



**DEVELOPING  
RENEWABLES**

Renewable Energy that benefits all

## Country energy information Senegal

September 2006

SIXTH FRAMEWORK PROGRAMME PRIORITY 3

Underpinning the economic potential and cohesion of a larger and more integrated EU

SPECIFIC SUPPORT ACTION

Project Acronym: RECIPES

Project full title: Renewable Energy in emerging and developing countries: Current situation, market Potential and recommendations for a win-win-win for EU industry, the Environment and local Socio-economic development

Contract number: 513733

Start date of contract: 1st January 2005

### Introduction

The information in this report was gathered from publicly available sources (the source list is available at [www.energyrecipes.org](http://www.energyrecipes.org)), like surveys, statistical data from the internet and books and other publications. The information consists of:

1. indicators and indices;
2. descriptions of the relevant energy items/subjects /themes.

Due to differences in availability of data per country the level of detail of these reports will differ.

For all the 114 developing and emerging countries of the INCO list a report like this is available. (see also [www.energyrecipes.org](http://www.energyrecipes.org) for the countries) Except for the following 15 countries, where more detailed reports are available.

Argentina

Brazil

Colombia

Mexico

Peru

China

India

Indonesia

Pacific

Islands

Thailand

Cameroon

Ghana

Niger

South-

Africa

Uganda

### The RECIPES project

The RECIPES project aims to contribute to the implementation of renewable energy in emerging and developing countries. The RECIPES project is financed under the 6th Framework Programme for Research and Technological Development of the European Commission.

The main objective of the RECIPES project is to provide the European Commission and other stakeholders with pragmatic information and recommendations facilitating appropriate action to further the implementation of renewable energy in emerging and developing countries, taking into account:

- | The effects on the local socio-economic situation.
- | The competitive position of European renewable energy industry.
- | The impacts on the local and global environment.

Data collection on the situation and potential of renewable energy in emerging and developing countries is the core of the RECIPES project.

An identification of the RE market potential is carried out for 15 developing and emerging countries. Local experts gathered data for all of these countries. The results of these in-depth studies are extrapolated to 99 other developing and emerging countries for which data is gathered through desk research.

See the RECIPES website ([www.energyrecipes.org](http://www.energyrecipes.org)) for relevant data collected and reports produced.

## **Environmental problems**

Wildlife populations threatened by poaching; deforestation; overgrazing; soil erosion; desertification; overfishing

## **Environment - international agreements**

Party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling

## **Energy situation**

Commercial energy resources in the region, primarily petroleum and natural gas, are concentrated in coastal and offshore regions. Electricity in Senegal is generated through thermal or hydroelectric resources. Natural gas has the potential to take a more significant role as fields in Senegal are developed. All crude oil is imported and processed in refineries to produce petroleum, which is used for the industrial sector and electricity generation.<sup>2</sup>

About half of the urban areas are electrified, but rural electrification has hardly taken place so far. A number of projects using PV-technology have been successfully completed, followed by the government now searching for ways to incorporate solar energy and wind energy into the electricity production.<sup>7</sup>

## **Energy sector organisation**

Senegal's Societe Nationale d'Electricite (SENELEC) handles the generation, transmission and distribution of the majority of the country's electricity. The government's ownership in SENELEC was reduced to a 41% share in March 1999, when a consortium comprised of the utilities Hydro-Quebec of Canada and Elyo of France acquired a 34% interest in SENELEC. In 2000, a series of power cuts prompted the government to take back the stake sold to the Franco-Canadian venture.<sup>2</sup>

## **Renewable energy potential**

There are significant biomass resources but they are so far only really utilized using traditional methods both for production and end use. There's a huge solar potential and the broad coastline also provides a fair amount of wind potential.

The solar potential is partly being exploited by introduction of PV-technology and a number of projects have been directed at using wind power for rural electrification.<sup>6</sup>

In 1986, the technically feasible hydropower potential of Senegal was estimated at 4250 GWh/year. Construction of the 200 MW Manantali plant (800 GWh/year), as part of the Senegal River project was scheduled to begin in September 1997 and was successfully completed in 2001.<sup>14</sup>

## Renewable energy

The current energy policy has three main thrusts: an economic aspect, whereby it aims to streamline conditions for supplying, producing, transmitting and consuming energy in accordance with the country's long-term interests; an environmental aspect that strives to respect basic ecological balances; and a social aspect, aiming to widen access to modern forms of energy. Furthermore an agency has been formed that is charged with supporting rural electrification (ASER).<sup>6</sup>

A number of RET programmes, mostly photovoltaic (PV), have been deployed in the country to date.

Mostly local enterprises are responsible for the distribution of the technology. Next to its ongoing efforts to incorporate solar energy into national electricity production, the government is also now looking to develop and promote the use of wind technology.<sup>7</sup>

To promote renewable energy the government has exempted all solar power lighting, water pump, and water heating kits from customs and fiscal taxes and VAT. Furthermore the Senegalese government is working to promote wind energy, e.g. it is co-operating with private and non-governmental institutions on the Alizé Senegal project.<sup>7</sup>

	Senegal	Unit
<b>General</b>		
Population (2005)	11126832	
Country area	196722	km <sup>2</sup>
Total density of population (people/km <sup>2</sup> )	57.000	capita/km <sup>2</sup>
Growth of people % /year	2.480	%
Land use arable (%)	12.780	%
Land use perm crops (%)	0.210	%
Percentage of total people living in cities	48.900	%
HDI (2002)	0.437	
<b>Social</b>		
Illiteracy	40.200	%
Year of estimation	2003	
Corruption (CPI 2003) 0=high 10=low	3.200	
GDP in ppp mostly \$ 2004 est	18.36	billion
<b>Economic</b>		
Income /capita \$ mostly 2004	1700	
Variability of income/capita GINI index (2004)	41.300	
Population below poverty line	54.000	%
Year of estimation	2001	
Total External Debt in % GDP (2004 est.)	55.200	%
Inflation rate (consumer prices) (%)	0.800	%
Year of estimation	2004	
Growth of economy	3.200	%
Year of estimation	2004	

EDI energy development index	0.280
------------------------------	-------

### Energy development

Percentage of people connected to the grid (electricity)	31.400	%
Traditional fuel consumption (% of total energy requirements 2002) . Estimated consumption of fuel wood, charcoal, bagasse (sugar cane waste) and animal and vegetable wastes.	72.500	
Oil consumption	31000.000	bbl/day

### Fossil fuel consumption

Year of estimation	2001	
Coal consumption (Million Short Tons)	0.000	millions short tonnes/year
Natural gas consumption, year 2001 if not mentioned others	50	million cu m
Nuclear power production (Billion Kilowatthours) 2003	0.000	billion kWh/year
Hydro electricity capacity (2003)	0.000	million kilowatts

### Renewable energy situation

Geothermal, Solar, Wind, Wood and Waste Electricity Installed capacity (2003)	0.000	million kilowatts
RE biomass production of primary energy from combustible Renewables and Wast TJ/Year 2002	75677.000	
RE energy electricity consumption (2003)	0.000	billion kWh/year
Total Primary Energy Supply 2000	36.050	billion kWh/year
Share of total renewables in % of TPES 2000	55.800	%
Share of renewables excluding combustible renewables and waste in % of TPES 2000	0.000	%
TPES 2003	37.200	billion kWh/year
Share of Renewables in TPES % (2003)	53.900	%
Hydro (2003)	1.700	%
Geothermal, Solar, Wind, Tide (2003)	0.000	%
Combustible Renewables and Waste (2003)	98.300	%
Total kWh per capita	3013.000	

### Energy consumption for various sectors

Industry	17.000	%
Transportation	26.000	%
Agriculture	3.000	%
Commercial and public services	1.000	%
Residential	54.000	%
Other purposes	0.000	%
Total oil production	0.000	bbl/day

### Energy production

Total coal production (Million Short Tons)	0.000	millions short tonnes/year
Total natural gas production	50	million cu m
Total Electricity Production GWh	1530.000	GWh

### Electricity

Electricity production from coal %	0.000	%
Electricity production from oil %	100.000	%
Electricity production from gas %	0.000	%
Electricity production from biomass %	0.000	%
Electricity production from waste %	0.000	%
Electricity production from nuclear %	0.000	%

Electricity production from hydro %	0.000	%
Electricity production from geothermal %	0.000	%
Electricity production from solar thermal and PV %	0.000	%
Electricity production from other sources %	0.000	%
Electricity consumption GWh (2003)	1239.000	GWh
Total final electricity consumption GWh (2002)	1352.000	GWh
Electricity used by Industry % (2002)	45.000	%
Electricity used by Transport % (2002)	0.000	%
Electricity used by Agriculture % (2002)	2.000	%
Electricity used by Commerce and Public Services % (2002)	17.000	%
Electricity used by Residential % (2002)	36.000	%
Electricity used by Other Non-Specified % (2002)	0.000	%
Electricity used by Non-Energy Use % (2002)	0.000	%