SWARTLAND MUNICIPALITY

DRAFT WHEELING FRAMEWORK

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Swartland Municipality Draft Wheeling Framework:

May 2025 Version

What is wheeling?

Wheeling refers to the financial transactions representing the transportation of third-party electrical energy (kWh) over the municipal/Eskom distribution network. It allows a third-party supplier to sell this electrical energy to a customer at their point of supply. The sale is governed by a bilateral power purchase agreement (PPA) which exists within a market environment, as opposed to a regulated environment, as the price of the energy is set between the parties and not by the Municipality/Eskom or the National Energy Regulator of South Africa (NERSA). The use of system charges (UoS) however needs to be approved by NERSA.

Wheeling in Distribution networks

Wheeling is the transport of electricity from a generator to a load via a third-party network. Wheeling does not necessarily mean that the same electrons entering the network from a generator will be used by the load. Instead, it is a financial transaction where electricity injected into the network by a generator is recognised at a specific value within the time of use (TOU) period, and this value is transferred to the load/customer. This is because after electrons are injected into a transmission network, they are not easily traceable to a specific generator amidst other electricity supply by various generators at the same time. In South Africa, the distribution network service providers (Distributors) are Eskom Distribution and Municipalities (Local Authorities). Wheeling in Distribution networks refers to electricity supply involving a third-party generator selling electricity to a customer situated in a Distributor's network. A third-party generator may be located or embedded in a municipal network whilst the consumer is in an Eskom network and vice-versa. Both the generator and consumer can be in either an Eskom or Municipal network. A generator may therefore need to wheel energy using the generator's municipal network and then through an Eskom network to eventually receive the wheeled

electricity at their connection located in yet another municipal network; this is referred to as inter-distributor wheeling. See Figure 1 for the different types of wheeling transactions.

A compelling case for Wheeling

Municipalities are receiving an increasing number of requests to wheel energy across the distribution grid, whether either or both generation facility and the customer premises is located within a Municipality jurisdiction. It is important that municipalities develop wheeling guidelines and processes for the following reasons:

- Wheeling allows the private sector to investment in electricity generation capacity which can contribute to ending loadshedding.
- Wheeling allows customers to procure clean energy to decarbonise their electricity supply and meet their climate targets.
- Wheeling may allow customers to procure cheaper electricity to reduce their electricity costs.
- Wheeling allows customers to sign long-term power purchase agreements which gives price certainty on electricity costs.
- Wheeling allows a customer to buy energy from a generation facility that is not physically connected to the customer

Further, distribution licensees are obligated to provide non-discriminatory access to their electricity grids and must therefore facilitate the wheeling of electricity across distribution grids.

Internationally, the evolution of the electricity sector signals that network services are set to become the main revenue earner for Distributors. As such, wheeling is an imperative, and Distributors need to respond accordingly with sustainable wheeling charges.

Distribution network services involve providing the capacity to transport and transform the electricity supply to voltage levels at which receiving loads can consume. This requires that Distributors provide voltage regulation services, invest in installation and refurbishment of transformers, cables, and lines. This is whilst ensuring the appropriate maintenance and operations for safe, available, dependable, and connected supply to consumers or customers connected in their networks. The nature of transmitting electricity is one where line losses occur meaning that less energy is received at the off-take point than injected by the generator. Further, in a distribution licensed area of supply, depending on the consumer's voltage of supply, associated network costs will differ and that the costs of providing distribution network services are not identical across Distributors.

The constitution empowers municipalities to distribute electricity and states that this service should be provided fairly and equitably to all customers. Distributors are by law through the Electricity Regulation Act (ERA), obligated to provide **non-discriminatory access** to their networks for third parties and may only raise charges approved by NERSA. At the same time, Distributors are conferred conditions under which access may be allowed, receipt of contributions from network users for strengthening or upgrading and payment for network use.

Enabling fair wheeling through COS studies

Regulations and methodologies specific to wheeling include the National Energy Regulator of South Africa (NERSA) Regulatory rules on network charges for third-party transportation of energy, the Tariff code, and the NERSA Cost of Supply (COS) framework. The Third-party rules and Tariff Code both require COS studies as the basis for calculating Distributor Wheeling charges. Additionally, the Tariff code requires that DUOS (Distribution use of System) charges for generators and loads (consumers) are based on the same COS study. And, for inter-Distributor wheeling raising of DUOS charges is limited to the immediate distributor where the end-customer is connected. The Cost of supply (COS) framework guides the development of COS studies for all licensed distributors enabling a consistent approach for the calculation of Wheeling charges. The COS framework also provides for a comprehensive recognition Distribution network costs that include shared costs, municipal surplus, operating costs, network line losses, repairs and maintenance (R&M).

Pragmatic billing for Wheeling transactions

Accompanying the pursuit of consistent costing for explicit DUOS charges is the present need to enable wheeling through billing treatments. This may alleviate the long lead-times associated with the billing system changes whilst ensuring Distributor Wheeling revenues and associated cost recovery. The pragmatic approaches are aimed at recognizing wheeled energy whilst recovering use of system (UOS) costs. Two types of tariffs based UOS charges are used, that is

(a) explicit UOS charges for wheeled electricity, and (based on COS Study)

(b) implicit UOS charges recovered through existing tariffs by crediting wheeled energy less losses.

Swartland conducted a Cost of Supply study in 2023/24 and proposed a total restructuring of its electricity tariffs. For several reasons, the municipality has not yet implemented the restructured tariff but will use some of the elements for wheeling purposes. For generators connected to the Eskom network or generators connected to the municipal network mainly for the purpose of wheeling a Use of System Charge (UOS) will be charged that are based on the proposed network charge for ToU consumptive customers connected at 11 kV.

The municipality's billing process for a wheeling agreement can be simplified into the following three steps:

1. The customer is charged in full (as usual) for all energy consumed
2. The customer is credited for wheeled energy to the value of avoided purchases i.e. Eskom purchase costs less distribution losses
3. The customer is charged an additional administration charge to cover the cost of the wheeling transaction

If the generator is located within the municipality's distribution network, then the municipality will need to meter the amount of electricity generated on a TOU meter. At the end of each month, the municipality credits the customer to the value of the avoided purchases for this wheeled energy at Eskom Local Authority Active Energy Time-of-Use tariffs. The municipality then credits the customer this amount less distribution losses.

The Generator is charged for the use of the municipal network as well as a basic charge.

Swartland Rules

NERSA has now approved the Regulatory rules on Network Charges for Third Party Wheeling of energy. Swartland has decided to provide a guideline for energy wheeling and to pilot the process for a few years. The Pilot will officially start once the first wheeling agreement is signed. This guideline describes the process and requirements for third party energy providers to wheel electrical energy through Swartland municipality's network. The guideline will be reviewed and amended regularly, as technical and financial capacity is built through approved applications by third-party energy providers, experience gained from other municipalities, possible changes to the Eskom Local Authority Tariffs or the full implementation of the restructured municipal tariffs. This is to avoid entering into unsustainable agreements that has the potential of eroding the municipalities income stream.

To focus our attention as part of this guideline we will focus on the case where both the generator and the customer is embedded in the municipal network and no involvement from Eskom is required.

Provision is however made for considering wheeling to/from the Eskom network on a case-by-case basis in line with the NERSA Rules and internal capability and readiness to deal with such arrangements.

Any agreement in terms of this guideline will have to comply/adhere to the licence conditions and any other legislative requirements that might be applicable.

The project will rely on standards already developed for IPPs connecting to the Eskom distribution Grid. This will ensure minimal technical risk for Swartland municipality and ensures compliance with all relevant technical standards.

All applications for wheeling will be handled on a case-by-case basis

Wheeling from generators not connected to the municipal network or connected to the municipal network mainly for wheeling to municipal customers, will be considered on a case-by-case basis on condition that the generator/trader is registered and/or licensed by NERSA and Swartlands internal capacity and readiness to deal with such arrangements.

Swartland Requirements

- For the Pilot programme only, generators connected to the municipal grid will be allowed to wheel electricity to Municipal Customers.
- External Generators (IPP's) will have to connect at 11 kV at one of the main distribution substations in the municipality.
- All cost applicable to the connection of the generator to the grid will be for the generator's account
- Wheeling will only be considered for generators > 1 MVA.
- An SSEG Customer, that exports energy to the municipality and gets compensated for the energy according to the Municipal export rate will not be allowed to wheel energy
- The Generator/Trader must adhere to NERSA's rules and regulations in terms of licensing and registration for wheeling as well as national legislation, regulations and codes.
- For the pilot program a generator cannot wheel to more than one customer/PoD.

- The Off-taker needs to be connected to the municipal network in the same town as the generator
- For the Generator Tariff 16 (TOU Wheeling Tariff) will apply
- The customer needs to be on a Tariff 10 (TOU tariff). Any cost to convert to the applicable tariff and changing of meters will be for the Customer's account.
- The billing will be reconciled half hourly on TOU consumption.
- The off-taker may not receive any electrical energy from more than one third party energy provider through a wheeling agreement.
- Any electrical energy supplied to the municipal network but not consumed by the off-taker in the same time of use period, will not be credited, i.e. no banking of energy will be allowed, and no compensation will be paid to the generator for energy not consumed by the off-taker in terms of the Wheeling agreement.

The contracts/agreements mentioned below must be signed before wheeling can take place.

1. Generator to apply for connection at municipality
2. The Generator/Trader needs to be registered with NERSA as a generator and/or trading
3. The Generator to connect at an 11 kV Main Infeed substation
4. A grid impact study needs to be performed for the Generator's cost and signed off by an independent Registered Professional Engineer. Results to be submitted to the municipality for evaluation.
5. Before connecting to the municipal grid, the generator needs to do a Quality of Supply study (at the busbar where the connection will be made) to determine the baseline and the generator to install a permanent QOS recorder on the busbar for continuous monitoring of the QOS parameters
6. The generator will need to comply to the various codes (Distribution Network Code, Renewable Power Plant Code, NRS 084 etc)

The generator will be responsible to sign a Use of System agreement (UoS) that will include the following:

- Basic Charge
- Network Capacity charges
- Network Connection charge (Once off for connecting infrastructure required)
- A separate account will be rendered for the consumption by the generator which will include the standard basic and demand and energy charges.

The Customer (Off-Taker) will be responsible for

- Signing a PPA with the generator/trader
- Amended the supply agreement with the municipality
- Pay an additional Basic Charge to cover the extra administrative costs associated with the processing of wheeling transactions

Limit on total capacity allocated for Wheeling

An allocation of Swartland Municipality's notified maximum demand (NMD) per infeed substation will be allocated to third party energy providers for wheeling purposes. This value is set to 25% of the NMD per substation.

- For the Malmesbury infeed substation this limit is set a 5.75 MVA based on a NMD of 23 MVA.
- For Klipfontein substation the limit is 2.0MVA,
- For Darling this will be 1.55 MVA,
- For Moorreesburg it will be 2.0 MVA and
- For Yzerfontein 1.13 MVA.

The total allocation for Swartland will not exceed 12.43 MVA.

Any additional charges for wheeling, to or from the Eskom network, that are added by Eskom to the municipality's account will be for the off taker's and/or generator's account.

ACCOUNTING

Accounting for wheeling energy to or from customers/generators will be done as follows for each of the different wheeling scenarios.

Municipal connected Generator/IPP for Wheeling to a Municipal Customer:

The Eskom bill:

- Eskom's bill to the municipality will automatically reduce because less energy will flow from Eskom to the municipality as the energy will be generated by the Generator connected after the Eskom meter.
- The amount of energy reduction in the Eskom bill will include the reduction in the losses as the flow of energy through the networks closest to the Eskom supply will reduce.
- There will however not be a clear adjustment in the Eskom bill, the consumption quantities will simply be less.

The Off taker Bill

The bill at the standard tariff applicable to the customer (TOU Tariff) will be charged

- An additional Basic charge will be levied to cover the additional costs relating to transacting the wheeled energy for both the off-taker and the generator.
- Network Charges and KVA demand charges will be charged as per TOU Tariff
- Energy will be charged as per TOU tariff based on energy going through the meter
- An energy credit will be applied for the wheeled energy at the Eskom Local Authority TOU Active Energy charges less Municipal Energy losses%. The Eskom TOU Charges at the applicable 11 kV infeed point will be applied.
- The Credit cannot exceed the Energy Charges as per the TOU Tariff applicable to the customer.

The Generator/IPP Bill.

- The generator will be billed a Basic Charge
- A Network Capacity Charge in R/kVA based on the proposed TOU charge as per the Cost of Supply study for MV customers.
- The Energy wheeled will be reflected on the bill, but no charges will be applied (for transparency and used in the customer's bill)
- The generator will receive a separate bill on the ToU tariff for the consumption of energy to the generator from the municipality.

Approved SSEG Customer Wheeling > 1MVA to a Municipal Customer

The Generator Bill.

- The generator will be billed an additional Basic Charge
- The Wheeled/export energy will be reflected on the bill, but no charges will be applied (for transparency and use in the customer's bill)

The Off-Taker Bill

The bill at the standard tariff applicable to the customer (TOU Tariff) will be charged

- An additional Basic charge will be levied to cover the additional costs relating to transacting the wheeled energy for both the off-taker and the generator.
- Network Charges and KVA demand charges will be charged as per TOU Tariff
- Energy will be charged as per TOU tariff based on energy going through the meter
- An energy credit will be applied for the wheeled energy at the Eskom Local Authority TOU Active Energy charges less Municipal Energy losses%. The Eskom TOU Charges at the applicable 11 kV infeed point will be applied.

The Credit cannot exceed the Energy Charges as per the TOU Tariff applicable to the customer

Municipal connected Generator for Wheeling to a Non-Municipal Customer

(Eskom or other Municipality's customer):

The generator will be billed

- A Basic Charge
- A Network Capacity Charge in R/kVA based on the proposed TOU charge as per the Cost of Supply study for MV customers.
- The Energy wheeled will be reflected on the bill but no charges will be applied (for transparency and used in the customer's bill) or paid for.
- The generator will receive a separate bill (on ToU at MV) for the supply of energy to the generator from the municipality.
- The Generator will be charged for any additional costs charged by Eskom as a result of the wheeling arrangement.

Eskom Connected Generator wheeling to a Municipal Customer

- Eskom's bill to the municipality (energy related) will not reduce since the wheeled energy will still flow through the Eskom meter.
- The normal Municipal bill to the off-taker will not change as a result of the wheeling agreement between the off-taker, Eskom and the generator.
- The Off-taker will be charged an additional Basic charge for the administration involved in the wheeling transaction
- The Off-taker will be invoiced for any additional cost that Eskom may charge onto the municipal bill as a result of the wheeling arrangement.
- The generator/trader will be charged a Use of systems charged equal to Network Capacity Charge in R/kVA based on the proposed TOU charge as per the Cost of Supply study for MV customers.

Note that this is still a Draft Framework that will be piloted by the municipality and could be updated from time to time based on learnings, applications and industry developments.