STATISTICAL PROFILE

# Ghana

## Sustainable Development Goal 7.2: Energy Indicators (2016)

| | | | |
|---|---|---|---|
| Renewable energy (% of TFEC) | 42.0 | Access to electricity (% of population) | 79.3 |
| Energy efficiency (MJ per $1 of GDP) | 3.5 | Access to clean cooking (% of population) | 23 |

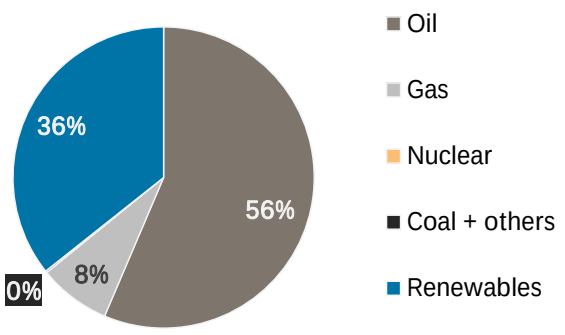
## TOTAL PRIMARY ENERGY SUPPLY (TPES)

| TPES | 2011 | 2016 |
|---|---|---|
| Non-renewable (TJ) | 153 079 | 215 718 |
| Renewable (TJ) | 120 006 | 119 642 |
| Total (TJ) | 273 085 | 335 361 |
| Renewable share (%) | 44 | 36 |

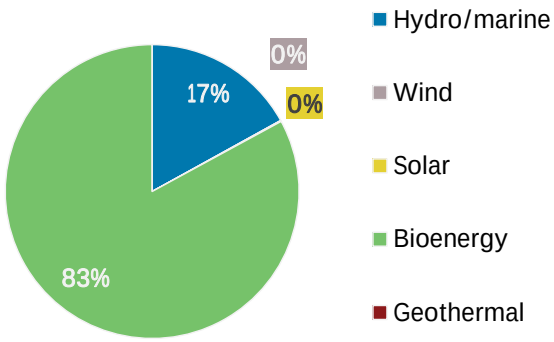
| Growth in TPES | 2011-16 | 2015-16 |
|---|---|---|
| Non-renewable (%) | +40.9 | -1.8 |
| Renewable (%) | -0.3 | +0.7 |
| Total (%) | +22.8 | -0.9 |

| Primary energy trade | 2011 | 2016 |
|---|---|---|
| Imports (TJ) | 189 365 | 213 031 |
| Exports (TJ) | 172 358 | 205 125 |
| Net trade (TJ) | - 17 007 | - 7 906 |
| Imports (% of supply) | 69 | 64 |
| Exports (% of production) | 65 | 61 |
| Energy self-sufficiency (%) | 97 | 100 |
| Net trade (USD million) | + 6 434 | + 1 185 |
| Net trade (% of GDP) | +16.3 | +2.2 |

Total primary energy supply in 2016




Renewable energy supply in 2016




## RENEWABLE ENERGY CONSUMPTION

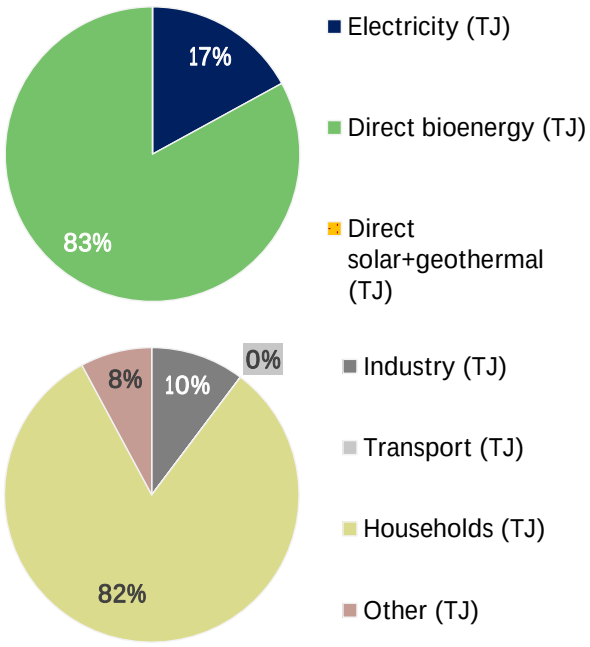
| Consumption by source | 2011 | 2016 |
|---|---|---|
| Electricity (TJ) | 23 327 | 17 698 |
| Direct bioenergy (TJ) | 81 215 | 86 249 |
| Direct solar+geothermal (TJ) | 0 | 0 |
| **Total (TJ)** | **104 542** | **103 947** |
| Electricity share (%) | 22 | 17 |

| Consumption growth | 2011-16 | 2015-16 |
|---|---|---|
| Renewable electricity (%) | -24.1 | +5.5 |
| Other renewables (%) | +6.2 | -0.4 |
| **Total (%)** | **-0.6** | **+0.6** |

| Consumption by sector | 2011 | 2016 |
|---|---|---|
| Industry (TJ) | 13 004 | 10 680 |
| Transport (TJ) | 0 | 9 |
| Households (TJ) | 84 044 | 85 087 |
| Other (TJ) | 7 494 | 8 170 |

| | | |
|---|---|---|
| Renewable share of TFEC | 48.0 | 42.0 |

Renewable energy consumption in 2016



# ELECTRICITY CAPACITY AND GENERATION

| Capacity in 2018 | MW | % |
|---|---|---|
| **Non-renewable** | **2 811** | **63** |
| **Renewable** | **1 656** | **37** |
| Hydro/marine | 1 584 | 35 |
| Solar | 63 | 1 |
| Wind | 0 | 0 |
| Bioenergy | 8 | 0 |
| Geothermal | 0 | 0 |
| **Total** | **4 467** | **100** |

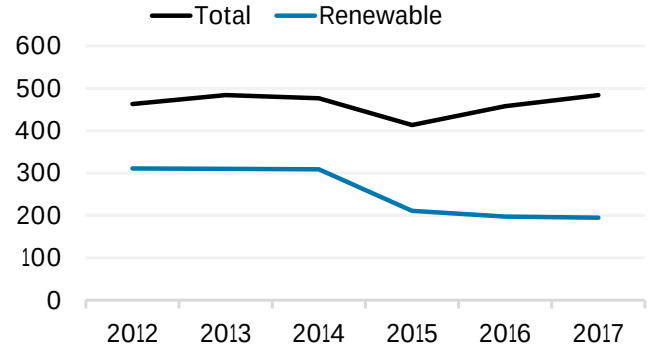
| Capacity change (%) | 2013-18 | 2017-18 |
|---|---|---|
| **Non-renewable** | **+ 88** | **+ 0.5** |
| **Renewable** | **+ 4** | **+ 1.5** |
| Hydro/marine | + 0 | 0.0 |
| Solar | + 2 000 | + 62.9 |
| Wind | 0 | 0.0 |
| Bioenergy | + 24 | 0.0 |
| Geothermal | 0 | 0.0 |
| **Total** | **+ 45** | **+ 0.9** |

## Net capacity change in 2018 (MW)

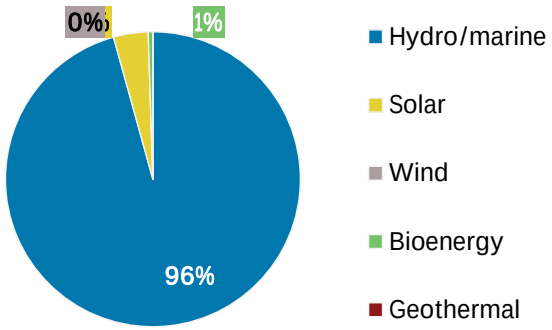
| | |
|---|---|
| Non-renewable + 15 | Hydro and marine 0 |
| Solar + 24 | Wind 0 |
| Bioenergy 0 | Geothermal 0 |

| Generation in 2017 | GWh | % |
|---|---|---|
| **Non-renewable** | **8 424** | **60** |
| **Renewable** | **5 672** | **40** |
| Hydro and marine | 5 617 | 40 |
| Solar | 36 | 0 |
| Wind | 0 | 0 |
| Bioenergy | 19 | 0 |
| Geothermal | 0 | 0 |
| **Total** | **14 096** | **100** |

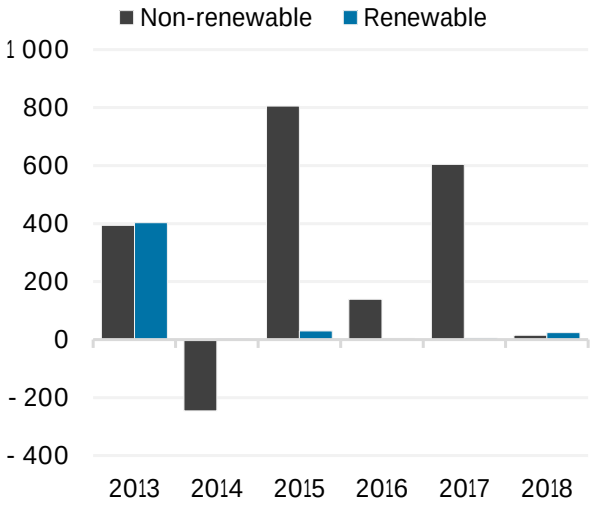
## Per capita electricity generation (kWh)



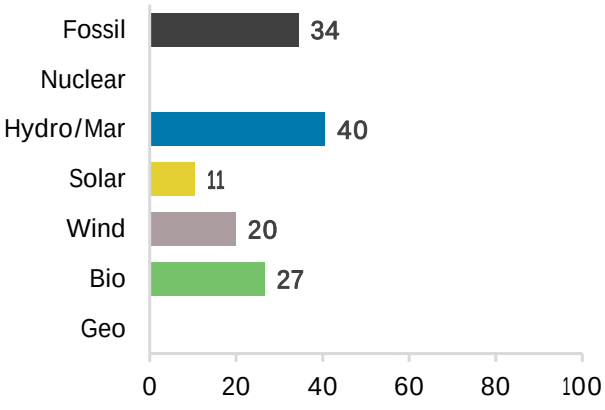

## Renewable capacity in 2018



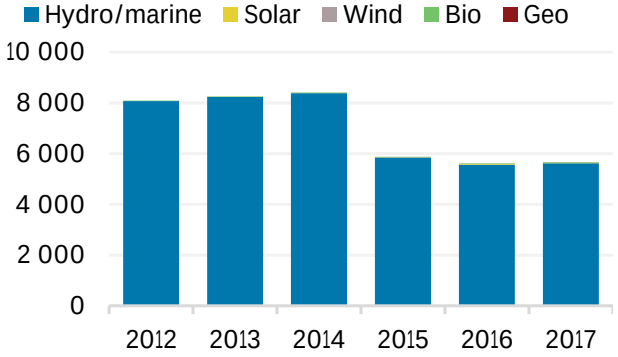

## Net capacity change (MW)




## Capacity utilisation in 2017 (%)




## Renewable generation (GWh)



## TARGETS, POLICIES AND MEASURES

### Most immediate clean energy targets & NDCs

| | year | target | unit |
|---|---|---|---|
| **Renewable energy:** | 2030 | 10 | % increase |
| Renewable electricity: | 2020 | 10 | % |
| Renewable capacity: | | | |
| Renewable transport: | | | |
| Liquid Biofuel blending mandate: | | | |
| Other transport targets: | | | |
| Renewable heating/cooling: | | | |
| Renewable Hydropower | 2030 | 225 | MW (additional) |
| Off-grid renewable technologies: | | | |
| Energy efficiency (Energy): | | | |
| Energy efficiency (Electricity): | | | |

### Latest policies, programmes and legislation

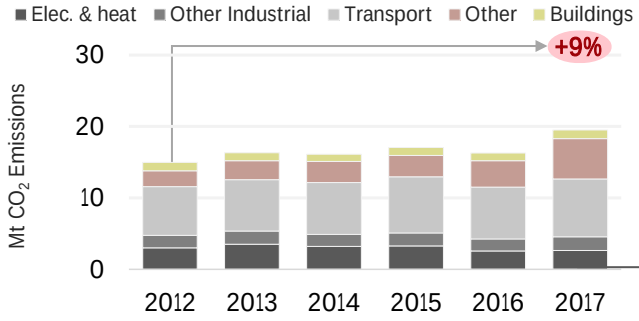
| | | |
|---|---|---|
| 1 | Feed-in tariff for electricity generated from renewable energy sources | 2013 |
| 2 | Renewable Energy Act 2011 | 2011 |
| 3 | Ghana National Energy Policy | 2010 |
| 4 | Ghana Energy Development and Access Project (GEDAP) | 2007 |
| 5 | National Electrification Scheme | 2007 |

### References to sustainable energy in Nationally Determined Contribution (NDC)

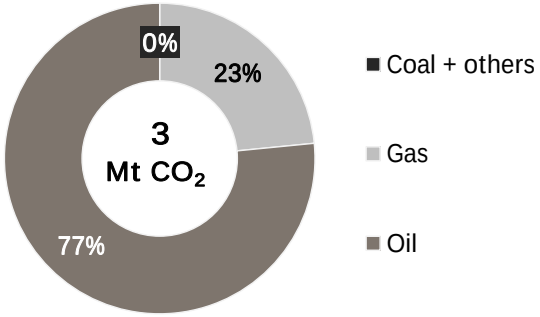
| | Conditional | Unconditional | unit |
|---|---|---|---|
| - **Renewable energy** | **10** | | **% increase** |
| - electricity | | | |
| - transport | | | |
| - heating/cooling | | | |
| - Energy efficiency | | | |

## ENERGY AND EMISSIONS

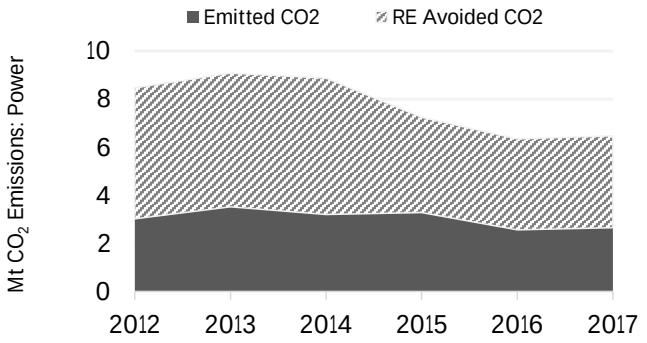
### Energy-related $CO_2$ emissions by sector




### Elec. & heat generation $CO_2$ emissions in 2017

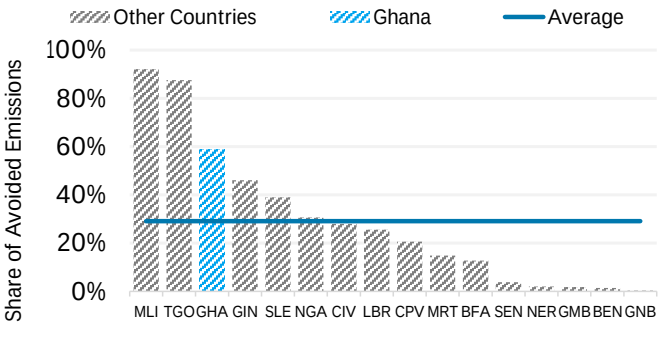



### Avoided emissions from renewable power




*Avoided emissions based on fossil fuel mix used for power*

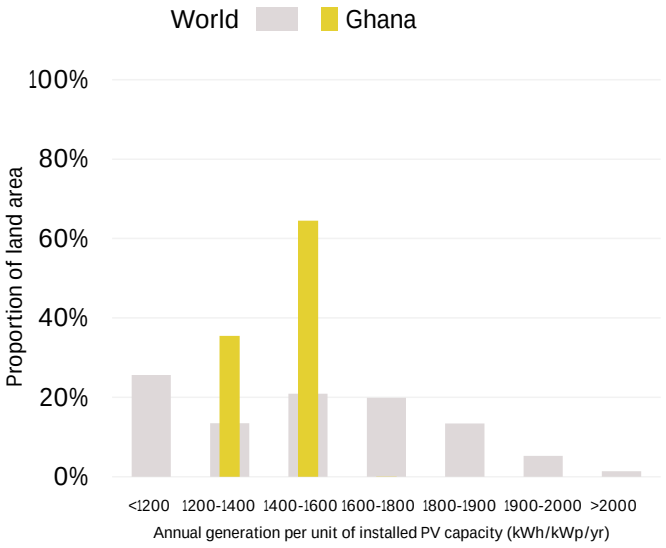
### Reduction in power emissions due to RE in 2017



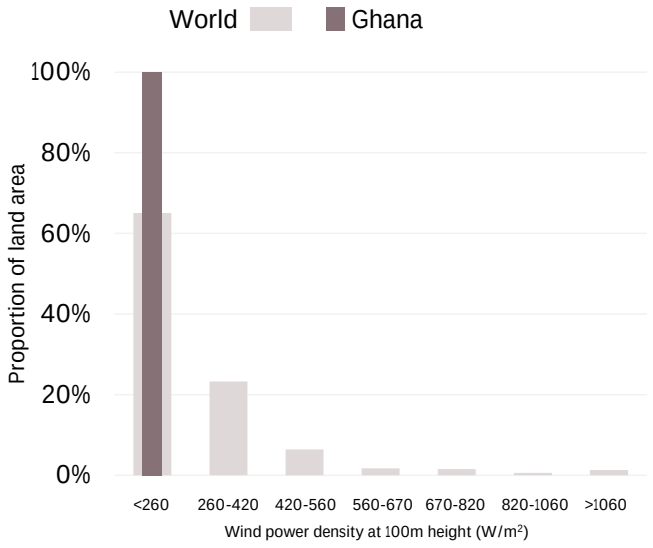

*Reduction is RE Avoided divided by sum of avoided and emitted*

## RENEWABLE RESOURCE POTENTIAL

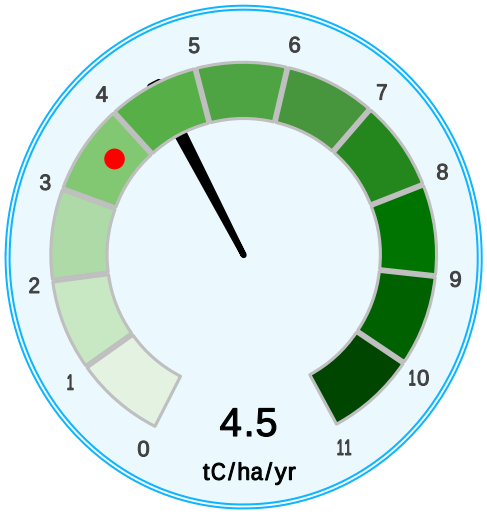
### Distribution of solar potential




### Distribution of wind potential




### Biomass potential: net primary production




### Indicators of renewable resource potential

**Solar PV:** Solar resource potential has been divided into seven classes, each representing a range of annual PV output per unit of capacity (kWh/kWp/yr). The bar chart shows the proportion of a country's land area in each of these classes and the global distribution of land area across the classes (for comparison).

**Onshore wind:** Potential wind power density (W/m$^2$) is shown in the seven classes used by NREL, measured at a height of 100m. The bar chart shows the distribution of the country's land area in each of these classes compared to the global distribution of wind resources. Areas in the third class or above are considered to be a good wind resource.

**Biomass:** Net primary production (NPP) is the amount of carbon fixed by plants and accumulated as biomass each year. It is a basic measure of biomass productivity. The chart shows the average NPP in the country (tC/ha/yr), compared to the global average NPP of 3-4 tonnes of carbon per year.

**Sources:** IRENA statistics, plus data from the following sources: UN SDG Indicators Database (original sources: WHO; World Bank; IEA; IRENA; and UNSD); UNSD Energy Balances; UN COMTRADE; World Bank World Development Indicators; EDGAR; REN21 Global Status Report; IEA-IRENA Joint Policies and Measures Database; IRENA Global Atlas; and World Bank Global Solar Atlas and Global Wind Atlas.

**Additional notes:** Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. The value of energy trade has been defined as including all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation has been calculated as annual generation divided by capacity x 8,760. Avoided emissions from renewable power have been calculated as renewable generation divided by fossil fuel generation multiplied by reported emissions from the power secrtor. This assumes that, if renewable power did not exist, fossil fuels would be used in its place to generate the same amount of power and using the same mix of fossil fuels. In countries and years where no fossil fuel generation occurs, an average fossil fuel emission factor has been used to calculate the avoided emissions.

This note has been produced to provide policy makers with a brief overview of developments in renewable energy in a country. The IRENA statistics team would welcome comments and feedback on its structure and content, which can be sent to statistics@irena.org.

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