Observatoire Europe-Afrique 2030

Promote a third generation mini-grids design / manufacture / construction sector in Africa

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In many areas of the African continent, electricity distributed through third-generation mini-grids[i] is already competitive with what it would cost to supply electricity through centralized grids. The technological advances made over the past ten years have made it possible to significantly lower the cost of electricity produced by these mini-grids. This cost is expected to decline further over the next decade, from $ 0.41 / kWh in 2020 to $ 0.20 / kWh in 2030[ii].

If this prospect is confirmed, the large-scale development of third-generation mini-grids in Africa would provide 81 million additional consumers in sub-Saharan Africa with access to electricity[iii], including industrial consumers[iv]. Moreover, this would significantly reduce greenhouse gas emissions[v] by gradually replacing diesel generators currently used on a large scale in urban[vi] and rural areas[vii].

However, an important shadow remains in this picture: the development of third-generation mini-grids would force the African states concerned to import most of the US $ 93 billion of equipment and services needed by 2030. The impact on the indebtedness and the trade balance of these countries would be very penalizing.

There is a solution to greatly reduce this financial burden: A unique opportunity indeed presents itself for African and European governments and entrepreneurs to demonstrate that it is possible to develop a manufacturing sector with high added value, competitive internationally, based on a logic of co-production between European and African industrialists.

Because of its “high-tech” characteristics, this project appears to break with the “traditional” sectors on which the prospects for manufacturing development in Africa are usually based (leather, textiles, etc.). The emergence of a sector of design / manufacture / installation of mini-grids in Africa would have major potential advantages:

• It is estimated that between 100,000 and 150,000 additional mini-grids will be needed in sub-Saharan Africa by 2030 to meet the "universal access to electricity" scenario[viii]. To date, "only" 2,160 mini-grids are operational, 63% of which being solar or hybrid solar.

• Such a huge potential market would allow for the creation of high capacity mini-grid manufacturing units, maximizing economies of scale. It is a particularly favorable context. As a counter-example, the development of local vehicle assembly lines is not economically justified in most sub-Saharan African countries due to the small size of African domestic markets for new vehicles.

• As the mini-grid market is still in the start-up phase at world level, Africa can claim a significant share in terms of design / production. Mini-grid production capacities located in Africa could easily be added to the existing global industrial capacity. Indeed, the context is totally different from a "high-tech" market like the smartphones manufacturing, which has reached maturity and is controlled globally by a well-established oligopoly.

• Polycentric governance of mini-grid projects is a realistic response to major governance issues in large power grids in sub-Saharan African countries lagging behind in access to electricity[ix].

• For European designers / manufacturers of hybrid mini-grid equipment, co-production is an opportunity to optimize their value chain and assert their competitiveness in African markets. It would promote the emergence of a long-term competitive offer in the face of competition, particularly from China, which will intensify over the coming years.

For the African and European companies wishing to embark on the establishment of a third generation mini-grid co-production sector, the "Business Model" could be structured around the following axes:

• During the first three to five years, the European company(ies) will contribute the technological know-how, train the workforce and provide the equipment to be assembled on African sites.

• The industrial tool on the “African” side would consist of training centers for senior technicians and engineers, as well as several manufacturing sites spread across sub-Saharan African countries representing the largest potential markets for mini-grids. (Nigeria, Democratic Republic of Congo, Ethiopia, Tanzania, Uganda) and several maintenance centers.

• The rate of integration of African sites would gradually increase, as the local establishment of sub / co-contractors. The objective would eventually be to obtain autonomy for African industrial sites within five years, in terms of the design of mini-grid projects, the supply of

components, the manufacture of certain key equipment (photovoltaic panels, inverters, batteries, etc.), on-site assembly of mini-grids, start-up and maintenance operations.

The success of such a project presupposes meeting several conditions:

• European companies will agree to embark on this type of project on condition of being closely accompanied and helped by the European Union and the African countries involved, in order to reduce the risks associated, especially the future evolution of the political and economic environment of the African countries concerned[x].

• African states must fully play the card of cooperation and transparency: contribution to the financing of investments, clear electricity pricing policies, income tax exemption for the manufacturing companies concerned, tax exemption on imported parts for assembly on the African production sites, guarantees relating to the safety of working force, guarantees relating to the quality of the access infrastructure to the production sites, ending price subsidies for diesel (which favors the use of conventional generators and undermines the development of mini-grids) and a clear definition of how the users of mini-grids will be economically protected in the event of the arrival of the centralized grid.

• It will be essential to train human capital so that African design / production industrial sites are operated and managed almost entirely by local staff, in order to avoid a drift in production costs.

These co-production projects are not utopian. As the AfCFTA enters its operational phase, the development of a "mini-grids" sector would be a strong signal of voluntarism in terms of concerted industrial policy. The chances of success would be significantly increased if several African countries decided, for example, to define specific modalities on the eligibility of goods to be traded in the area in relation to this sector, within the framework of the protection of infant industries[xi].

This industrial sector project would allow the African states concerned to curb their spiraling debt and prevent the deterioration of their trade balance. It would offer African companies the opportunity to gradually acquire know-how in a strategic sector. It would allow European companies, through an innovative co-production strategy, to remain competitive in the face of Chinese competition.

The success of this industrial project would serve as an example and could translate into a "snowball" effect in other high-tech sectors, thus allowing African countries to leave their current logic of bottom-up development for their manufacturing sector.

[i] These are hybrid photovoltaic mini-grids that can be connected to the main grid, equipped with remote management systems and smart meters with pay before consumption. They incorporate energy-efficient household or industrial appliances into their operating model for productive uses of electricity

[ii] Source: “State of the Global Mini-grids Markets - Report 2020” - MGP / Bloomberg NEF / Sustainable Energy for All ”.

[iii] Domestic consumers, industries…

[iv] This figure corresponds to the share of third-generation mini-grids in the scenario that would allow all populations to have access to electricity (source: ibid.)

[v] In Nigeria, the cumulative capacity of diesel generators, mainly used by households, reaches eight times the peak effectively operational capacity of the entire national grid. Nigerians spend at least $ 12 billion annually to purchase and operate gasoline generators (source: ibid.).

[vi] This market corresponds to companies or institutions (hospitals, etc.) that need a reliable supply of electricity to develop. It has two components: the replacement of existing generators and a “first equipment” component, for example for SMEs not equipped with generators.

[vii] This market includes a replacement component for firewood and diesel groups, as well as a "first equipment" component, for example for new agro-food installations in a rural area or for domestic households using firewood.

[viii] This estimate was obtained by cross-checking the work of the World Bank (“Mini-grids for half a billion people - ESMAP - June 2019) and Bloomberg SEF (ibid.).

[ix] These governance issues, which result in high costs for network users, fall within Elinor Ostrom’s interpretation of the tragedy of the commons. On this subject, see the following publication: "Electric mini-grids as an example of the application of Elinor Ostrom's theses on the polycentric governance of the tragedy of the commons" - Jean-Claude Berthelemy - University Paris 1, Panthéon-Sorbonne - 02 / 11/2016.

[x] The reader can refer to the following document produced by the Europe-Africa Observatory 2030: "Case study n ° 7: Promoting the development of manufacturing centers with an export vocation in sub-Saharan Africa: Proposal for a new financial incentive tool - Observatoire Europe- Africa 2030 - (November 2018) ”. This study describes an innovative investment incentive tool for European companies, based on the combination of two complementary aids.

[xi] African countries plan to launch the AfCFTA in January 2021. States parties to the free trade agreement should take advantage of the ordinary session of the Assembly of Heads of State on January 2, 2021 to approve the operational instruments of the first phase of the agreement: rules of origin which will determine the eligibility of goods to be traded in the zone, and modalities for the protection of infant industries. AfCFTA will require member countries to liberalize at least 97% of their tariff lines and 90% of their imports.