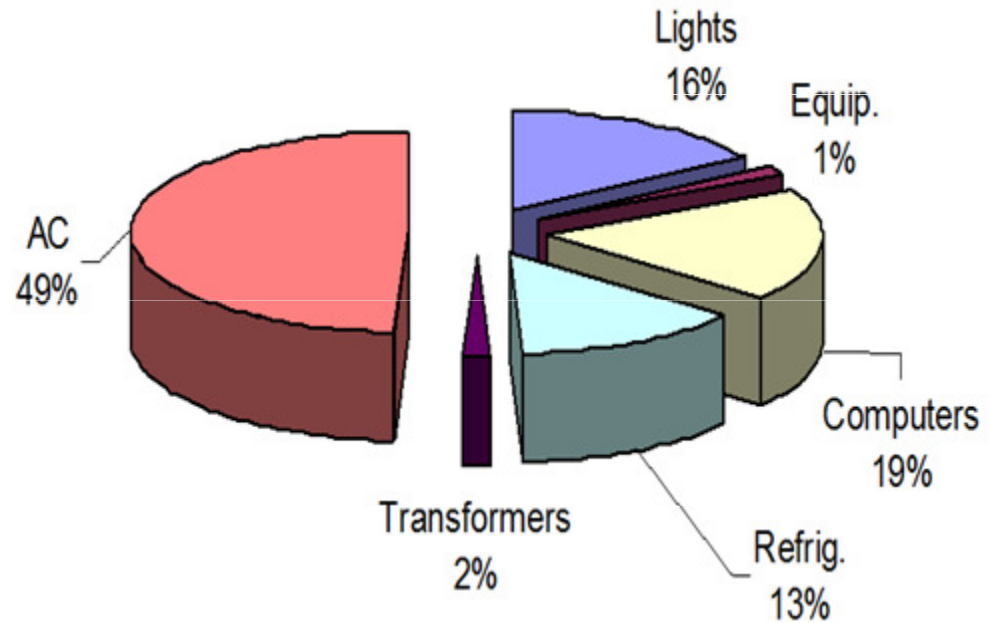


Findings & Experience

(Preliminary)



Typical Office Building kWh End Use Breakdown





Findings & Experience

(Preliminary)

Energy Conservation Opportunities (ECO)

“Soft Measures”

(less than 1- year simple payback period)

- Optimized maintenance and operational activities.
- Real-time monitoring and surveillance programme
- Develop a Computerized Preventive Maintenance Programme
- Carry out thermal scan of electrical panels and motor terminals; effect corrective actions where necessary.
- Service V&AC equipment, especially heat exchange surfaces.
- Change refrigerant from HCFC and HFC to (hydrocarbon) HC
- Install automatic Lighting controls in intermittently occupied illuminated spaces.





Findings & Experience

(Preliminary)

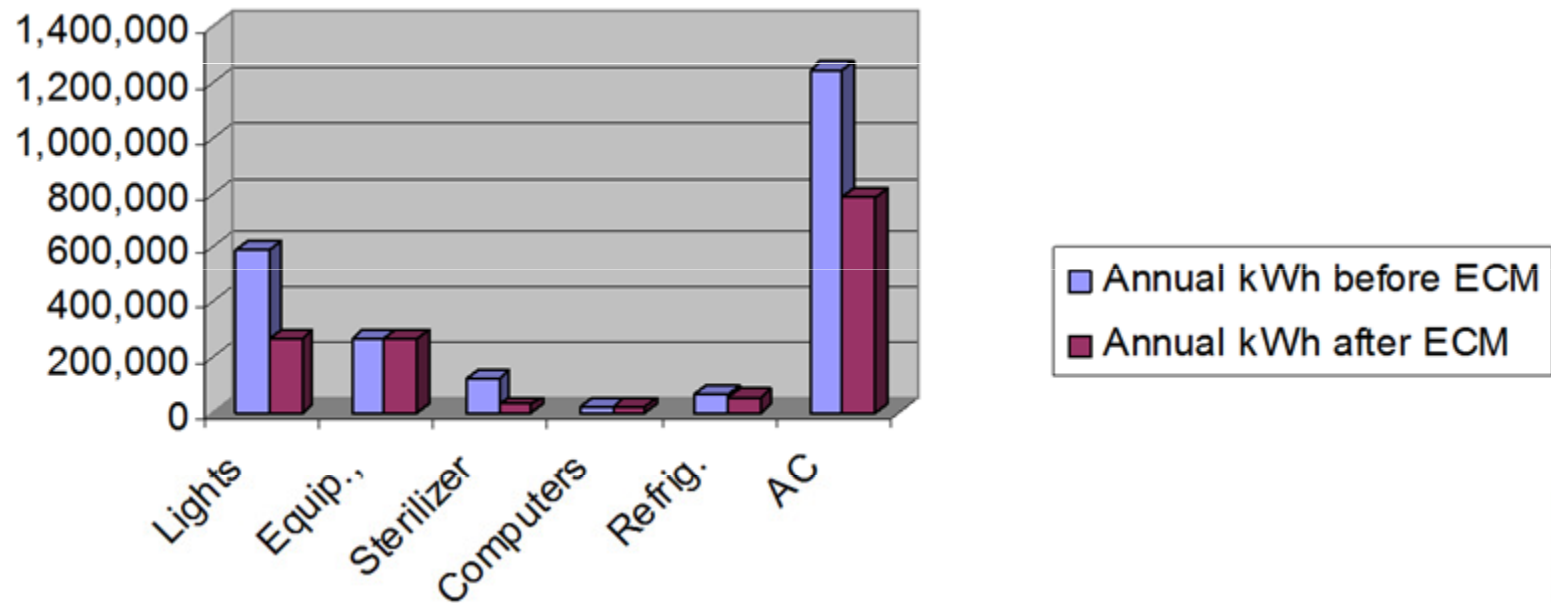
- Short List of Investment Type ECO and Estimated Simple Payback Period (yrs)
 - Install automatic air conditioning occupancy sensor controls. (1.5-2.5)
 - Install solar water heating system (2.0 - 3.0)
 - Install roof Insulation with radiant barrier of foam insulation (1.0 – 4.0).
 - Improve air conditioning EER with new (EER 13) mini-split systems and/or water chiller (EER 15) charged with hydrocarbon refrigerant. (2.5-4.0).
 - Install refrigerant-to-water heat exchanger to produce free domestic hot water. (1.5 – 2.0).
 - Retrofit fluorescent light fixtures with LED strip-lights (3.0 – 4.5).
 - Retrofit fluorescent lamp fixtures having 40-Watts T-12 tubes and magnetic ballasts, to 32-Watts, T-8 tubes and electronic ballasts. (1.5 - 2.5).
 - Install Solar Photovoltaic System (8.0 -11).
 - Install solar air conditioning systems (8).
 - Utilize alternative fuel (LPG) for sterilization process.
 - Cogeneration system (4 – 7)
 - Power factor correction



Findings & Experience

(Preliminary)

Typical Energy End Uses before and After ECM Implementation





The Way Forward

- Complete the SFA Funded EE Study and adopt recommendations of the study
- Develop terms of reference to 'unlock' additional SFA funding (€500 K) for implementation of study recommendations as far as possible
- Work with Gov't buildings' decision makers to implement other recommendations using funds from local budgets and/or other funding source(s)
- Replicate energy-saving strategies to buildings not audited over time

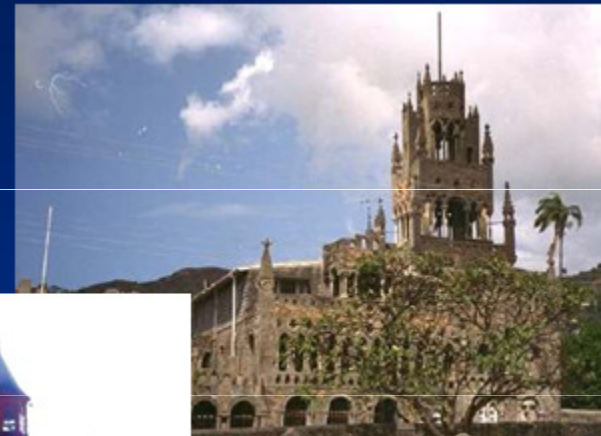




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Q & A



Thank you!

