DECARBONIZING THE BUDGET

- Key Issues for Enagagement and Advocacy by CSO in the Energy Sector.

- by
- **DEVELOPMENTAL ASSOCIATION FOR RENEWABLE ENERGIES (D.A.R.E.)**

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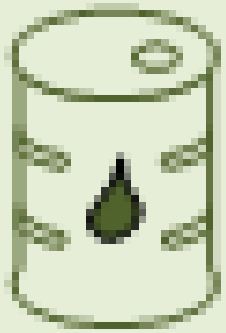
1. The provisions of the Economic Recovery and Growth Plan for the ENERGY sector.

- The Economic Recovery and Growth Plan, ERGP, states categorically that:

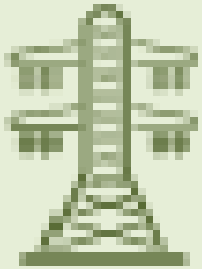
"The Energy sector is fundamental to development across all other sectors of the economy. The ERGP will address issues of energy from the perspective of *electric power* and the *petroleum sector"*.

A. Key Execution Priorities of the ERGP in the Energy Sector.

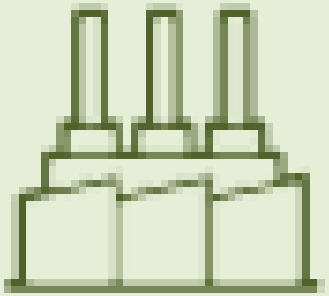
Ensure energy sufficiency in power & petroleum products



Urgently increase oil production



Expand power sector infrastructure



Boost local refining for self-sufficiency

The objectives are as follows:

- **The ERGP aims to optimize the delivery of at least 10 GW of operational capacity by 2020 and**
  - **to improve the energy mix including through *greater use of renewable energy.* S. 15, S. 31 R1**
- **Expand power sector infrastructure: Optimize the delivery of at least 10 GW of operational power capacity by 2020**
  - **to boost economic activity across all sectors and improve the quality of life of the citizenry.**

Competitiveness and business environment.

- **Sign agreements with solar companies so as to add 1.1GW to the national grid.**

Key Execution Priorities p. 29

- **Ensuring energy sufficiency (power and petroleum products) S. 29 R1**

The Strategic Implementation Plan (SIP)

- **Sign agreements with solar companies so as to add 1.1GW to the national grid.**

4.1.1 - Power

- The ERGP acknowledges that:-

"Today, Nigeria has 12.5 GW of installed capacity, but less than one-third is operational (average 3.9 GW in 2015; 3.2 GW in November 2016).

Overall, only about 15 per cent of installed capacity is eventually distributed to end users, resulting in a huge shortage of electricity supply across the country."

Steps to tackle this Issue

“The ERGP will address problems in the power value chain by overcoming governance, funding, legal, regulatory, and pricing constraints across the four main segments in the power value chain (gas supply, generation, transmission and distribution).”

Policy Objectives

- *Improve energy efficiency and diversify the energy mix, including / through greater use of renewable energy*.
- **Facilitate private sector investment in generation, transmission, and distribution**
- **Improve access to electricity to all Nigerians**
- *Increase rural electrification through the use of off-grid renewable solutions*
- **Restore financial viability in the electricity market**
- **Implement a data-driven approach in power sector development planning**
- **Eliminate sabotage of gas and power infrastructure**

STRATEGIES:

- ***Mobilize investments to execute renewable off-grid power solutions to improve energy mix.***
- ***Implement the National Renewable Energy and Efficiency Policy (NREEP).***

APPENDIX – PROGRAMME POWER

- Reach financial close on the 15 solar plants that have recently signed power purchase agreements projects (PPPs).
- Mobilize investments to execute renewable off-grid power solutions to improve energy mix .

5.6 ENVIRONMENTAL SUSTAINABILITY

- **Install 3,000 MW of solar systems over the next 4 years.**
- **Increase the number of households transiting from kerosene to cooking gas (LPG) to 20 per cent by 2020.**
- **Increase the number of households replacing kerosene lanterns with solar lamps by 20 per cent by 2020.**

OBSERVATIONS

- No real commitments given to development of low-carbon economy in the ERGP.
- Renewable Energy is incorporated just to satisfy all righteousness.
- Apart from Solar Energy, no mention is made of or strategy adopted to consider and incorporate other forms of Renwables (e.g. Wind, Biomass, Hydro etc.) in the document.

Observations – Cont'd

- Apparently, little or no consideration was given to the principles of SE4All initiative of the UN in the ERGP.
- Hence:

- No attention was paid to ***Energy Efficiency*** as part of the efforts to ensure sustainable access to energy.

- No strategy has been adopted to ***double*** the share of renewable Energy in the national energy mix.

2. NIGERIA'S PLEDGES IN THE INDC/NDC

at

Paris & Marrakech

COP 21

- **Nigeria submits its INDC to UNFCCC**

- President Buhari with Minister of Environment Mrs. Amina Ibrahim Mohammed at the UN Climate Change Conference COP 21, in Paris, France on 30th Nov., 2015

- President Buhari addressing COP 21

Nigeria‘s Contribution

- “In the event that an ambitious, comprehensive legally binding global agreement is reached at COP21 in Paris”:-

- Nigeria will make an unconditional contribution of 20 per cent below BAU.

(BAU = Business As Usual)

Buhari signing the Paris Accord in New York

on 22nd September 2016

Buhari's Quotes after the Signing Ceremony

- <u>On plans by the Federal Government:</u>

- ***" ……we are set to launch our first ever Green Bonds in the first quarter of 2017 to fund a pipeline of projects all targeted at reducing emissions towards a greener economy."***

- <u>Referring to commitments made by the Industrial countries in the Agreement:-</u>

- ***"Expectations are high for their leaders to deliver 100 billion dollars per year by 2020 in support of developing countries to take climate action, thus keeping their promise to billions of people."***

COP 22

MARRAKECH

Heads of States at COP 22

- President Buhari delivering the ***National Statement*** at the High Level Segment of COP 22 in Marrakech Morocco on 15th November, 2016.

Extracts from Buhari's Speech

- **"We have also announced our plans to reduce emissions by 20% by the year 2030, with the intention of raising this target to 45%, with the support of the international community".**

- **"This commitment comes from the recognition of the grave social, economic and environmental threats that climate change poses to humanity.**

- **In Nigeria for example, the impact is being felt by more than 2.1 million people displaced by devastating floods that the country has continued to suffer since 2012……..**

- **For us in Nigeria, the larger dimension of the challenge goes beyond emission rights. Survival rights are also at stake".**

Nigeria‘s Committments

- 20% GHG Reduction: **unconditional**

- 45%$_{(20+25)}$ GHG Reduction: **conditional**

3.Present State of Carbon Emission

in

the Energy Sector

CURRENT ESTIMATES USED BY W.B.

	Million Metric Tons						Metric per USD	
	Total Carbon Dioxide Emissions from the Consumption of Energy	CO2 Emissions from the Consumption of Coal	C02 Emissions from the Consumption and Flaring of Natural Gas	C02 Emissions from the Consumption of Natural Gas	C02 Emissions from the Flaring of Natural Gas	CO2 Emissions from the Consumption of Petroleum	Carbon Intensity using Market Exchange Rates (metric tons of Carbon Dioxide per thousand year 2005 U.S. Dollars)	Carbon Intensity using Purchasing Power Parities
2000	81.000	0.022	44.515	13.203	31.312	36.000	1.200	0.600
2001	91.000	0.007	47.136	12.183	34.953	44.000	1.200	0.600
2002	91.000	0.101	46.884	12.477	34.407	44.000	1.100	0.600
2003	92.000	0.054	50.374	16.695	33.679	42.000	1.000	0.500
2004	92.000	0.019	51.963	18.284	33.679	40.000	0.900	0.400
2005	106.000	0.019	60.591	19.800	40.792	45.000	0.900	0.500
2006	101.000	0.019	60.420	20.870	39.550	41.000	0.800	0.400
2007	100.000	0.054	59.808	20.258	39.550	39.000	0.800	0.400
2008	101.000	0.078	57.286	23.460	33.827	42.000	0.700	0.400
2009	69.000	0.080	44.371	18.814	25.557	35.000	0.500	0.300
2010	80.000	0.090	38.806	9.613	29.193	40.000	0.500	0.300
2011	83.000	0.076	41.393	10.320	31.073	42.000	0.500	0.200
2012	95.000	0.076	52.061	28.063	23.998	43.000		
2013	96.000	0.100	52.832	30.782	22.050	44.000		
2014	97.000	0.300						

Source: International Energy Statistics, Monthly Update

Last updated:Thursday, 02 February 2017

ESTIMATES (NDC)

- Estimated emissions by 2030: **900 Mio. t CO2e**
- per capita Current: **around 2 tonnes CO2e**
- 2030 BAU scenario: **around 3.4 tonnes CO2e**

4. DECARBONIZING THE BUDGET

- In the Energy Sector, ***Decarbonization*** means:- Reduction or Removal of carbon dioxide from energy sources.
- This means we have to reduce the Carbon intensity due to our:-

  - Consumption of Coal
  - Consumption of Natural Gas
  - Flaring of Natural Gas
  - Consumption of Petroleum
  - Consumption of Biomass (mainly wood and charcoal)

Recommendation for the Budgeting Process

- **The key to decarbonizing our budget /economy is to build a new energy system that does not rely on carbon-based fuels.**

For this to happen

- We need to conduct
  - an Energy Audit of all the sector of the economy
  - a Carbon Audit of all the sectors as wel,

  in order to be able to do a cost-benefit analysis of the carbon-based energy generation system and the low-carbon or carbon neutral Renewables.

Considering the MDAs

- In the 2017 budget proposals, the amount earmarked for power generation by the Federal Government for the MDAs is over ₦17.4 billion mostly through conventional means, namely, burning of fossil fuels through plants and generators. At official rate of ₦305/$, ₦ 17,397,470,115 = **$57,040,886**
- This largely contradict the targets enshrined in the National Determined Contribution (NDC) of **20%** unconditional emission reduction and **45%** conditional reduction.

Solar and Diesel Generators cost estimates

For Solar Plants	**For Generators**
Using the amount budgeted for MDAs for conventional power generation in the 2017 budget (which is ₦17,397,470,115) , the same amount can be used for solar power plant installations. It is assumed that maintenance cost of solar installation for 5 years = 10% of procurement cost = **₦1,739,747,012** Thus, total cost of running the solar plant for 5 years = ₦17,397,470,115 + ₦1,739,747,012 = **₦19,137,217,127**	2017 proposed expenditure on fossil-based power generation for the MDAs = ₦17,397,470,115 Cost of Generators alone (2017) = ₦2,022,219,523 Recurrent expenditure without generator = ₦17,397,470,115 – ₦2,022,219,523 = **₦15,375,250,592** Assuming steady expense for 5 years = [4 x ₦15,375,250,592] + ₦17,397,470,115 = **₦78,898472,483** Total cost of running these generators for 5 years = **₦78,898,472,483**.

Solar versus Generator Savings Calculations

- Savings accrued from using solar power (over the five year period) =
- ₦78,898,472,483 - ₦19,137,217,127 = **₦59,761,255,356**
- Dollar equivalent (305/$) = **$195,938,542.2**

Emissions Calculations

- **$57,040,886** can construct **21 MW Solar Farm(s)**.
- **In the absence of Figures for the MDAs, let's assume that the above sum will also power 21 MW generator plants.**

Emissions of 21 MW Diesel Plant

- Each litre of diesel produces 2.68kg of CO_2 on combustion
- For the five year period of estimations:

  27,417,600 litres * 2.68 (at full load operating capacity) will produce =

  73,479,168 kg of CO_2 or **<u>73,479 tonnes</u>** of CO_2
-

Carbon Revenue

- **Projected price of 1 tonne of Carbon Emission Reduction (CER) = $ 24 (Paris Agreement proposal)**
- **Thus, Revenue to be accrued in 5 years = 73,479 * $24 = $1,763,496**
- **In naira equivalent at ₦305/$, 1,763,496 * 305 = ₦537,866,280**
- **On an annual basis:**
- **Revenue accruable in USD for displacing generators with 21 MW solar = $1,763,496 / 5 = $352,699.20**
- **Thus, annual revenue to be accrued from CO2 emissions reduction (Naira equivalent) = ₦107,573,256**
- **This is amount is an additional revenue from carbon emission reduction annually earned for displacing 21MW diesel powered electricity generator.**

BENEFITS TO NIGERIA

- If Nigeria should adopt the Save 80 Project as one of mitigation measures, the **Benefits** include:-

1. **High annual revenue**, e.g. 3,700,000 stoves disseminated across the State will produce 12,950,000 CERs p.a., which at the rate of
   - **5€/CER** will yield **64,750,000 Euro** p.a.
   - **12€/CER** will yield **155,400,000 Euro** p.a.
     (***Nordic (Scandinavian) countries special rate for African CERs***).
   - **22€/CER** will yield **284,900,000 Euro** p.a.
     (***French President's declaration at COP 21***)
2. **Creation of about 200,000 jobs** – Youth Empowerment.
3. **Improving maternal Health** - about 6 000 deaths due to IAP could be avoided annually.
4. **Protecting the environment** – by saving at least 4,440,000 trees annually.
5. **Poverty alleviation** - Ca. 3,200 Naira can be saved by each household in firewood expenditure/month (This means a total of **11.8 Billion Naira**/Month) .

COST IMPLICATION

This Project has zero net cost or indeed achieves a net economic benefit. That is, the measures would benefit Nigeria overall, **even before taking into account the climate benefits.**

– Overall Procurement and Implementation Costs:
(in 4 years):- **650,000,000 €**
Approx. 130 Mill. € p.a.

– CER Dividends(French Option): **2,77 billion Euros**
i.e. if project is executed in 4 years and run for 10 years, excluding proceeds from 4 yr. implementation period.

5.6 ENVIRONMENTAL SUSTAINABILITY

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Replacing Kerosene Lamps with Solar Lamps

- YOUTH EMPOWERMENT AND SKILL ACQUISITION

Theory

Practical Training

Testing on the field

Recharging of the device with the solar panel during the day

Mass Production of the Solar Lamps

Trainees proudly displaying their feat

Two staff of DARE trained as Trainers to carry on the basic training


MR16 21LEDS
12VAC/DC
WARM WHITE
CE

Graduation Day

HRH recharging his handset

5.Recommendations for the budgeting process.

- Sensitization of Executive and Legislature on the importance and benefits of implementing Low Carbon projects.
- Provide Examples of what has been achieved elsewhere
- Adopt principles of SE4All in drafting our Budget on Energy

CARBON FINANCING

Untapped potential in Nigeria

Practical Examples

- 1. The Save 80 Project:

To date, there are 47,000 units distributed across Nigeria. Every year, after Monitoring and Verification, **164,500** CERs are issued.

Their monetary value is: **2,961,000 Euros.**

Currently, that would be equivalent to

= N = 1, 480,500,000.00 p.a.

Note: The Germans need the Certificates, not the Money.

2. CHINA

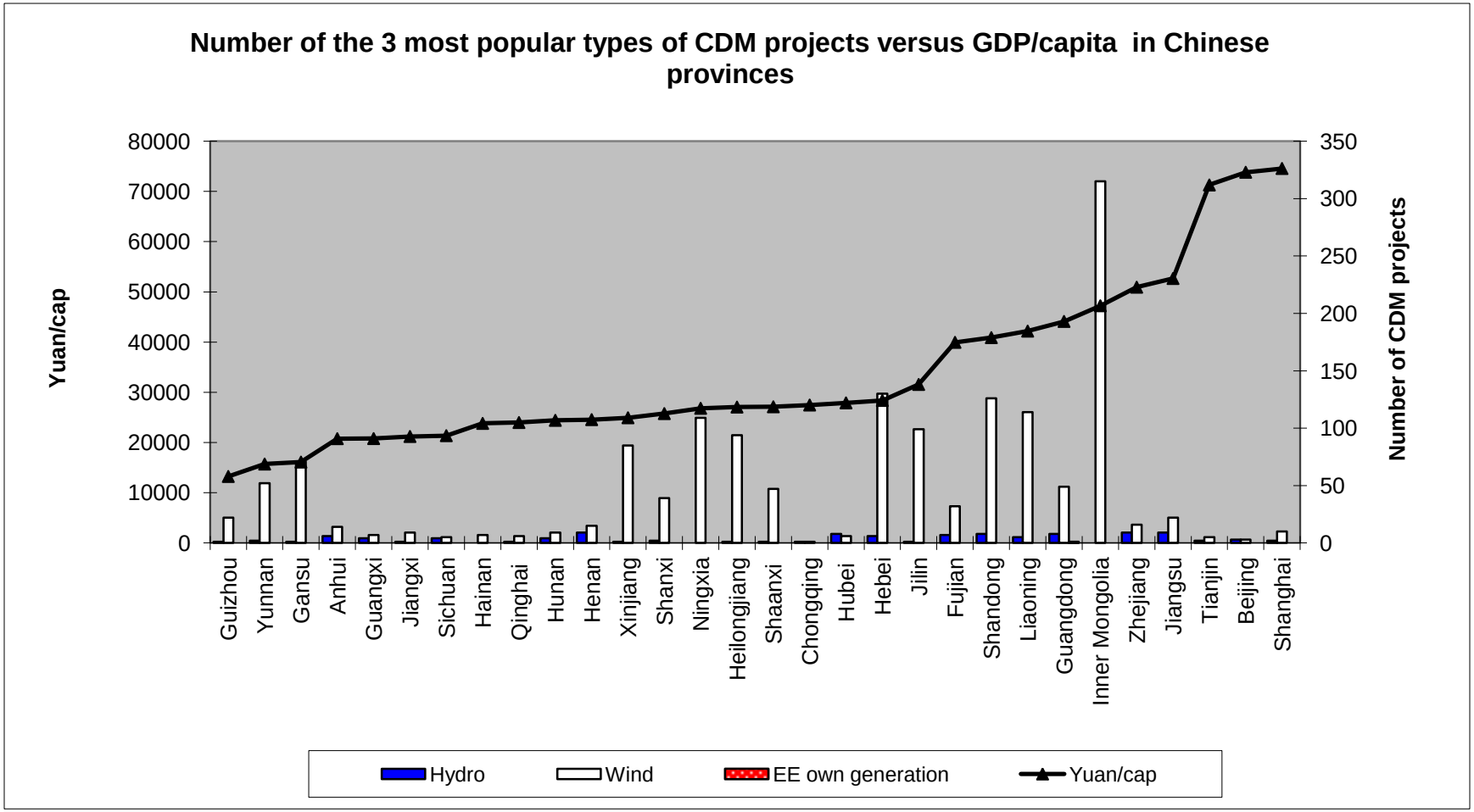
- It is estimated that the sum of venture capital, private equity, asset financing and public markets investment in renewable energy in China amounted to slightly over 2 Billion USD in 2005, and has almost doubled in 2006 to 3.96 Billion USD. This figure is estimated to have reached up to 5bn USD in 2007. In comparison to overall returns on CDM investments, i.e. annual CER revenue of all projects in the pipeline **or a total of 2.5bn USD per annum,** CDM can be judged to measure relatively significantly versus total renewable energy investment.

- This means: 2.5bn x 11yrs = **27.5bn USD** revenue generated from CERs on Renewable Energy projects alone.

- Total Net Profit: (27.5 – 5) Billion USD = **22.5 bill. USD**

- **Source:** http://acs.allianz.com/files/9114/0378/5313/wwfcarbon_markets_china.pdf

China – Ct'd.


Number of the 3 most popular types of CDM projects versus GDP/capita in Chinese provinces
Yuan/cap
Number of CDM projects
80000
70000
60000
50000
40000
30000
20000
10000
0
350
300
250
200
150
100
50
0
Guizhou
Yunnan
Gansu
Anhui
Guangxi
Jiangxi
Sichuan
Hainan
Qinghai
Hunan
Henan
Xinjiang
Shanxi
Ningxia
Heilongjiang
Shaanxi
Chongqing
Hubei
Hebei
Jilin
Fujian
Shandong
Liaoning
Guangdong
Inner Mongolia
Zhejiang
Jiangsu
Tianjin
Beijing
Shanghai
Hydro
Wind
EE own generation
Yuan/cap

The State of CDM in Africa

- **A report of a research initiative supported by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) to explore the possibilities of supporting CDM activities on the African continent, revealed that: -**

- As of October 2016, there are:-

  - 245 active CDM projects in Africa, of which 205 are fully registered and hosted by 31 African countries.

- Importantly, there are also:-

  - 126 PoAs in Africa, of which 101 are fully registered.

State of CDM in Africa – Ct'd

- These CDM activities have potential to generate up to: -

  - 402 million CERs by 2020 (132 million of which are from PoAs).

- With only **37.5 million** issued to date (0.9 million from PoAs), and life times of up to 28 years in the case of PoAs, it is clear that the CDM is only beginning to deliver benefits to Africa.
- A crucial advantage of CDM PoAs is that they provide a fully operational, UNFCCC-approved framework that allows for replicating mitigation activities over long periods of time and including micro-scale activities that promote household and community energy access.

CDM PoAs in Africa

Host country	Title	CPAs	2012 MtCO2	2020 MtCO2
Madagascar, (many)	*PoA for the Reduction of emission from non-renewable fuel from cooking*	59	0	29 854
Uganda	*Uganda Municipal Waste Compost*	12	136	1 018
South Africa	*Green Power for South Africa*	11	0	12 333
Tunesia	*Solar Water Heater Programme in Tunesia*	8	15	417
South Africa	*SASSA Low Pressure Solar Water Heater*	7	166	3 258
South Africa	*CDM Africa Wind and Solar PoA for South Africa*	7	0	20 337
Burundi, Rwanda, Tanzania,Uganda	*DelAgua Public Health Program in Eastern Africa*	7	0	1 593
Ghana	*African Improved Cooking Stoves PoA*	6	0.6	2 370
Rwanda	*Improved Cook Stoves programme for Rwanda*	6	10	2 221
Rwanda	*Renewable Energy CDM Programme of Rwanda (RECPR)*	6	0	256
Nigeria	***Improved Cooking Stoves for Nigeria PoA***	**5**	**11**	**990**
Tanzania	*Tanzania Renewable Energy Programme*	5	0	504
Egypt	*Egypt Vehicle Scrapping and Recycling Programme*	3	0,03	212
Nigeria	***Distribution of fuel-efficient improved cooking stoves***	**3**	**11**	**1 266**
Senegal	*Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal*	1	0	41
Kenya	*KTDA Small Hydro Programme of Activities*	1	0	180
South Africa	*City of Cape Town Landfill Gas Extraction and Utilisation*	1	0	288
Morocco	*ONE Wind Program of Activity, Morocco*	1	0	4 577
Uganda	*Accelerating Electrification through Grid Extension and Off-Grid Electrification in Rural Areas of Uganda*	1	0	640
Ethiopia	*Ethiopia – Clean Cooking Energy Program*	1	0	245
Ethiopia	*Ethiopia Off-Grid Renewable Energy Program*	1	0	158

Source: Authors, based on UNEP DTU 2016b

Article 6 creates the following three frameworks

- i) one for **cooperative approaches to allow the linking of emissions trading systems** - Articles 6.2 and 6.3 ***("internationally transferred mitigation outcomes" or ITMOs***) - also referred to as

Joint Crediting Mechanism (JCM).

As of January 2017, Japan has started the JCM with 17 partner countries (including 2 African countries – Ethiopia and Kenya)

- ii) one for a new **"mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development"** (SDM) - Articles 6.4 to 6.7 - to replace Kyoto's flexible mechanisms,

and

- iii) one non-market mechanism to promote **"integrated, holistic and balanced non-market approaches"** - Article 6.8 and 6.9

According to **El Hadji Mbaye Diagne**

Lead negotiator for carbon markets of

- *the African Group of Negotiators*
- *and the Least Developed Countries*
- *and Delegation of Senegal*

- **The UNFCCC Secretariat identified four new areas where the CDM can contribute to global efforts to reduce GHG emissions in the new Mechanism: -**

1. Support implementation of Nationally Determined Contributions (NDC), whereby the CDM can provide a means for realising domestic targets or support the achievement of higher conditional targets proposed by Parties;

2. Encourage voluntary offsetting by corporations, governments or sectors that are likely to face compliance targets in a post-2020 environment (e.g. ICAO)

3. Increase the number of market-based carbon pricing policies intended to utilise CERs by linking to emerging Emissions Trading Schemes (ETS) worldwide - (***Strong Reason to establish a West African ETS based in Abuja***).

4. Serve as an effective Monitoring, Reporting and Verification (MRV) tool to enable credible and transparent results-based payments using both public and private climate finance.

The Future Demand of CERs

Emerging Initiatives

- **1) Generation of more domestic demand by countries.**
- **2) International Civil Aviation Organization.**
- **3) Initiatives by some developed countries.**
- **4) Framework of the Carbon Initiative for Development (Ci-Dev) of the World Bank.**

1) Generation of more domestic demand by countries.

- LOCAL GOVERNMENTS ALL OVER THE COUNTRY ARE SELLING SUCH STICKERS CALLED "***GASEOUS***" TO MOTORISTS IN THE NAME OF CLEANING THE EMISSIONS FROM VEHICLES.

2) International Civil Aviation Organization

The International Civil Aviation Organization (ICAO) has agreed on a market mechanism called *Carbon Offsetting and Reduction Scheme for International Aviation* (CORSIA), to offset emissions growth from international air travel after 2020.

A total of 66 countries covering 86.5% of international aviation volume have agreed to participate in CORSIA from the beginning (i.e. 2020), including the United Arab Emirates (UAE) and Qatar.

Eligible offset mechanisms include the Clean Development Mechanism (CDM) and Joint Implementation under the Kyoto Protocol, and the new mechanisms under Article 6 of the Paris Agreement.

ICAO – Cont'd

- **Although no specific quality criteria for offsets and prices have been agreed, global costs for offset purchase would reach €60–850 million in 2021 and then increase linearly.**

- **As airlines from UAE and Qatar cover about 11.5% of global aviation volume, their costs for offset purchase may reach €7–100 million in 2021** and **€70–1000 million in 2030.**

ACCESS TO VARIOUS FUNDINGS

1) **CLIMATE CHANGE ADAPTATION FUND**: Helping developing countries build resilience and adapt to climate change.

2) **The Gender Policy and Direct Access Funding (Morocco got 9.97 Mill. USD in 2015)**

3) **REDD+ FUND (Reducing Emissions from Deforestation and forest Degradation)**

4)NAMA FUND

5) **LOSS & DAMAGE MECHANISM:** Facilitating the mobilization and securing of expertise, and enhancement of support, including **finance, technology and capacity-building**, to strengthen existing approaches and facilitate development and implementation of additional approaches to address loss and damage.

NAMA Facility

Supporting the Implementation of Nationally Appropriate Mitigation Actions (NAMAs)

- **Aim: -**

- **Support developing countries and emerging economies in implementing ambitious actions to mitigate greenhouse gas emissions (Nationally Appropriate Mitigation Actions, NAMAs).**

- **NAMAs can function as an important vehicle to implement nationally determined contributions (NDCs) under the Paris Agreement.**

- **Facts about the NAMA Facility: -**

- **Multi-donor funds established by Germany (BMUB) and UK (BEIS) in 2013**

- **Denmark (EFKM, MFA) and the European Commission joined in 2015 as additional donors**

- **Total funding made available through the NAMA Facility since its**
- **Inception (2013): ~ EUR 262 m.**

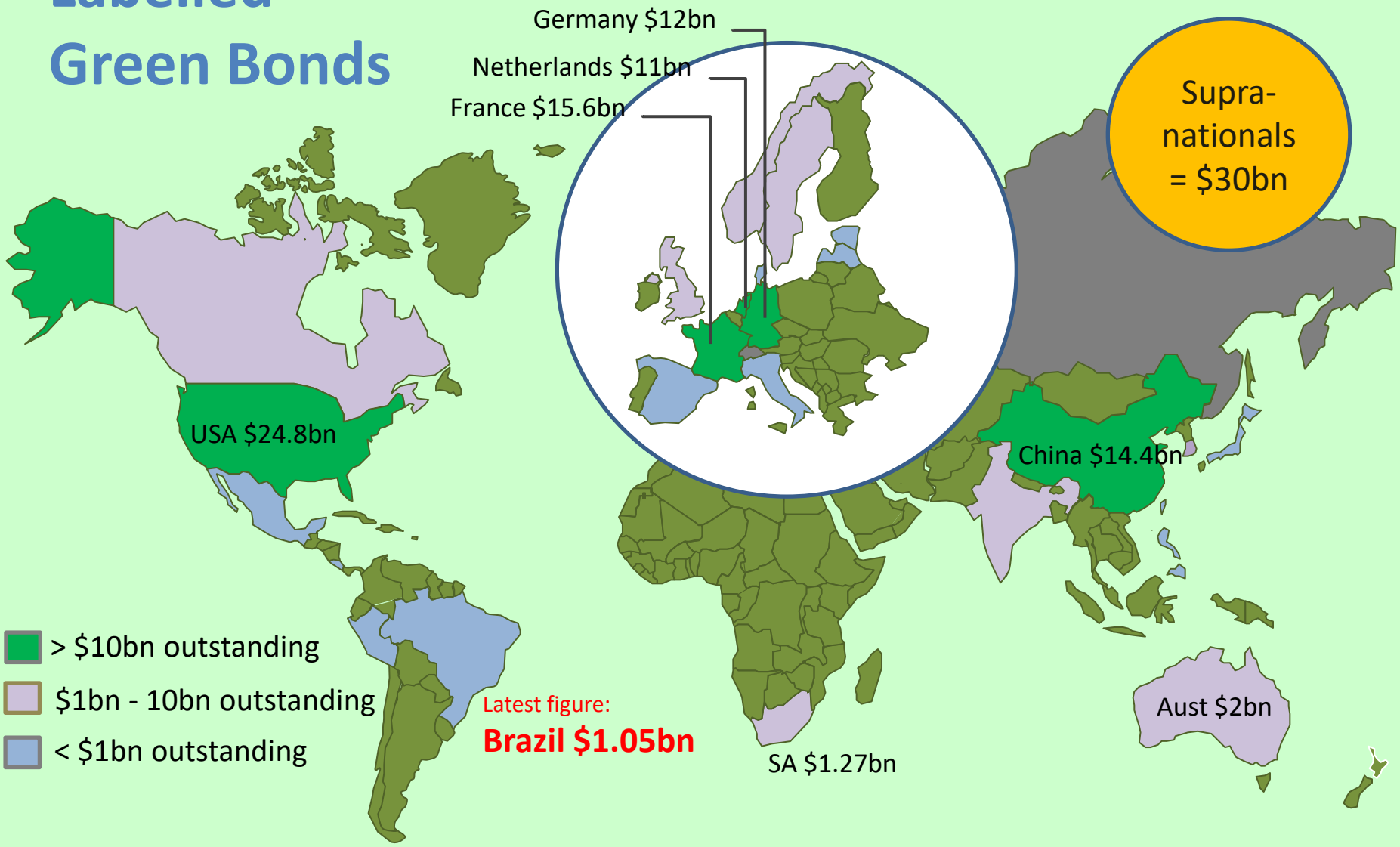
- **In 3 Calls, 14 projects have been selected so far**

4th Call of the NAMA Facility

- **The 4th Call for projects has been launched on 4 July 2016**
- BMUB and BEIS have committed up to **EUR 60 Mill.** of additional funding
- Amended Call procedures include:
- Simplified application procedures to increase accessibility to a wider range of applicants
- Enhanced appraisal phase (Detailed Preparation Phase, DPP) to strengthen appropriate design and readiness for implementation of projects
- **Submission deadline for projects: 31 October 2016**
- Projects must have an implementation period of 3-5 years and a budget of **EUR 5-20 Million**
- The Call is open to all regions and sectors

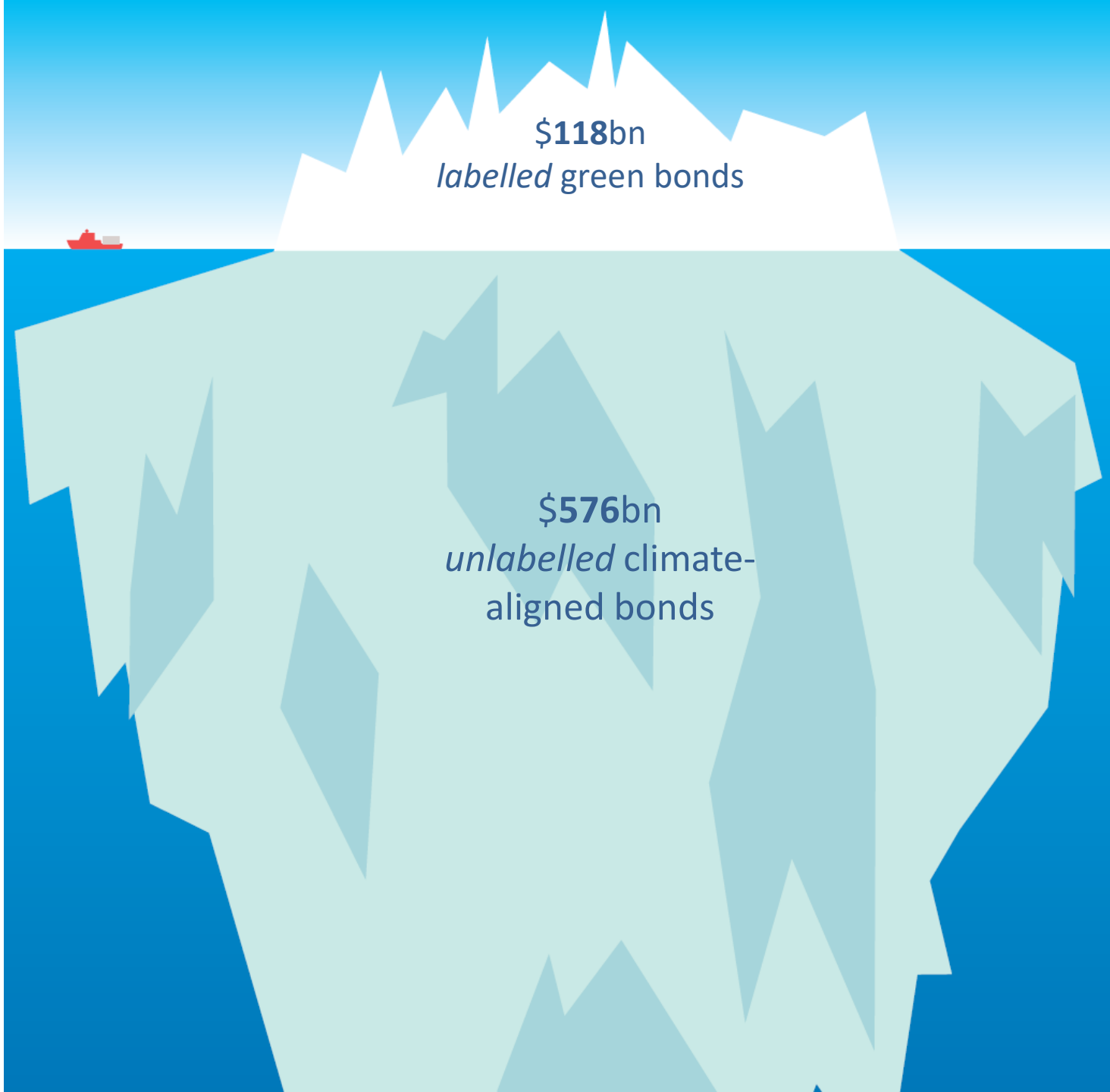
Networked Carbon Markets

Labelled Green Bonds



Climate Bonds INITIATIVE

A $**694**bn climate-aligned bond universe



Thank you for your attention