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*To Toss a Coin or Shake a Hand: An Overview of Renewable Energy Interventions and Procurement in selected African Countries*

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## **Abstract**

Open and competitive bidding process (toss a coin) promotes transparency, efficiency and cost reduction as compared to direct negotiations (shake a hand). This paper provides an overview of renewable energy interventions in Angola, Algeria, Cote Dvoire, Ghana and Nigeria. Further, best practices in Germany and South Africa are discussed. It was discovered that, apart from South Africa, most countries in Sub-Saharan Africa uses direct negotiations and feed-in-tariff which has contributed to high cost of renewables. The study recommends that countries should build tendering capacity, put in place simple but robust tendering process and research to identify their renewable energy potential to procure new renewable energy capacity through open and competitive bidding process.

**Key words:** Competitive Bidding, Renewable Energy Investments, Sub-Saharan Africa, Energy

## **1. Background**

As part of a major electricity market restructuring in 1990, the United Kingdom developed a universal charge on electricity sales with a tendering procedure for acquiring new renewable resources (Mitchell, 1995). This practice is not different from most developed economies due to the ability of open and competitive bidding to promote transparency, efficiency through competition and lower cost of power generation. This notwithstanding, countries in Sub-Saharan Africa continue to use direct negotiations to procure additional capacity of renewable energy.

According to Berry and Jaccard (2001), four main categories of support for renewable energy. First, the increased cost of polluting sources through the removal of subsidies on non-renewable fuel sources, increased energy-related pollution sources and/or the induction of emission cap regulations. Second, the provision of direct financial support to renewables which may include capital grants, preferential purchase price, tax advantages, or low interest loans, preferential fixed purchase tariffs (Germany), fixed premium on the prevailing electricity price (Spain), or a premium by competitive bidding (England). These support may come government or from consumers (public benefit change). The third is indirect support to promote the commercialisation

of renewables such as training funding and research and development support. Finally, there are voluntary or mandatory market shares through renewable portfolio standards. These interventions are boosting renewable energy investments in Germany (see case study) and other developed economies.

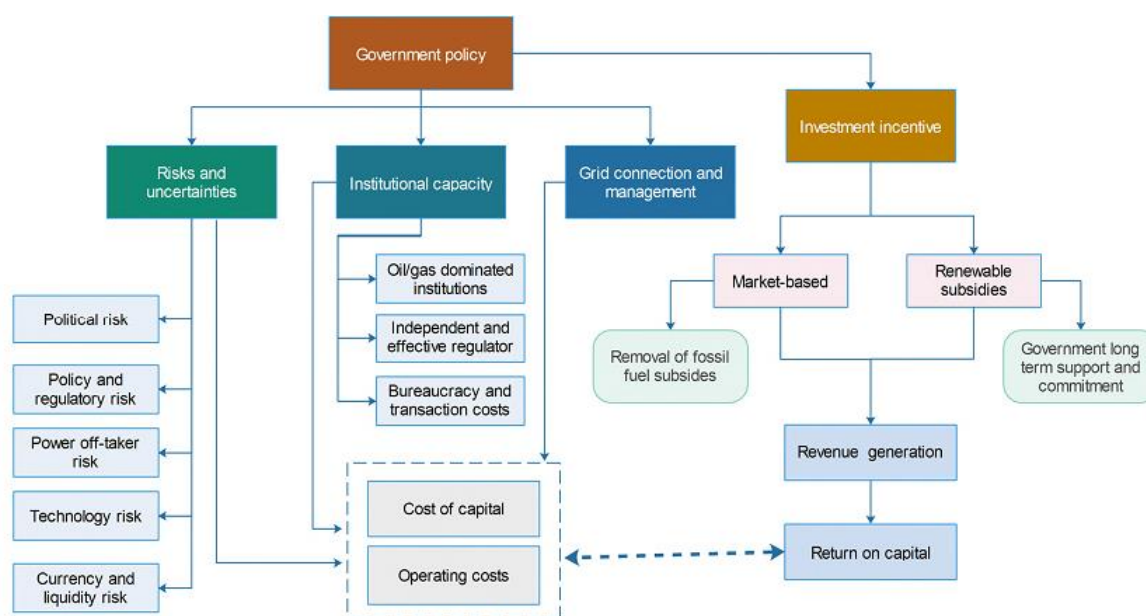


Figure 1. Renewable Energy Investment Risks and Interventions

Source: Poudineh et al, 2016

Poudineh et al., (2016) groups government interventions in promoting renewable investments into market based and subsidies (policy-based) and assert that both market and policy factors are needed to drive investment in renewable energy. Despite these interventions, Eberhard and Kaberger, (2015) posit that apart from South Africa, countries in Sub-Saharan Africa use direct negotiations more than competitive bidding process. This paper provides an overview of renewable energy interventions in Angola, Algeria, Cote Dvoire, Ghana and Nigeria. Further, best practices in Germany and South Africa are discussed.

## 2.0 To Bid or Negotiate

Direct negotiations outnumber competitive bidding in Sub-Saharan Africa (Eberhard and Kaberger, 2015). Usually, direct negotiations originates from unsolicited proposals from interested investors. The advantage of the direct negotiation is that, it allows for a quick fix. However, whilst

these negotiated projects may come online quickly, there are inherent medium to long term challenges that can be attributed to the ‘quick fix’’. For instance, a number of companies negotiate to obtain licences but takes in long time to produce. In Ghana, 82 renewable energy provisional licences has been issued as at 2015 to generate 5546 MW. Even though Ghana enjoys about 330 days of sunshine annually and the Solar irradiation levels range from 4.5-6.0kWh/m<sup>2</sup>/day with the highest irradiation levels occurring in the northern half of the country, Ghana generates less than 0.5% of its power from renewable energy sources<sup>i</sup> (Mohammed and Ackah, 2015, Ackah, 2016). Between 2000 and 2014, over 38,000 solar home systems and lanterns have been deployed in more than 120 communities throughout the country for off-grid applications and 25 grid-tied installations with total installed capacity of 7 MW according to the Ghana Energy Commission. In addition, the Government of Ghana procured about 50,000 solar lanterns to be distributed in 2015/2016.

The weakness of these interventions is that, it is not coordinated and seem to be driven by political patronage instead of need-based assessment. Therefore such investments are driving by ‘deals’ and ‘who knows you’ rather than economic analysis. Further, the Ghana Energy Commission which is mandated to undertake such distribution is often undermined by politicians who undertake the distribution. Finally, there is little education and information on how the solar lanterns or home systems can be assessed.

In Sub-Sahara, South Africa is leading the competitive bidding process. For instance, between 2011 and 2015, South Africa conducted four renewable energy auctions which led to \$19 Billion in private investments. This was made of up of 92 projects to produce 6327 MW. Eberhard and Kaberger (2015) estimated that electricity prices of wind and solar would fall by 46% in South Africa due to the auctions. Indeed, the auction price dropped to as low as USc 6.4 /kwh for solar and USc 4.7/kwh. This is relatively cheaper than the feed in tariff of Ghana. In 2013, Feed-in Tariffs (FIT) for solar, was 40.2100Ghp/kwh (about 10 cents). Table 1 summarises renewable energy laws and interventions in selected Africa.

Table 1. Summary of renewable energy frameworks for selected countries

African Countries	Sources	Regulations	Targets
Ghana	<ul style="list-style-type: none"> <li>-Solar (PV and thermal)</li> <li>-Wind</li> <li>-Hydro (Mini and small Hydro)</li> <li>-Modern Biomass</li> </ul>	<ul style="list-style-type: none"> <li>-Renewable Energy Act 832 - 2011</li> <li>-Feed-in-tariff scheme with a feed-in-tariff rate</li> <li>-RE Purchase Obligation</li> <li>- Net Metering</li> <li>-Mandatory purchase of electricity from RE source</li> <li>-Free Access of RE to transmission and distributing systems</li> <li>-Establishment of RE Authority</li> <li>-Creation of RE fund dedicated to the promotion of RE development</li> <li>-National Energy Policy -2010</li> <li>-National Electrification scheme- 2007</li> <li>-Ghana Energy Development Access Project- 2007</li> <li>-Strategic National Energy Plan – 2006-2020 - 2006</li> <li>-Renewable Energy Service Program (RESP) – 1999</li> <li>-Tax and Duty exemptions - 1998</li> <li>-Strategic National Energy Plan (SNEP) – 2006</li> </ul>	<ul style="list-style-type: none"> <li>-10% of electricity generation from RE by 2020</li> <li>-National Electrification project with the objective of electrifying rural communities with population of 500 by 2020</li> <li>-Create legislation to encourage RE technology and development by adopting a RE law</li> <li>-Established Higher level educational institutions for RE training - University of Energy and Natural Resources and KNUST Centre for RE studies</li> <li>-Off-grid electrification for isolated communities</li> <li>-Promotion of Clean Cookstoves</li> </ul>

		<ul style="list-style-type: none"> <li>-The National Energy Policy- 2010</li> <li>-The Energy Sector Strategy and Development Plan - 2010</li> </ul>	
Nigeria	<ul style="list-style-type: none"> <li>-Solar (Photovoltaic and thermal)</li> <li>-Hydro (Small and large hydro),</li> <li>-Geothermal,</li> <li>-Wind,</li> <li>-Tide and wave,</li> <li>-Biomass and waste (animal waste and crop residue)</li> </ul>	<ul style="list-style-type: none"> <li>-Electricity Power Sector Reform Act 2005 (EPSA) – encourage energy generation diversification and Introduce competition in electricity generation</li> <li>-Rural Electricity Agency – (REA) responsible for the distribution of the rural electricity fund and funding for the Renewable Electricity Trust Fund (REF)</li> <li>-Independent Electricity Distribution Network</li> <li>-Embedded Generation 2012</li> <li>- National Energy Policy</li> <li>-Renewable Energy Master Plan</li> <li>-Energizing Access to Sustainable Energy (EASE)</li> <li>-Nigeria Biofuel Policy</li> <li>-licensing arrangements for private sector investments</li> <li>-Feed-in tariffs and clarifying market rules for RE services and products</li> </ul>	<ul style="list-style-type: none"> <li>-50% reliance on RE by 2020</li> <li>-Rural electrification are to take RE into full account</li> <li>-Liberalisation has led to private sector participation in generation and IPPs</li> <li>-Establishment of off-grid generation/distribution plant is encourage</li> <li>-Vision 20:2020 diversification of energy supply mix</li> </ul> <p><b>RE target for 2025</b></p> <ul style="list-style-type: none"> <li>-small hydro-2000MW</li> <li>-Solar PV – 500MW</li> <li>-Biomass based power plant – 400MW</li> <li>-Wind -40MW</li> <li>-Electrification Access – 75%</li> </ul>



		<ul style="list-style-type: none"> <li>-moratorium on import duties for renewable energy technologies</li> <li>-design tax credits, capital incentives, and preferential loan opportunities for renewable energy projects</li> <li>-Feed-in tariffs for solar energy, wind power and small hydro</li> </ul>	
Algeria	<ul style="list-style-type: none"> <li>-Solar</li> <li>-Wind</li> <li>-Hydro</li> <li>-Biomass</li> <li>-Geothermal</li> <li>-Ocean</li> </ul>	<ul style="list-style-type: none"> <li>-Law 98-11 on research -1998</li> <li>-Law 99-09 on the management of energy – 1999</li> <li>-Law 02-01 Creating Feed-in-tariffs for RE electricity-2002</li> <li>-Renewable Energy Agency Algeria Established – 2002</li> <li>-Law 04-09 Renewable Energy Promotion 2004</li> <li>-Decree 04-92 on the diversification of power generation cost.</li> <li>-Ministerial order of 2008 – adaptation of technical regulation concerning Silicon PV modules for ground application</li> </ul>	<ul style="list-style-type: none"> <li>-5% electricity generation from RE by 2017</li> <li>-20% electricity generation from RE by 2030 and 35% by 2040</li> <li>-100MW of Wind capacity by 2015</li> <li>-170MW of concentrating Solar power by 2015</li> <li>-5.1MW of solar photovoltaic capacity by 2015</li> <li>-Thermal solar -169,440TWh/year</li> <li>-Photovoltaic -13.9TWh/year</li> <li>-Wind energy – 35TWh/year</li> <li>-RE share in energy mix</li> </ul>
Angola	<ul style="list-style-type: none"> <li>-Solar</li> <li>-Wind</li> <li>-Hydro</li> </ul>	<ul style="list-style-type: none"> <li>-General Electricity Law – 1996</li> </ul>	<ul style="list-style-type: none"> <li>-60% modern electricity access to the population by 2025</li> </ul>

	<ul style="list-style-type: none"> <li>-Biomass</li> <li>-Geothermal</li> <li>-Ocean</li> </ul>	<ul style="list-style-type: none"> <li>- Institute for Electricity Regulation Established -2002</li> <li>-Renewable Energy Office Established – 2009</li> <li>- Small Hydro and Solar PV programs – 2009</li> <li>-Biofuels Act – 2010</li> <li>- Economic Community of Central African States (ECCAS) White paper – 2035</li> <li>-Universal Access Goal of the Sustainable Energy for All</li> <li>-National Strategy on Renewable Energy- recently launched</li> <li>-Rural Electrification Agency</li> <li>-Angola 2025 Energy Vision</li> <li>- Energy Efficiency Law – 1999</li> </ul>	<ul style="list-style-type: none"> <li>-Increase generation by additional 6GW with 5GW of hydro</li> <li>-Distribution of 100,000 improved cookstoves</li> <li>-74% RE penetration in the power sector with hydro representing 66% and the rest 8%</li> <li>-Approve Feed-in-tariffs for RE up to 10MW and review applicable taxes</li> <li>-Allocate 1.000millionKz to Rural electrification agency every year till 2025 for RE</li> <li>-Map country’s mini-hydro and micro-hydro potentials for off-grid electrification projects</li> <li>-Creation of research centres for RE</li> </ul>
Cote d’Ivoire	<ul style="list-style-type: none"> <li>-Solar</li> <li>-Wind</li> <li>-Hydro</li> <li>-Biomass</li> <li>-Geothermal</li> <li>-Ocean</li> </ul>	<ul style="list-style-type: none"> <li>-National Authority for the Regulation of the Electricity Sector Established - 1998</li> <li>- National Commission on Sustainable Development Established – 2003</li> <li>- Renewable Energy Directorate established within the within the Ministry of Energy – 2009</li> <li>-Poverty Reduction Strategy Paper – 2009</li> </ul>	<ul style="list-style-type: none"> <li>-5% RE penetration by 2015 (excluding biomass)</li> <li>- 3% of primary energy from RE (excluding biomass) by 2013</li> <li>-Increase in RE in electricity generation from 1% to 16% by 2030</li> <li>-42% RE by 2030</li> <li>-2X23MW and 8.5MW of biomass plant by 2019</li> <li>- 20MW and 50MW solar plants by 2017</li> </ul>

		-Energy Policy and Electricity Code	
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**3. Country Case Studies**

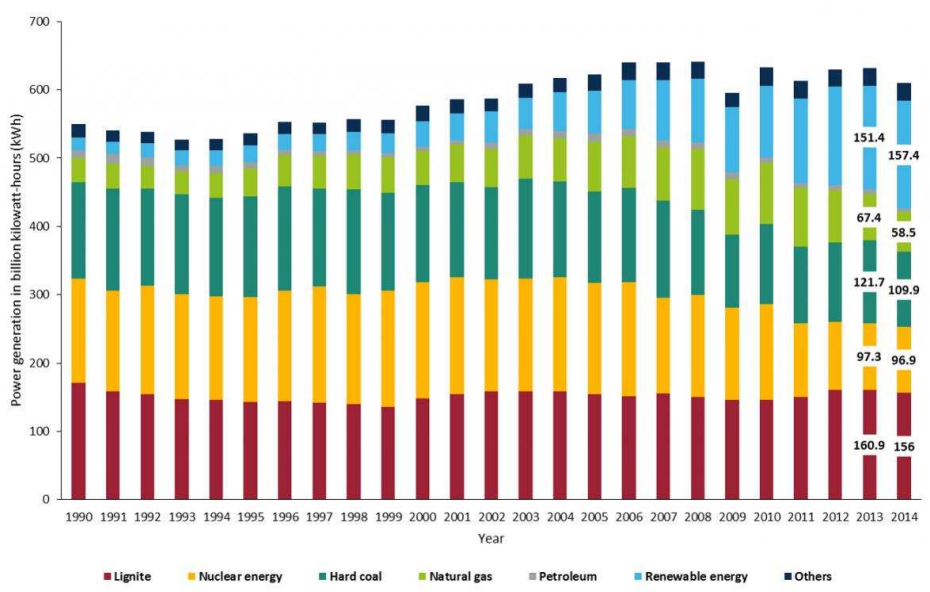
**3.1 South Africa**

The bid evaluation involved a two-step process. First, bidders had to satisfy certain minimum threshold requirements in six areas: environment, land, commercial and legal, economic development, financial, and technical. For example, the environmental review examined approvals, while the land review looked at tenure, lease registration, and proof of land use applications. Commercial considerations included the project structure and the bidders’ acceptance of the Power Purchase Agreement. The financial review included standard templates used for data collection that were linked to a financial model used by the evaluators. The technical specifications were set for each of the technologies. For example, wind developers were required to provide 12 months of wind data for the designated site and an independently verified generation forecast. The economic development requirements, in particular, were complex and generated some confusion among bidders. Bids that satisfied the threshold requirements then proceeded to the second step of evaluation, where bid prices counted for 70% of the total score, with the remaining 30% of the score given to a composite score covering job creation, local content, ownership, management control, preferential procurement, enterprise development, and socioeconomic development. Bidders were asked to provide two prices: one fully indexed for inflation and the other partially indexed, with the bidders initially allowed to determine the proportion that would be indexed. In subsequent rounds, floors and caps were instituted for the proportion that could be indexed. The bids were evaluated using a standard financial model (Eberhard et al. 2014).

**3.2 GERMANY**

According to RAP (2015) ( Report on the German power system ) a study commissioned by Agora Energiewende, the German power system is the largest in Europe. Germany also has the highest share of renewable power in Europe in terms of installed capacity, and in fact is the country with the third largest number of installed renewables capacity (excluding hydro) in the world. As of the

year 2000 the energy generation in the country was predominantly by fossil fuels (crude oil, hard coal, lignite and natural gas), followed by nuclear power, biomass (wood and biofuels), wind, hydro and solar. In fact, nuclear had a 29.5 per cent share of the power generation mix. In 2014, renewable energy accounted for more than one quarter of all electricity produced in the country. At the same time, hard coal and lignite contributed 44 percent of electricity production, while nuclear energy accounted for about 16 percent of productions. This was as a result of a transformative energy transition revolution which was pioneered following the March 2011 Fukushima accident, it was named 'Energiewende', or 'Energy Transformation a transformative energy transition revolution (Uwer et al, 2015). The main objectives of the revolution were to reform of the Renewable Energies Act (*Erneuerbare-Energien-Gesetz (EEG)*), Expose a lack of special rules with respect to the expansion of the German offshore grid, trigger legislative changes to push through the required network expansion needed to integrate electricity generation from renewable energy sources and provoke discussions of the future of "energy only" markets compared to capacity markets for new power plant projects. The German government vowed to shut down its nuclear capability within 10 years. Not just that, but to replace it with renewable energy, cut greenhouse-gas (GHG) emissions by 40% by 2020 and 80% by 2050, ensure renewables contribute 80% of Germany's energy by 2050, and ensure energy consumption drops 20% by 2020 and 50% by 2050. In effect, nuclear energy would be phased out by 2022 and the country would fill the gap with renew



According to Uwer et al,(2015), the energy sector in Germany is governed by a number of acts and ordinances which are subject to constant modifications and amendments. The main pieces of legislation are the Energy Industry Act (*Energiewirtschaftsgesetz* (EnWG)) and the Renewable Energies Act (*Erneuerbare-Energien-Gesetz* (EEG)).

The Energy Industry Act 2005<sup>1</sup> (amended 2012) is framework policy to enhance competition, security of supply and sustainable energy production. It requires electricity labelling according to type of energy source, providing greater information on electricity sources to allow consumers to make informed decisions about suppliers. in order to attract investments into the German offshore grid.<sup>2</sup> After the amendment in 2012, the legislative changes have actually provided guidelines to investors in offshore infrastructure projects, and the overall capacity of the offshore grid has been raised to 8 gigawatts (in the North Sea) by 2019. (Uwer et al, 2014). Ammended in 2014 and brought into force in 2000, the German Renewable Energy Sources Act (EEG) seemed to have helped fill the generation gaps created by the decline in nuclear power generation. The renewable energy sources in the power sector has seen a significant growth. solar, biomass and other regenerative sources of energy. Since the adoption of the Renewable Energy Sources Act, the proportion of power generation accounted for by renewable energy has risen from 6% in 2000 to 32.6% in 2015.<sup>3</sup> The report continues to cite that the country wants to tap more of their potential to boost electricity generation from solar and wind energy and to substantially expand the use of renewable energy. Their target is to increase the consumption of renewable energy 40 to 45% in 2025 and to about 60% in 2035.

According to the report by Uwer et al (2014), the German energy revolution, termed *Energiewende* has revealed the need for reform of the EEG. The reform involves producing electricity from renewable sources and integrating the end product into their general electricity market by moving away from the fixed feed-in tariffs ("produce and forget") to a mandatory direct marketing scheme for new installations. Again, the report continues that it is to address concerns under EU state aid

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<http://www.lse.ac.uk/GranthamInstitute/law/energy-industry-act-enwg><sup>1</sup>

[http://uk.practicallaw.com/5-524-0808?q=\\* &qp=&qo=&qe=](http://uk.practicallaw.com/5-524-0808?q=* &qp=&qo=&qe=)

<sup>2</sup>

<sup>3</sup> <http://www.bmwi.de/EN/Topics/Energy/Renewable-Energy/renewable-energy-at-a-glance.html>

rules, as voiced by the EU Commission, about the feed-in tariff regime and its subsequent recollection.

### **3.2.1 REGULATORY INSTITUTIONS**

RAP (2015) states that, the authority to regulate the German power sector is mandated by their statutory regulatory framework, Energy Industry Act. The report continues that, energy policy in Germany is developed and implemented in levels, that is the federal and regional levels. Within the government, the responsibility for energy policy is divided between the Federal Ministry of Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie, or BMWi) and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, or BMUB). Since 2014, responsibility for the power sector is mainly concentrated in the BMWi – with the exception of nuclear safety and climate protection. On the federal level, the German power sector is mainly regulated by the Bundesnetzagentur (BNetzA) which is the federal network agency, and by the Bundeskartellamt (BKartA), the federal cartel office. Both offices fall under the authority of BMWi. The power to regulate the power sector arises from the federal Energy Industry Act. Being the main ministry regulating the energy sector, this ministry seeks to reinvigorate social market economy, stay innovative in the long term and strengthening social fabric in Germany. They do this by focusing on six main mechanisms, investment, innovation, infrastructure, internationalization, integration of labor and energy reforms.<sup>4</sup> It was formally the Ministry of Economy before it was recreated between 2005 to include Technology<sup>5</sup> and later in 2014 the responsibility of the Power sector was also added. The ministry has 6 regulatory authorities under its wings out of which three deals with the power or energy sector. Although tasked with the responsibilities of other sectors like the transport sector, the central tasks undertaken by the Federal Network Agency with regard to energy regulation notably include the approval of network fees for the transmission of electricity and gas, the removal of obstacles that impede access to the energy supply networks for suppliers and consumers, the standardization of the relevant processes for switching suppliers, and the improvement of conditions under which new power plants are connected to the networks. Since 2011, the Federal Network Agency has also been responsible for

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<sup>4</sup> <https://www.bmwi.de/EN/Ministry/tasks-and-structure.html>

<sup>5</sup> [https://en.wikipedia.org/wiki/Federal\\_Ministry\\_for\\_Economic\\_Affairs\\_and\\_Energy](https://en.wikipedia.org/wiki/Federal_Ministry_for_Economic_Affairs_and_Energy)

the faster expansion of the electricity grid through implementation of the Grid Expansion Acceleration Act.<sup>6</sup>

Their approach is more of a protectionism one. It is an institution that regulates the market economy to protect competition. The Bundeskartellamt deals with all restraints of competition that affect Germany. If only one of the Länder is affected, the cartel authority of the respective Land is responsible; mergers, however, are scrutinised by the Bundeskartellamt. The work of the Bundeskartellamt is based on the Act against Restraints of Competition. Where appropriate, the Bundeskartellamt also bases its rulings on European competition law, provided that the European Commission does not take action itself.<sup>7</sup> The ministry was established after the Chernobyl disaster in 1986. The Federal Government at the time wanted to combine environmental authority under a new minister in order to face new environmental challenges more effectively. Prior to this, responsibilities for environmental issues were distributed among the ministries of the Interior, Agriculture and Health<sup>8</sup>. This means the responsibility of the ministry covers a lot of sectors, particularly dealing with environmental sustainability. With regards to the energy sector, the ministry deals with climate protection and energy, safety of nuclear facilities and nuclear supply and disposal and radiological protection due to the usage of nuclear energy in the country.

### **3.3 MOROCCO**

Morocco is the only country in MENA who has no known oil or gas reserves. Due to this fact, the country has had to rely excessively on imported oil crude and other fossil fuel to meet their continually growing energy demand (Annual electricity consumption in Morocco reached 33.5 TWh in 2014, and has been increasing by around 7% per year on average over the past decade, according to the national utility company, Office National de l'Electricité et de L'Eau Potable (ONEE)). The high demand was brought about not only due to the economic expansion and growing urban population but also due to the 100% electricity access rate of the country. Since

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<sup>6</sup> <https://www.bmwi.de/EN/Ministry/The-Ministrys-Agencies/federal-network-agency-bnetza.html>

<sup>7</sup> <https://www.bmwi.de/EN/Ministry/The-Ministrys-Agencies/bundeskartellamt-bkarta.html>

<sup>8</sup> [https://en.wikipedia.org/wiki/Federal\\_Ministry\\_for\\_the\\_Environment,\\_Nature\\_Conservation,\\_Building\\_and\\_Nuclear\\_Safety](https://en.wikipedia.org/wiki/Federal_Ministry_for_the_Environment,_Nature_Conservation,_Building_and_Nuclear_Safety)

1996, the rural electrification scheme connected over 37000 villages. This shot the electrification rate up from 18% in 1995 to 99% in 2013. The public finances of Morocco continued to plummet due to the volatile nature of oil prices on the market. The country thus strategized and resorted to a plan known as the National Energy Strategy in 2009<sup>9</sup>. The main aim of the strategy is to reduce dependence on foreign markets and increase the role of clean energy sources. The strategy intends to reach these goals by diversifying energy sources, optimizing the electricity mix, increasing local production particularly from renewable sources, promoting energy efficiency, and advancing regional integration. The strategy is to be implemented through energy sector reforms, including particularly legislative changes, increased transparency and competition, as well as capacity building<sup>10</sup>. In line with the strategy, Morocco planned to invest more than \$20 billion in the next 10 years to increase the installed capacity by about 6,750 MW. As at 2013 Morocco had installed capacity of 27,781 gwh. 11% of the energy mix was from renewable, 38% from coal, 18.4% from natural gas and 14.3% from crude oil<sup>11</sup>.

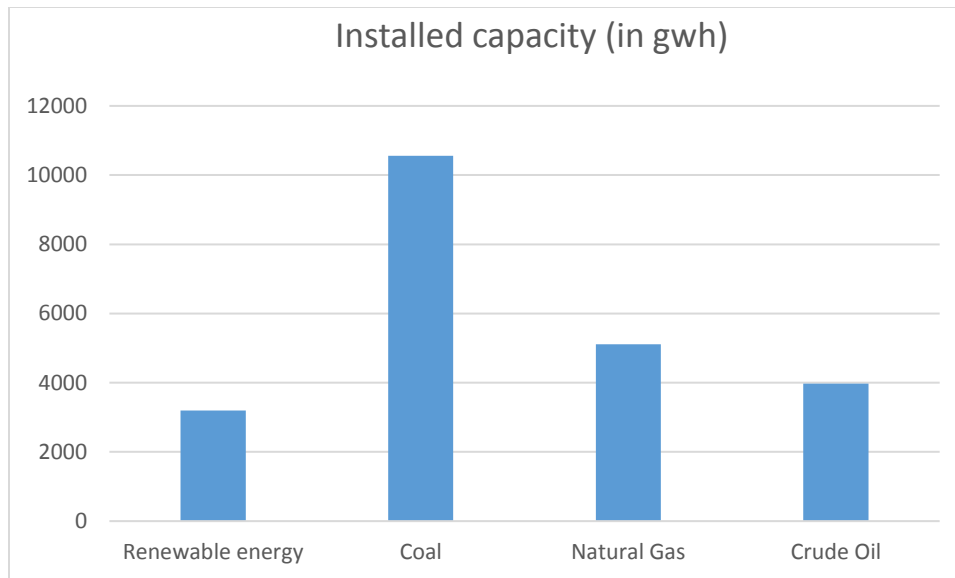
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<sup>9</sup> <https://www.oxfordbusinessgroup.com/overview/installed-capacity-rising-meet-moroccos-growing-energy-demand>

<sup>10</sup> [https://energypedia.info/wiki/Morocco\\_Energy\\_Situation#Energy\\_Policy\\_and\\_Strategy](https://energypedia.info/wiki/Morocco_Energy_Situation#Energy_Policy_and_Strategy)

<sup>11</sup> [https://energypedia.info/wiki/Morocco\\_Energy\\_Situation](https://energypedia.info/wiki/Morocco_Energy_Situation)





Energy Mix of Morocco as at 2013

### **3.3.1 REGULATORY FRAMEWORKS**

The ambitious National Energy Strategy in 2009 set the tone for the increase of renewable energy in the country's energy mix. Morocco plans to derive 52% of its energy from renewable sources by 2030. The strategy envisions a radical increase in renewables, so that by 2020, wind, solar and hydro would each account for 14% of power supply, with the remaining sources oil (14%), gas (11%), nuclear (7%), and coal (26%). The country therefore introduced modern legal and regulatory frameworks for the energy sector. In early 2010, relevant legislation and regulations were defined<sup>12</sup>.

Law n° 13-09 (2010) relating to renewable energy. This law liberalizes the renewable energy sector. It introduces major innovations, including the opening to competition of renewable electricity production and the ability to export electricity from renewable sources, by using the national grid (subject to the payment to the State of an annual fee). It also sets an authorization/declaration system, depending on the capacity of the facility. It also outlines a procedure for the authorization of renewable energy installations.

<sup>12</sup> <http://www.reegle.info/policy-and-regulatory-overviews/MA>

The law for the creation of the National Agency for the Promotion of Renewable Energy and Energy Conservation (ADEREE) (2010) outlines the reorganization and renaming of the existing Centre for the Development of Renewable Energy (CDER).

Law n° 57-09 creating the Moroccan Agency for Solar Energy (MASEN) setting out a specific framework for solar projects. This law sets MASEN specific targets regarding the implementation of the Solar Plan. MASEN ensures the management of the projects and remains liable for all the decisions which have been taken relating to the project.

Also, the legal framework for the generation, transportation and distribution of electricity is primarily governed by some laws.

Dahir n° 1-63-226 (1963), which created the Office National de l'Electricité (ONEE) and established the basis for private sector participation in energy production projects (Independent Power Producer projects or IPPs)

Dahir n° 1-11-160 dated 29 September 2011, which promulgated law no. 40-09 creating the Office National de l'Eau et de l'Eau Potable (ONEE), which replaces the ONE.

Law n° 54-05 (2006) on delegated management of services and public works. This law allows the State or local authorities to concede the management of a public service to a private entity. The main sectors in which delegated management were made are electricity, water, irrigation and urban transport.

Law n° 47-09 relating to energy efficiency (2011). This law lays the foundations of future thermal regulation by capitalizing on French and German experiences. It aims to increase the efficiency of energy resource consumption, to reduce energy costs on the national economy and to contribute to sustainable development. It also encourages the use of solar water heaters and energy-saving light bulbs.

In addition to the above laws, there is a new law on public private partnerships in the sector after King Mohammed VI insisted on “the need to develop contractual and public-private mechanisms in order to maximize the investments”, including in infrastructure and new technologies sectors. the law n° 86-12 (2015) pertains to public-private partnership contracts. The purpose of this law

is to help define a unified and incentivizing framework conducive to the development of infrastructures in Morocco and to increase the visibility of foreign and local investors. The law was drafted after analysing the different legal frameworks of public-private partnership contracts in various countries, such as France, Spain and Egypt, which influenced the legal scope applicable to these contracts<sup>13</sup>.

For the past twelve years, Morocco has worked on the introduction of an independent energy regulator, but past attempts have been unsuccessful mainly due to the complexity of restructuring distribution activities. The Government of Morocco has announced its intention to create an independent regulator (Agence Nationale de Régulation de l'Énergie - ANRE) and has started the process to design its functions, missions and organization<sup>12</sup>.

### ***Ministry of Energy, Mines, Water and Environment (MEMEE)***

Regulation of the energy sector in Morocco is the responsibility of the MEMEE. The MEMEE is in charge of developing and implementing government policy in the areas of energy, mines and geology. It also supervises companies and public institutions that come under its jurisdiction. The Ministry has three main departments, the mining development department, the fuels and energy department and the electricity and Renewable energies department<sup>12</sup>. There are also about nine institutions that operate within the sector. Centre de Développement des Énergies Renouvelables (CDER), Agence Nationale pour le Développement des Énergies Renouvelables et l'Efficacité Énergétique (ADEREE), Moroccan Agency for Solar Energy (MASEN), L'Association Marocaine des Industries Solaires et Éoliennes (AMISOLE), Office National de l'Électricité et de l'Eau Potable (ONEE), Jorf Lasfar Electricity Company (JLEC), Théolia, Centre National pour la Recherche Scientifique et Technique (CNRST) Unité des Technologies et Économie des Énergies Renouvelables (TEER), Delattre Levivier Maroc (DLM)<sup>12</sup>.

ONEE is also under the umbrella of the ministry of Energy, Mining, Water and Environment. The institution is bundled such that, its responsibility since 1963 has been to generate and transmit power in Morocco. In 1994, the system was liberalized to include private sector participation at the generation level. Thus, their production capacity was limited to 10 mw. For companies to build

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<sup>13</sup> <https://ppp.worldbank.org/public-private-partnership/library/%EF%BF%BCclient-alert-new-moroccan-ppp-law>

and operate above 50 mw, they were to be subjected to open tendering and also sell their power produced to ONEE. In 2001, a policy decision was made to further liberalize the electricity market with respect to generation, distribution and sale but little has been done since then to realise this.

Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE) is the main organization responsible for the development of energy management policies. Among others, the tasks of ADEREE comprise the development of national, regional and sectoral plans for renewable energy and energy efficiency, the realization and coordination of renewable energy and energy efficiency programs and projects as well as the provision of advice to the authorities for site selection and the formulation of legislation. Its goal is also to promote the adoption of the nation's energy strategy at regional level, and provide a contact point for investors<sup>12</sup>.

The implementation of the Moroccan Solar Plan is almost exclusively the responsibility of *Moroccan Solar Agency (MASEN)*. It is a state-owned limited company whose mission is to contribute to the development of the national solar industry. Activities of the agency include the conception of solar power projects, their promotion towards domestic and foreign investors, as well as the development of technical and economic feasibility studies<sup>12</sup>. In addition, *Association énergies renouvelables développement durable et solidarités* (AERDDS) has a great experience in implementing pilot projects. In addition, the organization has gained an outstanding experience in organizing workshops, debates and panel discussions and in engaging many stakeholders' towards achieving tangible results on sustainable development and deployment of renewable energy technologies at micro and small scales. The association is able to mobilize funds from national and international donors for its programs and able to invest these funds towards value addition and real benefits for communities, mainly for schools and students. The association has partnerships with local communes, Ministry of Energy and Environment, private companies and international organizations <sup>12</sup>. Moreover, **Centre de Développement des Energies Renouvelables (CDER)** deals with research and development in the field of Renewable Energy. They do standardization of Renewable Energy Conversion Equipment and conduct feasibility Studies in Renewable Energy. Their Expertise and consulting in Renewable Energy specialized training in the field of Renewable Energy doctoral training in the LMD.

In 1987, the Moroccan Association of Solar and Aeolian Industries (AMISOLE) was formed to promote the interests of industrialists and Moroccan professionals in the renewable energy sector.

It now includes forty companies bringing together several hundred employees. This association is open to manufacturers of renewable energy and professionals whose main activity is related to renewable energy<sup>14</sup>. In order to solve the energy challenges, JLEC complies with the National Energy Program to ensure power supply nationwide through the performance of the existing units and the expansion project of JLEC 5&6 which will raise the total capacity of the plant to 2056 MW<sup>15</sup>.

#### **4. Conclusion and Recommendations**

Apart from transparency, competitive bidding promotes efficiency. Unfortunately, most African countries use direct negotiation to procure additional renewable energy capacity. Indeed, such practice makes the cost of renewable energy high, deters investments through cumbersome processes, and promote the allocation of licenses to companies that may not have the capacity. Due to these and other challenges such as finance and technology, Africa seems to lack behind in the global transition to renewable energy sources.

The study recommends that countries should build tendering capacity, put in place simple but robust tendering process and research to identify their renewable energy potential to procure new renewable energy capacity through open and competitive bidding process.

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<sup>15</sup> JORF LASFAR ENERGY COMPANY (JLEC) A MAJOR PLAYER OF THE NATIONAL ENERGY

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<sup>i</sup> Per the renewable energy law of Ghana, hydro projects with more than 100 MW capacity such as the Akosombo Dam and the Bui Dam are not considered renewable energy.