

# Regional RE, EE and Energy Access Monitoring & Reporting Framework

## **Data Availability and Best Practices for RE/EE Data Collection**

Abidjan, 21 November 2017

# Content

1. Background Concept
2. Purpose / Reasons
3. Data and Information
4. Consolidation
5. Output, and Uses of Output



# Background

**Regional Targets**

**Country Targets  
Country Action Plans  
Country Policies**



**Do they all aggregate to the Regional targets?**



**7.6 GW**  
Small Hydro  
Power by 2030



**100% of people**  
will have access  
to Improved  
Cookstoves



Decentralized  
RE will serve  
**25% of Rural  
Population**



**41% of people**  
will use  
Modern Cooking  
Alternatives



Free-up  
**2,000 MW**  
of power  
generation by  
2020



Phase-out  
incandescent  
lamps by 2020



Reduce  
electricity  
distribution  
losses to  
**10%** by 2030



# Background



**7.6 GW**  
Small Hydro  
Power by 2030



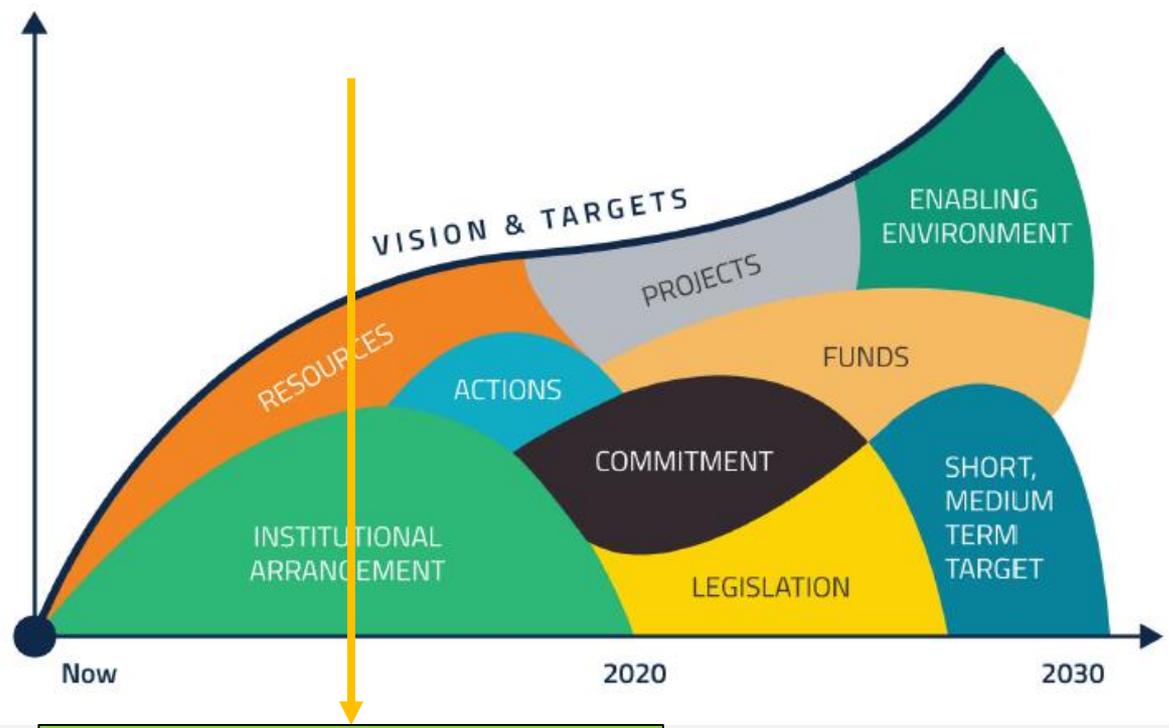
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**Yearly progress assessment**

**ECREEE is doing the monitoring logistics**



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**2,000 MW**  
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Phase-out  
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# Background

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- A first effort to consolidate the Action plans of all countries has been made, in order to assess the level of convergence of the Action Agendas, the NREAPs and the NREEAPs.
- At first view, aggregation of targets shows convergence with regional targets, but has revealed several issues
  - *Information, if available, does not always correspond to the same point in time or it is provided in different manners;*
  - *Even for “easy” information, such as existing generation capacity (Conventional or Renewable), information is not always available, e.g.*
    - *Installed vs available capacity*
    - *Ongoing projects vs commissioned*
  - *Cookstoves: It is not clear whether they refer to efficient stoves or improved cooking solutions*
  - *Population: which year does it refer?*

# Purpose of the monitoring framework

- Provide same information corresponding to the same point in time,
- In an aligned and uniform manner,
- Using similar sources or information, or
- Similar assumptions, **when information is processed**



In order to

- Provide a **real**, **harmonized** and **updated** snapshot of the regional status so that ECREEE can aggregate national data and establish where the region stands with regard to the regional targets.

# Areas of Reporting Interest

## 1. Access to Energy



## 2. Renewable Energy



## 3. Energy Efficiency



## 4. + General Information



# Areas of Reporting Interest

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## ■ General Information

- Number of inhabitants
- Total number of households or Average number of persons per households
- Total grid-connected electricity generation capacity in MW
- Total electricity generation in MWh

Such Information allows **establishment of baselines** but also allows **updates** and **processing**, as well as assessment of progress made

# Areas of Reporting Interest

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## ■ Energy Access

- Electrification
- Cooking energy

## ■ Renewable Energy

- Grid-connected RE
- Off-grid RE
- Solar Water Heaters
- Biofuels

## ■ Energy Efficiency

- Efficient lighting
- Efficient distribution of electricity
- EE in buildings
- EE in the industry
- Energy-efficient electrical appliances

# 1 / 1 General Information

Indicator	Sources of Information
<ul style="list-style-type: none"><li>• Number of inhabitants</li><li>• Total number of households or Average number of persons per household</li></ul>	Statistical Services of the countries
Notes	Issues to consider
<ul style="list-style-type: none"><li>• This information is needed for calculations required for establishing a base and aggregating data from all ECOWAS countries, so that the status of achievement of the regional targets can be established.</li><li>• Split should be given between <b>Urban</b> and <b>Rural</b> population</li></ul>	

# 1 / 1 General Information

## Population

### Benin

- Population and housing censuses have been carried out in 1978, 1992, 2002 and **2013**. Final were published in 2015.

### Cote d'ivoire

- Four general censuses of population and housing (French: Recensement Général de la Population et de l'Habitat (RGPH)) have been carried out in, the latest ones being in 1998 and **2014**

### Liberia

- 2008** census (<https://www.lisgis.net/>)

### Mali

- Recensement Général de la Population et l'Habitat (RGPH) **2009** (<http://www.instat-mali.org/>)

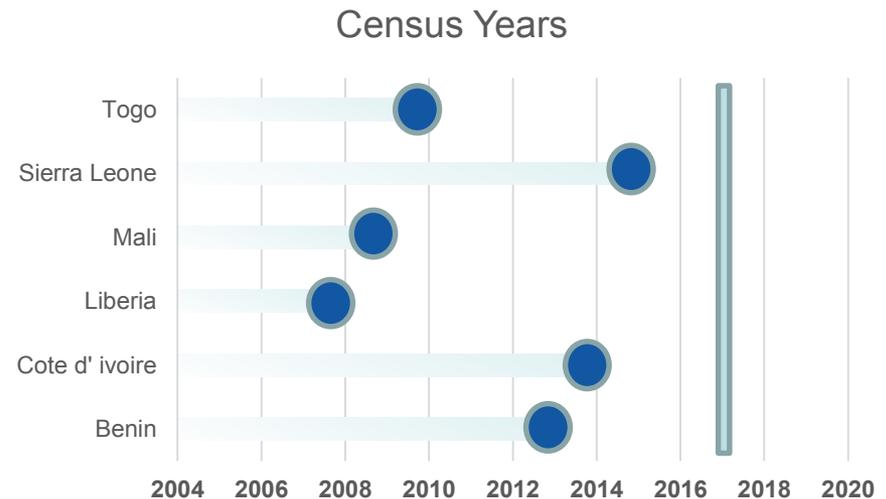
### Sierra Leone

- 1985, 2005, **2015** (<https://www.statistics.sl/>)

### Togo

- General population and housing censuses were carried out in 1960, 1970, 1981 and **2010**

## Sources of Information



Provide Information for same year (2017).  
Statistical services usually provide updates  
on yearly basis

# 2 / 1 Access to Energy

## Indicator

- Total **grid-connected** electricity generation capacity in MW
- Total **grid-connected** electricity generation in MWh

## Sources of Information

- Utility
- Regulator
- Energy Commission

Source: Burkina Faso

### CHIFFRES CLES 2010-2011

## Notes

- This information is needed to do calculations required for establishing e.g. the share of RE in the electricity mix and aggregating data from all ECOWAS countries, so that the status of achievement of the regional targets can be established.
- The figure for the electricity generation should only include generation by power plants that are located **within the national territory**.

DESIGNATION	2 010	2 011
<b>I - PUISSANCE NOMINALE INSTALLEE (kVA)</b>		
· Thermique	205 484	206 318
· Hydraulique	35 900	35 900
· Production Privée (thermique)		68 434
* APR KOSSODO		34 778
*GPS OUAGA 2000		33 656
<b>II - ENERGIE PRODUITE TOTALE (kWh) dont</b>	<b>565 229 035</b>	<b>530 271 625</b>
· Production énergie thermique	447 690 787	359 884 774
· Production énergie hydroélectrique	117 538 248	81 949 439
· Production Privée (thermique)		88 437 412
* APR KOSSODO		36 088 215
*GPS OUAGA 2000		52 349 197
<b>III - ENERGIE IMPORTEE (kWh)</b>	<b>384 506 687</b>	<b>495 211 027</b>
· Importation de la Côte d'Ivoire	339 459 000	449 474 000
· Importation du Ghana	44 028 240	44 367 024
· Importation du Togo	1 019 447	1 370 003
<b>ENERGIE TOTALE PRODUITE ET IMPORTEE ( II+III)</b>	<b>949 735 722</b>	<b>1 025 482 652</b>

# 2 / 1 Access to Energy

Issues to consider	Measures
<ul style="list-style-type: none"><li>• Installed vs available / operational capacity</li><li>• Ongoing vs commissioned projects</li><li>• Produced vs billed Electricity</li><li>• Imports / Exports</li><li>• Imports / Export must be given in terms of<ul style="list-style-type: none"><li>• Capacity of Interconnection</li><li>• Energy Imported / Exported</li></ul></li><li>• Both importing and exporting countries should disclose what information is included, so that ECREEE can make sure there is no double counting</li></ul>	<ul style="list-style-type: none"><li>• Known Initiatives for Generation capacity under Development</li><li>• Projects in-construction but not yet commissioned (these should be mentioned, but not counted in the generation capacity)</li></ul>

**Achats d'énergie**

En plus de l'énergie produite par ses propres centrales, Senelec a acheté de l'énergie électrique chez les partenaires suivants :

- GTI, Mauritanie, Manantali, Félou et Kounoune pour la production indépendante ;
- ICS pour l'auto- production ;
- Aggreko et APR pour la location de groupes.

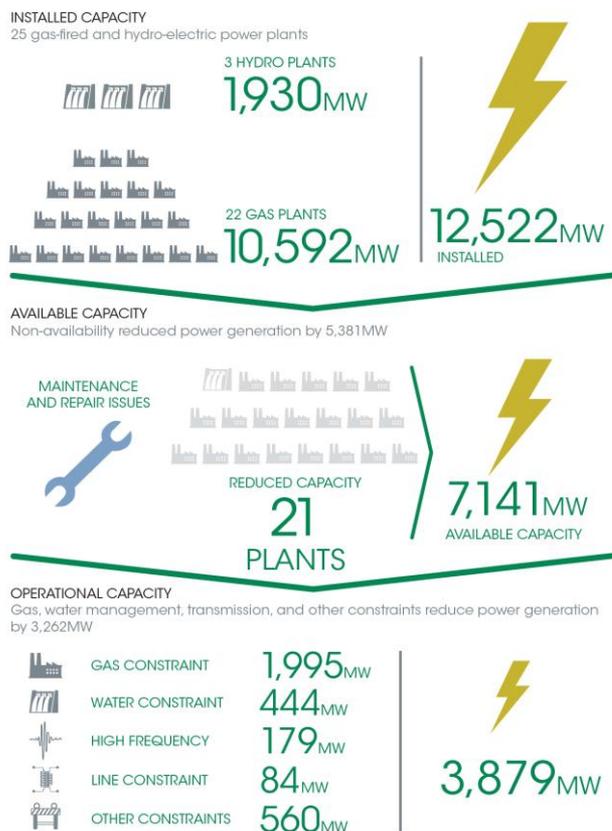
L'énergie injectée sur les réseaux de Senelec par les producteurs privés a augmenté de 113,71 GWh en passant de 1 085,91 GWh en 2014 à 1 199,62 GWh en 2015 soit une hausse de 10,47 %.

Source: SENELEC

# 2 / 1 Access to Energy

## Nigeria: Installed vs operational

### Nigeria's power generation efficiency<sup>1</sup>



<sup>1</sup> Available and operational capacity data points are daily averages from January to 15 August 2015

Source: Nigeria Power Baseline Report

## Ghana: Exports / Imports

### Ghana, Energy Commission, 2015

Table 3.3: Electricity Import, Export and Net Import (GWh)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Import	815	629	435	275	198	106	81	128	27	51
Export	639	754	246	538	752	1,036	691	667	530	522
Net Import	176	-125	189	-263	-554	-930	-610	-539	-503	-471

Source: GRIDCo

NB: Negative net import means net export

- Include example(s) on electricity imports, e.g.
- Ghana – Burkina Faso (BF importing from Ghana, but source of generation/mix not known)

## Niger: Imports

[http://www.energycharter.org/fileadmin/DocumentsMedia/Occasional/Niger\\_Energy\\_Sector.pdf](http://www.energycharter.org/fileadmin/DocumentsMedia/Occasional/Niger_Energy_Sector.pdf)

Table 4: Interconnection Lines

Interconnection line	Voltage (kV)	Capacity (MW)
Birni N'Kebbi-Niamey	132	120
Katsina-Gazaoua	132	60
Damasak-Diffa	33	5
Kamba-Gaya	33	5

# 2 / 1 Access to Energy

## Interconnections



# 2 / 1 Access to Energy

## Interconnections, the picture to draw

### WEST AFRICAN POWER POOL:

*Planning and Prospects for Renewable Energy, IRENA 2013*

✦ Merged interconnections

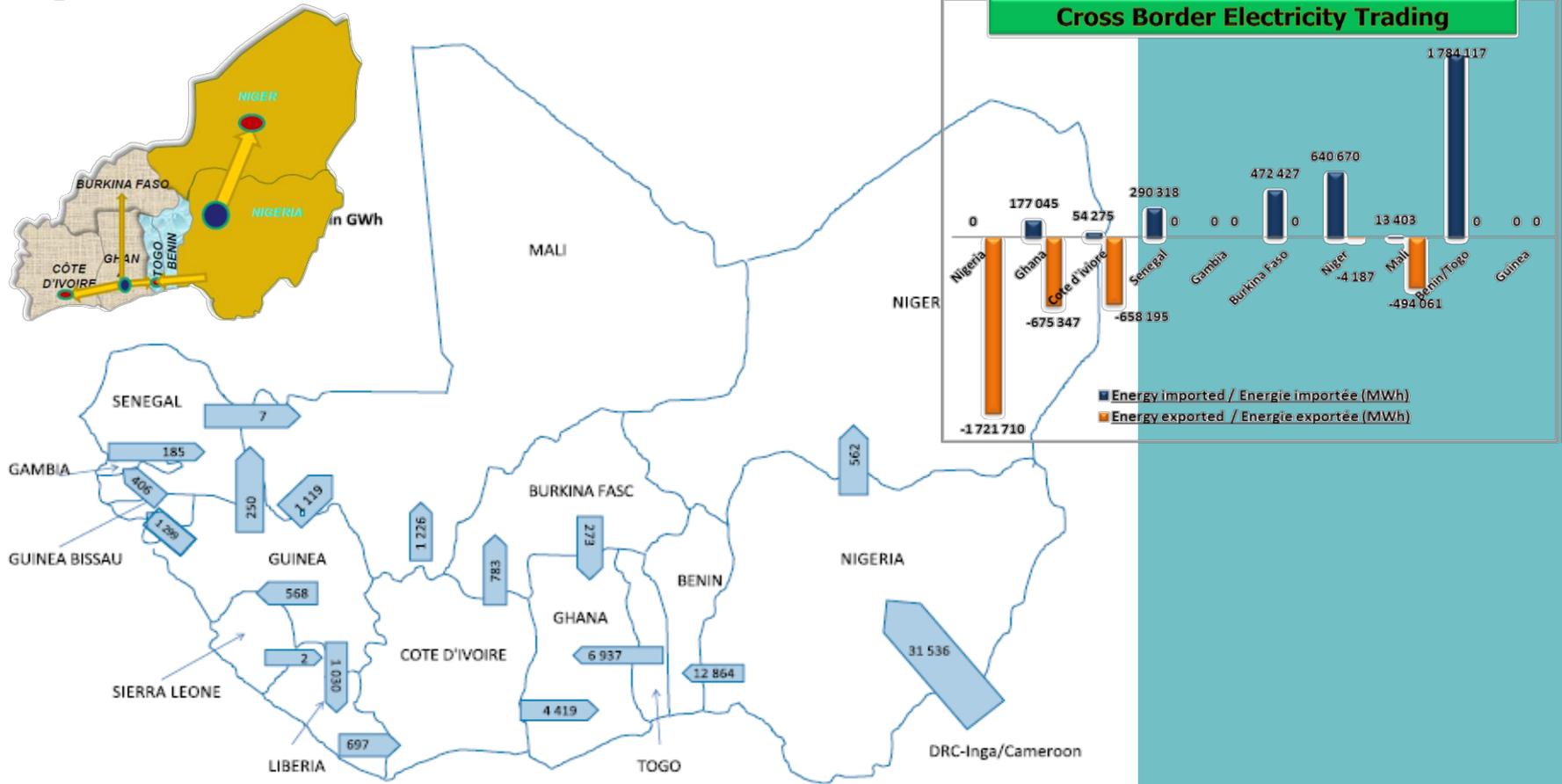


Figure 14. Regional Trade in 2030 in the Renewable Promotion Scenario

# 2 / 2 Access to Energy

## Indicator

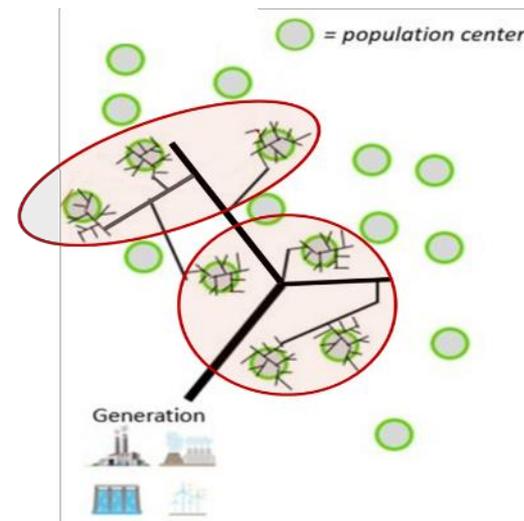
- Share of households **connected** to an electricity grid in %

## Notes

- The share of households is calculated by dividing the number of domestic electricity connections (connections of to the national grid and to mini-grids combined) by the total number of households living in the country in a certain year that existed in the same year.
- Most recent data to be used for the share of households connected to the national grid and to mini-grids. If available, breakdown into **national grid** and **mini-grids** as well as into **urban** and **rural**.

## Sources of Information

- Utilities (**# customers/connections**)
- Rural Electrification Agencies (for mini-grids)
- Occasionally census data



### Definition in SE4All Tracking Framework Report:

Based on data from omnibus surveys. Access to electricity is defined as a binary metric:

**DHS:** The household has an electricity connection

**LSMS:** The household uses electricity as primary source of lighting (LSMS)

### Data constraints imply that:

- Not reflective of usability attributes of supply
- Does not capture off-grid solutions
- Ambiguity about illegal and secondary connections

# 2 / 2 Access to Energy

## Issues to consider

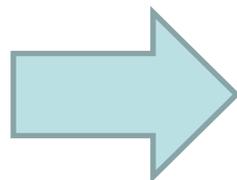
Despite being nationally representative, the survey estimates can differ based on their natural **sampling error** and their **methodology**.

Some surveys measure

- whether a household has access to electricity for any purpose, while others
- ask whether electricity is the main source of lighting.

The GED (Global Electrification Database) includes grid connections as well as off-grid sources such as generators and solar home systems, but sources of electricity are not always specified. So data may or may not include off-grid solutions, depending on the conventions in each country.

**CONNECTIONS must be reported**



## Measures

### Quantitative

- How many additional connections (main grid and/or mini-grids) have been achieved

### Qualitative

- New electrification strategy/plan (if applicable) – this will provide assessment of the potential and the trend
- Changes to institutional set-up (e.g. establishment of REA)
- Awarding of rural electrification concession (if applicable).

X-NOMBRE D'ABONNES	362 165	401 476	10,85
. Basse Tension (BT) compteurs classiques	308 536	339 324	9,98
. Basse Tension (BT) compteur à pré-paiement	52 556	61 032	16,13
. Haute Tension (HT)	1 073	1 120	4,38

Burkina Faso CHIFFRES CLES 2010-2011

# 2 / 3 Access to –clean- Energy

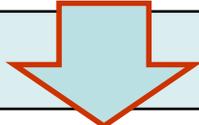
Indicator	Sources of Information
<ul style="list-style-type: none"> <li>Share of households using <b>improved cookstoves</b> in %</li> </ul>	<ul style="list-style-type: none"> <li>National agency working on cooking energy (e.g. AMADER)</li> <li>Surveys conducted by donors (e.g. based on SE4ALL Global Tracking Framework)</li> <li>Global Alliance for Clean Cookstoves, national clean cooking alliances</li> <li>New strategy or action plan to improve access to ICS, if applicable</li> <li>Major (new) stove dissemination projects / programmes, if applicable</li> <li>Standards and labels, if applicable</li> <li>Censuses ?</li> </ul>
<p><b>Notes</b></p>	
<ul style="list-style-type: none"> <li><b>“Improved cookstoves”</b> defined as fuelwood or charcoal stoves with a minimum efficiency of <b>35%</b>.</li> </ul>	<ul style="list-style-type: none"> <li><b>Available Information do not always provide off-the-shelf data</b></li> </ul>

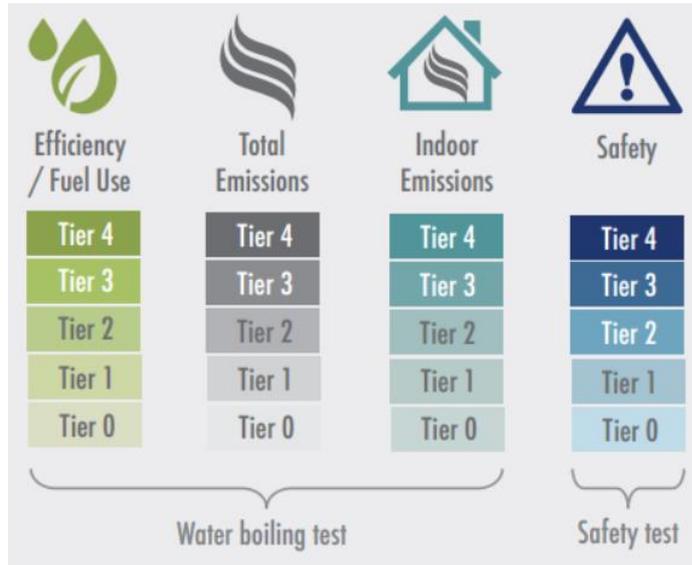
Table 43: Households by principal source of fuel for cooking by region, district and area of residence

Principal source of fuel for cooking											
Region / District / Area of Residence	Total	Electricity	Gas	Kerosene	Charcoal	Wood	Crop Residue	Saw Dust	Solar	Animal Waste	Other
Total Country											
Number	1 265 468	6 445	10 546	8 735	406 875	818 185	1 627	1 604	1 594	592	9 265
Percent	100.0	0.5	0.8	0.7	32.2	64.7	0.1	0.1	0.1	0.0	0.7

Sierra Leone Census

# 2 / 3 Access to –clean- Energy

<http://cleancookstoves.org/about/news/01-01-1990-iwa-tiers-of-performance.html>



Efficiency/fuel use Sub-tiers		
	High power thermal efficiency (%)	Low power specific consumption (MJ/min/L)
<b>Tier 0</b>	<15	>0.050
<b>Tier 1</b>	≥15	≤0.050
<b>Tier 2</b>	≥25	≤0.039
<b>Tier 3</b>	≥35	≤0.028
<b>Tier 4</b>	≥45	≤0.017

## 2 / 3 Access to –clean- Energy

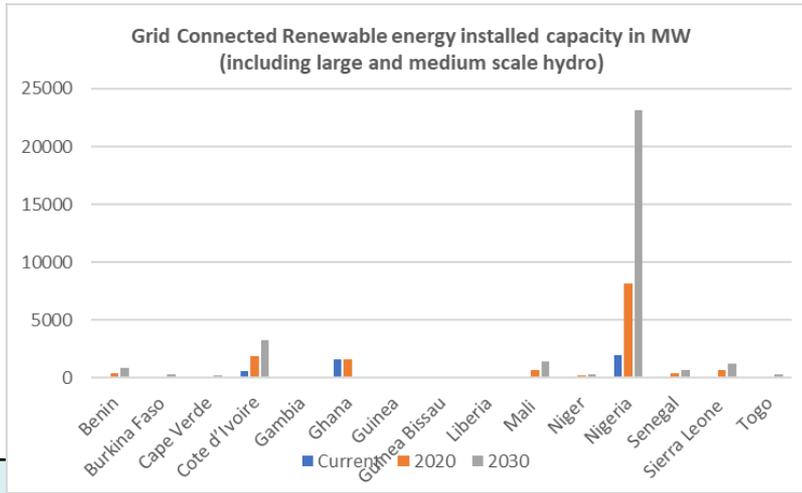
Indicator	Sources of Information
<ul style="list-style-type: none"> <li>Share of households using modern alternatives for cooking (e.g. LPG, biogas, solar cookers, kerosene, ethanol gel fuel, etc.) in %”</li> </ul>	<ul style="list-style-type: none"> <li>MoE department in charge of fossil fuels,</li> <li>Agency in charge of petroleum projects (e.g. ONAP in Mali)</li> <li>Global LPG Partnership (GLPGP)</li> <li>Producers</li> <li>Importers</li> </ul>
Issues to consider	Measures
<p>If there is no data, results should be included of: stove dissemination Programmes and / or sales figures of major stoves producers.</p> <p>If there is no data on the share, it would be good to know <b>how much LPG was imported/sold</b> (and how much of it was sold <b>for household consumption</b>, if available) so that ECREEE can estimate the number of households using it.</p>	<ul style="list-style-type: none"> <li>Any <b>new legislation, strategy or plan</b> <ul style="list-style-type: none"> <li>for <b>improving access to modern cooking energy</b>, including improved cookstoves, or</li> <li>in case there have been any major developments regarding the <b>institutional set-up</b>.</li> </ul> </li> <li>Any (new) initiatives to promote access to LPG or other alternatives to biomass</li> </ul>

# 3 / 1 Renewable Energy

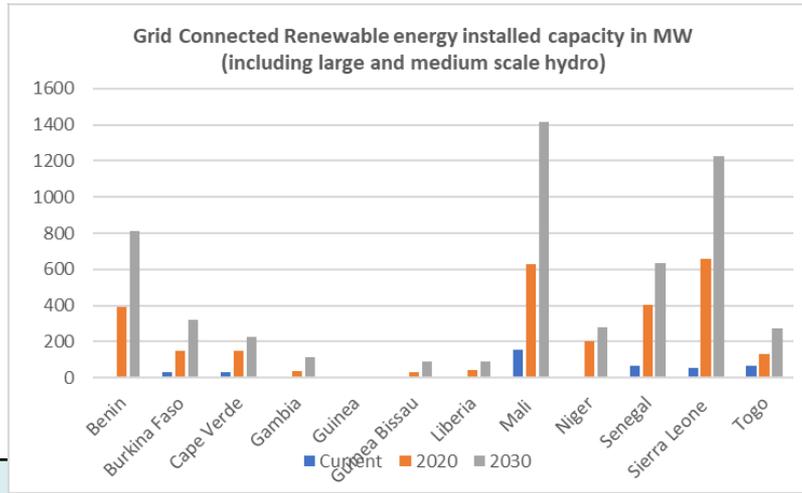
Indicator	Sources of Information
<ul style="list-style-type: none"><li>• <b>Grid Connected</b> Renewable energy installed capacity in MW (<b>excluding</b> large and medium scale hydro)</li><li>• <b>Grid Connected</b> Renewable energy generation in MWh (<b>excluding</b> large and medium scale hydro)</li><li>• Renewable energy installed capacity in MW (<b>including</b> large and medium scale hydro)</li><li>• Renewable energy generation in MWh (<b>including</b> large and medium hydro)</li></ul>	<ul style="list-style-type: none"><li>• Utilities,</li><li>• Regulators,</li><li>• RE agency</li><li>• IPP's</li></ul>
Notes	
<ul style="list-style-type: none"><li>• If the targets in the <b>action plans</b> and the data in the report include power plants that are cross-border or outside the national territory, please add an explanation how much of this capacity or generation is taken into consideration. This will allow ECREEE to avoid double counting when the information from the 15 countries is consolidated for the region.</li><li>• “Medium and large hydro” is defined as hydropower plants with a capacity exceeding <b>30MW</b>.</li></ul>	

# 3 / 1 Renewable Energy

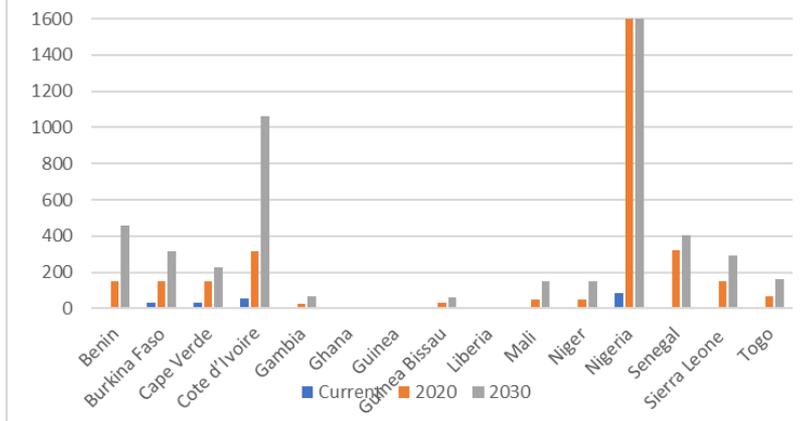
## All countries



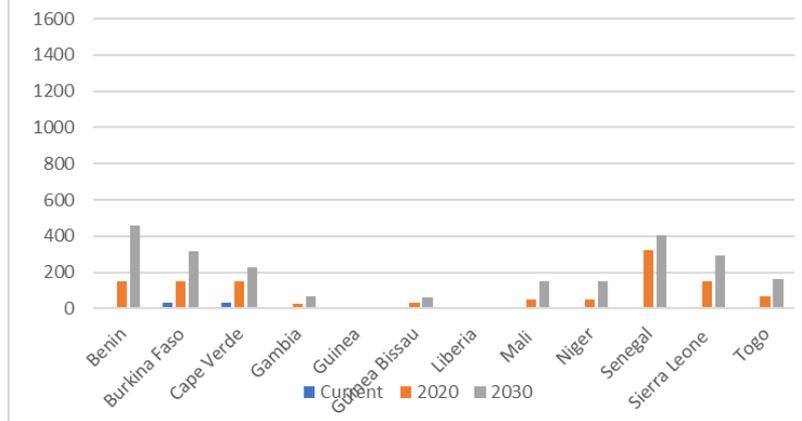
## Excluding CI, Ghana, Nigeria



## Grid Connected Renewable energy installed capacity in MW (excluding large and medium scale hydro)



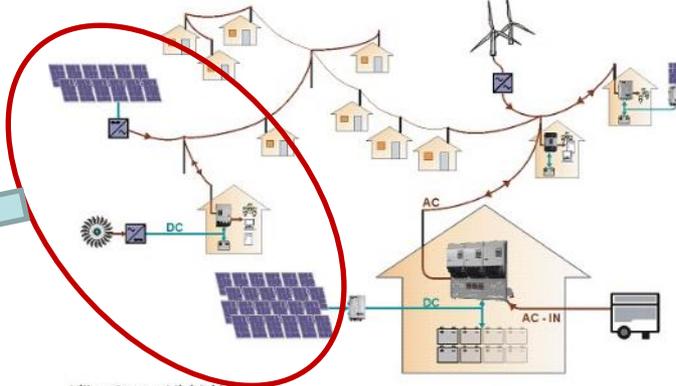
## Grid Connected Renewable energy installed capacity in MW (excluding large and medium scale hydro)



# 3 / 1 Access to –clean- Energy

Issues to consider	Measures																				
<ul style="list-style-type: none"> <li>Imports, e.g. Senegal – Mali (Senegal importing from Mali (Manantali dam), when source of generation known)</li> <li>Around 80 percent of the electricity consumed in Benin is already imported, with the majority of this coming from Ghana's Akosombo hydroelectric dam.</li> </ul> <div data-bbox="86 714 869 1285"> <p><b>Total Energy Imported and Exported</b></p> <table border="1"> <thead> <tr> <th>Country</th> <th>Energy Imported (TWh)</th> <th>Energy Exported (TWh)</th> </tr> </thead> <tbody> <tr> <td>Nigeria</td> <td>~100</td> <td>~-2500</td> </tr> <tr> <td>Côte d'Ivoire</td> <td>~100</td> <td>~-1000</td> </tr> <tr> <td>Cambodia</td> <td>~500</td> <td>~0</td> </tr> <tr> <td>Niger</td> <td>~1000</td> <td>~0</td> </tr> <tr> <td>Benin/Togo</td> <td>~2000</td> <td>~0</td> </tr> <tr> <td>Liberia</td> <td>~0</td> <td>~0</td> </tr> </tbody> </table> <p>Make it RE-specific, if possible</p> </div>	Country	Energy Imported (TWh)	Energy Exported (TWh)	Nigeria	~100	~-2500	Côte d'Ivoire	~100	~-1000	Cambodia	~500	~0	Niger	~1000	~0	Benin/Togo	~2000	~0	Liberia	~0	~0
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Niger	~1000	~0																			
Benin/Togo	~2000	~0																			
Liberia	~0	~0																			

# 3 / 2 Renewable Energy

Indicator	Sources of Information
<ul style="list-style-type: none"><li>• Share of households served by renewable energy / hybrid mini-grids (%)</li><li>• Share of households served by standalone renewable energy systems (%)</li><li>• Number of renewable energy / hybrid mini-grids</li></ul>	<ul style="list-style-type: none"><li>• R(R)EA,</li><li>• Utility (some mini-grids are owned and operated by utility),</li><li>• RE association (for SHS)</li><li>• Concessionaires</li></ul>
Notes / Definitions	
<p>A <b>RE or hybrid mini-grid</b> is defined as a mini-grid where <b>at least 10%</b> of the total installed capacity is <b>RE-based</b>.</p>	 <p>Village Power - Mini Grid</p>

# 3 / 2 Renewable Energy

## Notes / Definitions

**Stand-alone renewable energy systems** are defined as off-grid RE systems for lighting and powering electric appliances. These should provide at the minimum electricity services such as task lighting and phone charging (tier 1 of the SE4ALL multi-tier framework for access to electricity). This excludes solar lamps that are for lighting only.



Off grid systems supports many levels of energy need

Africa progress panel	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Energy service		Task lightning, phone Charge	General lightning, TV and fan	Tier 2 and medium powered appliances	Tier 3 and high powered appliances	Tier 4 and very high powered appliances
Capacity		< 12 Wh	< 200 Wh	< 1 kWh	< 3,4 kWh	< 8,3 kWh
Solar product	Solar lantern	Solar lantern + charger	Small SHS	Large SHS	Larger SHS	Larger SHS
Mini Grid			Mini grid	Mini grid	Mini grid	Mini grid

This programme is funded by the European Union and the German Government

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**Source:** Nigerian Energy Support Programme (NESP) Implemented by MINI-GRID, THE MISSING MIDDLE, AN OPPORTUNITY! Abidjan, March 2017  
**SHS:** Solar Home System

# 3 / 2 Access to –clean- Energy

## Issues to consider

- If there is no data on the share,
- number of mini-grids incl. number of connections and
  - number of installed stand-alone systems should be provided



## Measures

In case events such as:

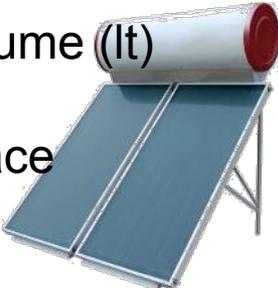
- Government has developed or adopted any **new legislation, strategy** or **plan** for improving access to off-grid electricity, or
- there have been any **major developments** regarding the **institutional set-up**,

These should be reported.

This would also include the awarding of concessions for providing access to off-grid systems.

- e.g. mini-grid tenders, projects/programmes for SHS dissemination, incentives for investments in SHS

# 3 / 3 Renewable Energy

Indicator	Sources of Information
<ul style="list-style-type: none"> <li>• Number of Solar Water Heaters installed in the <b>residential sector</b></li> <li>• Number of Solar Water Heaters installed in <b>public institutions</b></li> <li>• Number of Solar Water Heaters installed in <b>hotels, SMEs and industries</b></li> </ul>	<ul style="list-style-type: none"> <li>• RE agency</li> <li>• ECREEE market reports (like Cabo Verde, Senegal, Burkina Faso, Ghana, Nigeria),</li> <li>• RE association</li> <li>• Tourism association/Association of hotels</li> <li>• Industrial Association</li> </ul>
Notes	Measures
<ul style="list-style-type: none"> <li>• In each case, please also indicate the <b>solar collector surface</b> (measured in m<sup>2</sup>) as well as the water heating capacity (measured in litres), if available.</li> </ul> <div style="display: flex; align-items: center; margin-top: 20px;"> <div style="margin-right: 10px;">Tank Volume ((lt)</div>  </div> <div style="margin-top: 10px;">Surface</div>	<ul style="list-style-type: none"> <li>• Projects/programmes to promote SWH and/or install SWH on public buildings</li> <li>• New incentives for investments in SWH</li> </ul>

# 3 / 4 Renewable Energy

Indicator	Sources of Information
<ul style="list-style-type: none"> <li>Bioethanol production <b>for energy purposes</b> (in litres)</li> <li>Biodiesel production in litres</li> </ul>	<ul style="list-style-type: none"> <li>RE agency,</li> <li>Biofuel producers</li> <li>Projects or Programmes in the countries</li> <li>Donors supporting biofuels production and use</li> </ul>

Issues to consider	Measures
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Programmes for the production of Biofuels, **such as:**

**Burkina Faso:** 70,000 trees of jatropha oil seeds were planted in 2009

**Ghana:** In 2010, Ghana introduced a bioenergy policy, which was created to substitute the country's petroleum oil with 10% biofuels by 2020 and 20% by 2030.

**Mali:** One of the projects includes a local non-governmental organization (NGO) -Mali-Folkecenter Nyetaa- offering assistance to local farmers to grow jatropha oil seeds. Nearby communities are provided with electricity generated from power plants that uses jatropha oil seeds.

Source: <http://www.mdpi.com/2225-1154/4/2/33/pdf>

Also take into consideration liquid cooking fuels such as ethanol gelfuel (no briquettes)



[http://www.folkecenter.net/gb/mali/el\\_ppo/](http://www.folkecenter.net/gb/mali/el_ppo/)

# 3 / 4 Renewable Energy

## Indicator

- Bioethanol production **for energy purposes** (in litres)
- Biodiesel production in litres

## Sources of Information

Table 1. Biofuel production from agricultural waste in Sub-Saharan African countries [10].

Country	Feedstock	Biodiesel Yield (ML)	Bioethanol (ML)
Benin	Cassava	-	20
Burkina Faso	Sugarcane	-	20
Ivory Coast	Molasses	-	20
Ghana	Jatropha	50	-
Guinea	Cashew	-	10
Mali	Molasses	-	20
Malawi	Molasses	-	146
Kenya	Molasses	-	413
Ethiopia	Molasses	-	80
Niger	Jatropha	10	-
Nigeria	Sugarcane	-	70
Sudan	Molasses	-	408
Swaziland	Molasses	-	480
Senegal	Molasses	-	15
Tanzania	Molasses	-	254
Togo	Jatropha	10	-
Uganda	Molasses	-	119

ML: megalitres; -: data not available.

American Petroleum Institute. Renewable Fuel Standard. Available online: <http://www.epa.gov/otaq/renewablefuels/420f10007.pdf>

# 4 / 1 Energy Efficiency

Indicator	Sources of Information																
<ul style="list-style-type: none"> <li>• Penetration rate of efficient <b>on-grid</b> lighting in %.</li> <li>• Penetration rate of efficient <b>public lighting</b> in %</li> </ul> <table border="1"> <caption>Current share of Efficient lights</caption> <thead> <tr> <th>Country</th> <th>Current Share (%)</th> </tr> </thead> <tbody> <tr> <td>Benin</td> <td>15%</td> </tr> <tr> <td>Burkina</td> <td>10%</td> </tr> <tr> <td>Mali</td> <td>4%</td> </tr> <tr> <td>Niger</td> <td>15%</td> </tr> <tr> <td>Senegal</td> <td>56%</td> </tr> <tr> <td>Sierra Leone</td> <td>1%</td> </tr> <tr> <td>Togo</td> <td>20%</td> </tr> </tbody> </table>	Country	Current Share (%)	Benin	15%	Burkina	10%	Mali	4%	Niger	15%	Senegal	56%	Sierra Leone	1%	Togo	20%	<ul style="list-style-type: none"> <li>• EE agency,</li> <li>• EE projects,</li> <li>• Owner of street lights (e.g. utility, Municipality)</li> <li>• Results of Programmes for dissemination of EE light bulbs / promotion of energy efficient street lighting,</li> <li>• Information from (Tax / imports authority)</li> </ul>
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Notes	Measures																
<p>On-grid lights is defined as lights connected to the <b>national grid</b> or <b>mini-grids</b>.</p> <p><b>Penetration rate (%)</b> = Number of efficient lights sold or installed / total number of light (efficient + inefficient) sold or installed.</p> <ul style="list-style-type: none"> <li>• Ideally only lights that comply with <b>ECOWAS Minimum Energy Performance Standard (MEPS)</b> (minimum # of lumens/watt),</li> <li>• <b>For simplicity</b> include all CFLs, LED and other types of efficient lights</li> </ul>	<p>Measures such as:</p> <ul style="list-style-type: none"> <li>• <b>Regulations</b> to <b>phase out</b> incandescent bulbs</li> <li>• <b>Programmes</b> for the <b>replacement</b> of inefficient / incandescent lamps</li> <li>• Ban of imports of conventional lamps</li> </ul>																

# 4 / 2 Energy Efficiency

## Indicator

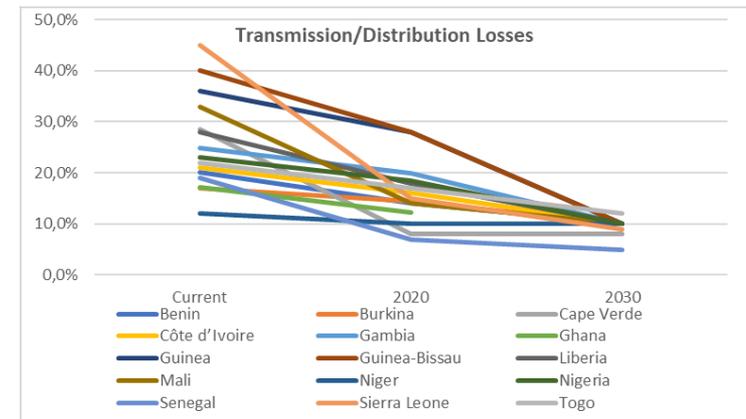
- Commercial losses in the electricity distribution system in %
- Technical losses in the electricity distribution system in %

## Sources of Information

- Electricity Utilities (billed vs distributed electricity)
- Network operators
- EE agency,
- EE projects



## Technical losses ?.....



# 4 / 3 Energy Efficiency

Indicator	Sources of Information
<ul style="list-style-type: none"><li>• Number of energy-efficient buildings</li></ul>	<ul style="list-style-type: none"><li>• EE agency</li><li>• EE projects</li></ul>
Notes	Issues to consider
<ul style="list-style-type: none"><li>• <b>Definition:</b> buildings that are designed and built in a way that minimizes demand for and consumption of energy/electricity for cooling, use of solar thermal for water heating</li><li>• For old and new <b>public buildings</b> with a total useful area over 500 m<sup>2</sup>, at least energy audit conducted</li><li>• If available, breakdown (different types of buildings) can be provided</li></ul>	<p><b>Measures:</b></p> <ul style="list-style-type: none"><li>• Projects</li><li>• Programmes</li><li>• Regulations</li><li>• Incentives</li></ul> <p>to promote EE in buildings.</p>

# 4 / 4 Energy Efficiency

Indicator	Sources of Information
<ul style="list-style-type: none"><li>• Number of Industries that implement Energy Efficiency Measures</li></ul>	<ul style="list-style-type: none"><li>• EE agency,</li><li>• EE projects,</li><li>• Ministry in charge of industry,</li><li>• Certification agencies for ISO certification (such as Bureau Veritas, TUV, Lloyd's, etc.)</li></ul>
Notes	Issues to consider
<p>Definition: Only industries with <b>20 or more employees</b> are considered.</p> <p>Energy efficiency (EE) measures considered include</p> <ul style="list-style-type: none"><li>• Energy audits</li><li>• Replacement of inefficient with efficient lights</li><li>• Replacement of inefficient with efficient cooling systems ones</li><li>• Replacement of inefficient with efficient motors</li><li>• Companies with ISO 50001 certification can be considered energy efficient</li><li>• Companies with ISO 14001 certification can be considered energy efficient, if their reports show that they are implementing EE measures</li></ul>	<p><b>Measures:</b></p> <ul style="list-style-type: none"><li>• Projects</li><li>• Programmes</li><li>• Incentives, including financing</li><li>• Initiatives</li></ul> <p>to promote EE in industry</p>

# 4 / 5 Energy Efficiency

Indicator	Sources of Information
<ul style="list-style-type: none"><li>• Penetration rate of energy-efficient air conditioners</li><li>• Penetration rate of energy-efficient refrigerators</li></ul>	<ul style="list-style-type: none"><li>• EE agency,</li><li>• UEMOA-financed market studies,</li><li>• Studies financed by other projects (e.g. Cabo Verde: UNDP, Nigeria: GIZ)</li><li>• Actions/ Programmes/ Projects undertaken by Donors</li></ul>
Notes	Measures
<ul style="list-style-type: none"><li>• <b>Definition:</b> Appliances that comply with the ECOWAS Minimum Energy Performance Standards (MEPS)</li></ul>	Regulations/standards for EE of ACs and refrigerators, projects/programmes to promote efficient ACs and refrigerators (e.g. Ghana's rebate Programme)

# 5

# Alignment & Consolidation



Information for all countries are, or can become available.

The issue is to have all information available, corresponding to the same point in time, Providing same kind of information

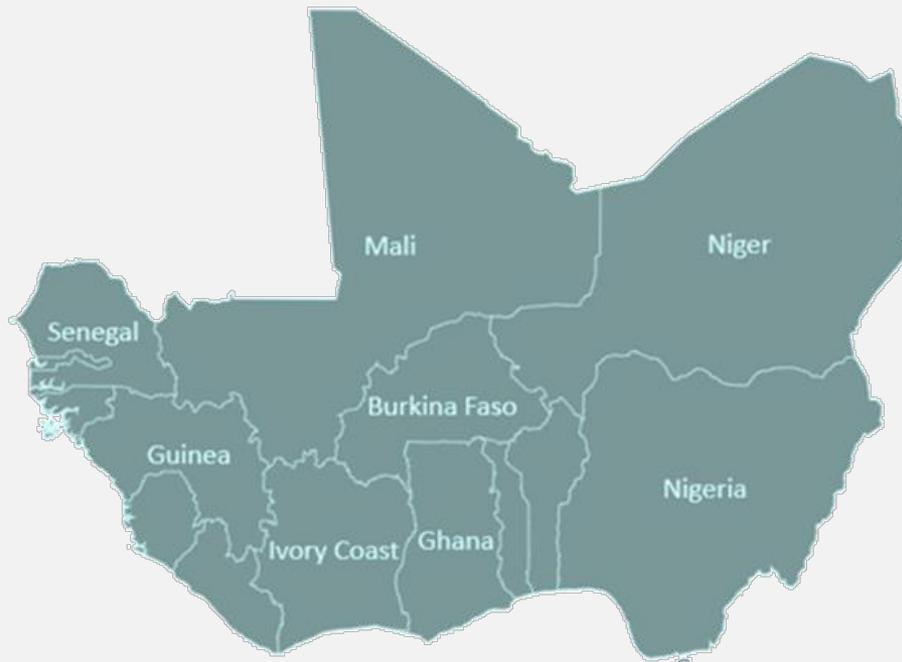
and be as much as possible.....

**ALIGNED**



# 6 Output & Uses of Output

The Monitoring Framework is aimed to be a **live instrument** for following-up progress in the region.



It is aimed to:

- Have a clear and yearly updated picture of the conditions
- Assess progress and
- Assess Effectiveness of Programmes and policies
- Support policy making across the region,
- Allow exchange of efficient and effective practices, or
- Assist in improvement of policies at regional and local level.

# 7 Discussion topics

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- Availability of Information
- Quality of information









### Assembling the data on access to electricity

Various household sources were leveraged to establish a historical series of data on electrification in 212 countries between 1990 and 2010. Data were collected from various sources and nationally representative household surveys (including national censuses). Survey sources included **Demographic and Health Surveys (DHS)** and **Living Standards Measurement Surveys (LSMS)**, Multi-Indicator Cluster Surveys (MICS), the World Health Survey (WHS), other nationally developed and implemented surveys, and data from various government agencies (for example, ministries of energy and utilities)—all captured in the World Bank Global Electrification Database. While utility data are a valuable complement to household survey data, they provide a different (supply side) perspective on access and cannot be expected to yield the same results as demand-side data. In particular, utility data may fail to capture (i) highly decentralized forms of electrification in rural areas and (ii) illegal access to electricity in urban areas.

Surveys such as the DHS and the LSMS/income-expenditure surveys are typically conducted every 3–4 years, whereas most censuses are held every 10 years. Thus, some countries have gaps in available data in any given year. There are 42 countries with no data points; for those countries, the weighted regional average was used as an estimate for access to electricity in each of the data periods. For the 170 countries with between one and three data points, missing data were estimated using a model with region, country, and time variables.

<https://openknowledge.worldbank.org/bitstream/handle/10986/18413/880600BRI0know00Box385214B00PUBLIC0.pdf?sequence=6&isAllowed=y>