

# **SADC SUB-REGIONAL WORKSHOP ON HARMONIZATION OF LOW SULPHUR FUELS STANDARDS AND USED VEHICLES REGULATION**

## **SADCSTAN Working Drafts on the Harmonisation of SADC low sulphur fuel standards**

**18<sup>th</sup> December 2023**

**Birchwood Hotel & OR Tambo Conference Centre  
Johannesburg, South Africa**

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# Presentation Outline

1. Background
2. Support from UNEP – Awareness Workshops & Development of Working drafts
3. Overview of Technical Content of the Working drafts on low sulphur fuels
4. Next Steps
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# Background



- SADC Secretariat (Infrastructure & Services Directorate – Energy Division) in collaboration with the SADC Cooperation in Standardization (SADCSTAN) Secretariat through its Technical Committee on Energy (SADCSTAN TC 16) and with support from the United Nations UN Environment Programme partnered to harmonise regional fuel and vehicle emission standards for the SADC region as follows:
    - **July 2017 (Eswatini):** SADC through joint meeting of Ministers responsible for Energy urged Member States to among other issues:
      - phase out high sulphur content diesel and migrate to 50 ppm sulphur content diesel by 2022;
      - further migrate to ultra-low-sulphur diesel (10 ppm) by 2030
- (information, courtesy of SADC Secretariat – Infrastructure & Services Directorate - Energy Division)*

# Background (Contd.)



- **December, 2021:** Ministers of Energy directed the Secretariat to liaise with the SADCSTAN, to commission harmonisation of regional fuel standards to ensure alignment with other Regional Economic Communities and the Continent
- **September, 2021:** SADC Secretariat submitted request to SADCSTAN Secretariat for the harmonization of standards on low sulphur fuels
- **February, 2022:** SADCSTAN TC 16 Secretariat (Malawi) circulated New Work Item Proposal (NWIP) for ballot to MS through NSBs or equivalent Institutions
- **February, 2022:** SADC Secretariat notify Ministries of Energy regarding the NWIP circulated by SADCSTAN and urge them to support NSBs in the exercise and nominate Focal point persons for the harmonization process



# Background - Processing of Proposal to harmonise the standards



Workshop was updated on the status of processing the proposal to harmonise standards on low sulphur fuels.

Balloting status as at June 2022

- Angola (P)
- Botswana (P)
- DRC (P)
- Eswatini (P)
- Malawi (P)
- Mauritius (O)
- Mozambique (P)
- Zambia (P)
- Zimbabwe (P)

**\*Only 3 MS need to kick start harmonization process**

**Call for MS to still ballot and indicate status of participation**

# Support from UNEP

# **Regional Awareness Workshop on the proposed NWIP on harmonization of standards on low sulphur fuels**



Regional Workshop Chaired by SADCSTAN Chairperson – Ms. Romana Marunda was virtually held on 24<sup>th</sup> June 2022.

## **Objectives:**

- (i) To raise awareness on the SADCSTAN Harmonisation Process; and
- (i) To raise awareness on the proposal to harmonise standards on vehicle emissions in the SADC Region.

## **Participation:**

UNEP and SADC Secretariat. Countries represented included; Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Malawi, Mauritius, Mozambique, South Africa, Tanzania, Zambia and Zimbabwe (National experts from Standards Bodies, Energy Regulatory Agencies, Environmental Protection Agencies and the private sector)

## Regional Awareness Workshop on the proposed NWIP on harmonization of standards on low sulphur fuels

- The **Workshop** noted that there would be need to further engage UNEP for support in the harmonisation of cleaner fuels and vehicle emissions standards (Support was availed for the development of the reference documents).
- Challenges to the approved NWIP on the harmonisation of standards on low sulphur fuels:
  - ✓ Unavailability of an international standards (for endorsement). MS have national standards in place. However, these provide for varying specifications which need to be harmonised.
  - ✓ ARSO (continental standardization body) had since harmonised standards (*ARS 1362-2020, Automotive Fuels—Unleaded Petrol-Requirements and test methods* & *ARS 1363-2020, Automotive Fuels—Diesel—Requirements and test methods*). SADC Member States who did not participate in the process usually prefer to review the harmonised standards for adoption (Diverse specifications between MS and also from ARSO).

**\*\* Hence there was need to develop **working drafts** that would be used in the harmonisation of SADC Standards**

# Development of Working Drafts on the harmonization of standards



SADCSTAN Secretariat was supported by UNEP in the development (consolidation) of the working drafts for harmonization of the SADC regional standards on clean fuels in consultation with the Technical Committee (TC) Secretariat – Malawi, SADC Secretariat & South Africa (as TC Chair) for MS data and information.

During the development of the base documents, SADC MS were requested by SADCSTAN Secretariat to **submit their national standards** on fuels for use as reference documents.

**Malawi, South Africa** and **Zambia** provided the reference standards for the development of the working drafts. The African Organisation for Standardization (ARSO) and East African Community (EAC) standards were also referenced in the development of the two working drafts.

# **Overview of Technical Content of the SADCSTAN Working Drafts for Harmonisation**

# Overview of Technical Content from Draft Harmonised Text- Automotive Gasoline.

## Specific quality requirements for automotive gasoline.

S/No.	PROPERTY	REQUIREMENT		TEST METHOD
		Min	Max	
i)	Research octane number (RON)	93		ISO 5164 ASTM 02699
ii)	Motor octane number (MON)	83		ISO 5163 ASTM 02700
iii)	Lead content, ppm		5	EN237 ASTM 03237 IP428 IP352
iv)	Benzene content, % v/v		1.0	EN 238 IP429 EN 12177 ASTM 04420
v)	Total aromatics,% v/v		35	ASTM 01319 ASTM 05580 ASTM 05443
vi)	Density (at 20 °C), kg/m <sup>3</sup>	716	771	ISO 3675
vii)	Density (at 15 °C), kg/m <sup>3</sup>	720	775	ASTM 04052 ASTM 01298
viii)	Sulphur content, ppm		10	EN 24260 ISO 8754 ASTM D 4294

# Overview of Technical Content from Draft Harmonised Text- Automotive Gasoline.



S/No.	PROPERTY	REQUIREMENT		TEST METHOD
		Min	Max	
IX)	Manganese, ppm		2.0	ASTM 02622/IP 336 ISO 20847 ASTM 03831
X)	Oxidation stability, min.	360		ISO 7536/IP 40 ASTM 0525
XI)	Existent gum content (solvent washed), mg/100 ml		5	ISO 6246 ASTM 0381
XII)	Copper strip corrosion (3 h at 50°C), rating		No. 1 strip	ISO 2160/IP 154 ASTM 0130
XIII)	Mercaptan sulphur, %, m/m		0.001	ASTM 03227
XIV)	Oxygenates, % v/v	Nil	Nil	EN 1601 EN 13132 ASTM 05599
XV)	RVP at 37.8 °C, kPa	47	65	ASTM 0323 ASTM 05191 EN 13016-1
XVI)	FVI <sup>b</sup>		93	See table footnote
XVII)	Distillation a) Temperature, °C for: <ul style="list-style-type: none"> <li>Initial boiling point</li> <li>10% volume evaporated fraction</li> <li>50 % volume evaporated fraction</li> </ul>	To be reported		ASTM D86 IP 123

# Overview of Technical Content from Draft Harmonised Text- Automotive Gasoline.

S/No.	PROPERTY	REQUIREMENT		TEST METHOD
		Min	Max	
	• 90% volume fraction evaporated	46	71	
	• Final boiling point, °C		210	
	a) Residue, % volume fraction		2.0	
	a) Evaporated to 70°C (E70), % volume fraction	To be reported		
XVIII)	Doctor test <sup>a</sup>	To be reported	0.0015	ASTM D4952 IP 30
XIX)	Colour	Read		Visual Inspection

a) If negative, no need to carry out Mercaptan Sulphur test.

b) The flexible volatility index (FVI) is an additional parameter which characterizes the volatility properties of petrol, and is calculated using the formula

$FVI = RVP + 0.7 E70$  where

RVP is the Reid vapour pressure, in kilopascals; and

E70 is the percentage volume fraction of petrol, evaporated to 70 °C.

# Overview of Technical Content from Draft Harmonised Text- Low Sulphur Gas Oil (LSGO)



## Requirements for Low Sulphur Gas Oil (LSGO)

CHARACTERISTICS	REQUIREMENTS		TEST METHODS
	Min	Max	
Density, 20°C, kg/m <sup>3</sup>	0.817	0.867	ASTM D 4052/ASTM D 1298
Appearance	Clear		Visual
Colour, max.		3.0	ASTM D 1500
Cetane Number, min.	51		ASTM D 613
ASTM Colour		3.5	ISO 2049 ASTM D1500

# Overview of Technical Content from Draft Harmonised Text- Low Sulphur Gas Oil (LSGO)

CHARACTERISTICS	REQUIREMENTS		TEST METHODS
	Min	Max	
Polycyclic aromatic hydrocarbons, % (v/v)		11	EN 12916
Cetane Index, calc., min.	48		ASTM D 976
Viscosity, at 40°C, cSt,	2.00	5.3	ASTM D 445 IP 71
Cloud point, °C, max	Report		ASTM D 2500
Cold Filter Plugging Point, °C, max		-4 .0	IP 309
Sulphur, % mass, max.		0.005	ASTM D 4294 ASTM D 5453 ASTM D 2622
Copper Corrosion 3 hrs at 100°C, max.		Class 1	ASTM D 130
Carbon Residue, 10% Bottoms, max.		0.15	ASTM D 524
Water Content, % Vol, max.		0.02	ASTM D 95/ASTM D 4377
Sediment, % Vol, max..		0.01	ASTM D 473/ ASTM D 2709
Ash, % Mass, max.		0.01	ASTM D 482

# Overview of Technical Content from Draft Harmonised Text- Low Sulphur Gas Oil (LSGO)



CHARACTERISTICS		REQUIREMENTS		TEST METHODS
		Min	Max	
Ash, % Mass, max.			0.01	ASTM D 482
Flash Point PMCC, °C, min.		60		ASTM D 93
Total Acidity, mg KOH/g, max.		0.3		ASTM D 664
Oxidation Stability, g/m <sup>3</sup> , max		20		ASTM D 2274 IP 388
Lubricity	Load, gms, min	3100		ASTM D6078
	Wear Scar, µm, max		450	ASTM D6079 or ISO12156-1
Particulates, mg/Kg, max.			24	ASTM D 6217 IP 440

# Overview of Technical Content from Draft Harmonised Text- Low Sulphur Gas Oil (LSGO)



CHARACTERISTICS		REQUIREMENTS		TEST METHODS
		Min	Max	
Neutralization value: Strong acid No. KOH, mg/g Total acid, KOH, mg/g		Nil	Nil 0.5	ISO 6619 ASTM D974 ISO 7537 ASTM D 664
Distillation Recovery, %, min	At 360 °C	85		ASTM D 86
	From 240 – 310 °C	45		

# Next Steps

# Next Steps



- ✓ Presentation of the **Working drafts** to the regional workshop for validation (provisions/parameters not specifications) for use as reference (base) documents in the harmonisation of the standards on low sulphur fuels through SADCSTAN TC 16 on Energy.
- ✓ Resolution of roadmap for the harmonisation of the standards by SADCSTAN TC 16

# Next Steps



- ✓ Call for officials, experts, NSBs, stakeholders to participate in the harmonisation of standards in the SADC Region through SADCSTAN TC 16 (Harmonisation process shared)
- ✓ Contribute through shared experiences, expertise, national standards

# Acknowledgements

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- SADC Secretariat
- UNEP
- Climate & Clean Air Coalition
- Environmental Compliance Institute
- ARSO/East African Community (EAC)/Malawi/South Africa/Zambia
- Workshop Delegates (NSBs, Ministries in charge of Energy, Environment, Mineral resources & Transport, Private Sector, TC 16 Secretariat-Malawi,)
- SADCSTAN ExCo & SMC
- Host Country – South Africa

***Thank you***

***Merci***

***Obrigado***

