**ENERGY PROFILE**

**Madagascar**

**COUNTRY INDICATORS AND SDGS**

### Total Energy Supply (TES)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-renewable (TJ)</td>
<td>41 512</td>
<td>50 464</td>
</tr>
<tr>
<td>Renewable (TJ)</td>
<td>208 763</td>
<td>330 661</td>
</tr>
<tr>
<td>Total (TJ)</td>
<td>250 275</td>
<td>381 125</td>
</tr>
<tr>
<td>Renewable share (%)</td>
<td>83</td>
<td>87</td>
</tr>
</tbody>
</table>

**Growth in TES**

<table>
<thead>
<tr>
<th></th>
<th>2015-20</th>
<th>2019-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-renewable (%)</td>
<td>+216</td>
<td>-8.9</td>
</tr>
<tr>
<td>Renewable (%)</td>
<td>+58.4</td>
<td>+3.9</td>
</tr>
<tr>
<td>Total (%)</td>
<td>+52.3</td>
<td>+2.0</td>
</tr>
</tbody>
</table>

### Primary energy trade

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports (TJ)</td>
<td>44 014</td>
<td>52 791</td>
</tr>
<tr>
<td>Exports (TJ)</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Net trade (TJ)</td>
<td>-44 011</td>
<td>-52 784</td>
</tr>
<tr>
<td>Imports (% of supply)</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Exports (% of production)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Energy self-sufficiency (%)</td>
<td>83</td>
<td>87</td>
</tr>
</tbody>
</table>

### Energy intensity

- **7.1.1 Access to electricity (% population)**: 7.1%
- **7.1.2 Access to clean cooking (% population)**: 27%
- **7.2.1 Renewable energy (% TFEC)**: 10%

### Air particulate matter (PM$_{2.5}$)

- **116.2 Air particulate matter (PM$_{2.5}$)**: 16.0 (2015), 16.0 (2016), 16.0 (2017), 16.0 (2018), 16.0 (2019), 16.0 (2020)

### GDP per capita

- **2015**: 8,100 USD (2017 PPP)
- **2016**: 8,100 USD (2017 PPP)
- **2017**: 8,100 USD (2017 PPP)
- **2018**: 8,100 USD (2017 PPP)
- **2019**: 8,100 USD (2017 PPP)
- **2020**: 8,100 USD (2017 PPP)

### Renewable energy supply in 2020

- **Hydro/marine**: 99%
- **Wind**: 0%
- **Solar**: 0%
- **Bioenergy**: 0%
- **Geothermal**: 0%

### GDP per capita growth rate

- **2015**: 3.2%
- **2016**: 3.2%
- **2017**: 3.2%
- **2018**: 3.2%
- **2019**: 3.2%
- **2020**: 3.2%

### Energy self-sufficiency (%)

- **2015**: 83%
- **2016**: 83%
- **2017**: 83%
- **2018**: 83%
- **2019**: 83%
- **2020**: 83%
## Consumption by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry (TJ)</td>
<td>10,074</td>
<td>14,518</td>
</tr>
<tr>
<td>Transport (TJ)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Households (TJ)</td>
<td>98,458</td>
<td>145,214</td>
</tr>
<tr>
<td>Other (TJ)</td>
<td>103,656</td>
<td>173,992</td>
</tr>
</tbody>
</table>

## Renewable energy consumption in 2020

- **Non-renewable**
  - Installed capacity trend
  - Renewable share (%)
- **Renewable**
  - Hydro/marine
  - Wind
  - Solar
  - Bioenergy
  - Geothermal

## Electricity capacity

- **Installed capacity trend**
- **Net capacity change (GW)**
- **Capacity utilisation in 2021 (%)**
**ELECTRICITY GENERATION**

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>GWh</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-renewable</td>
<td>1,143</td>
<td>57</td>
</tr>
<tr>
<td>Renewable</td>
<td>856</td>
<td>43</td>
</tr>
<tr>
<td>Hydro and marine</td>
<td>800</td>
<td>40</td>
</tr>
<tr>
<td>Solar</td>
<td>56</td>
<td>3</td>
</tr>
<tr>
<td>Wind</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Geothermal</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,000</td>
<td>100</td>
</tr>
</tbody>
</table>

**Per capita electricity generation (kWh)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Renewable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ENERGY AND EMISSIONS**

**Avoided emissions from renewable elec. & heat**

- Emitted CO2
- RE Avoided CO2

**CO2 emission factor for elec. & heat generation**

- MDG
- Africa
- World

**ENERGY-RELATED CO2 EMISSIONS BY SECTOR**

- Elect. & heat
- Other Industrial
- Transport
- Other
- Buildings

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

**CO2 EMISSIONSパイラム**

- Coal + others
- Gas
- Oil

**Elec. & heat generation CO2 emissions in**

- MDG
- Africa
- World

**LATEST POLICIES, PROGRAMMES AND LEGISLATION**

1. Tax Incentives for renewable energy
2. Decentralised Rural Electrification Program
3. 
4. 
5. 

**Electricity generation trend**

- Fossil fuels
- Nuclear
- Other Non-RE
- Hydro/marine
- Wind
- Solar
- Renewable share

**EMISSIONS AND ENERGY**

- Calculated by dividing power sector emissions by elec. + heat gen.
RENEWABLE RESOURCE POTENTIAL

Distribution of solar potential

- World
- Madagascar

Distribution of wind potential

- World
- Madagascar

Biomass potential: net primary production

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/m²) is shown in the seven classes used by NREL, measured at a height of 100 m. 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.

Sources: IRENA statistics, plus data from the following sources: UN SDG Database (original sources: WHO; World Bank; IEA; IRENA; and UNSD); UN World Population Prospects; UN Energy Balances; UN 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: Capacity per capita and public investments SDGs only apply to developing areas. Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. Energy trade includes all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation is calculated as annual generation divided by year-end capacity x 8,760 h/year. Avoided emissions from renewable power is calculated as renewable generation divided by fossil fuel generation multiplied by reported emissions from the power sector. 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.

These profiles have been produced to provide an overview of developments in renewable energy in different countries and areas. 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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