Progressing an Energy Attribute Certification system for South Africa

Summary report on behalf of

GIZ SAGEN

within the project

“Study on the use cases and regulatory requirements for the implementation of an EAC system for renewables and green hydrogen in South Africa”

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Content

Executive Summary:
Ten measures to implement a nationwide energy attribute certification system

1. **Clarify the ownership of green attributes for REIPPPP**
   A model agreement on the legal status of the green attribute should be achieved, which will be essential for REIPPPP plants or other contracted producers receiving public support.

2. **Define relationship between carbon offsets & EACs**
   A clear delineation or relationship, if applicable, between the carbon tax act and the EAC system should be codified in law.

3. **Define degree of governmental involvement**
   Stakeholders and government should identify the relevant public authorities to engage in the implementation process of the EAC system to support a growing national EAC market.

4. **Set up rules for a national EAC system**
   The legal framework including governance, roles, eligible power sources, rules on registration, issuance, and redemption of certificates, as well as data transferring and communication standards, is to be set up by the stakeholders.

5. **Assign roles of registrar, issuer & auditor**
   The three roles are the essential facilitators of the EAC system to be built. Stakeholders and government should agree on suitable parties and give them the mandate.

6. **Increase knowledge and capacity on EACs**
   Every stakeholder group should get the chance to make informed decisions to become an active market participant or facilitator.

7. **Develop the domestic EAC market**
   Facilitating market conditions should be created around EACs, including setting up a marketplace, inclusion of stakeholders of all sizes, implementation of new market roles and consideration of new trends such as high granularity of certificates and digital solutions.

8. **Set up meta registry for RE production facilities**
   A registry for power plants disclosing both EAC and carbon credit issuance should be established as a central database.

9. **Facilitate low carbon supply chains through EACs**
   Certification of renewable energy is indispensable to boost export of green hydrogen and other products with added value. An EAC system has to be aligned with the regulation of importing countries.

10. **Engage as a leading partner within African Renewable Energy Certificates Facility (AREC)**
    South Africa as a regional leader should actively participate at the AREC and initiate regional capacity building and knowledge exchange.

Legend: Colours represent the following fields of action:

Regulatory Framework	Governance	Ownership	Market

1 Preamble

South Africa's electricity sector is undergoing a profound transformation, as climate change demands the massively accelerated deployment of renewable energies (RE). Youngest load shedding events have revealed huge and aggravated deficits in generation capacity within the public supply system, which show the more that investments in both large and small, decentralized, RE production facilities are required.

An energy attribute certification (EAC) system, also called renewable energy certification (REC)[1] when talking about low carbon energy resources, is seen as a powerful means to bring transparency and market opportunities into the renewables sector. Evidence is provided by long-lasting international best practice.

The aim of the "study on the use cases and regulatory requirements for the implementation of an energy attribute certification system for renewables and green hydrogen in South Africa" on behalf of GIZ SAGEN was to support the public sector and stakeholders of the energy industry in South Africa. Eskom, independent power producers, municipalities, energy traders and industrial offtakers as well as governmental authorities were provided with knowledge to take further decisions on how to implement a national EAC system. The study was conducted in 2022. It elaborates on the international context and gives recommendations on the implementation of a well-functioning and widely accepted EAC system in South Africa. The results of the study were presented and discussed within four knowledge sharing workshops with the stakeholders named above, both in presence in Pretoria and virtually, between August and September 2022. Additionally, interviews with both South African and international experts in the field of energy certification were conducted.

With this report, we, the commissioned consultants, summarize the learnings of both the study, the interviews and the stakeholder exchange seeking to give comprehensive advice to all decision makers that may be involved in a subsequent implementation process. Ten key measures were derived from a wide range of experience, thoughts, ideas, questions and concepts that have been shared. With these ten measures we intend to meet the essence of which are the decisions and actions that have to be taken now and within the upcoming months. Here, we want to emphasize some categorical notes how to understand the measures and how to elaborate on them. Our main conclusions from the project may serve as guiding principles for a domestic, inclusive EAC system to be implemented now.

Two private business based EAC systems already exist in South Africa: With zaRECs and I-REC, well-functioning schemes acknowledging international standards have been developed within their niche. Particularly zaRECs sustained by its steadily growing membership organization RECSA, delivers well founded experience in self-regulation, trusted rule sets and industry support. Nevertheless, the impact on the electricity market has been limited since REIPPPP plants are not covered by the scheme. Many potential customers on the domestic electricity market do not include zaRECs in their energy procurement decisions since they do not know enough about the opportunities.

[1] EAC and REC are often used interchangeably. In this report we continuously use the term EAC, since it is an umbrella term for all types of RE certificates existing worldwide (for more, consult main study, Chapter 2.2).

The stakeholder exchange revealed: To establish an EAC market with wider opportunities for producers, IPPs and electricity consumers – meaning to increase certificate supply and demand – the existing certification system should evolve. A scalable system with high visibility and transparency is required. South Africa has large potential for RE production and even for its export. Energy policy can facilitate RE projects by combining market promoting instruments and regulation in an intelligent way.

There is a value for green attributes. Due to decreasing levelized costs of electricity for RE, a premium will be not needed anymore, but it is particularly the industry who asks for certified green electricity. Currently, green benefits from REIPPPP are not sold, and hence, get diluted in the grid mix. To make use of this value either for RE producers or for common welfare, the question of ownership of RE attributes for power from REIPPPP facilities is to be solved.

A domestic EAC system may include specific South African rules but should also reflect demands of the global supply chain and their corresponding reporting standards. Industry framed use cases range from transparency in energy procurement, meeting future carbon tax requirements to climate neutral production.

A domestic EAC system acknowledging decentralized green energy production contains the chance to come up with the needs of all kinds of stakeholders. Whereas an EAC market is a powerful instrument to satisfy green energy demand from the industrial sector, for most private households and smaller enterprises, reliability and affordability of electricity supply might be much more significant for social welfare than the source of energy. Municipalities delivering services of public interest and ethnic groups facing specific socio-economic challenges are two groups of stakeholders that should carefully be included in the upcoming capacity building and decision-making process. To empower consumers to influence the shaping of the energy system one has to create an inclusive, open and user-friendly system.

There is no single solution that fits all needs. Many decisions may be based on the norms and values of the stakeholders, of course under the legal framework of the Republic of South Africa. A set of decisions concerning the overall structure of the EAC system are still to be taken, i.e. about the role of government, the eligibility of REIPPPP facilities, the relationship between EAC and the carbon tax scheme, among others.

Just start! The complexity of a multi-purpose certification system should be acknowledged in a way that the system will be developing over time. But it should not lead to a wait-and-see approach until any uncertainty concerning the liberalizing electricity market is resolved.

The less complex applications may serve as a testing field to create win-win-situations. Rules may be adapted year-by-year for further purposes. Iterating on international best practice helps to improve continuously. An evolving governance structure may give room for new roles in the energy system such as consolidators or aggregators. The operational structure should facilitate the incorporation of new technologies, e.g. distributed ledger technology to come up with granular certification requirements.

We emphasize the role of Eskom and its part in the proposed activities, as Eskom initiated this project being a catalyst in the process of formulating recommendations for the next steps for

establishing a national EAC system. Eskom should be actively involved in the coming activities to signalize the interest and commitment of the key energy sector market players to this endeavour.

2 The measures

Based on the assumptions and principles in the preamble, we describe the next ten most relevant steps to be done. Each measure refers to a content discussed in detail within the document "Study on the use cases and regulatory requirements for the implementation of an energy attribute certification system for renewables and green hydrogen in South Africa", references are given in the text. The measures are all described with the same profile containing goals, relevant actors, opportunities and risks, the consultants' recommendation, and an indication of tangible activities on a timeline of five years.

2.1 Clarify the ownership of green attributes for REIPPPP

Goals

Up to now, generation from power plants enrolled in the REIPPPP has not been certified, and that could be an immediate source of certificates. Currently, the ownership of green attributes is not addressed in any PPAs. It has to be determined which party will own green attributes in existing and new PPAs. PPAs need to be amended accordingly. Possible owners could be IPPs, Eskom, but also municipalities which concluded PPAs directly with IPPs. The outcome should be a new standard PPA clause. More on the current constellation can be read in the main study, Chapter 3.3.1.

Eskom is very interested to claim these green attributes, primarily to retain customers by helping them meeting their RE targets. The ever-growing demand for green attributes among the Eskom customer base is standing out.

It is important to ensure that any extra income coming from trade with EACs, regardless of which party will be the owner, will flow into construction of new RE power plants, sustainable refurbishment of existing facilities and other market integration tasks such as grid expansion and strengthening. Green attributes can be sold to the interested corporate customers, who are ready to pay a premium for them, and citizens can get a tariff reduction. The social responsibility of the contracting parties is to split the costs for the transformation in a way that low-income and middle class consumers do not have to carry a disproportionate burden. In this sense EACs could be a means to reallocate part of the investment for RES to those who are interested in claiming to use RE, namely the target group of companies pursuing emission reduction goals.

Potential actors

- IPPs
- IPP Office
- Eskom
- Municipalities with PPAs
- Consumption side (e.g., EIUG)
- Legal experts

Opportunities

- Immediate increase of certificate supply

- Clear rules for the future PPAs
- Additional income source for the owners of green attributes
- Potential tariff reduction for those customers not interested in purchasing green attributes

Risks

- Determining ownership of this aspect does not bear any risks

Recommendation

With the help of consultations with affected stakeholders and legal advice to get clear answers is indispensable for engagement of many stakeholders and further development of a system.

Activities

Are there any no regret actions? All outlined activities.

short term / start immediately:

- Consult with the study on the subject commissioned by EIUG and other legal advice documents
- Assess the volume of additional certificates which will be available through determining legal ownership
- Gather affected stakeholders on one table and discuss how to handle existing and new PPAs in that respect
- Evaluate advantages and disadvantages of ownership of green attributes by different parties
- Draft a PPA clause on ownership of green attributes

mid-term / coming 1 to 2 years:

- Monitor how the system develops and if legal solutions require amendments; e.g., in case of REIPPPP amendment this provision may have to be amended as well
- Evaluate if the transparency of using this additional income stream, whichever party has been given a right to claim it, is provided; in case of a breach, take additional measures

long-term / 2 to 5 years:

- Regularly (e.g., on an annual basis) monitor, and report on the functioning of a system; evaluate its effectiveness for different economic players and social groups

Eskom activities

- Evaluate advantages and disadvantages of ownership of green attributes by different parties
- Negotiate with other affected stakeholders (IPPs, government) how to handle existing and new PPAs in that respect
- Draft a PPA clause on ownership of green attributes for existing and new PPAs

2.2 Define relationship between carbon credits & EACs

Goals

A clear delineation between carbon credits & EACs should be codified in law. Where organizations get confronted with both compulsory (carbon taxation) and voluntary schemes to reduce greenhouse gas emissions (carbon markets, EAC markets), regulation should indicate where the application of EACs ends and where that of carbon credits starts. International practice shows that the carbon taxation should not be merged with EAC accounting.

The knowledge sharing workshops showed that there is uncertainty within the industry, particularly among current or potential carbon taxpayers, about the relationship between EACs and carbon offsets. Requests to get EACs approved within the carbon tax scheme were expressed. It is crucial to distinguish between producers and consumers of electricity.

Organizations combusting fossil fuels to produce electricity are obliged to pay carbon tax according to the Carbon Tax Act that came into effect in 2019. Current rate is R134 per ton of CO_2e of greenhouse gas emitted by a taxpayer. The carbon tax is levied on the sum of greenhouse gas emissions, resulting from fuel combustion, industrial processes, and fugitive emissions, or roughly spoken, the emissions from an electricity producer. Tax can be reduced by a certain degree by using carbon offset allowances, among others. Carbon offsets simply means buying carbon credits that have been certified by one of the schemes listed in the offset regulations. The carbon tax is paid to, and administered by, the South African Revenue Service (SARS). Carbon credits can be traded on the South African carbon market. Thus, the carbon market may cover emitters' demands both for offsetting emissions under the carbon tax and for greening their company on a voluntary base.

Energy consumption is not covered by the Carbon Tax Act. Consumers are only indirectly charged by their suppliers when buying energy with fossil components. There is a different nature of both schemes, carbon credits to offset a certain amount of emissions (accounted in t CO2e), and renewable energy certificate as a proof for a certain amount of produced energy (accounted in MWh). Therefore, there is no option to balance any GHG emissions with EACs, and carbon tax related climate action will not result in additional demand for EACs.

It is to be decided whether a plant registered under an EAC system can also be registered in the Carbon Offset Administration System (COAS), or vice versa; eligibility and non-eligibility are addressed in the regulations attached.

A plant registered under an EAC system should not also be registered under a carbon offsets system; how this might progress under the carbon tax system is principally a topic for discussion with National Treasury. National Treasury wishes to avoid any "double dipping", therefore this was previously seen as a potential conflict, where REIPPPP projects can generate carbon offsets that can be used against a carbon tax liability. Eskom also benefits from claiming a tax deduction based on our REIPPPP purchase volumes in the first phase of the Carbon Tax Act. Thereby, analysis shows that not all the REIPPPP purchases are required to offset the carbon tax liability.

Potential actors

- Presidency / Operation Vulindlela
- National Treasury / South African Revenue Service (SARS)
- Department of Mineral Resources and Energy / Carbon Offset Administration System (COAS)

Opportunities

Despite the indicated separation of the accounting schemes for EACs and carbon credits, administrative bodies may learn vice versa from the other system, respectively. Synergies might be identified within registry operation; regulation of eligibility and accounting; communication technology and infrastructure for data management, transfer and security; establishing a market for credits/certificates.

Risks

Eskom accounting for about 40 percent of South Africa's GHG emissions has estimated an annual carbon-tax bill of around R11.5 billion when exemptions run out at the programme's planned second phase in 2026. Eskom and other fuel combusting industries will have to balance their investments in RE production against their projected tax rate.

Markets for EACs and carbon credits might compete where green energy producers have the choice to issue either certificates or credits. Currently, a market pull is being observed on the credit market due to carbon taxation and might intensify with the second phase of the Carbon Tax Act.

Eskom and other utilities could take advantage of the chance to shape a growing EAC market by claiming ownership or pre-emptive rights for EACs when contracting IPPs (see #1 "Clarify the ownership of green attributes").

Recommendation

From a today's point of view, it is not recommendable to merge carbon offsets and EACs in one instrument. International practice and guidelines for carbon taxation do not attest any linkages between carbon taxation and renewable energy certification. Research has shown that carbon offset markets and EAC markets are different instruments with their own history, regulation and use cases. So, for the time being, the recommendation is to keep carbon offsets and EACs separately from each other.

In the future, South African administration may be observing and learning from other jurisdictions whether a combination is feasible, thinking in converting EACs to carbon credits, e.g. India is undergoing an interesting discussion in this field. In the meantime, separate issuance may open up its own potentials.

Activities

Are there any no regret actions? Engage in consultation process on South African Carbon Offsets programme.

Short term / start immediately:

- Identify if carbon tax act needs to be amended concerning eligibility of green energy projects for carbon credits and/or EACs

mid-term / coming 1 to 2 years:

- Include clear delineation between EAC system and carbon tax system in the rule set for the EAC system

- Implement tools to avoid double counting (see measure # 8)
- Set rules for eligibility of green energy projects for carbon credits and/or EACs both within carbon tax and EAC legislation
- Establish regular exchange of experience and consultation between EAC administration system and COAS

long-term / 2 to 5 years:

- Observe international practice both on carbon taxation, carbon markets and EAC schemes and on convertibility between certificates and credits

Eskom activities

- Engage in consultation process on South African Carbon Offsets programme
- Decide on strategy to reduce tax burden in terms of carbon offsets and EACs in the second phase of the Carbon Tax Act after the allowances will be ceased

For further information, see chapters 2.7.4 and 3.3.1 of the study.

2.3 Define degree of governmental involvement

Goals

The results of the knowledge sharing workshops clearly demonstrated that different actors, especially ones who did not participate at any renewable energy certification scheme before, would like to have a state involvement. This is desired to ensure that a system, be it the existing one (RECSA) or the newly established one, complies with requirements, abide by the rules of good business conduct, does not discriminate any stakeholders and participants and provides accurate trustable reporting on their activities to the government. The workshop participants were not sure if credibility is given if the EAC system is governed by a voluntary private business based organization only.

Especially in light of the fact that South Africa already has two existing EAC systems, the question arises, if the competition between them supports further development of RE sector. Double counting of green attributes is another concern. So, the participants agreed that there should be some kind of auditing in place.

The goal of this measure is to determine suitable degree of governmental involvement for governance of EAC system considering governance of existing EAC systems, needs of sector players and constrained capacity of authorities coming into question. The result of implementing this measure should be motivation of more sector players to participate at an EAC system, thereby increasing supply and demand for certificates.

Following degrees of involvement are conceivable in the South African context (for more information on how government can have a role in an EAC system see main study, Chapter 2.1.2):

1. Governmental body as auditing and supervising authority. In this constellation, government will ensure that existing EAC systems as well as any other system which may enter the market

comply with the rules and requirements set by the government. Avoidance of double counting will be the responsibility of the government. It will also define such specifications as validity of certificates, eligible power sources and generation facilities, verification of metering data. It will be responsible for disclosure and calculation of residual grid mix. At the moment RECSA requires from facilities owners signing of production declaration, so that producers are obliged to provide their green attributes to only one system. In future, this task can be taken over by the government. This range of tasks can be combined with setting up a meta registry (for details see #8 "Set up meta registry for RE production facilities").

2. Legal endorsement, no active responsibility. The government in that case will endorse the existence of the voluntary zaRECs system, thereby increasing confidence of market players and their willingness to participate at the system. This requires only a little effort from the government and the governance of the existing system can be retained. In case of any disputes between market players and non-compliance with the market rules, the government can either nominate RECSA as a conciliation body or appoint an authority to do it.

Potential actors

- Operation Vulindlela as a government-wide initiative with contacts to all authorities
- Authority suitable for taking over an active (supervisor) or a passive (endorsement) role (to be determined in discussions)
- Production and consumption side of certificates (Eskom, IPPs, industry players) to vet the existing system and consult with
- RECSA as custodian of the zaRECs system
- GCC as the I-REC issuer in South Africa

Opportunities

- higher trust for investors and other market players
- tradability of certificates requires transparency
- more types of actors (e.g. municipalities) will be motivated to participate at the EAC market
- monitoring & legal enforcement in case of any conflicts

Risks

- more bureaucracy, administrative effort ("red tape")
- constrained capacity of authorities
- required time for system restructuring in case of government taking over an active role

Recommendation

In many countries, EAC systems have been established without governmental supervision, are based on private initiatives and are well accepted. Considering that the national zaRECs system exists for more than a decade and though it has a room for improvement, it is unclear if government which has not been involved in the EAC processes yet can bring about substantial additional value. Therefore, we recommend that after the system will be tested and positively assessed by different participant groups for its functionality the government should endorse the existing system and have

a supporting function in reconciliation processes remaining passive in other EAC activities to avoid overregulation.

Activities

Are there any no regret actions? All short-term activities.

short term / start immediately:

- Workshop with governmental bodies in order to inform and define responsibilities (to be done within current project). Timeline: till the end of December, 2022.
- Transmit clear benefits for all. Contacts should be established by Operation Vulindlela.
- Elaborate solutions for parties dependent on government decisions, such as municipalities: include it into regulation, define rules, communicate benefits etc.
- Vet the existing systems: zaRECs and on demand I-REC for testing how they work. Different actors, e.g. Eskom, should vet it to see if it functions well and fulfils their needs and expectations. As a result, knowledge and capacity on the side of testing entities and on the government side will be built up enabling to make more informed decisions. Then this experience should be analysed and specific recommendations for improvement should be derived.

mid-term / coming 1 to 2 years:

- Define rules and requirements for a nationwide EAC system (see #4 “Set up rules for a national EAC system”)
- Endorse an EAC system
- Implement improvement recommendations and see how it will affect the system performance; will supply and demand increase?

long-term / 2 to 5 years:

- Regularly monitor the system performance and evaluate if the degree of governmental involvement is optimal for current market situation

Eskom activities

- Conduct workshop with the government (takes place within this project)
- Register with zaRECs
- Vet zaRECs for its functionality and give advice to the government accordingly (see measure #6)

2.4 Set up rules for a national EAC system

Goals

Depending on the selected degree of government involvement, a regulatory framework for a national EAC system has to be elaborated. If the government choses to take over an active role in establishing a national EAC system, it has to define its key characteristics as well as rules and

requirements which market facilitators and market players have to abide by. Specifically, following aspects have to be determined:

- Basic data attributes in a South African EAC
- Eligible power sources and generation facilities
- Assigning responsibilities to supervise and control the functioning and operation of a system to a designated body (roles of an issuer, production registrar, production auditor, authorized measurement bodies)
- Relationship between an EAC system and public support mechanisms for renewable energy
- Relationship between an EAC system and carbon offsets
- Operation of registry & registry processes (how to issue, trade, redeem certificates, data transfer and communication rules)
- Any export and import restrictions

For institutions dependent on government decisions clear rules have to be elaborated on how to handle EACs. E.g., municipalities can produce their own electricity and procure it from IPPs, but the processes with EACs are not yet defined. Who will get the legal ownership of green attributes is an issue raised in #1 “Clarify the ownership of green attributes”. Will municipalities be allowed to trade with EACs is another question.

If the existing system will be endorsed, the existing rules still should be updated, making the processes more streamlined and shaping a more user-friendly system. Where there is a lack of governance, new rules should be created.

While elaborating defining rules it is important to keep track of the prevailing carbon reporting standards and initiatives which most industrial customers in South Africa are already members or seeking to become members of. In order to make certificate purchases more attractive for them, an additional data field can be included in a certificate stating if the underlying electricity volume is eligible for CDP, RE100 and other standards. Eligible certificates will be in more demand and higher-priced.

Potential actors

- Affected authorities: DMRE and NERSA for regulation, National Treasury for relationship with carbon offsets etc.
- RECSA and zaRECs for providing starting point
- International rule setting bodies like AIB, i-REC, AREC for data exchange on international and regional best practices
- Industry participants from the production and consumption side to consult with

Opportunities

- Settled regulatory framework with clearly defined rules and assigned roles
- Learn from international best practices and local experience from RECSA
- Standardization of certificates
- Increased investor confidence and participation of local governments

Risks

- Red tape
- Efficiency of the system and their benefits towards the existing system not guaranteed
- Substantial resource requirements
- Capacity building needed

Recommendation

A clear recommendation can be given after the vetting of the existing system (see #3 "Define degree of governmental involvement"). Perhaps, existing rules are sufficient and do not have to be elaborated further from the government side.

Activities

Are there any no regret actions? At the moment no.

short term / start immediately:

- Engage with RECSA/zaRECs and international bodies (AIB, AREC, I-REC) on existing rule sets
- Define after discussions with different authorities and other stakeholders which governmental bodies should deal with the regulation
- Define which laws should be amended to incorporate new rules
- Keep track of reporting standards

mid-term / coming 1 to 2 years:

- Include transitional phase with defined framework
- Finalize regulatory amendments

long-term / 2 to 5 years:

- Regularly monitor how the system functions and if the rules are optimal for the current market development

Eskom activities

- Assist government on drafting regulations
- Assist government on amendments and new laws
- Assist government on shaping transitional phase

2.5 Assign roles of registrar, issuer & auditor

Goals

In order to have a national EAC system up and running, it is important to assign the roles of an issuing body, production registrar and production auditor (for definitions consult main study, Definitions and Chapters 2.1.2 and 2.9). It has to be decided if the existing parties taking over these tasks by RECSA can fulfil the requirements for facilitators of a national EAC system or should all or some of these tasks be given to other bodies. In any case, the parties which are to undertake these tasks have to have a mandate to do this issued by the government.

It is possible to tender some of the key roles and the tasks can be taken over by external actors.

Potential actors

- Government departments giving a mandate to the roles of an issuer, production auditor and production registrar
- RECSA
- Other actors with potential to take over specific tasks

Opportunities

- Official acknowledgment of existing or new parties to fulfil the most important tasks in a national EAC system
- More investor confidence
- More transparency in the certification processes

Risks

- Not optimal allocation of tasks which can lead to resource inefficiency and system deficits
- Possible disputes with market actors with different interests

Recommendation

First vetting the existing system of zaRECs on how efficiently existing actors cope with their tasks and then giving mandate to the most suitable parties.

Activities

Are there any no regret actions? Testing the efficiency of the existing system and giving mandate to act to the most suitable actors.

short term / start immediately:

- Evaluate the efficiency of the existing RECSA system and find out if the market facilitators are set and act optimally and efficiently
- Based on this analysis, take a decision if current or new parties should take over the roles of an issuer, production registrar and production auditor
- Give a mandate to whichever party to perform these duties
- Evaluate demand and conduct capacity building for parties performing these duties

mid-term / coming 1 to 2 years:

- Evaluate the efficiency of the system functioning and compare it with previous performance
- Take action if the system deems to be not as efficient as expected/lost its efficiency compared to the previous period

long-term / 2 to 5 years:

- Regularly monitor if the key parties in the system are optimally set and capacitated and perform efficiently

Eskom activities

- Evaluate the efficiency of the existing RECSA system and find out if the market facilitators are set and act optimally and efficiently

- Assist government on decision of mandates
- Propose candidates from Eskom unbundled departments, e.g., National Transmission Company of South Africa (NTCSA)

2.6 Increase knowledge and capacity on EACs

Goals

Lacking knowledge about EACs and need for capacity building in that respect came to light very often during the knowledge sharing workshops. zaRECs, though it is a well established fully-fledged national system, suffers from not sufficient visibility. Through further knowledge sharing and capacity building measures more professionals can understand the significance of energy certification and be trained to actively participate at the system. If the government will be supposed to play a more active role on the certification market, a skills gap has to be closed. Stakeholders should be capacitated to orient themselves, to learn the principles and benefits of an EAC system and to know how to use it for their specific purposes.

Potential actors

- Potential interested stakeholders, such as IPPs, municipalities, private investors, industrial enterprises
- Funder(s) of capacity building measures: can be a development aid organization
- Organizer of capacity building measures: can be commissioned consultants

Opportunities

- Increased awareness of stakeholders about EACs and their benefits
- Increased demand and supply of EACs through more active system participants

Risks

- Resource (finance and time) requirements

Recommendation

Knowledge sharing and capacity building measures are needed in every case, independent from how the future EAC system will be designed and governed, because certification of renewable energy will gain impetus due to the coming boost of export of green hydrogen and other products with added value to countries with strict regulation on carbon neutrality of imported goods. The sooner capacity building measures will be conducted the more visibility the existing system will receive and the more new participants will come.

Activities

Are there any no regret actions? All short term measures.

short term / start immediately:

- Training for participants of vetting zaRECs to test its functionality

- Information campaign for municipalities, IPPs, potential IPPs, potential buyers about EACs and their benefits
- Series of workshops for capacity building on how to generate / purchase EACs
- Municipality round table for experience exchange
- Evaluation of feedback from participants on the quality of information events and capacity building measures

All of these measures need financing, possible under development aid, but not necessary.

mid-term / coming 1 to 2 years:

- Survey of EAC system participants, how their experience is and if there is further demand for capacity building
- Annual monitoring of EAC system participation, number of active participants, EACs issued/redeemed to see how the system is evolving
- Publication of leaflets on how to use EACs to reach out to sector players not participating at the system

long-term / 2 to 5 years:

- If government will appoint key positions such as issuer, registrar, auditor (see 2.5 Assign roles of registrar, issuer & auditor), designated training courses have to be organized. International organizations such as I-REC and AIB can be involved as experts.

Eskom activities

- Co-create and participate at the training for vetting zaRECs
- Co-create and participate at the knowledge exchange and capacity building measures
- Participate at surveys of EAC system participants & annual monitoring of EAC system performance

2.7 Develop the domestic EAC market

Goals

To enhance the development of the domestic EAC market in terms of increasing demand and supply of certificates and inclusion of more stakeholders, additional measures are to be taken. The ultimate list of these measures is to be finalized upon discussions with the official market facilitators (see #5 “Assign roles of registrar, issuer & auditor”), active participants of the system and international experts. Customized market for certificates should evolve in South Africa. International trends which are standing out right now have to be monitored closely to set up an EAC system ready for evolution consistent with market and regulatory developments.

Possible measures are:

- Setting up a marketplace for trading EACs considering the ERA Amendment Bill for electricity market

- Enabling inclusion of market participants without thresholds: open market for small and smallest entities, both on producer and consumer side
- Promoting new market roles such as aggregators, consolidators, traders for different EAC products. Aggregators and consolidators can help small scale facilities to engage in the market. Solutions have to be elaborated for different activities, e.g., selling EACs on behalf of small scale plant owners.
- Promoting granular certificates and certificates with higher time resolution (such as 1 hour or 15 minutes)

The marketplace can be hosted by different role players, e.g, by JSE since it has capacity and infrastructure. Eskom should frame its roles, since the company wants to buy and sell EACs.

It is important to consider that market participants should deal with new technologies, but it has not to be seen as a precondition to start action.

Potential actors

- RECSA and other existing or new market facilitators
- Participants of the EAC system on demand and supply side
- International experts such as I-REC, AIB, RECS International
- JSE as potential implementer of a marketplace

Opportunities

- Being at the forefront of international developments and establishing a resilient and at the same time flexible EAC system being able to act in accordance with new trends
- Becoming a regional leader in establishing a system compatible with international trends
- Enabling inclusion and right to a say of all stakeholders
- Enabling transparency of transactions and data
- Improving liquidity of EACs and transmitting clear pricing signals through a marketplace

Risks

- High resource requirements
- Capacity building and knowledge building needed
- Possible stranded costs following unpromising trends

Recommendation

Consult with international, regional and national experts to see what can be done in terms of market developments to enhance resilience and flexibility of the EAC system and enable stakeholder inclusion. Create trusted marketplaces for EACs; add higher time resolution to attributes contained in an EAC.

Activities

Are there any no regret actions? Monitor international trends of EAC market development.

short term / start immediately:

- Gather international, regional and national experts at one table to discuss which market trends to follow and implement
- Take active part at the activities of international initiatives for improved RE certification, such as EnergyTag (RECSA is already a member, but probably it has to be capacitated to engage more)
- Analyze which statements from the ERA Amendment Bill for liberalized electricity market can be used for the EAC market
- Assign tasks for EAC market development to the specific parties

mid-term / coming 1 to 2 years:

- Monitor the national EAC system development and international trends and decide if additional measures have to be implemented

long-term / 2 to 5 years:

- Regularly monitor international trends and evaluate if they have potential for the national EAC system

Eskom activities

- Take part at the discussions which market trends to follow and implement
- Take part at international initiatives for improved RE certification, such as EnergyTag
- Monitor the national EAC system development and international trends

2.8 Set up meta registry for RE production facilities

Goals

A central RE production facility database is needed for South African EACs. This "meta registry" should be complementing the proprietary registries for EAC issuance, trade and redemption in a way that relevant data on production facilities and certificate issuance are aggregated and transferred from the core registry to the meta registry within a certain interval. The overarching goal is to avoid double counting and not use the same energy unit for several claims. Likewise, the COAS should report data on issuance and redemption of carbon credits. In an ideal case the meta registry represents the central database on all decentralized renewable energy sources, and data transfer is performed bi-directionally, depending on the purpose. As an example, this would be controlling accounting, calculating the residual grid mix for the meta registry on the one hand, gaining market relevant data for the core registries on the other hand, and saving transaction costs for both parties. As a requirement to register small, decentralized production plant, a threshold of installed capacity can be defined in accordance with the rules of the EAC system and carbon offset standard, and to the usability of the registration process for owners.

Since there is a certain potential of overlapping interests to generate both EACs and carbon credits by one production facility (see measure #2) or to trade the same EAC over two different systems, the central function of the meta registry is to avoid double issuance and double counting. To make

registration and reporting easy and cost-effective, the data collection and transfer processes need to be standardized and, in an optimal case, largely automatized.

The core element of the meta registry will be the catalogue of reporting requirements. With room for variation, the following comprises some important features:

- Static data: Plant type, size, location, installed capacity, owner; point of grid connection; direct offtaker; registration for EAC/carbon credits or both, if applicable
- Dynamic data: certificates issued / cancelled / exported; respectively carbon credits
- Reporting interval, e.g. yearly

RECSA currently fulfils the functionality of an umbrella registry for both RECSA members, and those facilities traded within the I-REC system. Each facility must be registered at RECSA resulting in double registration costs for I-REC customers. This shows again that stakeholders should take the advantage to decide on the mandate: According to the decision on the responsibility of relevant governmental bodies (see measures #3 and #5), a public or private body is to be selected to run and supervise the meta registry.

Potential actors

- Stakeholders of the future EAC system
- zaREC / RECSA, GCC as the I-REC issuer and any potential issuing body, if applicable (see measures #3 and #5)
- Operation Vulindlela in case of government involvement
- Department of Mineral Resources and Energy / Carbon Offset Administration System (COAS) for consultation

Opportunities

Establishing a trusted and well-functioning production facilities registry in South Africa bears the chance to extend it on the AREC horizon, thus to provide registry services to other African countries or to transfer knowledge or technology.

Risks

The more complex the registering process arises for an individual plant owner, the higher will be the risk of failures. Owners may refuse registering their plant or remain with half-finished or incorrect datasets. A standardized and automatized registration and reporting process should be established for the whole cascade from the production facility to the EAC registrar and to the meta registry, including interfaces for grid operators. Digitization is currently producing a variety of secure communication processes with corresponding hardware to cover this demand and thus should be observed.

Recommendation

A meta-registry should be set up independently from the degree of government involvement. Following our recommendation on modest involvement of the government, the meta registry can be a multistakeholder or consortial task. In this case, the operation of the registry should be commissioned to an appropriate organization which can be public or private and costs may be split up between all registered users.

I-REC and some European countries show that the registry operator may operate as a service provider from another country. This entails the risk to lose control and the chance to build up a local knowledge base. South Africa is big enough to run the registry on its own with control over fees and revenues.

Activities

Are there any no regret actions?

short term / start immediately:

- Workshop with governmental bodies in order to inform and define responsibilities (to be done within current project). Timeline: till the end of December, 2022.
- Engage with RECSA/zaREC & I-REC: Analyse RECSA umbrella functionality on strengths and weaknesses
- Assess economic efficiency of a complementing registry with additional functions as facilities registry

mid-term / coming 1 to 2 years:

- Set up registration and reporting requirements in accordance to the developing EAC system and to COAS. Timeline: end of 2023
- Select and mandate responsible party, select operator
- Conceptualize meta registry, including operation platform, data processing etc.

long-term / 2 to 5 years:

- Launch meta registry 1.0. Timeline: beginning 2025
- Supervise and evaluate test phase

Eskom activities

- Conduct workshop with the government (within this project)
- Take part in discussions on functionality of a meta registry, eventually propose unbundled ex-Eskom departments to be a registry operator
- Register ESKOM plants at the meta registry

For further information, see chapters 2.8, 2.9, 3.4 and 3.5 of the study.

2.9 Facilitate low carbon supply chains through EACs

Goals

Certification of green electricity is indispensable for enabling export of green hydrogen and other green products. Global supply chains have to be ‘greened’ to pursue the climate change mitigation on the international level. South Africa should be recognized as a carbon neutral manufacturing base in the global supply chain. Moreover, in the future, South African energy suppliers should give their customers the opportunity to purchase 100% RE.

Certification of green hydrogen has to be aligned with the regulation of potential importing countries like the EU. In the short term, there should be an adherence to the European standards. In the long term, standards should be adapted to the African context and trade with hydrogen within the continent should be initiated. African actors have to develop African standards.

Considering cross-border trade of EACs, the trading countries should be physically interconnected, so SADC interconnectors and SAPP are important enablers which might be strengthened in the future.

Potential actors

- Government departments with relation to international trade and enabling competitiveness of the South African industry with foreign market players
- Hydrogen producers, e.g. Sasol, Enertrag
- Potential customers
- Potential investors
- SADC
- SAPP
- Legal and market experts from the EU and other potential importing countries

Opportunities

- Ample export opportunities
- Enhanced investor confidence due to diversified outlets for production
- Creation of local job opportunities and development of local economy
- Increased competitiveness of hydrogen due to high fossil fuel prices

Risks

- Strict sustainability requirements for imported products of importing countries
- Substantial investments in green hydrogen and other products with added value needed

Recommendation

- Advertise comprehensive EACs and market places among potential purchasers
- Search for contacts with potential customers and consider their regulations to enable compliant certification
- Align certification of green hydrogen with regulations of potential importing countries.
- Short term: Adhere to European standards.
- Long term: Adapt standards to African context

Activities

Are there any no regret actions? Monitor regulatory developments of potential importing countries and consider them when setting up an EAC system.

short term / start immediately:

- Assess the existing regulatory framework and monitor future developments for imported goods of potential importing countries

- Assess the possibilities to capacitate the existing EAC system or establish a new one to enable for certification of green hydrogen and other products with added value

mid-term / coming 1 to 2 years:

- Integrate regulatory requirements for certification of imported goods into the national EAC system rules

long-term / 2 to 5 years:

- Regularly monitor regulatory developments of importing countries to align the national EAC system with their certification requirements

Eskom activities

- Start issuing EACs
- Market green power to international (and national) corporates
- Develop green hydrogen production facilities
- Monitor regulation of importing countries
- Consult with the government and other stakeholders on possibilities to standardize certification approach

2.10 Engage as a leading partner within AREC

Goals

Membership and active participation at the AREC activities (for more details on AREC see main study, Chapter 3.1.5) on the government level is desirable. Markets can develop one by one but should be aligned later.

African meta-registry can de-risk double counting, but it needs a national resource to oversee the electricity market with the designated capacities. There should be a facilitating regulation.

Potential actors

- Government departments which will be found suitable for participating at AREC
- AREC
- RECSA as the active AREC member
- Issuing bodies and other market facilitators and players from other African countries

Opportunities

- Facilitation of international trade with certificates on the regional level
- Access to more demand and supply of certificates
- Saving costs through regional and not national knowledge sharing and capacity building measures
- As a perspective, forming a common market for certificates, similar to the AIB members

Risks

- Risk of cheaper certificates from other countries flowing into the South African market

Recommendation

Engage a state actor into AREC activities which will actively shape the structure and governance of the AREC international trade system.

Activities

Are there any no regret actions? Define the actor for participation at the AREC activities and actively co-organize them.

short term / start immediately:

- Decide which state actor shall become an AREC member
- Participate at the AREC events
- Host events
- Seek to engage development aid or other funding sources for shaping AREC structure
- Co-create a plan for knowledge sharing and capacity building measures on the regional level

mid-term / coming 1 to 2 years:

- Closely monitor and shape AREC activities
- Assess the performance of the initiative

long-term / 2 to 5 years:

Hard to predict, as it is still early days of AREC existence.

Eskom activities

- Become a member of AREC
- Participate at the AREC events and host them
- Co-create a plan for knowledge sharing on the regional level

3 The roadmap

We recommend implementing and developing the South African EAC system over the upcoming two to three years, with first steps to be taken quite quickly. The long-term view over the next five years should contain first iterations of review and adjustment in a sense of continuous improvement.

To illustrate the process, Figure 1 represents the timeline beginning from now, November 2022, and ranging until 2027. It contains key activities selected from the measures one to ten. These activities are more of a generic nature: who exactly will take them over is yet to be decided. These may serve as milestones for the planning of the upcoming implementation process.

Figure 2 demonstrates Eskom-specific activities.

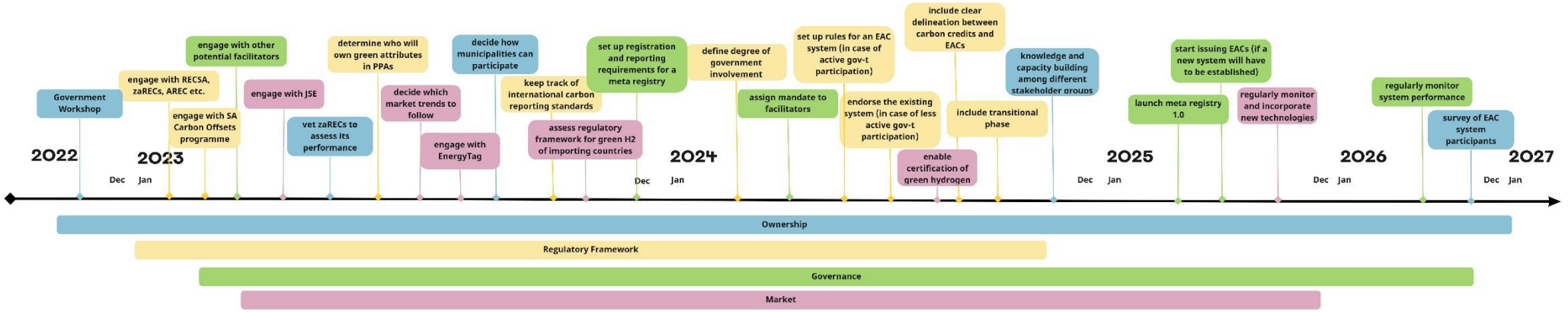

Figure 1: Roadmap to implement the South African energy attribute certification system: generic activities.

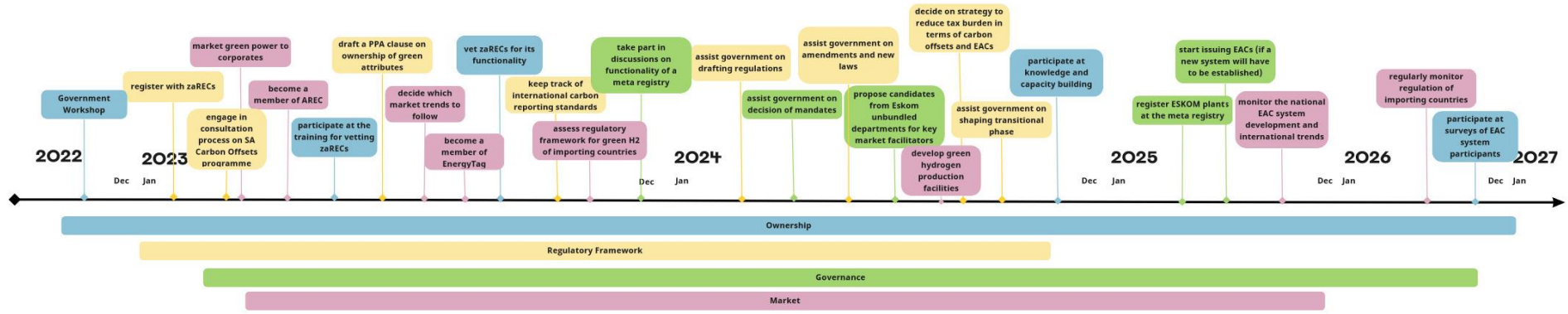

Figure 2: Roadmap to implement the South African energy attribute certification system: Eskom-specific activities