GHANA'S ENERGY SITUATION

International Centre for Hydropower

Ing. Philip Tetteh Padi

September 3, 2019

OBJECTIVE OF PRESENTATION

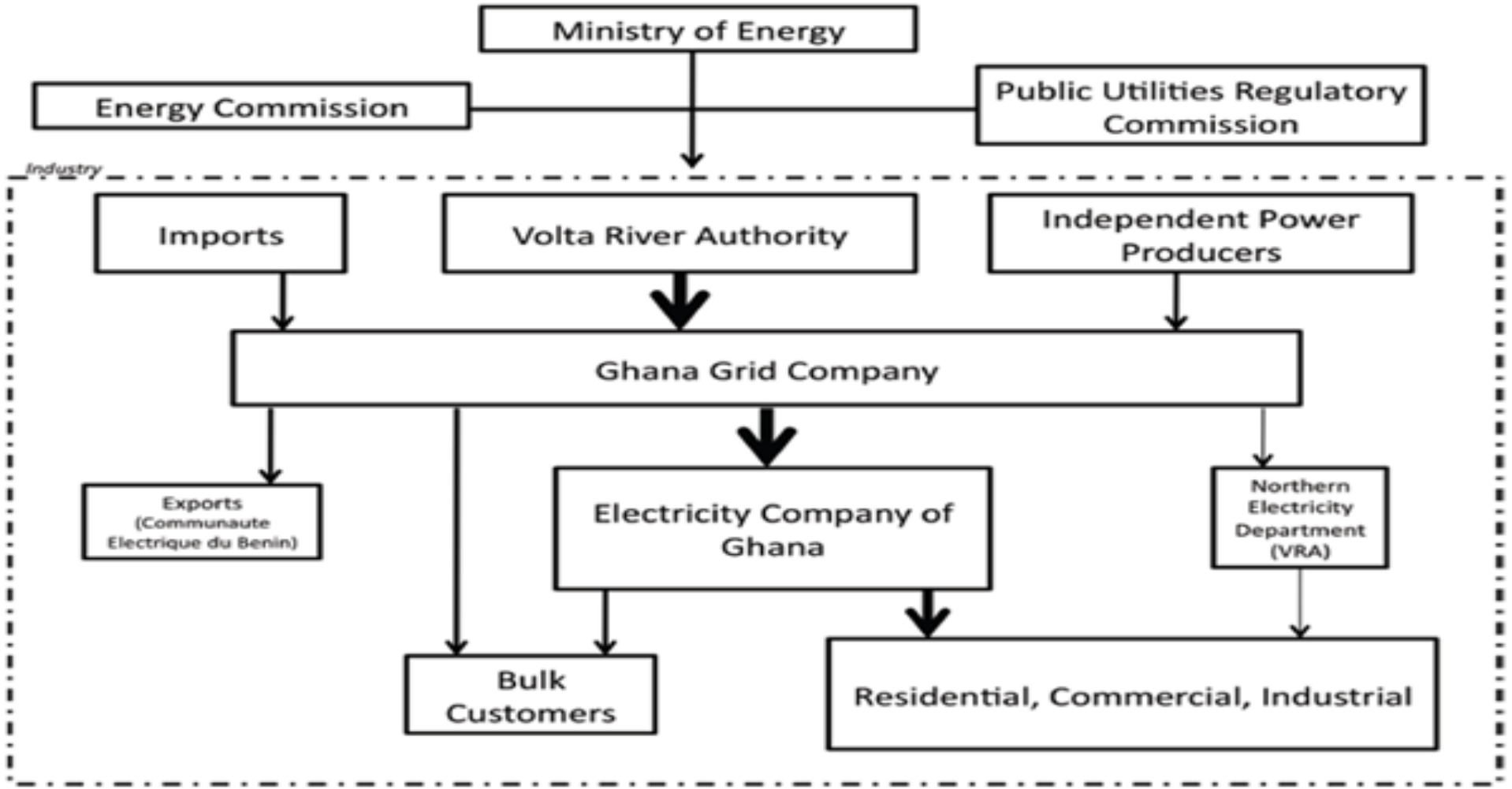
To highlight the energy situation in Ghana with focus on the structure of the energy section in Ghana, energy demand and supply, policies on renewable energy, access to energy and plans for renewable energy

PRESENTATION OUTLINE

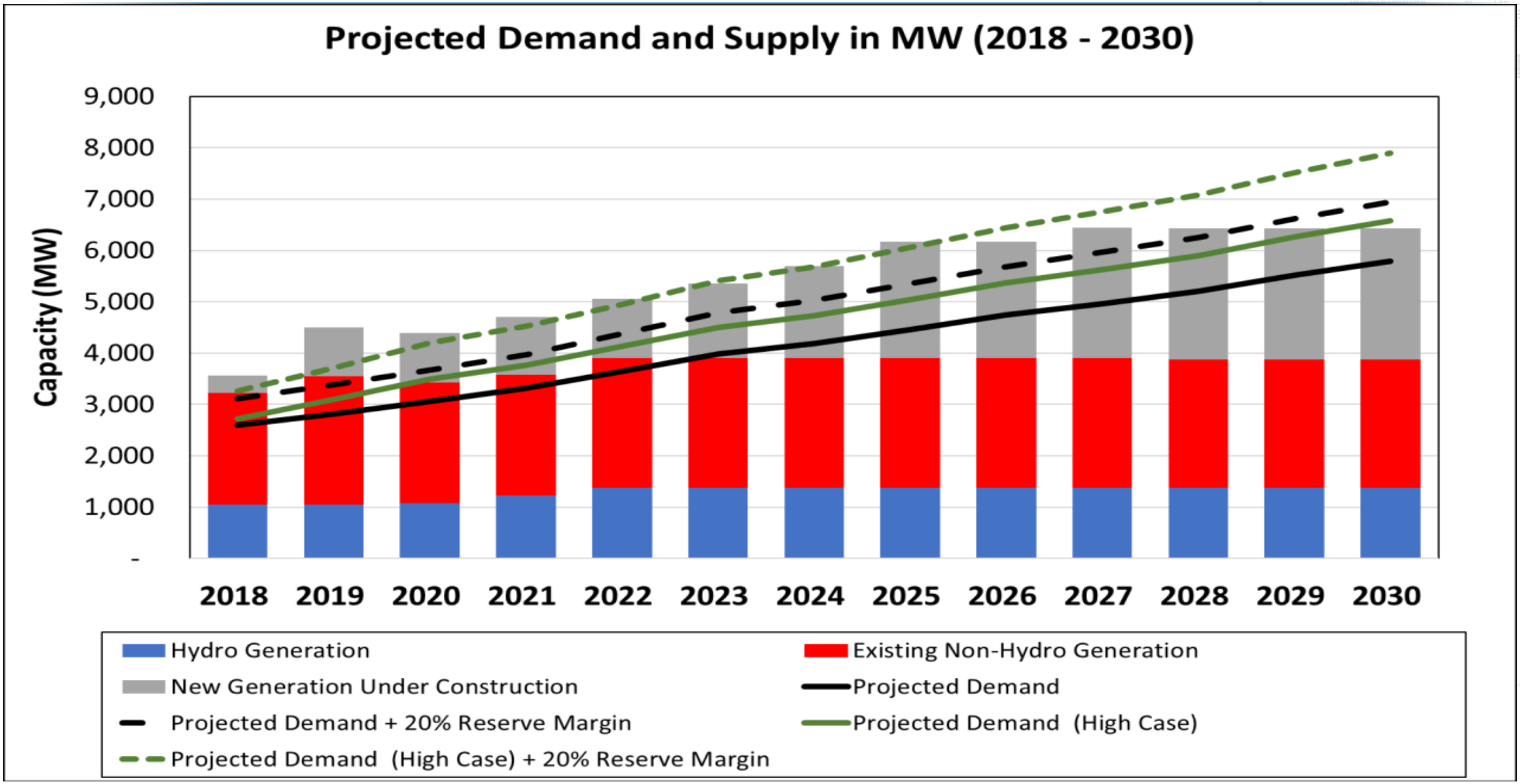
- Structure of the Energy sector in Ghana
- Energy Demand and Supply
- Renewable Energy and Policies

- Future Plans

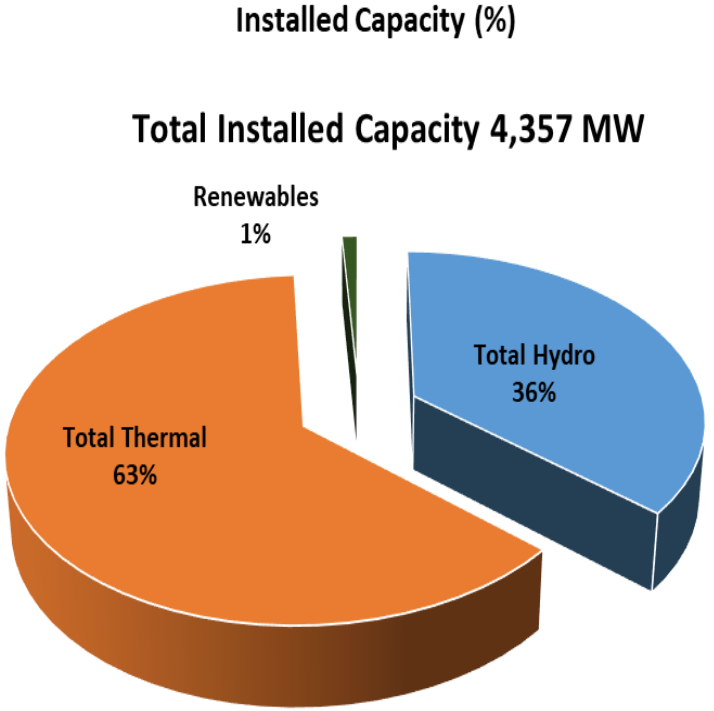
STRUCTURE OF THE ENERGY SECTOR IN GHANA

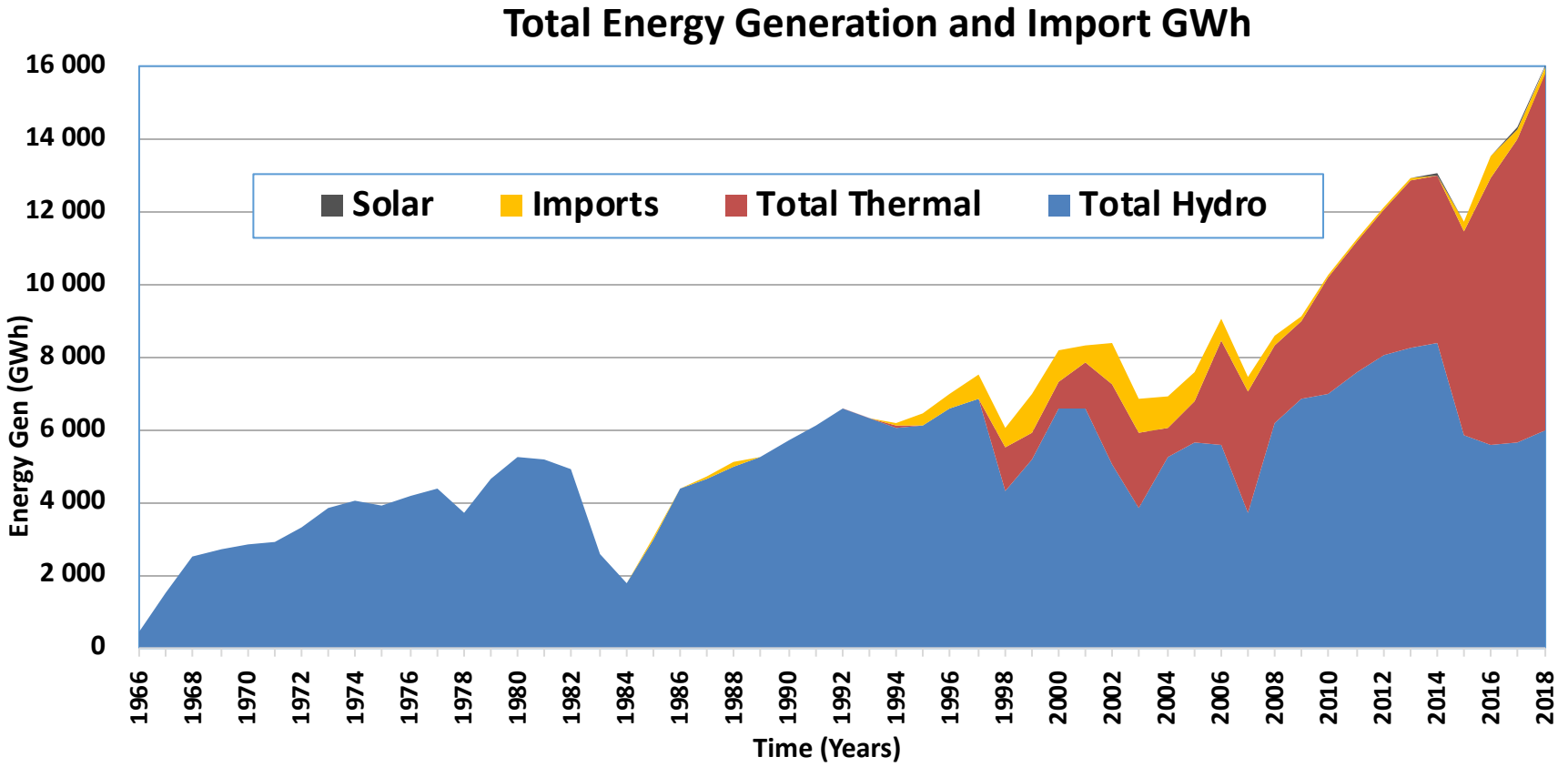


ENERGY DEMAND AND SUPPLY

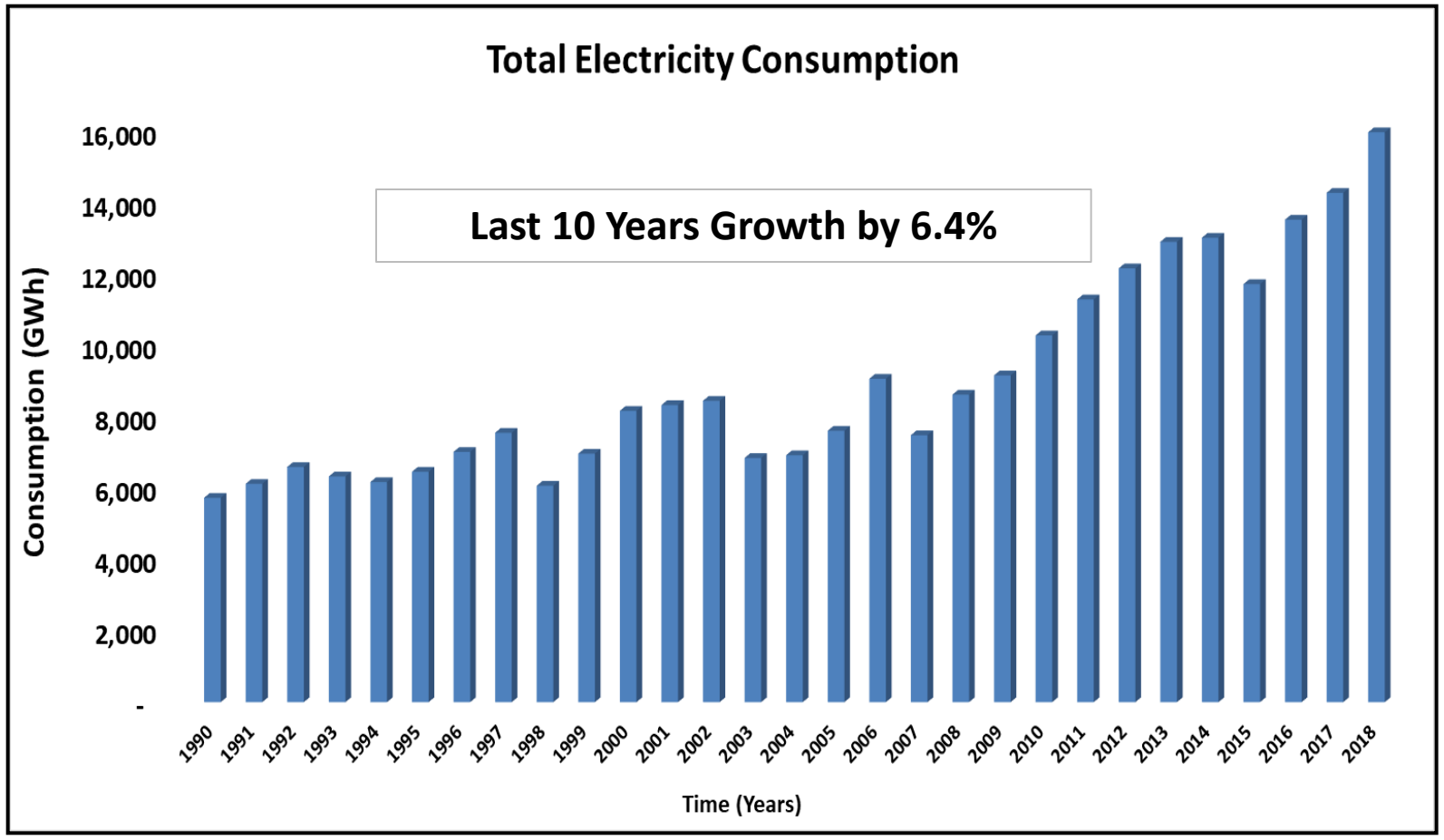


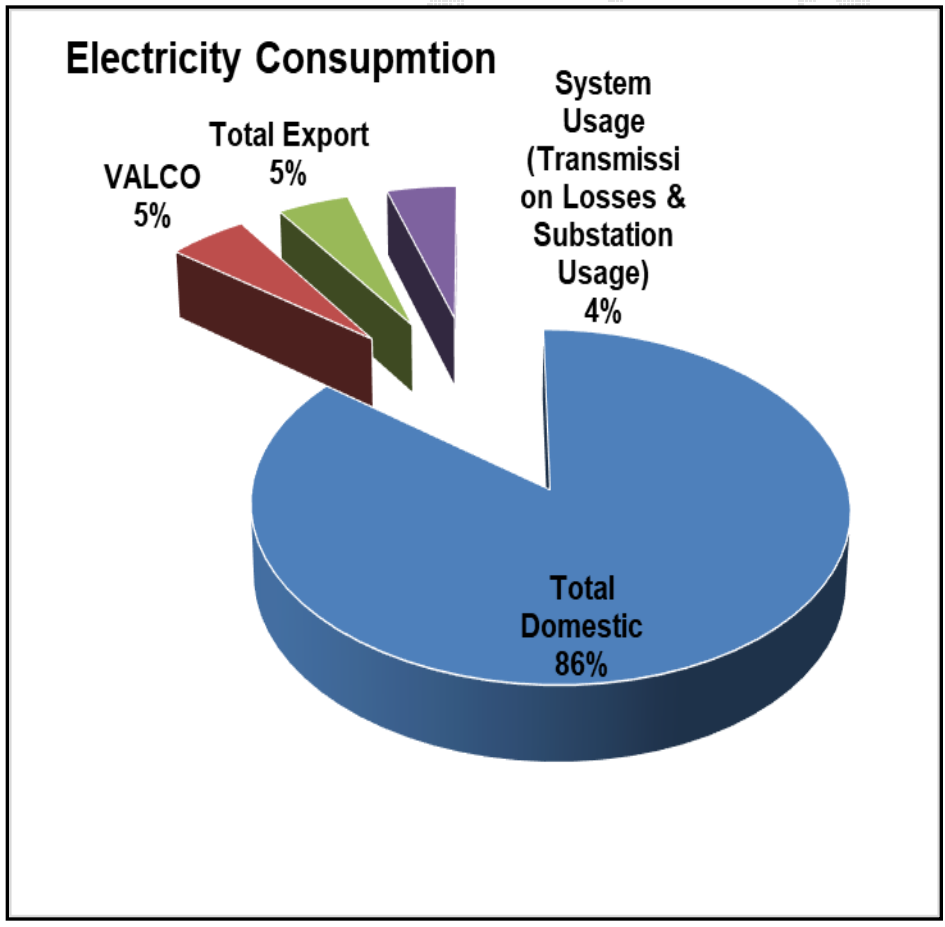
ENERGY SUPPLY





ENERGY DEMAND





POWER CRISIS

Period	Key Characteristics/Impact
1982 – 84	• All-hydro system crippled by drought; Low Reservoir Level • domestic load shedding (6-hrs supply/day)
1997 – 98	• Delay in 330MW Takoradi 1 (T1) plant and low reservoir inflow • Valco shut-down, power cuts to both industry & domestic users
2002 – 03	• Low Reservoir Level • Minimal domestic load shedding
2006 – 07	• Low Reservoir Level/Thermal Plant • imports - 300MW load shedding
2013	• Gas Supply Challenges • 300MW – 400MW deficit
2015 & 2017	• Gas Supply Challenges • Low Reservoir Levels

GHANA RENEWABLE ENERGY MASTER PLAN

Major policies, plans and strategy documents that have been developed since 1986 for the promotion of RETs in Ghana

a) Issues and Options in the Energy Sector (1986)
b) National Electrification Scheme (1989)
c) National Renewable Energy Strategy (2003)
d) Strategic National Energy Plan (2006/2020)
e) Ghana Shared Growth and Development Agenda I & II (2009/2014))
f) National Energy Policy (2010)
g) Energy Sector Strategy and Development Plan (2010)
h) Renewable Energy Act, 2011 (Act 832)
i) Sustainable Energy for All Action Plan / Agenda of Ghana (2012/2016)
j) Mini-grid Electrification Policy (2016)

http://energycom.gov.gh/files/Renewable-Energy-Masterplan-February-2019.pdf

RENEWABLE ENERGY IN GHANA

Public Utilities Regulatory Commission (PURC)

Feed-in-tariff rates

Public Utilities Regulatory Commission
Feed-in-tariff rates applicable to Renewable Energy Project PPAs effective 1st October 2016

SCHEDULES

TYPE OF TECHNOLOGY	Ghana Pesewas per kWh (Effective October 01, 2016)
Wind	65.3529
Solar PV	59.7750
Hydro <= 10 MW	52.9428
Hydro (>10 MW and <=100 MW)	56.5312
Tidal Wave (Ocean Wave)	52.9428
Run-of- River	52.9428
Biomass	69.1225
Biomass (Enhanced Technology)	72.8589
Biomass (Plantation as Feed Stock)	78.1092
Landfill Gas	69.1225
Sewage Gas	69.1225
Geoplutonic (Geothermal)	46.5817

Note:
Ghana Cedi-US Dollar Exchange Rate of GHS 3.9476 to US$1.0000 (Inter Bank Selling Rate as at August 31, 2016 from Ghana Association of Bankers).

http://www.purc.com.gh/purc/node/193 and
http://www.purc.com.gh/purc/sites/default/files/fit_2016.pdf

International Centre for Hydropower

REMP IMPLEMENTATION PLAN - RE TARGETS UP TO 2030										
Renewable Energy Technologies	Reference 2015		Cycle I (2019-2020)		Cycle II (2021-2025)		Cycle III (2026-2030)		Cumulative in 2030	
	No. of units	MWp	No. of Units	MWp	No. of Units	MWp	No. of Units	MWp	No. of Units	MWp
Solar Energy										
Solar Utility Scale	-	22.5	-	130	-	195	-	100	-	447.5
Distributed Solar PV		2		18		80		100		200
Standalone Solar PV	-	2	-	8	-	5	-	5	-	20
Solar Street/Community lighting	-	3	-	4	-	4	-	14	-	25
Solar Traffic signals (% of total traffic signals installed in the country)	14	3	11	-	15	-	20	-	60	-
Solar Lanterns	72,000	-	128000	-	300000	-	500000	-	1000000	-
Solar irrigation	150	2.8	6000	6	20000	20	20000	20	46150	48.8
Solar Crop Dryers	70	-	80	-	250	-	300	-	700	-
Solar Water Heaters	4,700	-	15300	-	50000	-	65000	-	135000	-
Wind Energy										
Wind Utility Scale	-	0	-	0	-	275	-	50	-	325
Standalone Wind Systems	-	0.01	-	0.1	-	0.9	-	1	-	2
Wind Irrigation/Water Pumping	10	-	25	-	30	-	35	-	100	-
Biomass / Waste-to-Energy										
Biomass Utility-Scale	-	0	-	0	-	72	-	0	-	72
Waste-to-Energy Utility Scale	-	0.1	-	0	-	30	-	20	-	50.1
Biogas (Agricultural/Industrial Organic Waste)	10	-	20	-	70	-	100	-	200	-
Biogas (Institutional)	100	-	80	-	140	-	180	-	500	-
Biogas (Domestic)	50	-	30	-	50	-	70	-	200	-
Woodlot Cultivation (ha)	190,000	-	60000	-	100000	-	78000	-	428000	-
Charcoal (Local Demand)	1,551,282	-	94017	-	93947	-	100877	-	1840123	-
Charcoal (Export)	190,450	-	59550	-	100000	-	78000	-	428000	-
Briquetting/Pelleting	19,700	-	20300	-	25000	-	35000	-	100000	-
Biofuel (tonnes)	0	-	100	-	4900	-	15000	-	20000	-
Hydro / Wave Power										
Small/Medium Hydro Plants	-	0	-	0.03	-	80	-	70	-	150.03
Wave Power	-	0	-	5	-	0	-	45	-	50
Hybrid Mini-Grids										
Mini/Micro-grids	13	-	73	-	114	-	100	-	300	12
End User Technologies										
Improved Biomass Cookstove (Domestic)	800,000	-	500000	-	500000	-	1200000	-	3000000	-
Improved Biomass Cookstove (Institutional/Commercial)	1,800	-	1200	-	7000	-	8000	-	18000	-
Total Installed RE Electricity Capacity										*1353.63*

Thank You

International Centre for Hydropower

Klæbuveien 153
N-7465 Trondheim, Norway

Fax: +47 73 59 07 81
Website: www.ich.no
E-mail: mail@ich.no