



**COUNTRY REPORT FOR MALAWI  
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JICA TRAINING CENTER, TOKYO, JAPAN ,**

**28<sup>TH</sup> JUNE, 2017 TO 29<sup>TH</sup> JULY, 2017.**



## GENERAL COUNTRY INFORMATION

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- Malawi is situated in South-East Africa and is a land-locked country.
- Occupies 118,484 square kilometers with an estimated population of 17,419,395 (2015 est.).
- Bordered by Zambia to the northwest, Tanzania to the northeast, and Mozambique on the east, south and west.
- Capital city is Lilongwe and commercial city is Blantyre.
- Official language is English while vernacular language is Chinyanja/Chichewa.
- Gained independence from the United Kingdom in 1964

# GENERAL COUNTRY INFORMATION



- ▶ Currency = Malawi Kwacha
  - ▶ US\$1 = MK 723.33
  - ▶ The calling code is +265
  - ▶ GNI per capita(year 2016):\$320
  - ▶ GDP(year 2016):\$ 5.442 Billion.
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- ▶ Economy depends on Agriculture as its backborn,
  - ▶ Main cash crops : **A.** Tobacco **B.** Cotton, and **C.** Sugar.



C.



A

B.





# GENERAL COUNTRY INFORMATION





## GENERAL COUNTRY INFORMATION

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- Malawi has installed electricity generation capacity of 361 MW and national electricity access at around 10% (i.e., 30% in urban and 2% rural areas) both of which are the lowest in the SADC region.
- The country identified energy as a priority sector number one in order to address developments in other sectors such as Agriculture and Industry
- The government is also very committed to improving the security and reliability of energy supply through implementation of a number of development projects which are aimed at increasing the installed capacity and expansion as well as strengthening of the electricity network.

## **1. NATIONAL ENERGY POLICY (2003)**

- Has outlived its life span and currently finalizing its review together with other associated legislations
- A draft Energy Policy(2017) in place awaiting cabinet approval.

## **2. LEGAL INSTRUMENTS**

- i. Energy Regulation Act (2004)
  - ii. Electricity Act (2004) and the amended (2016)
  - iii. Rural Electrification Act (2004)
  - iv. Liquid Fuels and Gas Act (2004)
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## 3. NATIONAL ENERGY STRATEGIES AND PLANS

- i. Malawi Integrated Resource Plan 2017
  - ii. Malawi Renewable Energy Strategy 2017
  - iii. National Energy Strategic Plan 2017
  - iv. Draft Malawi Growth and Development Strategy (MGDS iii) 2017.
  - v. Independent Power Producers Framework 2016
  - vi. Malawi National Cook stoves RoadMap 2016
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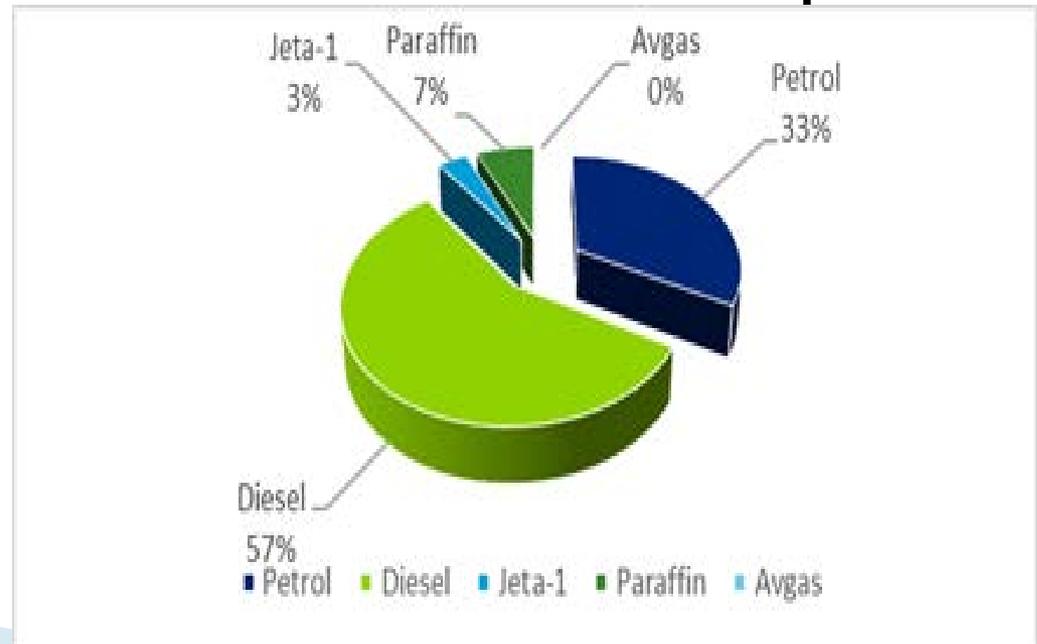
# PAST ENERGY DEMAND AND SUPPLY STATISTICS



<b>YEAR</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Installed Hydro Capacity (MW)	245.85	265.85	285.85	285.85	285.85	285.85	285.85	285.85	351	351	351
Maximum (Peak) Demand (MW)	241.7	251.03	241.88	259.67	273.01	277.75	277.88	279.73	323.91	335.26	328.26
Energy generation (GWh)	1,390.81	1,453.06	1,543.00	1,642.02	1,809.17	1,871.88	1,911.51	1,828.2	1,906.51	1,975.02	1,976.99
Number of Consumers	163,147	164,795	75,157	189,166	194,459	205,045	218,164	238,211	269,469	312,857	344,953
Consumption Domestic (GWh)	418.60	434.63	461.56	502.08	571.56	593.85	596.10	577.65	614.20	699.03	766.3
General (GWh)	183.78	197.55	213.73	226.16	253.70	250.43	244.47	214.96	183.26	150.30	117.4
Power Demand (GWh)	502.76	512.17	527.08	577.84	580.76	612.23	604.88	613.82	639.27	620	620
Export (GWh)	10.2	11.85	17.17	15.94	20.66	19.08	21.1	23.82	23.62	21.85	24.43
Total Consumption (GWh)	1115.34	1156.2	1219.54	1322.02	1426.68	1475.59	1,466.52	1,429.68	1460.35	1491.18	1,854.82

## Supply of Petroleum Products in Malawi

- ▶ Malawi imports all its petroleum fuel and gas requirements through Mozambique and Tanzania.
- The daily fuel demand for the country is 1.124 million litres.
- The dominant petroleum products used are diesel and petrol as shown in figure below.



# OUTLOOK OF ENERGY DEMAND AND SUPPLY FOR MALAWI



- Malawi is one of the least electrified countries in the world with just 10% of the overall population connected to electricity
- Biomass is the dominant fuel for cooking both in the urban and rural areas
- Biomass is projected to remain dominant in the country's energy mix, but its contribution will significantly decrease from over 90% in 2000 to below 50% by 2030 as shown in the figure below.

# OUTLOOK OF ENERGY DEMAND AND SUPPLY FOR MALAWI



## Energy Mix Projections 2000 - 2050

	2000	2010	2020	2050
Biomass	93	75	50	30
Liquid Fuels	3.5	5.5	7	10
Electricity	2.3	10	30	40
Coal	1	4	6	6
Renewables	0.2	5.5	7	10
Nuclear	0	0	0	4
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



# ENERGY DEMAND SITUATION

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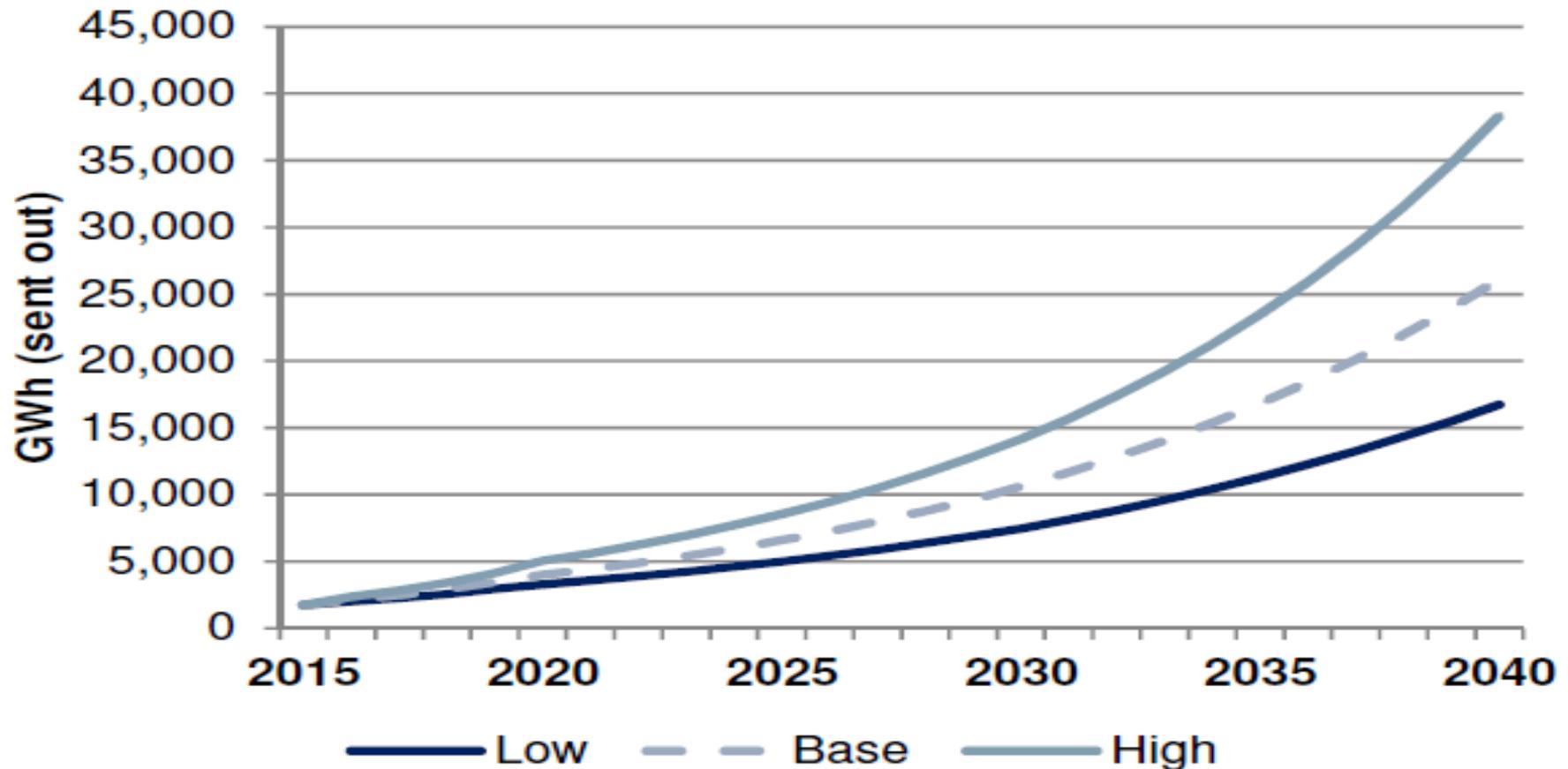


- The current suppressed electricity demand in the country is around 450 MW against the total generation capacity of 361 MW giving a deficit of around 89 MW
  - Recent studies done by Government and ESCOM shows that the total electricity demand in the country increases from 462.32 MW in 2015 to 719 MW in 2020, 1,873 MW in 2030 and 4,620 MW by 2040, in the base scenario.
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# ENERGY DEMAND PROJECTIONS UP TO 2040



*High, base and low electricity demand forecasts  
(GWh, sent out)*



# ENERGY DEMAND PROJECTIONS UP TO 2040



*High, base and low electricity demand forecasts (maximum demand, **MW** sent out)*

Year	Low	Base	High
2020	567	719	982
2030	1,236	1,873	2,591
2037	2,245	3,566	5,217
2040	2,841	4,620	6,946

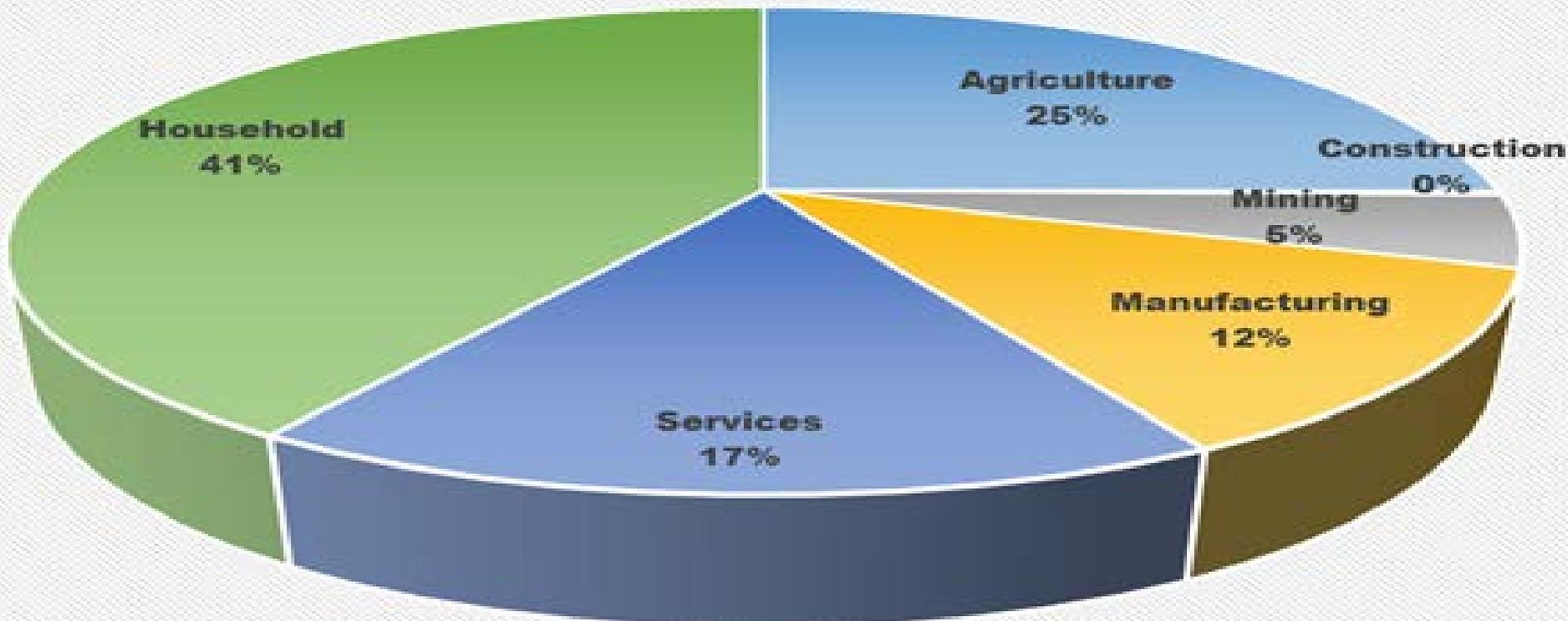
# ENERGY DEMAND SITUATION



## ELECTRICITY CONSUMPTION BY SECTOR

➤ Electricity consumption in Malawi is mainly dominated by the household sector at 41% as shown in the figure below.

**Electricity use by sectors**





# ENERGY DEMAND SITUATION

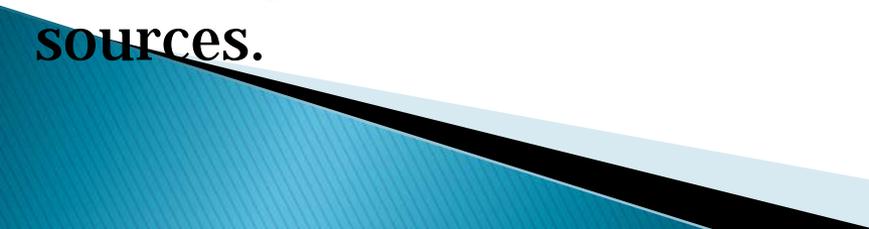
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## **ELECTRICITY DEMAND GROWTH DRIVERS (2015 – 2020)**

- Mining Sector (800MW)
- Manufacturing and processing (700MW)
- Domestic Demand (700MW)
- Service Sector (500MW)
- Green Belt Irrigation Initiative (130MW)

**NB:** Among other strategies in place to meet this demand, GOM is planning to develop additional power stations from different sources.



# CURRENT ENERGY PRICES IN MALAWI



ENERGY PRICES EFFECTIVE: 12TH MARCH, 2017.

## A. PETROLEUM FUELS

PRDUCT	UNIT (LITRE) COST IN MWK	UNIT (LITRE) COST IN \$USD
Petrol	824.7	1.14
Diesel	815.8	1.13
Paraffin	648.7	0.90
Jet A - Chileka	708.78	0.98
Jet A - KIA	758.94	1.05

## B. ELECTRICITY

PRDUCT	UNIT (KWh) COST IN MWK	UNIT (KWh) COST IN \$USD
Electricity	57.72	0.08

## C. GAS

PRDUCT	UNIT (kg) COST IN MWK	UNIT (kg) COST IN \$USD
Liquid Petroleum Gas	2178.7	3.01



## 1. FOSSIL FUELS

- Coal
- Hydrocarbons
- Uranium

## 2. RENEWABLE ENERGY RESOURCES

- **Hydro**-Malawi's electricity system is currently 100% fed from renewable energy resource, hydro in particular and 99% from one river (shire)
- **Wind**-speeds of 2-7m/s

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- The flag of Malawi is shown in the top left corner, featuring a black upper section with a red sunburst, a red middle section, and a green lower section.
- **Solar:** Malawi is blessed with sunshine hours of 2555Hours/year and Solar radiation of 21.1mj/M<sup>2</sup>.
  - **Biomass-** Main source of energy for cooking at 85% of primary energy consumed in the country.
  - **Geothermal-** over 60 hot springs documented in Malawi with maximum surface temperatures recorded at 79°C.

# GENERATION EXPANSION-2017 TO 2036



Installed Capacity (MW)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Existing hydro	351	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363
Generic Solar	15	45	55	75	95	105	105	115	115	125	125	135	135	145	145	155	155	165	165	165
Kanengo	10	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Lilongwe	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Mzuzu	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Mapanga		10	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Generic Wind			15	15	15	30	30	30	30	45	45	45	45	60	60	60	60	60	60	60
Generic Biomass			10	30	30	40	60	70	70	70	70	90	90	90	90	100	100	100	100	100
Kammwamba			43	172	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258
Tedzani IV			23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
MSD (LFO)			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
SSD (HFO)			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Kapichira III				112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
Mpatamanga							300	300	300	300	300	300	300	300	300	300	300	300	300	300
Hamilton Falls										96	96	96	96	96	96	96	96	96	96	96
Fufu higher											163	163	163	163	163	163	163	163	163	163
Kholombidzo												200	200	200	200	200	200	200	200	200
Pamodzi														120	120	120	120	120	120	120
Generic Coal															273	546	546	820	1093	1366
Lower Songwe																	90	90	90	90
<b>Total installed capacity</b>	<b>387</b>	<b>448</b>	<b>598</b>	<b>879</b>	<b>985</b>	<b>1020</b>	<b>1340</b>	<b>1360</b>	<b>1360</b>	<b>1481</b>	<b>1644</b>	<b>1874</b>	<b>1874</b>	<b>2019</b>	<b>2292</b>	<b>2585</b>	<b>2675</b>	<b>2958</b>	<b>3232</b>	<b>3505</b>
<b>Firm capacity</b>	<b>372</b>	<b>403</b>	<b>529</b>	<b>791</b>	<b>877</b>	<b>888</b>	<b>1208</b>	<b>1218</b>	<b>1218</b>	<b>1316</b>	<b>1478</b>	<b>1698</b>	<b>1698</b>	<b>1820</b>	<b>2093</b>	<b>2376</b>	<b>2466</b>	<b>2739</b>	<b>3013</b>	<b>3286</b>
<b>Peak load</b>	<b>449</b>	<b>526</b>	<b>614</b>	<b>709</b>	<b>781</b>	<b>864</b>	<b>953</b>	<b>1050</b>	<b>1155</b>	<b>1268</b>	<b>1391</b>	<b>1524</b>	<b>1668</b>	<b>1859</b>	<b>2049</b>	<b>2253</b>	<b>2475</b>	<b>2714</b>	<b>2972</b>	<b>3251</b>
<b>Reserve margin (%)</b>	<b>-17.2</b>	<b>-23.2</b>	<b>-13.8</b>	<b>11.6</b>	<b>12.2</b>	<b>2.8</b>	<b>26.8</b>	<b>16.0</b>	<b>5.5</b>	<b>3.8</b>	<b>6.3</b>	<b>11.4</b>	<b>1.8</b>	<b>-2.1</b>	<b>2.1</b>	<b>5.5</b>	<b>-0.4</b>	<b>0.9</b>	<b>1.4</b>	<b>1.1</b>



# MAJOR ENERGY INVESTMENTS/DONARS

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## 1. JICA/Japanese Government

- Rural Electrification Master Plan
- Electrification of Forestry reserves
- Rural Electrification Advisor.

## 2. World Bank

- Energy Sector Support Project USD \$84.7,2011 – 2018.

## 3. Millennium Challenge Corporation(MCA)–USA

- Running a \$USD350.7 Million Energy project which is Upgrading Transmission and distribution network from 133kV to 400kV; Revolutionarise the operations of ESCOM(Malawi's utility Company); Power Market Restructuring ;and IPP procurement processes.2012 –2018.



# MAJOR ENERGY INVESTMENTS/DONARS

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## 1. African Development Bank

- Kholombidzo Hydro Power Plant project
- Sustainable Energy for All Action Agenda and Investment prospectus projects

## 2. UNDP & GEF

- Clean Minigrids Promotion project –US \$3,570,000.00 ,2015–2019
- Sustainable Energy Management project –US \$2,120,000 ,2013–2016.

## 3. Scottish Government

- Research and Grants

# CHALLENGES FACED IN FORMULATING ENERGY POLICIES

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- Inadequate specialized Human Resources
- Nonexistence of National Energy Data Base
- Inadequate Funding for The Energy Sector



## SUBJECTS OF INTEREST

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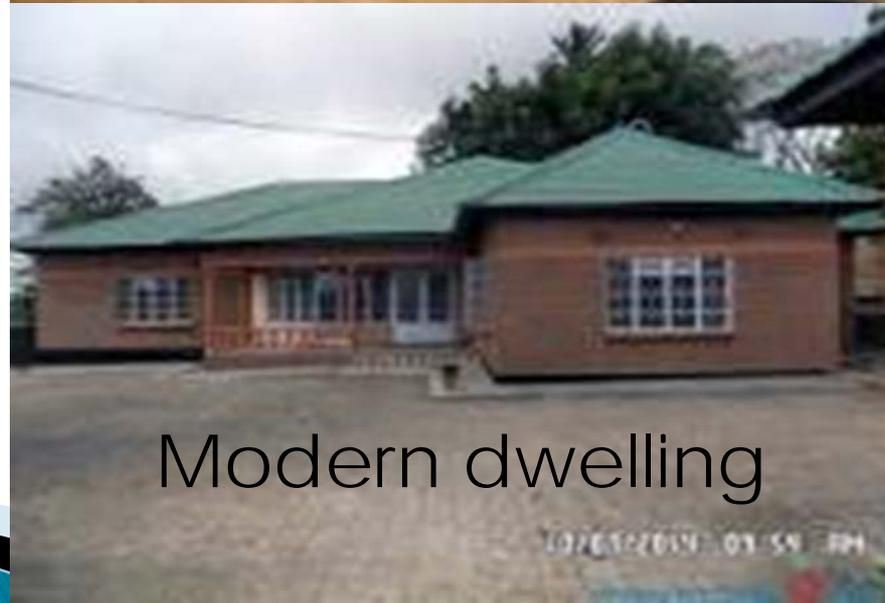
- **Survey Techniques for Energy Data Collection**
- **Construction of Energy Mixes and Balance Tables**
- **Energy Supply and Demand Forecasting**



# PHOTOGRAPHS OF MALAWI



Traditional dwelling



Modern dwelling

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# PHOTOGRAPHS OF MALAWI

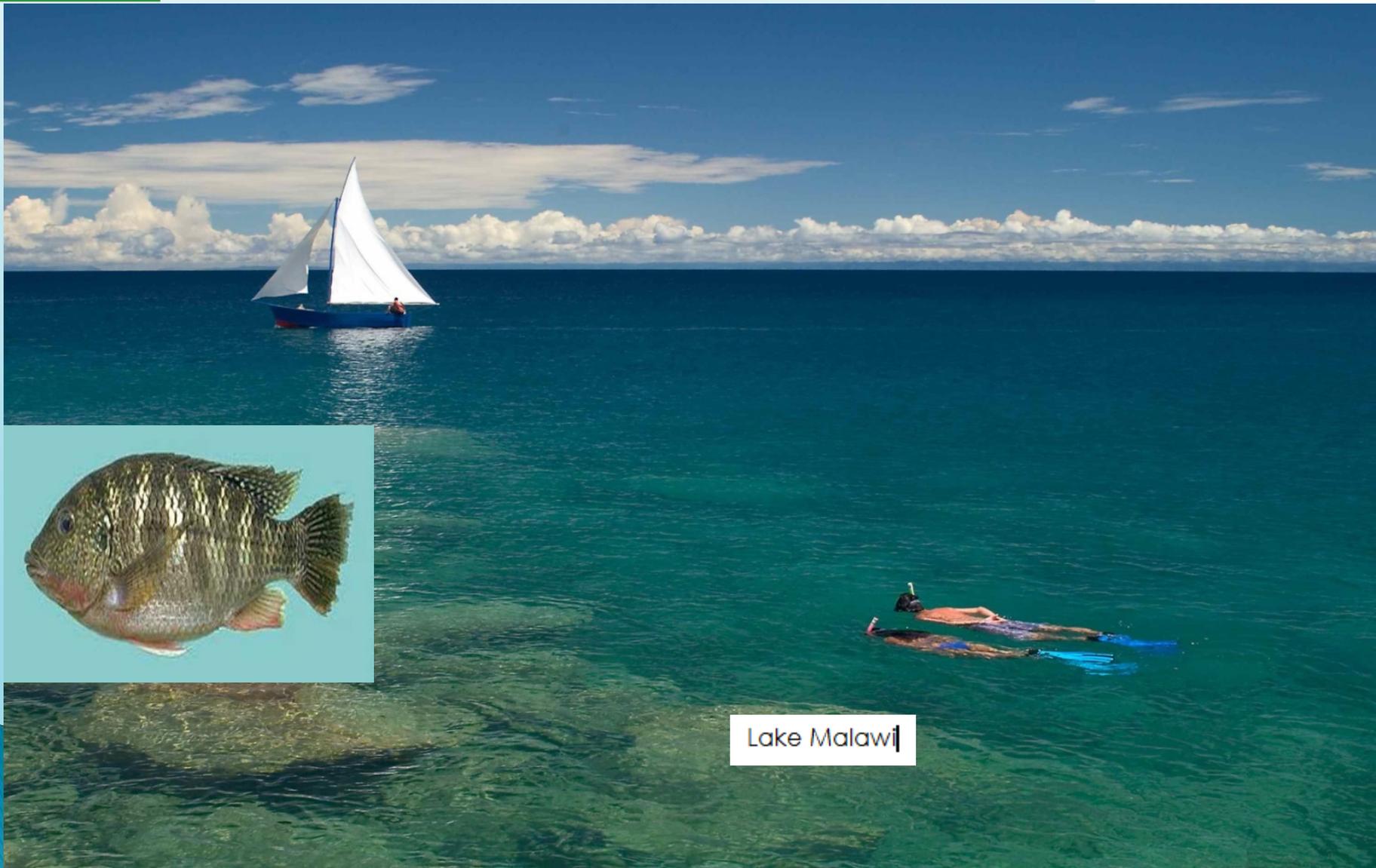


- Staple is nsima
- Other areas root crops





# PHOTOGRAPHS OF MALAWI



Lake Malawi



THANK YOU VERY MUCH!!!



ZIKOMO KWAMBIRI!!!



ARIGATO GOZAIMASU!!!