ARSO /AFSEC
Collaboration

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Concept Note

NEW ARSO/AFSEC JTC1

*ARSO/AFSEC Renewable Energy Electricity Access JTC1 – **AREEA***

A) Introduction

AFSEC/AFSEC have agreed on options to kickstart technical collaboration opportunities involving specific AFSEC Technical Committees and has allocated the task to a ARSO/AFSEC joint Task Force to pursue.
The task force had to unpack the identified joint opportunities and start the joint initiatives, one of the opportunities identified was a new Joint Technical Committee (JTC1) on *Renewable Energy Electricity Access (AREEA)* with possible related topics e.g. solar energy, wind energy, hydropower, energy storage systems, tidal and wave energy, green hydrogen, fuel cells, training for safe work, etc

ARSO/AFSEC JTC1 relates to some of the work covered under the scopes of: ARSO TC47 & ATC 82. This work could also mirror the scopes of the following international technical committees (TCs) among others: ISO 339, IEC TC4, TC88, TC64, TC57, TC120, TC105, TC114, TC21, SC21A, SC8B and LVDC_SYC. The titles and scopes of these committees are given in Annex A.

B) General Content for new JTC1.

Theme:

The socio-economic and technological challenges of *Renewable Energy Electricity Access* deployment.

Some stats on electricity access in AFRICA:

Presently approximately 600m people in Africa lack access to electricity despite the abundant availability of renewable energy resources.
In many countries there has and are many initiatives for electricity/energy access.
If we look at the world bank view, the Energy Sector Management Assistance Program (ESMAP), they use tiers to simulate the evolution from the traditional open fire for cooking and liquid fuel for lightning visualized below from Tier 0 to Tier 5 for the ultimate electricity access.

World Bank Multitier Framework for Energy Access (https://www.esmap.org/node/55526)

- Tier 0 is where Africa does not want to be.
- the 1st tier has/is been relatively well successfully addressed with the IEC standards 62257-9-5 and 9-8 in conjunction with other organizations with solar lanterns which has been commercially and socially accepted.
- For the 2nd tier, following on the success of the tier one solution, the two IEC standards were upgraded to also cover solar kits up to 350W which has also had great success in various countries.

To date there are 220 T1 &T2 products certified and 65 million sold since 2010 proving that implementing standards with compliance results in success. These solutions have also created local employment for sales agents and technical support.
Unfortunately there is still gaps with these two solutions due to improper governance to minimize counterfeit products.

Solar lanterns

Solar Kits

- The present challenges start from Tier 3 – 5 as these imply installation or micro grid solutions and need more complex attention, specifically on standardization.
- One of the main failures is that many electricity access projects has been implemented with capital expenditure (capex) and no operation and maintenance (O&M) capital and lack of ownership (community or government) for a sustainable solution mainly due:
  - Local standards are not implemented or not available;
  - the department involved is not "geared" for the technology solution with related technical expertise and mostly focus on the political gain than on a sustainable solution; and
  - lack of community involvement and training/education.

C) Context for the establishment of ARSO/AFSEC JTC1

Challenges
Socio-Political Acceptance is the broadest of the three dimensions, operating at the macro or national level. This dimension encompasses how the public and other stakeholders view the policy environment surrounding the deployment of new energy technologies, which is typically gauged through opinion polls.
Community Acceptance refers to the specific acceptance of siting decisions and renewable energy projects by local stakeholders, particularly residents and local authorities and is often characterized by a time, dimension showing a U-curve pattern with acceptance being higher in the proposal and running phase, lower in the implementation phase.
Market Acceptance or market adoption of innovation that involves all the market actors at different level: consumers whose decisions are affected by a number of communication and societal dynamics steering the consumption choices and investors (industry actors, SMEs and intermediaries) that must choice among alternative technologies.

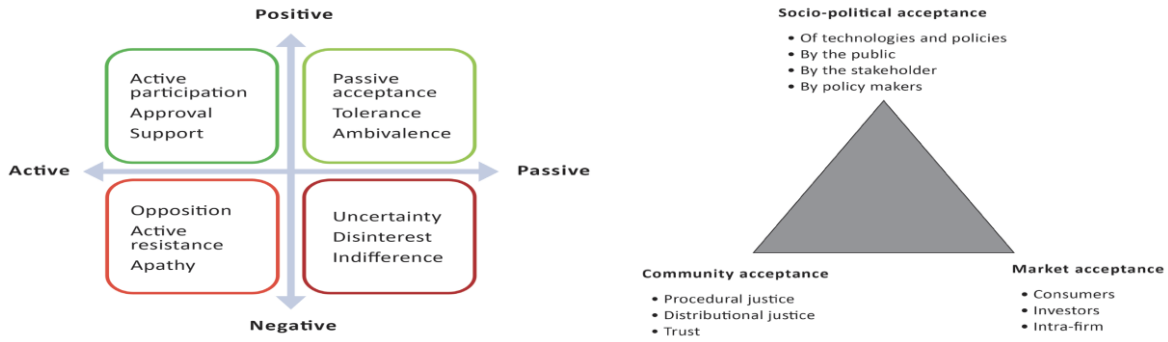
Electricity will be the cornerstone of our future decarbonized energy systems and social development of the AFRICA Continent people. Renewable energy technologies (RETs) are the key technologies to deliver this

decarbonized electricity in sufficient quantities, at affordable cost, and in an environmentally & societally sustainable way for electricity access. RETs will therefore play a prominent role to achieve the clean energy targets, as well as global sustainability goals. However, the massive roll-out needed in the coming decades of renewable energy, its integration into the energy system and into our living environment. And the required circularity of the entire value chain will pose serious technological and non-technological challenges on the further development and deployment of RETs for electricity access.

These challenges, notably from a technical point of view and conformance, are mostly covert by international standards from a product perspective. Yet, to achieve widespread deployment of RETs solutions and reach electricity access targets, it is imperative to also address and overcome the significant socio-economic challenges that accompany this transition. Recognizing the interdependence of these challenges is a key insight as addressing technological obstacles without considering the economic and societal aspects will become more and more of an incomplete approach.

More specifically, projects should provide an overview of the most pressing and important socio-economic challenges for the further massive deployment of RETs in our society by focusing on four key dimensions: (1) Social Acceptance, (2) Public Engagement, (3) Skills and Workforce, (4) Environmental and Social Sustainability

The social acceptance matrix



We need to support RETs' **sustainable growth** and look at the ecological and social effects of solar systems. Comprehensive societal cost-benefit analyses are needed to find the optimal path for RETs' growth considering the environmental impact, employing Life Cycle Assessment (LCA) analysis to scrutinize the ecological footprint of RETs, whilst also looking at the Social Impact through Social Life Cycle Assessment (S-LCA). Furthermore, we need outlines for Environmental, Social and Governance (ESG) frameworks, to promote sustainable and responsible practices across the solar sector.

By **bridging the gap** between technological and socio-economic considerations we enrich the discourse surrounding our transition to a sustainable energy system, ensuring that these critical socio-economic dimensions are given due consideration alongside the technological aspects

D) Opportunities

Some area's (not exhausted) that the joint ARSO / AFSEC TC on Renewable Energy can pursue that will assist with the deployment of affordable and sustainable RETs:

- Access to electricity – development of standards that facilitate access to electricity and load diversity.
- Large Rooftop PV Installations - establish standards for the design, installation, and maintenance of large rooftop solar installations to ensure safety, efficiency, and interoperability, particularly for community projects aiming to access affordable clean energy.

- Remote and/or offgrid solutions - establish standards for the deployment of renewable energy systems in remote areas without reliable utility connections, focusing on ensuring reliability and safety.
- Energy storage systems – establish standards for energy storage systems to ensure quality, safety, and environmental sustainability.
- Efficient Appliance – develop standards for energy efficient DC appliances.
- Clean cooking – develop standards for clean cooking technologies
- LVDC – establish standards for LVDC energy systems to address control, arcing, and safety concerns, ensuring compatibility and interoperability among different components and systems.
- Establish standards for remote access with a communication media technology focusing on communication protocols, security, and interoperability for applications such as customer communication, vending control, remote support, tamper detection, etc.

E) ARSO/AFSEC JTC1 Structure

Roles and responsibilities are as detailed in the African Standards Harmonization Manual (ASHAM).

Scope of ARSO/AFSEC JTC1

Standardization in the field of renewable energy technologies for electricity access.

ARSO/AFSEC JTC1 Subcommittees

The JTC will work through subcommittees (SCs) covering the following related technical areas but not limited to these :

solar PV energy, wind energy, hydropower, energy storage systems, tidal and wave energy, green hydrogen and fuel cells.