

POTENTIAL, POLICIES, FINANCING, AND
DE-RISKING IN RENEWABLE ENERGY SECTOR
IN AFRICA



Décembre 2017

Disclaimer: This report is an attempt to explore the complex yet important and solvable problem of energy access in Africa. Our estimates and analyses reflect the precision and estimates we had access to and should not be taken at their face value, rather in the context of the analysis alone. We received helpful comments and contributions from ADI's directorate of publications, and would like to extend our gratitude to them. All other flaws and errors in the report are ours.

L'AFRIQUE DES IDÉES PRESENTATION



Boris HOUENOU

PhD (2018) in Economics, Washington State University

Partner at Afrique Metrics

Chief Research Officer at Afrique des Idées



Prudence DATO

Doctorat en Sciences Economiques, Université Grenoble Alpes

Attaché Temporaire Enseignement et Recherche

Université Savoie Mont Blanc.



Ivan MEBODO

Doctorant en Economie (Cameroun)

Tables of contents

Executive Summary	6
Introduction.....	7
1. Abundant renewable energy sources but poor access to energy in Africa: Overview of the potential of renewable energy in Africa.....	8
a. More than 50% of Africans do not have access to electricity in 2016	8
b. Abundance of resources yet poor access to energy.....	8
c. Potential re-assessed: Entrepreneurship, Investments and Global partnership focus	11
2. Ambitious Targets for unmatched investments: Translating targets into working policies.....	14
a. Renewable energy targets and investments' performance: A Review	14
b. Policy analysis: Countries standing out in policies and Benchmarking enabling factors and downsizing poor policy environment.....	16
c. Policy landscape in Africa: countries success stories and areas of improvement	18
3. Anticipating the future: Labor force anticipation, Education, Maintenance, and Quality	24
4. Suggestive Policies and concluding remarks	27
Appendix	29
Bibliography.....	32

List of tables

Table 1: Renewable energy capacities in Africa (2015)	10
Table 2 : Risk to investments in RE in Africa	20
Table 3 : Major organizations and their objectives	29
Table 4 : Integration of renewable energy into the Electrical system	31

List of figures

Figure 1: Renewable energy use in Africa in 2013 and a projection for 2030	10
Figure 2 : New Investments in Renewable Energy Africa & Middle-East Chart	15
Figure 3 : Human Capital formation in the renewable sector worldwide.....	23
Figure 4 : Human capital formation breakdown by renewable energy type for Africa and Europe	26

KEY MESSAGE

Poor access to electricity in Africa

- ❖ Installed capacity on the rise but a large proportion of the population still lives without electricity: 20% increase in supply over a decade, yet 600 million have no access to electricity
- ❖ Rise in supply is driven by recent investments in renewable energy which gains cost competitiveness again conventional electricity.

Low investments

- ❖ Growth in new investments, after a 300% jump in 2012 it starts slacking around 50% in 2015
- ❖ Fluctuated growth but the trend is positive on average
- ❖ Growth driven by Morocco and South-Africa both in terms of local and foreign investments attraction

Ambitious targets, yet poor policy targets

- ❖ Poorly structured policy tools lacking favorable institutional landscape
- ❖ Risk management in the sector is at its infancy
- ❖ Multi-risk landscape: mainly political, operational, exchange rate and currency
- ❖ Morocco, Kenya, Rwanda and South Africa are fair success stories to learn from

Recommendations for countries

- ❖ Explore alternative financing tools, and develop a very strong and pro-active Public-Private Partnerships for investments in the sector
- ❖ Accelerate reforms and lay out working and ambitious fiscal policies that signal countries' commitment to attract investments
- ❖ Work on operative regional platforms, especially around large-scale projects and anticipate the labor force and human capital development to gear up for the near future needs of the sustainable renewable energy sector

Executive Summary

600 million Africans have no access to electricity while the energy sources, especially renewable energies (RE) abound on the continent. Its key features: environment friendly, availability and its recent cost competitiveness gains over fossil energy; make renewable energy an excellent avenue to start an energy revolution in African. However, having affordable, sustainable and smooth access to energy has a cost. Public policy in investments promotion and risk mitigation in the RE sector are among other issues on which African Government should work on.

After re-evaluating the potential of the continent in terms of renewable energy sources, and the energy needs in various sectors, we note the significant gap between the installed capacities and forecasted energy mix needs. We assess the investment needs in light of the renewable energy targets of African countries. Strong competition for capital exists in the sector, between developed and developing countries, and also within developing countries. We point out how countries are performing with regard to putting in place incentives for investors, while contrasting national and regional performance disparities. After the near future projections of the continent's labor force, human capital formation, maintenance and quality in the scenario where investments and subsequent policies are in place, we suggest avenues of actions in attracting and substantiating investments, de-risking the sector, and taking advantage of the potential of the continent.

We find that, in terms of installed energy capacity and policies, countries perform very differently with, for instance, Morocco and South Africa leading the way, to attract most of the foreign and domestic investments. At the regional level, Northern and Eastern Africa show strong commitment by laying out ambitious incentives tools and fiscal policies. West Africa has strong regional platforms, with aspirations that are yet to be operational. Regarding small-scale projects, most countries have several ongoing projects, at least to address the energy needs of local communities. However, Morocco is the only country that has a Concentrated Solar Plant (CSP), while a few other countries are host to several large-scale projects. Most African countries are lagging behind in terms of labor force anticipation and human capital training for maintenance, implying the need for better forecasting of critical areas that will affect the sustainable, renewable energy sector in the long run.

In the light of those findings, we recommend that:

1. African countries explore alternative financing tools, or better still, develop very strong and pro-active Public-Private Partnerships for investments in the sector.
2. African countries accelerate reforms and lay out working and ambitious fiscal policies that signal their commitment to attract investments.
3. African countries work on operative regional platforms, especially around large-scale projects, and anticipate the labor force and human capital development to gear up for the near future needs of the sustainable renewable energy sector.

Introduction

Despite the recent advances in green energy, most African countries cannot deliver full access to electricity and affordable energy to their population. With technological progress, the spate of possibilities has suddenly expanded, as obstacles to financial access have been reduced significantly, thus opening the door to a competitive renewable energy cost. An interesting takeaway from the 2016 Paris Agreement was that developed countries have pledged to invest \$100 billion yearly - between 2020 and 2025 - in climate friendly solutions to support developing countries. Africa is poised to make the most of such valuable opportunities, given the continent's considerable energy resources. Things are evolving in the right direction although the so-called "natural resources curse" applies here more than anywhere else. Though fragmented, a market has begun to emerge. Africa needs to increase its energy production, and this will be possible only by taking the next big step into a newer, more affordable and sustainable renewable energy sector. In most African countries¹, as the political willingness to pave the landscape for an ideal environment where investments and entrepreneurship can thrive increases, a revolution in the sector is slowly unfolding. Highlighting the importance of large and effective investments along with policy incentives, regional integration around large-scale projects, development of standards, quality and anticipating the labor force demand in the maintenance sector; are conditions that must be met to build a successful strategy.

The rest of the report is organized as follows: in section one we explore the problem; section two lays out the facts; section three analyzes causes and consequences, mainly incentives and policies; while section four contains recommendations following the findings.

¹ Morocco, Kenya, Rwanda, Ghana, Togo for instance

1. Abundant renewable energy sources but poor access to energy in Africa: Overview of the potential of renewable energy in Africa

In this section, we revisited the potential of renewable energy in Africa along with the energy needs that await many countries.

a. More than 50% of Africans do not have access to electricity in 2016

The large proportion of Africans without access to electricity, and the rise in absolute terms of the numbers of undeserved electricity needs contrast with the abundant energy resources... Only 37.5% of sub-Saharan African populations had access to electricity in 2014 (The World Bank, 2014)². Even though, it represents a tremendous increase of 20% over a decade, almost 600 million Africans are still left behind (CNN, 2016)³ more than a century after Nikola Tesla ushered humanity to commercial electricity. Electricity has been a game changer in terms of economic progress and its incredible potential is unexplored in Africa. Another game changer triggered a recent story of energy affordability in Africa. The output of renewable energy as a percentage of total electricity output has grown by 38% in a decade, while electricity production from renewable sources, excluding hydroelectric in kwh has grown to 400% within the same period (The World Bank, 2014)⁴. The cost competitiveness of renewable energy and the escalating innovative solutions that shorten the path of energy access to low income countries (people) are unique opportunities for Africa.

If added to the abundant sources of renewable energies, Africa is undoubtedly on the way to experiencing an important revolution that can accelerate the growth of the share of the population (empowered) brought from “darkness” to “light” at an untold pace. The key to unlocking economic growth, the revolution of healthcare, education (all as human capital building initiatives), infrastructure gearing and social safety nets for public goods (to empower the vibrant young population to become the engine of a sustainable development) are all hinged on the massive investments that the energy sector requires in Africa. Nevertheless, Africa has to clear some unfinished business that involve the enduring issues of poor performing institutions, regulation capture risk among other preventable (manageable) risks that can impede the momentum of clean, affordable and sustainable energy access.

b. Abundance of resources yet poor access to energy

Abundant renewable energy offers a tremendous opportunity to reduce poor energy access and limit firewood share in energy mix in the near future... Access to energy is crucial for economic and social development due to its indispensable contribution to any production activity. The world is facing a double challenge: (i) increasing supply and access to power for people who do not have it and (ii) reducing the use of fossil energy. Although Africa is

² <http://data.worldbank.org/indicator/EG.ELC.RNWX.KH?locations=ZG&start=2004>

³ <http://www.cnn.com/2016/04/01/africa/africa-state-of-electricity-feat/index.html>

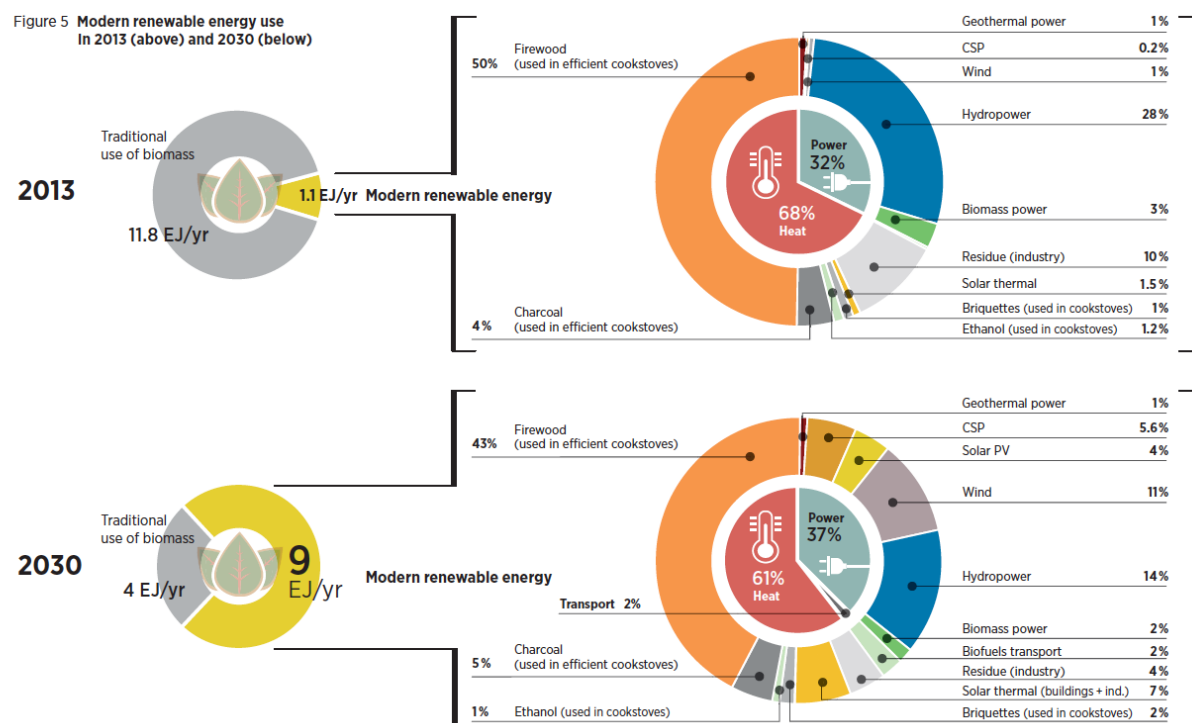
⁴ (The World Bank, 2014).

endowed with enormous energy resources (i.e. wind, solar, water), more than 620 million people in sub-Saharan Africa (two-thirds of the population) live without electricity and 950 million people are expected to gain access to electricity in sub-Saharan Africa by 2040 (IEA, 2014). Most of this population lives in rural and remote areas and relies on firewood for cooking or heating their houses. In these places, the nearest electricity grid infrastructure's capacity is already constrained (i.e. unreliable and overloaded), which makes any grid extension very costly. In this context, electricity generation with renewable sources could be particularly suitable for such decentralized energy systems, while also contributing to fighting climate change.

Renewable energy adoption can offer multiple benefits and opportunities in Africa. It can efficiently provide basic access to electricity to communities and households in remote areas. For example, RE can be used for lighting, communication, in schools, to power electrical appliances, and health facilities, which are all essential for poverty reduction. Moreover, as African countries are capital-constrained, RE technologies would be suitable for its low-investment requirements, at least for small scale systems (for instance: off-grid systems). Moreover, most renewable energy technologies use renewable sources (i.e. wind, solar, water), which are available and abundant in Africa. They also rely on local expertise that can drive multiple local employment opportunities. The RE sector is estimated to employ 8.3 million people worldwide and only about 61,000 in Africa (IRENA, 2017) and to provide more employment opportunities than fossil-based energy, due to higher labor intensity (Jacob et al. 2015). RE also offers off-grid electricity opportunities for agriculture (land preparation, planting and transplanting, weed control, harvesting, transport and irrigation, etc.), and to micro and small enterprises in Africa. Finally, independent power systems with RE such as micro-grids can also improve the energy supply in dense urban areas. They can either connect into the main grid or disconnect from it in the case of extreme weather events, or other national security risks.

The African continent has a large and diverse RE potential across various regions. The abundance and diversity of renewable energy resources could benefit countries by creating and connecting regional power pools. The main types of renewable resources that are exploitable in Africa are: solar, wind, biomass, hydropower, geothermal and biofuels. Currently, half of all energy consumption in Africa comes from biomass resources (mainly firewood) that have negative effects on health and the environment. Figure 1 shows that in 2013, traditional renewable energy (mainly firewood) supplied 56% of Africa's total final energy consumption, while the modern renewable energy (mainly hydropower) supplied only 5%.

Figure 1: Renewable energy use in Africa in 2013 and a projection for 2030



Source: Africa 2030: roadmap for a renewable energy future, IRENA (2015b).

It is expected that CSP⁵ and wind energy use will attain 5.6% and 11% respectively in 2030 against 0.2% and 1% in 2014, while firewood use will decrease from 50% to 43%. This is a key indication of the modernization of the RE sector. Although the African continent has abundant renewable resources, it has a small share (1.85%) of the cumulative renewable energy capacities with respect to the world's capacity (see Table 1). However, the continent presents a huge potential for renewable energy deployment in terms of both electricity generation and consumption.

Table 1: Renewable energy capacities in Africa (2015)

Types of RE	Hydropower	Marine energy	Wind energy	Solar energy	Bioenergy	Geothermal energy	Total
Capacity (in MW)	29 277	0	3 135	2 317	1 332	614	36 677
% of total capacity	79.82%	0%	8.55%	6.32%	3.63%	1.68%	100%
% of world capacity	1.85%	0%	0.73%	1.02%	1.29%	4.69%	1.85%

Source: Own computation from IRENA (2016)

In 2014, an IRENA report highlighted the vast potential for generating electricity from wind and solar in Africa, which is estimated at around 1 590 Petawatt hours (PWh) per year. Africa

⁵ Concentrating Solar Power Plant

could equally take advantage of its exceptional solar resource (due to its Saharan, Sahelian and tropical conditions) to produce cleaner electricity by means of solar photovoltaic (household and utility-scale) and concentrated solar power technologies (utility-scale). In this regard, Morocco inaugurated one of the most advanced CSP plants in Africa in 2016. Solar technologies are expected to provide 1 130 PWh of electricity annually, especially in Eastern Africa with a potential of 395 PWh, while wind technologies could potentially produce 460 PWh annually with Eastern Africa also leading with a capacity of 170 PWh. Hydropower is another abundant renewable resource in Africa. Half of the economically viable hydropower potential is already being exploited in the world. In Africa, 92% of the total potential has not yet been developed (IRENA and IEA-ETSAP, 2015). However, Central Africa concentrates about 40% of the continent's hydro resources (Hydropower and Dams, 2014). Geothermal energy and bioenergy have rather small potential with 15 gigawatts (Geothermal Energy Association, 2015), and 0- 3861111 gigawatt hour (IRENA, 2014), respectively. Considering all that potential, entrepreneurship has a margin of inventiveness in the sector.

c. Potential re-assessed: Entrepreneurship, Investments and Global partnership focus

Entrepreneurship, investments and global partnership must be facilitated and developed adequately. Entrepreneurship is playing a key role in promoting green technologies in Africa by creating and managing adequate, reliable and affordable energy services in remote areas and by helping to meet the Sustainable Development Goals (SDG). Models that build partnerships with local entrepreneurs have been proven to have better outcomes. Many studies have highlighted the expensive cost of green technologies and this is a major hindrance in developing countries. The entrepreneurial dynamic needs financial support to thrive. The financial aids would not be sustainable as already argued for some other financing development policies. Moreover, they generally provide less technical and managerial skills for local maintenance or sustainable deployment of green technologies. The offer of a package deal containing financial support and the possibility to enhance technical and managerial skills, especially human capital capacity building in renewable energy, is crucial for sustaining success in the sector. Another incentive to promote entrepreneurship would be to provide multiple benefits such as environment protection, economic profitability and local socio-economic development. For example, renewable energy equipments could be designed using low-cost technologies that require local materials. Consequently, solar panels can be produced locally at lower cost and would therefore be affordable for poor households.

Fortunately, there is an increasing interest in investments in the economic growth of Africa, mainly in the energy sector. According to the report from Havas Horizons (2016), international investors are very optimistic about the short and long term economic prospects in Africa. Ethiopia, Nigeria, Morocco, Ghana and Senegal are the top 5 African countries in which investors are willing to invest by 2020 because of their regulatory framework that enables and protects investments, but also because of the size and openness of the market. The investments will be mainly directed at the renewable energy sector which is the most

promising sector. Indeed, this sector is less risky (compared to the agricultural sector for instance) and it presents a huge potential. More precisely, 51% and 16% of investors state that solar energy and hydropower respectively, are the priority in Africa. Generally, investments in green technologies have become more attractive in developing countries than in developed countries. The availability of resources, the exploding demand (and inelastic potential) driven by a lack of substitutability with other forms of energy (the way it is in developed economies), are among factors that drive the profit margin. According to the report of the Renewable Energy Policy Network for the 21st Century (Ren21, 2016), investment in renewable energy was higher in the world's poorest countries than the richest ones for the first time in 2015. Given that most green innovation is concentrated in a few developed countries, there is a need to accelerate technology transfer to developing countries.

Facilitating access to green technology in Africa can play a crucial role in reducing poverty (directly) and strengthening existing development policies (indirectly). Green technology transfer provides relevant skills and capacity building at a local level, which can facilitate green entrepreneurship. This would require identifying the appropriate technologies (among all existing RE technologies), which have to be adapted to the African context. Both the technology transfer and capacity building are part of the commitments stated in the Paris Agreement (COP21). As the agreement was recently ratified by most of the leading countries, we would expect the implementation to follow. The Climate Technology Centre and Network (CTCN), which is the operational arm of the UNFCCC established by COP 16, facilitates the transfer of technologies by providing solutions, advice and capacity building. More precisely, the Centre promotes the accelerated transfer of green technologies for low carbon and climate resilient development at the request of developing countries. The recent withdrawal of the US will surely affect that agenda; however, most of the other leading countries confirm that they are bound to the agreement. Increased access to energy will positively impact productivity, education as well as healthcare access. As the correlation between education and accountable institutions is known, we then expect an indirect effect of energy access on development policies and the quality of institutions in the long run.

Without large scale green technology transfer to developing countries as stated in the Paris agreement, a large deployment in RE in Africa would lead to some negative outcomes. For example, in the absence of the necessary skills to maintain solar panels in rural areas, and despite the low initial cost of installing solar panels, people will have to reinvest to repair any malfunctions that may arise. Therefore, they will eventually spend more on external green technology solutions, leading to high dependence on these sources because solar panels are not produced locally. As a result, developing countries would not necessarily benefit from a large deployment of renewable energy without appropriate technologies transfer. This can even worsen their development strategies given the new challenge of intermittency that arises from using RE (example: sunlight between 6am to 5pm). This new challenge can be overcome by smart technologies that will require a large diffusion of other technologies such as a high quality and stable internet connection. RE is unique because a consumer can also be a producer, and therefore, smart technologies can facilitate a better production

schedule (that maximizes the available sunlight). Moreover, smart technologies will also enable efficient transmission and feed-in as well as efficient energy use by households and firms. In addition, developing countries should be careful about the euphoria of green energy that may redirect existing aids to green projects at the expense of other sectors of public goods. Indeed, it may be not socially efficient if it replaces investments in development projects such as building infrastructures, health, education, etc. During the negotiations at COP 22, developing countries called for a large share of investments in adaptation policies.

Africa, particularly its power sector, presents a huge opportunity for a high penetration of RE into the electricity grid. The benefits are multiple: from reducing CO₂ emissions to job creation and to reducing energy poverty. This will be possible only if the continent can deal with the technical, market and political challenges; and can implement appropriate incentive policies.

2. Ambitious Targets for unmatched investments: Translating targets into working policies

African countries claim ambitious targets, but insufficient investments and unattractive investment policies limit the efficacy of the legitimate goals.

a. Renewable energy targets and investments' performance: A Review

Investment pattern is heterogeneous and countries with highly structured mechanisms and dynamic economies tend to drag most of the investments. Others lag behind.

The proportion of energy needs in Africa has no comparable measure in the world since no other part of the world has so been lagged in terms of electricity access. The investment needs track coverage, efficiency, affordability of the energy requirements. In the face of that challenge, African countries exhibit two trends that do not necessarily add up.

The first trend is that Africa has one of the highest targeted shares for renewables in the World. Most African countries have reported an increase in renewable energy targets in 2015 (GSR6 2015). Though the targets might not be binding, they show strong aspiration and a serious commitment to creating a better future in terms of energy access. For instance, the majority of the 15 ECOWAS⁷ member countries completed their National Renewable Energy Actions Plans (NREAP⁸). At the same time, many Eastern African countries commit to ambitious targets and some of them are binding in countries like Rwanda. It is reported that "South Africa garnered another impressive step showing in the latest round of its renewable tendering program and began using the same model to support biofuels" (GSR 2015). However, those targets are not detailed and fall short in terms of planning either in the long run, or in covering other sectors where power is expected to reach and bring productivity and performance such as in, healthcare and transportation. Electricity is the most covered sector even though 80% of energy uses in Africa come from biomass, mostly devoted to heating (cooking). Equally dwarfed are the ambitious targets if they are not tractable to implementable policies. That situation stems from the non-binding and mostly aspirational targets, the poor design and arbitrage between the ambitions and the available resources to bring them to fruition.

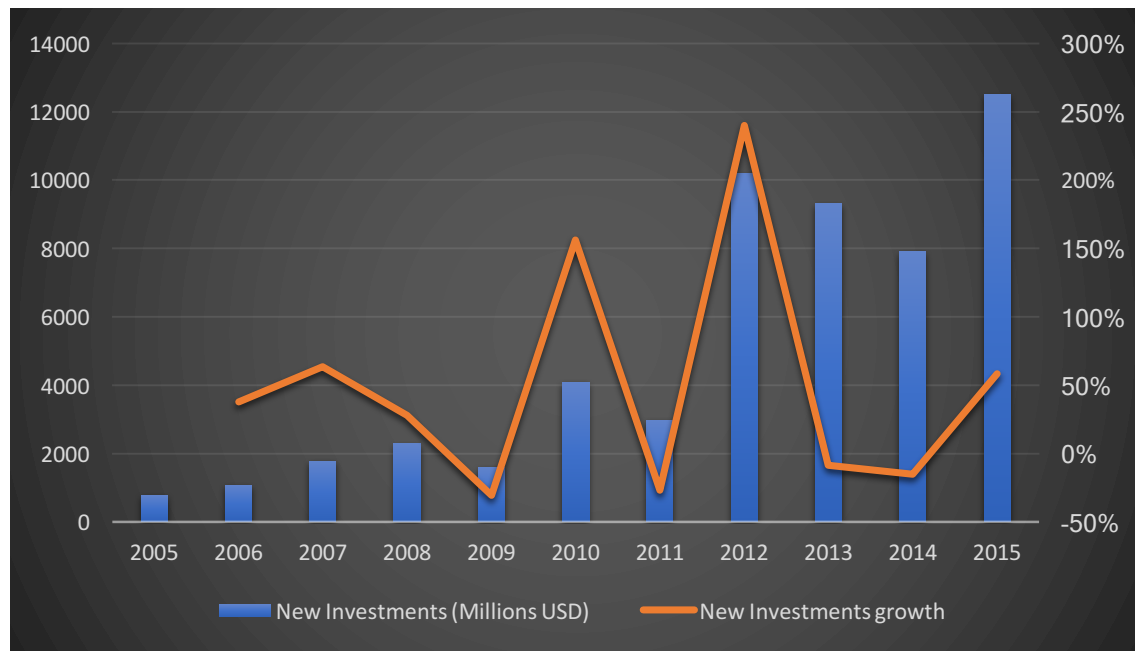
On the resources, many achievable targets hinged on investments. The new investments in renewable energy in Africa, in any proportion, are not comparable to the level of needs. Figure 2 represents the new investments in absolute terms and in percentage growth.

⁶ Global Status Report

⁷ Economic Community of West African States

⁸ Outlines the key actions that each member of the ECOWAS projects to take towards RE sector.

Figure 2 : New Investments in Renewable Energy Africa & Middle-East Chart



Source: Renewables 2016 · Global Status Report, REN21, 2017

This figure obviously hides the impetus in renewable energy investments from countries like Morocco and South Africa. South Africa's successful Renewable Energy Independent Power Producer Program (REIPPP) is a key driver of that increase. The Global Status Reports (REN21, 2017) point out that investments have rebounded to USD 4.5 billion in 2016, up from USD 1 billion in 2014 in South Africa. It is almost certain that this figure does not portray the state of affairs in investments in Africa, although, some other countries in Eastern and Northern Africa have also experienced an increase in investments. For instance, Morocco (the second largest investor in Africa) has poured about USD 2 billion, followed by Kenya (USD 357 million), Uganda (USD 134 million) and Ethiopia (USD 100 million). That is certainly the rosy part of the story. If the average investments in renewables have surged, the percentage growth is somewhat deceiving. Investments in renewables do not follow the pattern of the energy need of Africa. Moreover, in terms of investment types, the most innovative schemes are still lagged in Africa. Asset finance, venture capital, private equity and acquisition activities are limited on the continent compared to the level of acceleration needed and relative to other parts of the world. Most investment results from public market investments and small-scale distributed capacity that have been deployed in the last 2 years. In general, the attractiveness of the continent in terms of investments and innovative financing schemes is rigged by the poor environment and plagued with high levels of risk and uncertainty. Investors are therefore reticent in making unsecure deals even when renewable energy sources are abundant. The unfolding failure of Inga3 hydroelectric power in DRC⁹ is a typical illustration.

⁹ Democratic Republic of Congo

b. Policy analysis: Countries standing out in policies and Benchmarking enabling factors and downsizing poor policy environment

On the policy matrix, countries exhibit difference attached to their policies with Morocco, South Africa and recently Kenya and Rwanda leading the way, but still lagging behind the performance of other world giants in renewable energy.

Renewable energies require investments, and this has created some unprecedented competition for capital between various countries. African countries, besides the lag in management capacities in innovative finance schemes, have regulation and adapted policies shortage to impulse investments.

A simple survey of the newly deployed policy tools aiming to transform renewables targets into implementable actions reveals that African countries are mostly behind. For instance, in the electricity sector we can enumerate auctions or competitive solicitations, feed-in tariffs (FITs) or standard offer contracts, feed-in premiums (FIPs) or contracts for differences (CfDs), low-interest loans or revolving loan programs, renewables obligations or mandates, bilateral contracts¹⁰, tradable renewable energy certificates (RECs) or tradable green certificates (TGCs), net metering or net billing, tax incentives¹¹. Among the policy tools, many African countries, most of the time, tax incentives. In a later section, we develop the fiscal incentives and actions to limit the risk associated with investing in renewables. There are some rare cases of Bilateral contracts (direct negotiations with IPPs), like in Burkina Faso.

In the heating and cooling (cooking) sector, which accounts for the majority of the energy used in the continent, most countries experience dire policy deployment. For instance, some incentives in that sector cover (not limited) mandates¹², performance-based incentives¹³, soft-cost reduction ¹⁴ and low-interest or revolving loans. Kenya is experimenting with mandates policies but ongoing initiatives in other countries are scarce. Kenya outlays policies and strategies that address prefeasibility costs of projects (which quite often discouraged private investments), litigation settlement. In the appendix, we provide some major policies related to RE and cross cutting legal reforms (actions) contains in the Kenyan National Energy Policy (Ministry of Energy, 2004. sessional paper no. 4 on energy). In the following snapshot, we provide the main fiscal policies that the Kenyan Government has developed to ensure the mobilization of financial resources.

¹⁰ Direct negotiations with IPP (Independent Power Producer)

¹¹ For instance, investment tax credits, production tax credits, accelerated depreciation, VAT (Value added tax) and duty exemptions

¹² Minimum share of RES-H&C (Renewable energy sources of heating/cooling) use on public buildings, new construction, households, etc.

¹³ Renewable heating/ cooling production incentives in USD/kWh

¹⁴ For instance, training and certification, streamlining permitting for district heating/cooling, etc.

Working Fiscal Policies: Kenya's Snapshot

Electric power development by its very nature is capital intensive and the volume of funds needed to implement a power generation project can hardly be mobilized entirely from local sources. Furthermore, the response by the private sector in this area since the liberalization of the power generation segment in 1996 has been lukewarm. Our fiscal regime has not helped to improve this situation. Specifically, the income tax regime has been cited by potential developers as wanting and should be made more attractive in order to get more competitive generation tariffs.

To address these constraints, the Government will in the medium to long term review the fiscal regime applicable to the energy sector with a view to granting :

- a. fifteen (15) year income tax holidays for hydroelectric projects whose installed capacity will not be less than 50 MW; 10 years for projects of between 20 MW and 49 MW, and 7 years for those below 20 MW but not less than 1 MW;
- b. ten (10) year tax holiday for geothermal and fossil fuel power plants of at least 50 MW, 7 years for plants of between 30 MW and 49 MW and 5 years for plants between 29 MW and 10 MW;
- c. ten-year tax holiday for power plants using renewable energy including biomass;
- d. tax holidays on dividend incomes from investments made on domestic energy sources for seven (7) years; and,
- e. income tax exemption on interest incomes to domestic creditors including commercial banks and institutional investors extending loans, with repayment periods of at least seven (7) years, to companies engaged in power generation, transmission and distribution for the duration of their loans.,
- f. continuing the current fiscal policy of allowing the procurement of plants, equipment and related accessories for generation and transmission projects free of duty and taxes during project implementation. The procurement of major spare parts for the power plants, transmission and distribution systems including high voltage conductors will also be exempted from duty and taxes;
- g. exempting public electricity suppliers from income tax subject to expanding the network at a cost equivalent to foregone income tax in the preceding year on an annual basis. The ERC will monitor compliance and report back to the Minister for Finance on the amounts spent annually. In the event that such amounts are less than the foregone income taxes, the same will be liable for collection as income tax and treated as late payment attracting appropriate penalties under the Income Tax Act, Cap 470. This policy will be in place until the countrywide electricity access rate is above 70%;
- h. Promoting biomass-based power generation projects; and,
- i. Granting income tax holidays to investors in new oil refining facilities for a period of between 5 and 10 years depending on the size of the investment, in addition to allowing duty free imports for the construction of such refineries.

Source: Kenya National Energy Policy

Transportation is another sector where renewables incentives are yet to be generalized in Africa. Because it is an important source of CO₂ emissions, it lends itself to viable and implementable incentive schemes. Indeed, transportation like in other parts of the world, appeals for more incentive tools. Among the most readily available policy tools, we can name biofuels production subsidies, competitive tendering (for biofuel production facilities for instance), biofuel blending mandates and grant and direct subsidies (a.k.a advanced biofuels). Those policies are levers to investments but also to employment and economic development. If some tools are only policy dependent (mainly the mandates), the other relate to the economic dynamism and business enabling environment. As long as a country performs poorly in those areas, poorly scaled incentives are more likely to be the spillovers rather than the causes.

In more coordinated efforts, the economies of scope enable some parts of Africa to translate, at least in planning, targets into policy tools. For example, IRENA, (2016) reports that "ECOWAS Member States are taking the NREAP¹⁵ process one step further in terms of both detail and specificity by developing Investment Prospectuses (ECREEE, n.d.)." The plan underscores specific investment opportunities designed to accelerate the achievement of the regional target. Yet, more efforts are needed to turn regional targets into effective national targets which can become investments viable projects.

c. Policy landscape in Africa: countries success stories and areas of improvement

Regional institutions do not necessarily guarantee a jumpstart of working policies and heterogeneity persists in risk management policies, fiscal policies, the necessary regulation of natural monopolies and their relationships with newly investments landscape in the sector, the adoption of smart and modern tools in renewable energy funding, production and distribution as well as human capital formation in the sector.

If geography does not determine policies to outperform, RE policy proves to be more successful in northern and southern Africa, than central and western Africa. Again, institutions, information, and capital may have made the difference. Also, a huge potential does not necessarily translate into viable energy penetration. For instance, holding 50% of Africa's total hydropower (UNIDO, 2009) does not prevent the DRC from being the country with the least penetration of RE. In fact, coherent, cohesive and long-run policies are conducive to vital results in RE development. A context of poor leadership that cannot clearly give direction reveals to be unsuccessful to RE development. Furthermore, bad experiences of unprepared (uninformed) adoption of RE technologies as well as the mismatch between the supply cost and the income level may be disruptive to RE penetration. In the last decade, many projects in Africa, for example street lights in Lagos (Nigeria), fail to calibrate their deployment with regard to those parameters.

¹⁵ National Renewable Energy Action Plan

If the recent trends show that many countries develop ad hoc institutions to handle RE policy, we are forced to notice that these decisions are mostly aspirational and the institutions are not equipped with the effective legal or regulatory framework. Moreover, those institutions may face incompetency and unclear missions. In Sub-Saharan Africa, except South Africa, most of the institutions devoted to RE are recent (only created in last decade) taking the form of agencies, state-owned entities or public authorities in charge of RE promotion. Among some examples, we have Agence Nationale pour les Énergies Renouvelables (ANER of Senegal, Tunisia, and Benin), New and Renewable Energy Authority (Egypt), MASEN (Morocco), and Geothermal Development Company (Kenya). In terms of institutional change, the influence of interest groups (political) who already achieved regulation capture in the conventional energy sector (fossil-based energy), the rent-seeking behavior emerging from interest groups, the incumbent business models and practices as well as the fear of uncertainty (due to non-available information) are all together hindering factors. It then takes a clear and benevolent leadership to foster credible and effective institutional frameworks that develop rules, provide information; and implement and monitor policies to achieve increased investments, penetration of RE, and efficiency. If institutional change is a key to RE development in Africa, investments and financing are even a giant that need to be beheaded to extract the potential that the continent has. Putting viable and working legal frameworks that attract and protect investments, faster and independent judiciary system as well as proactive Public-Private Partnerships tools are essential.

"De-risking¹⁶" the sector is an inevitable path to attractiveness for the RE sector. Then fiscal incentives, auctions mechanisms, feed-in tariffs and Public-Private Partnership (PPP), as well as alternatives financing schemes must be explored. With de-risking, political risk, regulation capture risk (corruption), change of law risk, property rights protection risk, currency risk, counterpart risk, operational risk and support regimes risk are among the main to consider. We provide in table 2 a description of some risks, their degrees and the solutions to downsize them.

¹⁶ Refers to legal, political and economic actions intend to reduce or eliminate the risk associated to a sector or activity.

Table 2 : Risk to investments in RE in Africa

Risks, level and mitigation			
Risk	Description	Level of severity	Mitigation
Political Risk rule of law; expropriation; war/civil disturbance; convertibility/ remittability risk; political Force Majeure (FM) (war, including civil war); and compliance with contracts.	Political risk is by far the most imminent threat to RE investments given that its spillovers are operational and performance risks, loose property rights protection, judiciary risk and more. Countries are diversely ranked in that matter.	Recent research from the UK's DECC ¹⁷ (2014) suggests that the principal concern relates to payment delays under PPAs (Power Purchase Agreements) rather than real or stealth expropriation or total non-performance. Unrest and civil war devastated countries are located in each region of Africa. However, some new emerging democratic regimes offer stability that lower political risk.	Political risk is best managed through a range of measures including: careful choice of partners; good diligence, structuring and contingency planning; a strong and fair PPA/investment agreement; clear government commitments; political risk insurance such as Multilateral Investment Guarantee Agency (MIGA); access to BIT ¹⁸ and use of offshore arbitration; and involvement of multilateral and development finance institutions and export credit agencies.
Corruption risk	It involves regulation capture as well as bribery. Wining against corruption is a titanic challenge in investing in projects. It is critical to ensure that PPAs and concessions are obtained in a fair, transparent way.	Where the governance and institutions are weak, corruption is strong. Transparency International annual report on the issue is a guide to check good partners. However, some heterogeneities may apply.	Ensure robust ABC due diligence and "know your client" work is undertaken early, and that politically exposed persons (PEPs) are identified. Projects should have robust and effective compliance systems to manage this, particularly with regard to government officials and PEPs. Make use of precautions in dealing with PEPs.
Change of law risk	Change of law adversely affects the viability of the project. It can also affect the performance and operations and timely delivery of the output.	If corruption is high, there is risk of change of law and any political risk exacerbates the situation.	Clear court regime and judiciary performance are at stake here. If they work, change of law risk is reduced.
Property rights protection risk	It involves expropriation and imitation of projects.	A poor judiciary system (in term on delays, enforcements and impartiality) is a critical signal to watch for.	Think of extra-territorial justice system in the due diligence.
Currency risk	Exposure to volatile local currencies may not provide for sufficient long-term certainty for equity investors or lenders.	Many countries face that risk. Some like XOF ¹⁹ monetary zone is less exposed.	Given limited market capacity for affordable long-term FX ²⁰ hedging, it is still the norm in many countries for project revenues to be in hard currency.
Support regimes	Change in policy reducing the economic viability of the project (e.g. by loss of subsidy, tax credit).	If the tax credit or subsidy is not through lawmaker's rule, be aware of its change. Moreover, an instable political system is exposed to such support regimes changes.	Where incentive regimes exist at law, some export credit agencies ("ECAs") and IFI ²¹ 's will offer policy risk insurance (e.g. Overseas Private Investment Corporation ("OPIC")).

Source: Authors and Linklaters (2015)

¹⁷ "Policy Risk in Renewable Energy Investments in Developing Countries" dated July 2014 by Cambridge Economic Policy Associates Ltd, for the UK Department of Energy and Climate Change (DECC)"

¹⁸ Bilateral Investments Treaties

¹⁹ Local currency used by 13 French speaking countries in Africa

²⁰ Foreign Exchange

²¹ International Financial Institutions

Fiscal incentives can be a valuable tool to finance RE. Subsidizing, rebate or removing tax are among the most implemented fiscal incentives. For instance, Botswana, South Africa, Egypt, Mauritius, Zambia, Tanzania, and Uganda rebate for RE technologies, Cameroon and Burkina Faso have removed the value-added tax on all renewable energy products, whereas Madagascar has reduced import taxes for renewable energy equipment (IASS, 2016).

Fiscal policies have more to offer in investing in RE. Tax credit for large scale investments should be explored further. Many African countries are using the feed-in tariffs (Algeria, Egypt, Ghana, Kenya, Nigeria, Rwanda, Senegal, Tanzania, and Uganda) (REN21 2015). More are building on those models when there is no need to review the energy law code before implementation. Auction mechanisms are not only theoretically valid to introduce some competition (increases the welfare) in rare resources sector where natural monopoly is pervasive, they are true and effective tools in the RE sector.

In most African countries, the energy sector is traditionally a state-owned monopoly operated by national electricity companies. Giving preference or relying only on those entities to invest in and develop RE may widen the existing demand and supply gap. Ever since, auctioning renewable sources (project) to attract investors is becoming handy. Following South Africa's success story in up-scaling an installed renewable energy capacity for the construction and supply of 3 625 MW of large-scale (>5MW), and Morocco's experience with the largest concentrated Solar Power (CSP) of 500 MW in 2012 (IRENA 2013b). Akon Lighting Africa through Solektra International is involved in projects (street lights, domestic kits) in Mali, Niger, Senegal, Guinea (Conakry), Burkina Faso, Sierra Leone, Benin, Guinea Equatorial, Gabon, Republic of Congo, Namibia, Madagascar, Kenya and Nigeria.

Also 12 African countries (Algeria, Burkina Faso, Cape Verde, Egypt, Ivory Coast, Kenya, Lesotho, Mauritius, Rwanda, Senegal, and Uganda) have employed auctions in RE. While PPP has some history in few African countries, it remains a concept with tedious implementation in many others. Even though PPP is a powerful tool to fund RE and hedge risk, the lack of effective legal framework and competent public counterpart complicates its implementation. Many countries need to develop legal frameworks that include the recent development of the mechanism and the emerging financing schemes that may utilize that channel to finance RE in Africa. Technical assistance and experimented donors (as public counterpart) may be the key to accelerate that transformation in the use of PPP. Paris' COP21 agreement and its embedded financing schemes as well as the advances at COP22 in Morocco may offer a valid model to learn from. Net metering has recently opened more opportunities, for small-scale projects.

Net metering incentive to self-consumption and scale incentives find a valid application in small-scale solar PV projects. In fact, a revolution of RE is that a consumer can also be a producer. Net metering gives kwh credits for storage (bank) of excess electricity from RE. Cape Verde, Egypt, Lesotho, Morocco, Senegal, Seychelles, Tunisia and Mauritius (coupled net-metering with feed-in-tariff) employ net-metering (REN21 2015). Finally, alternative

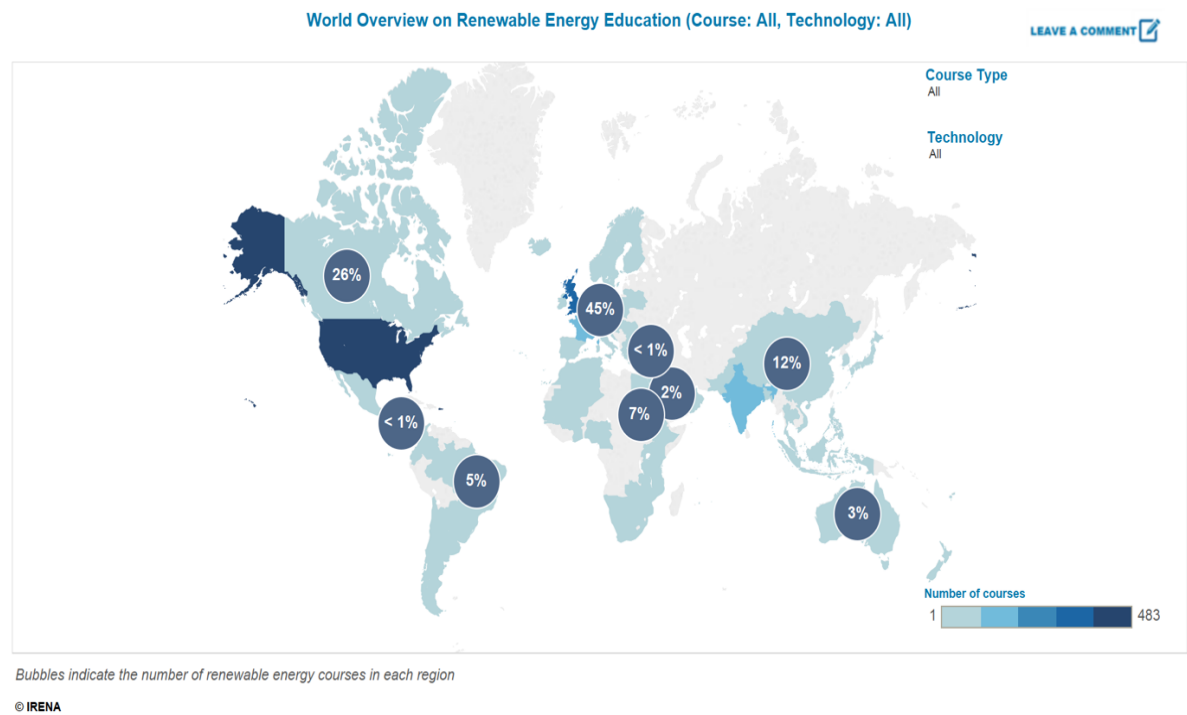
finance schemes have a promising future. The use of remittances (captured effectively and channeled to rentable and de-risked projects) can be further explored. Similarly, social security and retirement funds excess as well as Islamic finance (Sukuk) collateralized with public buildings and assets are all appropriate in strategizing for RE finance. Though it has rigid and pre-determined principles, which means adapting countries' regulations to ensure they fit in, the Sukuk is an interesting alternative financing tool for African countries. Taking advantage of the cost competitiveness and the widened gap between demand and supply of the energy, all those finance schemes could prove to be beneficial for solving investment challenges that the sector faces.

In managing cost competitiveness, integration can downsize the capital spending. For example, McKinsey estimates that regional integration could save more than US\$40 billion in capital spending (McKinsey, 2015). Reducing the transaction costs and enabling economies of scope and scale are all way through regional integration can save money which may find other valuable uses. Some regional entities are devoted to promoting the RE sector. In fact, the potential abounds, not necessarily where innovation, capital, human capital and demand flourish. Pooling resources and strategies is a vital policy to enhance RE development. Building on their history of electricity transactions, West African countries instituted ECOWAS and the Centre for Renewable Energy and Energy Efficiency (ECREEE), while North African countries developed the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE) aiming to enable and increase the adoption of renewable energy and energy efficiency practices (IASS, 2016). Electricity pools are formed in many parts of the continent: Maghreb Electricity Committee (Comelec), the West African Power Pool (WAPP), the Central African Power Pool (CAPP), the Eastern African Power Pool (EAPP) and the Southern African Power Pool (SAPP) (AEEP 2014, IRENA 2014a) with various fortunes. Only SAPP has significantly increased the electricity trade; up to over 5.3 TWh of electricity was traded in 2012-13 (SAPP 2013). However, for the other regional pools, their very existence guarantees outlets in times of renewable energy production boom. Finally, in terms of integration, the Africa50 fund is a promising initiative in financing infrastructures including energy.

Human capital development policies that are conducive to RE development and efficiency in energy are “orphans” in most of the gearing strategies developed by African countries. The challenges of financing the sector, developing effective laws and legal framework and the daily routine of under-supply of the increasing demand explain a big part of this situation. Also, policies that fall short in planning in the long run will surely ignore how the lack of innovation, technology and education on energy efficiency may jeopardize the enormous efforts deployed today in other aspects. For instance, the need for labor in RE systems in Africa is increasing; while the current data show limited education endeavors towards creating a vital labor force in RE (see figures 3 and 4). Missing that aspect can create non-operating systems or in the best scenario create dependency of the African energy sector on foreign expertise with the increased cost that comes with it. Moreover, new technologies, and interoperability can benefit the cost effectiveness of the RE, facilitate its adoption and enable energy efficiency. To make the most of its unlimited potential and reap long term stability in

the use of RE, African countries need to anticipate education needs and develop policies including expertise excellence centers in RE, through integration.

Figure 3 : Human Capital formation in the renewable sector worldwide



3. Anticipating the future: Labor force anticipation, Education, Maintenance, and Quality

Investments and working policies landscape are pillars of the sector vitalization but unaddressed issues of labor force participation, education, maintenance and quality management are some of the nearer challenges to emerge in the awake of Africa to renewable energy sector success.

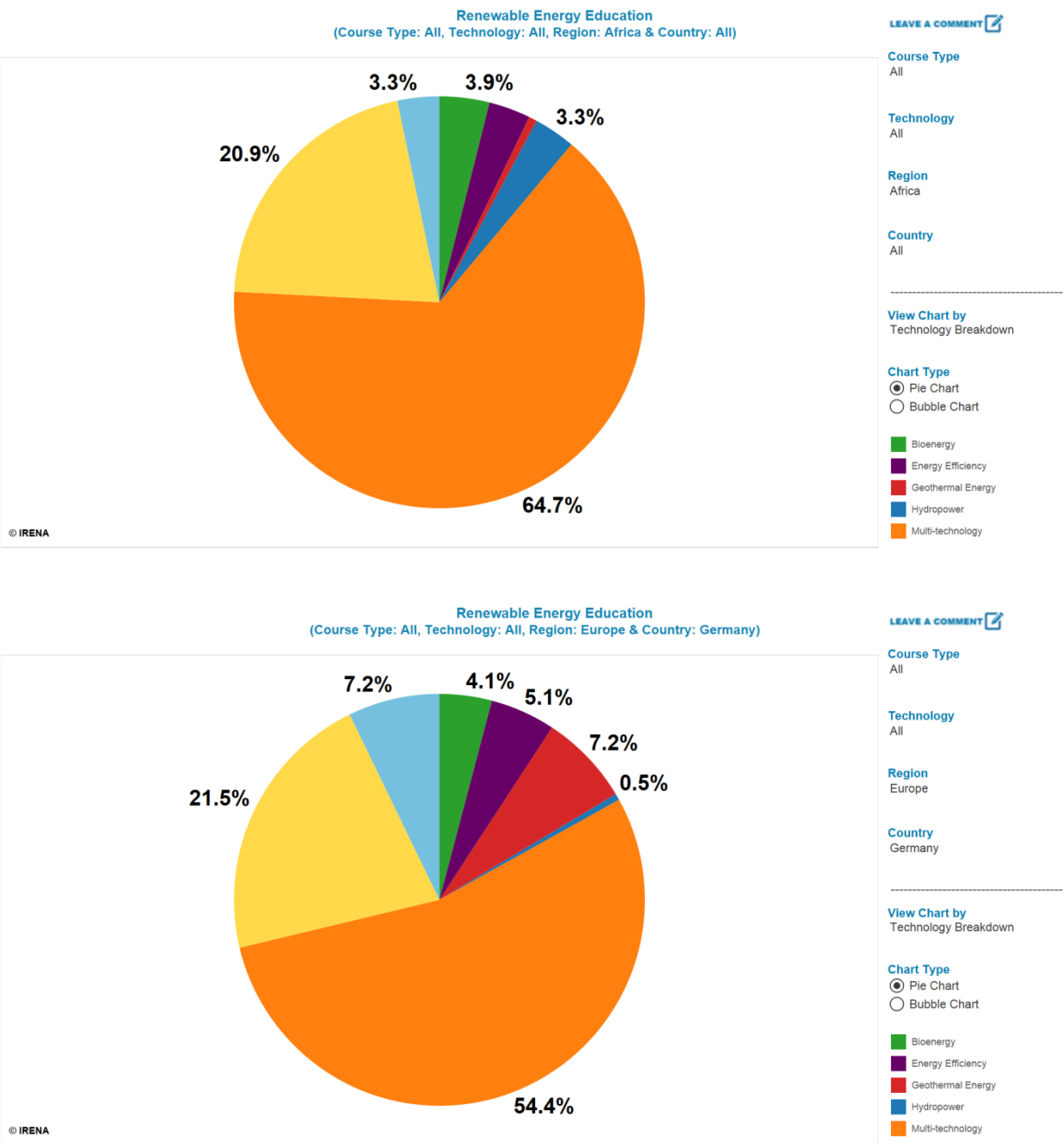
When investments and regulatory work in the sector, the sustainability of their dynamic will rely on the labor force anticipation, human capital formation, and the maintenance and the quality of the investments. While the cost effectiveness and the access to green energy technology continue to die out as hindrances to RE use, more efforts must be devoted to investments, education, maintenance and quality. The last three aspects share a common ground and are interdependent. If the investments become profitable and the de-risking effective, Africa can reap the direct benefits of the prediction that placed RE as the third profitable industry in Africa in the next 10 years (WEF, 2016). However, the education, quality and maintenance challenges may assail the industry, and the consumer satisfaction sooner than we might think. Several initiatives promote directly or through innovative solution a paced payment system and delivery of solar energy to household. It is reported in many countries, initiatives as Pay-as-you-go (PAYG), layaway, paced payments options that fit the income cycle of the rural household. For example, in Benin, Netherlands International Development Agency (SNV) just launched a PAYG to bring solar solutions to rural households. In the same country, solar energy surges through partnerships between providers, local officials and households to access a solar kit for less than \$100. In Benin (in region piloting those schemes), the local's governments involvement reduces the transaction costs, the risk and substantiate a viable market where the local communities' energy needs are addressed. The direct implication of such initiative is the need of maintenance as a required condition to any durable use.

If we do not have a detailed figure about the maintenance labor force in the next ten years, we can still confidently argue that few things are done to anticipate the explosion of the demand for the maintenance labor force. The earlier introduction of the RE technologies carried an astonished deception of the early adopters for the same reason, that quality, maintenance and customer care were almost absent. This turned the experience into a set of abandoned equipment, unused streets lighting systems and the solid belief that RE might not be a solution.

Luckily the cost effectiveness of green energy technology wipes out the negative resentment and open a door for enchantment. This time, careful choice of equipment, development of standards, working on an elaborated strategy for maintenance, and human capital building are mandatory and sine qua none conditions for the momentum of the RE. Because, RE is not just an alternative but also a vital fuel to a thriving and industrialized economy, providing a solid solution to household energy use. If solar energy and more energy-access-democratizing options lift the weight of household energy use on the conventional energy

system, they would have remove a serious pressure. And for the sake of completeness, affordable and clean energy, at household level is one of the 17 SDG. Surely, that means a global partnership interest into the household energy and poured aid, investments and attention to abound. Henceforth, large-scale grid or large-scale systems of energy will find their way easily to industrial use, supplying the energy-hungry urbanization and economic productivity. The good news is that, unlike large-scale energy systems, small-scale energy systems or household energy use required low specialized labor force. But, the share of labor in the RE sector will outgrow relative to the other subsector of energy labor share. And here is where the anticipation as strategy kicks-in. Moreover, the need and huge demand must not outbalance quality concerns. The reason is simple. Buying and maintaining a solar or an RE kit is a tremendous investment for many households. Energy is a disproportionately large expense for (household) business in Africa, and the cost-effectiveness will only reduce that fact progressively. And that investment is supposed to be on long run for household to enjoy energy use.

Figure 4 : Human capital formation breakdown by renewable energy type for Africa and Europe



4. Suggestive Policies and concluding remarks

Africa is in the need of energy and things are moving faster than we could imagine. The changes are fueled by the global push of climate awareness, the exceptional technology progress that cut cost and increases cost-effectiveness, and the attractiveness of the industry. The competitive position of the RE technologies toward the conventional and fossil-driven energy is a big asset on which both Africa and its partners can build on. Investing in climate and clean energy is investing in the future. The progress is irreversible even though the shadow of climatic-skeptic and climate-change deniers was permanent on COP22, due to the recent US-election outcome. Such irresistibility should not blind the African countries for which any international change can undo all the efforts and the momentum on climate. They, rather, have to anticipate and open their focus on alternative and sustainable financing schemes that can assure the ongoing progress into a greener, lighter, and happier world. Many structuring actions stem around Africa and the RE landscape looks brighter than couple of years ago. The continuous development of the regional and pooled actions, regional and integrated institutions might be a resourceful tool to the usual adjustment factor that aid, international partnership and, even the now-acted Paris Agreement represent. Africa must get out of the contrast of being a rich continent in energy and poor in its use, to forge better future where households, schools, healthcare and economic productivity rise with effective energy use. It takes investments, entrepreneurship, education, strategizing, regional integration, and building a smooth landscape for successful investments, quality and anticipation in the labor force in the sector. Political willingness and pragmatism are all ingredients to the achievement of these objectives.

On investments, it is important to note that capital attraction competition will increase and one way to avoid confrontation is to cooperate at regional level on large-scale projects in order to give a chance to inflame solidarity. Moreover, activate local investments niches, excess social funds and alternative funds might be a route to explore. For instance, those mechanisms will enable the financing of pre-feasibility of the projects as well as pro-active Public-Private Partnerships but guaranteeing public share of the needed investments. If the need for energy is capitalized into a constructive instrument, it will generate enough interest from the investors to substantiate investments, an energy market as long as rules of the game are not clear enough, and transparently laid out. Mobile-banking, layaway, pay-as-you-go and more options offer flexible opportunities to aspire the households' energy use and its subsequent finance needs. Regarding the large-scale energy systems, Islamic finance and alternative finance schemes complement the Nationally Determined Contributions (NDC) cornerstones and its subsequent international climate financing architecture (\$100 billion yearly), which may face fragmentation and chronic under-financing. There are enough reasons to bet such prediction as the Washington new Administration, known to be climate change denier, is setting up.

On the RE types, the availability of the resources (sunlight, water, geothermal, wind, biomass...), of user-friendly technology, and the consumer preferences are the preliminaries to the choice. It seems clear that the need triggers by mobile technology penetration, and its emerging daily uses will magnify and maintain a need for energy in Africa at any layer of user, rural households, an escalating urban households, businesses and emerging industries. Solar has a hegemonic dominance in use and flexibility, and tops the household choice. Scaling up at business level and substantiate a large-scale use at industry level to quicken industrialization may require larger investments in solar and other sources of energy.

On the incentives, public stakeholders must take a strong stand on paving the landscape for large, structured investments as well as local entrepreneurship including women entrepreneurship. Fiscal policy including tax-cut, tax-structuring still matter in this sector. On top of that, fiscal policy, legal system, mainly swift deliberation and procedural speeding are among the room of improvement that can usher investments into the sector in Africa. Regional cooperation on large-scale projects while pooling the resources induce risk-mitigation and foster investments into projects that individual country may fail to implement. Countries must learn from DRC projects on INGA3.

Morocco deepened its lead in the sector and continues to attract more investments in renewable because of the political willingness, a structured landscape for RE investments. Moreover, hosting COP22 generates spillovers through international exposure and deals. Those spillover effects can extend to all Africans countries through the leadership of Morocco and African Union.

In total, we have to keep the hope lightened that the future of the world is with Africa and without Africa it will not be, especially in renewables industry.

Appendix

Description of some regional partnerships in renewables in Africa

Today, the exploitation of renewable energy for the sustainable improvement of the socio-economic welfare is a major challenge. But RE sector development inevitably involves the creation of a legislative and regulatory framework that enables investment. This necessity activates the majority of African countries to develop reforms at national and regional levels. But this shift in energy policy strategies, particularly in the case of renewable energy does not advance at the same speed throughout the continent. While at the regional level, the political willingness to promote renewable energy is clearly evidenced, at the national level, policy efforts need to be more incisive in most countries, especially in sub-Saharan Africa. Regionally, renewable energy development policies are based on the four power pools in the continent:

1. The North Africa Power Pool
2. The West Africa Power Pool, launched in 2000 by 14 countries of the Economic Community of West African States (ECOWAS)
3. The Central Africa Power Pool, launched in 2003 by 11 countries of the Economic Community of Central African States (ECCAS)
4. The East and South Africa Power Pool, launched in 2005.

North Africa

In North Africa, structures have been created, and institutional, legislative and regulatory reforms engaged. These development strategies and incentives for technological development in renewable resources mainly aimed at funding and structuring a more open market for renewable energy. We summarize in table 3, the main strains of those actions.

Table 3 : Major organizations and their objectives

Structure	Objectives and themes	Major development activities capacity and R & D
RCREEE ²²	Policies and strategies, R & D, Development capacity	Wind Energy Training (design, operation and maintenance, software) RE financing including feed-in tariffs, energy audits, certification, network codes (grid codes) Grants for young researchers (internship)
MEDREC ²³	Training and information dissemination; developing pilot projects	Study on identifying building needs RE capacity in North Africa (2009-01-10) Training courses on the CES capacity building program on CDM
MEDENER ²⁴	Strengthen interregional partnership: knowledge and "best practices"	Events on RE for the Mediterranean countries and developing joint proposals for submission to international bodies. Marginal activities in R & D and capacity building

Source: Economic Committee report of the United Nations for Africa (CEA-NA) 2012

²² Regional Center for Renewable Energy and Energy Efficiency

²³ Centre Méditerranéen des Energies Renouvelables

²⁴ Association méditerranéenne des agences nationales de maîtrise de l'énergie.

🌍 West Africa

Dubbed (REPE) Regional policies represent a voluntary contribution of ECOWAS in SE4All initiative (Sustainable Energy for All -2030) ECOWAS. The Renewable Energy Policy of the ECOWAS-REPE is emerging as a base, with the guidelines, the achievement of targets identified and quantified by all ECOWAS member states. The main objectives are the following:

- Improve energy security and energy sustainability,
- Ensure universal access to modern energy services,
- Propose solutions of domestic energy for cooking,
- Create a favorable environment to attract private sector and the use of renewable energy as an engine of industrial development, promoting economic and social development,
- Integrating gender issues in matters related to renewable energy in particular, the place of women in productive activities,
- Reduce the environmental impact of negative externalities of the current energy system,
- Strengthen synergies with the energy efficiency policy of ECOWAS (CCAP).

🌍 Central Africa

Designed around the Central Africa Power Pool (PEAC), it was adopted in 2012 out of the Conference of Ministers of ECCAS on the green economy and is based on 12 strategic areas. This green economy and renewable energy system ECCAS, is essentially based on the establishment of a number of programs to develop several energy sectors and the transition to renewable and clean energy.

- Carbon economy "Programme de Développement de l'Economie du Carbone";
- Reforestation economy "Programme de Développement de l'Economie de Reboisement";
- Bioenergy economy "Programme de Développement de l'Economie des Bioénergies";
- Waste management" Programme de Développement de l'Economie des Déchets";
- Solar economy "Programme de Développement de l'Economie Solaire";
- Wind energy "Programme de développement de l'Economie de l'Energie Eolienne:
- Hydropower program"Programme de Développement de l'Economie de l'Hydroélectricité".

East and South Africa

Beyond the issues of access to energy, energy policies in these two regions also include the development of efficient production methods (R & D), the mobilization of the necessary and sufficient funding, the increased intake of renewable energy into the electricity production and the development of a renewable energy market.

Table 4 presents the objectives of some countries on the integration of renewable energy into the electrical system.

Table 4 : Integration of renewable energy into the Electrical system

Country	Share of RE in 2010	Objective for ER	Deadline
Eritrea	0%	50%	Not defined
Madagascar	57%	75%	2020
Seychelles	-	5% 15%	2020 2030
Uganda	54%	61%	2017

Source: REN21, 2012. Renewables 2012 Global Status Report (Paris: REN21 Secretariat)

At the national level the situation is much different. In August 2015, most of the African countries have set national Renewable Energy targets (of all type) but only few have a comprehensive and binding target that involves the whole mix-energy. In general, the targets are aspirational and deal with the electricity only. Obviously, this does not mean failure, but submitting the SCOND represents a strong symbol of commitment to the national plan for the promotion of renewable and clean energy, and to reducing emission of greenhouse gases.

In North Africa, due to the different natural endowments in terms of renewable energy sources, Algeria, Morocco, Egypt and Tunisia are much more ahead than others.

In Central and West Africa, the success of regional strategies is based mainly on the development of effective national policies. In this regard, Nigeria, Ghana and Angola have advanced notably in terms of policy incentives for development of renewable energy as compared to others.

In Eastern Africa, more progress has been made due to the implementation of new ambitious instruments²⁵ aimed at expanding access to renewable energy, particularly in countries such as Ethiopia, Uganda, Rwanda, and Burundi.

²⁵ PAYG (Pay As You Go) or for instance in Rwanda an approved new energy policy, which included a target of reaching 22% of its population with Distributed Renewable Energy systems by 2017/2018

Bibliography

ABDOU DIOP : Politiques régionales de la CEDEAO, Energies renouvelables –Efficacité énergétique, Atelier du RC&D du 14 au 18 Avril 2015, Paris, ENDA-Energie.

AEEP (2014): Status Report Africa-EU Energy Partnership. Progress, achievements and future perspectives.

BUREAU POUR L'AFRIQUE DU NORD DE LA COMMISSION ECONOMIQUE DES NATIONS UNIES POUR L'AFRIQUE (CEA-AN) : Le secteur des énergies renouvelables en Afrique du Nord Situation actuelle et perspectives Septembre 2012.

BUREAU SOUS-REGIONAL POUR L'AFRIQUE DE L'EST : Accès à l'énergie et sécurité énergétique en Afrique de l'Est Situation actuelle et moyens de l'améliorer

<http://cop22.ma/en/#actualites>

Geothermal Energy Association, 2015. US-East Africa Geothermal Partnership (EAGP). [Online] Available at: <http://www.geo-energy.org/EastAfrica/EAGP.aspx> [Accessed August 2016].

UK Department of Energy and Climate Change, DECC (2014): Policy Risk in Renewable Energy Investments in Developing Countries" Cambridge Economic Policy Associates Ltd.

Havas Horizons (2016). Financer la croissance Africaine à l'horizon 2020 : perception des investisseurs internationaux. [Online] Available at: <http://presse.havasparis.com/financer-la-croissance-africaine-a-lhorizon-2020/> [Accessed November 2016].

Hydropower and Dams, 2014. Hydropower and Dams World Atlas, Wallington: Aqua-Media International.

IASS (2016) Institute for Advanced Sustainability Studies: The Future of Africa's Energy Supply: Potentials and Development.

IEA (2014). Africa energy outlook: a focus on energy prospects in Sub-Saharan Africa. World energy outlook special report. IEA publishing.

IRENA (2013) : l'Afrique et les énergies renouvelables, la voie vers la croissance durable

IRENA (2013b): Renewable Energy Auctions in Developing Countries.

IRENA (2014): RE-thinking Energy: Towards a new power system.

IRENA, 2014. Global Bioenergy Supply and Demand Projections: A working paper for REmap 2030, Abu Dhabi: IRENA.

IRENA (2015a): Renewable Energy Capacity Statistics 2015.

IRENA (2015a). Renewable energy and jobs: annual review. Technical report. IRENA

IRENA (2015b). Africa 2030: roadmap for a renewable energy future. Technical report. IRENA

IRENA (2015c). Renewable Energy Target Setting

IRENA (2016). Renewable capacity statistics. Technical report. IRENA

IRENA and IEA-ETSAP (2015). Hydropower. Technology Brief E06 – February 2015. Hydropower Technology Brief. IEA-ETSAP and IRENA.

Jacob, K.; Quitzow, R.; Bär, H. (2015). Green jobs: impacts of a green economy on employment. BMZ/GIZ, Bonn/Eschborn.

JAVIER LESACA : Eléments pour la promotion du développement des énergies renouvelables en Afrique du Nord, tendances économiques, afkar/idées, printemps 2010.

Linklaters (2015): Renewable Energy in Africa. Trending rapidly towards cost-competitiveness with fossil fuels.

LIVRE BLANC DE LA CEEAC ET DE LA CEMAC 2014-2030 (2014) : Politique régionale pour un accès universel aux services énergétiques modernes et le développement économique et social 2014 – 2030.

McKinsey (2015): Brighter Africa — The Growth Potential of the Sub-Saharan Electricity Sector, McKinsey & Company, February 2015.

REN21 (2015): Renewables 2015. Global Status Report. Paris, Renewable Energy Network for the 21st Century.

REN21 (2016): Renewables 2016. Global Status Report. Paris, Renewable Energy Network for the 21st Century.

REN21 (2006) : rapport sur le statut mondial des énergies renouvelables

Southern African Power Pool (SAPP) (2013): Annual Report.

http://unfccc.int/paris_agreement/items/9485.php

UNIDO (2009): Scaling up Renewable Energy in Africa, 12th Ordinary Session of Heads of State and Governments of the African Union.

World Economic Forum (2016): Top profitable industries for investment in Africa

Remerciements :

Cette étude a été réalisée sous la supervision de Tite YOKOSSI et a bénéficié de l'assistance de Pacha NZANZA et de Hery MAHOLISOA, Editeurs de L'Afrique des Idées. Les auteurs remercient tous les membres du bureau exécutif de L'Afrique des Idées pour leur soutien.



L'Afrique des Idées est un think-tank indépendant. Sa vocation est de mener des analyses et d'élaborer des propositions novatrices sur des sujets économiques, politiques et culturels liés à l'Afrique. Fondée en 2011 sur une approche basée sur l'afro-responsabilité, L'Afrique des Idées a pour ambition de s'imposer parmi les cercles de réflexion leaders en Afrique et en particulier dans l'espace francophone.

Un concept moteur : L'Afro-responsabilité

Afin de favoriser une meilleure compréhension des problématiques africaines, une réappropriation par les jeunes africains du discours sur l'Afrique et un engagement socio-économique porteur de croissance inclusive et durable, L'Afrique des Idées promeut le concept fort et innovant d'afro-Responsabilité. Ni «afro-optimisme», ni «afro-pessimisme», l'«afro-responsabilité» répond à une logique différente: **mieux comprendre les défis auxquels fait face le continent africain afin d'œuvrer à ce qu'il puisse les relever.**

L'afro-responsabilité est sous-tendue par **une conviction forte** : dans un environnement complexe et en pleine mutation, le continent africain a besoin d'espaces d'échanges d'idées avec des jeunes de divers horizons, capables d'exprimer des avis équilibrés et des recommandations concrètes, puis de les partager avec le plus grand nombre.



Retrouvez l'ensemble de nos publications à l'adresse : lafriquedesidees.org

© L'Afrique des Idées, tous droits réservés | Design : Marine Durand