

Using the Interactive Data Portal on ECOWREX for Data-Driven Decision

22nd November 2017,
Abidjan, Côte d'Ivoire

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OUTLINE

- Introduction
- Flagship Product: Spatial Data Infrastructure
- Flagship Product: Spatial Data Infrastructure
- Next Steps
- Explore the ECOWREX Interactive Portal

INTRODUCTION

ECOWREX, developed in October 2012, is a free and open web-based information platform aimed at

- ❑ addressing poor data quality and information in the sphere of sustainable energy in the ECOWAS region;
- ❑ Providing decision makers, project developers, investors and other stakeholders with tailored energy information and planning tools.

Flagship Products

- ❑ ECOWREX Map Viewer
- ❑ ECOWREX Interactive Data Portal

The screenshot shows the ECOWREX website homepage. At the top, there is a header with the ECREEE logo (ECOWAS Observatory for Renewable Energy and Energy Efficiency) and the tagline 'TOWARDS SUSTAINABLE ENERGY'. To the right of the header are language options (EN, FR, PT), a search bar, and a 'Login' link. Below the header is a navigation menu with links for 'ABOUT ECOWREX', 'COUNTRY PROFILES', 'MAPS', 'RESOURCES', and 'CONTACT US'. The main content area features a large image of a solar farm with the caption 'Ghana-20MW PV plant: the largest existing in West...'. To the right of this image is a 'LEARN MORE ABOUT ECOWREX' section with a video player showing a globe and the text 'ECOWREX - ECOWAS OBSE...'. Below the main image are three icons: 'COUNTRY PROFILES' with a globe, 'MAPS VIEWER' with a map, and 'ANALYSIS & TRENDS' with a pie chart. To the right of these icons is a 'DATA PORTAL' section with a map of West Africa. At the bottom of the page, there is a footer with the text 'ECOWAS OBSERVATORY FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY', a paragraph about the importance of accurate knowledge, a world map, and the website URL 'WWW.ECREEE.ORG'. The footer also includes logos for 'gef', 'UNIDO', 'USAID FROM THE AMERICAN PEOPLE', 'Austrian Development Cooperation', 'MINISTERIO DE ASUNTOS EXTERIORES Y DE COOPERACION', and 'aacid'. The ECREEE logo is repeated in the bottom right corner.



USAID
FROM THE AMERICAN PEOPLE

Austrian
Development Cooperation



aacid



ECREEE
TOWARDS SUSTAINABLE ENERGY

Flagship Products: SPATIAL DATA INFRASTRUCTURE



Funded by the EU through the ACP-EU Program

SDI

www.ecowrex.org/page/maps

Map Viewer

www.ecowrex.org/mapView/

Metadata Catalogue

www.ecowrex.org:8080/

130 GEOSPATIAL LAYERS available for West Africa

RE resources and potential (solar, wind, biomass and hydro)

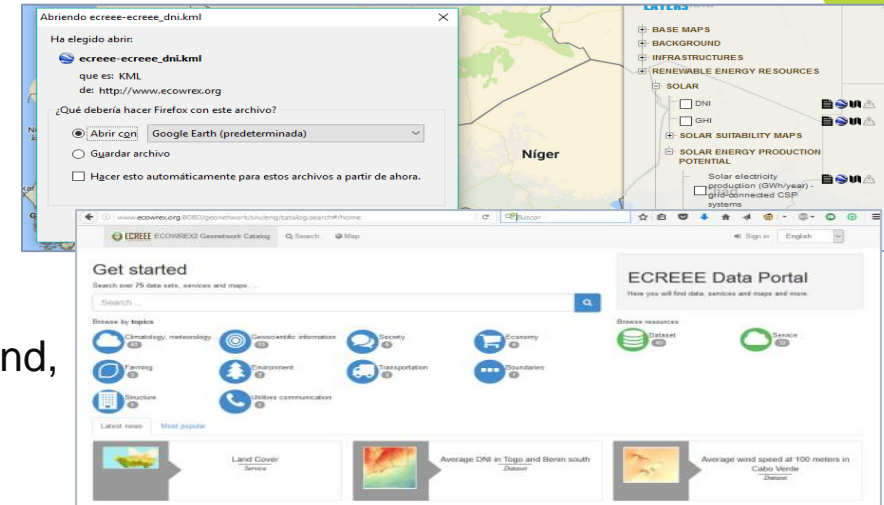
Population Distribution

Energy Demand

Grid Network

Power Plants

AND MORE!



FUNCTIONALITIES

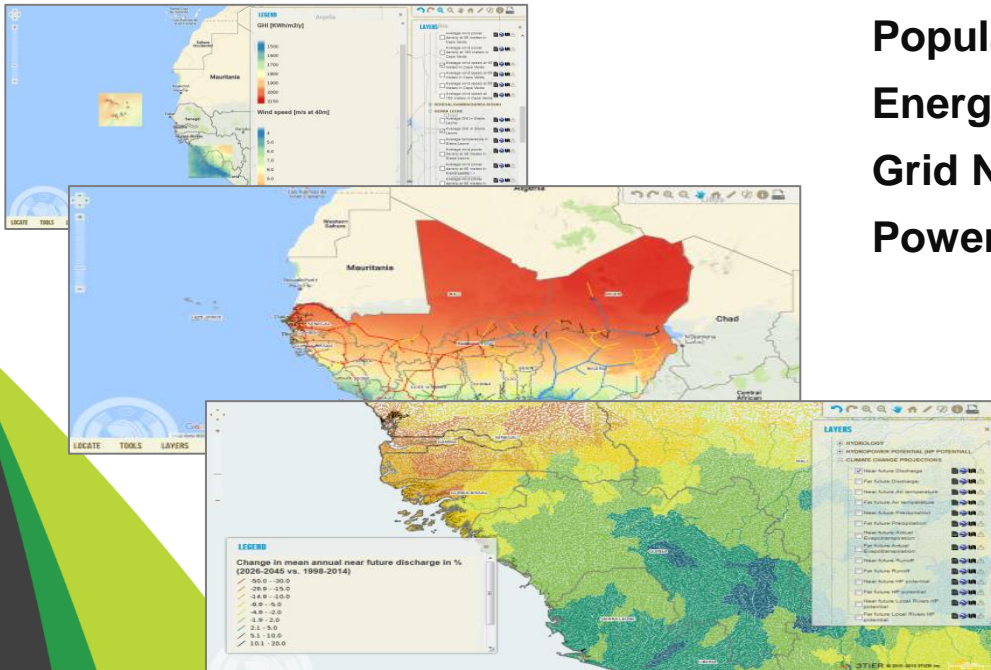
Data visualization

Data download

Data sharing

OGC Standards: WMS, WFS, WCS

Metadata catalogue



Flagship Products: INTERACTIVE DATA PORTAL

The **ECOWREX Interactive Data Portal** is a tool used for managing and sharing RE and EE information for all ECOWAS Member States. It archives data covering information from the years 2010 to date for the member states.

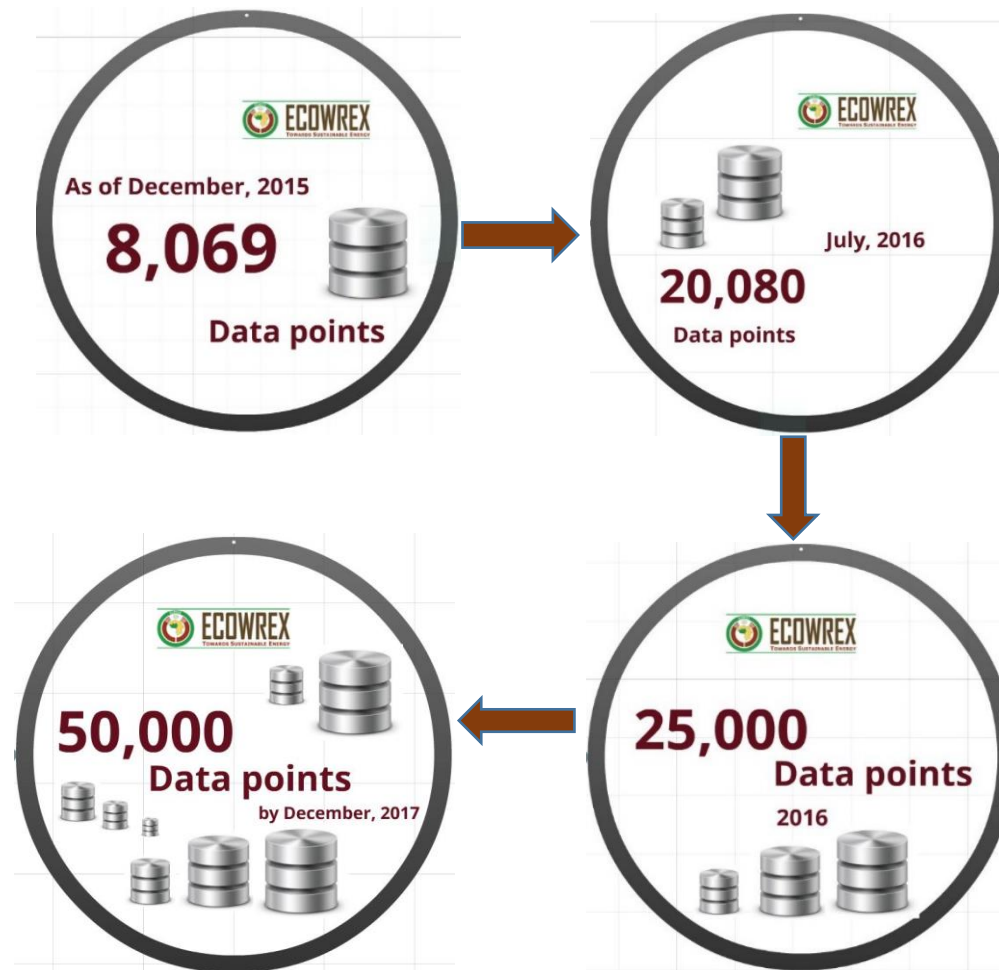
Functionality

- Integration
- Shareability
- Downloadability
- Data analysis

New Topics

- Electricity
- Energy Access
- Energy Efficiency
- RE Policy
- Investment, Industry & Finance
- Targets
- Thermal Power Plant Efficiency
- Additional Information

Data Archiving Trajectory



<http://www.ecowrex.org/page/tableau-country-profiles-dashboard>

INTERACTIVE DATA PORTAL (Contd.)

The portal consist of 5 dashboards

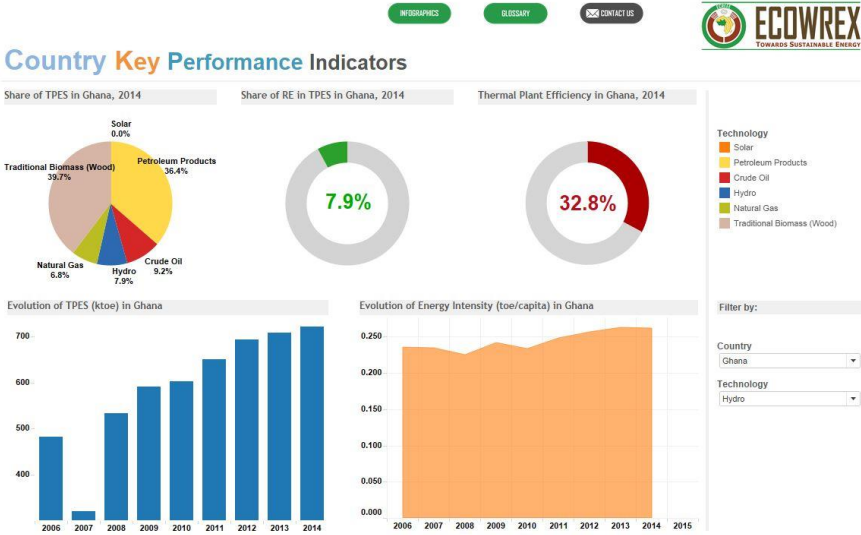
- **Map Interface:** It is an interactive map with a tooltip that displays socio-economic data.
- **Country Profile:** Displays RE and EE indicators for each country in a tabular format.
- **Energy Balance:** Summarizes the energy situation (demand, transformation and supply) of each member state.

Country Profiles

Country: (All) Topic: (All) Indicator: (All) Technology: (All) Data Year: (All) Raw Data

Country	Data Type	Topic	Indicator	Description	Technology	Sub Tech	Value/Unit	Sources	
Benin	Government	Additional Informa	Noteworthy Trends	The strategy for the ad...	Non-Technology ..			✓	
				Generation from Renewables (Share)	Sustainable biomass generation	Bioenergy	Biomass	1 %	✓
	Electricity	Target rate of access t...	Installed Capacity (On-Grid)	Dogo Bis on the Ouém...	Target rate of access t...	Bioenergy	Biomass	36 %	✓
					Target rate of access t...	Bioenergy	Biomass	60 %	✓
					Target rate of access t...	Hydro		128 MW	✓
					Target rate of access t...	Hydro	Small Hydro	2 MW	✓
					Target rate of access t...	Bioenergy	Biomass	0 MW	✓
					Target rate of access t...	Hydro		0 MW	✓
					Target rate of access t...	Solar		0 MW	✓
					Target rate of access t...	Solar		0 MW	✓
					Target rate of access t...	Wind		0 MW	✓
					Target rate of access t...	Wind		0 MW	✓
	Energy Access	Access to Electricity, National (% total of population)			Access to Electricity, National (% total of population)	Non-Technology Specific		28.4 %	✓
					Access to Electricity, National (% total of population)	Non-Technology Specific		29.2 %	✓
					Access to Electricity, National (% total of population)	Non-Technology Specific		30.78 %	✓
					Access to Electricity, National (% total of population)	Non-Technology Specific		32.44 %	✓
					Access to Electricity, Rural (% of rural population)	Non-Technology Specific		4.48 %	✓
					Access to Electricity, Rural (% of rural population)	Non-Technology Specific		5.5 %	✓
	Energy Access	Access to Electricity, Urban (% of urban population)			Access to Electricity, Urban (% of urban population)	Non-Technology Specific		6.22 %	✓
					Access to Electricity, Urban (% of urban population)	Non-Technology Specific		7.02 %	✓
Access to Electricity, Urban (% of urban population)					Non-Technology Specific		55.2 %	✓	
Access to Electricity, Urban (% of urban population)					Non-Technology Specific		56.4 %	✓	
Energy Efficiency	Energy Efficiency Pol...	National Agency for R...	Improved Clean Cookstoves (Share)	Energy Efficiency Pol...	Non-Technology ..		61.71 %	✓	
				Energy Efficiency Pol...	Non-Technology Specific		3 %	✓	
Energy Efficiency	Improved Clean Cookstoves (Share)	Non-Technology Specific		-34 %	✓				

MOE Ministry of Energy
Rural Electrification
Renewable Energy
Energy Management and Energy Efficiency
Electricity/Energy Regulator
Electricity Operator



- **Country KPIs:** Key metrics that measure the progress of a country’s current situation against the sustainable energy goals of the country.
- **Regional KPIs:** This dashboard analyses the status of sustainable energy at an aggregated (regional) level.

INTERACTIVE DATA PORTAL (Contd.)

INFOGRAPHICS

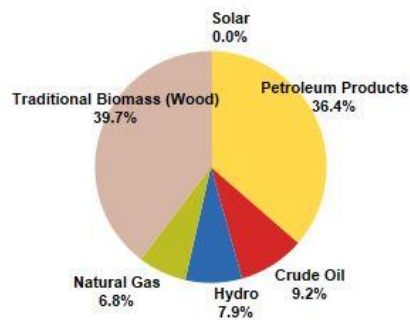
GLOSSARY

CONTACT US

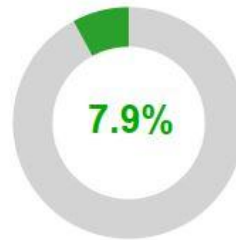


Country Key Performance Indicators

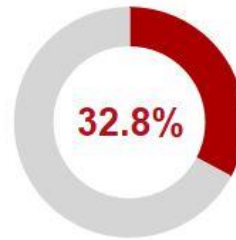
Share of TPES in Ghana, 2014



Share of RE in TPES in Ghana, 2014



Thermal Plant Efficiency in Ghana, 2014



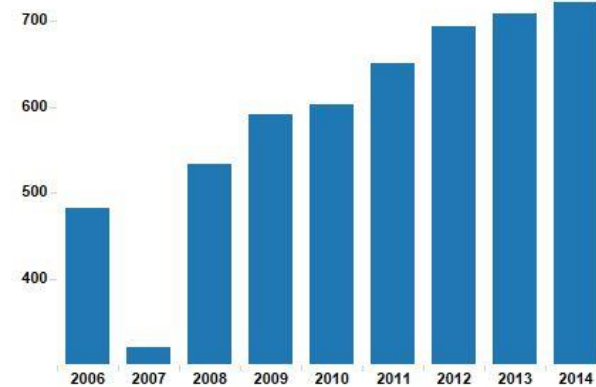
- Technology
- Solar
 - Petroleum Products
 - Crude Oil
 - Hydro
 - Natural Gas
 - Traditional Biomass (Wood)

Filter by:

Country
Ghana

Technology
Hydro

Evolution of TPES (ktoe) in Ghana



Evolution of Energy Intensity (toe/capita) in Ghana



Methodology

1. Values were retrieved from energy balance sheets.
2. Wood is not considered as share of RE in TPES.
3. Aggregation of all energy input and output values for all TPs in a country.

Steps

1. Filter by country.
2. Hover over donut chart for details.

Status (of Member States) in terms of Data Contribution

Country	Number of Data Points	Share of Total (%)	Rank
Mali	6064	11.04	1
Senegal	5720	10.42	2
Benin	5324	9.69	3
Niger	4821	8.78	4
Burkina Faso	4700	8.56	5
Nigeria	4594	8.37	6
Sierra Leone	4592	8.36	7
Côte d'Ivoire	4386	7.99	8
Ghana	3157	5.75	9
Liberia	2929	5.33	10
Cabo Verde	2917	5.31	11
The Gambia	2203	4.01	12
Guinea-Bissau	1989	3.62	13
Guinea	917	1.67	14
Togo	605	1.10	15
TOTAL	54918		

NEXT STEPS

- Engage in knowledge development to generate new data/information that feeds into the value chain of sustainable energy development in the ECOWAS region.
- Implementation of best practices for data collection and management
- Develop new energy tools for data analysis, modelling, etc. to encourage data-driven decisions in energy planning.
- Grow a community of data contributors to ensure the sustainability of data collection.
- Build capacity with the aim of strengthening local content to equip member states with transferable skills on data collection, mining and management as well as energy planning.
- Implementation of an annual progress monitoring report indicating the status of the ECOWAS region with respect to the EREP, EEEP and SE4ALL targets.

Exploring the Interactive Portal

Map Interface | Country Profile | Energy Balance | Country KPIs | Regional KPIs

Select tabs to navigate to each dashboard.

INFOGRAPHICS

GLOSSARY

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Search, zoom in and out, select, lock and preset map with map toolbar.

Select a country to navigate country profile dashboard.

On hover tooltip feature that displays social and economic indicators.

Country: **Ghana**
 Total population: **26,786,598**
 Population growth (%): **2.35**
 Surface Area (sq. km): **238,540**
 GDP, PPP (current international \$): **109,334,081,602.39**
 GDP per capita (current international \$): **1,441.64**
 GDP growth (%): **3.99**
 Human Development Index: **0.58**
 Doing Business Index: **112**

Data Year: **2014**
 Source: **World Bank Data; UNDP Human Development Reports**

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area. Although the information visualized from sources is believed to be reliable, ECREEE makes no warranties, expressed or implied, regarding accuracy, adequacy, completeness, legality, reliability or usefulness of any information on the data portal. Changes may be periodically made to the information herein. It is recommended that careful attention be paid to the contents of any data and that the originator of the data or information be contacted with any questions regarding appropriate use. If you find any errors or omissions, please report them to the webmaster.

Filter for Renewable Energy (RE) and Energy Efficiency (EE) data by Country, Topic, Indicator, Technology and Data Year.

Map Interface | Country Profile | Energy Balance | Country KPIs | Regional KPIs

COUNTRY Profiles

Country: (All) | Topic: (All) | Indicator: (All) | Technology: (All) | Data Year: (All) | Data

Country	Topic	Indicator	Description	Technology	Sub Tech	Value/Unit	Sources
(All)	Additional Informa..	Noteworthy Trends	The strategy for the ad..	Non-Technology ..	Null		✓
Benin	Electricity	Generation from Renewables (Share)	Sustainable biomass generation.	Bioenergy	Biomass	1 %	✓
Burkina Faso						36 %	✓
Cabo Verde			Target rate of access t..	Bioenergy	Biomass	60 %	✓
Côte d'Ivoire							✓
Gambia		Installed Capacity (On-Grid)	Dogo Bis on the Oué...	Hydro	Null	128 MW	✓
Ghana						2 MW	✓
Guinea			No instal..	Bioenergy	Biomass	0 MW	✓
Guinea-Bissau							✓
Liberia			M..	Hydro	Null	0 MW	✓
Mali							✓
Niger			No installed solar PV c..	Solar	Null	0 MW	✓
Nigeria							✓
Nigeria	Energy Access	Access to Electricity, Rural (% of rural population)	Null	Non-Technology Specific	Null	28.4 %	✓
Senegal						29.2 %	✓
Sierra Leone						30.78 %	✓
Togo							
			Access to Electricity, Rural (% of rural population)	Non-Technology Specific	Null	4.48 %	✓
			Access to Electricity, Urban (% of urban population)	Non-Technology Specific	Null	5.5 %	✓
					Null	6.22 %	✓
					Null	7.02 %	✓
	Energy Efficiency	Energy Efficiency Pol..	National Agency				✓
		Final Energy Consu..	Null				✓
		Renewable Share	Renewable share				✓

- MoE - Ministry of Energy
- Rural Electrification
- Renewable Energy
- Energy Management and Energy Efficiency
- Electricity

Data year range is from 2010 to 2016.

25,000 Data points
as of November 2016

Use a mini map to filter for country data.

On hover tooltip displays RE and EE institution per country selection.

Map Interface | Country Profile | Energy Balance | Country KPIs | Regional KPIs

INFOGRAPHICS | GLOSSARY | CONTACT US

COUNTRY Profiles

Country: Ghana | Topic: (All) | Indicator: (All) | Technology: (All) | Data Year: (All) | Data

Download underlying RE and EE data in excel format.

Select to view detailed source reference.

Data type classification that allows users to view data sourced from state actors and non-state actors.

Country	Data Type	Topic	Indicator	Description	Technology	Sub Tech	Value/Unit	Sources		
Ghana	Gov	Additional Information	Noteworthy Trends	6 national rural electrif..	Non-Technology ..	Null		✓		
				Ghana is now operatin..	Non-Technology ..	Null		✓		
				In 2009, automatic cap..	Non-Technology ..	Null		✓		
				Total energy generatio..	Hydro	Null	6726.69 GWh	✓		
				Total energy generatio..	Hydro	Null	361.63 GWh	✓		
				Total energy generatio..	Hydro	Null	730.367 GWh	✓		
				Total energy generatio..	Hydro	Null	1144.45 GWh	✓		
				Total energy generation at Kpong GS in 2014.	Hydro	Null	1147.65 GWh	✓		
							6508.61 GWh	✓		
				Potential for mini hydro..	Hydro	Small Hydro	720 kW	✓		
				Potential for mini hydro..	Hydro	Small Hydro	364 - 1,900 kW	✓		
				Potential for mini hydro..	Hydro	Small Hydro	472 - 2,150 kW	✓		
				Potential for mini hydro..	Hydro	Small Hydro	226 - 1,150 kW	✓		
				Potential for mini hydro..	Hydro	Small Hydro	499 - 2,100 kW	✓		
				Potential for mini hydro..	Hydro	Small Hydro	5,591 - 24,505 kW	✓		
				Potential for mini hydro resource in the Volta Region.	Hydro	Small Hydro	3,117 - 12,065 kW	✓		
							913 - 4,420 kW	✓		
				Energy Access	Access to Electricity, ..	There is 75 % national ..	Non-Technology ..	Null	75 %	✓
				Energy Access Policy	ECG/NEDCo : ECG an..	Non-Technology ..	Null		✓	
					Turn Key Projects: The..	Non-Technology ..	Null		✓	
RE for Energy Access	The national plan is to ..	Non-Technology ..	Null	2000000 Unit(s)	✓					
RE for Energy Acces..	Until 2014, forty nine in..	Bioenergy	Null	49 Unit(s)	✓					
Energy Efficiency	Efficient Electrical Ap..	Refrigerator Energy Eff..	Non-Technology ..	Null	27,000 MWh	✓				
	Efficient Electrical Ap..	Refrigerator Energy Eff..	Non-Technology ..	Null	4,000 Unit(s)	✓				

Keep Only | Exclude
 Data Year: 2013
 Source: VRA Fifty Third Annual Report & Accounts 2014
 Source Type: Report
 Source Year: 2014
[Web Link](#)

- Renewable Energy
- Energy Management and Energy Efficiency
- Electricity/Energy Regulator
- Electricity Operator

INFOGRAPHICS

GLOSSARY

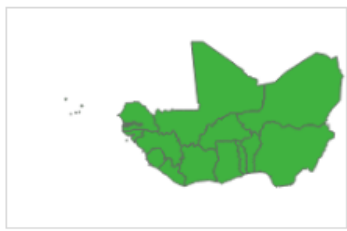
CONTACT US



COUNTRY Profiles

Country: (All) | Topic: (All) | Indicator: (All) | Technology: (All) | Data Year: (All) | Data

Country	Data Type	Topic	Indicator	Description	Technology	Sub Tech	Value/Unit	Sources				
Benin	Government	Additional Informa..	Noteworthy Trends	The strategy for the ad..	Non-Technology ..	Null		✓				
				Electricity	Generation from Renewables (Share)	Sustainable biomass generation.	Bioenergy	Biomass	1 %	✓		
						36 %				✓		
						Target rate of access L.	Bioenergy	Biomass	60 %	✓		
				Installed Capacity (On-Grid)	Dogo Bis on the Ouém..	Hydro	Null	128 MW			✓	
								Installed small hydropo..	Hydro	Small Hydro	2 MW	✓
								No installed biomass c..	Bioenergy	Biomass	0 MW	✓
				No installed hydropow..	Hydro	Null	0 MW	✓			✓	
								No installed solar PV c..	Solar	Null	0 MW	✓
								No installed wind capa..	Wind	Null	0 MW	✓
				Electricity, (% total of on)	Null	Non-Technology Specific	Null	28.4 %			✓	
								29.2 %			✓	
								30.78 %			✓	
								32.44 %			✓	
								4.48 %			✓	
5.5 %			✓									
Electricity, (% of rural (tion)	Null	Non-Technology Specific	Null	6.22 %			✓					
				7.02 %			✓					
				55.2 %			✓					
Electricity, (% of urban (ulation)	Null	Non-Technology Specific	Null	58.4 %			✓					
				58.4 %			✓					
				61.4 %			✓					



- Hover for more details
- Submit Data ↑
- MoE Ministry of Energy
 - Rural Electrification
 - Renewable Energy
 - Energy Management and Energy Efficiency

Incorporate climate change data & reach 50,000 Data points by December, 2017

Share dashboards via email, Facebook and Twitter. Easily integrate dashboards on other web platforms with embedded code.

Embed Code

```
<div class='tableauPlaceholder' id='viz'>
```

Link

<http://public.tableau.com/views/MapI>

Share | Download | Full Screen

Download dashboards in pdf and image format.

← Undo → Redo |← Reset

Map Interface Country Pr

Summary of demand, transformation and supply side of energy situation per country.

Download underlying data in excel format.

INFOGRAPHICS GLOSSARY CONTACT US



ENERGY Balance (ktoe)

Row Names	Coal	Crude Oil	Petroleum Products	Natural Gas	Wood	Charcoal	Hydro	Electricity	Heat	TOTAL
Production	-	5435	-	52.6	28.70	-	721.3	-	-	9,838
Imports	-	707.1	3,512.10	568	-	-	-	4.4	-	4,792
Exports	-	-5446.5	-	-	0	-0.4	-	-44.9	-	-5,492
International marine bunkers	-	-	-11.0	-	-	-	-	-	-	-11
International aviation bunkers	-	-	-105.6	-	-	-	-	-	-	-106
Stock changes	-	149.9	-64.7	-	-	-	-	-	-	85
TPES	0	845.5	3330.8	620.6	3628.7	-0.4	721.3	-40.5	0	9,106
Transfers	-	-	-	-	-	-	-	-	-	0
Statistical Differences	-	5.1	-82.90	25	-	-	-	-34	-	-87
Electricity Plants	-	-599.7	-1.5	-595.6	-	-	-721.3	1114.8	-	-804
Oil Refineries	-	-177.3	131.2	-	-	-	-	-	-	-46
Other Transformation	-	-	-	-	-2,049.00	1212.4	-	-	-	-837
Energy Industry Own Use	-	-12.1	-	-	-	-	-	-5	-	-17
Losses	-	-51.2	-	-	-	-	-	-150.4	-	-202
Total Final Consumption	0	10.3	3377.6	50	1579.7	1212	0	884.9	0	7,115
Industry	-	-	357.6	-	243.30	3.6	-	326.2	-	931
Transport	-	-	2,609.80	-	-	-	-	0.5	-	2,610
Residential	-	-	185	-	1304.8	1101.7	-	410.3	-	3,002
Commercial and public services	-	-	15.0	-	31.6	106.7	-	215.8	-	363
Agriculture/Forestry	-	-	104.5	-	-	-	-	0.2	-	105

- Country
- Côte d'Ivoire
 - Ghana
 - Niger
 - Senegal

Year
2014

Filter by country and year to display countries information.

Total: **2,610 ktoe**
Source: Energy Commission of Ghana.

On hover tooltip displays source of energy balance information for selected country.

Available energy balances where computed within the respective ECOWAS members states unless stated otherwise.
TBC - To be confirmed.

Download infographics that include charts and

- Map Interface
- Country Profile
- Energy Balance
- Country KPIs
- Regional KPIs

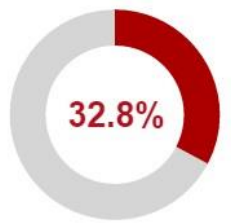
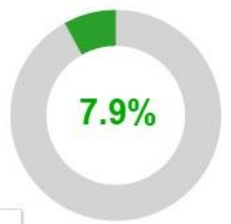
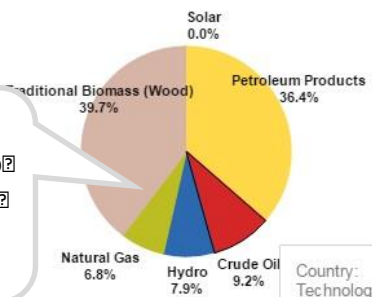
- INFOGRAPHICS
- GLOSSARY
- CONTACT US



Country Key Performance Indicators

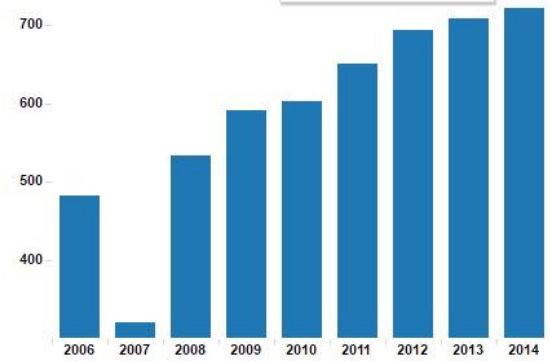
- Share of TPES in Ghana, 2014
- Share of RE in TPES in Ghana, 2014
- Thermal Plant Efficiency in Ghana, 2014

Each chart has an on-over tooltip displays further information.

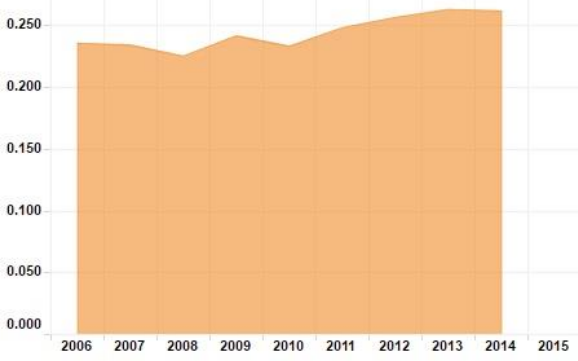


Country: Ghana
 Technology: Crude Oil
 Share: 9.2%
 TPES: 845.4 ktoe

Evolution of TPES (ktoe) in Ghana



Evolution of Energy Intensity (toe/capita) in Ghana



Use Technology legend to filter information on charts.

- Technologies:
- Solar
 - Petroleum Products
 - Crude Oil
 - Hydro
 - Natural Gas
 - Traditional Biomass (Wood)

Filter by:

- Country: Ghana
- Technology: Hydro

View Terms and definition related to RE and EE

Map Interface Country Profile Energy Balance Country KPIs Regional KPIs

INFOGRAPHICS

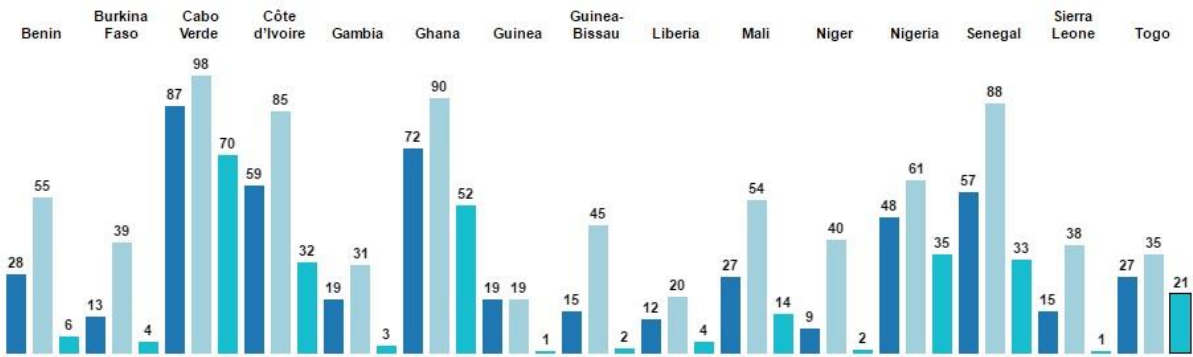
GLOSSARY

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Regional Key Performance Indicators

Electricity Access in ECOWAS Member States, 2010

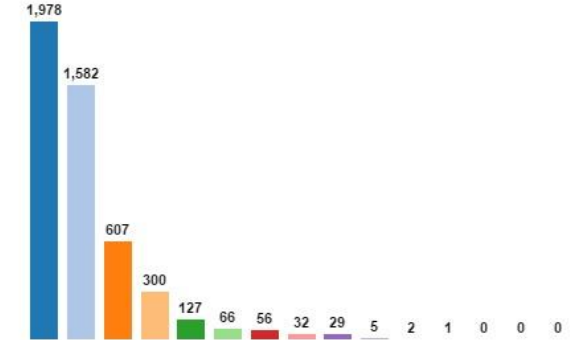


Electricity Access
 National (% total of population)
 Urban (% of urban population)
 Rural (% of rural population)

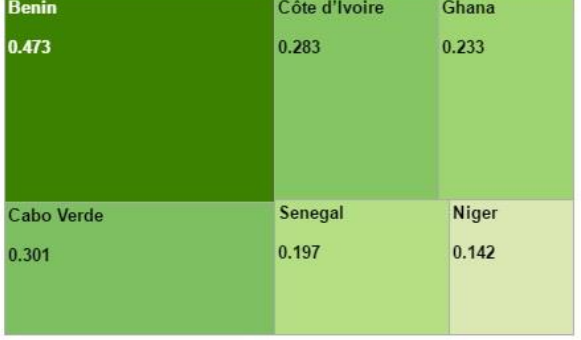
Each chart has an on hover tooltip displays further information.

Country: Togo
 Indicator: Rural (% of rural population)
 Value: 21 %

Grid-Connected RE Capacity (MW) in ECOWAS Region, 2014



Final Energy Consumption/Capita, 2010



Country Legend:
 Nigeria, Ghana, Côte d'Ivoire, Mali, Guinea, Togo, Sierra Leone, Cabo Verde, Burkina Faso, Liberia, Benin, Gambia, Guinea-Bissau, Niger, Senegal

Use legends to filter information on charts.



Sessions by Country from 31 October,
2012 to 9 January, 2013

Country	Sessions	% Sessions
1.  Cape Verde	627	26.58%
2.  Turkey	469	19.88%
3.  Spain	406	17.21%
4.  United States	165	6.99%
5. (not set)	57	2.42%
6.  France	54	2.29%
7.  Senegal	52	2.20%
8.  Germany	51	2.16%
9.  United Kingdom	48	2.03%
10.  Ghana	29	1.23%

Sessions by Country from 27 July, 2015 to
5 October, 2015

Country	Sessions	% Sessions
1.  United States	398	7.95%
2.  Egypt	362	7.23%
3.  United Kingdom	335	6.69%
4.  Ghana	329	6.57%
5.  France	308	6.15%
6.  India	252	5.03%
7.  Côte d'Ivoire	241	4.81%
8.  Nigeria	197	3.93%
9.  Cape Verde	170	3.39%
10.  Benin	149	2.97%

Sessions by Country from 27 July, 2016 to
5 October, 2016

Country	Sessions	% Sessions
1.  United States	364	7.43%
2.  Ghana	334	6.81%
3.  Senegal	320	6.53%
4.  Cape Verde	312	6.37%
5.  United Kingdom	303	6.18%
6.  France	259	5.28%
7.  Côte d'Ivoire	239	4.88%
8.  Nigeria	204	4.16%
9.  India	201	4.10%
10.  Benin	176	3.59%

Toolbox for Renewable Energy Tariff Design in West African Countries



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