European Commission

JRC support to the implementation of the Covenant of Mayors in Sub-Saharan Africa

CoM SSA Advisory Board
Addis Ababa, 1 March 2018

J.F.Dallemand

Energy Efficiency & Renewables Unit

Energy, Transport & Climate Directorate

Ispra, Italy

Joint Research Centre

European Commission

JRC report on Science for the AU-EU Partnership

Building knowledge for sustainable development

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Contents

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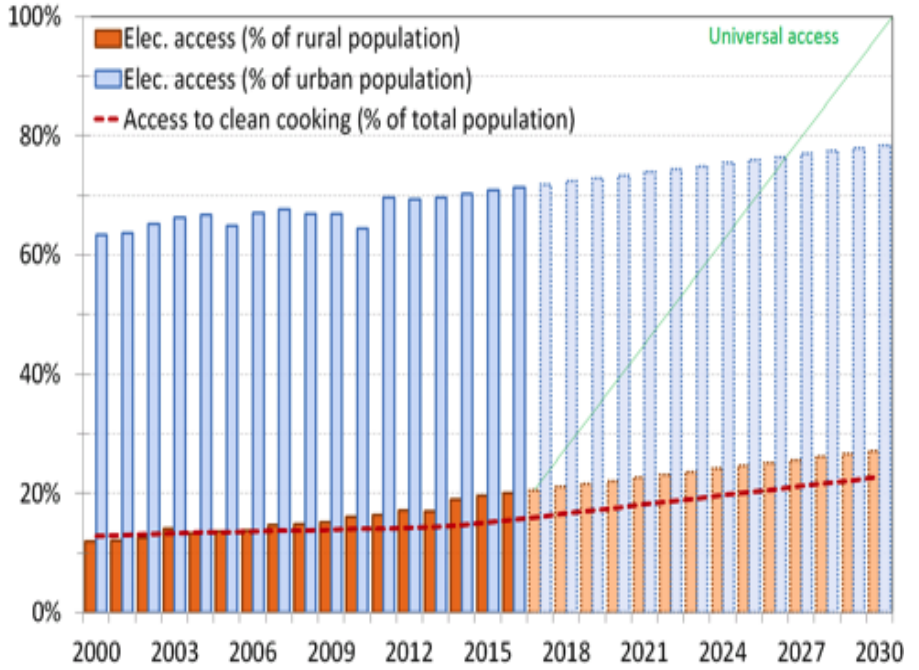
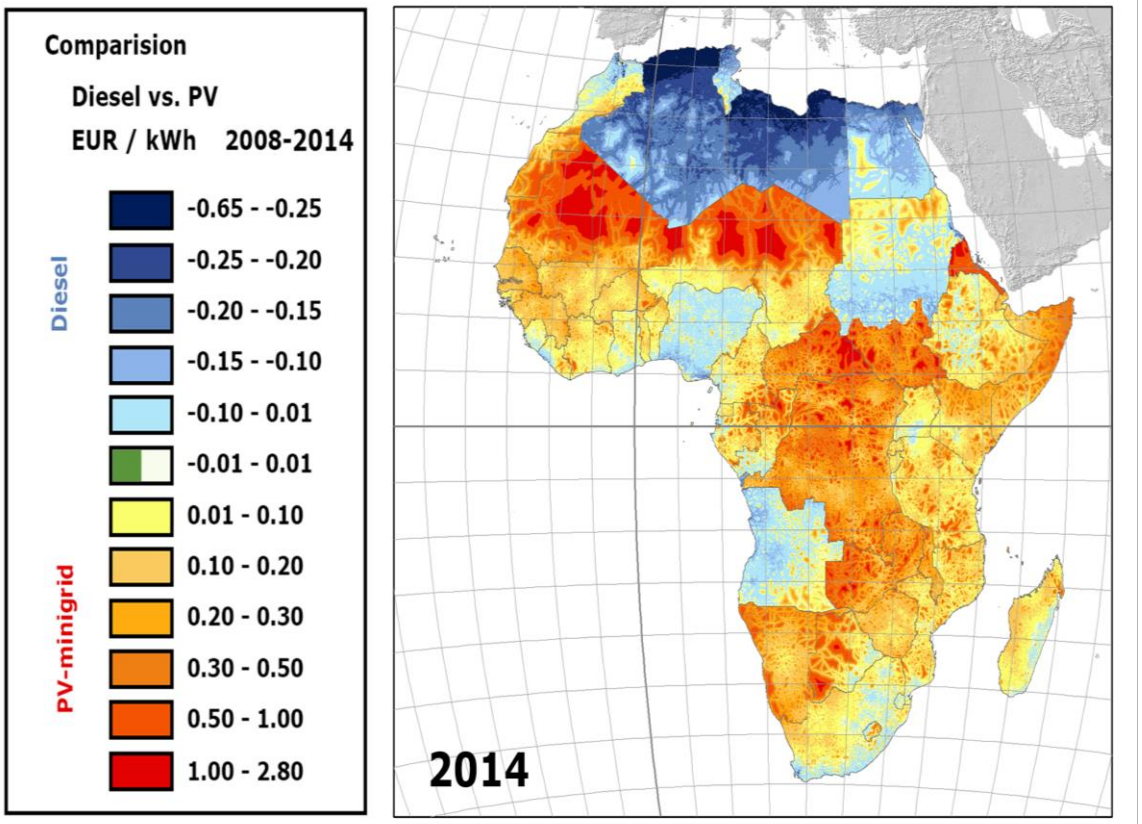
Source: The role of wood energy in Africa S. Amousa, FAO

- Almost 90% of all wood removals in Africa are used for energy
- Fuelwood meets 85% of rural energy demands, charcoal most of the rest



Source: World Bank Open Data, 2017



- Population and economic growth drives energy demand

- Mini grids and off-grid systems offer a solution

- Where do alternatives to fossil fuels for rural electrification work best ?

- Where will high-tech jobs be created, training opportunities emerge and business development occur in each energy sector ?

Model results of the competitiveness of diesel generators and photovoltaic mini grids in providing off-grid electricity in 2008 and 2014 (in the areas in yellow/red PV-generated electricity is cheaper, while for the blue areas electricity from diesel generators is cheaper)

Africa's current population of around **1.2 billion** will continue to grow faster than that of any other continent. About half of Africa's people live within **100 km of the coast**. Between 1990 and 2015 urban populations grew by over **480 million.** Built area per person varies substantially across the continent. Average road density is just over **200 km of roads per 1 000 km^2 of land,** only a quarter of which is paved. In the past 40 years, droughts, floods, disease outbreak and cyclones have affected almost 500 million people Cereal production has largely kept pace with population growth. 20 African states have achieved the Millennium Development Goal of hunger reduction. Africa is highly vulnerable to climate change, although the continent's greenhouse gas emissions of four tonnes/person/year are far below the global average of **7.3 tonnes/person/year**. Africa will become hotter by the end of the 21st century. Southern Africa will experience longer dry spells interspersed with more extreme rainfall events when they occur. Africa recorded a net loss of **31 million ha of forest from 1990 to 2010**. Wildfires burn between **150 000 and 200 000 km^2** of forest, savannah and grassland per year. Water distribution across the continent is very uneven, with three arid regions, several 'water towers' with abundant supply and large regions where inter and intra-annual variability are high. Growing demand for water will lead to increased water scarcity in several regions. Droughts are likely to become more severe and persistent. **Between 8% and 13% of Africa's soils** are free of natural constraints for agriculture. Some fertile areas are shrinking due to climate change and land degradation. The value of farmland is rising. In 2015, **agriculture employed 65%** of the labour force and accounted for **32% of GDP. Over 600 million** people living in Africa have no access to electricity. Sub-Saharan Africa has only **0.3 million km of power lines,** compared with the EU's 10 million km. **30%** of the world's gas and oil discoveries in the past five years were made in Africa. Africa is a major global supplier of several critical raw materials. Africa still has less than **100 researchers** per million people, compared to the global average of 1 000. The low indicators regarding traditional R&D for Africa may not capture the actual dynamics of innovation, especially in the service and informal sectors. Africa has a burgeoning entrepreneurial sector, especially in ICT, wholesale and retail. Africa is already a world leader in terms of money transfers using mobile phones (**14%** of all Africans are receiving money through mobile transfers), but this also makes mobile devices a target of cybercrime. Violent histories and environmental factors such as water stress and hydrocarbon resource locations are particular contributors to the continent's elevated risk levels for conflict. Over **90% of Africa's imports and exports are transported by sea**. Maritime security is a prerequisite for trade, fishing, tourism, and other sea-based activities. The risk of global threats in the chemical, biological, radiological and nuclear (CBRN) area is increasing. In Africa, chemical risks associated with the industrial and agricultural sectors have intensified, and exposure to health risks (epidemics and disasters) remains high. Uranium is mined in many African countries, and there are ten operating nuclear research reactors across the continent. However, **only South Africa operates a commercial nuclear power plant.**

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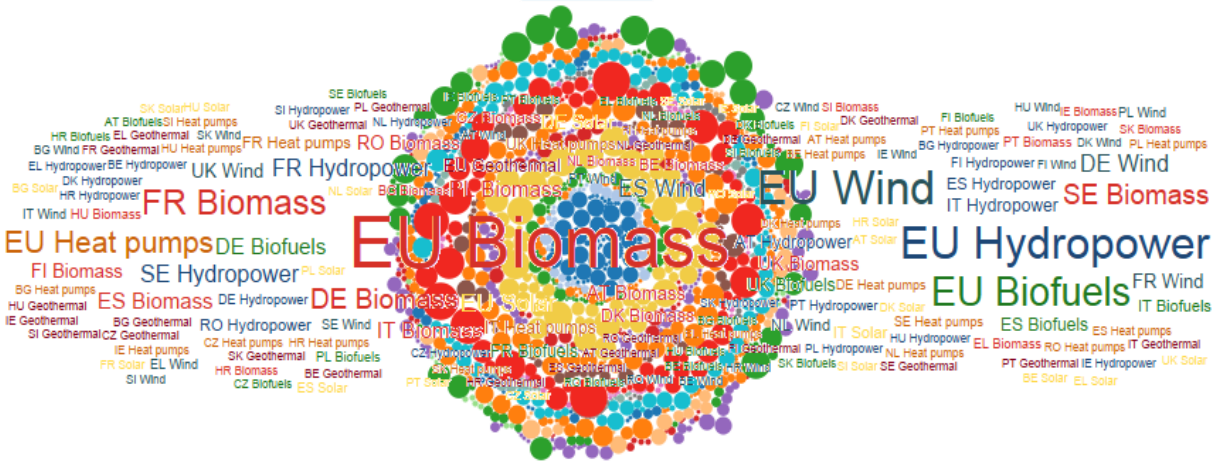

JRC & Africa related activities

Renewables, RE Technologies for Africa, PV…….
Tropical deforestation Monitoring with Remote Sensing
Fire Monitoring
Biodiversity Mapping & Monitoring
Food Security & Agriculture monitoring
Water/Energy/Food/Nexus in West Africa
Emergency and crisis
Global Human settlements

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Context

- Urban energy consumption generates about three quarters of global carbon emissions (*IPCC, 2014*)
- 75% of European Union population lives in urban areas
- Cities are part of the problem and part of the solution
- Cities and Regions: a huge potential for a sustainable energy use, with a positive impact on local economies
- Need of a new model of multi-level governance for the implementation of climate policies

The Covenant of Mayors (CoM)

European Commission

Voluntary initiative launched in 2008 by the European Commission to support local authorities in the sustainable energy development and the fight against climate change

Mayors commit to go beyond EU energy and climate objectives

at least 20% CO2 reduction in their respective territories by 2020

ACCOUNTABILITY of local authorities, which take the lead in the fight against climate change

- **Define a Baseline Emission Inventory (BEI)**
- **Prepare a Sustainable Energy Action Plan (SEAP)**
- **Implement their Action Plan and report periodically on progress**

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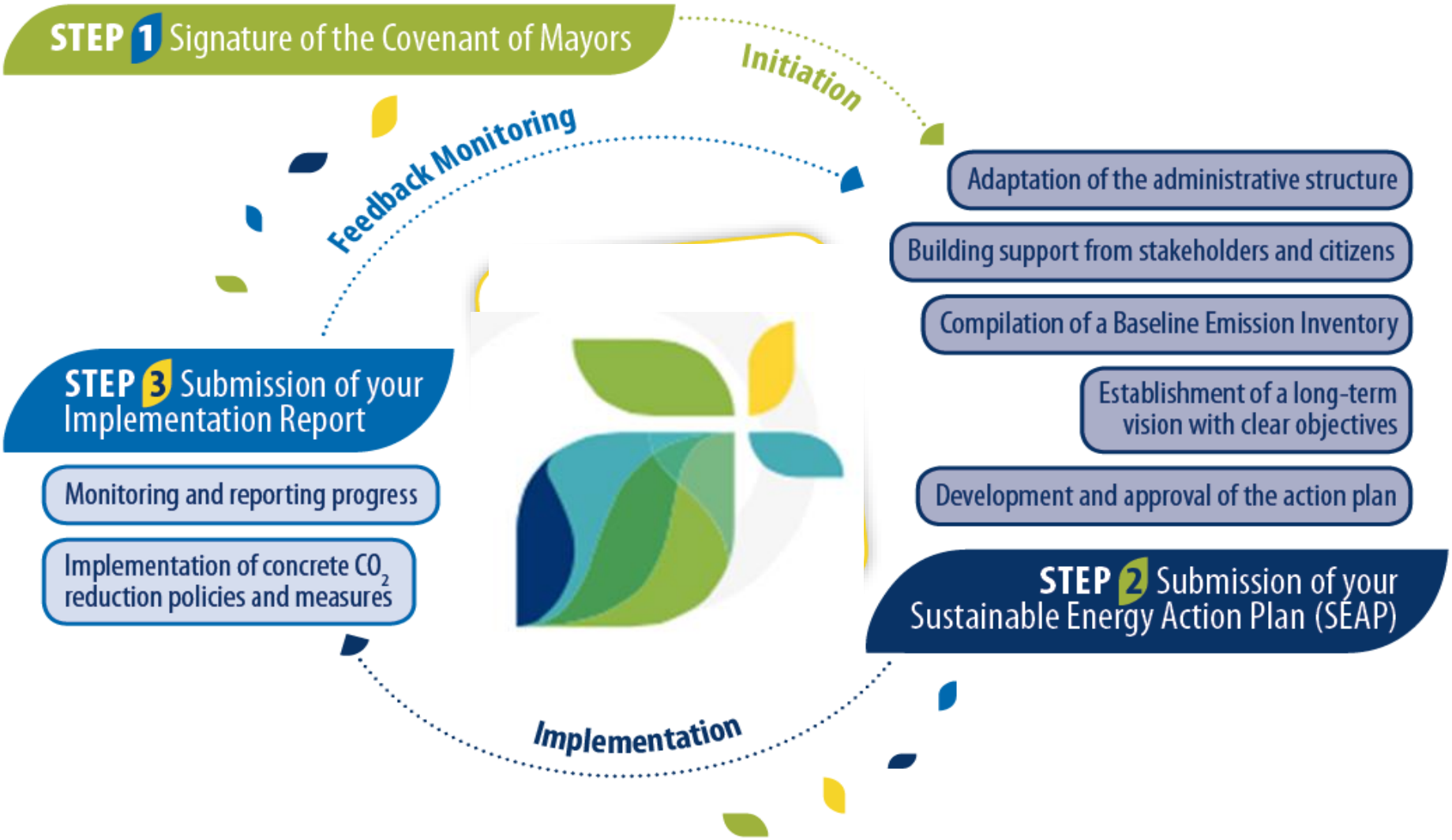
The SEAP process: a holistic approach



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57 Countries
(as of 26/2/2018)
7 755 CoM signatories
252,6 million citizens
Covenant East
Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine
Covenant EU
28 EU Member States + EEA Countries
Covenant South
Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia

Priority areas for action EU CoM

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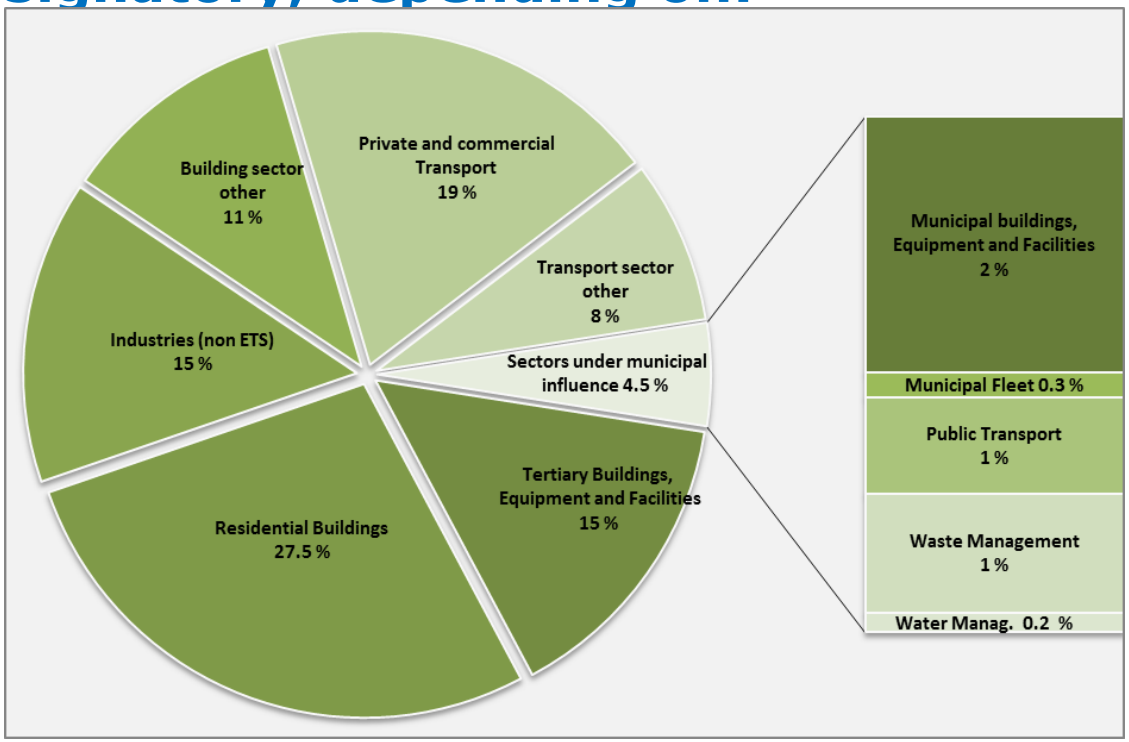
The choice of sectors to tackle and of specific measures to implement is entirely left to the responsibility of the signatory, depending on:



Breakdown of GHG emissions in Baseline Emissions Inventory (951 Mt CO2-eq/year)

- **political mandate of the Mayor**
- **national framework regulations, grants, etc.**
- **size of the local authority availability of human & financial resources, expertise, etc.**

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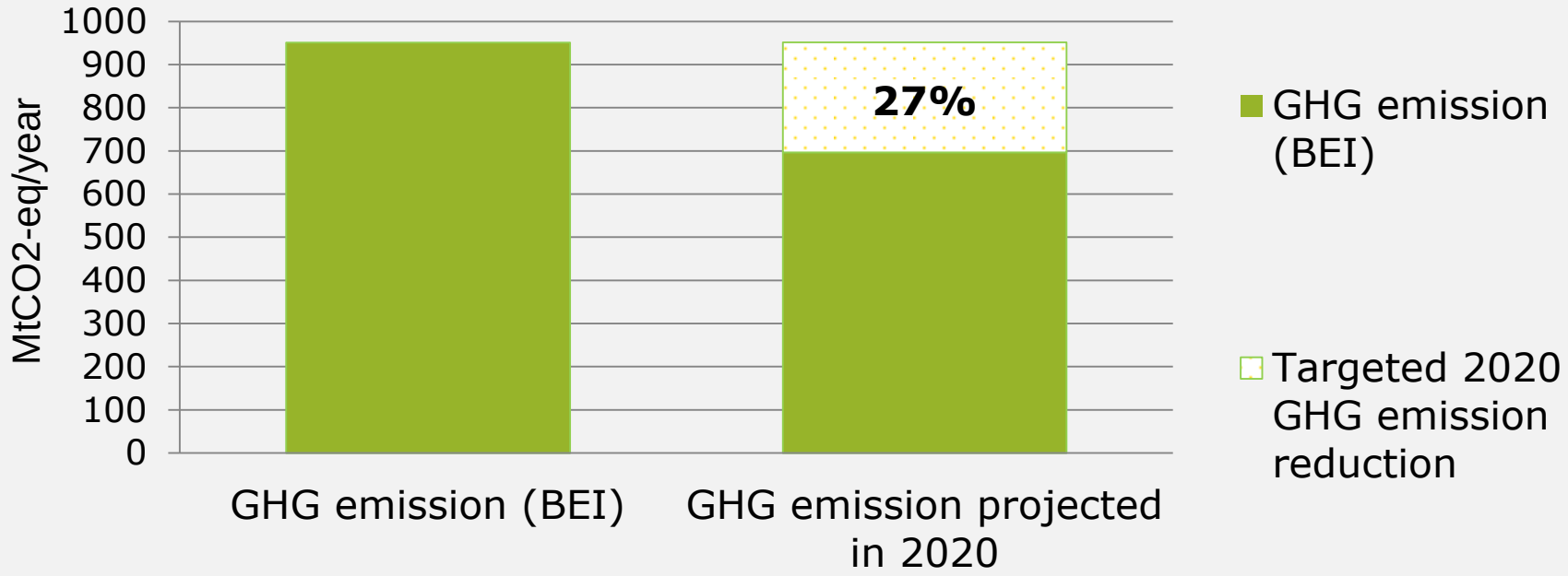
Local authorities having signed up to the CoM

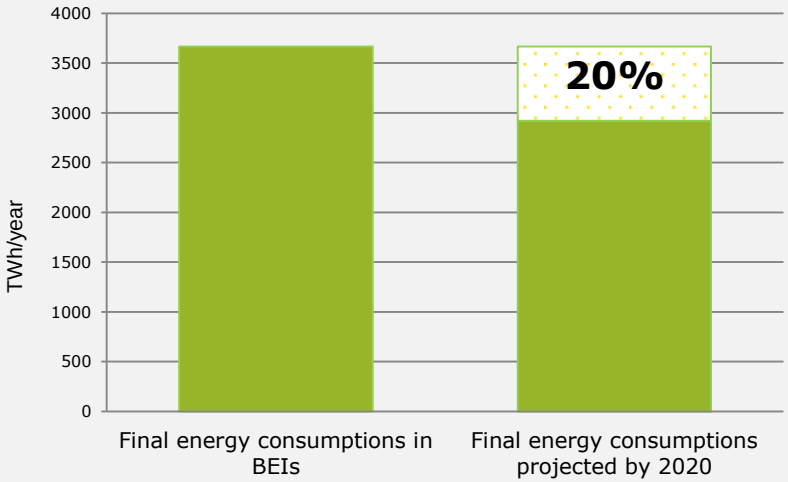
- **6201 signatories (representing 6926 local authorities) cover 213 million inhabitants, with 86% of the CoM population from EU-28:**
  - **5767 signatories (covering 83% of the CoM population) have committed to develop a mitigation plan**
  - **434 have committed to develop an adaptation strategy (412 of which combined with a mitigation plan)**

Emission reduction commitments based on submitted SEAPs - 2016, (Sustainable Energy Action Plans)

- For all CoM (Signatories from 50 countries), overall emission reduction commitment of 27% by 2020;
- EU-28 CoM signatories commitment may represent 31% of the overall EU-28 GHG emission reduction target by 2020 compared to 2005

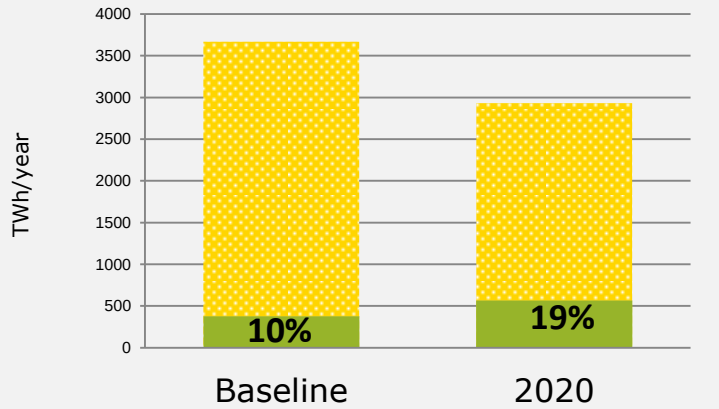


Energy savings and local energy production commitments based on submitted SEAPs -2016



Overall CoM signatories reducing their final energy consumption by 20 % in 2020

Overall CoM signatories increasing the share of local energy production from 10 % in the Baseline emission inventory to 19 % by 2020.



Covenant achievements in 2014, 315 signatories

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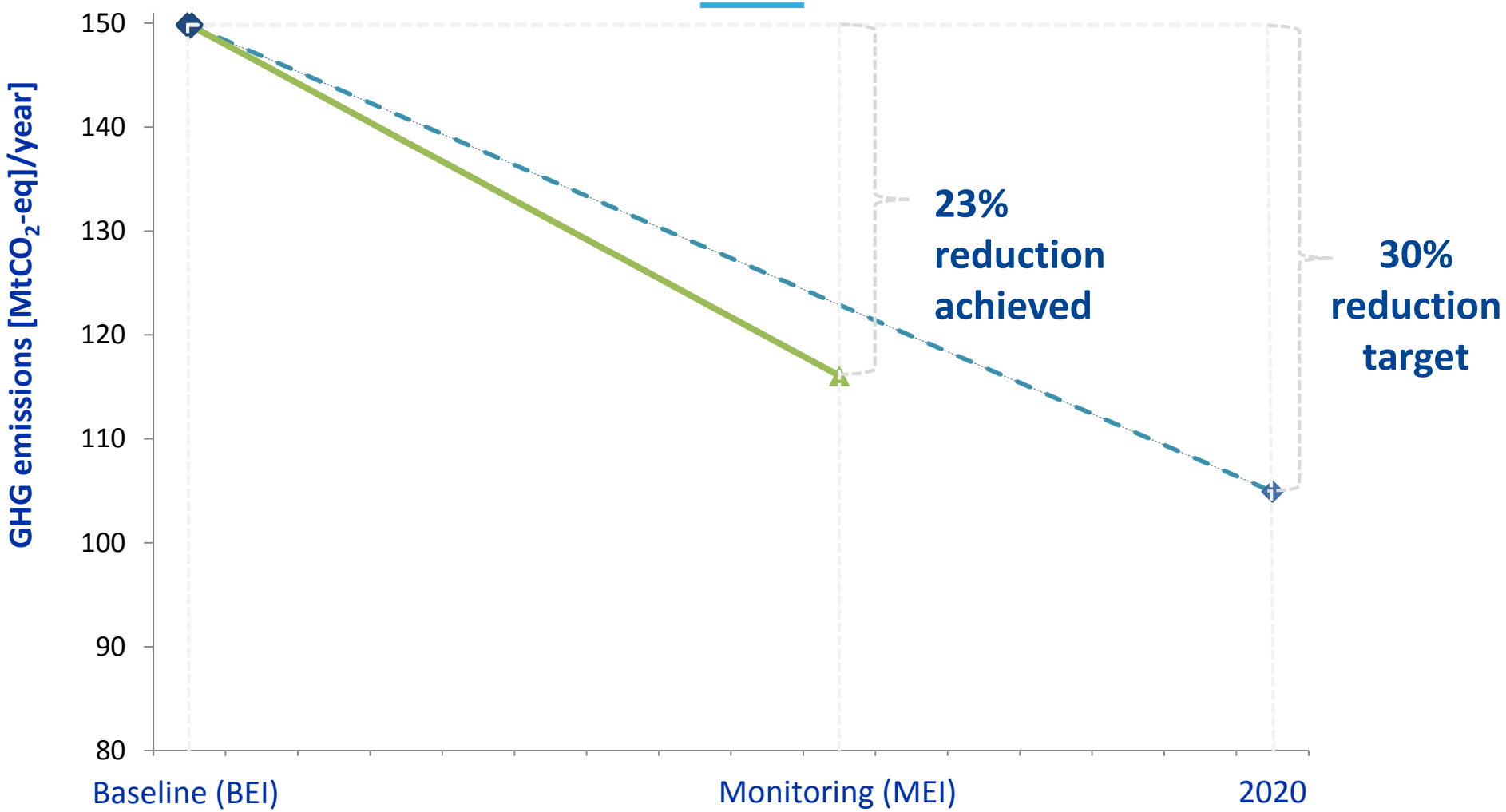

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GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

GHG emissions reduction in 2014

- emissions related to electricity consumption fell by 17 % due to
  - a less-carbon-intensive fuel mix
  - more efficient electricity generation power plants
- emissions in buildings from heating and cooling fell by 36 %
  - lower energy consumption levels due to improved energy efficiency in buildings
  - more efficient local heat production from district heating networks
  - increasing shares of renewable resources in decentralised local heating production
- emissions in the transport sector fell by 7 % driven by
  - more efficient vehicles
  - an increase in the share of biofuels
  - shift towards public transportation and electric mobility

What is New about CoM activities (from JRC perspective)?

- Adaptation to Climate change (21 adaptation plans received)
- Data policy (Not privacy)
- 8 year assessment of CoM Europe (Quantitative)
- More integrated data analysis (Aggregation study)
- Additional geographic extensions
- First update of Europe CoM Technical Guidebook (Draft 1 March 2018)
- Ongoing work of GCoM Technical Working Groups (TWG)
- JRC Staff ? 1 post GCoM Brussels

World Resources Institute- EC JRC-GCoM

UNFCC COP Bonn 2017

GCoM commitments = 7494 cities
681 179 900 population
1.29 Billion tons of CO_2e avoided annually in 2030

Towards

UNFCCC COP Katowice 2018

JRC participation in Global Covenant of Mayors (GCoM) Technical Working Groups (TWG) on:

1) Data

Climate Action & Energy Access
Emissions & Targets
Risk & Vulnerabilities
Reporting Platforms

2) Global Regional Coherence

2017 JRC Missions to Argentina, Israel, Moldova +SSA
+ India & Georgia in preparation (beginning 2018)

JRC Covenant of Mayors SSA missions 2017

- Accra, Ghana, Advisory Board CoM SSA, February 2017
- Kampala, Uganda, Inception visit, March 2017
- Accra, Ghana, Training Course and SAMSET Conference (Supporting SSa municipalities with Sustainable Energy transitions), June 2017
- Dakar, Sénégal, Inception visit, September 2017

CoM Europe Guidebook update

(As of 1 March 2018, Draft Part I & II sent for comments to DG ENER & CoM Office)

Part I :
Sustainable Energy & Climate Action Plan (SECAP) process

Part II :
Baseline Emissions Inventory (BEI)
and Risk & Vulnerability Assessment (RVA)

Part III :
Local policies and strategies for SECAP implementation

CoM SSA Guide Book, Status & perspectives

Late (October 2017)

Why ?
- Inception visits
- Europe GuideBook

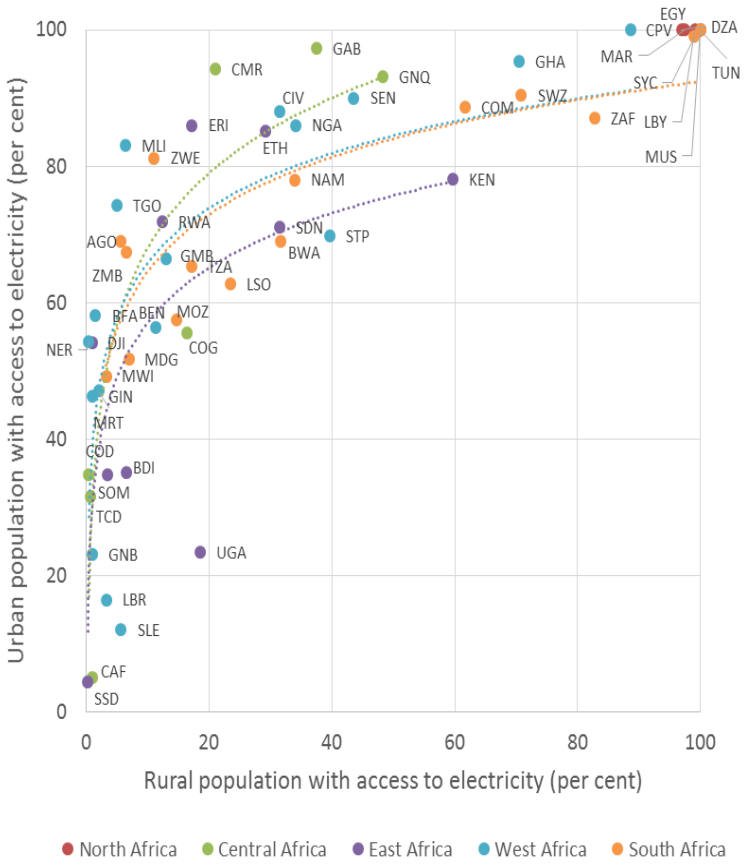
But ++++

Access to Energy & Electricity (SSA)

Electricity access in Africa urban areas

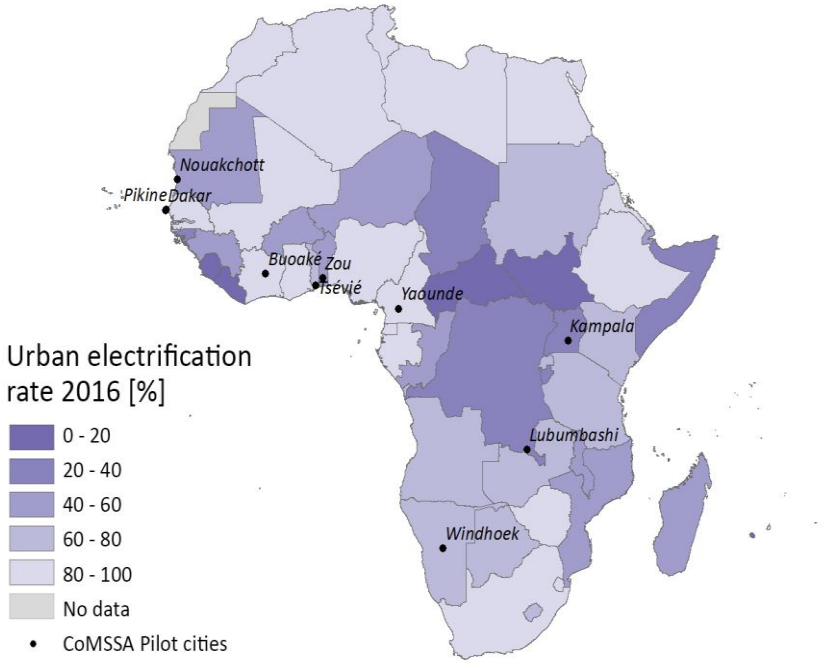
European Commission

Rural and urban population with access to electricity, Africa, 2016.



(OECD / IEA, 2017a)

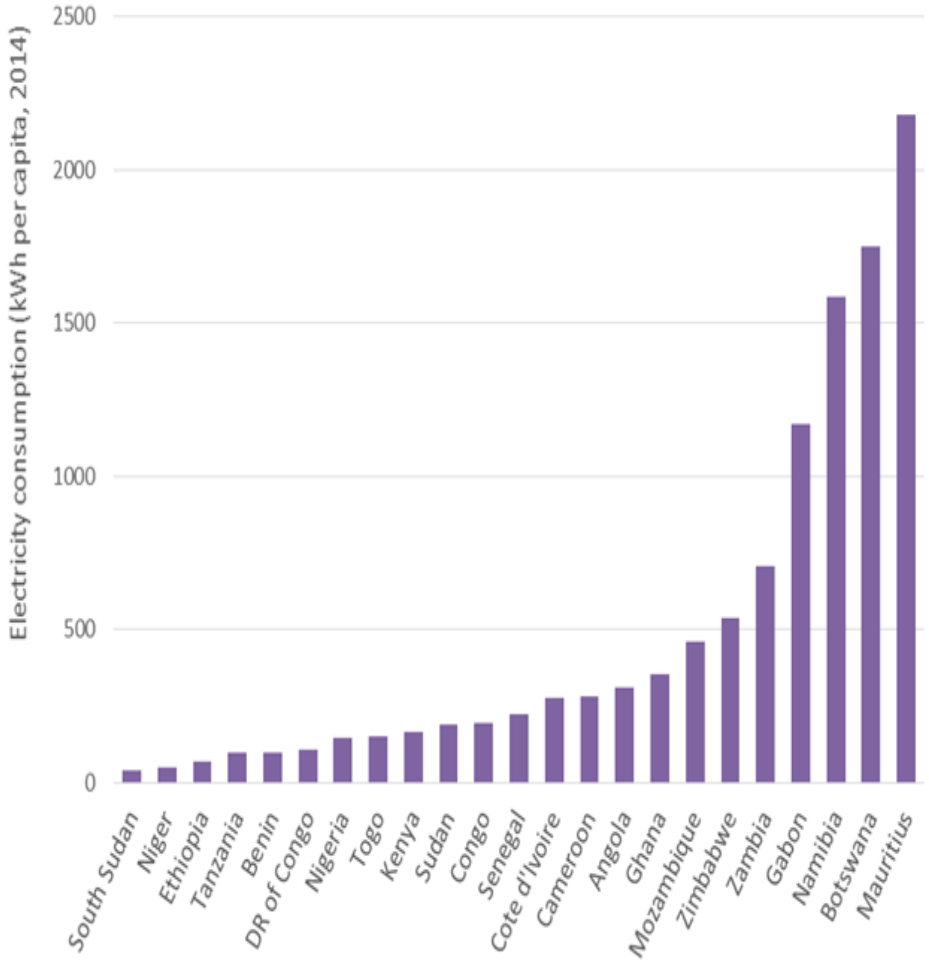
Electricity access in Africa: urban rate of access, 2016



(OECD / IEA, 2017a)

Electricity Consumption (SSA)

- One in three people in SSA have access to electricity.
- Average electricity consumption : 162 kWh per person a year (1600 kWh per person a year is the average in the EU)



(The World Bank, 2017)

Urban population Growth/Africa

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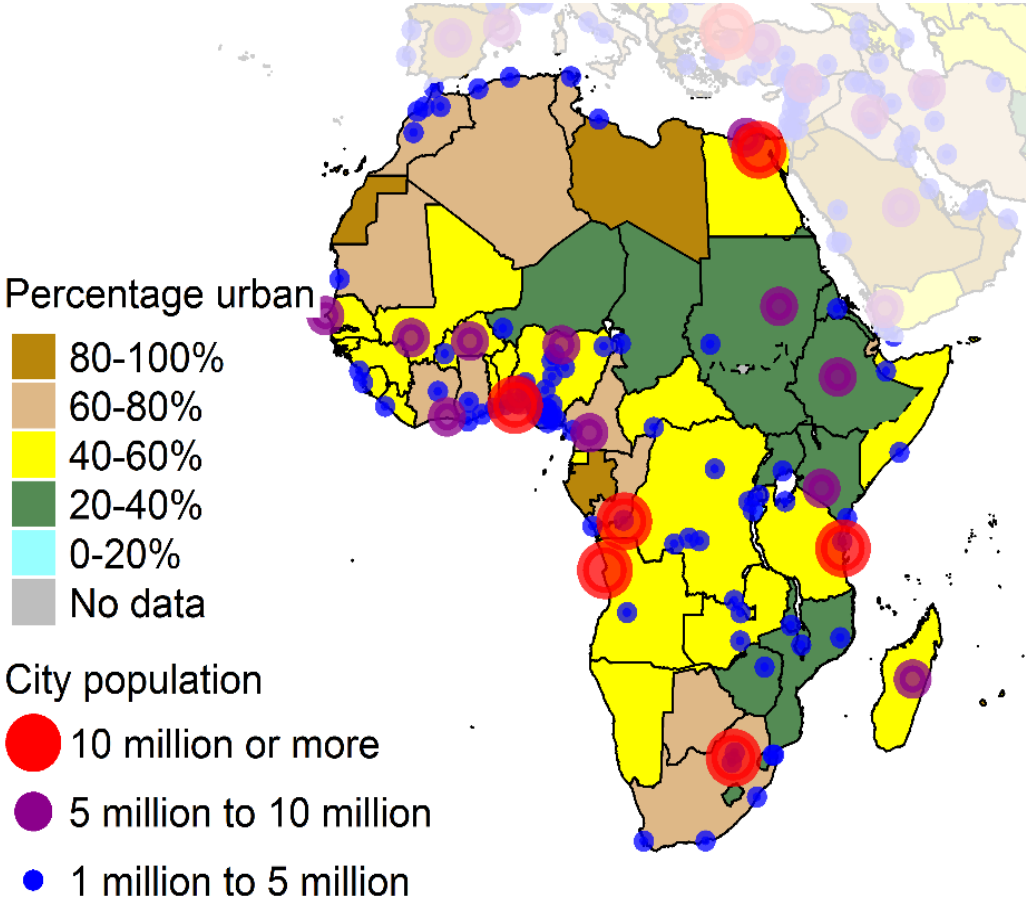
- In 2014, only 37 % of the entire population o sub-Saharan Africa lived in cities, making it the world's least urbanized region. The Africa continent is urbanising fast. By the mid-2030s, the majority of Africans will live in urban areas.

- Energy demand will increase



(UN Department of Social and Economic Affairs Population Division, 2014)

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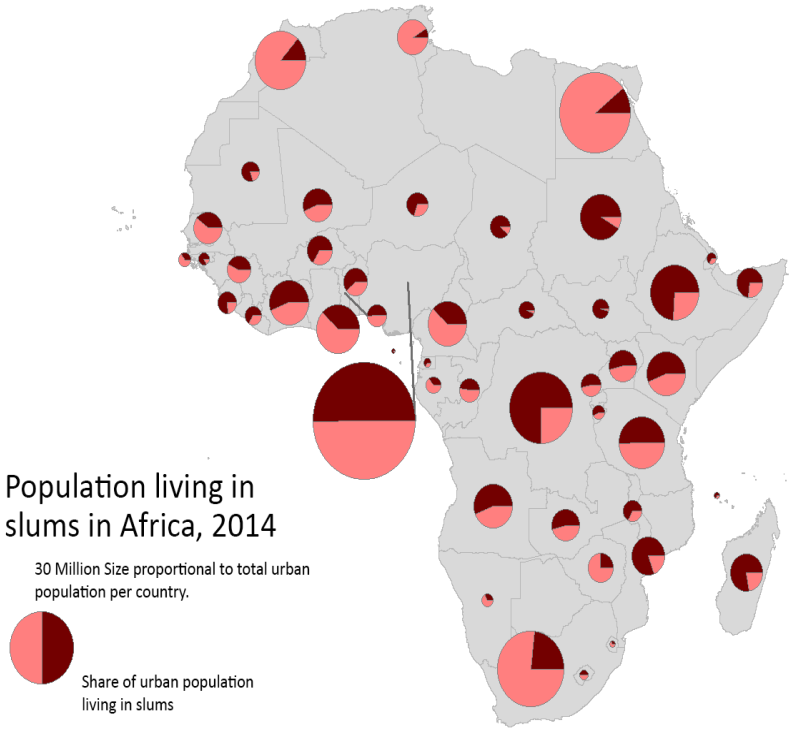
Informal settlements



(The World Bank, 2017)

Population living in slum by regions, 2005 - 2014.

	Urban slum population at mid-year by region (Million)			Proportion of urban population living in slum (per cent)		
	2005	2010	2014	2005	2010	2014
Developing Regions	830	872	881	35,6	32,6	29,7
Northern Africa	13	14	11	13,4	13,3	11,9
Sub-Saharan Africa	152	183	201	63,0	61,7	55,9
Latin America and the Caribbean	112	113	105	25,5	23,5	21,1
Eastern Asia	250	250	252	33,0	28,2	26,2
Southern Asia	196	196	191	40,0	35,0	31,3
South-eastern Asia	80	84	84	34,2	31,0	28,4
Western Asia	27	32	38	25,8	24,6	24,9
Oceania	515	563	591	24,1	24,1	24,1

(UN Habitat, 2014b)

70% of Africa's urban population lives in informal settlements and 60 per cent of total urban employment is in the informal economy (Escudero et al., 2017).

CoM SSA Guide book, Table of Contents (?)

European Commission

A. Targets

1.1 What kind of targets would you propose (qualitative/quantitative…) for each covenant pillar
Mitigation of GHG emissions……..
Adaptation to climate change…….
Access to energy……
1.2 What would be ambitious but realistic targets for your city to include as a part of your Action Plan for:
Mitigation of GHG emissions
Adaptation to climate change
Access to energy
1.3 What is the relation between the local targets and the national ones?
1.4 Which pillar has the highest priority in your municipality?

What kind of targets would you propose (qualitative/quantitative…) for each covenant pillar
Mitigation of GHG emissions
Adaptation to climate change
Access to energy
What would be ambitious but realistic targets for the cities to include as a part of your Action Plan for?
Mitigation of GHG emissions
Adaptation to climate change
Access to energy

What should the relation between the local targets and the national ones?
Which pillar has the highest priority in the SSA context?

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CoM SSA Guide book, Table of Contents (?)

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B. Inventories/ data collection

2.1 What do you propose as baseline year for any pillar
2.2 Do you have a reference document regarding the baseline suggested?
2.3 Which data do you consider most relevant in order to get the best baseline inventory that can serve as the starting point for determining and prioritising actions within the three pillars?
2.4 Main problems faced on collecting the data
2.5 What is the %of access to electricity in your municipality?
2.6 What is the % of access to drinking water in your municipality?

C. Sectors

3.1 What sectors (transport, residential buildings, commercial and institutional buildings and facilities, agriculture, waste and waste water management, industrial…) do you intend to cover in your SEACAP? (Covering all pillars)
3.2 Are those sectors in line with the EU key Covenant sectors (municipal buildings and facilities, residential and transport)? Will it feasible to tackle those sectors in your municipality?
3.3 Are you planning to address water and waste management sectors?
3.4 What sectors do you consider most important to cover within your action plan? (Prioritise the sectors consider to go into the SEACAP)
3.5 Are there any electricity generating/power stations within the municipal boundaries and if yes how much fuel do they consume?

CoM SSA Guide book, Table of Contents (?)

D. Involvement and Stakeholders

4.1 What stakeholders are considered necessary to involve in the process of developing your SEACAP?

4.2 What levels of governance do you intend to involve in the planning and implementation of your SEACAP?

4.3 Name the most important Institutions/stakeholders in order for you to carry out and anchor your Action Plan

4.4 Do you intend to develop internal mechanisms supporting the Covenant in case of local or national government changes?

+ Policies, case studies, good/best practices, References

CoM SSA Technical Guidebook, 2018 Planned Time Table

- End of March, Comments on Energy Access document
+ Draft Table of Contents
- End of August, First Draft for comments from Consortium + DG DEVCO
- September, Comments + Check + Regional Global Coherence
- End of September, Final Draft

Questions to CoM SSA Consortium & Partners in relation to CoM SSA Guidebook preparation

Input/Suggestions/Recommendations asked by the JRC to the CoM SSA Consortium & partners (31/1/2018, non exhaustive, possible additional requests/topics to be discussed)

- Targets (Quantitative, Qualitative ? INDC ?.....)
- Reference years ? Time frame suggested for implementation, including submission & monitoring of the plan
- Reporting platform used presently or to be considered in the future
- Quantitative results achieved by SSA cities in local sustainability initiatives
- Examples of convincing policies/programmes/measures , best practices & case studies in urban local sustainability in SSA : Mitigation, adaptation, access to energy & electricity, waste management (Reducing, re-using, recycling, conversion to energy……), water management, renewables use & production……
- Suggested indicators about access to energy & electricity and access to clean water
- If cities face difficulties in data collection, any databases (global/regional) which could serve as reference/starting point?
- Connections CoM SSA with Global CoM ?

The role of JRC

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Scientific-technical support to the development, implementation and monitoring of the CoM

- Research on existing methodologies and tools for the development of a SEAP (with recent inclusion of adaptation to climate change)
- Development of the guidebook "How to develop a (SEAP)" + its adaptation to CoM East and CoM South
- Continuous improvement of data collection process
- Evaluation of submitted SEAPs, with feedback to Covenant cities
- Development of a specific monitoring template & instructions for signatories
- Overall assessment of the CoM and publication of reports
- Publication of a report on the in-depth analysis of 25 SEAPs
- Capacity building (technical trainings for cities and regions)

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The role of JRC in CoM East, South

European Commission

- **Methodological adaptation** of the Covenant approach to take into account the specific situation of:
  - **Eastern Partnership & Central Asia;**
  - **ENPI (European Neighbourhood & Partnership Instrument)-South countries (publication of two specific Guidebooks)**
- SEAP **Evaluation** with feedback to cities
- **Training** of trainers on the Covenant approach (e.g. workshops for city officers and/or for the technicians working for the CES-MED local focal points)

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JRC Administrative Arrangement with DG DEVCO for 36 months with "the purpose …. to provide support to the Covenant of Mayors: sustainable energy planning in cities in Sub-Saharan Africa with adapted methodologies and reporting tools"

1) Methodology adaptation and reporting tools :

Adaption of the methodology to develop Sustainable Energy Access and Climate Action Plans (SEACAPs) and Emission Inventories (EIs) taking into account the specificity and needs of cities in Sub-Saharan Africa.

Energy access will be given particular relevance.

Identification of **Specific Key Performance Indicators (KPIs)** to allow for monitoring and tracking progress of cities towards the Covenant goals.

These will be described in **guidance material** made available to cities.

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1) Methodology adaptation and reporting tools :

- Development of reporting tool for SEACAPs and monitoring either as an Excel tool to use offline or as an online application.
- The methodological tools take into account and allow the possibility for cities to use a variety of EI/monitoring/progress tracking tools (including the ones promoted by the Compact of Mayors)
- Application to perform automatic checks on the data inserted in the SEACAP and monitoring templates
- The methodology will be developed in close cooperation with CoM SSA Office (Work Package 5)

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2) Guidebook for SSA local and national authorities

Adaptation of the documents and the experience of the CoM in the EU and ENPI (especially South) to support SSA actors to improve their capacities and to design, facilitate and implement SEACAPs.

The Guidebook (How to develop, implement & monitor SEACAP ?) will include the experiences from the field with input from CoMO SSA Consortium partners.

JRC will share the draft Guidebook with CoMO SSA for comments before finalization.

3) Assistance in developing SEACAPs (including Emission Inventories EI):

The JRC will assist the CfP selected cities in the preparatory activities for SEACAP development as well as for the regular related monitoring processes. The aim is to build capacity of cities' officers and not to play the role of a consultant for the direct elaboration of the Baseline Emission Inventories BEI / SEACAP.

Overall, up to 45 cities will be assisted in SEACAP preparation, including the revision of draft SEACAPs.

4) SEACAPs Assessment

- Review (not formal approval) of draft SEACAPs before the approval by the respective city councils.
- Formal assessment, approval and feedback to cities of SEACAPs submitted by cities based on the templates (up to 40 SEACAPs per year). The template and feedback should be provided in English and French.

5) Training

Provide support to the cities in their process of capacity building in regional workshop or webinars (identifying their needs, the necessary internal capacities to acquire and the possible external support and network of consultants that they can rely on).

The JRC will provide training to city officers in regional workshop or webinars to identify appropriate data sources and methodologies for SEACAP preparation (including KPIs).

The workshops are going to be organised by the CoM Office SSA, the JRC will participate to **max 4 workshops**

Agenda, content and materials will be discussed with CoMO SSA prior to each training. The CoMO SSA will identify the most appropriate location and target groups for the trainings.

6) Help Desk

A CoMO SSA helpdesk will link the request for assistance coming from signatory cities and other Covenant stakeholders: the helpdesk will be jointly operated by the CoMO-SSA technical assistance platform and the JRC.

JRC will operate the "2nd line technical helpdesk" in English and French, replying (via telephone, e-mail, etc.) to scientific-technical questions that cannot be answered based on published guidance material and/or relate to new methodological developments.

7) Evaluation

In-depth evaluation of up to 10 SEACAPs: The JRC will carry out an in-depth evaluation of a sample of SEACAPs (well-balanced as regards the size, typology and geographical location of signatories) in order to identify case studies and lessons learned which could be disseminated by the CoMO SSA.

Overall assessment: The JRC will carry out an overall assessment of the CoM SSA, based on the data from submitted SEACAPs and related EIs. This assessment will be complementary to CoMO SSA's work on impact oriented monitoring and evaluation under WP6.

JRC publication on CoM

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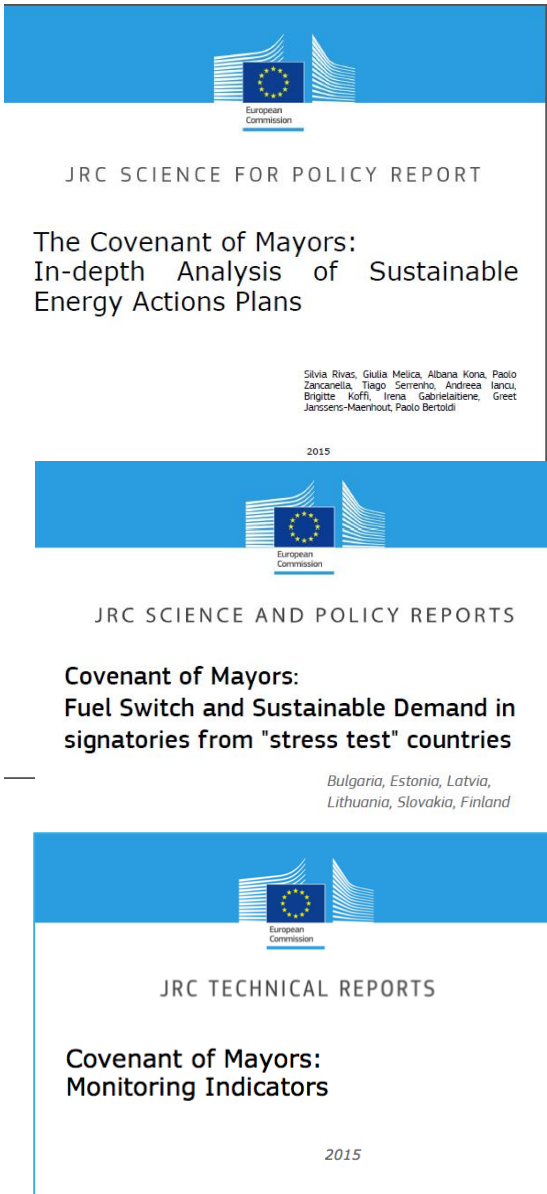
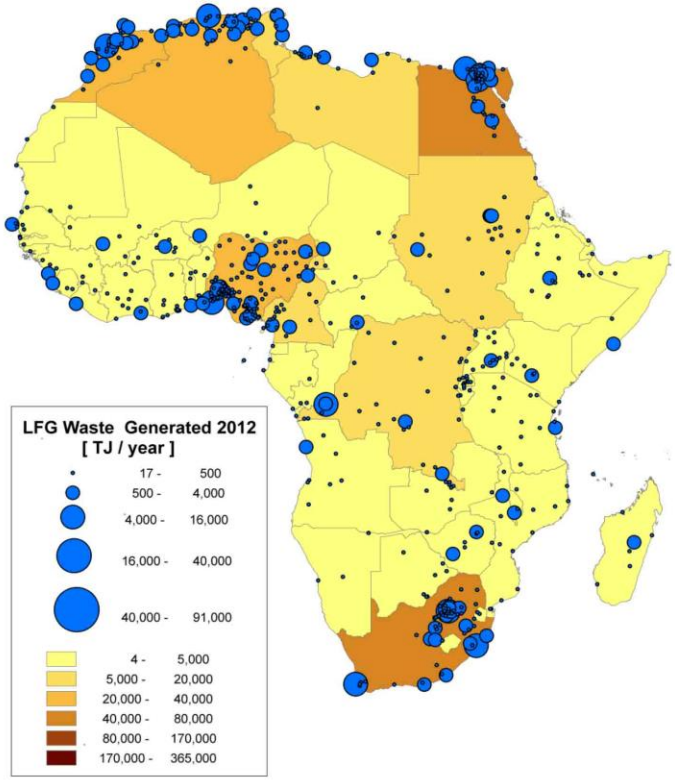
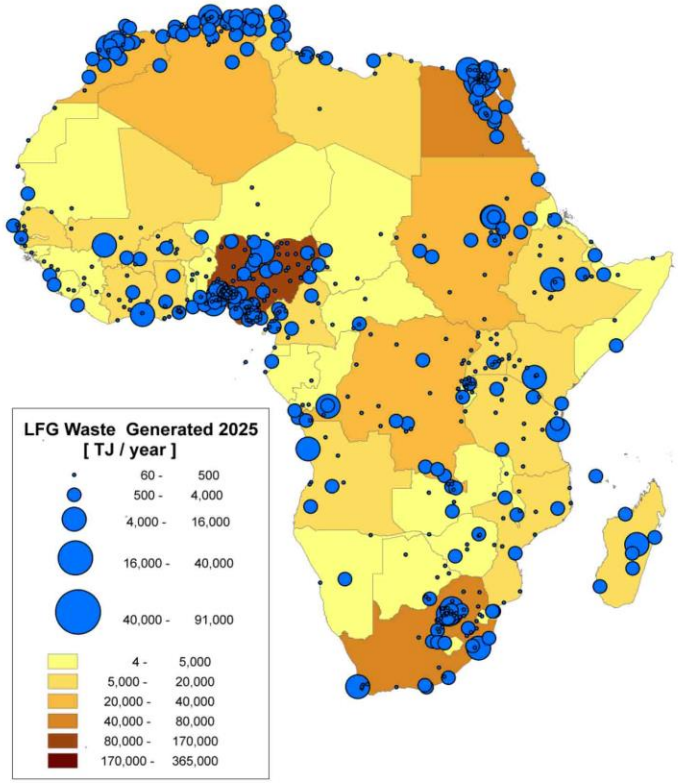
The twenty-second session of the Conference of the Parties: European Union Energy Day- Energy for Cities

Marrakech, November 14th 2016



Assessment of energy potential from Municipal Solid Waste in Africa (LFG = Land Fill Gas)





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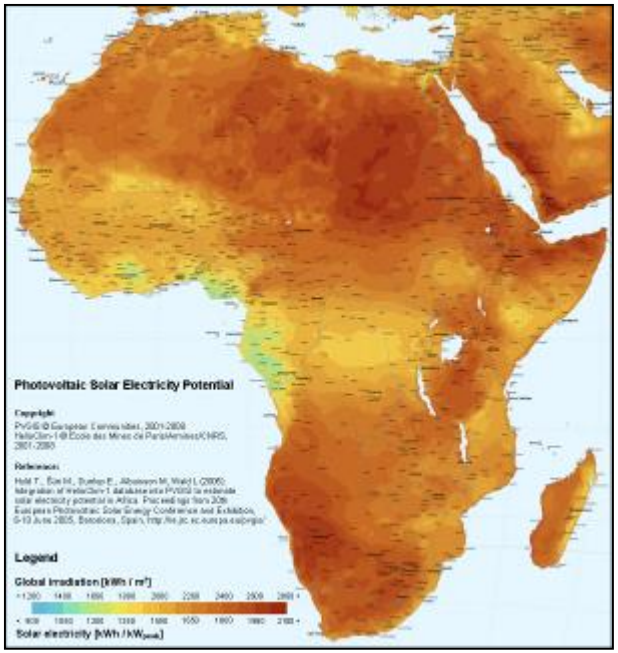
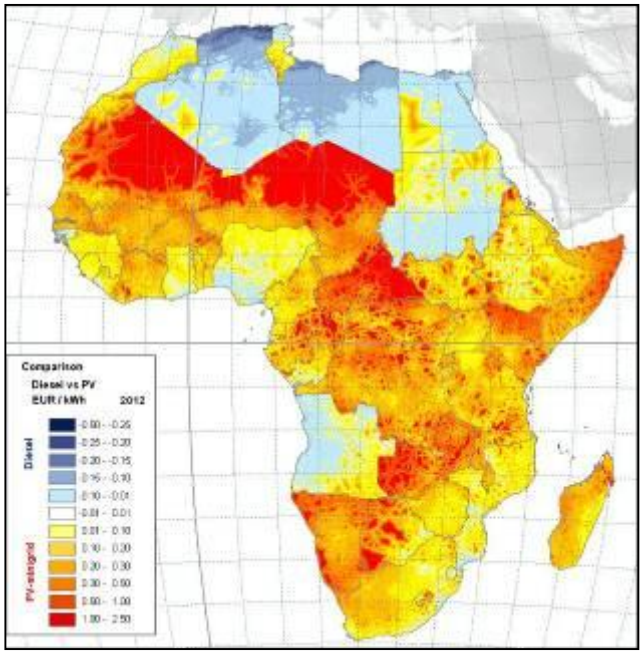
Opportunities for renewables in Africa…..

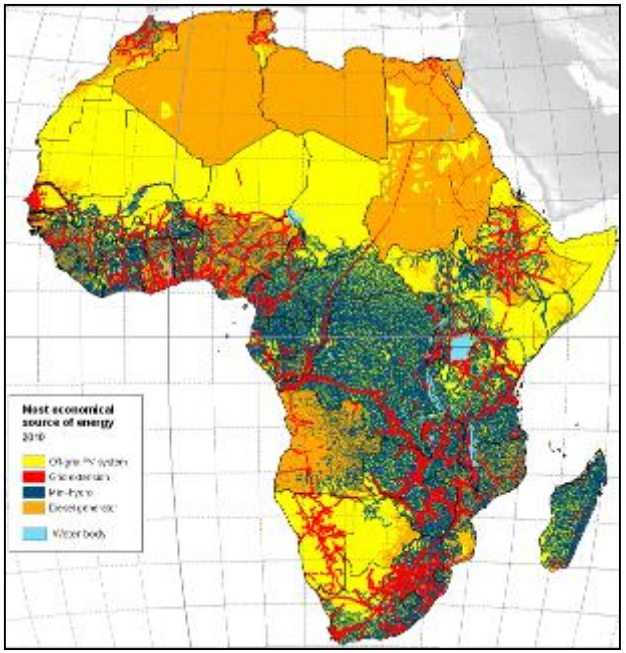
Photo Voltaic Solar electricity potential



Technology Comparison: Solar PV vs. Diesel



A continental vision… … for different solutions…



Source: Szabó,S.; Bódis,K.; Huld, T. 2012

European Commission

JRC Scientific and Technical Reports

Renewable energies in Africa

Current knowledge

A. Belward, B. Bisselink, K. Bódis, A. Brink, J.-F. Dallemand, A. de Roo, T. Huld, F. Kayitakire, P. Mayaux, M. Moner-Girona, H. Ossenbrink, I. Pinedo, H. Sint, J. Thielen, S. Szabó, U. Tromboni, L. Willemen

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The availability of renewable energies in a changing Africa

Assessing climate and non-climate effects

Authors: E. Bartholomé, A. Belward, K. Bódis, F. Bouraoui, J.-F. Dallemand, T. Huld, M. Gaetani, A. Jaeger-Waldau, P. Mayaux, M. Moner-Girona, F. Monforti, V. Motola, H. Ossenbrink, L. Pozzoli, S. Russo, N. Scarlat, J. Skøien, S. Szabó, J. Thielen, E. Vignati

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Joint Research Centre

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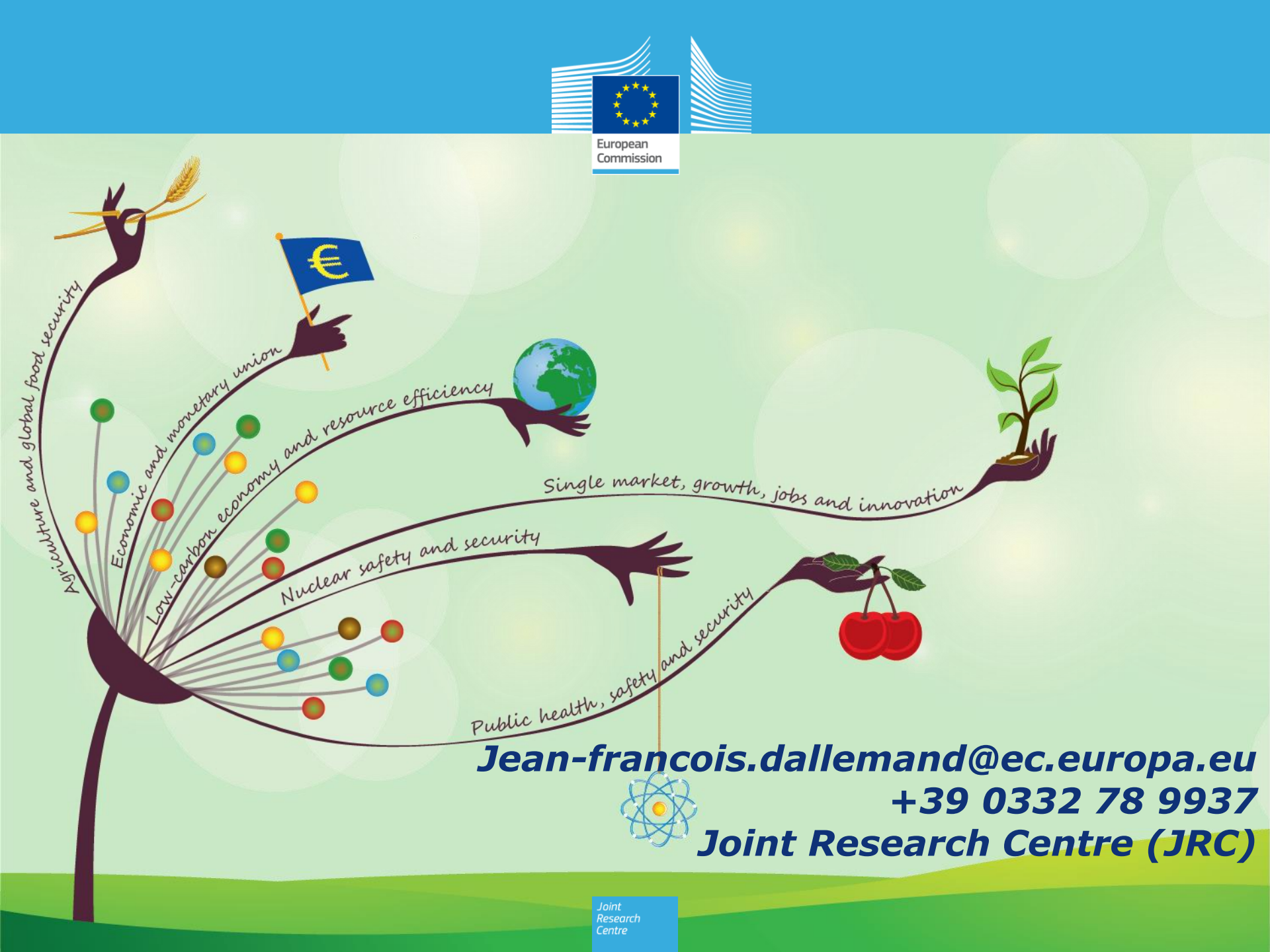
Conclusions

Output:

Tec/Scient. content
+ Society relevant
+ Specific but compatible
+ Public Private Partnership/Funding mechanisms for implementation ?



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