Energy Efficiency for Sustainable Tourism

Framework, Energy Efficiency, Case Studies and Ideas

Carlos A. Santos Silva
MIT-Portugal Program
Instituto Superior Técnico
SUSTAINABILITY: GENERAL FRAMEWORK
Sustainability

Cultural authenticity

Low environmental impact

Economic benefits

Environment (Technological)

Sustainable

Viable

Bearable

Equitable

Social

Meet present tourism needs and preserve future tourist needs
UN Millennium Goals

1. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
2. Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss
3. Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation
4. By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers
Ecological Footprint

Available in: http://www.footprintnetwork.org
Human Development vs Ecological Footprint

Ecological Footprint
measure of the amount of biologically productive land and sea area needed to
• regenerate the resources a human population consumes
• and to absorb and render harmless the corresponding waste

Human Development Index
Summary average achievements in a country in three basic dimensions:
• a long and healthy life
• access to knowledge
• decent standard of living
Climate Change and Energy

84% of current CO2 emissions (65% GHG) are energy-related
Where to decrease CO₂ emissions?

Source: Energy Technology Perspectives 2010, International Energy Agency
How to decrease CO₂ emissions?

Source: Energy Technology Perspectives 2010, International Energy Agency
ENERGY EFFICIENCY
Energy Conservation and Energy Efficiency

Energy Conservation refers to the reduction in the amount of energy consumed in a process or system, or by an organization or society, through:

- economy,
- elimination of waste,
- rational use.

  Eliminate stand-by is a energy conservation measure
  Using natural light instead of artificial light

Energy Efficiency refers to getting more use out of the same amount of energy source:

- Using more efficient appliances
- Using alternative energy sources
- Using alternative processes
  - Replace light bulbs by fluorescent lights, controlling light intensity
  - Heating hater with solar energy
  - Heating with gas instead of electricity

- Using at alternative schedules
Energy in Tourism (Hotels, Restaurant)

- Energy costs represent a significant share of operation costs
  - 4% to 10% of revenue (depending on geography, type of lodging, dimension)
  - ~ 30% potential of savings
How much does it cost? (US)

Source: Global GHG abatement curve, McKinsey
Average price of avoided energy consumption is the industrial price. £30.65/kWh/yr represents the highest regional electricity price used in the study (just based on AEO10 and future construction costs).

How much does it cost? (PT)

Data PPEC/ERSE Processment CEEETA-ECO Source: ENERGYIN
Energy Efficiency Measures in Buildings (PT)

Data PPEC/ERSE Processment CEEETA-ECO Source: ENERGYIN
The role of ICT
Using at different hours
Using at different hours

- Energy savings: 0%
- Cost savings: 5%
Environmental behaviors: the power of norms

• **Descriptive social norm**
  – *Define a norm that represents the desired behavior*

• **Injunctive social norm**
  – *Adoption of the norm by others*

Join your fellow guests in helping to save the environment. Almost 75% of guests who are asked to participate in our new resource savings program do help by using their towels more than once. You can join your fellow guests in this program to help save the environment by reusing your towels during your stay.
Mailand Portugal

CASE STUDIES
Jardim Atlântico Madeira
Energy Efficiency study

- Medium size Hotels 3*, 4*
  - 20 to 50 rooms
  - Conference rooms
  - Spas
- Large Hotels 4*
  - Up to 100 rooms

- Evaluate the potential for
  - Solar thermal
  - Cogeneration
  - Trigeneration
  - Biomass
Building Energy Solutions Evaluation
Results
Results

Pousada de Estói

Avaliação de potencial:
• Não existe potencial de investimento em soluções de energia.

Soluções encontradas
• Reajuste da inclinação dos painéis existentes respeitando o plano de arquitectura.

Verde - Linha de visão do jardim
Vermelho - Correção da inclinação dos painéis de modo a melhorar o seu rendimento
Laranja - Inclinação actual
Results

Pousada de Palmela
Avaliação de potencial:
- Painéis solares térmicos
- Soluções de Cogeração
- Soluções de Trigeração

Soluções encontradas
- 29 Painéis Solares térmicos
- Avaliação económica: Viável

PRJ = 12 anos
VAL = 18798€
Poupança Anual = 5058€

Cogeração: 1 Unid. Micro-Turbina a gás
82kW(t) 30kWe
- Horas de funcionamento = 4471 h/ano
- Avaliação económica: Inviável

Trigeração: 2 Unid. Micro-Turbina a gás
82kW(t) 30kWe
- Sist. absorção LiBr - 54,5kW (solução 1/2)
- Horas de funcionamento = 4555 h/ano
- Avaliação económica: Inviável

• Anomalia detectada nos consumos do sistema de AVAC - Recomenda-se uma verificação
Energy Consumption
Energy use per energy service
Hotel Energy Solutions

It's time the accommodation sector got smarter about its energy consumption. Hotel Energy Solutions will show you how.

HOTEL ENERGY SOLUTIONS
Online toolkit set to help hotels reduce energy footprint and costs

Following three years of testing and extensive research, the World Tourism Organization (UNWTO) and its partners have launched an online tool to help hotels evaluate their energy consumption and assist in improving their energy management and cutting costs.

The Hotel Energy Solutions (HES) e-toolkit, the main output of the Hotel Energy Solutions project, provides hoteliers with a report which shows their current energy use and recommends appropriate renewable energy and energy efficiency technologies and actions. It further sets out what kind of savings or operational expenses hotels can expect from their green investments through a return on investment calculator.

HES e-TOOLKIT
Enter DEMO of the HES e-toolkit

SHOW DEMO

HES e-TOOLKIT
Enter Here

News
HES is an Official Partner of the Sust. (SEE)
A European campaign aimed at raising awareness on energy.
27 September 2010
Read More

HES Pilot Destination: Palma de Mallorca
The first hotel destination to join the HES E-tool
10 September 2010
Read More

Programme HES conference
ANNUAL CONFERENCE

PUBLICATIONS
For download
IDEAS
Energy Efficiency

- Efficient Lighting
  - Eliminate incandescent
  - Diming with natural light
  - Presence sensors in corridors and rooms
  - Management software

- HVAC
  - Management software
    - Scheduling, setpoints correlated with external temperature
      - 25°C summer is fine! 20° winter is fine!
    - Promote natural ventilation during the day in rooms
    - Invest in proper shading systems
Fuel switch

- Solar thermal
  - Hot water
  - Pools
  - Laundry
- Cogeneration systems
- Transport (within islands)
  - Walking / Biking
  - Public Transportation
  - Vehicle Renting
    - Car sharing
    - Electric Vehicle
Change Processes

• Cooking
  – Plan energy usage during the day (up to 15% cost savings)
    • Avoid peak hours use of electricity

• Cleaning
  – Avoid peak hours use of electricity
  – Promote natural ventilation / room shading
Promote environmental behavior

- Energy Management
  - Maintain, operate and manage energy services
  - Promote processes and behavioral changes
- Define and communicate norms and results
  - *Towels*
  - Water usage
  - HVAC usage
Azores

<table>
<thead>
<tr>
<th>Question</th>
<th>7.5%</th>
<th>92.5%</th>
<th>0</th>
<th>0</th>
<th>93</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you read the proposed definitions of sustainable development and sustainable tourism?</td>
<td></td>
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<tr>
<td>Have you analyzed the impact of the activity of your organization on the environment and local development?</td>
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<tr>
<td>Did you implement measures to reduce energy consumption?</td>
<td>79.3%</td>
<td>17.4%</td>
<td>3.3%</td>
<td>0</td>
<td>92</td>
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<tr>
<td>Did you implement technologies to save energy?</td>
<td>50%</td>
<td>45.7%</td>
<td>4.3%</td>
<td>0</td>
<td>92</td>
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<tr>
<td>Eco-labels, environmental awards</td>
<td>4.3%</td>
<td>95.7%</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Management Systems</td>
<td>6.5%</td>
<td>93.5%</td>
<td>92</td>
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Sustainable Management Summer School

- Hotel’s managers
  - Understand economic benefits
- Hotel operation managers
  - Knowledge technical solutions
- Architects & engineers
  - Design solutions
- Policy makers
  - Adapt regulatory framework
The Azores Sustainable Card (?)

- Challenge guest to be sustainable
  - Deliver a point card to guests
  - Collect points for sustainable activities
    - Use public transportation
    - Walking activities
    - Less use of towels, energy

- Reward guests
  - Points can be changed by typical azorean products in shops
  - Points can be changed in restaurants
  - Points can be changed in touristic activities

Voluntary instruments:
- eco labels
- prizes
- awards