The IRENA Renewable Energy Country Profiles take stock of the latest development of renewable energy in two regions where renewable energy can make a significant contribution to combat climate change and bring modern energy services to everyone: Africa and the Pacific. These two regions are presented separately in this volume and its sister publication.

The country profiles combine elements of IRENA analysis with the latest information available from a vast array of sources in order to give a brief yet comprehensive and up-to-date picture of the situation of renewable energy that includes energy supply, electrical capacity, energy access, policies, targets, investment climate, projects and endowment in renewable energy resources. Because of the different timelines of these sources, data presented here refer to years between 2008 and 2012. Data availability also differs from country to country, which makes comparison with a wider regional group possible only for the year for which figures are available for all the members of the group; while this may not be the most recent year, the differences between countries, regions and the world remain striking.

The current country profiles are just a starting point; they will be extended upon with new indicators to make them more informative, and maintained as a live product on the IRENA website as a key source of information on renewable energy. Your comments and feedback on both the format and the contents would be most appreciated at statistics@irena.org.
ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 1,664.6 PJ - Of which renewables: 3.6 PJ (0.2 %)
- Energy self-sufficiency: 383.0%
- Fuel imports: 413 million USD (1.1 % of total imports)
- Electricity generation: 42.8 TWh - Of which renewables: 342.0 GWh (0.8 %)
- Electricity use per capita: 973 kWh
- Electrical capacity*: 8.1 GW - Of which renewables: 280 MW (3.4 %)
- Electricity access rate: 99.3%
- Share of population using solid fuels: < 5%

*2008

TARGETS:
- 5% of electricity generation from renewables by 2017
- 20% of electricity generation from renewables by 2030
- 100 MW of wind capacity by 2015
- 170 MW of concentrating solar power by 2015
- 5.1 MW of solar photovoltaic capacity by 2015
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 10 MW of wind capacity addition by mid-2012 (1 project)
- 150 MW of combined solar thermal/natural gas capacity addition announced (2 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 148 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 10 MW of wind capacity addition by mid-2012 (1 project)
- 150 MW of combined solar thermal/natural gas capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

*excluding electricity trade

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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Figure 1: GDP per capita for 2010

Middle Africa includes Angola, Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

Figure 2: Electricity use per capita for 2008

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 498.1 PJ - Of which renewables: 310.8 PJ (62.4 %)
- Energy self-sufficiency: 848.7%
- Fuel imports: Not available
- Electricity generation: 4,172 GWh - Of which renewables: 3,173 GWh (76.1 %)
- Electricity use per capita: 203 kWh
- Electrical capacity*: 1,155 MW - Of which renewables: 498 MW (43.1 %)
- Electricity access rate: 30.0%
- Share of population using solid fuels: 48%

*2008

TARGETS:

- No information available
Policies in place to promote renewable energy since the Rio Conference of 1992

- 190 MW of small hydro capacity addition announced (3 projects)
- 30 million litres of ethanol per year capacity addition announced (1 project)

World Bank Ease of Doing Business Index for 2012: Ranked 172 out of 183

Renewable Energy Projects from the Government and Private Sectors:

- 190 MW of small hydro capacity addition announced (3 projects)
- 30 million litres of ethanol per year capacity addition announced (1 project)

Number of Registered Clean Development Mechanism Projects Focusing on Renewable Energy: 0

Renewable Energy Resources:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
**RENWUE ENERGY COUNTRY PROFILE**

**BENIN**

6.6 billion USD GDP (2010)
720 USD GDP per capita (2010)

**ENERGY NATIONAL PROFILE 2010**

- Total Primary Energy Supply: 156.8 PJ - Of which renewables: 86.0 PJ (54.9 %)
- Energy self-sufficiency: 54.9%
- Fuel imports: Not available
- Electricity generation: 113.6 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 92 kWh
- Electrical capacity: 92.3 MW - Of which renewables: 0.5 MW (0.5 %)
- Electricity access rate: 27.4%
- Share of population using solid fuels: 94%

**TARGETS:**

- 50% of rural electricity from renewables by 2025
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 6 MW of solar photovoltaic capacity addition announced (1 project)
- 50 million litres of ethanol per year capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 175 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 6 MW of solar photovoltaic capacity addition announced (1 project)
- 50 million litres of ethanol per year capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10³ kWh); TWh: terawatt-hour (1 TWh=10³ GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10³ MW).

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ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 85.8 PJ - Of which renewables: 20.2 PJ (23.6 %)
- Energy self-sufficiency: 45.8%
- Fuel imports: 625 million USD (13.2 % of total imports)
- Electricity generation: 444.0 GWh (excludes emergency generation from diesel) - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 1,528 kWh
- Electrical capacity*: 292 MW - Of which renewables: 0 MW (0 %)
- Electricity access rate: 45.4%
- Share of population using solid fuels: 40%

*2008

TARGETS:
- All targets under review
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 5 million litres of biodiesel per year capacity addition by 2012 (1 project)
- 1 MW of solar photovoltaic capacity addition by mid-2012 (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 54 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 5 million litres of biodiesel per year capacity addition by 2012 (1 project)
- 1 MW of solar photovoltaic capacity addition by mid-2012 (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind ○ Solar ○ Hydro ○ Biomass ○ Geothermal ○ Ocean ×

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA; IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

BURKINA FASO

8.8 billion USD GDP (2010)
542 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 137.0 PJ - Of which renewables: 110.3 PJ (80.5%)
- Energy self-sufficiency: 80.5%
- Fuel imports: Not available
- Electricity generation: 619.4 GWh - Of which renewables: 135.9 GWh (21.9%)
- Electricity use per capita: 43 kWh
- Electrical capacity: 252 MW - Of which renewables: 32 MW (12.7%)
- Electricity access rate*: 14.6%
- Share of population using solid fuels: > 95%

*2009

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- **20 MW of solar photovoltaic capacity addition announced** (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 150 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 20 MW of solar photovoltaic capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- **Wind** ○
- **Solar** ○
- **Hydro** ○
- **Biomass** ○
- **Geothermal** ○
- **Ocean** ×

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh = 10^12 kWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

IRENA welcomes your comments and feedback at statistics@irena.org
**Figure 1: GDP per capita for 2010**

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per capita 2010 (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>189</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>536</td>
</tr>
<tr>
<td>Africa</td>
<td>1,594</td>
</tr>
<tr>
<td>World</td>
<td>9,197</td>
</tr>
</tbody>
</table>

**Figure 2: Electricity use per capita for 2008**

<table>
<thead>
<tr>
<th>Country</th>
<th>Electricity use per capita (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>23</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>169</td>
</tr>
<tr>
<td>Africa</td>
<td>579</td>
</tr>
<tr>
<td>World</td>
<td>2,777</td>
</tr>
</tbody>
</table>

Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.

**Energy National Profile 2009**

- Total Primary Energy Supply: 98.2 PJ - Of which renewables: 95.4 PJ (97.2%)
- Energy self-sufficiency: 97.3%
- Fuel imports: 10 million USD (2.6% of total imports)
- Electricity generation: 241.5 GWh - Of which renewables: 237.2 GWh (98.2%)
- Electricity use per capita: 23 kWh
- Electrical capacity*: 32 MW - Of which renewables: 31.4 MW (98.1%)
- Electricity access rate: 2.7%
- Share of population using solid fuels: > 95%

*2008

**Targets:**

- 2.1% of final energy from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WATER AND ELECTRICITY UTILITIES LIBERALISED

ENERGY SECTOR POLICY

MINISTRY OF ENERGY AND MINES CREATED

PRESIDENTIAL DEGREE 100/08 ON THE STRUCTURE

ENERGY STRATEGY AND ACTION PLAN FOR BURUNDI

2000

2006

2007

2010

2011

POVERTY REDUCTION STRATEGY PAPER

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 169 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 30 MW of small hydro capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^6 MW).

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CAMEROON

20.0 million Population (2010)
22.4 billion USD GDP (2010)
1,122 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 289.6 PJ - Of which renewables: 200.2 PJ (69.1 %)
- Energy self-sufficiency: 127.9%
- Fuel imports: 961 million USD (22.4 % of total imports)
- Electricity generation: 5.7 TWh - Of which renewables: 4,025 GWh (70.1 %)
- Electricity use per capita: 266 kWh
- Electrical capacity*: 1,105 MW - Of which renewables: 805 MW (72.9 %)
- Electricity access rate: 48.7%
- Share of population using solid fuels: 81%

*2008

TARGETS:

- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- Law 98/022 on the electricity sector, creating the rural electrification agency (1998)
- Poverty reduction strategy (2003)
- National energy plan (2005)
- Cameroon renewable energy fund created (2005)
- Vision 2035 (2009)
- Ratified the IRENA statute (2011)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 161 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 19 MW of biomass-fired capacity addition announced (1 project)
- 12 MW of small hydro capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

CAPE VERDE

513,000 Population (2010)
1.6 billion USD GDP (2010)
3,215 USD GDP per capita (2010)

Figure 1: GDP per capita for 2010

Figure 2: Electricity use per capita for 2008

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 5.1 PJ - Of which renewables: 0.1 PJ (2.7%)
- Energy self-sufficiency: 2.7%
- Fuel imports*: 78 million USD (11% of total imports)
- Electricity generation: 286.8 GWh - Of which renewables: 5.5 GWh (1.9%)
- Electricity use per capita: 422 kWh
- Electrical capacity: 75 MW - Of which renewables: 3 MW (4%)
- Electricity access rate*: 87.0%
- Share of population using solid fuels: 36%

*2009

TARGETS:
- 50% of electricity generation from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 7.5 MW of solar photovoltaic capacity addition announced (2 projects)
- 29 MW of wind capacity addition announced (6 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 119 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 7.5 MW of solar photovoltaic capacity addition announced (2 projects)
- 29 MW of wind capacity addition announced (6 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour; PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
CENTRAL AFRICAN REPUBLIC

4.5 million Population (2010)
2.0 billion USD GDP (2010)
447 USD GDP per capita (2010)

FIGURE 1: GDP PER CAPITA FOR 2010

FIGURE 2: ELECTRICITY USE PER CAPITA FOR 2008

MIDDLE AFRICA INCLUDES ANGOLA, CAMEROON, THE CENTRAL AFRICAN REPUBLIC, CHAD, CONGO, THE DEMOCRATIC REPUBLIC OF CONGO, EQUATORIAL GUINEA, GABON AND SÃO TOME AND PRÍNCIPE.

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 44.7 PJ - Of which renewables: 41.0 PJ (91.6 %)
- Energy self-sufficiency: 91.6%
- Fuel imports: Not available
- Electricity generation: 162.0 GWh - Of which renewables: 132.0 GWh (81.5 %)
- Electricity use per capita: 37 kWh
- Electrical capacity: 46 MW - Of which renewables: 25 MW (54.3 %)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

TARGETS:

- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 182 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

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Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh = 10^9 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^6 MW).

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CHAD

11.5 million Population (2010)
7.6 billion USD GDP (2010)
659 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 119.8 PJ - Of which renewables: 112.8 PJ (94.2%)
- Energy self-sufficiency: 317.0%
- Fuel imports: Not available
- Electricity generation: 103.0 GWh - Of which renewables: 0.0 GWh (0%)
- Electricity use per capita: 9 kWh
- Electrical capacity: 32 MW - Of which renewables: 0 MW (0%)
- Electricity access rate: Not available
- Share of population using solid fuels: 93%

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 183 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind 🌬️ Solar ☀️ Hydro 🏝️ Biomass 🌿 Geothermal 🌌 Ocean ✗

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

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Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).

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COMOROS

675,000 Population (2010)
541 million USD GDP (2010)
802 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 4.5 PJ - Of which renewables: 2.7 PJ (58.9 %)
- Energy self-sufficiency: 58.9%
- Fuel imports: Not available
- Electricity generation: 54.0 GWh - Of which renewables: 5.0 GWh (9.3 %)
- Electricity use per capita: 84 kWh
- Electrical capacity: 6 MW - Of which renewables: 1 MW (16.7 %)
- Electricity access rate*: 46.0%
- Share of population using solid fuels: 76%

*2009

TARGETS:

- No information available

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 157 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- Electrification of six villages with solar photovoltaic micro-power station

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES: High Medium Low Unknown Not applicable

Wind Solar Hydro Biomass Geothermal Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh=10^9 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

CONGO

3.8 million Population (2010)
11.9 billion USD GDP (2010)
3,165 USD GDP per capita (2010)

Figure 1: GDP per capita for 2010

Figure 2: Electricity use per capita for 2008

Middle Africa includes Angola, Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 58.7 PJ - Of which renewables: 31.2 PJ (53.2%)
- Energy self-sufficiency: 1,089.6%
- Fuel imports: Not available
- Electricity generation: 516.0 GWh - Of which renewables: 330.0 GWh (64%)
- Electricity use per capita: 157 kWh
- Electrical capacity*: 148 MW - Of which renewables: 119 MW (80.4%)
- Electricity access rate: 37.1%
- Share of population using solid fuels: 84%

*2008

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 181 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kwh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^15 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^6 MW).

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MIDDLE AFRICA

67.8 million Population (2010)
13.1 billion USD GDP (2010)
194 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 959.7 PJ - Of which renewables: 927.1 PJ (96.6 %)
- Energy self-sufficiency: 101.9%
- Fuel imports: Not available
- Electricity generation: 7.8 TWh - Of which renewables: 7.8 TWh (99.6 %)
- Electricity use per capita: 101 kWh
- Electrical capacity*: 2,475 MW - Of which renewables: 2,442 MW (98.7 %)
- Electricity access rate: 11.1%
- Share of population using solid fuels: > 95%

*2008

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 9 MW of small hydro capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind 🌬️ Solar ☀️ Hydro 🏊️‍♂️ Biomass 🌿 Geothermal 🌍 Ocean 🌊

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).
CÔTE D’IVOIRE

22.8 billion USD GDP (2010)
1,056 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 433.5 PJ - Of which renewables: 333.4 PJ (76.9 %)
- Energy self-sufficiency: 114.9%
- Fuel imports: 1.5 billion USD (21.4 % of total imports)
- Electricity generation: 5.9 TWh - Of which renewables: 2,238 GWh (38 %)
- Electricity use per capita: 187 kWh
- Electrical capacity *: 1,218 MW - Of which renewables: 606 MW (49.8 %)
- Electricity access rate: 47.3%
- Share of population using solid fuels: 79%

*2008

TARGETS:
- 3% of primary energy from renewables (excluding biomass) by 2013
- 5% of primary energy from renewables (excluding biomass) by 2015
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 60 MW of biomass-fired capacity addition by 2013 (1 project)
- 33 MW of biogas-fired capacity addition announced (2 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 167 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 60 MW of biomass-fired capacity addition by 2013 (1 project)
- 33 MW of biogas-fired capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 3

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh=10^3 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^9 MW).

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DJIBOUTI

879,000 Population (2010)
Not available GDP (2010)
Not available GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 11.2 PJ - Of which renewables: 3.6 PJ (32.3%)
- Energy self-sufficiency: 32.3%
- Fuel imports: Not available
- Electricity generation: 335.0 GWh - Of which renewables: 0.0 GWh (0%)
- Electricity use per capita: 394 kWh
- Electrical capacity: 118 MW - Of which renewables: 0 MW (0%)
- Electricity access rate: Not available
- Share of population using solid fuels: 16%

TARGETS:
- 30% of rural electrification to come from solar photovoltaic by 2017
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

50 MW of geothermal capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 170 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 50 MW of geothermal capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind Solar Hydro Biomass Geothermal Ocean

High Medium Low Unknown Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 3,015.1 PJ - Of which renewables: 115.1 PJ (3.8 %)
- Energy self-sufficiency: 122.5%
- Fuel imports: 4.4 billion USD (9.9 % of total imports)
- Electricity generation: 139.0 TWh - Of which renewables: 14.0 TWh (10.1 %)
- Electricity use per capita: 1,487 kWh
- Electrical capacity*: 23.4 GW - Of which renewables: 3,147 MW (13.4 %)
- Electricity access rate: 99.6%
- Share of population using solid fuels: < 5%

*2008

TARGETS:

- 14% of primary energy from renewables by 2020
- 20% of electricity generation from renewables by 2020: 12% from wind (equivalent to more than 7,200 MW installed), 6% from hydro and 2% from other renewables

Northern Africa includes Algeria, Egypt, Libya, Morocco, Sudan and Tunisia.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 250 MW of wind capacity addition by 2014 (1 project)
- 100 MW of solar thermal capacity addition by 2015 (1 project)
- 540 MW of wind capacity addition announced (3 projects)
- Up to 100 MW of small hydro capacity addition announced (2 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 110 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 250 MW of wind capacity addition by 2014 (1 project)
- 100 MW of solar thermal capacity addition by 2015 (1 project)
- 540 MW of wind capacity addition announced (3 projects)
- Up to 100 MW of small hydro capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 4

RENEWABLE ENERGY RESOURCES:

Wind ● Solar ● Hydro ● Biomass ● Geothermal ● Ocean ●

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^6 MW).

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**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 66.8 PJ - Of which renewables: 2.0 PJ (3.0 %)
- Energy self-sufficiency: 1,443.4%
- Fuel imports: Not available
- Electricity generation: 100.0 GWh - Of which renewables: 7.0 GWh (7 %)
- Electricity use per capita: 152 kWh
- Electrical capacity: 31 MW - Of which renewables: 1 MW (3.2 %)
- Electricity access rate: Not available
- Share of population using solid fuels: Not available

**TARGETS:**

- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 155 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not pre-judge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^6 MW).
ERITREA

5.2 million Population (2010)
2.1 billion USD GDP (2010)
405 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 30.4 PJ - Of which renewables: 23.5 PJ (77.4 %)
- Energy self-sufficiency: 77.4%
- Fuel imports: Not available
- Electricity generation: 295.0 GWh - Of which renewables: 2.0 GWh (0.7 %)
- Electricity use per capita: 51 kWh
- Electrical capacity*: 167 MW - Of which renewables: 1 MW (0.6 %)
- Electricity access rate: 32.0%
- Share of population using solid fuels: 63%

*2008

TARGETS:
- 50% of electricity generation from wind
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 180 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electric access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

ETHIOPIA

85.0 million Population (2010)
29.7 billion USD GDP (2010)
350 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 1,368.2 PJ - Of which renewables: 1,271.7 PJ (92.9 %)
- Energy self-sufficiency: 92.9 %
- Fuel imports: 1.3 billion USD (16.4 % of total imports)
- Electricity generation: 4,106 GWh - Of which renewables: 3,598 GWh (87.6 %)
- Electricity use per capita: 45 kWh
- Electrical capacity*: 929 MW - Of which renewables: 791 MW (85.1 %)
- Electricity access rate: 17.0 %
- Share of population using solid fuels: > 95%

*T2008

TARGETS:
- 760 MW of wind capacity addition by 2013
- 5,600 MW of hydro capacity addition by 2013
- 450 MW of geothermal capacity addition by 2013

Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.
Policies in place to promote renewable energy since the Rio Conference of 1992

- 120 MW of wind capacity addition by 2012 (1 project)
- 50 MW of geothermal capacity addition announced (2 projects)
- 149 million litres of biofuel per year capacity addition announced (2 projects)

World Bank Ease of Doing Business Index for 2012: Ranked 111 out of 183

Renewable energy projects from the government and private sectors:
- 120 MW of wind capacity addition by 2012 (1 project)
- 50 MW of geothermal capacity addition announced (2 projects)
- 149 million litres of biofuel per year capacity addition announced (2 projects)

Number of registered Clean Development Mechanism projects focusing on renewable energy: 0

Renewable energy resources:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA; analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^6 MW).
1.5 million Population (2010)
13.0 billion USD GDP (2010)
8,667 USD GDP per capita (2010)

**FIGURE 1: GDP PER CAPITA FOR 2010**

**FIGURE 2: ELECTRICITY USE PER CAPITA FOR 2008**

- Middle Africa includes Angola, Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

**ENERGY NATIONAL PROFILE 2009**

- Total Primary Energy Supply: 75.1 PJ - Of which renewables: 49.6 PJ (66.0 %)
- Energy self-sufficiency: 757.4%
- Fuel imports: Not available
- Electricity generation: 1,666 GWh - Of which renewables: 893.0 GWh (53.6 %)
- Electricity use per capita: 924 kWh
- Electrical capacity*: 415 MW - Of which renewables: 170 MW (41 %)
- Electricity access rate: 36.7%
- Share of population using solid fuels: 27%

*2008

**TARGETS:**

- More than 70% of electricity generation from renewables by 2016
- 80% of final energy from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

RURAL ELECTRIFICATION PROGRAMME

INTERIM POVERTY REDUCTION STRATEGY PAPER

ENERGY POLICY

SIGNED THE IRENA STATUTE

2000

2005

2009

2009

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 156 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:

- 78 MW of small hydro capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

GAMBIA

1.8 million Population (2010)
807 million USD GDP (2010)
461 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 19.5 PJ - Of which renewables: 13.6 PJ (69.8%)
- Energy self-sufficiency: 69.8%
- Fuel imports*: 47 million USD (15.5% of total imports)
- Electricity generation: 242.0 GWh - Of which renewables: 0.0 GWh (0%)
- Electricity use per capita: 136 kWh
- Electrical capacity: 53 MW - Of which renewables: 0 MW (0%)
- Electricity access rate: Not available
- Share of population using solid fuels: 95%

*2009

TARGETS:
- No information available

FIGURE 1: GDP PER CAPITA FOR 2010
FIGURE 2: ELECTRICITY USE PER CAPITA FOR 2008

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

**WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012:** Ranked 149 out of 183

**RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:**
- 14 MW of waste-to-energy capacity addition announced (1 project)

**NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY:** 0

**RENEWABLE ENERGY RESOURCES:**

<table>
<thead>
<tr>
<th>Wind</th>
<th>Solar</th>
<th>Hydro</th>
<th>Biomass</th>
<th>Geothermal</th>
<th>Ocean</th>
</tr>
</thead>
</table>

High  Medium  Low  Unknown  Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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Figure 1: GDP per capita for 2010

Figure 2: Electricity use per capita for 2008

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 386.9 PJ - Of which renewables: 295.0 PJ (76.2%)
- Energy self-sufficiency: 76.3%
- Fuel imports: 1.1 billion USD (14% of total imports)
- Electricity generation: 9.0 TWh - Of which renewables: 6.9 TWh (76.8%)
- Electricity use per capita: 265 kWh
- Electrical capacity*: 2,111 MW - Of which renewables: 1,280 MW (60.6%)
- Electricity access rate: 60.5%
- Share of population using solid fuels: 86%

*2008

TARGETS:

- 10% of electricity generation from renewables by 2020
Policies in place to promote renewable energy since the Rio Conference of 1992

- 50 MW of waste-to-energy capacity addition announced (1 project)
- 2 MW of biomass-fired capacity addition announced (1 project)
- 150 million litres of biofuel per year capacity addition announced (1 project)

World Bank Ease of Doing Business Index for 2012: Ranked 67 out of 183

Renewable energy resources:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Renewable energy projects from the government and private sectors:
- 50 MW of waste-to-energy capacity addition announced (1 project)
- 2 MW of biomass-fired capacity addition announced (1 project)
- 150 million litres of biofuel per year capacity addition announced (1 project)

Number of registered Clean Development Mechanism projects focusing on renewable energy: 0

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).
GUINEA

10.3 million Population (2010)
4.5 billion USD GDP (2010)
437 USD GDP per capita (2010)

**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 179.0 PJ - Of which renewables: 161.4 PJ (90.2%)
- Energy self-sufficiency: 90.2%
- Fuel imports*: 385 million USD (36.3% of total imports)
- Electricity generation: 1,000 GWh - Of which renewables: 528.8 GWh (52.9%)
- Electricity use per capita: 102 kWh
- Electrical capacity: 331 MW - Of which renewables: 123 MW (37.2%)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

*2009

**TARGETS:**
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

Policies:
- Electricity sector efficiency improvement project: 2007
- Poverty reduction strategy paper: 2007
- Energy sector policy document: 2009
- Signed the IRENA Statute: 2009

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 179 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Regelle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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GUINEA-BISSAU

1.6 million Population (2010)
879 million USD GDP (2010)
533 USD GDP (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 9.2 PJ - Of which renewables: 4.5 PJ (48.7 %)
- Energy self-sufficiency: 48.7%
- Fuel imports: Not available
- Electricity generation: 15.0 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 10 kWh
- Electrical capacity: 15 MW - Of which renewables: 0 MW (0 %)
- Electricity access rate: 10.0%
- Share of population using solid fuels: > 95%

TARGETS:

- 2% of primary energy from solar photovoltaic by 2015
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- Diffusion of solar home systems in rural areas

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 176 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- Diffusion of solar home systems in rural areas

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind 🌬️  Solar ☀️  Hydro ⚪️  Biomass 🔴️  Geothermal 🌇️  Ocean 🌊

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
KENYA

40.9 million Population (2010)
31.4 billion USD GDP (2010)
769 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 783.9 PJ - Of which renewables: 652.0 PJ (83.2%)
- Energy self-sufficiency: 83.2%
- Fuel imports: 2.1 billion USD (20.8% of total imports)
- Electricity generation: 6.9 TWh - Of which renewables: 3,846 GWh (55.9%)
- Electricity use per capita: 146 kWh
- Electrical capacity*: 1,286 MW - Of which renewables: 862 MW (67%)
- Electricity access rate: 16.1%
- Share of population using solid fuels: 75%

*2008

TARGETS:

- Double installed renewable capacity by 2012
- 5,000 MW of geothermal capacity by 2030
Policies in place to promote renewable energy since the Rio Conference of 1992

- 32 million litres of ethanol capacity addition by 2012 (2 projects)
- Up to 600 MW of geothermal capacity addition by 2017 (5 projects)
- More than 550 MW of wind capacity addition by 2013 (3 projects)
- 100 MW of biomass-fired capacity addition announced (4 projects)
- 45 MW of small hydro capacity addition announced (13 projects)

Number of registered Clean Development Mechanism projects focusing on renewable energy: 4

Renewable energy projects from the government and private sectors:

- 32 million litres of ethanol capacity addition by 2012 (2 projects)
- Up to 600 MW of geothermal capacity addition by 2017 (5 projects)
- More than 550 MW of wind capacity addition by 2013 (3 projects)
- 100 MW of biomass-fired capacity addition announced (4 projects)
- 45 MW of small hydro capacity addition announced (13 projects)

World Bank Ease of Doing Business Index for 2012: Ranked 109 out of 183

Renewable energy resources:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA; analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; electrical capacity: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21; IRENA; Policy/legislation: IEA, Reegle; REN21; IRENA; research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kwh: kilowatt-hour; GW: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
**LESOTHO**

2.1 million Population (2010)
2.1 billion USD GDP (2010)
1,023 USD GDP per capita (2010)

**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 37.2 PJ - Of which renewables: 33.4 PJ (89.7 %)
- Energy self-sufficiency: 89.7%
- Fuel imports*: 125 million USD (6.4 % of total imports)
- Electricity generation: 522.3 GWh - Of which renewables: 519.8 GWh (99.5 %)
- Electricity use per capita: 253 kWh
- Electrical capacity: 76 MW - Of which renewables: 76 MW (100 %)
- Electricity access rate*: 16.0%
- Share of population using solid fuels: 71%

*2009

**TARGETS:**

- 35% of rural electrification to come from renewables by 2020

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- NATIONAL ELECTRIFICATION MASTER PLAN 1994-2003
- POWER SECTOR POLICY STATEMENT 1994
- VISION 2020 1998
- GENERATION MASTER PLAN 2010-2011 2010

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 143 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 25 MW of wind capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

LIBERIA

4.1 million Population (2010)
986 million USD GDP (2010)
240 USD GDP per capita (2010)

Figure 1: GDP per capita for 2010

Figure 2: Electricity use per capita for 2008

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 98.7 PJ - Of which renewables: 91.0 PJ (92.2 %)
- Energy self-sufficiency: 92.2%
- Fuel imports: Not available
- Electricity generation: 353.0 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 87 kWh
- Electrical capacity: 198 MW - Of which renewables: 0 MW (0 %)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- Emergency Power Programme: 2006
- Liberia Energy Assistance Programme: 2007
- Division of Electricity and Renewable Energy Created Within the Ministry of Lands, Mines and Energy: 2009
- Signed the IRENA Statute: 2010
- Liberia Energy Sector Support Programme: 2010

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 151 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 7 MW of biomass-fired capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 1

RENEWABLE ENERGY RESOURCES: High ◼ Medium ◼ Low ◼ Unknown ◼ Not applicable

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^3 kWh); TWh: terawatt-hour (1 TWh = 10^6 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 854.3 PJ - Of which renewables: 7.0 PJ (0.8 %)
- Energy self-sufficiency: 427.0%
- Fuel imports: 99.8%
- Electricity generation: 30.4 TWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 4,068 kWh
- Electrical capacity*: 6.3 GW - Of which renewables: 0 MW (0 %)
- Electricity access rate: 99.8%
- Share of population using solid fuels: < 5%

*2008

TARGETS:

- 10% of primary energy from renewables by 2020
- 10% of electricity generation from renewables by 2020
- 30% of electricity generation from renewables by 2030
- 1,000 MW of wind capacity by 2015
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- More than 600 MW of wind capacity addition announced (5 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Not ranked

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- More than 600 MW of wind capacity addition announced (5 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh=10^3 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^8 MW).
MADAGASCAR

8.7 billion USD GDP (2010)
433 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 274.2 PJ - Of which renewables: 248.5 PJ (90.6 %)
- Energy self-sufficiency: 90.6%
- Fuel imports*: 327 million USD (10.2 % of total imports)
- Electricity generation: 1,104 GWh - Of which renewables: 699.7 GWh (63.4 %)
- Electricity use per capita: 45 kWh
- Electrical capacity: 246 MW - Of which renewables: 124 MW (50.4 %)
- Electricity access rate*: 19.0%
- Share of population using solid fuels: > 95%

*2009

TARGETS:

- 54% of final energy from renewables by 2020
- 75% of electricity generation from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- **19 MW** of small hydro capacity addition announced (2 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 137 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 19 MW of small hydro capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 1

RENEWABLE ENERGY RESOURCES:

- **Wind**
- **Solar**
- **Hydro**
- **Biomass**
- **Geothermal**
- **Ocean**

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour; 1GWh = 10^9 kWh; TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 134.0 PJ - Of which renewables: 118.0 PJ (88.1%)
- Energy self-sufficiency: 89.1%
- Fuel imports*: 211 million USD (11.7% of total imports)
- Electricity generation: 1,801 GWh - Of which renewables: 1,544 GWh (85.7%)
- Electricity use per capita: 85 kWh
- Electrical capacity: 315 MW - Of which renewables: 290 MW (92.1%)
- Electricity access rate*: 9.0%
- Share of population using solid fuels: > 95%

*2009

**TARGETS:**

- 7% of primary energy from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 75 KW micro hydropower project with mini-grid in final stages of completion
- Plan to construct isolated wind farms with total installed capacity of 120 MW starting in year 2012
- 450 KW grid-connected Solar Power Project underway
- 10MW small hydropower project about to start

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 145 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 75 KW micro hydropower project with mini-grid in final stages of completion
- Plan to construct isolated wind farms with total installed capacity of 120 MW starting in year 2012
- 450 KW grid-connected Solar Power Project underway
- 10MW small hydropower project about to start

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 109 kWh); TWh: terawatt-hour (1 TWh=1012 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=103 MW).

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**RENEWABLE ENERGY COUNTRY PROFILE**

**Mali**

- Population (2010): 15.4 million
- GDP (2010): 9.3 billion USD
- GDP per capita (2010): 602 USD

**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 135.0 PJ - Of which renewables: 105.8 PJ (78.4%)
- Energy self-sufficiency: 78.4%
- Fuel imports*: 265 million USD (10% of total imports)
- Electricity generation: 977.0 GWh - Of which renewables: 279.0 GWh (28.6%)
- Electricity use per capita: 111 kWh
- Electrical capacity: 280 MW - Of which renewables: 155 MW (55.4%)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

*2009

**TARGETS:**

- 15% of primary energy from renewables (excluding biomass) by 2020
- 25% of electricity generation from renewables by 2020

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Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 80 MW of small and mini hydro capacity addition announced (2 projects)
- 20 MW of waste-to-energy capacity addition announced (1 project)
- 15 million liters of ethanol per year capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 146 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 80 MW of small and mini hydro capacity addition announced (2 projects)
- 20 MW of waste-to-energy capacity addition announced (1 project)
- 15 million liters of ethanol per year capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 1

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

*excluding electricity trade

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 62.6 PJ - Of which renewables: 36.6 PJ (58.5 %)
- Energy self-sufficiency: 99.1%
- Fuel imports*: 436 million USD (30.5 % of total imports)
- Electricity generation: 486.9 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 145 kWh
- Electrical capacity: 253 MW - Of which renewables: 97 MW (38.3 %)
- Electricity access rate: Not available
- Share of population using solid fuels: 60%

*2009

TARGETS:

- 15% of primary energy from renewables (excluding biomass) by 2015
- 20% of primary energy from renewables (excluding biomass) by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 159 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 83 to 150 MW of wind capacity addition announced (4 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
RENEWABLE ENERGY COUNTRY PROFILE

MAURITIUS

1.3 million Population (2010)
9.7 billion USD GDP (2010)
7,589 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2010

- Total Primary Energy Supply: 59.0 PJ - Of which renewables: 11.3 PJ (19.1%)
- Energy self-sufficiency: 19.1%
- Fuel imports*: 561 million USD (15% of total imports)
- Electricity generation: 2,577 GWh - Of which renewables: 608.9 GWh (23.6%)
- Electricity use per capita: 1,870 kWh
- Electrical capacity: 739 MW - Of which renewables: 59 MW (8%)
- Electricity access rate: 99.4%
- Share of population using solid fuels: < 2%

*2009

TARGETS:
- 35% of electricity generation from renewables by 2025
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 12 MW of solar photovoltaic capacity addition by the end of 2013 (2 projects)
- 38 MW of wind capacity addition by the end of 2014 (2 projects)
- 3 MW of landfill gas to energy capacity by the end of 2011 (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 23 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 12 MW of solar photovoltaic capacity addition by the end of 2013 (2 projects)
- 38 MW of wind capacity addition by the end of 2014 (2 projects)
- 3 MW of landfill gas to energy capacity by the end of 2011 (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation, Targets: IRENA, IEA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^6 kWh); TWh: terawatt-hour (1 TWh = 10^9 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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MOROCCO

32.4 million Population (2010)
91.2 billion USD GDP (2010)
2,816 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 631.5 PJ - Of which renewables: 30.9 PJ (4.9 %)
- Energy self-sufficiency: 5.2%
- Fuel imports: 6.7 billion USD (20.5 % of total imports)
- Electricity generation: 21.4 TWh - Of which renewables: 2,989 GWh (14 %)
- Electricity use per capita: 747 kWh
- Electrical capacity*: 6.0 GW - Of which renewables: 1,514 MW (25.2 %)
- Electricity access rate: 97.0%
- Share of population using solid fuels: 7%

*2008

TARGETS:

- 8% of primary energy and 10% of final energy from renewables by 2012
- 20% of electricity generation from renewables by 2012 and 42% by 2020
- 400 MW of small hydro capacity by 2015
- 2,000 MW of solar capacity by 2020
- 1,440 MW of wind capacity by 2015, increased to 2,000 MW by 2020
- 400,000 m² of solar hot water capacity by 2012, increased to 1.7 million m² by 2020

FIGURE 1: GDP PER CAPITA FOR 2010

FIGURE 2: ELECTRICITY USE PER CAPITA FOR 2008

Northern Africa includes Algeria, Egypt, Libya, Morocco, Sudan and Tunisia.
Figure 3: Total Primary Energy Supply * in 2000 and 2009

2000: 420.3 PJ
2009: 614.9 PJ

*excluding electricity trade

Policies in Place to Promote Renewable Energy Since the Rio Conference of 1992

- 450 MW of wind capacity addition by 2014 (3 projects)
- Up to 1,100 MW of wind capacity addition announced (10 projects)
- 130 MW of solar thermal capacity addition announced (2 projects)
- 9 MW of solar photovoltaic capacity addition announced (2 projects)

Renewable Energy Projects from the Government and Private Sectors:

- 450 MW of wind capacity addition by 2014 (3 projects)
- Up to 1,100 MW of wind capacity addition announced (10 projects)
- 130 MW of solar thermal capacity addition announced (2 projects)
- 9 MW of solar photovoltaic capacity addition announced (2 projects)

Number of Registered Clean Development Mechanism Projects Focusing on Renewable Energy: 4

Renewable Energy Resources:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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MOZAMBIQUE

23.4 million Population (2010)
9.6 billion USD GDP (2010)
410 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 408.9 PJ - Of which renewables: 395.5 PJ (96.7 %)
- Energy self-sufficiency: 122.0%
- Fuel imports: 581 million USD (15.4 % of total imports)
- Electricity generation: 17.0 TWh - Of which renewables: 17.0 TWh (99.9 %)
- Electricity use per capita: 453 kWh
- Electrical capacity*: 2,428 MW - Of which renewables: 2,179 MW (89.7 %)
- Electricity access rate: 11.7%
- Share of population using solid fuels: > 95%

*2008

TARGETS:

- 6,000 MW of wind, solar and hydro capacity (2,000 MW each)
- Installation of 82,000 solar photovoltaic systems, 1,000 biodigesters, 3,000 wind pumping systems, 5,000 renewable-energy-based productive systems and 100,000 solar heater in rural areas

Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 420 million litres of ethanol per year capacity addition announced (3 projects)
- 100 million litres of biodiesel per year capacity addition announced (1 project)
- 32 MW of biofuel-fired capacity addition announced (1 project)
- 120 MW of wind capacity addition announced (2 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 139 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 200 million litres of ethanol per year capacity addition announced (3 projects)
- 100 million litres of biodiesel per year capacity addition announced (1 project)
- 32 MW of biofuel-fired capacity addition announced (1 project)
- 120 MW of wind capacity addition announced (2 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).
RENWEABLE ENERGY COUNTRY PROFILE

NAMIBIA

2.2 million Population (2010)
12.2 billion USD GDP (2010)
5,502 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 71.7 PJ - Of which renewables: 13.8 PJ (19.2%)
- Energy self-sufficiency: 19.2%
- Fuel imports: 374 million USD (7.5% of total imports)
- Electricity generation: 1,742 GWh - Of which renewables: 1,429 GWh (82%)
- Electricity use per capita: 1,628 kWh
- Electrical capacity*: 264 MW - Of which renewables: 249 MW (94.3%)
- Electricity access rate: 34.0%
- Share of population using solid fuels: 57%

*2008

TARGETS:

- 40 MW of renewable capacity (excluding hydro) by 2011
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- Up to 450 MW of wind capacity addition announced (5 projects)
- 26 MW of small hydro capacity addition announced (3 projects)
- 400 MW of solar thermal capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 78 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- White Paper on Energy Policy
- Rural Electricity Distribution Master Plan
- Namibian Renewable Energy Program Established
- Cabinet Directive Making Solar Water Heaters Mandatory for All Public and Semi-Public Buildings

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reggle, IRENA research; Clean Development Mechanism projects: UNFCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^6 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

NIGER

15.9 million Population (2010)
5.5 billion USD GDP (2010)
349 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply*: 169.6 PJ - Of which renewables: 156.8 PJ (92.5 %)
- Energy self-sufficiency**: 95.3%
- Fuel imports: 212 million USD (11.2 % of total imports)
- Electricity generation: 242.3 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 40 kWh
- Electrical capacity*: 230 MW - Of which renewables: 1 MW (0 %)
- Electricity access rate: 8.6%
- Share of population using solid fuels: > 95%

*2008
**2011

TARGETS:

- 10% of primary energy from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 173 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 4,532.3 PJ - Of which renewables: 3,864.3 PJ (85.3%)
- Energy self-sufficiency: 211.3%
- Fuel imports: 335 million USD (1% of total imports)
- Grid electricity generation: 19.8 TWh - Of which renewables: 4,529 GWh (22.9%)
- Grid electricity use per capita: 120 kWh
- Grid electrical capacity*: 5.9 GW - Of which renewables: 1,938 MW (32.9%)
- Grid electricity access rate: 50.6%
- Share of population using solid fuels: 79%

*2008

TARGETS:
- 18% of electricity from renewables by 2025
- 20% of electricity from renewables by 2030
- 100 MW of small hydro capacity by 2015 and 760 MW by 2025
- 300 MW of solar photovoltaic capacity by 2015 and 4,000 MW in 2025
- 40 MW of wind capacity by 2025
- 5 MW of biomass-fired capacity by 2015 and 30 MW by 2025

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 10 MW of wind capacity addition by 2012 (1 project)
- 2,930 MW of hydropower capacity addition announced (3 projects)
- 80 million litres of biodiesel per year capacity addition announced (1 project)
- 225 million litres of ethanol per year capacity addition announced (4 projects)
- 5 MW of biomass-fired capacity addition announced (1 project)
- 10 MW of dispersed solar photovoltaic projects (for water pumping, street lights and mini-grids)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 133 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 10 MW of wind capacity addition by 2012 (1 project)
- 2,930 MW of hydropower capacity addition announced (3 projects)
- 80 million litres of biodiesel per year capacity addition announced (1 project)
- 225 million litres of ethanol per year capacity addition announced (4 projects)
- 5 MW of biomass-fired capacity addition announced (1 project)
- 10 MW of dispersed solar photovoltaic projects (for water pumping, street lights and mini-grids)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 1

RENEWABLE ENERGY RESOURCES:  
- Wind  
- Solar  
- Hydro  
- Biomass  
- Geothermal  
- Ocean  

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Targets: REN21, IRENA, Energy Commission of Nigeria; Policy/Legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research, Energy Commission of Nigeria; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).
RENEWABLE ENERGY COUNTRY PROFILE

RWANDA

10.3 million Population (2010)
5.6 billion USD GDP (2010)
548 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 111.2 PJ - Of which renewables: 101.2 PJ (91.0%)
- Energy self-sufficiency: 91.1%
- Fuel imports*: 28 million USD (2.3% of total imports)
- Electricity generation: 196.8 GWh - Of which renewables: 71.5 GWh (36.3%)
- Electricity use per capita: 22 kWh
- Electrical capacity: 67 MW - Of which renewables: 37 MW (55.2%)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

*2009

TARGETS:

- 90% of electricity generation from renewables by 2012
- 42 MW of small hydro capacity by 2015

Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:

- 28 MW of small capacity addition by end 2012 (1 project)
- 5 MW of small capacity addition announced (1 project)
- 16 million litres of biodiesel per year capacity addition announced (1 project)
- 1 MW of biogas-fired capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 45 out of 183

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

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Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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SAO TOME AND PRINCIPE

165,000 Population (2010)
197 million USD GDP (2010)
1,190 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 3.0 PJ - Of which renewables: 1.1 PJ (38.5 %)
- Energy self-sufficiency: 38.5%
- Fuel imports*: 16 million USD (15.4 % of total imports)
- Electricity generation: 33.7 GWh - Of which renewables: 12.0 GWh (35.6 %)
- Electricity use per capita: 210 kWh
- Electrical capacity: 14 MW - Of which renewables: 6 MW (42.9 %)
- Electricity access rate: Not available
- Share of population using solid fuels: Not available

*2009

TARGETS:
- No information available

Middle Africa includes Angola, Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 163 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind - Solar - Hydro - Biomass - Geothermal - Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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**ENERGY NATIONAL PROFILE 2009**

- Total Primary Energy Supply: 158.4 PJ - Of which renewables: 86.8 PJ (54.8 %)
- Energy self-sufficiency: 55.5%
- Fuel imports: 1.1 billion USD (23.2 % of total imports)
- Electricity generation: 2,858 GWh - Of which renewables: 292.0 GWh (10.2 %)
- Electricity use per capita: 189 kWh
- Electrical capacity*: 548 MW - Of which renewables: 2 MW (0.4 %)
- Electricity access rate: 42.0%
- Share of population using solid fuels: 51%

*2008

**TARGETS:**

- 15% of primary energy from renewables by 2025
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- **125 MW of wind capacity addition by the end of 2011 (1 project)**
- **25 MW of biomass-fired capacity addition announced (1 project)**

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 154 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 125 MW of wind capacity addition by the end of 2011 (1 project)
- 25 MW of biomass-fired capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 1

RENEWABLE ENERGY RESOURCES:
- High
- Medium
- Low
- Unknown

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Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).

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RENWABLE ENERGY COUNTRY PROFILE

SEYCHELLES

89,000 Population (2010)
937 million USD GDP (2010)
10,524 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 10.1 PJ - Of which renewables: 0.0 PJ (0.0 %)
- Energy self-sufficiency: 0.0%
- Fuel imports: 205 million USD (25.4 % of total imports)
- Electricity generation: 275.7 GWh - Of which renewables: 0.0 GWh (0 %)
- Electricity use per capita: 2,660 kWh
- Electrical capacity*: 95 MW - Of which renewables: 0 MW (0 %)
- Electricity access rate: 96.0%
- Share of population using solid fuels: < 5%

*2008

TARGETS:

- 5% of electricity generation from renewables by 2020
- 15% of electricity generation from renewables by 2030

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 18 MW of wind capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 103 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 18 MW of wind capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable
Solar ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable
Hydro ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable
Biomass ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable
Geothermal ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable
Ocean ![High](#) ![Medium](#) ![Low](#) Unknown Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^6 MW).

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SIERRA LEONE

5.8 million Population (2010)
1.9 billion USD GDP (2010)
326 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2008

- Total Primary Energy Supply: 114.3 PJ - Of which renewables: 96.2 PJ (84.1%)
- Energy self-sufficiency: 84.1%
- Fuel imports: Not available
- Electricity generation: 63.0 GWh - Of which renewables: 20.0 GWh (31.7%)
- Electricity use per capita: 11 kWh
- Electrical capacity: 52 MW - Of which renewables: 4 MW (7.7%)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

FIGURE 1: GDP PER CAPITA FOR 2010

FIGURE 2: ELECTRICITY USE PER CAPITA FOR 2008

Western Africa includes Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 90 million litres of ethanol per year capacity addition announced (1 project)
- 32 MW of biomass-fired capacity addition announced (1 project)
- 50 MW of small hydro capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 141 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 90 million litres of ethanol per year capacity addition announced (1 project)
- 32 MW of biomass-fired capacity addition announced (1 project)
- 50 MW of small hydro capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Regal, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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SOMALIA

Not available GDP (2010)
Not available GDP per capita (2010)

**ENERGY NATIONAL PROFILE 2008**
- Total Primary Energy Supply: 224.8 PJ - Of which renewables: 216.0 PJ (96.1 %)
- Energy self-sufficiency: 97.3%
- Fuel imports: Not available
- Electricity generation: 326.0 GWh - Of which renewables: 15.0 GWh (4.6 %)
- Electricity use per capita: 33 kWh
- Electrical capacity: 65 MW - Of which renewables: 5 MW (7.7 %)
- Electricity access rate: Not available
- Share of population using solid fuels: > 95%

**TARGETS:**
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Not ranked

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES: [Wind ● Solar ● Hydro ● Biomass ● Geothermal ● Ocean ●]

*excluding electricity trade

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not preclude the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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**RENEWABLE ENERGY COUNTRY PROFILE**

**SOUTH AFRICA**

**Figure 1: GDP per capita for 2010**

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per capita (2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>7,280 USD</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>6,903 USD</td>
</tr>
<tr>
<td>Africa</td>
<td>1,594 USD</td>
</tr>
<tr>
<td>World</td>
<td>4,000 USD</td>
</tr>
</tbody>
</table>

**Figure 2: Electricity use per capita for 2008**

<table>
<thead>
<tr>
<th>Country</th>
<th>kWh per capita (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>4,759</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>4,293</td>
</tr>
<tr>
<td>Africa</td>
<td>579</td>
</tr>
<tr>
<td>World</td>
<td>2,777</td>
</tr>
</tbody>
</table>

Southern Africa includes Botswana, Lesotho, Namibia, South Africa and Swaziland.

**ENERGY NATIONAL PROFILE 2009**

- Total Primary Energy Supply: 6,030.7 PJ - Of which renewables: 600.8 PJ (10.0%)
- Energy self-sufficiency: 111.5%
- Fuel imports: 13.7 billion USD (18.7% of total imports)
- Electricity generation: 246.8 TWh - Of which renewables: 1,764 GWh (0.7%)
- Electricity use per capita: 4,532 kWh
- Electrical capacity*: 44.1 GW - Of which renewables: 675 MW (1.5%)
- Electricity access rate: 75.0%
- Share of population using solid fuels: 17%

*2008

**Targets:**

- 10,000 GWh of renewables produced by 2013
- 3,100 MW of renewable capacity by 2013, including 500 MW of wind and 50 MW of concentrating solar power
- 4% of electricity generation from renewables by 2013
- 13% of electricity generation from renewables by 2020
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 12 MW of biogas-fired capacity addition by 2012 (2 projects)
- 100 MW of solar photovoltaic capacity addition by 2013 (2 projects)
- More than 400 MW of wind capacity addition by 2014 (5 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 35 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 12 MW of biogas-fired capacity addition by 2012 (2 projects)
- 100 MW of solar photovoltaic capacity addition by 2013 (2 projects)
- More than 400 MW of wind capacity addition by 2014 (5 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 10

RENEWABLE ENERGY RESOURCES:

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; European energy consumption rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^3 kWh); TWh: terawatt-hour (1TWh=10^9 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

SUDAN

Note: This country profile and map relate to Sudan and its borders prior to the independence of the Republic of South Sudan and its subsequent admission to the United Nations as a new Member State in July 2011.

43.6 million Population (2010)
62.0 billion USD GDP (2010)
1,425 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 662.2 PJ - Of which renewables: 461.9 PJ (69.8%)
- Energy self-sufficiency: 222.6%
- Fuel imports: Not available
- Electricity generation: 6.8 TWh - Of which renewables: 3,228 GWh (47.8%)
- Electricity use per capita: 115 kWh
- Electrical capacity: 2,300 MW - Of which renewables: 1,550 MW (67.4%)
- Electricity access rate: 30.0%
- Share of population using solid fuels: 80%

TARGETS:
- No information available

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 60 million litres of ethanol per year capacity addition announced (1 project)
- 50 million litres of biodiesel per year capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2010: Ranked 154 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 60 million litres of ethanol per year capacity addition announced (1 project)
- 50 million litres of biodiesel per year capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:  

- Wind
- Solar
- Hydro
- Biomass
- Geothermal
- Ocean

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- Installation of solar water heaters in public buildings
- Cogeneration in sugar mills using sugar cane waste (70 MW, proposed 30MW)
- Installation and promotion of efficient wood stoves
- Distribution of solar and LED lighting units for rural schools
- Bioethanol blending with petroleum

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 118 out of 183

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:  
- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudice the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Energy data: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).
United Republic of Tanzania

45.0 million Population (2010)
23.1 billion USD GDP (2010)
512 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 821.3 PJ - Of which renewables: 730.3 PJ (88.9 %)
- Energy self-sufficiency: 92.0%
- Fuel imports: 1.5 billion USD (23.1 % of total imports)
- Electricity generation: 4,628 GWh - Of which renewables: 2,784 GWh (60.2 %)
- Electricity use per capita: 85 kWh
- Electrical capacity*: 1,006 MW - Of which renewables: 579 MW (57.6 %)
- Electricity access rate: 13.9%
- Share of population using solid fuels: 90%

*2008

TARGETS:

- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 127 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 100 million litres of ethanol capacity addition by the end of 2011 (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- High
- Medium
- Low
- Unknown
- Not applicable

Wind ☺ Solar ☺ Hydro ☺ Biomass ☺ Geothermal ☺ Ocean ☺

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^9 MW).

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RENEWABLE ENERGY COUNTRY PROFILE

TOGO

6.8 million Population (2010)
3.2 billion USD GDP (2010)
465 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 110.0 PJ - Of which renewables: 91.7 PJ (83.4%)
- Energy self-sufficiency: 83.4%
- Fuel imports: 228 million USD (16.3 % of total imports)
- Electricity generation: 126.0 GWh - Of which renewables: 95.0 GWh (75.4 %)
- Electricity use per capita: 99 kWh
- Electrical capacity*: 85 MW - Of which renewables: 67 MW (78.8 %)
- Electricity access rate: 20.0%
- Share of population using solid fuels: > 95%

*2008

TARGETS:
- No information available
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 162 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- No information available

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:
- High
- Medium
- Low
- Unknown
- Not applicable

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Regge, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^3 MW).

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TUNISIA

10.5 million Population (2010)
44.3 billion USD GDP (2010)
4,204 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 385.2 PJ - Of which renewables: 54.8 PJ (14.2%)
- Energy self-sufficiency: 84.9%
- Fuel imports: 2.2 billion USD (11.4% of total imports)
- Electricity generation: 15.7 TWh - Of which renewables: 176.0 GWh (1.1%)
- Electricity use per capita: 1,312 kWh
- Electrical capacity*: 3,496 MW - Of which renewables: 82 MW (2.3%)
- Electricity access rate: 99.5%
- Share of population using solid fuels: < 5%

*2008

TARGETS:

- 4% of electricity generation from renewables by 2011
- 11% of electricity generation from renewables by 2016
- 25% of electricity generation from renewables by 2030
- 330 MW of wind capacity, 15 MW of solar photovoltaic capacity and 750,000 m² (500 MWth) of solar hot water capacity by 2011
- 1,000 MW of renewable capacity by 2016
- 4,700 MW of renewable capacity by 2030

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- More than 250 MW of wind capacity addition announced (3 projects)
- 5 MW of solar combined cycle power capacity addition announced (1 project)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 46 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- More than 250 MW of wind capacity addition announced (3 projects)
- 5 MW of solar combined cycle power capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

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Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^6 MW).

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**UGANDA**

**33.8 million** Population (2010)  
**17.0 billion USD** GDP (2010)  
**503 USD** GDP per capita (2010)

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**ENERGY NATIONAL PROFILE 2008**

- Total Primary Energy Supply: 659.6 PJ - Of which renewables: 620.5 PJ (94.1 %)  
- Energy self-sufficiency: 94.1%  
- Fuel imports*: 125 million USD (2.9 % of total imports)  
- Electricity generation: 2,058 GWh - Of which renewables: 1,467 GWh (71.3 %)  
- Electricity use per capita: 40 kWh  
- Electrical capacity: 515 MW - Of which renewables: 315 MW (61.2 %)  
- Electricity access rate*: 9.0%  
- Share of population using solid fuels: > 95%

*2009

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**TARGETS:**

- 61% of electricity generation from renewables by 2017  
- 188 MW of small hydro, biomass and geothermal capacity by 2017  
- 30,000 solar water heaters by 2017  
- 100,000 biogas digesters by 2017

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

- 40 MW of waste-to-energy capacity addition announced (1 project)
- 60 MW of small hydro capacity addition announced (7 projects)

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 123 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 40 MW of waste-to-energy capacity addition announced (1 project)
- 60 MW of small hydro capacity addition announced (7 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 2

RENEWABLE ENERGY RESOURCES:

Wind ⬤ Solar ⬤ Hydro ⬤ Biomass ⬤ Geothermal ⬤ Ocean ☒

Note: The information on resources should be taken as an indication only. It refers to a general trend of available resources, and does not prejudge the feasibility of individual projects. The thresholds are indicative, and do not refer to any technological choice. The analysis is based on the literature.

Sources: Population and GDP: World Bank; Energy data: IEA, IRENA analysis based on UN data; Share of fuel imports in total imports: World Trade Organisation; Electrical capacity: IEA, EIA; Electricity access rate: World Energy Outlook 2010 database (IEA); Share of population using solid fuels: World Health Organisation; Targets: REN21, IRENA; Policy/legislation: IEA, Reegle, IRENA research; Ease of doing business index: World Bank; Renewable energy projects: Bloomberg New Energy Finance, IRENA research; Clean Development Mechanism projects: UNFCCC; Renewable energy resources: IRENA analysis.

Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh = 10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW = 10^9 MW).

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**RENEWABLE ENERGY COUNTRY PROFILE**

**ZAMBIA**

12.9 million Population (2010)

16.2 billion USD GDP (2010)

1,253 USD GDP per capita (2010)

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**ENERGY NATIONAL PROFILE 2009**

- Total Primary Energy Supply: 328.9 PJ - Of which renewables: 303.2 PJ (92.2%)
- Energy self-sufficiency: 92.2%
- Fuel imports: 529 million USD (13.9% of total imports)
- Electricity generation: 10.3 TWh - Of which renewables: 10.3 TWh (99.7%)
- Electricity use per capita: 625 kWh
- Electrical capacity*: 1,680 MW - Of which renewables: 1,672 MW (99.5%)
- Electricity access rate: 18.8%
- Share of population using solid fuels: 86%

*2008

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**TARGETS:**

- No information available

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Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.
POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 84 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 8 MW of small hydro capacity addition announced (3 projects)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind ● Solar ● Hydro ● Biomass ● Geothermal ● Ocean ●

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Units: USD: United States dollar; kWh: kilowatt-hour; GWh: gigawatt-hour (1 GWh = 10^9 kWh); TWh: terawatt-hour (1 TWh=10^12 GWh); PJ: petajoule; MW: megawatt; GW: gigawatt (1 GW=10^3 MW).

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ZIMBABWE

12.6 million Population (2010)
7.5 billion USD GDP (2010)
591 USD GDP per capita (2010)

ENERGY NATIONAL PROFILE 2009

- Total Primary Energy Supply: 398.3 PJ - Of which renewables: 276.2 PJ (69.4 %)
- Energy self-sufficiency: 89.7%
- Fuel imports: 454 million USD (15.7 % of total imports)
- Electricity generation: 7.9 TWh - Of which renewables: 4,202 GWh (53.3 %)
- Electricity use per capita: 1,022 kWh
- Electrical capacity*: 2,099 MW - Of which renewables: 754 MW (35.9 %)
- Electricity access rate: 41.5%
- Share of population using solid fuels: 71%

*2008

TARGETS:
- 10% share of biofuels in liquid fuels by 2015

Figure 1: GDP per capita for 2010

Figure 2: Electricity use per capita for 2008

Eastern Africa includes Burundi, Comoros, Djibouti, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.

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POLICIES IN PLACE TO PROMOTE RENEWABLE ENERGY SINCE THE RIO CONFERENCE OF 1992

WORLD BANK EASE OF DOING BUSINESS INDEX FOR 2012: Ranked 171 out of 183

RENEWABLE ENERGY PROJECTS FROM THE GOVERNMENT AND PRIVATE SECTORS:
- 5 MW of small hydro capacity addition announced (1 project)

NUMBER OF REGISTERED CLEAN DEVELOPMENT MECHANISM PROJECTS FOCUSING ON RENEWABLE ENERGY: 0

RENEWABLE ENERGY RESOURCES:

Wind | Solar | Hydro | Biomass | Geothermal | Ocean

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