

## Sustainable Energy Technology at Work - SETatWork

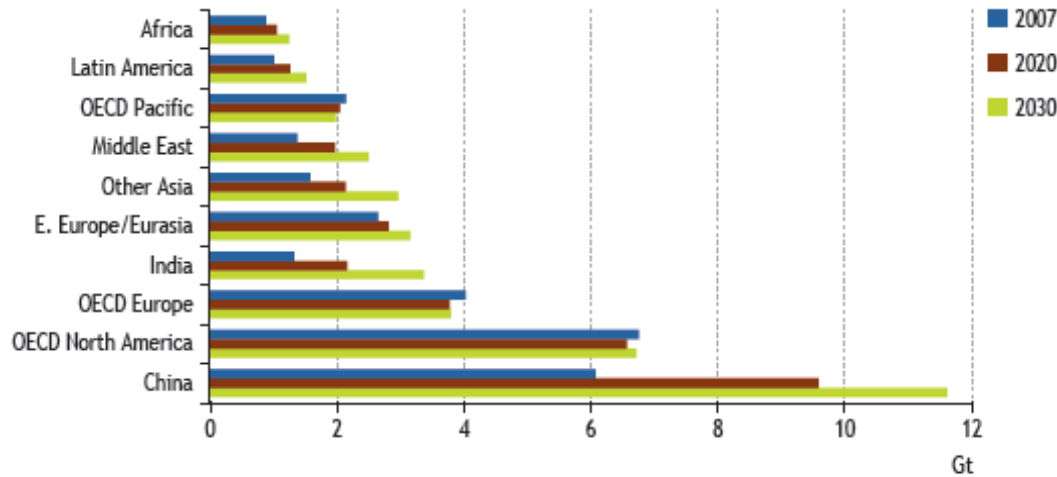
# Africa – Project Examples

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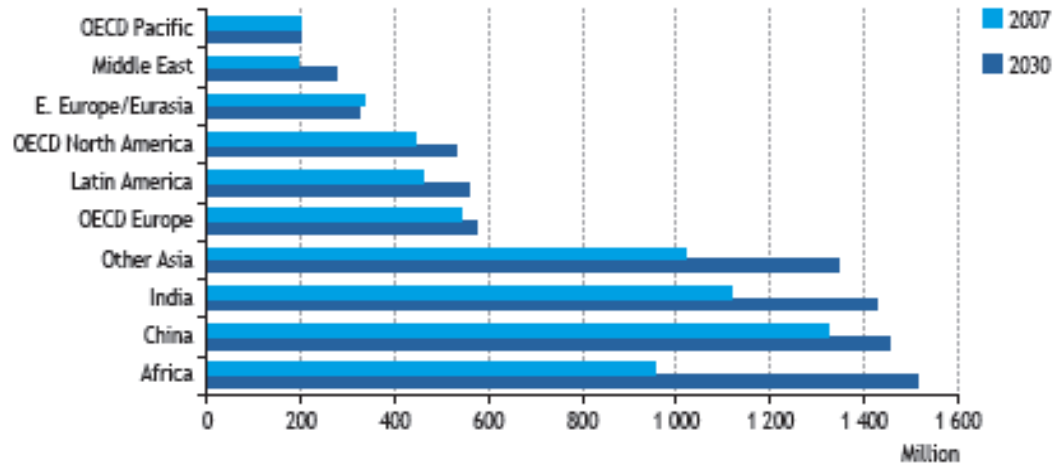


# General figures

Energy-related CO2 emissions by region in the Reference Scenario



Population by major region



## Figures for the ten largest hydrocarbon-producing sub-Saharan African countries

Access to electricity and reliance on fuelwood and charcoal in assessed sub-Saharan African countries

	Number of people without electricity access				Number of people relying on fuelwood and charcoal for cooking			
	2006		2030		2006		2030	
	Million	%	Million	%	Million	%	Million	%
Angola	14.6	88	18	59	15.7	95	18	60
Cameroon	14.2	78	17	64	14.2	78	17	65
Chad	10.1	97	18	92	10.2	97	16	79
Congo	2.9	78	4	68	2.9	80	4	69
Côte d'Ivoire	11.6	61	14	50	14.7	78	21	73
Equatorial Guinea	0.4	73	0.4	50	0.3	59	0.4	42
Gabon	0.9	70	1.2	66	0.4	33	0.5	28
Mozambique	18.6	89	22	72	16.9	80	18	58
Nigeria	76.6	53	66	29	93.8	65	109	48
Sudan	26.9	71	30	51	35.2	93	40	69
<b>Total</b>	<b>176.9</b>	<b>65</b>	<b>191</b>	<b>44</b>	<b>204</b>	<b>75</b>	<b>244</b>	<b>57</b>

Note: Assumptions for GDP growth rates are based on information provided to the IEA from the World Bank, the African Development Bank and the OECD. Population growth rates from the UN Population Division.  
Source: IEA databases and analysis.

Cumulative cost of providing universal access to modern energy in assessed sub-Saharan African countries, 2006-2030

	Investment requirements for universal electricity access (\$ billion)	Investment requirements for stoves and cylinders (\$ billion)	Costs of universal access to electricity and clean cooking stoves and cylinders as a share of government take (%)
Angola	1.36	0.22	0.1
Cameroon	1.26	0.20	13.0
Chad	1.14	0.17	2.0
Côte d'Ivoire	1.06	0.23	18.0
Congo	0.27	0.04	0.4
Equatorial Guinea	0.03	0.01	0.1
Gabon	0.08	0.01	0.1
Mozambique	1.70	0.23	5.6
Nigeria	6.09	1.32	0.3
Sudan	2.35	0.49	1.5
<b>Total</b>	<b>15.35</b>	<b>2.91</b>	<b>0.4</b>

- SYNERGY Cabo Verde
- SYNERGY Moçambique
- IE4SAHEL
- CDM Africa
- CDMSIDS
- CDM Meda
- SESAM-ER

# SYNERGY Cabo Verde

## Assistance to the Implementation of Energy Policies in Cabo Verde

### Objectives

- Provide institutional support to political authorities and main energy consumers aiming at restructuring the energy sector;
- Technical capacity building for energy sector institutions;
- Promotion of dialogue between decision-makers about energy and environment-related questions;
- Identification of a coherent regional strategy for Cape Verde (legislation and financial resources, national and international);
- Proposal of recommendations for the development of the electricity and petroleum sectors;
- Identification of priorities and possibilities for cooperation;
- Capacity building for energy efficiency measures for final users; and
- Increase in contribution of renewable energy to energy production.

## Coordinator:

- IST – Instituto Superior Técnico

## Partners:

- PARTEX – Consultoria em Engenharia SA (Portugal)

## Project Co-financed by:

- European Commission
- Direcção Geral de Energia – Portugal
- CEDINTEC - Centro para o Desenvolvimento e Inovação Tecnológica  
- Portugal.

# SYNERGY Mozambique

## Assistance to Energy Policy Implementation in Mozambique

### Objectives

Creating the basis for the development of the energy sector in Mozambique, which will become an important tool for the development of the country



### Goals

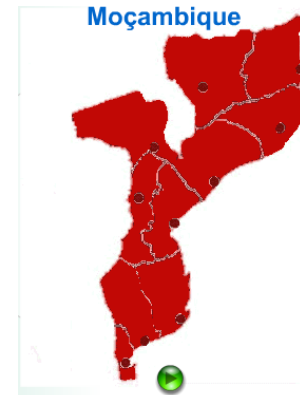
- Provide institutional support to political authorities and main energy consumers aiming at restructuring the energy sector;
- International cooperation and technical programmes implemented by the European Commission to assist in strengthening the energy sector;
- Build continuous energy policy dialogue; and
- Allow further progress in global efficiency of the sector.

## Coordinator:

- IST – Instituto Superior Técnico

## Partners:

- PARTEX – Consultoria em Engenharia SA (Portugal)
- SOMAGUE – Grupo SOMAGUE SA (Portugal)
- NTUA – National Technical University of Athens (Greece)
- CEISA – Centre for Studies in Industrial, Safety and Environment Issues (Mozambique)



## Energy for Poverty Reduction in Sahel

### Main topics

#### RESEARCH:

Assessment of the energy policies in the Region

Study of the Renewable Energy potential

Elaboration of policy recommendations for sustainable energy policies targeted at poverty reduction

#### COOPERATION:

Capacity Building for the Centre AGHRYMET

Organization of two Regional Conferences

Development of a Professionals' Network Organisation d'ateliers régionaux



## Countries

Burkina Faso  
Cape Verde  
Chad  
Guinea Bissau  
Mali  
Mauritania  
Niger  
Senegal  
The Gambia

## Coordinator

IST – Instituto Superior Técnico (Portugal)

## Partners

ARC – AGRHYMET Regional Centre (Niger)

ESD – Energy for Sustainable Development (UK)

CRES – Centre for Renewable Energy Sources (Greece)

# CDM Africa

## Capacity Building for CDM in Sub-Saharan African Countries

### Objectives

Contribute to creating the most appropriate framework enabling implementation of CDM activities in the Sub-Saharan African countries, mainly from the Sahel (Sahara desert boundary) and the SADC (Southern Africa) regions, presenting the greatest diversity of resources and facing crucial development problems at all levels.

### Goals

- Evaluate Sub-Saharan African countries' potential to contribute to the Kyoto objectives;
- Identify an appropriate framework enabling CDM-linked investment flows to the Sub-Saharan African countries;
- Create a methodology to assess social and economic impacts of CDM-linked projects
- Estimate the potential contribution of CDM in Sub-Saharan African countries to European commitments;
- Mapping of best geographical areas for EU CDM investments in Sub-Saharan Africa
- Identify CDM-linked project development opportunities for environmental, social and economic feasibility studies in one Sahel country (Niger)



## Coordinator

IST – Instituto Superior Técnico

## African Partners

ARC – AGRHYMET Regional Centre (Niger)

CSIR – Council for Scientific and Industrial Research (South Africa)

CEEEZ – Centre for Energy, Environment and Engineering (Z) Ltd (Zambia)

EECG – Energy, Environment, Computer and Geophysical Applications  
(Botswana)

CEISA – Centre for Studies in Industrial, Safety and Environment Issues  
(Mozambique)

## Facilitating the Kyoto Protocol Objectives by Clean Development Mechanism in Small Island Developing States – CDMSIDS Project

### Objectives

- Promoting CDM in SIDS and LDC
- Focusing on clean technologies viable for SIDS
- Energy demand assessed during the next 30 years
- Potential for renewable energy technology transfer
- Evaluating supply side efficiency technologies like combined cycle
- Evaluating demand side efficiency technologies
- Identification of potential CDM projects will be identified
- Workshop to disseminate the project results and CDM knowledge

## Tasks

- Collection of data about energy system, economy, demography, renewable energy technologies and supply side efficiency technologies
- Modelling the scenarios
- The assessment of the financial, infrastructure and institutional barriers and by establishing a framework for CDM linked investment
- Identification of potential CDM projects in Cape Verde
- Capacity building of Cape Verde Institutions

## Conclusions

- Islands have significant potential for competitive renewable energy (wind)
- CDM can help investment and lowering barriers, technology transfer, and indirectly, the acceptance of Climate Change mitigation in SIDS
- RES + CDM can significantly increase energy security of supply for islands

### Objectives

Build the private sector's capacity in CDM project activities and related carbon trading concepts. This would facilitate an active and major participation on the part of the private sector in flexible mechanisms proposed by the Kyoto Protocol that aims to alleviate global greenhouse gas emissions.

### Goals

- Produce promotional and analytical tools;
- Conduct capacity building events specifically designed for the private sector that will describe the implications as well as the achievement of high environmental standards (especially for urban areas) and new economic opportunities linked to CDM projects;
- Target private enterprise and industry.

**Coordinator:** EPU – Energy Policy Unit (Greece)

## EU Partners

IST – Instituto Superior Técnico (Portugal)

JIN – Foundation Joint Implementation Network (Netherlands)

## Mediterranean Partners

Sonelgaz (Algeria)

OEP – Organisation for Energy Planning (Egypt)

ICTAF – University of Tel Aviv (Israel)

MEMR – Ministry of Energy and Mineral Resources (Jordan)

ALMEE – Lebanese Association for Energy Saving (Lebanon)

UM - University of Malta (Malta)

CDER – Centre de Developpement des Energies Renouvelables (Morocco)

MoE – Ministry of Electricity (Syria)

Bogazici University (Turkey)

## Sustainable Energy Services for Rural Populations Isolated Micro-Networks with Renewable Energy on the island of Santo Antão (Cape Verde)



*Santo Antão*

779 km<sup>2</sup>

43 845 inhabitants (1990)

47 124 inhabitants (2000)

Source: INE Cabo Verde

SESAM-ER will improve the life quality of around 1.200 people

## Consortium

- Águas de Ponta Preta (Cabo Verde)
- Câmara municipal do Porto Novo (Cabo Verde)
  - Águas do Porto Novo (Cabo Verde)
  - Trama tecnoambiental (Cabo Verde)
    - Erhtec (Spain)
- Instituto de engenharia mecânica (Portugal)
  - Transenergie (França)

## Objectives

- Improving the population access to quality electricity services, working 24 hours a day, to allow the creation of income generating activities
- Ensuring socio-economic sustainable through the involvement of local active target groups in all phases of the project implementation
- Dimensioning and installing of a micro-hybrid network based in a renewable power generation system of 39kVA in photovoltaic and a mini-hidro of 75 kVA, with the support of a generator.



# SESAM-ER Project

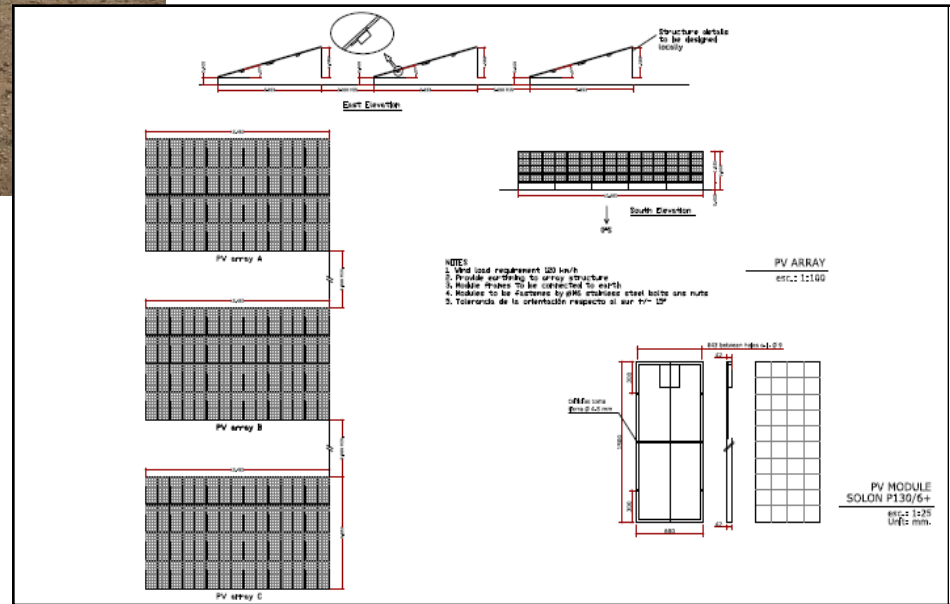




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# SESAM-ER Project

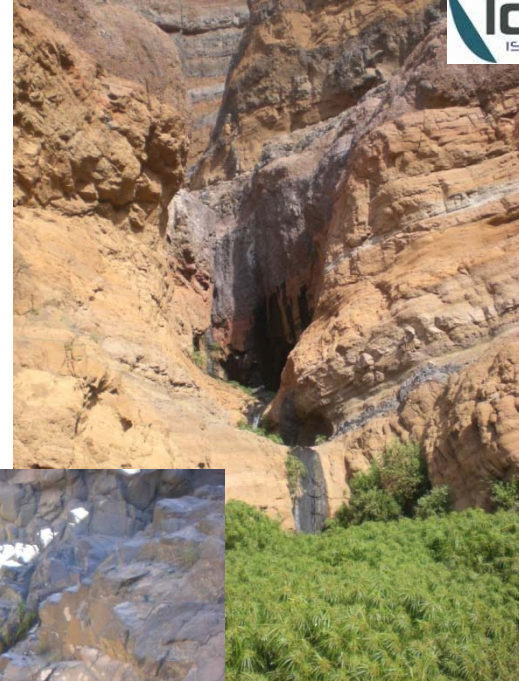




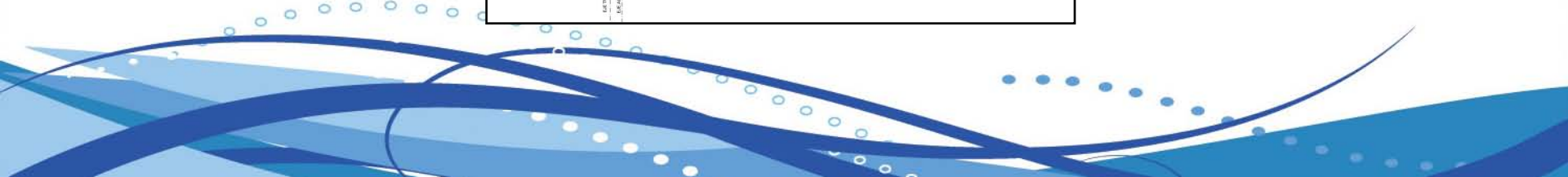
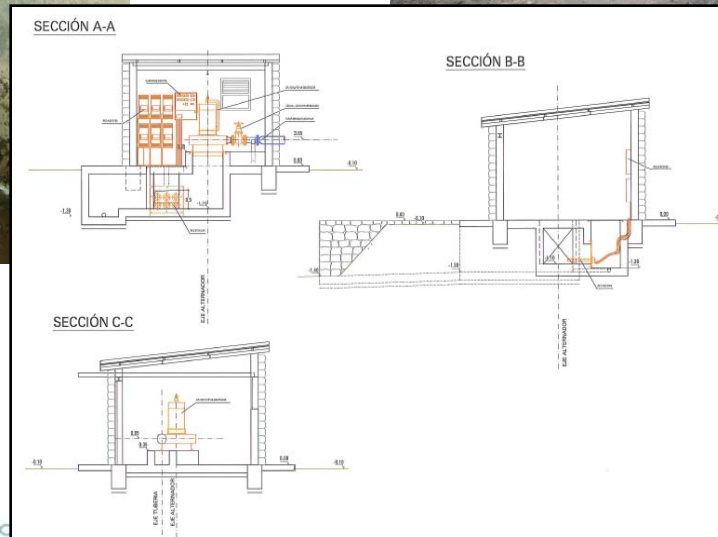
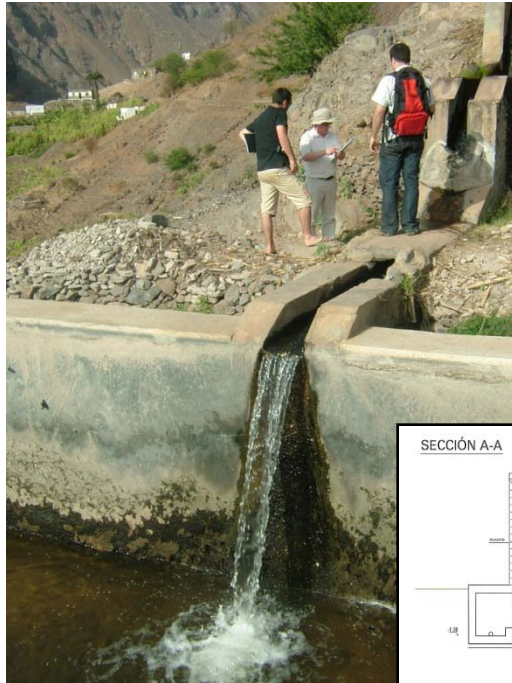


Sustainable Energy  
Technology at Work

# SESAM-ER Project



# SESAM-ER Project



# Further Information

Find out more about the activities of SETatWork  
and access the SETatWork Database at:

**[www.SETatWork.eu](http://www.SETatWork.eu)**

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