



Standards &  
Engagement

# The Africa of Tomorrow

A Standards Roadmap





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# About

## ARSO

Admitted as an Observer member of the WTO TBT Committee in November 2015, the African Organisation for Standardisation (ARSO) is an intergovernmental Organisation established by the Organization of African Unity (OAU, currently African Union (AU)) and the United Nations Economic Commission for Africa (UNECA) in 1977, hosted by the Government of the Republic of Kenya and with a current membership of 42 AU member States. The principal mandate of ARSO, also recognised under the AfCFTA Agreement, is to harmonise African Standards and conformity assessment procedures based on the WTO TBT Agreement and best international practices in order to reduce Technical Barriers to Trade in Africa, thus promoting intra-African and international Trade. This entails the mandate to Harmonise national and/or sub-regional standards as African Standards; Encourage and facilitate the adoption of international standards by member bodies as the basis of Regulations and Conformity Assessment procedures; initiate and coordinate the development of African Standards (ARS) with references to products which are of peculiar interest to Africa and where no international standards exist; Develop tools for Good Conformity Assessment practices including Mutual Recognition Arrangements; Promote Capacity building and awareness creation in standardisation activities; Avail relevant information on standards, Technical Regulations, Conformity Assessments and Co-ordinate the views of its members at the ISO, IEC, OIML, Codex and other international organisations concerned with standardisation activities. In fulfilling its mandate and currently through the 2022–2027 Strategic Plan, ARSO has partnered with various stakeholders including International standards bodies, Donor Community and funding agencies.

## UL Standards & Engagement

UL Standards & Engagement translates scientific discoveries into standards and policies that have the power to make a systemic impact on public safety throughout the world.

Distinguished by our independent research and informed foresight, we've been driving cutting-edge science into practical standards since 1903. Our extensive library of standards helps to make everyday things safer, more secure, and more sustainable, from life jackets to batteries to autonomous cars.

It's a mission we pursue across the globe. We partner with leading minds and national standards bodies around the world to draw upon an ever-growing body of scientific knowledge from UL Research Institutes and global experts. Together, we're creating a dynamic road map to a safer future





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# Abbreviations used in this document

AfCFTA – African Continental Free Trade Area  
ARS – African Regional Standard  
ARSO – African Organisation for Standardisation  
ARSO CACO – African Organisation for Standardisation Conformity Assessment Committee  
ASN – Senegalese Standards Association  
BS – European Standard  
CA – Conformity Assessment  
CVC – Continental Value Chain  
EAC – East African Community  
EN – European Standard  
FTA – Free Trade Area  
GSA – Ghana Standards Authority  
GVC – Global Value Chain  
IEC – International Electrotechnical Commission  
ISO – International Organization for Standardization  
KEBS – Kenya Bureau of Standards  
NC – Nonconformity  
NIS – Nigerian Industrial Standards  
NRS – National Standard in South Africa  
NSB – National Standards Body  
OSQH – One Stop Quality Holdings  
PAQI – Pan African Quality Infrastructure  
REC – Regional Economic Community  
RVC – Regional Value Chain  
SABS – South African Bureau of Standards  
SANS – South African National Standard  
SC – Standards Catalogue  
SDO – Standards Development Organization  
SON – Standards Organisation of Nigeria  
TC – Technical Committees  
ULSE – UL Standards & Engagement  
ZABS – Zambia Bureau of Standards  
NRCS – National Regulator for Compulsory Specifications  
ZCSA – Zambia Compulsory Standards Agency

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# Foreword

## ARSO

OAU (currently AU) and UNECA formed the African Organization for Standardization, formerly the African Regional Organization for Standardization (ARSO) in 1977 amidst the unfolding events and the prevailing mood of the African socio-political and economic Pan-Africanism of the 1970s. Now headquartered in Nairobi, Kenya, ARSO has a current membership of 41 African countries (~75% of the continent)<sup>1</sup> including key economies such as Kenya, Egypt and South Africa supporting its mandate to promote the Standardisation and Conformity Assessment and related activities in Africa. The tireless contributions of the current goodwill ambassadors, ARSO members, and development partners sustain ARSO's activities towards its mission.

The seamless flow of goods and services under the African Continental Free Trade Area (AfCFTA) Agreement<sup>2</sup> requires a harmonised Standards and Conformity Assessment, which ties into the fundamental mandate of ARSO of developing tools for standards development, standards harmonization and implementation of these systems to enhance Africa's internal trading capacity. This trading capacity enhancement would help increase Africa's product and service competitiveness globally, and uplift African consumers as well as the standardization forum for future prospects in international trade referencing.

Categorised as the largest threat to the global economy since the financial emergency of 2008–09,<sup>3</sup> &<sup>4</sup> COVID-19 disrupted external supply chains in just a few days, for close to two years. Efforts to build and trade in competitive, resilient, and robust value chains with supportive policy reorientation that would promote Africa-made goods, industrialisation, quality infrastructure and shift from global to regional and local supply chains have been amplified in a bid to unlock Africa's business potential, shedding light on Small and Medium Enterprises (SMEs) and manufacturing industries in the continent.<sup>5</sup>

Instilling and supporting a quality-conscious culture should also address human, animal and plant health and safety needs. An effective Quality Policy must necessitate compliance of products and services with market requirements and standards on consumer health and safety, environmental impact, labour conditions and sustainability. Their balanced governance is key to competitiveness in global business relations.

The potential of Standardisation in Africa can fully unleash only if the relevant actors (regulatory authorities, policymakers, the education sector, standards developing organisations, companies, consumers, users and other interest groups) take the onus of relevant decisions and professional and effective implementation of their standards activities and evaluation.

This study is an undertaking in partnership with UL Standards & Engagement, to facilitate trade and spread awareness about the need for cooperation with other standardisation bodies and also evolve local standards portfolios in the key areas of Fire Safety, Renewable Energy, and Sustainability that reflect the unique demands of African countries and address the gaps they each experience.

– **Dr. Hermogene Nsengimana,**  
*Secretary General, ARSO*

## UL Standards & Engagement

UL Standards & Engagement is a non-profit dedicated to making the world safer, more secure, and sustainable. Our longstanding partnerships with various government bodies, research organizations and leading academic institutions over the years help us conduct rigorous independent research, share knowledge through safety education and public outreach initiatives, and develop standards to ensure safer environments. We serve as a vital resource and facilitator for policymakers in regulatory and legislative environments.

In Africa, a large part of our focus has been on furthering education and demonstrating best practices in safety to help its countries tap on a potential of nearly 40 percent to over-50 percent rise in intra-African trade between the initiation year of the reform (2020) and 2040.<sup>6</sup> With the AfCFTA agreement in place, 55 nations have committed to removing tariffs on 90 percent of goods, progressively liberalising trade in services, and addressing a host of other non-tariff barriers. Safety and sustainability are two such key non-tariff barriers.

As our first partner in Africa, ARSO shares our goal of improving public safety through the establishment of effective safety standards and helps us advance fundamental and applied safety science research, facilitate critical partnerships, and engage a wide gamut of stakeholders. The organisation also connects us with its 41 member nations in advancing standards cooperation and to developing additional agreements with standards bodies in individual African nations.

This study maps the standards ecosystem vis a vis fire safety, renewable energy, and sustainability, derives opportunities for the adoption of global standards and to adapt them to local cultures, and to further develop local standards in the focus areas in selected countries as a model for the larger African continent. The study has revealed a high rate of adoption of a few global standards. However, national and regional work items have a lot of ground to cover. We find vast opportunities for initiating standardisation projects in which further evolution of standards for emerging technologies can be addressed through adoption or adaption of the global standards.

We sincerely thank ARSO for helping us engage with their member nations through this research and intervention initiative, and the National Standards Bureaus and key policy-maker officials that participated in this study towards our vision of making African manufacturing businesses and industries safe, secure and sustainable.

– **Ms. Sonya Bird,**  
*Vice President, International Standards,  
UL Standards & Engagement*

<sup>1</sup> [https://www.arso-oran.org/?page\\_id=5305](https://www.arso-oran.org/?page_id=5305)

<sup>2</sup> <https://au.int/en/treaties/agreement-establishing-african-continental-free-trade-area>

<sup>3</sup> [https://www.wto.org/english/news\\_e/pres20\\_e/pr855\\_e.htm](https://www.wto.org/english/news_e/pres20_e/pr855_e.htm)

<sup>4</sup> <https://www.oecd.org/newsroom/global-economy-faces-gravest-threat-since-the-crisis-as-coronavirus-spreads.htm>

<sup>5</sup> Annex 3

<sup>6</sup> <https://www.brookings.edu/research/intra-african-trade-a-path-to-economic-diversification-and-inclusion/>



# Executive Summary

Adhering to international standards of safety is important for Africa to participate in global trade. But the uniqueness of local socio-economic conditions may present gaping holes in intra-African exports and trade. Harmonising Standards and Conformity Assessments across African nations in line with the AfCFTA Agreement would help enterprises of all scales and sectors – especially in manufacturing – adopt and adapt global standards to evolve local standards and address existing gaps. The massive potential for growth in intra-African exports of \$21.9 billion, with \$9.2 billion in a time span of just the next five years should motivate such adoption and adaption of global standards, as relevant, to local standards.<sup>7</sup>

The pandemic may have distanced us physically, but African nations chorused the need to scale industrialisation across the continent. Establishing local standards and adopting international standards in industrialization, safety, trade, and projects will directly help raise local output and forge trust and reliance amongst intra-African states, enabling better cross-border trade and investment.

The current national standards ecosystems in Africa slant towards retrofitting international standards to varying degrees. Some have developed and adopted global standards alone, while certain others do not possess the infrastructure and capacity to do so at the moment. These standards have undergone little-to-no tweaking for local requirements and challenges.

This study endeavours to derive opportunities for global standards adoption, adaptation and need for the development of the local standards in the focus areas by mapping the standards ecosystem in selected countries as a sample for the African continent, as well as mapping the standards in the focus areas for the African continent. The study derives opportunities not only for the adoption of global standards, but also to adapt them according to local cultures and develop local standards in the focus areas. These focus areas fall under the wider gamut of (i) fire safety; (ii) renewable energy; and (iii) sustainability.

Available data on national standards in each selected country has been mapped vis-a-vis globally available standards to identify key opportunities for adoption/adaption or development of the standard. These standards include three key areas: (i) fire safety; (ii) renewable energy; and (iii) sustainability. The development of these standards, their capacity, and the existing cooperation and collaboration with regional and global standards development organisations have also been assessed to identify and help various nations to cater to specific market needs for these standards.

Fire safety encompasses fire containment, fire resistance and fire safety engineering are covered under ARSO TC 026; the ambit of renewable energy includes photovoltaic systems and applications, lithium-ion batteries, energy storage systems, wind energy and electric vehicles under ARSO/TC47 and ARSO/TC 70.

While detailed recommendations are discussed in the relevant section of this report, a general boost in bespoke local and regional standardisation has been felt, which ULSE and ARSO are poised to support. Most nations have successfully articulated guidelines based on global standards defined by ISO and IEC. However, the requirements of each country and region may differ from the generic global guidelines. As unique geographies in themselves, within Africa and in the global context, these nations must invest additionally toward seeking local expertise to address domestic gaps and capacity building in the standards portfolio. Awareness initiatives would fuel the harmonisation of standards pan-Africa and help implement the AfCFTA Agreement to greater depth and breadth.

In the case of renewables, we further observe that there is vast opportunity for the adoption of global standards with national gaps addressed wherever necessary in the local standards to scale operations.

Additionally, representation of the various nations amongst regional as well as international communities is felt to be low. ARSO's awareness campaign for its members, alongside policy and strategies in stakeholder

engagement would help them better understand their role as not only interested beneficiaries, but also as contributors who could change the levels and nature of their engagement.

ARSO's fundamental mandate is to develop tools for standards development, standards harmonization, and implementation of these systems to enhance Africa's internal trading capacity, increase Africa's product and service competitiveness globally, and uplift the welfare of African consumers as well as a standardization forum for future prospects in international trade referencing.

We live in times when distance is already a norm. As Africa resurfaces from the throngs of widespread calamity, it is presented with the choice of making reparations that allow resilience in the face of future challenges. To effectively reach the industrial and trade goals of the next few decades, it is vital that climate consciousness and gender parity are actively incorporated in the African nations' safety standards portfolios. There is little space for differences, and entities not only in individual capacities, but at organisational as well as continent levels must collaborate – whether to trade or establish standards that meet global requirements as well as cater to bespoke local needs.

<sup>7</sup> <https://unctad.org/press-material/africas-free-trade-area-can-deliver-considerable-inclusive-economic-growth-continent>





## Introduction

At the continental level, African Union Member States introduced the AfCFTA Agreement in 2018. This Agreement makes harmonising standards, conformity assessment procedures, and technical regulations urgent requirements to facilitate trade among the signee nations. Its implementation from the beginning of 2021 has opened vast avenues for member nations to produce goods and services that will be competitive and enhance participation in RVCs and also tap into GVCs. The introduction of this Agreement coincided with ARSO's own mandate of harmonising African Standards and Conformity Assessments to reduce trade barriers among African countries. It is, therefore, necessary to draw up a roadmap for globally facing and locally relevant standards to facilitate trade further.

In 2019, UL Standards & Engagement signed a Memorandum of Understanding (MoU) with ARSO. Objectives of the MoU include the improvement of knowledge exchange between the two organisations, promotion of the organisations' communication and collaboration as well as utilisation of UL Standards & Engagement' resources to strengthen ARSO's standards development system.

This standards opportunity study presents a deep assessment of the standards ecosystem of focus areas selected by ARSO's in 13 ARSO member countries (Chad, Senegal, Cameroon, Democratic Republic of Congo, Gabon, Ghana, Kenya, Nigeria, Rwanda, Tanzania, Uganda, South Africa and Zambia) under the MoU.

The study identifies the status of focus areas in the selected countries based on the priority standards harmonisation programme of ARSO, and the gaps that exist in adoption or adaptation from global standards. This assessment concludes with observations and recommendations for the development of standards that can help further conceive interventions at regional levels as one of the strategic solutions to achieve the targets of the African Continental Free Trade Area Agreement.

### This study focuses on three broad focus areas selected by ARSO:

1. Fire safety: ARSO/TC26 – Built environment
  - a. Fire safety, fire containment and fire resistance
  - b. Fire safety engineering
2. Renewable energy: ARSO/TC47; ARSO/TC70
  - a. Solar photovoltaic system applications
  - b. Wind energy
  - c. Lithium-ion batteries, energy storage systems and electric vehicles; and
3. Sustainability standards

UL Standards commissioned One Stop Quality Holdings (Pty) Ltd, and the Rwanda Standards Board to carry out the study and make recommendations for the achievement of the objectives of the MoU between UL Standards & Engagement and ARSO.

## Scope of Work for the Study

ARSO's work in the African continent comprises an array of initiatives that spread awareness about, and the need for, safety standards – not only those in existence globally, but also to encourage African nations to adapt them, and evolve local safety standards that would address existing and foreseeable gaps in current trade practices, in addition to encouraging more robust intra-nation trade in Africa.

UL Standards & Engagement conducts collaborative research that supports careful analyses of current safety trends. We oversee the creation of trusted standards to guide the safe and sustainable use of new products and emerging technologies and make recommendations on local standards and spread awareness based on global best practices as well as opportunities for improvement in local trade as well as to make the most of opportunities that the new African Continental Free Trade Area (AfCFTA) Agreement has opened up.

The objectives of this study have been derived from the larger purpose for which ARSO and UL Standards & Engagement entered into a Memorandum of Understanding in 2019. The MoU was signed with the purpose of improving knowledge sharing between the two organisations, promoting the organisations' communication and collaboration as well as using UL Standards & Engagement' resources to strengthen ARSO's standards development system. With ARSO's widespread presence in the continent through members as well as partners, both organisations join forces to better understand the safety, security, and sustainability issues that emerging technologies and industries pose.

For the purview of this study, a national standards ecosystem assessment was conducted with three primary objectives:

- A. To map the standards ecosystem in selected countries (Chad, Senegal, Cameroon, Democratic Republic of Congo, Gabon, Ghana, Kenya, Nigeria, Rwanda, Tanzania, Uganda, South Africa and Zambia) as a cross-section of the larger cluster of African countries.
- B. To map the standards in the focus areas (Fire safety, Renewable energy, Sustainability) for the African continent.
- C. To highlight the opportunities for global standards adoption or adaption and underscore the need for development of the local standards in the aforementioned focus areas and opportunities for both the organisations to work on capacity-building in the area of standards development.
- D. To serve as a technical and advocacy document to provide much-needed information to all stakeholders for all future planning of standards roadmaps across the chosen areas.





# Methodology

The national standards ecosystem assessment conducted for the scope of this study addresses three main objectives:

- a. Mapping focus area standards (Fire Safety, Renewable Energy, and Sustainability) for Africa to assess the prevalent standards development systems, standards development capacity, existing cooperation and collaborations amongst regional and global standards development organisations;
- b. Mapping the currently available national standards ecosystems in each of the ARSO member countries selected for this study against globally available standards. This mapping would help identify the areas of opportunity for adoption/adaption or development of each standard as a representative cross-section serving as a model for other African countries; and
- c. Identifying the gaps in standards and emphasising the need to develop local standards in the focus areas in African countries at large.

## Primary Data Sources

To explore the existing potential larger benefits for African countries and propagate intra-African trade, the study is designed to facilitate a deeper understanding of the standards ecosystem in each African country. The broader study takes a three-pronged approach to information-gathering – (i) Desktop Reviews; (ii) Survey Questionnaires; and (iii) Interviews as Primary Data Sources.

### i. Desktop Review

The Desktop Review entailed evaluation of the published standards catalogues corresponding to the focus areas of this study of the National Standards Bodies (NSBs) in the selected countries. The Standards Catalogues available on the websites of these NSBs were studied to identify relevant standards for the sectors defined within the scope of the Study.

Considering the questionnaire fatigue observed in previous studies as well as while conducting this study, our research teams made conscious efforts towards minimising the respondents' need for answering yet another long-winded questionnaire.

In the case of organisations that had not published their standards in the form of a Standards Catalogue, we ran a search on their website for standards relevant to the scope of this Study. Additionally, the Standards Catalogue for the EAC was used specifically to identify standards relevant to Kenya.

In addition to standards catalogues on websites, the Desktop Review also examined the standards development work programme, Technical Committee business plans, National Standardisation Strategies if any, standards approval and publication reports.

### ii. Country Surveys

While the Desktop Reviews supplied several details, we felt the need for additional inputs and views in the context of the standards catalogues – whether to seek clarification or for additional information. To supplement, and in certain cases, gain most information unavailable from the websites, we distributed a survey questionnaire<sup>8</sup> by email from the National Standards Bodies and relevant Regulators (NRCS in South Africa, ZCSA in Zambia) in the participating countries, and to Compulsory Specifications/ Standards Agencies (OSQH and Liliane Kimanzi) in two of the 13 countries (Chad, Senegal, Cameroon, Democratic Republic of Congo, Gabon, Ghana, Kenya, Nigeria, Rwanda, Tanzania, Uganda, South Africa, and Zambia).

While assessing the available national standards and the adopted regional and global standards, an observable gap in the availability of standards was considered while designing the questionnaire.

The survey questionnaire sought, among other aspects, responses about the published standards and the development status (if applicable) and implementation of standards in circulation. An Excel Spreadsheet to enable respondents to list the relevant standards under the various categories in line with the objectives of this study was sent in addition to the questionnaire. Online data collection forms were also shared with focal persons identified in every selected country.

The data collection questionnaires also proved helpful in identifying the local market needs of each country.

### iii. Interviews

For ARSO as well as UL Standards & Engagement, the power of human connection reigns supreme. We have often experienced that people in key positions of authority and liaising can offer meaningful insight and additional details owing to their vast and deep experience, which are unmatched in comparison with passive desktop reviews, and the delayed, even if interactive, responses to questionnaires.

Our research teams interviewed (when possible) Technical Committee secretaries and Heads in charge of standards development and publication activities to understand the performance and strategic orientation in the defined focus areas.

## Additional information from secondary sources

UL Standards & Engagement has a vast body of work to our credit, even before signing the Memorandum of Understanding with ARSO. It should be noted that the broader goals of the MoU were to improve knowledge exchange between the two organisations, promote the organisations' communication and collaboration as well as use UL Standards & Engagement' resources to strengthen ARSO's standards development system. With the vast body of work available from both partner organisations, in addition to the Desktop Reviews, Questionnaires and Interviews, our researchers also used the websites and SCs of ARSO and UL, where they were available, as sources of further information relevant to the study. Additionally, the standards catalogue for the East African Community (EAC) was used to specifically identify standards relevant to Kenya.



<sup>8</sup> Annex 2



## Findings of the study

This study assesses the available national standards and the adopted global standards data currently prevalent in the selected countries in the identified focus areas. This is an analysis of the currently available national standards data and identification of areas of opportunity for adoption/adaption or development of the standards.

### Major challenges affecting intra-Africa trade include:

- I. Low participation in existing continental standards harmonisation development programs;
- II. High cost of compliance requirements leading to a burden for industries engaged in intra-Africa trade in the focus areas of this study;
- III. Uneven capacity, where in some countries it is nil, while in other countries have good capacity to build standards and harmonization of standards;
- IV. Adoption or adaption of global standards is not uniform and a unified structured approach is missing;
- V. Participation of NSBs in global standards development is not uniform. It varies from nil participation to fair participation.

Tables 1 and 2 respectively represent (i) the performance of national standards bodies in publishing developed national standards, and (ii) adopted international standards in the identified focus areas in the selected African countries.

**Table 1. Performance of National Standards Bodies in developing and publishing National Standards.<sup>9</sup>**

*Upon reviewing the catalogues of national developed standards aligned with the ARSO standards harmonisation focus areas, findings from the assessment of the available national published standards are documented in this table.*

Sl. No.	Country	Fire Safety; Fire Containment; Fire Resistance and Fire Safety Engineering	Solar Photovoltaic system and applications	Lithium-ion batteries, Energy storage systems	Electric Vehicle	Wind Energy	Sustainability Standards
1	CHAD	No national standard is available in this area as the standard body (ATNOR) is newly established.	No national standard is available in this area as the standard body (ATNOR) is newly established.	No national standard is available in this area as the standard body (ATNOR) is newly established.	No national standard is available in this area as the standard body (ATNOR) is newly established.	No national standard is available in this area as the standard body (ATNOR) is newly established.	No national standard is available in this area as the standard body (ATNOR) is newly established.
2	SENEGAL	Completed questionnaire disqualified owing to inaccurate responses due to a misunderstanding arising out of translation <sup>10</sup>					
3	CAMEROON	One (1) national standard available.	No national available standards in this area	No national available standards in this area	No national available standards in this area	No national available standards in this area	No project was initiated at the national level as a new work item and published at the national level as a national standard in this area.
4	DEMOCRATIC REPUBLIC OF CONGO	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
5	GABON	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
6	GHANA	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
7	KENYA	Six (6) standards were developed covering Fire Safety of Building	Eight (8) standards have been developed covering Solar Energy standards	No national available standards in this area	No national available standards in this area	No national standards available in this area	One (1) national Code of Practice has been developed towards eco-tourism in managing protected natural areas sustainably
8	NIGERIA	No national standard available in this area	No national standard available in this area	No national standard available in this area	No national standard available in this area	No national standard available in this area	No national standard available in this area
9	RWANDA	Five (5) standards were developed covering the code of Practice for Fire Safety of Building.	Three (3) national standards covering the requirements, repair and maintenance and mechanical qualification test of domestic storage solar water heating systems were developed	No national standard available in this area	No national standard available in this area	No national standard available in this area	One (1) national standard is available in the area covering Biomass fuel cookstove specifications.

<sup>9</sup> As on July 2022 (See Annex 3 to 17 for further details)



Of the 13 countries selected for the study, only six NSBs from Cameroon, Kenya, Rwanda, Tanzania, South Africa, and Zambia have been found to make their SCs publicly available.

The Senegalese standards catalogue is only available in French; even though the Kenyan SC is available publicly, specific standards require individual search on the website. Chad, the Democratic Republic of Congo, Gabon, Ghana, and Nigeria did not have publicly available SCs at the time of this study. Having said that, Uganda does have one national standard around fire resistance detailed in this table.

10	TANZANIA	Five (5) National standards are available.	One (1) national standard is available in this area covering requirements for off-grid solar photovoltaic lighting kits.	Four (4) national standards are available at the national level in this area.	No national standards available in this area	No national standards available in this area	No national standards available in this area
11	UGANDA	There are no national standards available about fire safety, fire safety engineering and fire containment.  However, Uganda has availed one national standard around fire resistance covering performance classification & Specification for Hydraulic fluid (categories HFAE, HFAS, HFB, HFC, HFDR and HFDU)	Nine (9) National standards are available.	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
12	SOUTH AFRICA	Three (3) National standards are available.  General principles for the design, installation and maintenance of automatic sprinkler installations for fire-fighting purposes in buildings and industrial plants are also under development.	Four (4) national standards are available.  No separate national solar energy standards are currently in existence.	One (1) national standard is available.  Guidance on procedures & protective measures for testing the effectiveness of devices used to reduce explosion hazards; a guide to equipment manufacturers and users about identifying and characterising possible hazards inherent in the application, use and abuse of nickel-cadmium cells and batteries; and guidance for the use of passive a.c. harmonic filters and shunt capacitors to limit harmonics and power factor correction in industrial applications at low and high voltages are under development.	No national available standards in this area	Three (3) national standards are under development.	45 national standards are available.
13	ZAMBIA	Two (2) national standards in Fire Safety in relation to mitigation are publicly available.	No national available standards in this area	No national available standards in this area	No national available standards in this area	No national available standards in this area	No national available standards in this area

<sup>10</sup> Due to a misunderstanding of language translation that arose at the ASN end, they answered ‘yes/no’ to the examples that were given to them by us of the types of standards and descriptions therein. The misunderstanding seems to have been that the questions were whether they had adopted any of the specific UL Standards examples we highlighted in the Excel template which we made available to them. Consequently, their answers to any of the categories of standards were a definite ‘no’. We will treat this scenario as an outlier and not consider the response in the analysis - meaning that we cannot confidently use the completed Senegalese questionnaire for this study. Had we had a translation available we would have probably had a more fruitful response from ASN.



**Table 2: Performance in adopting global standards to facilitate cross-border trade.<sup>11</sup>**

*This table indicates findings from the assessment of the available international/regional adopted standards as identified from the reviewed catalogues of standards aligned with the ARSO standards harmonisation priority sectors.*

Sl. No.	Country	Fire safety; Fire containment; Fire resistance and Fire Safety Engineering	Solar Photovoltaic system and applications	Lithium-ion batteries, Energy storage system	Electric Vehicle	Wind Energy	Sustainability Standards
1	CHAD	No adopted standard is available in this area as the standard body (ATNOR) is newly established.	No adopted standard is available in this area as the standard body (ATNOR) is newly established.	No adopted standard is available in this area as the standard body (ATNOR) is newly established.	No adopted standard is available in this area as the standard body (ATNOR) is newly established.	No adopted standard is available in this area as the standard body (ATNOR) is newly established.	No adopted standard is available in this area as the standard body (ATNOR) is newly established.
2	SENEGAL	Completed questionnaire disqualified due to translation misunderstanding, therefore, inaccurate responses.					
3	CAMEROON	One (1) ISO standard was adopted at the National level, and they set up a method for describing the fire safety performance of houses.	No national available standards in this area	No national available standards in this area	No national available standards in this area	No national available standards in this area	No project was initiated at the national level as a new work item and published at the national level as a national standard in this area.
4	DEMOCRATIC REPUBLIC OF CONGO	No adopted standard available in this area	Two (2) IEC adopted standards on the selection of photovoltaic individual electrification systems (PV-IES) and photovoltaic generators	Nine (9) IEC adopted standards available.	No adopted standard available in this area	No adopted standard available in this area	Nine (9) ISO standards adopted
5	GABON	No adopted standard available in this area	One (1) IEC standard adopted covering requirements for the installation of PV Solar Energy System	One IEC standard adopted covering Primary Batteries-Security for Lithium-Ion batteries	No adopted standard available in this area	No adopted standard available in this area	Two (2) ISO standards were adopted at the National Level. They cover principles, guidelines and requirements for eco-efficiency assessment and water footprint.
6	GHANA	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
7	KENYA	11 ISO standards have been adopted	11 ISO standards have been adopted	Three (3) IEC standards have been adopted for Solar power.	No national available standards in this area	No national standards available in this area	One (1) national Code of Practice has been developed towards eco-tourism in managing protected natural areas sustainably
8	NIGERIA	No adopted standard available in this area	No adopted standard available in this area	No adopted standard available in this area	No adopted standard available in this area	No adopted standard available in this area	No adopted standard available in this area
9	RWANDA	Four (4) ISO standards were adopted.	Three (3) ISO standards were adopted.	Four (4) IEC standards were adopted.	No adopted standard available in this area	12 IEC standards were adopted.	One (1) national standard is available in the area covering Biomass fuel cookstove specifications.

<sup>11</sup> More details on the adopted regional and international standards in Annex 3 to 17.



As observed in table 2, international standards such as those developed by ISO, IEC, EAS or ARSO were mostly adopted by the various NSBs in each country, when these were required and made available. Countries whose SCs were available and were thus analysed adopted international standards as far as possible (see Annex 2).

Analysis of the UL SC (Annex 7) yielded a substantial number of standards that could be considered for possible adoption in the countries under this Study.

Based on the SC accessed, we found that Nigeria has not adopted or adapted to any published National or International Wind Energy standards.

South Africa’s sustainability standards have a wide scope and cover many aspects such as Business Continuity, Quality Management, Environmental Management, Tourism and HIV/AIDs management, and exploitation of natural resources amongst others.

In both Nigeria and South Africa, compliance frameworks include compulsory regulatory requirements.

### National Standardisation Bodies and their Views on Standardisation activities as collected from the shared questionnaire.

The questionnaire was designed to allow the assessment of four (04) main factors:

- a. **Factor number one** addresses the planning of standards development activities where 5 of the below-assessed aspects/issues were focused on:
  - Availability of National Standardisation Strategy;
  - Availability of Standards Development Work Programmes;
  - Availability of TCs capturing the identified focus areas and their alignment to ARSO TCs;
  - Availability of documented procedures/ automated systems guiding the Standards Development process;
  - Availability of future plans related to standards development activities.

10	TANZANIA	18 ISO standards were adopted in this area	One (1) IEC standard has been adopted at the national level.	14 IEC standards have been adopted.	14 global standards have been adopted.	No national standards available in this area	No national standards available in this area
11	UGANDA	13 ISO Standards around fire safety were adopted.	Nine (9) National standards are available.	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area
12	SOUTH AFRICA	Three (3) European Standards have been adopted.	Four (4) IEC photovoltaic standards have been adapted.	Four (4) IEC standards are adopted.	No adopted standard available in this area	1 IEC standard with regards to the first part of the design requirement for Wind turbines has been adopted.	6 European Standards have been adopted.
13	ZAMBIA	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area	No national standards available in this area

- b. **Factor number two** focuses on participation in regional and international standards development activities where 4 below assessment aspects have been considered:
  - Representation of the identified country’s NSB in regional standardisation activities;
  - Representation of the identified country’s NSB in international standardisation activities;
  - Representation of the identified country’s NSB in other regional Technical Committees (other than the identified focus areas);
  - Representation of the identified country’s NSB in other international Technical Committees (other than the identified focus areas).
- c. **Factor number three** focuses on the publication of nationally developed standards or adopted regional/ international standards (availability and format (e-catalogue or uploaded document) of standards catalogues).
- d. **Factor number four** focuses on the following:
  - Capacity building;
  - Challenges in the National Standardisation Ecosystem;
  - Potential areas of intervention.





**Table 3. Assessed Factor: Planning of standards development activities**<sup>12</sup>

Sl. No.	Country	National Standardisation Strategy (NSS)	Work program	Available TCs & their alignments with ARSO/TC	Standards Development Process (Documented procedures & web-based systems on standards development activities)	Future plan
1	CHAD	Not available	Not available	Not available	No process available	Planning to initiate new work items at the national level for all the identified sectors.
2	SENEGAL	Completed questionnaire disqualified due to translation misunderstanding, therefore, inaccurate responses.				
3	CAMEROON	NSS available	WP established and published	Available TCs: <ul style="list-style-type: none"> <li>TC 45: Security and Fire protection</li> <li>TC 18: electricity, Electrotechnics</li> <li>TC19; New and new renewable energy</li> <li>TC 28: Chemical Engineering</li> </ul> No available other TC related to focus areas	The process has been established as per the International best practices The process is not digitalised	Adoption of regional standards in the identified ARSO priority sectors.
4	DEMOCRATIC REPUBLIC OF CONGO	No response received				
5	GABON	NSS not available	WP established and published	Only one TC 6 on sustainability Standards	The process has been established as per the International best practices	No adopted standard available in this area
6	GHANA	Could not access NSS via desktop study.				
7	KENYA	Could not access NSS via desktop study.				
8	NIGERIA	Could not access NSS via desktop study.				
9	RWANDA	NSS available as well as TCs Business plans (annexure attachment)	WP established and published (annexed as attachment)	The following RSB/TCs are available: <ul style="list-style-type: none"> <li>RSB/TC 028: Fire Safety</li> <li>RSB/TC 049: Solar Energy system and accessories</li> <li>RSB/TC 050 Electrical Energy, equipment &amp; accessories</li> <li>Other RSB / TCs covering related areas</li> <li>RSB/TC 041: Environmental protection</li> </ul>	The process has been established as per international best practices The process is digitalized (using ISolutions)	<ul style="list-style-type: none"> <li>Adoption of regional Standards in the areas of fire safety and solar</li> <li>Adoption of International standards in the areas of Fire Safety, Wind Energy, Lithium-ion, Energy Storage Systems, Electric Vehicles and Sustainability Standards</li> </ul>

<sup>12</sup> See Annex 3 to 17 for further details



10	TANZANIA	NSS available	WP established and published (annexed as attachment)	Available TCs: <ul style="list-style-type: none"> <li>• Fire and Fire Fighting Technical Committee (MEDC 13)</li> <li>• Renewable energies Technical Committee (EDC 5)</li> <li>• Energy storage and extra-low voltages Technical Committee (EDC 2)</li> </ul>	The process has been established as per the International best practices	Adoption of International standards (ISO and IEC) in the areas of Fire safety, electrical engineering Revision of National standards in the areas of Fire Safety and Renewable (green) Energy technology
11	UGANDA	NSS available (annexed as attachment)	WP established and published (annexed as attachment)	Available TCs: <ul style="list-style-type: none"> <li>• UNSB/TC110: Firefighting and fire safety</li> <li>• UNSB/TC113: Renewable energy</li> <li>• UNSB/TC115: primary/secondary cells and batteries</li> <li>• UNSB/TC417: Urban planning and sustainable development</li> <li>• UNSB/TC82: Solar Photovoltaic and Energy Systems</li> </ul>	<ul style="list-style-type: none"> <li>• The process has been established as per the International best practices</li> <li>• The process is supported by an operational digital platform</li> </ul>	<p>Initiation of new work items at the national level in the areas of Fire Safety, Fire Containment, Fire Resistance and Fire Safety Engineering.</p> <p>Adoption of International standards in the areas of Solar Photovoltaic systems and applications, Wind Energy, Lithium-ion Energy Storage Systems and Electrical Vehicle and Sustainability Standards</p>
12	SOUTH AFRICA	Could not access NSS via desktop study.				
13	ZAMBIA	Could not access NSS via desktop study.				



**Table 4. Assessed Factor: Participation in Standards development activities<sup>13</sup>**

Sl. No.	Country	NSB represented in Regional Standards Development	NSB represented in International Standards Development	NSB represented in other regional TCS	NSB represented in other International TCs
1	CHAD	Not represented	Represented by Agence Tchadienne de Normalisation at the ISO level as a correspondent member where it is involved as an observing member in ISO/DEVCO and ISO/COPOLCO and in 07 Technical committees that are not covered in the focus areas of this study.	Not represented	Represented as Affiliate Country in IEC by Agence Tchadienne de Normalisation but does not actively participate in TC activities.
2	SENEGAL	Completed questionnaire disqualified due to translation misunderstanding, therefore, inaccurate responses.			
3	CAMEROON	Cameroon is represented by ANOR in standards harmonisation at the ARSO level	Represented by Agence des Normes et de la Qualité at ISO level where it is involved as a participating member in ISO/DEVCO and 04 Technical committees including ISO/TC 323 falling under the sustainability standards of this study.	Not represented	Represented as an Affiliate Country in IEC by Agence des Normes et de la Qualité but does not actively participate in TC activities. However, ANOR has contributed under this membership framework in 12 TCs
4	DEMOCRATIC REPUBLIC OF CONGO  (No response received but according to the publicly available data, the information about TBS participation is given in the subsequent columns)	DRC is represented by OCC in standards harmonisation at the ARSO level	Represented by Office Congolais de Controle as Member Body at ISO level where is involved as participating member in ISO/CASCO, ISO/COPOLCO, ISO/DEVCO and in 38 Technical committees including ISO TCs whose the scope is aligned with the focus areas of this study (ISO/TC207/SC3 on Environmental Labelling, ISO/TC 301 on Energy management and energy savings, ISO/TC 323 on Circular Economy, ISO/TC285 Clean cookstoves and clean cooking solutions, ISO/TC333 on Lithium among others) OCC also represents DRC in 15 TCs as an observing member.	Represented in AFSEC as Statutory Member	Represented as Affiliate Country in IEC by Office Congolais de Controle but does not actively participate in TC activities. However, OCC has contributed under this membership framework in 9 TC including IEC/TC 82 on Solar photovoltaic energy systems
5	GABON	Gabon is represented by AGANOR in standards harmonisation at the ARSO level	Represented by Agence Gabonaise de Normalisation as a Member Body at the ISO level where it is involved as a participating member in ISO/DEVCO and 1 project committee (ISO/PC 337 on Guidelines for the promotion and implementation of gender equality). AGANOR also represents Gabon as an observing member in ISO/CASCO, ISO/COPOLCO, and 19 Technical Committees including ISO TC whose scope is aligned with the focus areas of this study (ISO/TC 301 on energy management and energy savings)	Not represented	Represented as Affiliate Country in IEC by Office Agence Gabonaise de Normalisation (AGANOR) but does not actively participate in TC activities. However, AGANOR has contributed under this membership framework in 13 TC including IEC/TC 82 on Solar photovoltaic energy systems
6	GHANA	Could not ascertain via desktop study.			
7	KENYA	Could not ascertain via desktop study.			
8	NIGERIA	Could not ascertain via desktop study.			

<sup>13</sup> See Annex 3 to 17 for further details



9	RWANDA	Rwanda is represented by the Rwanda Standards Board in standards Harmonisation at East African (EAC) and the Continental and ARSO levels.	Represented by Rwanda Standards Board as Member Body at ISO level where is involved as participating member in ISO/CASCO, ISO/COPOLCO, ISO/DEVCO and in 25 Technical committees including ISO TCs whose the scope is aligned with the focus areas of this study (ISO/TC207/SC 5 on Life Cycle Assessment, ISO/TC 268 Sustainable City and Communities, ISO/TC301 Energy Management and energy savings, ISO/TC285 Clean cookstoves and clean cooking solutions, circular economy, ISO/TC268/SC2 on Sustainable cities and communities - Sustainable mobility and transportation among others) RSB also represent Rwanda in 14 TCs as an observing member	Represented in AFSEC as a Statutory Member	Represented as Affiliate Country in IEC by Rwanda Standards Board but does not actively participate in TC activities. However, RSB has contributed under this membership framework in 9 TC including IEC/TC 82 on Solar photovoltaic energy systems
10	TANZANIA  (No response received but according to the publicly available data, the information about TBS participation is given in subsequent	Tanzania is represented by the Tanzania Bureau of Standards in standards Harmonisation at East African (EAC) and Continental and ARSO levels	Represented by Tanzania Bureau of Standards as Member Body at ISO level where is involved as participating member in ISO/CASCO, ISO/DEVCO and 33 Technical committees including ISO TCs whose the scope is aligned with the focus areas of this study (ISO/IEC JTC 1/SC 39 on Sustainability, IT and Data Centres, ISO/TC 94/SC 14 on Fire Fighters' equipment, ISO/TC 180 on Solar Energy, ISO/TC 207/SC 3on Environmental labelling, ISO/TC207/SC 5 on Life Cycle Assessment, ISO/TC207/SC 7 on Greenhouse gas management and related activities, ISO/TC 268 Sustainable City and Communities, ISO/TC285 Clean cookstoves and clean cooking solutions, ISO/TC 301 on Energy management and energy savings among others) TBS also represent Tanzania in 137 TCs and ISO/COPOLCO as an observing member	Not represented in AFSEC	Represented as Affiliate Country in IEC by Tanzania Bureau of Standards but does not actively participate in TC activities. However, TBS has contributed under this membership framework in 11 TC including IEC/TC 82 on Solar photovoltaic energy systems
11	UGANDA	Uganda is represented by the Uganda National Bureau of Standards in standards Harmonisation at East African (EAC) and Continental and ARSO levels	Represented by Uganda National Bureau of Standards as Member Body at ISO level where is involved as participating member in ISO/CASCO, ISO/COPOLCO, ISO/DEVCO and in 71 Technical committees including ISO TCs whose the scope is aligned with the focus areas of this study (ISO/TC207/SC 5 on Life Cycle Assessment, ISO/TC 268 Sustainable City and Communities, ISO/TC285 Clean cookstoves and clean cooking solutions, ISO/TC268/SC2 on Sustainable cities and communities - Sustainable mobility and transportation, ISO/TC 322 on sustainable finance among others) UNBS also represents Uganda in 24 TCs as an observing member and plays the role of TC Secretary for ISO/TC 202/SC 1	Represented in AFSEC as Statutory Member	Represented as Associate Member in IEC by Uganda National Bureau of Standards Under this membership framework, UNBS is represented as a participating member in IEC/TC 111 on Environmental standardisation for electrical and electronic products and systems
12	SOUTH AFRICA	Could not ascertain via desktop study.			
13	ZAMBIA	Could not ascertain via desktop study.			



**Table 5. Assessed Factor: Publication**

Sl. No.	Assessed Country	Availability of Catalogue	Where the catalogue is published
1	CHAD	Not available	Not available
2	SENEGAL	Yes, but only in French	Information unavailable
3	CAMEROON	Available	Only hard copy
4	DEMOCRATIC REPUBLIC OF CONGO	No response received	No response received
5	GABON	Available	Only hard copy
6	GHANA	No response received	No response received
7	KENYA	Available	Online, but only accessible by running a search on specific standards on search engines
8	NIGERIA	Available	Online
9	RWANDA	Available	Online
10	TANZANIA	No response received	No response received
11	UGANDA	Available	Hard copy and online
12	SOUTH AFRICA	Available	Online
13	ZAMBIA	Available	Online

*From the list of published standards reviewed, the extent of standards development for those organisations that had publicly available SCs differs from country to country. In comparative terms, relatively highly developed economies like South Africa and Nigeria have a higher number of publicly-available standards than their counterparts in the Study.*





**Table 6. Assessed Factor: Capacity building, challenges, and areas of intervention**

Sl. No.	Assessed Aspect	Capacity building (NSB staff and Stakeholders)	Challenges in the national standardisation ecosystem	Areas of interventions
1	CHAD	NSB staff and stakeholders are not trained	Limited human and financial resources	<ul style="list-style-type: none"> <li>Establishment of national quality policy</li> <li>Establishment of National Standardisation Strategy</li> <li>Training of NSB staff in the establishment of the Technical Committee</li> <li>Training of NSB staff in coaching and positioning enterprises for certification</li> <li>Finalisation of the membership process to ARSO</li> </ul>
2	SENEGAL	Completed questionnaire disqualified due to translation misunderstanding, therefore, inaccurate responses.		
3	CAMEROON	NSB staff and stakeholders are trained	<ul style="list-style-type: none"> <li>Lack of fund</li> <li>Low level of participation in regional and international activities</li> <li>Lack stakeholder engagement</li> </ul>	<ul style="list-style-type: none"> <li>Resources mobilisation for standardisation work</li> <li>Training in administration techniques and virtual animation of standardisation projects and works (Training in the use of digital tools that are applied in standards development &amp; TC Meeting convening and other standards-related activities.)</li> <li>Management techniques and profitability of standards monitoring</li> <li>Capacity building of TC committee actors</li> <li>Capacity building in the establishment of normative monitoring with NSB, editing of normative documents</li> <li>Establishment of a document exchange platform between NSBs</li> </ul>
4	DEMOCRATIC REPUBLIC OF CONGO	No response	No response	No response
5	GABON	NSB staff and stakeholders are trained	<ul style="list-style-type: none"> <li>Financial and participation at regional and international level</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of a national standardisation strategy</li> <li>Training/participation in the harmonisation of ARSO standards</li> </ul>
6	GHANA	No response received	No response received	No response received
7	KENYA	No response received	<ul style="list-style-type: none"> <li>Low level of participation in national activities</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of national quality policy</li> <li>Establishment of National Standardisation Strategy</li> <li>Training of NSB staff in the establishment of the Technical Committee</li> <li>Training of NSB staff in coaching and positioning enterprises for certification</li> </ul>
8	NIGERIA	No response received	No response received	No response received
9	RWANDA	NSB staff and stakeholders are trained	<ul style="list-style-type: none"> <li>Low level of participation in regional and international activities</li> <li>Lack of stakeholders' engagement</li> <li>Low level of awareness</li> </ul>	None



### National Standardisation Bodies stakeholders' views on Standardisation activities as collected from the shared questionnaire.

The questionnaire given to respondents from NSB Stakeholders was designed with a view to assessing key factors as bases to understand their contribution to standards development, their specific needs in standards and standards development matters, the capacity development status and existing challenges that hinder their ability to deliver standardisation.

The questionnaire to assess stakeholders' views was also designed to allow assessment of the following main factors that may inform the level of stakeholder's participation in standardisation activities:

- a. Scope of activities for the organisation represented by the respondent and his/her role in standardisation activities;
- b. Access to information related to national, regional and international standardisation activities;
- c. Stakeholder participation in standard development at regional and international levels;
- d. Capacity development needs;
- e. Possible challenges faced by stakeholders involved in standards development activities and areas of intervention.

A low level of cooperation from NSB stakeholders in responding to the questionnaire was experienced. However, the limited responses from the 13 selected countries reveal key points of consideration.

For this target group, we received responses from Rwanda, Gabon and Uganda. No response was received from Chad, Senegal, Cameroon, Democratic Republic of Congo, Ghana, Kenya, Nigeria, Tanzania, South Africa and Zambia.

According to the received responses, we observed active participation from representative organisations that play an important role in standards development (private sector, policymakers, regulation, academia and standard bodies). However, with the exception of Nigeria, South Africa, and Kenya which have some established systems, it is felt that the rest of the countries need extensive national work in all areas. Capacity building is felt to be the biggest challenge in the face of pan-nation standardisation in African countries.

10	TANZANIA	No response received	No response received	No response received
11	UGANDA	NSB staff and stakeholders are trained	<ul style="list-style-type: none"> <li>• Low level of stakeholder engagement and appreciation of standards</li> <li>• Low level of participation in international and regional standardisation activities due to poor appreciation from politicians who see them as just trips abroad</li> </ul>	<ul style="list-style-type: none"> <li>• engaging at the strategic level (political leadership) to understand the need for active participation in regional and international standardisation to influence the agenda at that level</li> <li>• training of stakeholders in standards development procedures</li> </ul>
12	SOUTH AFRICA	No response received	<ul style="list-style-type: none"> <li>• Low level of participation in international and regional standardisation activities</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of international quality policy</li> <li>• Establishment of National Standardisation Strategy</li> <li>• Training of NSB staff in the establishment of the Technical Committee</li> <li>• Training of NSB staff in coaching and positioning enterprises for certification</li> </ul>
13	ZAMBIA	No response received	<ul style="list-style-type: none"> <li>• Low level of participation in national, international as well as regional standardisation activities</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of international quality policy</li> <li>• Establishment of National Standardisation Strategy</li> <li>• Training of NSB staff in the establishment of the Technical Committee</li> <li>• Training of NSB staff in coaching and positioning enterprises for certification</li> </ul>

### Summary of response from NSB officials.

As reported in the above tables, the questionnaire given to NSB official respondents was designed in a way to allow the assessment of key factors that may describe the national standardisation ecosystem in each selected country.

Regardless of the low level of cooperation from NSBs in maximizing the data collection, the limited responses from the 13 selected countries reveals key points of consideration where the expected number of respondents was set at least at 21.

In this exercise, no response was received from DRC, Ghana and Tanzania and the Senegal questionnaire was disqualified due to miscommunication due to improper translation; the given general picture represents the assessment of the overall situation from Chad, Cameroon, Gabon, Kenya, Nigeria, Rwanda, Uganda, South Africa and Zambia.

In addition to the reported national situation based on the individual responses from each of the selected countries, the general picture indicates other potential areas of intervention as clearly specified in the summary and recommendation part of this report.

It was observed that a considerable number of the national technical committees aligned to the ongoing continental interventions considering their alignment with ARSO TCs in the identified focus areas, where a majority has responded in the affirmative for operational national TCs in Fire Safety, Renewable Energy, Energy Storage Systems and Sustainability Standards.

According to the received responses, the adoption of global standards was observed to be preferable in capturing the standard gaps.

There is also a limited representation and participation in regional and international standardisation activities. While a majority remains unrepresented at the regional or the international levels in the focus areas of Sustainability, Energy Storage Systems, and Wind Energy, nearly half of the selected countries respectively remain unrepresented in the focus areas of Solar Energy and Fire Safety respectively.

More than half the respondent countries indicated that currently, their country is not represented in regional and international standardisation activities.

Further conclusions and recommendations are made in the following separate section on the same.



**Table 7. Assessed factors for the NSBs stakeholders<sup>14</sup>**

*From the responses received, issues regarding conformity assessment, compliance and intra-Africa trade around this Study indicate that existing conformity assessment services supporting the focus areas in countries such as Kenya and Rwanda are inadequate due to limited availability of the necessary infrastructure. Moreover, in the countries in which standards are available, conformity assessment structures for the validation of compliance are inadequate.*

Sl. No.	Assessed Factor	Scope of activities	Role of stakeholder	Access to information	Organisation representation in Reg. & Intern.	Capacity building	Challenges	Areas of interventions
1	CHAD	No response received						
2	SENEGAL	No response received						
3	CAMEROON	No response received						
4	DEMOCRATIC REPUBLIC OF CONGO	No response received						
5	GABON	Private sector	TC chair	<ul style="list-style-type: none"> <li>No information on regional areas of standardisation</li> <li>Inaccessibility of information on participation in standardisation activities at regional and international</li> <li>No information on the ongoing standardisation work</li> </ul>	Not represented	Trained in good standardisation practices (WTO Agreement, Standardisation Principles, ISO Guides among others)	Applicability of standards at national levels	Other sectors to be considered: <ul style="list-style-type: none"> <li>Food quality and safety</li> <li>Agronomic and disease research</li> <li>Establishment of an information platform at the national and regional level which can bring together all the actors</li> <li>Use of all communication media</li> </ul>
6	GHANA	No response received						
7	RWANDA	Any other category	TC member	<ul style="list-style-type: none"> <li>Aware of the regional and international interventions</li> <li>Information on participation is available</li> </ul>	Not represented	Not trained		Other sectors to be considered: <ul style="list-style-type: none"> <li>Oxygen plant</li> <li>Packaging system and technical specification</li> <li>Time allocation (in TC meeting)</li> <li>Harmonized standards in regional power network interconnection (shared grid at regional level and harmonized power supply practices).</li> <li>Training of TC on standardisation principles</li> <li>Lighting</li> </ul>
		Regulator	TC member	<ul style="list-style-type: none"> <li>Not aware of regional intervention in standards development</li> <li>Information standardisation is not accessible</li> </ul>	Represented in Fire Safety, Wind Energy, Sustainability Standards			
		Standards Body	TC member	<ul style="list-style-type: none"> <li>Aware of regional intervention in standards development</li> </ul>	Not represented,	Not trained on good standardisation practices	None	Moto vehicles emissions, environmental standards Effective communication Standardisation around personnel certification, social responsibility gender equality

<sup>14</sup> See Annex 18 for details about people contacted.



		Private sector	TC member	Easy access to information on participation in regional and international standards development activities	Represented in Fire Safety, Wind Energy, Sustainability Standards	Trained not on good standardisation	NA	Proper implementation of standards on lighting, portable firefighting equipment and maintenance
		Standards Body	TC member	Aware of regional intervention in standards development easy access to information on how to participate in standardisation activities (regional and international).	Represented in both regional and international	Trained not on good standardisation	Laboratories facilities for cases of uncertainty	Other sectors <ul style="list-style-type: none"> <li>Energy equipment</li> <li>Food and beverage</li> </ul>
		Policymaker	TC member	<ul style="list-style-type: none"> <li>Aware of the regional and international interventions only in solar photovoltaic systems and applications</li> <li>Easy access</li> </ul>	Represented at the national level in solar photovoltaic systems and applications	Trained not on good standardisation	No training on standards development at the national and regional levels	NA
		Academic institution	TC member	Aware of regional interventions in areas of standardisation (fire safety, solar photovoltaic system and applications, sustainability standards)	Represented at the national level in solar photovoltaic systems	Trained not on good standardisation		Other sectors to be considered: <ul style="list-style-type: none"> <li>Cyber security standards, Artificial Intelligence, and Internet of Things standards</li> <li>Use of web and mobile applications to improve access to information</li> <li>Capacity building of stakeholders on national and international standards platform</li> <li>Capacity in conformity assessment</li> <li>Need assessment (survey on the uptake of standards in Africa)</li> </ul>
8	TANZANIA*	No response received						
9	UGANDA	Academic institution	TC member	<ul style="list-style-type: none"> <li>Information on some regional areas of standardisation in Fire Safety, Wind Energy, and Sustainability Standards</li> <li>Accessibility of information on participation in standardisation activities at regional and international</li> <li>Information available on the ongoing standardisation work</li> </ul>	Represented in both regional and international standards for Fire Safety, Wind Energy, Sustainability Standards	Trained in good standardisation practices	NA	Other sectors to be considered: <ul style="list-style-type: none"> <li>Faecal sludge management in Agriculture</li> <li>Capacity development in standards dissemination of developed, published and adopted standards</li> </ul>
10	SOUTH AFRICA	No response received						
11	ZAMBIA	No response received						

\*No responses received from Chad, Cameroon, Democratic Republic of Congo, Ghana, Kenya, Nigeria, Tanzania, South Africa, and Zambia.



# Conclusions and recommendations

The larger goal of this study is to explore opportunities and emphasise the need for the adoption/adaption or development of local and regional standards in countries across the African continent. These local or regional standards would, in turn, help bridge the gaps that currently adopted global standards, or the lack of any adopted standards present and expand intra-African Trade monumentally in line with national and global economic goals. To this end, this study maps the currently available national standards ecosystems in each of the ARSO member countries selected for this study against globally available standards, in the focus areas of Fire Safety, Renewable Energy, and Sustainability for Africa. It assesses the existing local or regional standards development systems and capacity, and the existing cooperation and collaboration amongst regional and global standards development organisations.

We evolved the methodology for this study based on existing Standards Catalogues on national and regional public agency websites, responses to questionnaires created based on this preliminary public knowledge, and personal interviews with key decision-makers. Despite our researchers having to contend with limitations such as non-existent national standards catalogues in certain countries, and an overall “questionnaire fatigue” due to the COVID-19 pandemic, the data received has helped in arriving at key conclusions and formulating recommendations that can be implemented. At the onset, it would not be far-fetched to state that Standards Catalogues that are easily accessible to the larger public in any economy make for a more accurate predictor of that country’s economic growth. Standards facilitate trade and commerce with a perspective of national regulations. Availability and public knowledge of national standards would not only make the goods and services produced or traded in the economy in themselves more consistent in terms of quality within the country, but also across African nations and globally.

In a world of Global Value Chains (GVCs) and Regional Value Chains (RVCs), countries should be able to import as easily as possible to raise their export volumes. A first and foremost recommendation is therefore to leverage these value chains for the continent to succeed in its pursuit of industrialisation and growth in intra-Africa trade. The standards developed, adopted, or promoted in Africa need harmonisation as much as to be designed to encourage a sufficiently large number of African firms to enter and participate in RVCs and

become active players in the industrialization process in Africa. These standards should endeavour toward the facilitation of trade and global competitiveness with accessibility not only in the availability of the national standards catalogues but also in their articulation. They should be as easy for regulators to administer as for businesses to comply with at a reasonable cost. It goes without saying that while future standards may follow the same rigour as existing trade rules under the RECs trading arrangements, making them any more stringent would defeat the purpose.

This report concisely defines the observed gaps in the standards ecosystem in the identified focus areas in the selected countries. ARSO and UL Standards can also bridge identified gaps in the following aspects:

- Upgrading the standards portfolio to cover the gap of important standards that are not available in the selected countries and the possibility that they may not exist in African countries at large
- Support in the establishment of communication strategy with stakeholders.

The findings of this study lead to the following key observations that invite deeper discussions with ARSO and UL Standards and their bespoke solutions towards establishing, adapting and implementing national and regional safety standards in the focus areas of this study. The conclusions drawn below are largely in the general context of the selected ARSO countries in this study, and some from pragmatic, country-specific situations.

## Overall recommendations:

The recommendations below apply to all selected ARSO countries included in the scope of this study

To avoid an exhaustive list of standards, and to prevent the duplication of conformity assessments, it is recommended that standards derived from harmonised or international standards be adopted through the implementation of the One Standard One Test and One Certificate principle.

This principle entails a Mutual Recognition System based on compliance with harmonised standards and conformity assessment procedures and results based on accredited services (calibration, inspection, testing,

and certification). This process can begin at the REC level as a building block toward a continental system, coordinated by ARSO CACO. Pan African Quality Infrastructure (PAQI) institutions are instrumental in ensuring the aims of existing Mutual Recognition Arrangements (MRAs) are achieved.

These Pan African Quality Infrastructure (PAQI) institutions can facilitate intra-African trade given the prospect of agreement on applicable harmonised standards and conformity assessment results, easing the movement of goods and services, thus enhancing trade within and between RECs. When the range of traded products expands under the AfCFTA Agreement, more relevant standards and CA capacity stand to evolve.

- To support standards compliance, among African businesses, the various NSBs can consider initiating the below activities:
  - Releasing official translations of standard catalogues in major local languages;
  - Spreading awareness through campaign-led workshops and seminars;
  - Supporting robust Conformity Assessment (CA) systems such as testing, inspection, certification, and metrology, enabling national legal frameworks with provisions for appropriate sanctions in each country;
  - Introducing government policies where none currently exist.
- The area of Electric Vehicles (EVs) is largely under-explored in all selected countries, whether from locally initiated new work items or the process of global standards adoption. Given the global shift toward EVs, ARSO and UL Standards & Engagement are in a position to identify countries that have publicly expressed the intent toward the adoption of EVs and promote fair trade in the focus area.
- We also observe that except for the one focus area standard that Rwanda has adopted, no other selected country has explored the area of Wind Energy yet for standards adoption. Once again, considering the international proliferation of Wind Energy exploration and infrastructural development, and also the opportune topography of most African countries, Wind Energy is an area in which ARSO and UL Standards & Engagement can aid further

infrastructural development with comprehensive recommendations on standards at the continental level.

- According to the responses from NSBs and NSB stakeholders, countries hold memberships in regional and international standardisation organisations. However, they are not actively represented and engaged in standards development and standards harmonisation. This raises the prospect for a continued UL Standards & Engagement-led ARSO awareness campaign for member countries to understand their role in regional and international standardisation activities and the benefits of active participation.
- Based on the responses to the questionnaires, NSBs with appropriate infrastructure are already equipped to extend their services to other countries that do not have to facilitate intra-Africa trade.
- According to the responses collected from NSB officials and stakeholders in the selected countries, stakeholder engagement in standardisation activities is limited. UL Standards and ARSO can support the identified countries in establishing policies and strategies that target key stakeholders to engage in further developing standardisation.

Beyond the current study, the below standards in order of priority beg consideration for further standardisation work:

- 1. Goods**
  - a. Unmanned vehicles
  - b. Mini-hydro tech and Biomass
  - c. Electro-medical devices
- 2. Services**
  - a. Electricity supply in rural settlements
  - b. Health and allied services

Future studies stand to be more effective if conducted outside the Christmas holidays when key organisational staff is more likely to be accessible. This would avoid repeated and unresponsive follow-ups when most organisations are completely shut for operations or operating with skeletal staff.



### Country-specific recommendations:

Most of the selected countries in this study have predominantly adopted global ISO and IEC standards. But it was observed that other than these two, none of the other global standards has been adopted in any of the selected countries. In addition, nationally initiated work items have a significantly low rate of adoption.

These gaps open the potential for ARSO and UL Standards & Engagement to support African countries to offer the expertise to support African countries in bridging these identified gaps in the essential standards portfolio and also help them initiate standardisation projects, capturing emerging local technologies, which the adoption of international standards may not supplement.

The level of adoption of regional standards is also low, especially regional EAS and ARSO standards in the East African countries of Kenya, Rwanda, Uganda, Tanzania, and Zambia. ARSO and UL Standards & Engagement can maximise efforts towards raising awareness and promoting the harmonisation of standards at the continental level to support the implementation of the AfCFTA Agreement.

It should be noted that owing to the recent establishment of the Standards body, no standards catalogue, whether developed at the national level or adopted from global standards, was available from respondents in Chad.

Some specific recommendations for the selected countries based on the responses received are below:

Sl. No.	COUNTRY	Key consideration concluded from the findings	Proposed recommendation
1	CHAD	ATNOR is newly established, this justifies the fact that there is no available domestic and adopted international standard.	UL Standards and ARSO are recommended for: <ul style="list-style-type: none"> <li>Supporting ATNOR in the establishment of policy, legal and regulatory frameworks as the fundamental basis for effective operationalization of a National Quality Infrastructure.</li> <li>Providing capacity building of ATNOR staff in standardisation, metrology, and conformity assessment matters.</li> <li>Supporting the operationalisation of the institution (development of internal policies, procedures and guidelines)</li> </ul>
2	SENEGAL	No existing standards equivalent to the UL Standards & Engagement standards given as examples for inference	ARSO and UL Standards & Engagement need to support in availing all necessary standards to strongly position Senegal in cross-border trade.
3	CAMEROON	a. Limited understanding of best practices applied in standardisation to members of technical committees.	Support ANOR in providing training to TC members and other key players to ensure a thorough understanding of the guiding principles of standardisation.
		b. ANOR has established a standards development process (supported by documented procedures) however, no digital platform that supports the standards development work to easier participation both at the national and international level	Exploring digitalisation of standards development to ensure easy access and participation.

		c. Cameroon has huge Standards Gaps in all identified focus areas where no national standard nor adopted in Solar Photovoltaic systems and applications, Lithium-ion batteries, Energy storage systems, Electric vehicle Wind energy, except three adopted standards (fire safety (1) and sustainable standards (2) and one nationally developed standard in fire safety	<ul style="list-style-type: none"> <li>UL Standards &amp; Engagement and ARSO need to support access to all necessary standards to strongly position Cameroon in cross-border trade.</li> </ul>
		d. Standards Catalogue is not comprehensive with all required information as aligned to the applicable international best practices.	<ul style="list-style-type: none"> <li>Capacity building;</li> <li>Also exploring the option of supporting ANOR to avail a user-friendly online catalogue for easy access to information on published standards.</li> </ul>
4	DEMOCRATIC REPUBLIC OF CONGO	No special concern was observed as the country did not respond to the questionnaire	N/A
5	GABON	a. AGANOR has not yet established a National Standardisation Strategy but expressed interest to be supported in the development of the NSS	Exploring the opportunity to support Gabon in establishing the NSS.
		b. Limited understanding of best practices applied in standardisation to members of technical committees.	Support AGANOR in training TC members and other key players to ensure understanding of principles guiding standardisation.
		c. Gabon has huge Standards Gaps in all identified focus areas where no national standard nor adopted in Fire Safety systems, Lithium-ion batteries, Energy storage systems and Electric Vehicles, except for two standards adopted around Solar Photovoltaic systems (1) and applications and Wind energy (1)	<ul style="list-style-type: none"> <li>UL Standards &amp; Engagement and ARSO need to support in availing all necessary standards to strongly position Gabon in cross-border trade.</li> </ul>
		d. AGANOR has established a standards development process (supported by documented procedures) however, no digital platform that supports the standards development work to easier participation both at the national and international levels	Exploring digitalisation of standards development to ensure easy access and participation.
		e. Standards Catalogue is not comprehensive with all required information as aligned to the applicable international best practices.	<ul style="list-style-type: none"> <li>Capacity building,</li> <li>Also exploring the option of supporting AGANOR to avail a user-friendly online catalogue for easy access to information on published standards.</li> </ul>



6	RWANDA	No special concern was observed. The observed gaps are reported in the general context, mainly related to the identified gap in national and adopted standards.	N/A
7	TANZANIA	No special concern was observed as the country has not responded to the questionnaire	N/A
8	UGANDA	No special concern was observed. The observed gaps are reported in the general context, mainly related to the identified gap in national and adopted standards.	N/A
9	SOUTH AFRICA	When it comes to standards in sustainability, South Africa has a wide, holistic approach that includes disaster management, quality management, business continuity, food safety management, environmental management.	ARSO and UL Standards can examine gaps in other African countries and help evolve regional and national sustainability standards inspired by this geography across the wider continent.

Beyond these specifics, we recommend that NSBs as well as other safety standards stakeholders promote capacity development initiatives around applicable standardisation best practices with a focus on Chad, Cameroon, the Democratic Republic of Congo, Gabon, Kenya and Zambia. NSBs also need to make more efforts in supporting strategic planning for standardisation in the selected countries, especially the French-speaking.

Moreover, there is a significant need for digital platforms in standards development activities in Chad, Senegal, Cameroon, Democratic Republic of Congo, Gabon, Ghana, and Tanzania, hence we implore the selected country NSBs to actively participate in both regional and international fora for the development of nation-specific standards that bridge their bespoke needs and gaps.

In view of the AfCFTA Agreement, harmonising standards, conformity assessment procedures and technical regulations for easier intra-African trade is

an urgent need. The recommendations suggested in this study would help reduce trade barriers amongst the African countries, and open up opportunities to produce goods and services competitively, while enhancing participation in RVCs and tapping into GVCs.

Standardisation in Africa can help unleash its full potential only if its stakeholders - both public and private, organisational as well as individual - participate actively in the decision-making and implementation of standards and their continuous evaluation and evolution.

The suggestions in this document can help both participating nations in this study as well as others in Africa chart a roadmap for globally facing and locally relevant standards to facilitate intra-African trade as well as trade with geographies the world over.

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