

Angolan Country Presentation

JICA Training Dialog Program / May 2010

Angola macro data

- **Independent since 1975**
- **Area: 1.246.700 km²**
- **16m inhabitants (est. 2010)**
 - **Main language is Portuguese**
- **macroeconomics**
 - **GDP (est.)**
 - 21,1% (2007),
 - 13,2%(2008),
 - -0,6%(2009)
 - **Local currency kwanza**
 - 1 USD / 93 kwanza (est. April 2010)
 - **Budget:**
 - revenues: \$30.82 billion
 - expenditures: \$27.91 billion (2009 est.)
 - Energy Investment Budget \$1 billion / year
 - **Public debt:**
 - 16.8% of GDP (2009 est.)
 - **Inflation rate (consumer prices):**
 - 13.1% (2009 est.)

Outlook for power consumption

■ Consumption GWh

ANOS	2008	2009	2010	2011	2012	2013
GWh	4828	6068	7351	7818	8370	8992

Tabela N° 16 Valores Previsionais Globais da Procura de Electricidade (GWh)

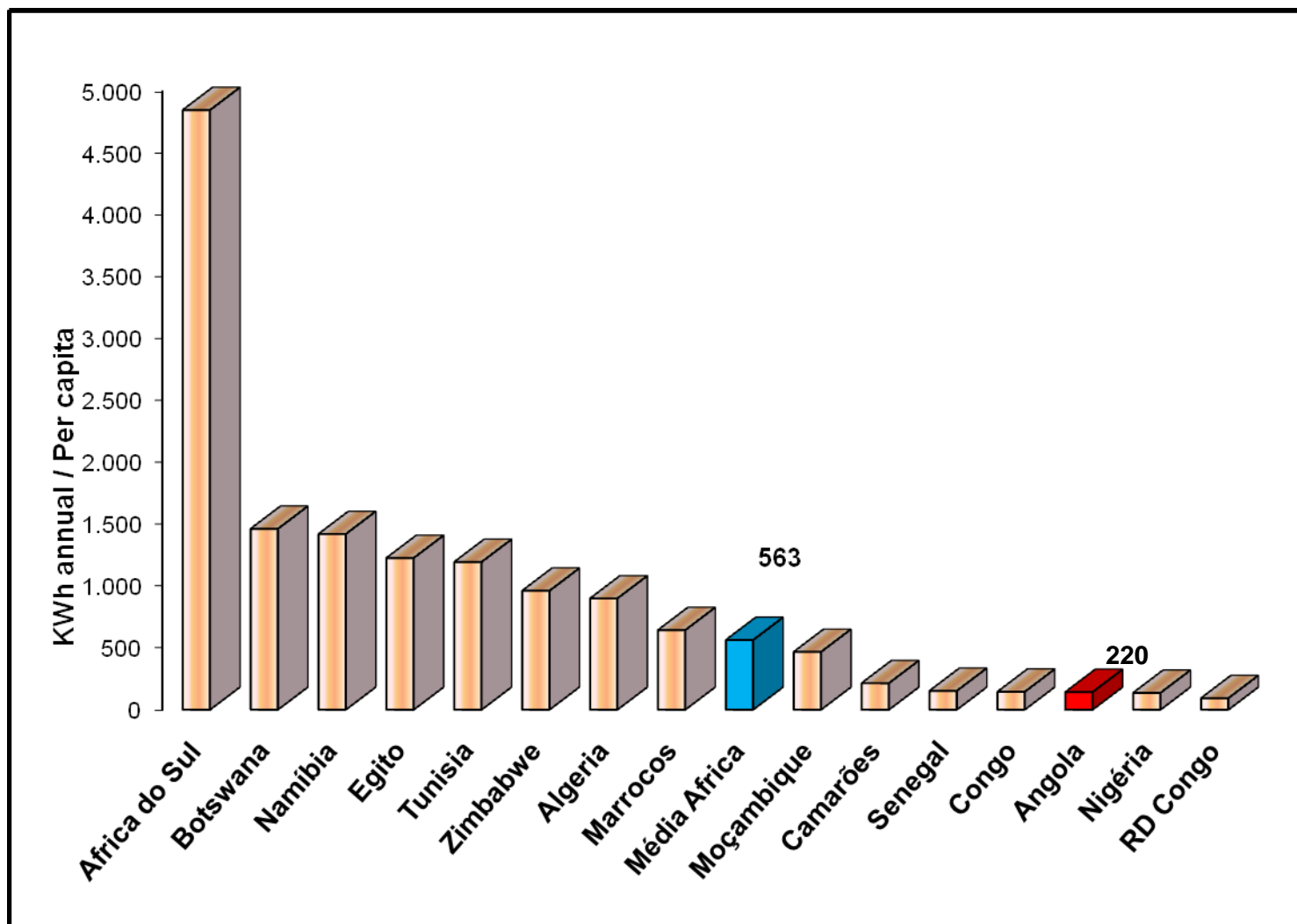
■ Peak Demand / year (MW)

	SN	SC	SS
2008	740	86	40
2009	789	91	43
2010	878	102	46
2011	884	103	47
2012	924	107	48
2013	959	112	50

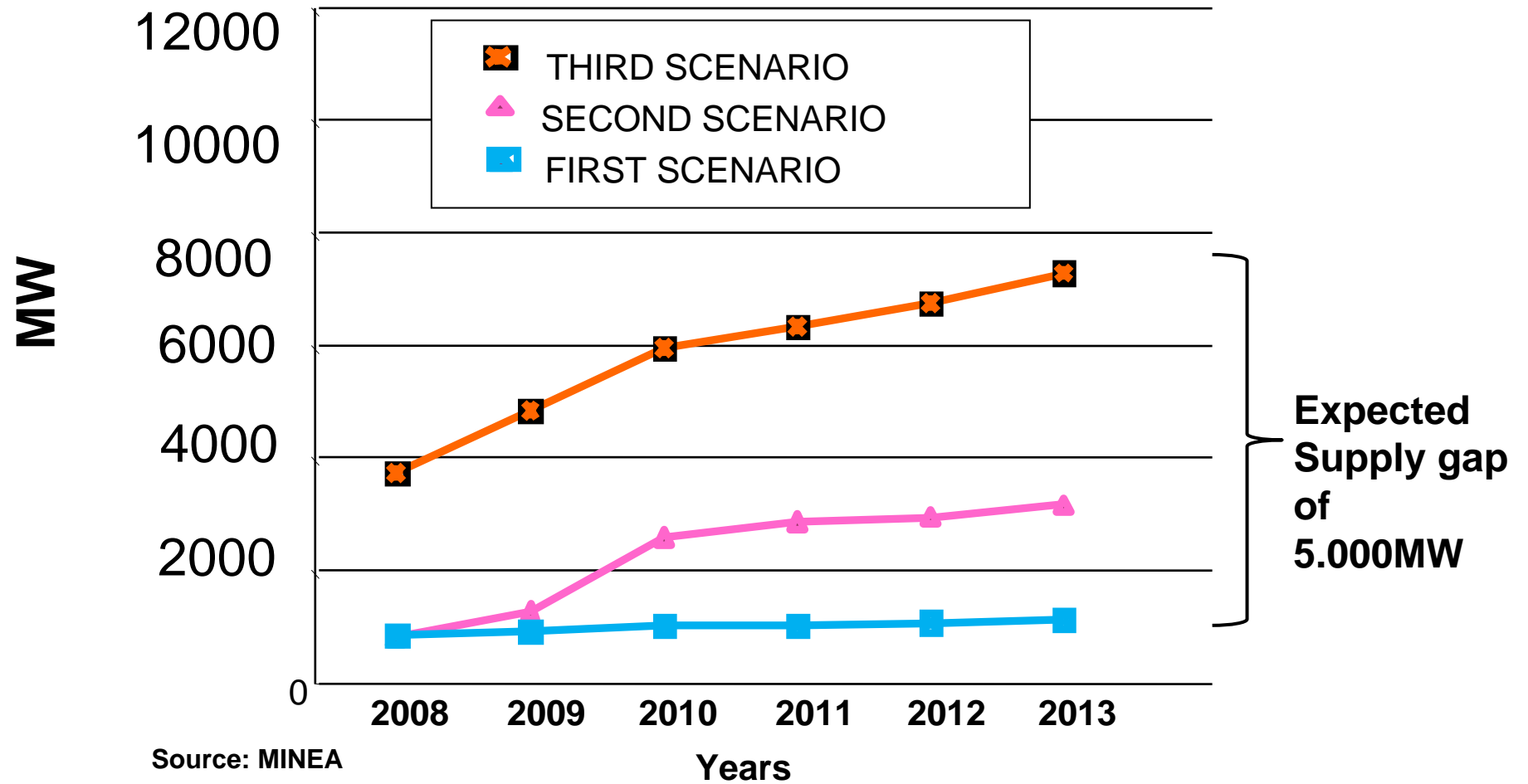
Tabela N° 17 Ponta Anual do Consumo de Electricidade (MW)

- Only 15% of the population has access to electricity. (*Development Strategy of the Power Sector in Angola / 2007)
- Low cost KW/h

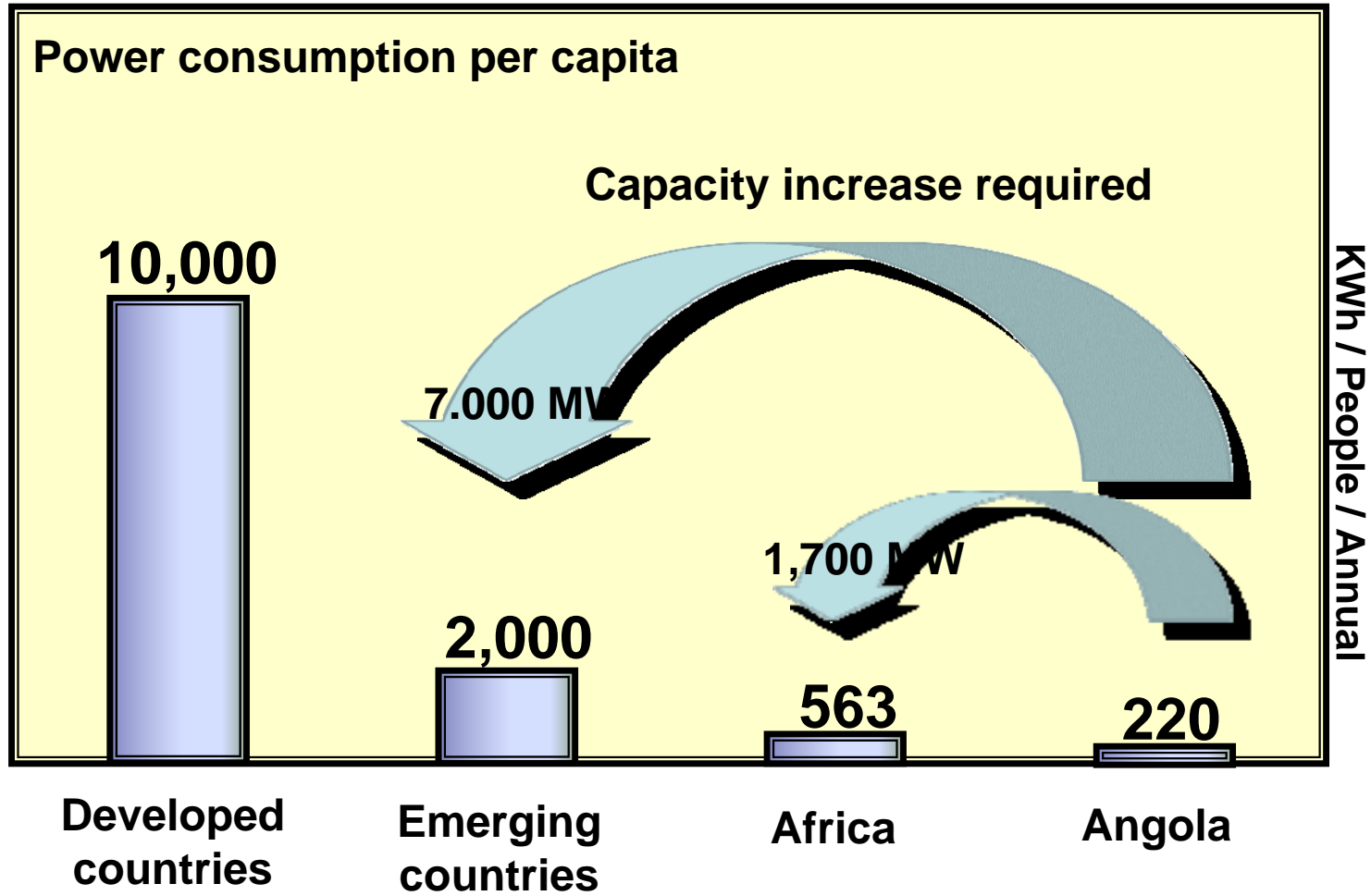
Consumption per capita



Scenarios for Power Demand



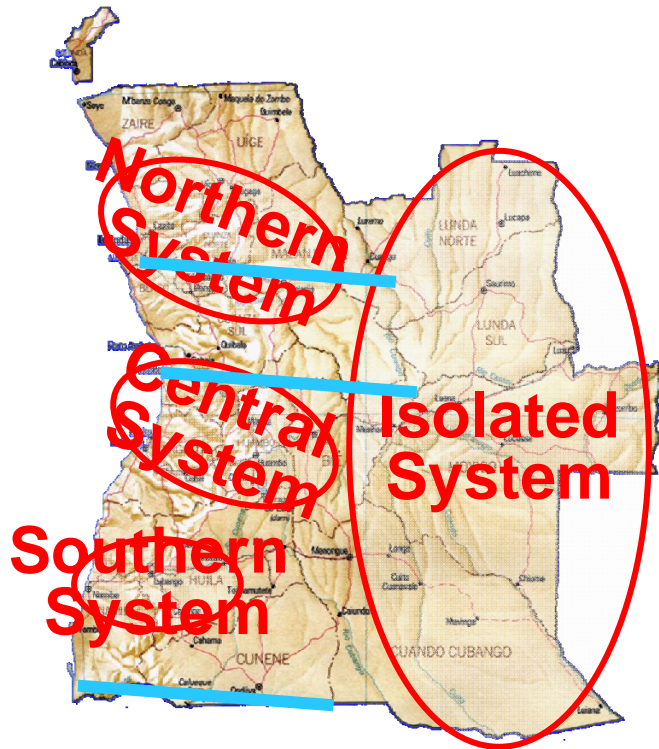
Power capacity required increase



Source: IEA 2005

FYR: Japan 8,220 kWh/p/a

Disconnected National Grid & 18GW hydro potential



- Disconnected national grid
- Lack of generation capacity
- Unsatisfied demand & unstable system
- 5% of hydro potential used
 - 900MW operation / 18GW

Basin	Potential Capacity (MW)	Basin area (km ²)	Potential Capacity (GWh)	Installed Capacity (MW)	Installed as % of potential
Kwanza	8.199	147.738	34.746	700	9%
Queve	3.020	23.000	11.786	0	0%
Cunene	2.492	128.600	6.225	41	2%
Catumbela	1.930	16.640	10.660	49	3%
Longa	1.190	23.320	4.796	0	0%
N'gunza, Quicombo, Evale and Balombo	1.086	17.270	3.488	0	0%
Cubango	350	148.860	592		0%
Total	18.267	505.428	72.293	790	4%

*source: Estratégia de Desenvolvimento do Sector Eléctrico de Angola (2002)

*

• see Google earth pres.

Power Sector Scenario

Current installed capacity is equivalent to 1,300 MW; 60% from hydroelectric power plants and the remaining 40% from diesel thermo-generators.

- Almost 2,000MW are supplied by small-generators or chartered diesel thermo-generators, (estimate).
- represents a cost of more than USD 200 / KWh.

The Angolan Government expects to increase the capacity in about 5,000 MW* to cover the non-satisfied demand.

Master Plan presented to the Council of Minister the 2010-2016 Master Plan

- Capital expenditure amounts to 17B USD over 6 years+
- Focus on interconnection of the Northern, Central, Southern System
 - Luanda will see a 4GW capacity increase
 - Hydro, thermal (diesel, gas) and renewables
 - Progressive phasing out of lease diesel plant (Agrekko)

The main foreseen new generation projects are:

- Satellite Power
 - Diesel Thermolectric Plants (100-200MW)
 - Mid GT
 - Renewable (Wind, Solar)
- Giant Hydro Power
- Thermal Power (Associated Gas Power, CCGT)

Angola: status of the power generation capacity

- **Hydro**
 - **738,6 MW operational to date***
 - **Coming on Matala (13,6), Mabubas (17,8), Lomáum (35), Bíopio (7,2), Gove (60) MW**
 - **Mini-hydro developments**
 - **Outlook 2013: 900 MW**
- **Thermal**
 - **Above 400 MW**
 - Including (237MW) temporary Agrekko power plants
 - **Coming on**
 - Luanda GT (5x25MW),
 - Cabinda GT (2x35MW)
 - Namibe GT (1x35MW)
 - Mid-speed plant in Saurimo, Luena, Kuito (approx 10MW each),
 - **Outlook 2013: 358 MW**
- **Overall,**
 - **2932 GWh produced in 2006***
 - (2010-2011, 20.4551 GWh forecasted by Eskom (more than 50x) at 5,37 USD cents)
 - **total operating capacity outlook 2013 is 1258 MW (hydro+thermal)**

Energy policy topics

- Project finance culture is needed
 - To date: “sunk costs” that are paid for by oil revenue
 - Accountability
 - Debt/equity
- Target
 - Electricity penetration
 - %households access to grid (urban, 100%; peri-urban, 60%; rural 30%, by 2012)
 - %remaining to satellite generation
 - Diesel genset, solar, wind
 - kWh produced per head
 - Long-term cost of kWh: 20-30€/MWh
- Investment planning for baseload generation
 - Short-to-mid term
 - to support economic growth
 - phasing out / increase based on fuel availability
 - Thermal: MINEA should make it investors-friendly for IPP players market entry
 - Fast roll out
 - low capex / high opex
 - Long-term
 - Hydro: to secure cheap financing/availability
 - Longer rollout
 - High capex / low opex
- Energy security
 - Balanced exposure to each sources, within long-term opex target
 - Regional integration

**Thank you very much
for your kind attention**