



# The eccos

ENERGIA E CONSTRUÇÃO SUSTENTÁVEIS



# Network

NASA/C3P Workshop 2010  
Nov 2-4, San Diego, CA





# What is the



# Network?

- 7 Municipalities
- 40 Stakeholders

## GOALS:

Innovative and Competitive Cities centered on Energy Efficiency

## BASED ON:

- *Sustainable Construction*
- *Renewable Energies*

## FUNDED BY:

- Government, Municipalities & Stakeholders

# Vision

## Intelligent Mobilization of Sustainable Energy & Construction

- Build a *networked eco-community* centered on sustainable energy and construction
- To increase accumulation of knowledge, allowing creation of innovative products, services and solutions, complementary among themselves, reproducible in different locations
- Leading to urban development, emergence of new economic functions and international projection of partner cities



San Diego,  
CA, USA



Lisbon,  
Portugal

## 7 ECOS-Networked Municipalities

Promoting:

- Proximity Relationships
- Distance Relationships



### Climates:

- 3 - Mixed Atlantic & Mediterranean
- 3 - Mediterranean w/ Continental influence
- 1 - Mediterranean w/ Maritime influence

# Ongoing ECOS Projects among ECOS Network by Municipality

<b>Óbidos</b>	Eco-Vila	Social Carbon Óbidos	Óbidos Technological Park	
<b>Peniche</b>	Ocean Energy Research Center	Berlenga Sustainable Laboratory	CARSurf	Sustainable Social Housing
<b>Torres Vedras</b>	Eco-Urbe	Mais Boavista	Santa Cruz High School	Environ Educ Center

Sustainable Construction

Renewable Energy

Integrated Projects

# Ongoing ECOS Projects among ECOS Network

<b>Beja</b>	Sustain. Bldg	BioECOS	RH Beja Technology	Solar Sports			
<b>Serpa</b>	Soil Lab & Sustain. Construc.	Sustain. Construc. & Renew Energy Cluster	Eco-Vila	Eco-Quarter	From City to River	Municip Water Heating Systems	Integrated Systems Certific.
<b>Moura</b>	Zero Emission Bldg	Microgen. in Sensitive Urban Environ	Photovolt R&D Unit	Techno Park Managemnt . Structure	EcoCoop	Energy Product. Plants via Renew. Sources	SUN FLOWER
<b>Silves</b>	Thermal Solar Energy for Water Heating	Sustain. Rehab of City Heritage Garden	Clean House				

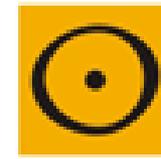
Integrated Projects

Renewable Energy

Sustainable Construction



## Eco-Town



MUNICÍPIO DE  
ÓBIDOS

Showcase for Innovative Solutions for Urban Qualification Within Historical Centers



- \* Reduce carbon emissions by 40% until 2020
- \* Reduce energy costs

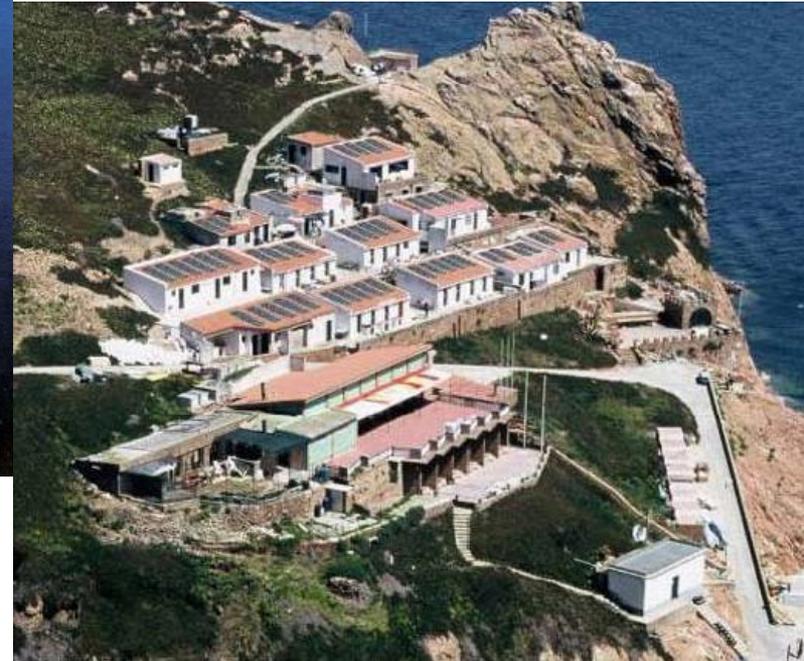


Integrated within the Program  
“Óbidos Social Carbon”



# Berlenga Laboratory of Sustainability

  
PENICHE  
Capital da Onda



Zero Emissions Island

- \*Improvement of Tourist Infrastructures
- \*Reduction of Ecological Footprint
- \*Promotion of a Sustainable Destination



# Boavista Social Housing Rehabilitation



Built in 1960's:  
Municipal Social Housing  
for families on welfare.



Rehabilitation of social  
housing, introducing  
measures to improve  
energy efficiency and  
technologies for solar  
energy production.

## Santa Cruz Eco-Urbe



*80 m<sup>2</sup> Open Space for Exhibit Area,  
Amphitheatre & Offices.*



Sustainable House:

- \*Passive Construction for Improved Energy Efficiency
- \*Wind & Solar Microgeneration and Water Recycling Systems
- \*Modular Building Design

**Showcase for Sustainable  
Energy Systems,  
Technologies & Equipment**



## Environmental Education Center



Pilot Building in Sustainable Construction  
\* Integrating Sustainable and Bioclimate Systems





## Santa Cruz High School

### Sustainable Measures:

#### \*Geothermal system for air conditioning:

- high performance heat pump
- 2 air Treatment units with heat recuperation via enthalpy

#### \*Microgeneration:

- Solar Photovoltaic (sold to grid)
- Solar Heating for water heating

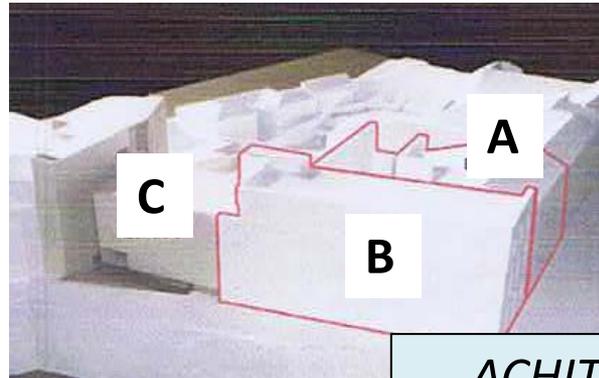
#### \*LED outdoor lighting

**Estimated annual reduction of 2.3 tons CO<sub>2</sub>**



# Sustainable Municipal Buildings

## Rehabilitation of Services Building in Historical City Center



*ARCHITECTURAL CONCEPT:  
"Integration by contrast"*

Bldg A to be rehabilitated  
Bldg B to be restored  
Bldg C new construction

- \* Zero Carbon building
- \* Reduction in energy costs
- \* Showcase for sustainable technologies



**Eco-Quarter**

*ARCHITECTURAL CONCEPT:  
"Integration by contrast"*

Rehabilitation of Urban Block in Historical Center



**New and Traditional, Energy Efficient  
and Sustainable Building Materials**

# Eco-Neighborhood

Rural Residential Cluster Integrating:

- \* Renewable Energy Systems
- \* Energy-Efficient Building Materials & Techniques



Test New Development Paradigm  
With New Urban Planning and  
Zoning Model.





## Zero Emissions Building

Solar Energy Research Lab



Showcase  
Sustainable  
Construction

# Microgeneration in Sensitive Urban Environments



Optimize Energy Production with Integrated Synergistic Systems

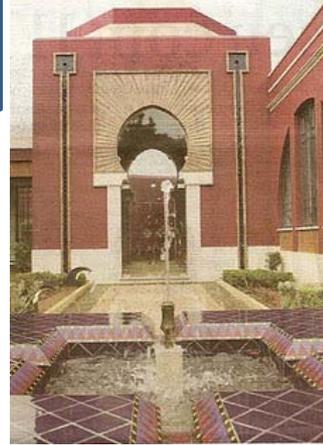
Solar Panels  
Mini Wind Turbine  
Hydrogen Fuel Cell

for Production of Electricity, Space and Water Heating.



*Moura's Vertical Gardens*

# Heritage Garden-Park



## Soil Architecture

- \* Algarve traditional brick
- \* Silves red stone



## “Clean House”

**Increase Community Awareness  
of  
Sustainable Construction and  
Renewable Energies**

- Solar Panels & Wind Turbine
- \* Lighting
  - \* Water heating
  - \* Earthquake alarm
  - \* TV
  - \* Computer
  - \* Coffee-machine

**Building materials  
made from waste  
products**

**Energetically  
efficient  
equipments**

**Cross  
ventilation**

**Photovoltaic  
energy**

**Reduced loss of  
materials**

**Waste  
recycling**

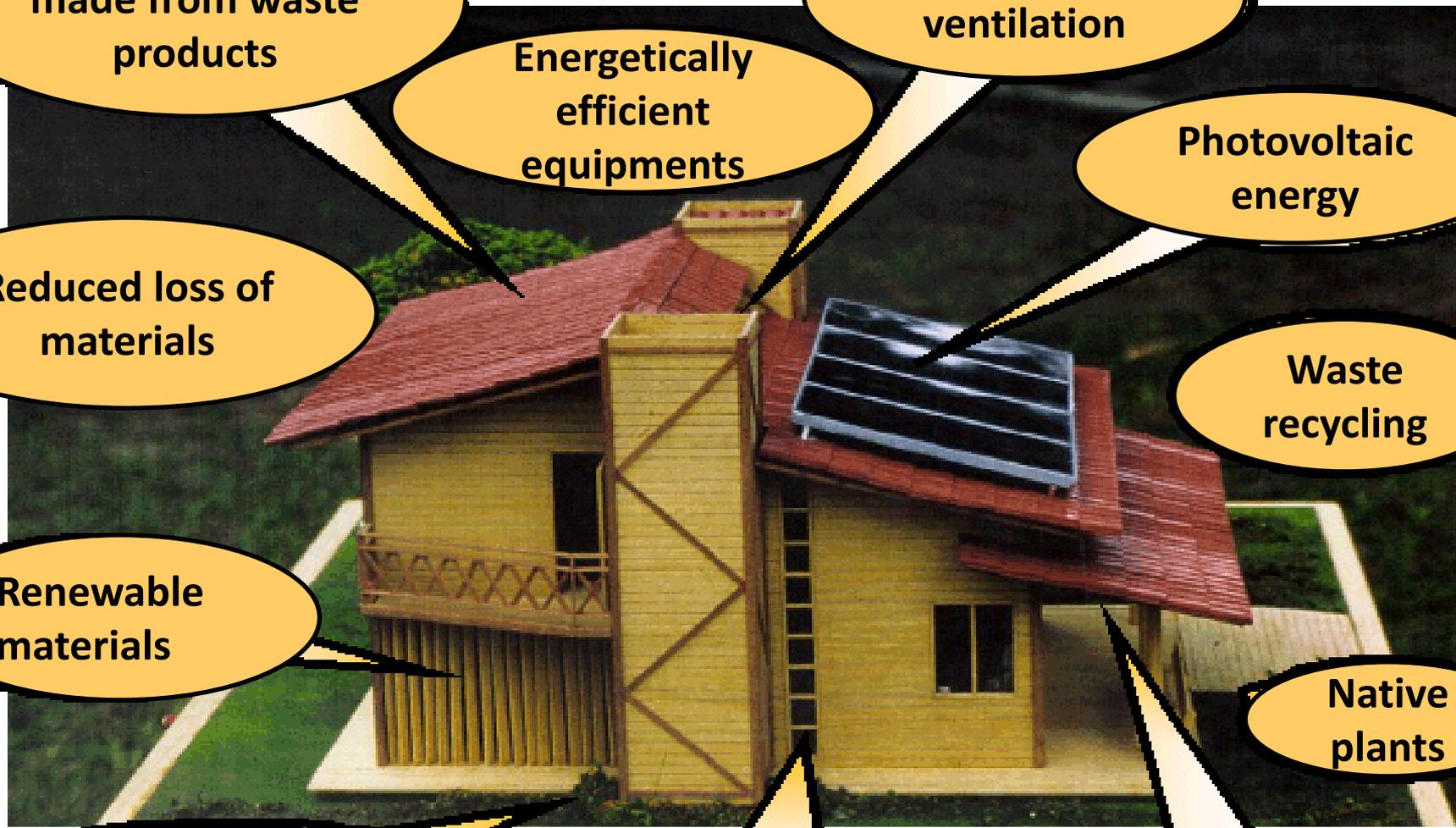
**Renewable  
materials**

**Native  
plants**

**Humidity control**

**Using natural  
light**

**Protection,  
unwanted sunlight**





## Other ECOS Network Projects Include:

- Hydrogen
- Urban Mobility Systems
- International cooperation with Universities
- International cooperation networks
- Cooperation with Sister Cities

\* ECOS projects are centered on the development of sustainable solutions with ***social interest.***

\* ECOS projects take advantage of Portugal's ***endogenous national resources:***  
Sun, Water & Wind



# Thank you for your attention

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