

**Access to Sustainable Energy
for All With Gas
Gas Training Seminar
Abidjan, Côte d'Ivoire, 4 – 5
November 2013**



**Sustainable Energy
Perspectives of the
ECOWAS Region**

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THE ECOWAS REGION

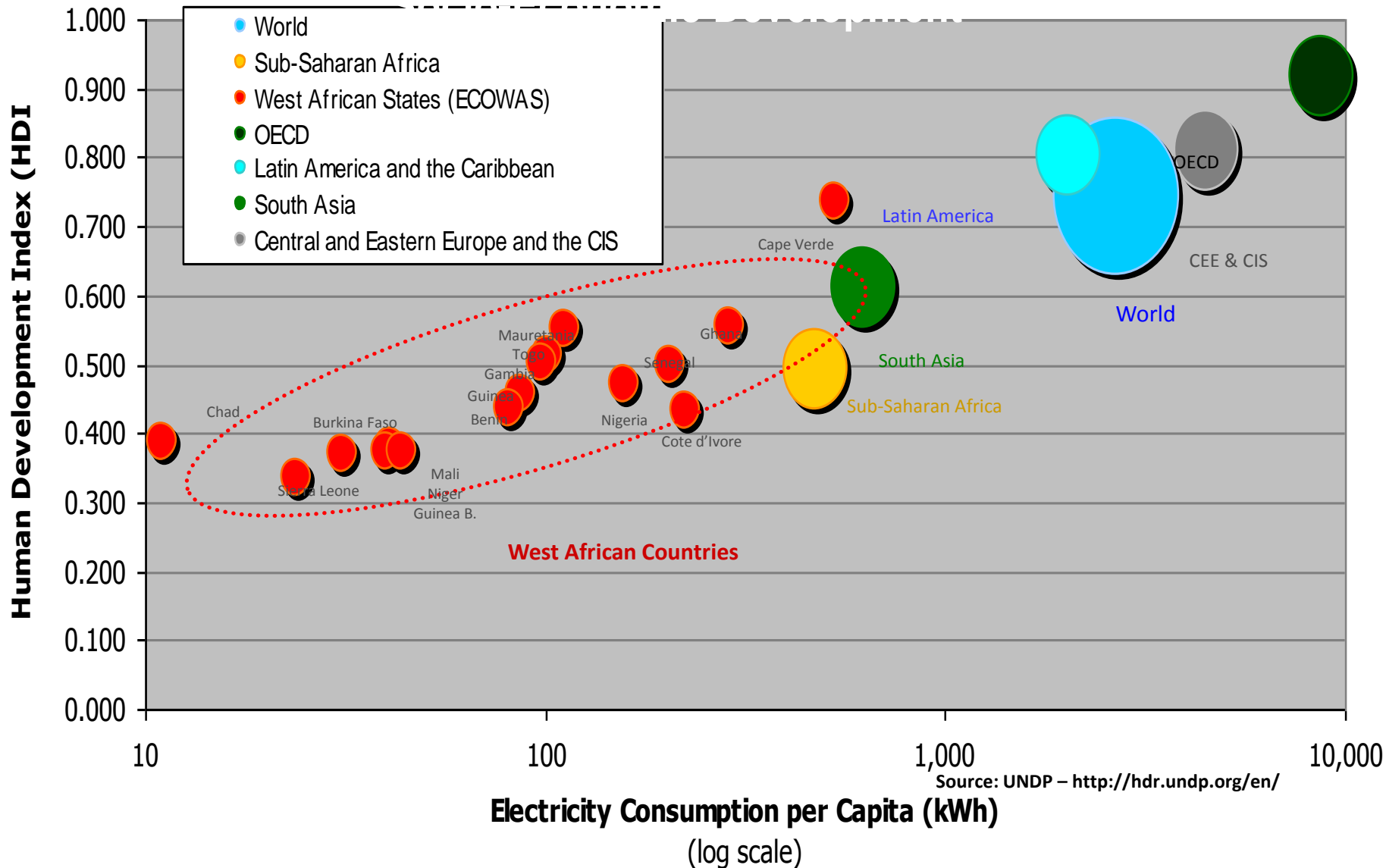
- *15 countries with a land area of 5 million m²*
- *Climate from semi-arid to humid tropical*
- *Population of over 300 million people*
- *60% of population live in rural areas*
- *11 of the 15 countries are LDCs*
- *Almost 176 million people have no access to electricity (52%)*



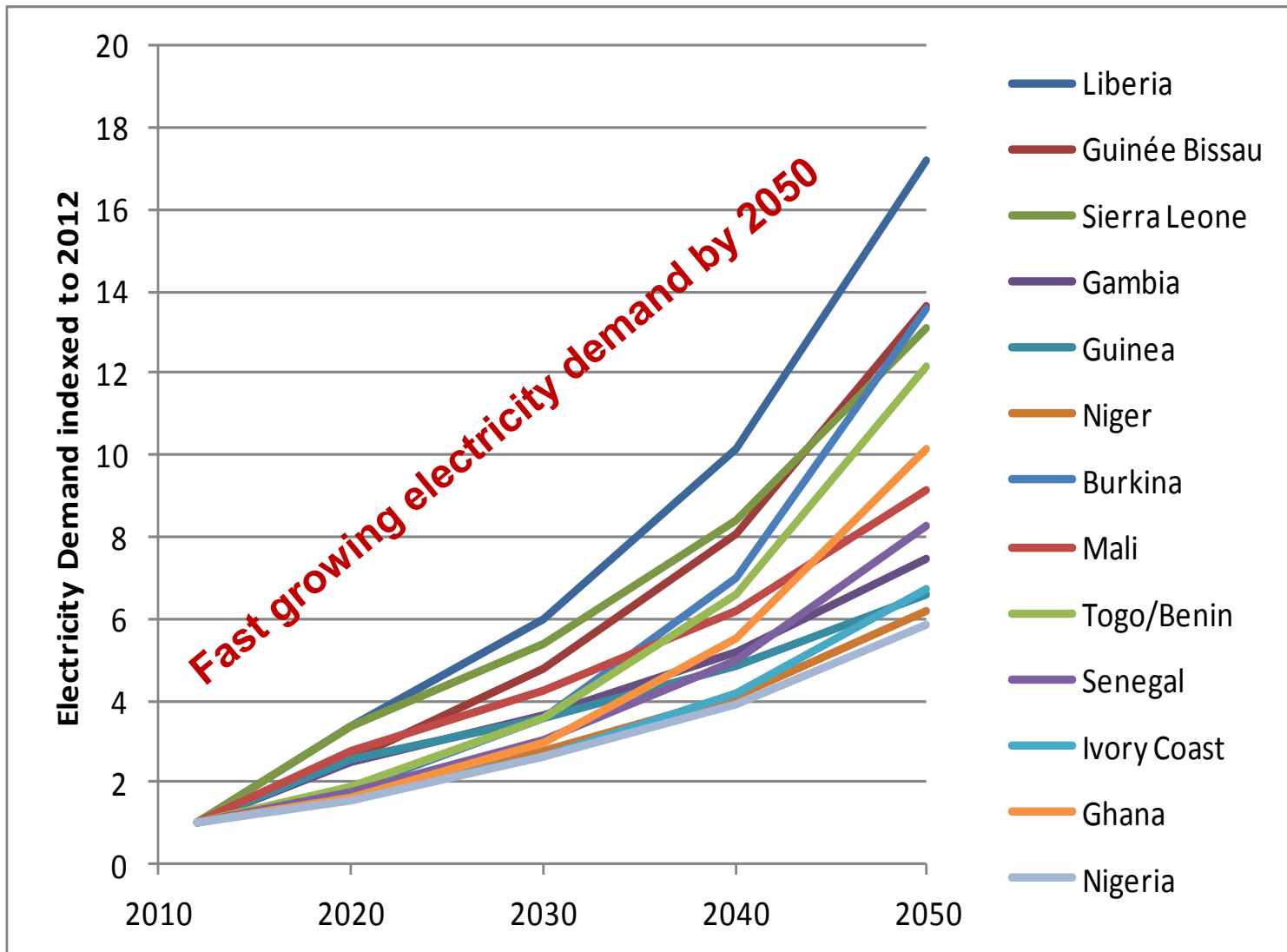
Energy Challenges

- **Interrelated challenges of energy poverty, energy security and climate change mitigation and adaptation**
- **Low Access to modern energy service**
 - One of the lowest energy consumption rates in the world;
 - The poor spend more of their income on low quality energy services;
 - Rural areas rely mainly on traditional biomass to meet their energy requirements;
 - Household access to electricity services is only around 20% (40% in urban and 6-8% in rural areas);
- **Energy security concerns**
 - High vulnerability to fossil fuel price volatility (60 % of electricity generation from oil)
 - Gap between rising urban energy demand, available generation capacities and limited investment capital;
 - High losses in the energy systems (e.g. high energy intensity and low demand and supply side efficiency);
- **Climate changes concerns**
 - Increasing energy related GHG emissions (new investments determine GHGs for the next 20-30 years)
 - Climate change impacts vulnerable West African energy systems (e.g. water flows, extreme weather events)

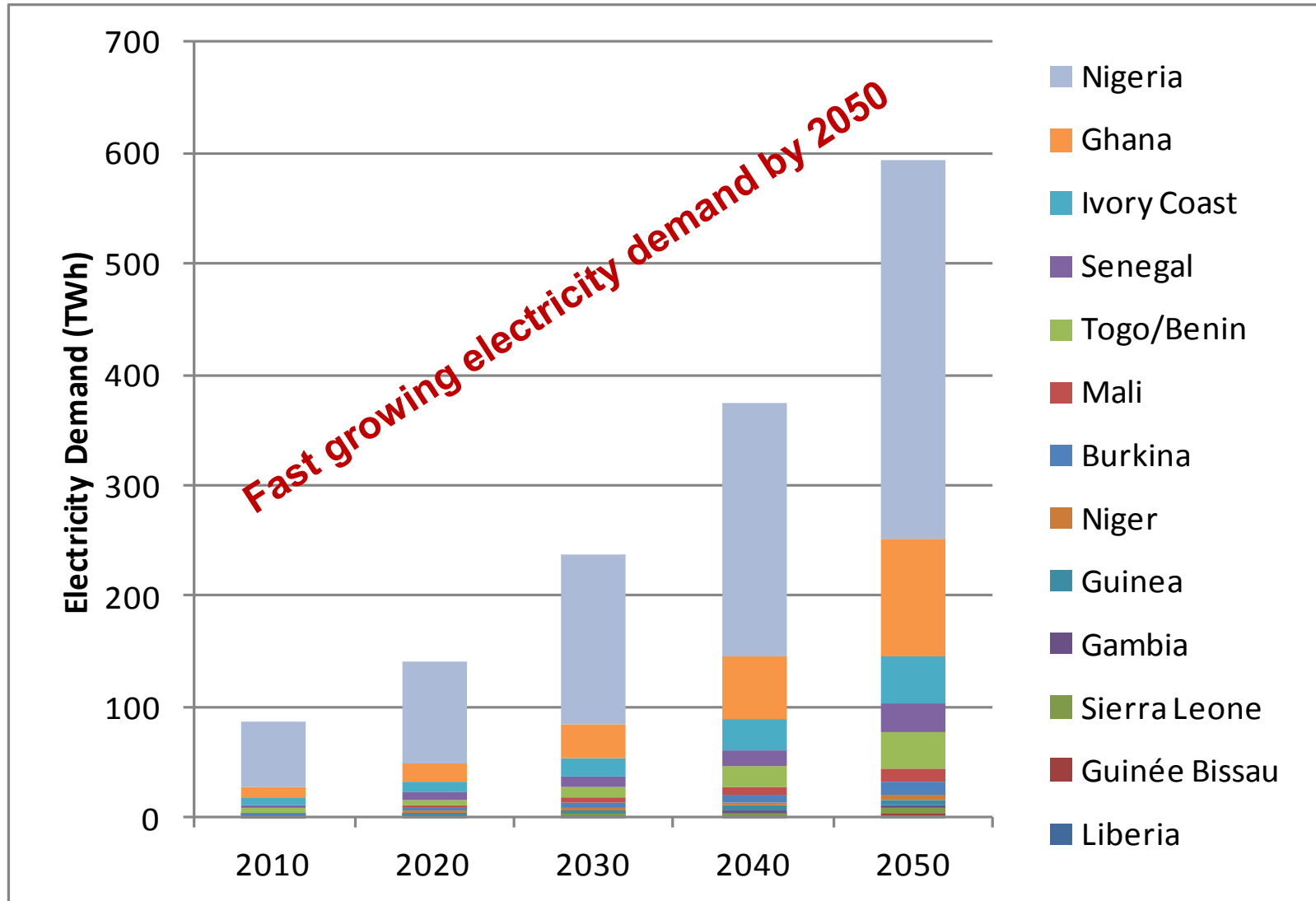
Lack of Electricity and Socio-Economic Development



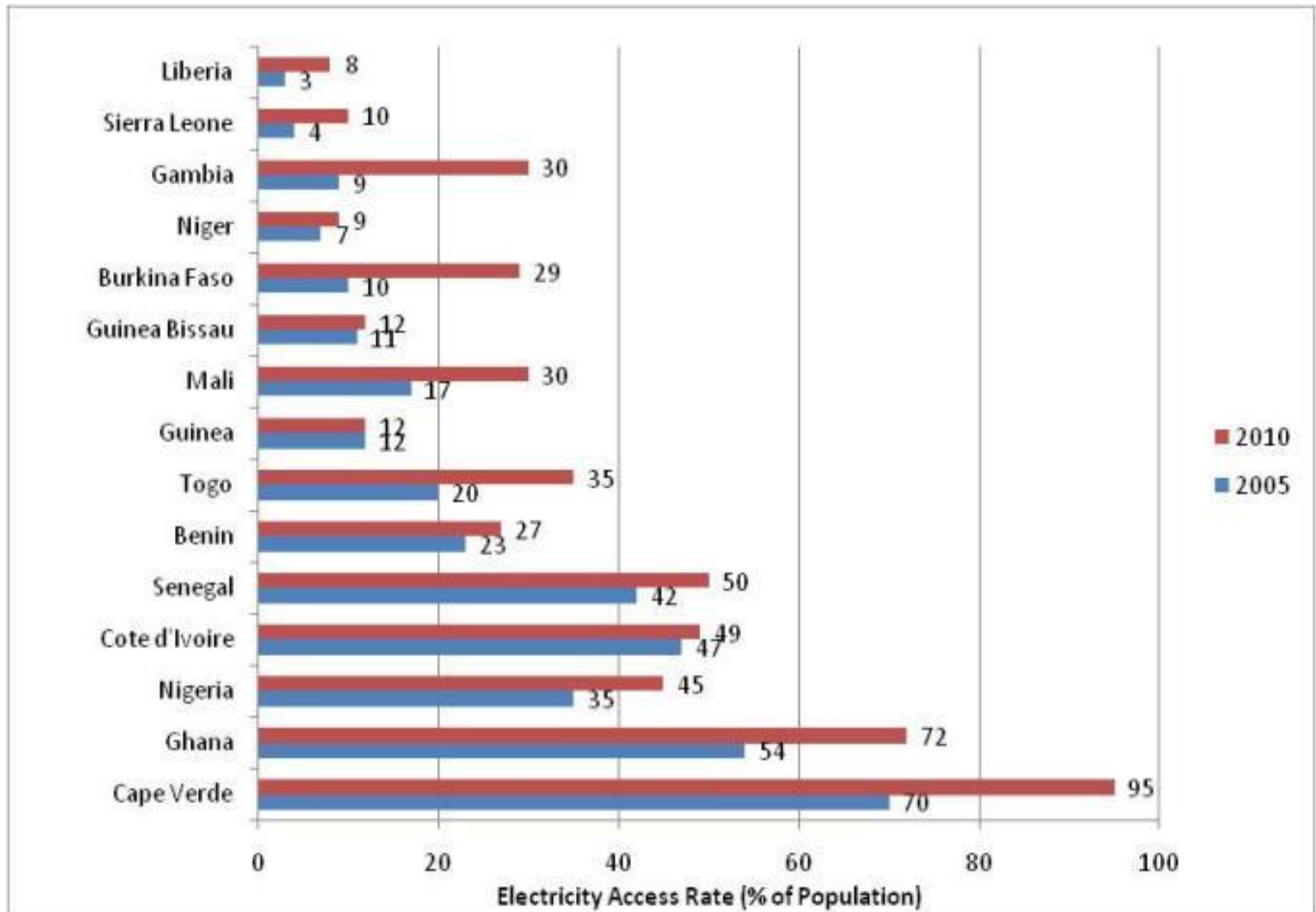
Electricity Demand



Electricity Demand



Access Rates 2005 & 2010



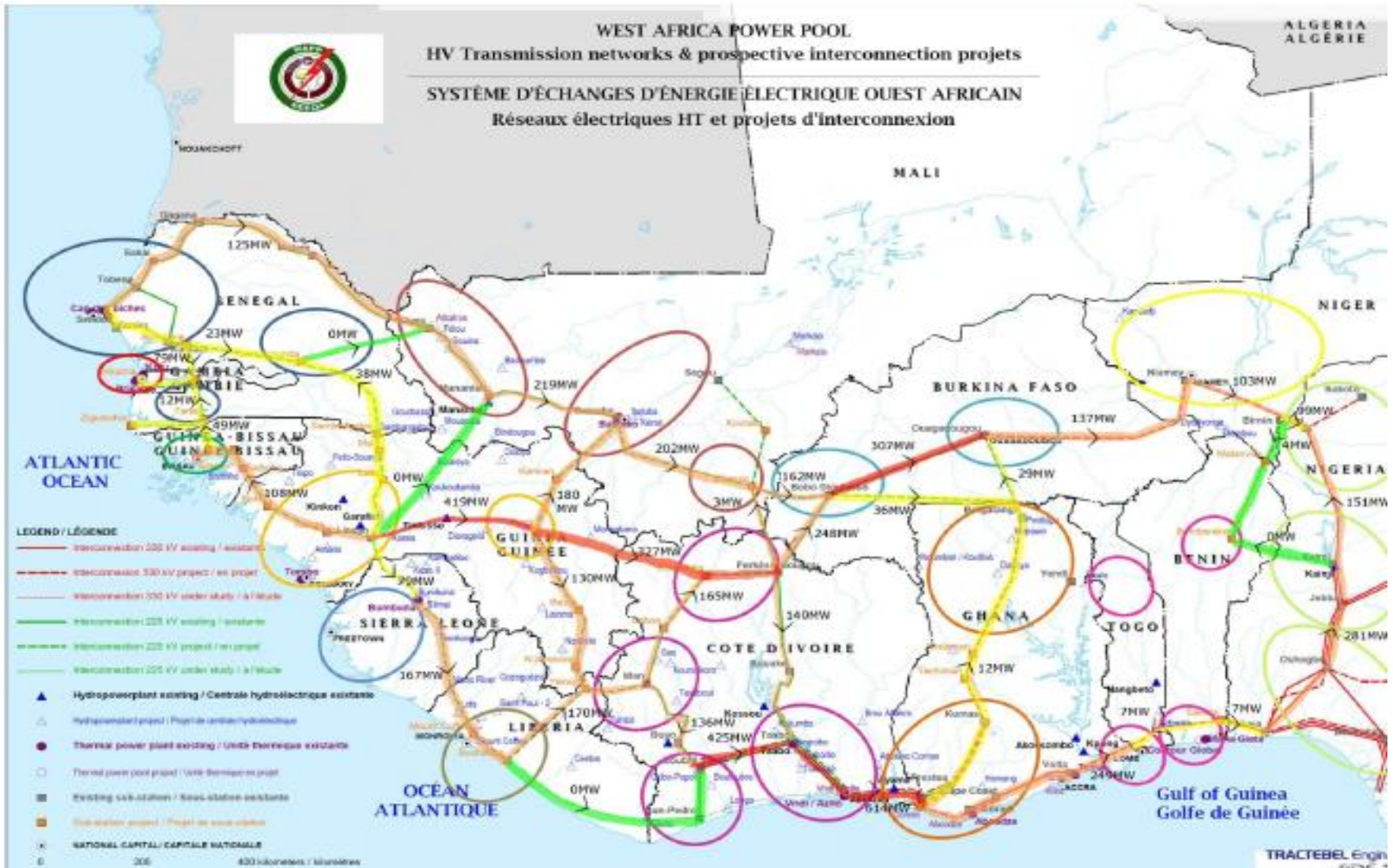
Energy Integration in the ECOWAS

- Article 28 of the ECOWAS treaty of 1975 and seeks to establish a common energy policy and a collective resolution of ECOWAS energy development challenges;
- ECOWAS Energy Protocol (modelled after the European Energy Charter Treaty) aims to promote investment and trade by serving as a security for foreign direct investments in the energy sector
- The West African Power Pool (WAPP) – seeks a unified regional electricity market where electricity supply costs are lowered and energy security improved in order to contribute towards further regional energy integration.
- The West Africa Gas Pipeline (WAGP) project - seeks to utilise gas flared in Nigeria and ensure the supply of affordable gas for electricity generation in the neighbouring countries of Ghana, Togo and Benin, but will also spread its benefits to the whole Gulf of Guinea Region
- WAGP provides an opportunity for diversifying the region's energy mix away from the region's heavy reliance on hydroelectric power from its major rivers.
- WAGP will enable the electricity sector a measure of price stability, as the long-term gas contracts will serve as a buffer to variations in the international prices, thus making the region's electricity industry competitive.

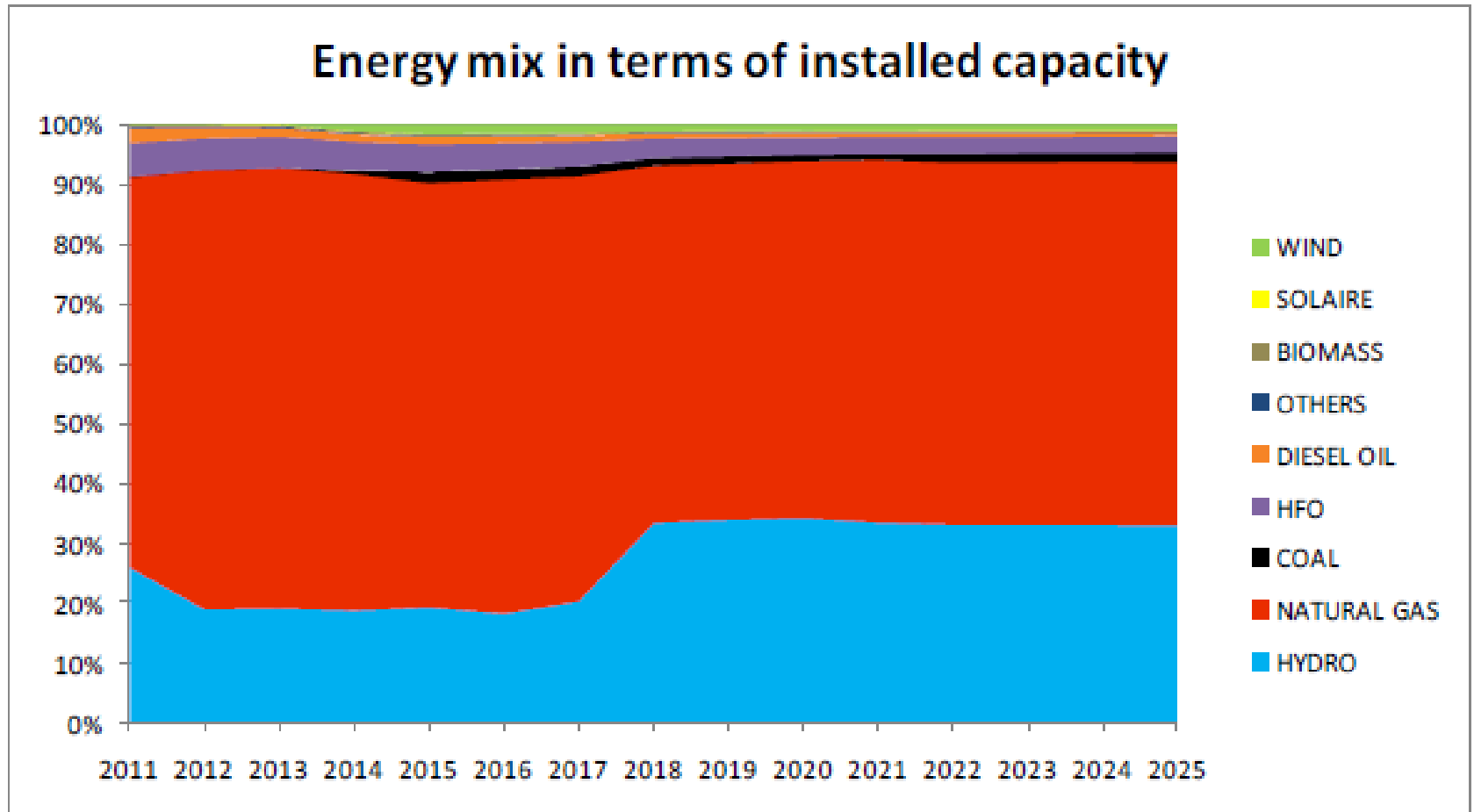
Energy Integration in the ECOWAS

- The ECOWAS/UEMOA Regional White Paper on Access to Energy Services for Populations in Rural and Peri-urban Areas (The ECOWAS White Paper) - adopted in 2006 by the ECOWAS Heads of States and Government in recognition of the key role that energy plays in the achievement of the Millennium Development Goals (MDGs).
- The ECOWAS Regional Electricity Regulatory Authority (ERERA) - established in 2008 to promote the development of infrastructure, improve governance of the electricity sector and attract significant private capital. The specific mission of ERERA is to regulate cross border electricity exchanges between ECOWAS countries.
- The ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) - established in 2008 as a specialized ECOWAS agency with a public mandate to promote regional renewable energy and energy efficiency markets.
- Adoption of Regional Green Policies – 2012/2013

WAPP Master Plan Scenario by 2025

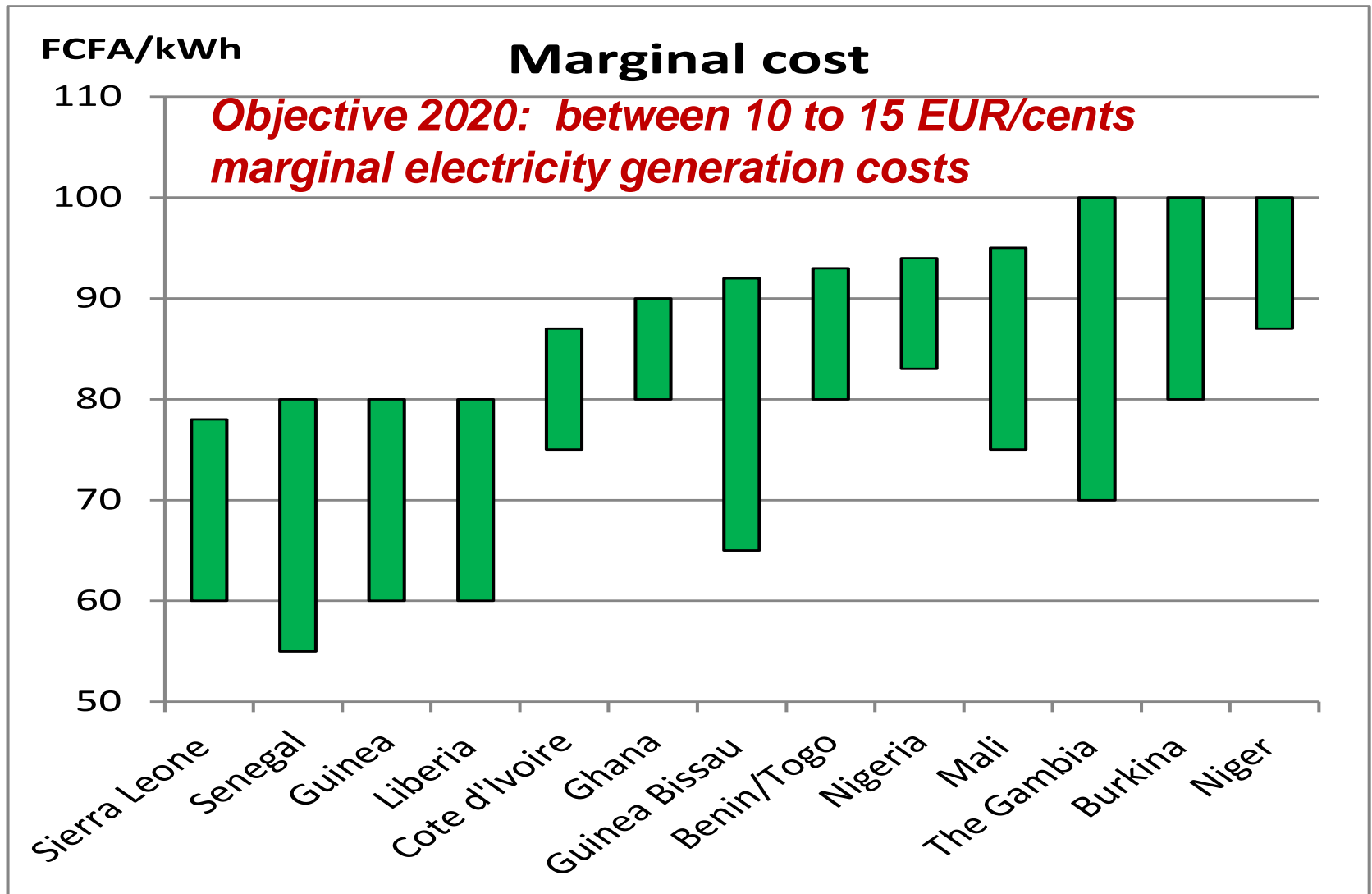


WAPP Master Plan Scenario



Scenario based mainly on large hydro and gas!

WAPP Master Plan Scenario



ECOWAS RE&EE POLICIES

- ECREEE RE Baseline Report developed by ECREEE with technical assistance of IED – based on the WAPP Master Plan
- ECOWAS Renewable Energy Policy (EREP) and ECOWAS Energy Efficiency Policy (EEEP) developed with support of UNIDO, EU, Austria, Spain and GEF
- Validated by ECOWAS Experts Group Meeting, June 2012, Dakar
- Adopted by ECOWAS Energy Ministers during the High-Level Energy Forum, Oct 2012, Accra
- Considered and adopted by the ECOWAS Council of Ministers, June 2013, Abidjan
- Adopted by the ECOWAS Authority of Heads of State and Government, July 2013, Abuja
- Regional policies represent a voluntary contribution of ECOWAS to the SE4ALL Initiative
- Implementation at national levels ongoing

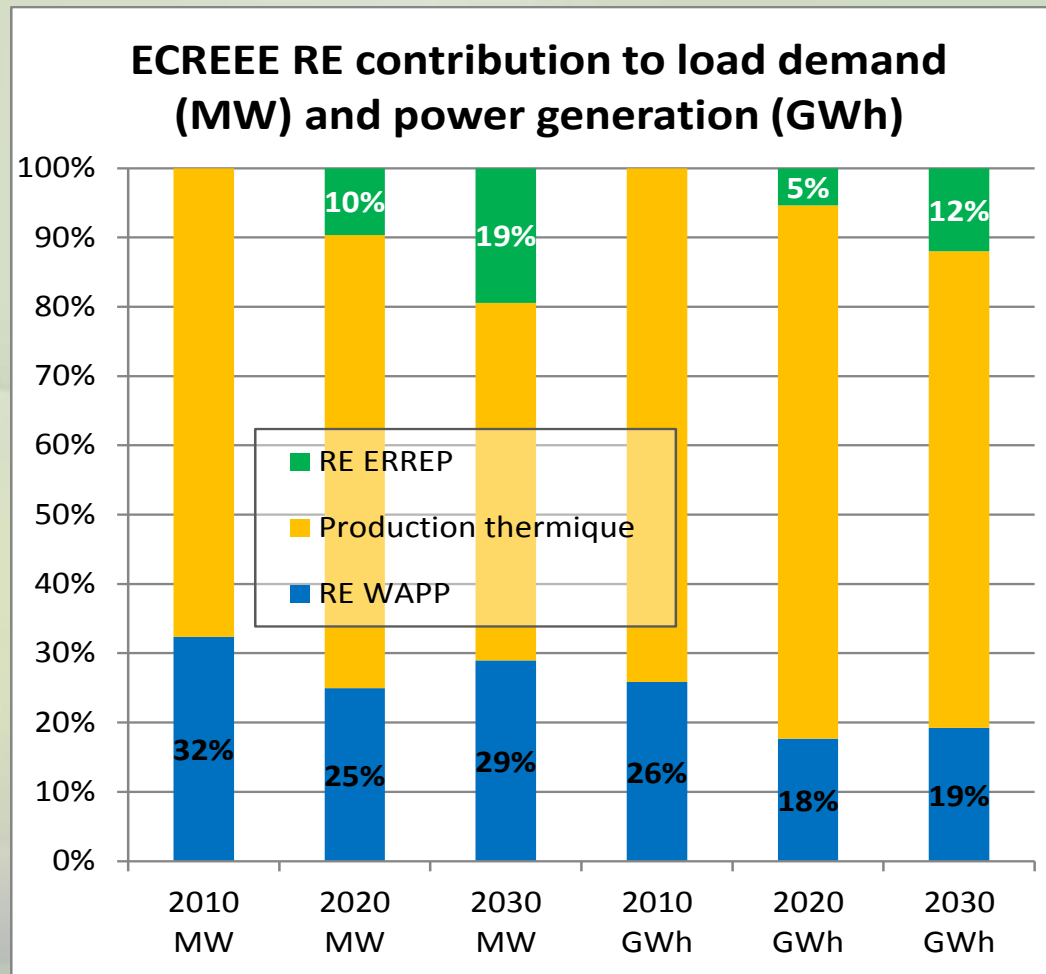


ECOWAS RE POLICY TARGETS BY 2020/2030

in MW of installed capacity	2010	2020	2030
Load forecast ECOWAS, in MW peak load	10,659	25,128	39,131
WAPP total RE capacity (medium and large hydro)	3,447	6,272	11,340
WAPP RE Penetration in % of peak load	32%	25%	29%
EREP renewable energy options in MW	0	2,425	7,606
EREP renewable energy options in % of peak load (excl. medium and large hydro)	0%	10%	19%
Total RE penetration (incl. medium and large hydro hydro)	32%	35%	48%

in GWh of produced electricity	2010	2020	2030
Load forecast ECOWAS – electricity demand in GWh	65,696	155,841	243,901
WAPP RE total production (medium and large hydro) in GWh	16,965	27,494	46,844
WAPP RE production Share (medium and large hydro)	26%	18%	19%
EREP renewable energy options – production in GWh	0	8,350	29,229
EREP renewable energy options - % of electricity demand (excl. medium and large hydro)	0%	5%	12%
RE production Share	26%	23%	31%

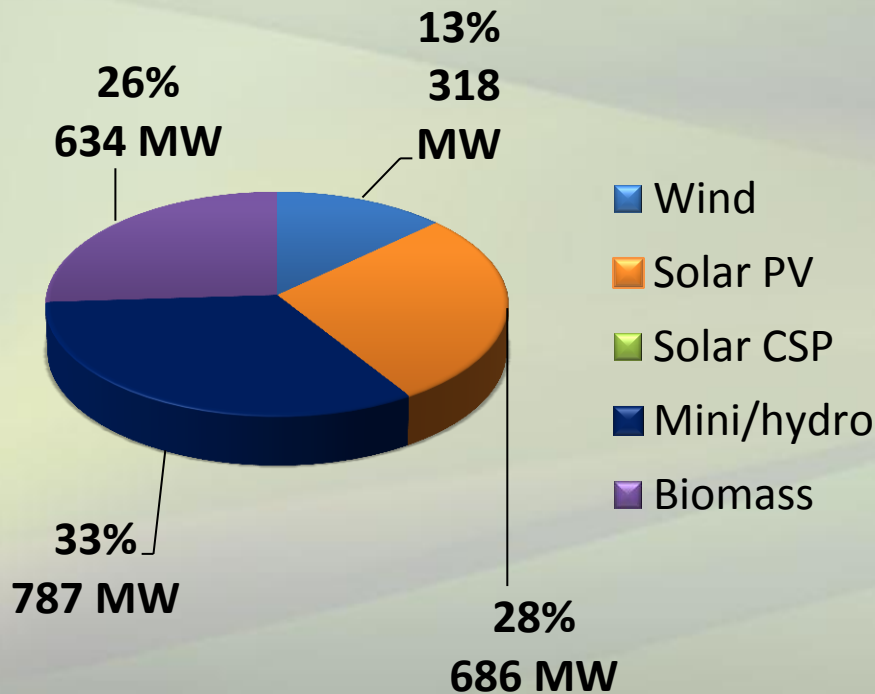
ECOWAS RE POLICY TARGETS BY 2020/2030



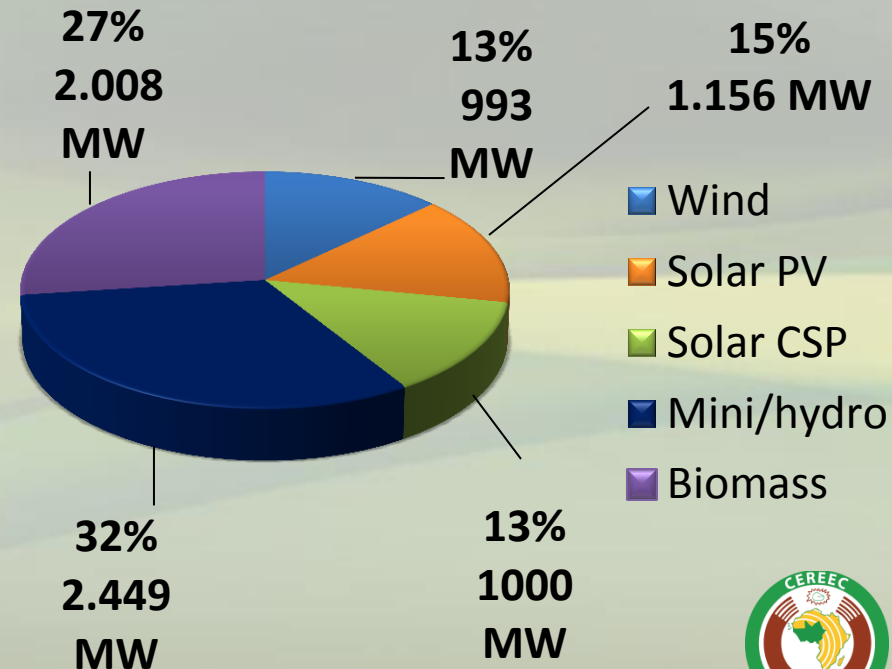
SCENARIO OF ECOWAS BY 2020/2030 (excl. medium and large hydro)

Individual countries decide on RE mix!

Installed RE Capacity 2020
2,425 MW



Installed RE Capacity 2030 –
7,606 MW

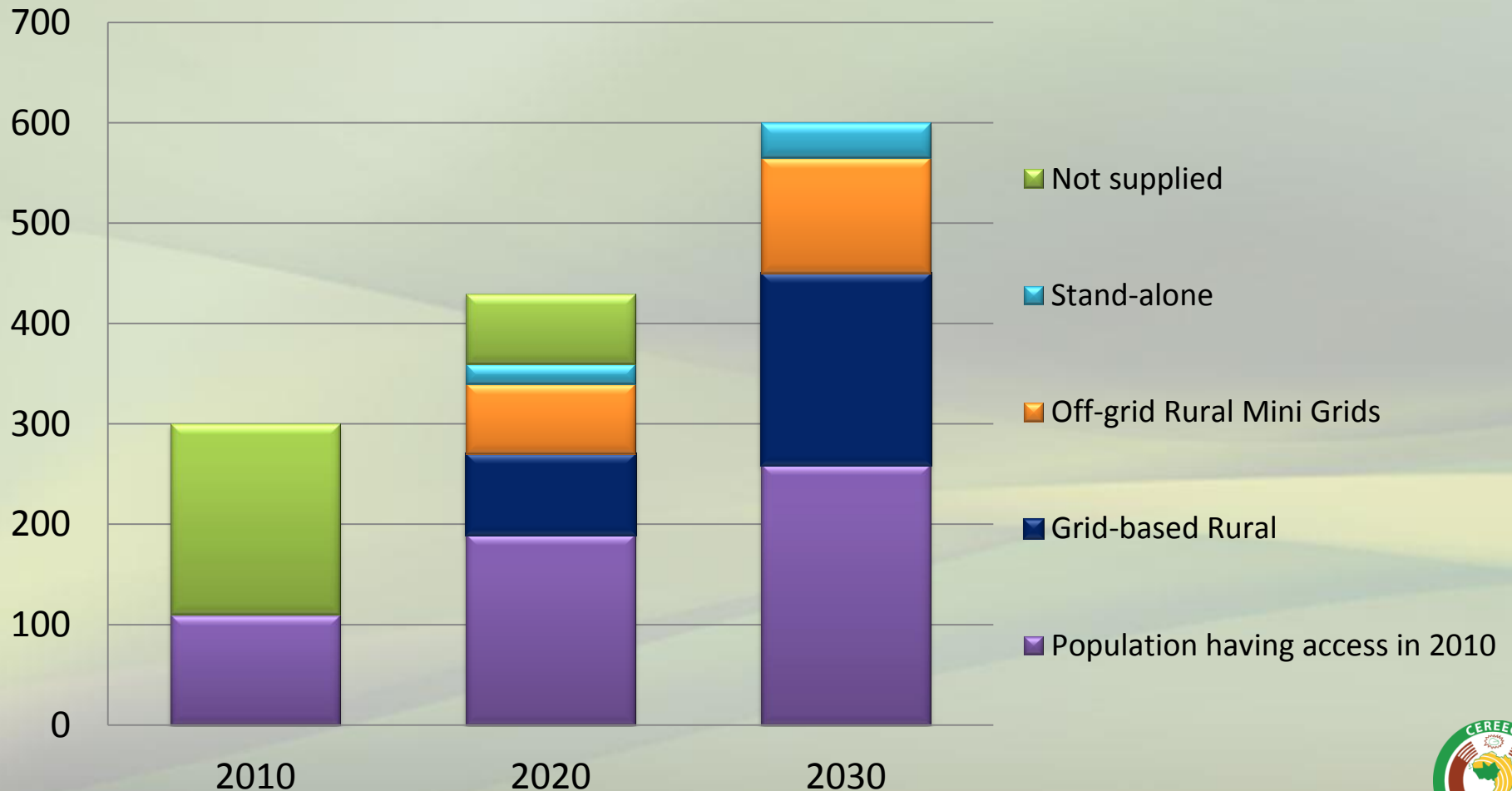


ECOWAS RE POLICY TARGETS BY 2020/2030

Rural RE Electricity Targets	2010	2020	2030
Share of rural population supplied by mini-grids and stand-alone systems in %	?	22%	25%
Mini-Grids to be installed		60,000 3,600 MW	128,000 7,680 MW
Stand-alone systems		210,000	262,000

ECOWAS RE POLICY TARGETS BY 2020/2030

Population in mio inhbts



ECOWAS RE POLICY TARGETS BY 2020/2030

Least-cost option	2010	2020	2030
Biofuels (1st generation)			
Ethanol as share of Gasoline consumption		5%	15%
Biodiesel as share of Diesel and Fuel-Oil consumption		5%	10%
Improved cook-stoves – in % of population	11%	100%	100%
Efficient charcoal production share-%		60%	100%
Use of modern fuel alternatives for cooking (e.g. LPG) - % of population		36%	41%
Solar water heater technologies for sanitary hot water and preheating of industrial process hot water:			
<ul style="list-style-type: none"> ▪ Residential sector (new detached house price higher than €75,000) ▪ District health centres, maternities, school kitchen and boarding schools ▪ Agro-food industries (preheating of process water) ▪ Hotels for hot sanitary water 		At least 1 system installed	At least 1 system installed
		25%	50%
		10%	25%
		10%	25%

Synergies with the ECOWAS EE policy

- **by 2013, create the institutional basis for five priority regional initiatives, with the following concrete objectives:**
 - lighting: phase out inefficient incandescent bulbs by 2020;
 - electricity distribution: reduce electricity distribution losses from the current level of 15 - 40% to under 10% by 2020;
 - cooking: achieve universal access to safe, clean, affordable, efficient and sustainable cooking for the entire population of ECOWAS, by 2030;
 - standards and labels: establish an ECOWAS Technical Committee for Energy Efficiency Standards and Labelling, and adopt initial region-wide standards and labels for major energy equipment by end 2014;
 - by 2015, begin implementation in each ECOWAS country at least one of the priority initiatives;
 - by 2016, implement measures that free 2 000 MW of power generation capacity: the equivalent of creating forty virtual EE power plants, with a capacity of 50MW each, available to power development, serving new users and new needs;

Implementing the EREP

- **The EREP includes a detailed action plan** of national and regional activities;
- **Action 2 of the EREP:** Each Member State will develop National Renewable Energy Action Plans (NREAPs) and develop/revisit their National Renewable Energy Policies (NREPs);
- NREAPs to be developed by the end of 2014;
- Similar process to development, implementation and monitoring of the EU Directive 2009/28/EC on RE.
- **National Renewable Energy Action Plans (NREAPs) include:**
 - Baseline of RE penetration and measures in 2010
 - Setting of national RE targets by 2020 and 2030 (scope: electricity, heating, cooling, rural urban) which aggregate to the regional targets
 - Measures and actions to be implemented on national levels to reach the RE targets



EREP Country Modelling

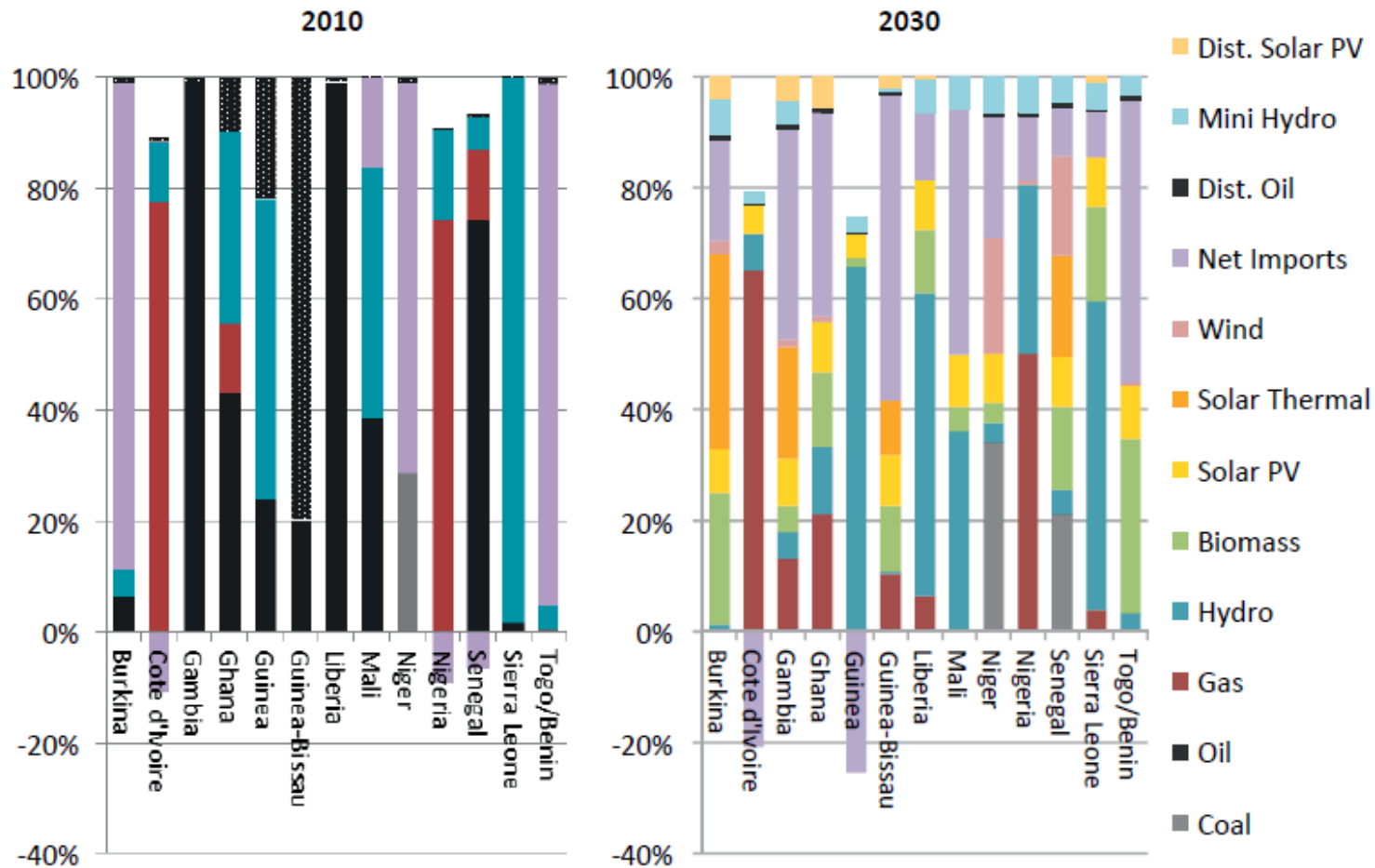


Figure 13. Electricity Production Shares by Country in 2010 and 2030 under the Renewable Scenario

Conclusion

- Expansion of power generation from renewable resources offers the opportunity to complement other important conventional sources of power production (e.g. large hydro and natural gas) and also to complement WAPP's regional power trade scenario.
- The magnitude of thermal or hydro production (base load) is sufficient to balance possible variations through RE production (e.g. wind, solar).
- Natural gas can play a critical role in a successful regional energy integration regime, given its relative competitiveness and availability in the region.
- Flared gas should be utilised and oil companies provided incentives to invest in gas gathering infrastructure that feeds power plants and the West Africa Gas Pipeline, as well as for powering mini-grids in oil producing areas.

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Thank you! Merci! Muito Obrigado!

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