AFRICAN DEVELOPMENT BANK GROUP
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20 OCTOBER - 13 NOVEMBER 2020
africa energy forum

African Utility of the Future | Design Competition

Management Pack

8th October to 13th November 2020

Your mission

"Good day Utility Visionaries…. Your mission, should you choose to accept it, involves the design of the "African Utility of the Future.

You may select any number of team members, but it is essential that your team remains anonymous. Your success will depend on your team's capability to design a futuristic, SMART, sustainable and agile African Power Utility.

The quality of your submissions will be judged against its innovative approach to ensure effective and transformative outcomes across the following 5 areas:

- *Governance & Regulation*
- *Operations & System planning*
- *Human capital development*
- *Financial sustainability, pricing structures, ownership models, government involvement, and;*
- *Technology enhancements & Partnerships*

You have 29 days to recruit your team and to submit your proposed design on-line.

Should your design be deemed exceptional by the panel of experts appointed, you and your team will be rewarded with 5000 US.

This message will remain live until the closing date of 6 November 2020. Stay safe!"

1. Background

The majority of African countries are still struggling to meet their electrification goals and a significant portion of their population still do not have access to electricity. Those with access to electricity struggle with low reliability of supply and most times, high connection costs. A typical African utility is characterized by end-user tariffs that are not cost-reflective, low investment, lack of adequate operational capacity, high losses, poor technical performance, electrification challenges and poor customer service.

However, there is a silver lining to these challenges. Africa has the opportunity to embrace innovations in enabling and evolving technologies, business models, system operations, and power market designs. In the medium- and long-term, the digitalization of the Electricity Supply Industry (ESI) will be transformational for every aspect of system planning, design, operations, and maintenance. The issue of modernizing the utilities can start now without the issue of sunk costs. Utilities have a good chance to meet their obligations, not only in terms of electrification and customer satisfaction, but also in the integration of disruptive technologies and business models to ensure a cost effective and efficient, digitally transformed utility which we shall refer to as the ***Utility Of the Future (UOF)***.

UOFs are expected to be flexible and able to quickly adapt fast-changing policy, regulatory and socio-economic environments. They need to integrate various solutions in a cost-effective manner; including stand-alone, on-grid and mini- grid / micro-grid systems. UOFs should be able to manage the integration of Distributed Energy Resources (DER)s into the grid while providing reliable supply of excellent quality, be cost efficient and effective in other to provide affordable power; and carry customers along as partners using delivery platforms, such as one-stop portals for all utility products and services.

All these will be driven by the convergence of Information Communications Technology (ICT) and Energy Supply solutions, such as big data storage, analytics and Internet of Things (IoT), and and distributed energy technologies and business models.

2. **What are the expected focus areas for the African Utility of the Future?**

What will be the key focus areas for the utilities to consider in the short- to-medium term:

a. **Use of Multiple Solutions and seamless integration of renewable sources of energy will be in the heart of operations:** With the increasing flexibility of conventional generation technologies and the need for cleaner energy, there will be need for increased penetration of renewables in the system generation mix. This will imply the need for rapid and expanded digitization, which will include the use of predictive analytics and data visualization for decision making. Big data analytics, anchored on accurate data modeling will be essential for planning design, operations and maintenance across the power value chain; including retailing of power, which will employ tariff options that will send the right pricing signals to customers, and also provide appropriate incentives to facilitate better customer experiences with utilities.

b. **Improved reliability of Power through use of digital systems**: The use of big data analytics (e.g. predictive analytics for preventive maintenance / repairs and advanced image analytics to evaluate network failure) will be required by the utilities to optimize the scheduling and implementation of plant maintenance and/or repairs: Thus, improving plant and overall power system availability, reliability and efficiency. There will be need to use digital platforms to maximize asset availability (and economic life), minimize network failures and restore supplies quickly.
c. **Utilities to become Smart is no longer an option**: The competition to utilities is no longer from other utilities, but mainly from Consumers who have increasingly looked into their own captive power solutions, and have turned into Prosumers (who sell excess power to the grid where feasible). The need to have smart networks with optimum inventory analytics, that will be a part of integrated system value chains is one key effort, utilities must make to survive and thrive in the future. UOFs will have to develop complex, efficient metering and billing systems, and capacities, to interact with more demanding Consumers and Prosumers. With real-time control over their electricity consumption and output, individual customers will gain insight into their energy requirements, costs and consumption levels, and gain the ability to control the energy sources they use and the best times to sell power. Smart devices and controls will complement smart meters, armed with machine learning and artificial intelligence to maximize comfort and economy.
d. **Seamless communication with customer** and **consumer centric Business Model:** This should be enabled via a one-stop interactive consumer portal that will help with complaints resolution, system supply / demand management and flexible payment solutions. The deployment of Smart meters and utility back-end systems will be exceptionally helpful.
e. **Cybersecurity**: With the digitization of most operations, Cybersecurity becomes extremely Important for the utility of the future; and appropriate governance and operational mechanisms will have to be put in place; including capacity building for key stakeholders.
f. **Regional Integration**: Regional markets will play an important role to accelerate access (to cheaper electricity) and promoting more RE in the energy mix: Nationally constraints in transmission lines / infrastructure and market development will have to be addressed through an increased scope / role for private sector participation (e.g. through project finance and/or PPP models). Investing in transmission interconnections and associated soft infrastructure (e.g. as members of power pools, with regional planning, regulation, and system operation); and creating common policies, standards, market rules, and enforcement mechanisms; to facilitate mutually beneficial cross-border trade. The emergence of power

aggregators is also expected, these bodies have the potential of closing market gaps as viable / creditworthy off takers. The need for (independent) system operators to build capacity to integrate and manage the power system, due to increasing complexity (variable generation complemented by flexible and decentralized resources); virtual power plants, energy communities with embedded grids and peer-to-peer trading, community-shared ownership, pay-as- you go and, eventually, perhaps even distributed ledger systems.

g. **Regulatory agility and support in the ever changing environment :** Disruptive technologies and business models are opening new opportunities and provoking the need for new regulatory, policy, and economic tools to harness them. National and regional regulators will need to be more proactive; and flexible with utilities and other market participants.

3. **AfDB participation at the aef Digital Energy Festival:** The Power Systems Development Directorate (PESD) of the African Development Bank will be participating during the Digital Energy Festival, mainstreaming the concept of: "*The African Utility of the Future*", the theme for the 2019 AfDB-APUA CEO Leadership Forum. This is a continuation on the concept of "The Second Wave of Power Sector Reforms" as it relates to Sustainable Utility Transformation (SUT) programme of the Bank, which is a key component that will continue to drive the Bank's Light Up and Power Africa strategic objective.
   The Bank will be hosting a Boardroom session on the topic "The African Utility of the Future" on the 29th of October 2020 and in addition will be sponsoring the "The African Utility of the Future Competition". The competition with its US$ 5,000 prize money (already included in the Bank's sponsorship), seeks to spark and inspire creative thinking around innovative ideas to transform current utilities into Advanced, Futuristic, SMART, Sustainable and Agile African Power Utilities. The design to be grounded around the five pillars of the Sustainable Utility Transformation (SUT).

4. **Competition Concept:** The 'African Utility of the Future' competition is to be sponsored by the African Development Bank and facilitated by Energy NET throughout aef, running from 8 October to 13 November 2020. The overarching principle is to create a platform for current asset-owners to come up with innovative, realistic, practical and implementable ideas for "leap-frogging" existing utilities in into the future.

5. The objective of the competition is to inspire out-of-the-box creative thinking around new ideas to transform existing African Utilities into Futuristic, SMART, Sustainable and Agile African Power Utility.

   Only anonymous team entries will be allowed, and the use of Team Names are encouraged. As the objective is to solicit realistic and practical ideas, relevant to African Utilities currently operating, only submissions from teams representing current Distribution asset owners will be allowed. These Distribution asset owners can be public sector, or private sector, on, off or mini-grid based.

   Only the winning team will be named, unless, (based on the quality of the submissions) the judges feel that the proposals of the 2nd and 3rd place teams should be mentioned.

   Submissions will be done on-line through a web-based submission portal, using simple submission templates to be designed by Energy NET, based on the defined judging criteria developed by the Bank.

   Based on the outcome of similar events run by the AEF, it is anticipated that between 5 and 15 submissions can be expected. However, since the concept is quite new to the specific sector, submissions may even be less. Should however the competition attract more than 15 submissions, the AfDB team (Liezl & Chigo) may have to do a pre-screening to provide a shortlist of <=15 submissions to be shared with the judges.

   To asses interest in the competition and to control participation to some extent it is proposed to ask participants to register for participation during a limited time period. It is proposed that all submissions to be registered between the period 8 to 23 October 2020.

6. **Judging Criteria:** The quality of the submissions to be judged against their innovative approach to ensure effective and transformative outcomes across each of the 5 pillars of sustainable utility operation. These pillars are:

   - Improved Sector Governance
   - Least Cost Integrated Resource Planning
   - Human Capital Development
   - Sector Reforms & Financial Sustainability
   - Smart Partnerships & performance monitoring

Team submissions could include one or many design elements per pillar, but each team submissions must provide a design element for each of the pillars, (minimum of 5 design element per submission)

7. **Judging parameters:** Design elements will be scored between 1-10, depending on their perceived effectiveness by each of the 5 judges. Designs will be scored for each pillar topic and the overall submission score will be the average. The judges, as experienced professionals in their respective fields, will judge each submission based on its perceived merit, however the following guidelines are provided.

   For purposes of the competition, only proposals relevant to Distribution utilities in their various forms to be considered.

   i) Governance: What are the new Governance (and management) arrangements that need to be taken into consideration for the "utility of the Future ". On a scale of 1 – 10 how much impact will the proposed governance/regulation design have on the performance and sustainability of the utility? How different is this to the current applied governance structures of African utilities now?

   ii) Planning: On a scale of 1 – 10 what innovative approach is given towards operational design/planning? What new innovative tools and planning methodologies are proposed from existing ones? What innovative operational designs / processes are proposed to improve efficiency? How are alternative generation capacity options incorporated in the planning methodology? How can the system planning incorporate islanding operation, DER integration and also regional integration where need be?

   iii) Human capital development: On a scale of 1 – 10 what leadership structures with positive gender considerations are proposed? What innovative policies and organizational structures are proposed? What apprenticeship & retraining programme for employees are proposed. Even considering the upskilling of staff to new technologies and business processes.

   iv) Financial sustainability & sector reform: On a scale of 1 – 10 what ownership models (public/private) are proposed? This can be expanded into relationship with government, communities and private sector. What is proposed to enhance tariff / subsidy policy design and maximize revenues and cash collections? What is proposed to reduce total system losses and operational expenses? Innovative financing mechanisms that will attract private investment?

v) Smart Partnerships: On a scale of 1 – 10 what partnership opportunities are proposed? What futuristic technology advancements and processes are proposed to improve sustainability of the utility?

8. **Submission Format:** Team submissions to be limited to 6x A4 pages, including no more than 3500 words and if required relevant diagrams. Each idea per SUT pillar to be well described.

9. **Panel of judges (confirmed):** The following judges have already confirmed their participation as a panel member during the AUoF boardroom session as well as a judge for the AUoF competition.

Mr Ibrahima Konate	AfDB	PESD.2 Manager
Mr Abel Tella	APUA	DG APUA-ASEA
Prof Ignacio J. Pérez-Arriaga	FSR	Prof at MIT
Anujesh Dwivedi	Deloitte Touche	Partner, Energy & Resources
Liezl Harmse	AfDB	Chief Utility Management Officer

10. **Submissions are allowed from:**

-Teams representing current/operational Distribution utilities;
-Public utilities
-Private utilities
-Utility developers, on, off or mini-grid based.

- **You must register your interest by 23rd October 2020**
- **You must complete your application by 6th November 2020 and send it by email to Charlotte@energynet.co.uk**