

**Burundi** 

**Ethiopia** 

**Kenya** 

**Rwanda** 

**Sudan** 

**Tanzania** 

**Uganda** 

## Regional Carbon Market Profile

### Role of carbon markets in Eastern African NDCs

- Eastern African countries submitted their revised NDCs between 2020 and 2022, with Uganda having made the most recent NDC update in September 2022.
- According to the updated NDCs, the countries will reduce Greenhouse Gas (GHG) emissions by an average of 37% by 2030 relative to the business-as-usual scenario. This is a significant increase in mitigation ambition from the 32% average in 2020. This would be achieved through unconditional as well conditional measures which rely on international support for means of implementation in the form of finance, investment, technology development and transfer, as well as cooperative approaches under Article 6 of the Paris Agreement.
- The regional NDCs estimates that circa USD 394.2 billion will be required for mitigation and adaptation actions across all sectors and countries until 2030.
- Most Eastern African countries explicitly mention their interest in using international market-based mechanisms to achieve their NDCs. Moreover, practical steps have already been taken in preparing for Article 6 readiness including through engagement in the Eastern African Alliance on Carbon Markets and Climate Finance.

### Eastern Africa's Carbon Market Portfolio – key insights

- In total, Eastern African countries have successfully registered 501 CDM activities: Burundi (<1%), Ethiopia (3%), Kenya (42%), Rwanda (12%), Tanzania (3%), Sudan (<1%), Uganda (38%). There are 52 single project activities and 449 component project activities (CPA) within 61 Programme of Activities (PoA).
- 36% of all CDM activities in the region have issued over 31.9 million certified emission reductions (CERs) from the following main sectors: improved cook stoves (38%), run-of-river hydro projects (23%), and water purification (16%).
- While these issued carbon credit volumes are noteworthy, the existing pipeline has significant further carbon credit issuance potential. Eastern Africa's carbon market pipeline has further mitigation potential of over 169.8 million tCO<sub>2</sub>e between 2021-2025 from these registered activities. In addition, new activities, especially in emerging NDC priority sectors like electric mobility and others not yet supported by current carbon market activities could further increase this potential significantly.
- The region has also 299 registered activities across the main voluntary carbon market (VCM) standards (Gold Standard, Verra

and Plan Vivo), with over 73.6 million issued credits. 80% of the activities are in energy efficiency with Gold Standard registering the dominant share (94%).

- In sum, across all carbon standards, EAA countries have thus generated approximately 100+ million carbon credits, even though only a small number of countries and sectors have generated substantial mitigation outcomes and more efforts are needed to benefit additional sectors and countries. Some of these voluntary carbon credits have been issued for post-2020 vintages, which highlights the

actual need for integrating VCM transfers with NDC accounting and reporting.

- Eastern Africa has also taken initial steps towards Article 6 readiness and piloting. A key challenge for responsible authorities is to establish institutional frameworks and oversight for the diversity of Article 6 cooperative approaches, including the VCM. However, if the region can build on its substantial pipeline and expand to additional activity types, aligned with NDCs and Article 6 rules, carbon market implementation at scale can materialize.

## Summary

**501 CDM**  
activities

**299 Registered**  
activities across VCM standards

**31.9 Million**  
Certified Emission Reductions

**Aprox 100+M**  
Carbon Credits (CDM+VCM)

mitigating potential

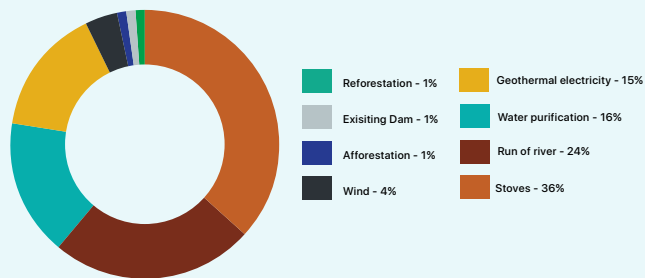
**169.8 Million**  
tCO<sub>2</sub>e between 2021-2025

**Initial Steps**  
Article 6 readiness & piloting

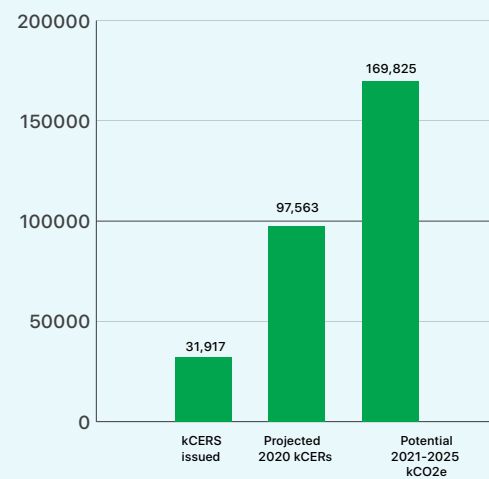
## 2. CDM portfolio and performance

- There are 501 registered CDM activities: 52 single project activities and 61 PoAs with a total of 449 CPAs. The CDM activities have issued over 31.9 million CERs.
- Total projected 2020 mitigation potential of registered activities was over 97.5 million CERs, while 2021-2025 mitigation potential of current CDM activities could be estimated at 169.8 million emission reductions.

CDM subsector issuance (kCERS)



Projected CDM issuances



## Volume of CER issuance and potential of currently registered CDM activities by sector

Activity Type	Sub-sector	No. of PA	No. of PoA	No. of CPA	kCERs issued	Projected 2020 ktCO <sub>2</sub> e	Mitigation Potential between 2021-2025 ktCO <sub>2</sub> e
<b>Overall</b>		<b>52</b>	<b>61</b>	<b>449</b>	<b>31,957</b>	<b>97,563</b>	<b>169,825</b>
<b>Afforestation</b>	Afforestation	1	-	-	345	352	124
	Bagasse power/Briquettes	1	-	-	-	1,296	-
	Agricultural residues	1	1	1	-	121	69
<b>Biomass Energy</b>	Gasification of biomass		1	2	34	371	469
	Connection of Isolated grid	-	2	3	57	1,750	6,190
	Efficient electricity distribution	-	1	2	-	173	403
<b>Energy Distribution</b>	Biomass briquettes or pellets	1	-	-	-	353	84
	Lighting	1	1	8	64	952	1,364
	Solar Lamps	1	6	8	128	1,272	2,189
<b>EE Households</b>	Stoves	4, (1)*	30	264	11,979	36,092	98,568
<b>EE Industry</b>	Petrochemicals	1	1	-	-	42	-
<b>EE Service</b>	Water purification	-	6	114	4,963	15,355	39,793
<b>Geothermal</b>	Geothermal electricity	4	1	2	4,721	11,064	3,476
	Hydro dam		2	6		256	345
<b>Hybrid Renewables</b>	Solar Wind and Others	-	2	2	60	-	1,380
	Run of river	7	2	10	7,396	9,478	3,335
<b>Hydro</b>	Existing dam	2			247	902	612
	Landfill composting	1	1	13	33	281	3,364
<b>Landfill gas</b>	Landfill flaring	3	-	-	93	3,935	1,263
	Wastewater	3			139	732	843
<b>Methane avoidance</b>	Domestic manure	1	3	6	15	1,559	3,000
<b>Reforestation</b>	Reforestation	11, (1)*	-	-	86,(255)*	1,889	888
	Solar PV	-	1	4	46	125	664
	Solar PV water purification	0	1	4	-	117	235
<b>Solar</b>	Solar water disinfection	2				55	3
<b>Transport</b>	Biodiesel for transport	1	-	-	-	48	201
<b>Wind</b>	Wind	6	-	-	1,295	8,993	963

\*deregistered

## CDM transition potential

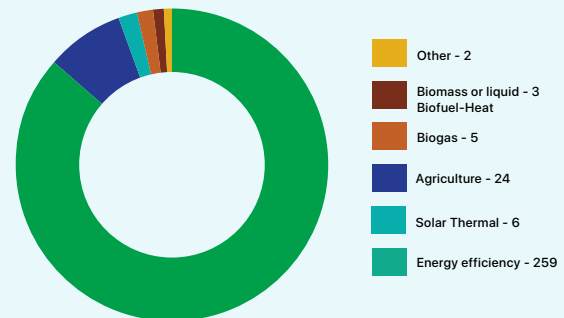
Many Eastern African CDM activities may be eligible for transition, provided UNFCCC rules remain as in current draft documents. As the Article 6.4 Supervisory Body will make the transition process available in mid-2023, host countries need to immediately establish criteria and an approval procedure for activity transition aligned with UNFCCC rules. Since, there is only vague guidance for host countries to determine how CDM activities that seek to transition to the Art.6.4. Mechanism may contribute to their NDCs, countries will need to determine their own procedures. Beyond transitioning existing activities, there is potential for scaling up and expanding the regional carbon market portfolio especially through transitioned PoAs that can serve multiple technologies and even countries.

- 36 CDM project activities and 44 CPAs were registered before 2012, while 16 projects activities and 405 CPAs were registered post-2012. Therefore, the majority of Eastern African CDM activities registered after 2012 may be able to generate carbon credits from pre-2020 vintages that could be used also for first NDCs.
- The CDM has 31.9 million pre-2020 vintage credit issuances from 39 project activities and 283 CPAs; and no post-2020 vintage issuances yet.

## 3. Voluntary carbon market portfolio and performance

- Eastern Africa has issued a total of 73.6 million credits from 299 activities in the VCM. The Gold Standard is the dominant voluntary carbon standard with 84% of the activities, with VCS at 13% and Plan Vivo at 2%.
- However, VCS has achieved the highest issuance volume with 43.9 million issued credits (59%), GS at 27 million credits issued (37%) and Plan Vivo issuing 2.7 million credits <4%.

## Registered Voluntary Carbon Standard activity by sector



### Gold Standard (GS)

- Eastern Africa hosts 253 GS activities (211 VPAs and 42 standalone projects) with a total issuance of over 27 million credits.
- GS issued 27,090,310 verified emission reductions (VERs) and 1,011,047 planned emission reductions (PERs), as well 977,642 Certified Emission Reductions (CERs) from 15 activities that received double certification (GS + CDM).
- 87% of GS carbon credits are from the energy efficiency sector with improved cook stoves.
- Kenya has generated the most GS credits making up 46% of credits (over 12.7 million), followed by Uganda at 39% (10.6 million), Rwanda at 9% (2.4 million), Ethiopia at 3% (790,877) with Tanzania (383,467) and Sudan (368,399) at 1% respectively.
- GS has 25,208,191 pre-2020 vintage credit issuances from 127 activities: and a total of 1,882,119 post 2020 vintage credit issuances from 134 activities.

## VERRA (VCS)

- VCS hosts 40 activities with a total of 43.9 million issued credits, of which the large majority have been generated by REDD+ projects.
- VCS has 26,750,254 pre-2020 vintage issuances and 17,198,376 post 2020 vintage issuances.
- In July 2022, Burundi registered the first VCM carbon market activity under Verra/VCS, which is a significant development for their national voluntary carbon market portfolio. As of October 2022, 575,239 VCUs have been issued.

## Plan Vivo

- Hosts 6 projects across the region in Ethiopia, Kenya, Tanzania and Uganda, with a total issuance of 2.7 million credits.
- These initiatives apply various tree planting and improved land management methods to various settings including with small-scale farmers.
- Plan Vivo has 511,890 pre 2020 vintage credit issuances from 6 project activities and 486,139 post-2020 vintage credit issuances from their registered projects.

## 4. Article 6 readiness and piloting

- All Eastern African countries intend to participate in Article 6 and have begun establishing readiness activities, including through cooperation with the Eastern African Alliance, UNFCCC regional collaboration center, and several development partner activities. No country has fully established all participation requirements, but all of them are working towards this objective.
- Some countries have already taken steps towards active Article 6 pilot activities, including through the Japanese Joint Crediting Mechanism (Ethiopia, Kenya), which is the most advanced bilateral market mechanism as an example of Article 6.2 cooperative approaches.
- Moreover, the World Bank Ci-Dev has established CDM PoAs in several countries with the intention to move towards applying the Standardized Crediting Framework. Rwanda is actively participating in this Art. 6.2 pilot; there are also Ci-Dev PoAs also in Ethiopia, Kenya, and Uganda (UNEP CCC, 2022b).
- The significant potential for transition of CDM activities to the emerging Art.6.4 Mechanism may rapidly increase the number of ongoing activities once the transition process will be operational. Moreover, ITMO exports from VCM activities may also be regulated by Art. 6.2, depending on their use cases and claims.
- Additional bilateral cooperation initiatives are under discussion between several ITMO buyer countries and Eastern African

states, but currently have not yet decisively moved ahead.

- Additional efforts and opportunities for accessing carbon market revenues can also be found in several member states. Sudan is exploring ways to strengthen access to climate finance resources e.g. from the Green Climate Fund (GCF) (GCF 2017).

### CORSIA Potential

- There are several hundred eligible carbon market activities in the CDM, Gold Standard and VERRA pipelines eligible for CORSIA, which can serve the emerging domestic carbon credit demand from within the region in the future.
- Tanzania, Kenya, Uganda and Rwanda Airlines are already participating in CORSIA's voluntary pilot phase (2021-2023). Ethiopian Airlines is Africa's largest airline with a comprehensive international flight network and expected to generate significant demand, but has not formally positioned itself.
- Burundi Airlines has been recently established but and may generate some demand for voluntary or compliance compensation in the future.



## References

Gold Standard (2022): Impact Registry, all projects, <https://registry.goldstandard.org/projects> (accessed August 2022)

Plan Vivo (n.d.): Markit Registry, [https://mer.markit.com/br-reg/public/index.jsp?entity=retirement&sort=account\\_name&dir=ASC&start=0&acronym=PV&limit=15&additionalCertificationId=&categoryId=100000000000001&name=&standardId=100000000000004&unitClass=](https://mer.markit.com/br-reg/public/index.jsp?entity=retirement&sort=account_name&dir=ASC&start=0&acronym=PV&limit=15&additionalCertificationId=&categoryId=100000000000001&name=&standardId=100000000000004&unitClass=), (accessed August 2022)

UNEP CCC (2022): CDM pipeline overview, <http://www.cdmpipeline.org/> (accessed August 2022)

UNEP CCC (2022b): Article 6 pipeline overview, <http://www.cdmpipeline.org/> (accessed August 2022)

VERRA (2022): VERRA all projects, downloaded from <https://registry.verra.org/app/search/VCS> (accessed August 2022)

## 6. Key assumptions

- Data referring to the CDM (projects and programmes) has been taken from the UNEP CCC CDM project and PoA pipelines as of August 2022. To remain conservative, we only include registered activities. We did not assess data quality regarding whether a project is still active, as UNEP is the commonly recognized database drawing directly on UNFCCC Secretariat data.
- While there is a high degree of uncertainty regarding the issuance potential of individual activities, these are difficult to assess and will be affected by future political decisions. Only PoAs which have an included component project activity (CPA) in the profiled country have been counted.
- While UNEP CCC captures estimated accumulated emissions until 2025 based on transparently available CDM activity design documents (PDD; PoA-DD, it is clear that meeting these estimations is subject to political decisions and therefore theoretical.
- Any future mitigation potential is expressed in kilotons of carbon dioxide equivalent (ktCO<sub>2</sub>e = 1000 tCO<sub>2</sub>e) in order not to prejudge the type of certification that post-2020 mitigation outcomes may be using.
- Voluntary carbon standard data has been taken from the official databases of the respective standards. Verified Carbon Standard data is as of August 2022. Data on Gold Standard (GS) activities have been obtained from the GS registry while Plan Vivo data was obtained directly from the standard in August 2022.
- Parties agreed at COP26 that projects will be able to transition from the Clean Development Mechanism to the new Article 6.4 mechanism. A limited number of Certified Emission Reductions (CERs) could be used towards countries' NDCs, noting that the projects will not be able to receive issuances for post-2020 emission reductions, unless they transition to the new Art.6.4 mechanism. Vintages issuances post-2021 will require corresponding adjustments.



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**Authors:** Stephan Hoch, Peris Waweru (Perspectives Climate Group), Tim Cowman, Tom Owino, Diana Imbugwa (Climate Impact Partners). This regional profile has been prepared in the context of the project “Climate Finance Innovators – [Linking carbon markets with climate finance in Africa](#).”

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