



# SPOT THE ENERGY SAVINGS OPPORTUNITIES

January 23, 2014





Welcome!

If you are unable to hear audio, please dial in to 1-877-423-6338 and enter 963215 as the participant passcode.



# POWER SAVERS CAMPAIGN



The Organisation of Eastern Caribbean States Secretariat has launched Power Savers, an energy efficiency public education and awareness campaign

Non-domestic campaign elements include

- Three webinars
- Website located on the OECS website
- Three newsletters



# WHY IS THE OECS RUNNING THE CAMPAIGN?



- In 2011, businesses and institutions in OECS member countries spent \$340 million on all fuels
- The median percentage of operating costs represented by energy costs was 10%
- Results showed a large potential for improvement of energy data management practices



# BACKGROUND ON THE WEBINAR SERIES



In response to the survey results, we will be hosting 3 webinars:

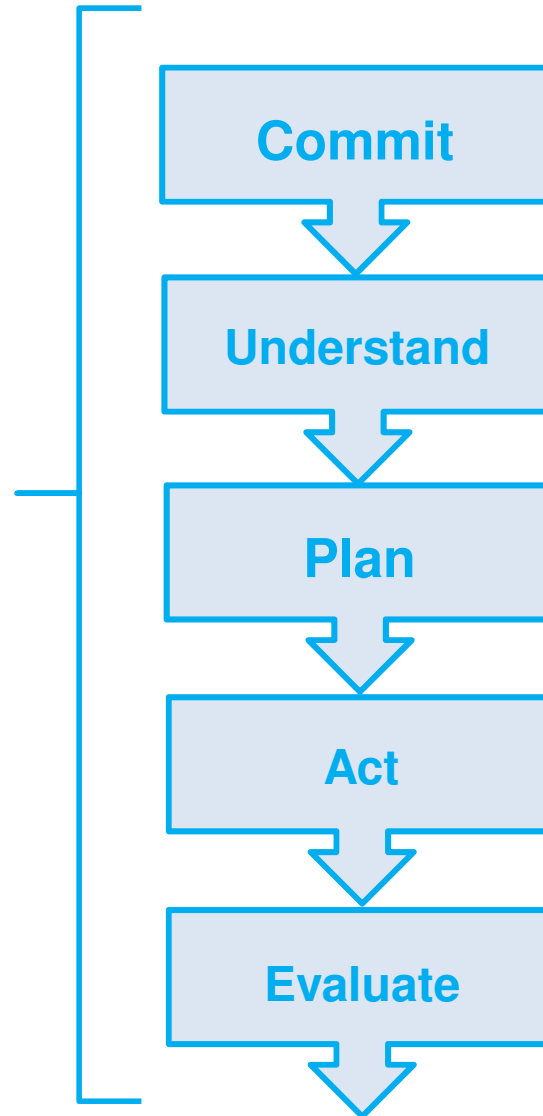
- 1. Energy Performance Assessment (November 2013)
- 2. Spot the Energy Savings Opportunities
- 3. Energy Management Planning (February 2014)



# HOW DO THE WEBINARS FIT TOGETHER?



*Webinar 3: Energy Management Planning Process*



*Webinar 1: Energy Performance Assessment*

*Webinar 2: Spot the Energy Savings Opportunities*



# RECAP: ENERGY PERFORMANCE ASSESSMENT



## Understand Costs

- What is your facility's current energy usage?
- How much does energy cost on a monthly/annual basis?

## Understand When and Where

- What are your facility's major end uses?
- How often and for how long does your equipment operate?

## Compare Yourself

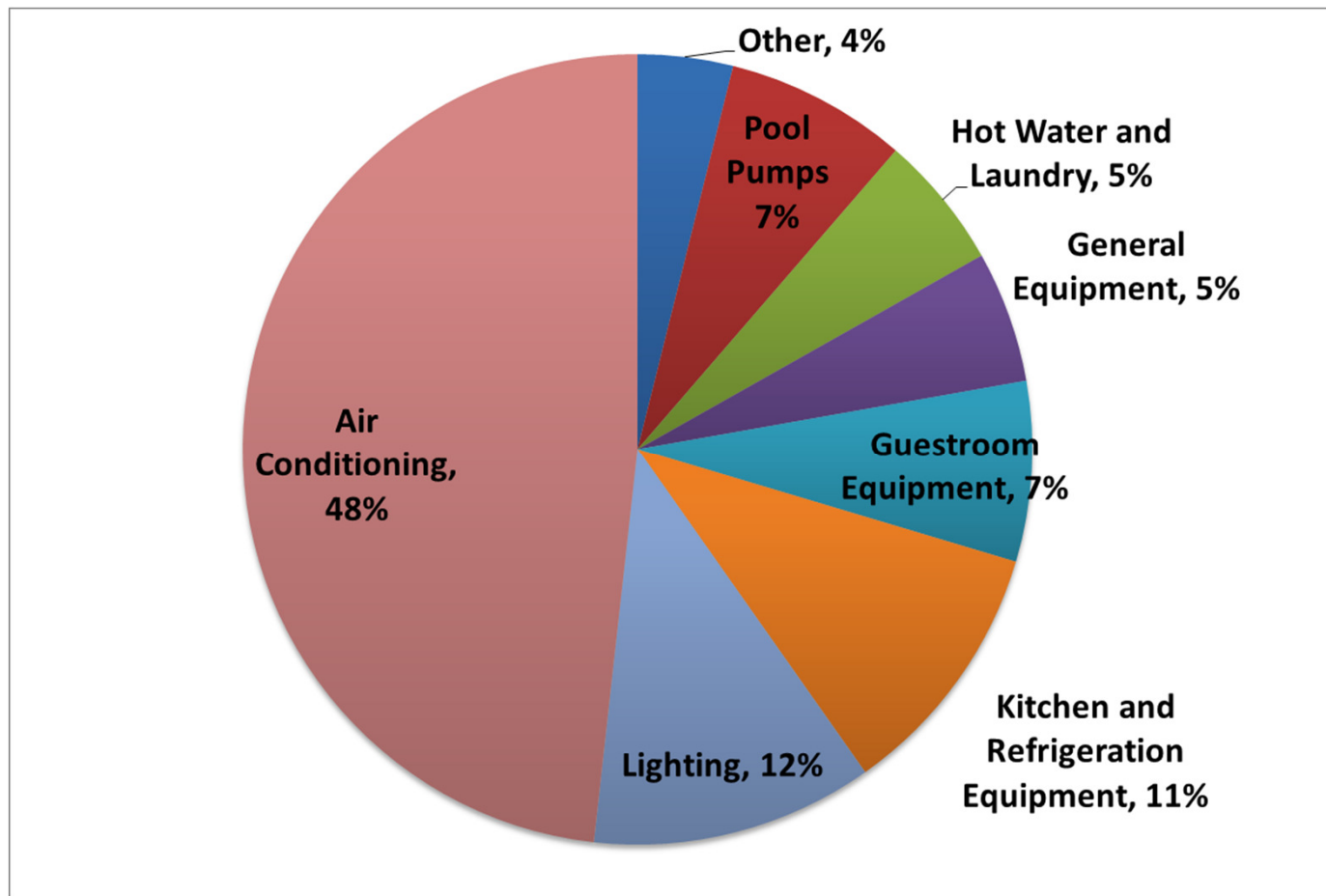
- How does current energy use compare to past use?
- How does your energy use compare to that of its peers?



# RECAP: ENERGY PERFORMANCE ASSESSMENT



## End-Use Profile for a Hotel





# LEARNING OBJECTIVES



## Webinar 2: Spot the Energy Savings Opportunities

- Describe a process for identifying energy savings opportunities
- Identify energy savings opportunities in your facility
- Explain the key components of a financial business case for an energy efficiency investment



# AGENDA FOR TODAY'S WEBINAR



- A process for identifying savings opportunities
- Lighting retrofit opportunities
- Air conditioning retrofit opportunities
- Key elements for developing a financial business case for your energy efficiency projects



# A PROCESS FOR IDENTIFYING ENERGY SAVINGS OPPORTUNITIES



## Eliminate Waste

- Match the operation of equipment to meet the needs of the space
- Example: set back thermostats, install occupancy sensors

## Maximize Efficiency

- Maintenance practices & equipment retrofits
- Example: re-lamp/re-ballast existing light fixtures

## Optimize Supply

- Major equipment replacements & renewable energy
- Example: AC unit replacement, solar hot water heater installation



# LIGHTING



## Checklist of questions to help identify lighting opportunities:

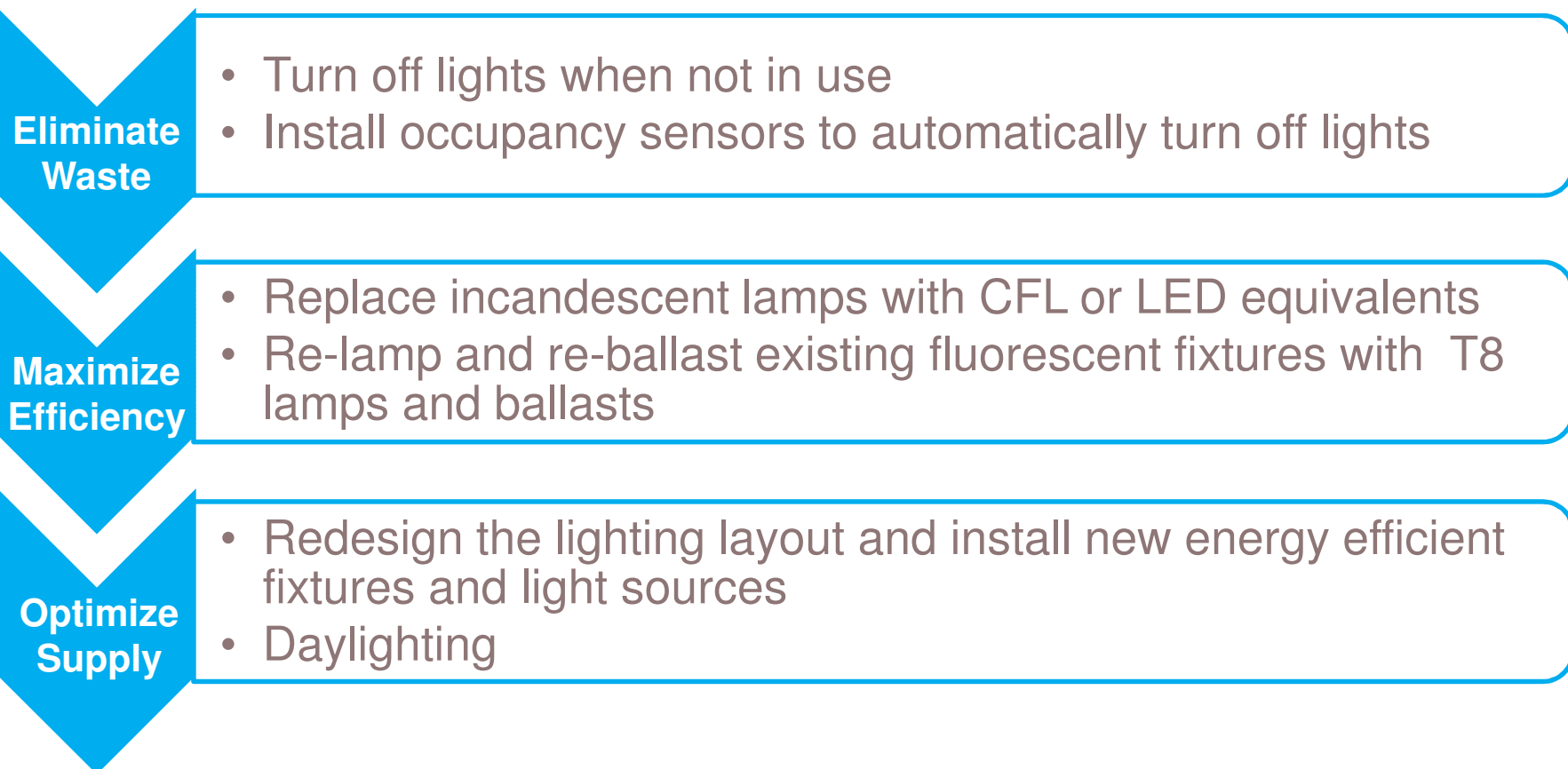
- Are lights on when space is unoccupied?
- Are sufficient switches available?
- Is the light level appropriate for the activity/task?
- Is the light source efficient?
- Is the light fixture at the end of its service life?



# LIGHTING



## Categorize opportunities:



# AIR CONDITIONING



## Checklist of questions to help identify air conditioning opportunities:

- Are windows open in cooled spaces?
- Are blinds closed in unoccupied rooms?
- What is the indoor temperature set to?
- Do thermostats have setback and time scheduling?
- What maintenance is performed on air conditioning equipment?
- Is the air conditioning equipment at the end of its service life?
- Is heat available for recovery?



# AIR CONDITIONING OPPORTUNITIES



## Categorize opportunities:

### Eliminate Waste

- Close blinds and curtains in unoccupied rooms to reduce heat gain
- Raise indoor temperature during unoccupied hours
- Install programmable thermostats

### Maximize Efficiency

- Perform regular maintenance (e.g. clean filters, condensers)
- Install variable frequency drives

### Optimize Supply

- Replace inefficient AC equipment and motors with best-in-class equipment
- Heat recovery for pre-heating hot water



# AIR CONDITIONING OPPORTUNITIES



- Technology profile on Air Conditioning Units in the second edition of the *Power Lines* newsletter
- The technology profile includes a discussion of:
  - Basics of the refrigeration cycle
  - Energy efficiency rating
  - Determining energy consumption and cost





# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



- Many organisations face the challenge of selling projects internally
- Developing a compelling financial business case for your energy efficiency project can help to get support and funding required from management for implementation
- A business case is typically required for a capital intensive project (i.e. not needed for low-cost/operational changes)



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



Sections of a financial business case report:

1. Description of the base case (existing equipment)
2. Description of the upgrade case (proposed equipment)
3. Financial analysis for proposed equipment
4. Impact of proposed equipment on operation and maintenance
5. Estimated service life of proposed equipment
6. Impact of proposed equipment on indoor environment
7. Implementation approach and schedule for installation of proposed equipment



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 1. Description of the base case (existing equipment)

- Provide a description of the existing equipment
- Explain why the existing equipment should be retrofitted/replaced

**Example:** The base case consists of (100) 120 W incandescent pot lamps that run approximately 5 hours/day. One lamp is installed in each guest room of the hotel. The lamps are nearing the end of their lifetime and should be replaced in favor of more energy efficient options.



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 2. Description of the upgrade case (proposed equipment)

- Provide a description of the proposed equipment
- Explain the benefits of the new equipment

**Example:** The proposed equipment consists of (100) 14 W LED lamps. LED lamps consume less energy than incandescent lamps, and also have a much longer lifetime.



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 3. Financial Analysis for proposed equipment

- Calculate annual cost, electricity, fuel and water savings (if applicable)
- Provide an estimate for cost of the upgrade measure
- Calculate financial criteria that drive decision making (e.g. simple payback, NPV, ROI)

### Example:

Annual electricity savings =  $(120 \text{ W} - 14 \text{ W}) \times 100 \text{ lamps} \times 5 \text{ hours/day} \times 365 \text{ days/year}$   
= 19,345 kWh /year

@ \$0.34/kWh, project will save  $\$0.34/\text{kWh} \times 19,345 \text{ kWh/year} = \$6,577/\text{year}$



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



- Simple payback = initial cost / annual savings

## Example:

LED lamps cost \$45 each, so total equipment cost is \$4,500.

Simple payback =  $\$4,500 / \$6,577/\text{year} = 0.7 \text{ years}$



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 4. Impact of proposed equipment on operations and maintenance

- Identify any changes to that will need to be made to existing operations and maintenance practices

## 5. Estimated service life of proposed equipment

- Provide an estimate for the service life of the new equipment

**Example:** There will be a significant reduction in the labour costs associated with annual lamp change out because LED lamps have a much longer lifetime than incandescent lamps. The estimated lifetime of the LED lamps is 13.7 years (25,000 hours x 1 day / 5 hours x 1 year / 365 days = 13.7 years).



# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 6. Impact of proposed equipment on indoor environment

- Identify improvements to guest/employee comfort that will result from the implementation of the upgrade measure
- Could include improved light levels, better indoor air quality

**Example:** The LED lamps will provide a different quality of light, which should be acceptable to employees and guests.





# DEVELOPING A FINANCIAL BUSINESS CASE FOR YOUR ENERGY EFFICIENCY PROJECT



## 7. Implementation approach and schedule for installation of proposed equipment

- Explain how and when the measure will be implemented
- If business case is for a group of measures, identify the measures that should be implemented first and why
- Identify any external support that will be required to implement the project
- Describe plans to measure and verify savings

**Example:** Replacing the incandescent lamps with the LED lamps can be done by the hotel's maintenance staff over the course of one week. No external support will be required to implement the project. Measurement and savings approach will be a pre and post retrofit power measurement.



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# QUESTIONS?



# NEXT WEBINAR TOPIC: ENERGY MANAGEMENT PLANNING



- Energy management program framework
- Why implement an energy management program?
- What is an Energy Management Plan (EMP)?
- Sections of an EMP



# VISIT OUR WEBSITE



For more information on the OECS Power Savers program, visit

[www.powersavers.org](http://www.powersavers.org)



# REFERENCES



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**END SLIDE**

