

BUFFALO CITY METROPOLITAN MUNICIPALITY

Buffalo City Electricity Trading Services Unit

ELECTRICITY WHEELING POLICY FRAMEWORK

Use of the BCMM electricity network to deliver energy bought from third-party generators, with effect from 1 July 2027

DRAFT v0.1 for Council approval · 21 October 2026 · Prepared by: Chris Gower, Senior Revenue Protection Manager (chrisg@buffalocity.gov.za, 062 027 4537)

This policy is to be read with the 2027/28 cost of supply study (Section 8.6 and Annexures H and I), the 2027/28 tariff book and the BCMM Electricity Supply By-law. All rates are the proposed 2027/28 rates, excluding VAT, and are subject to Council approval and NERSA's decision.

1. Purpose

This policy sets out how a customer of Buffalo City Metropolitan Municipality (BCMM) may buy electricity from an independent generator and have it delivered over the BCMM network ("wheeling"), what the customer and the generator pay BCMM for that service, and how the energy is metered, credited and settled. It replaces the pilot wheeling provisions in the 2026/27 tariff schedule, which allowed wheeling on a pilot basis under the BCMM wheeling guideline with approval of the General Manager: Electricity.

The policy has three aims: (1) to open the BCMM network to private generation and support the energy transition and local investment; (2) to recover the full cost of the network and of BCMM's Eskom capacity from wheeling customers, so that other customers do not pay for it; and (3) to keep wheeling revenue-neutral for BCMM.

2. Legal and regulatory framework

- Constitution, Schedule 4 Part B: electricity reticulation is a municipal function.
- Electricity Regulation Act 4 of 2006 (as amended): section 15(1) (tariffs must recover the efficient cost of supply plus a reasonable margin, without undue discrimination) and section 15(2) (no tariff may be charged unless approved by NERSA); Schedule 2 (registration and licensing of generation facilities).
- NERSA's approval of BCMM's distribution licence (NER/D/EC124) and annual tariff decisions; NERSA rules and guidelines on wheeling and on the registration of embedded generation.
- Municipal Systems Act 32 of 2000, section 74 (tariff policy), and Municipal Finance Management Act 56 of 2003, sections 17, 22 to 24 (tariffs as part of the budget, with public participation).
- BCMM Electricity Supply By-law (Provincial Gazette Extraordinary No. 5016, 24 November 2023), including the provisions on embedded generation, metering, resale and separate sources of supply.
- Grid connection standards: NRS 097-2-1 and 097-2-3 (embedded generation up to 1 MVA), the South African Grid Code for Renewable Power Plants (above 1 MVA), SANS 10142-1, and BCMM's SSEG and grid-connection requirements.
- Eskom's wheeling framework and the Eskom Municflex tariff, where the generator is connected to the Eskom network.

3. Definitions

Term	Meaning
Wheeling	Delivery over the BCMM network of energy that a customer buys from a generator other than BCMM, with BCMM charging only for the use of its network and services.
Wheeling customer	A BCMM customer who has a signed wheeling agreement and buys some or all of its energy from a generator.
Generator	A registered or licensed generation facility (for example solar PV, wind or a battery) that sells energy to a wheeling customer. It may be embedded in the BCMM network or connected to Eskom's network.
Wheeling class	The class of charges applied to the wheeling customer, set by its connection voltage: W1 and W2 (LV, 230/400 V, no demand meter), W3 (LV large power, 400 V, demand metered) and W4 (MV, 11 kV).
Credit factor	The share of the energy generated that is credited at the customer's meter after technical losses on the networks it crosses (section 7.2).
kWh credited	kWh generated in the month × credit factor.
Top-up energy	The energy the customer still buys from BCMM: consumption less kWh credited, if positive.
Excess energy	kWh credited above the customer's consumption in the month.
Wheeling network contribution	A charge of R0.230/kWh on kWh credited, which keeps the contribution to network and social costs that the customer's normal tariff carries (section 7.4).
LV, MV, HV	Low voltage (230/400 V), medium voltage (11 kV) and high voltage (66 kV and above, at an Eskom intake point to BCMM).

4. Scope and eligibility

- Wheeling is available to BCMM customers on non-subsidised tariffs: Scales 1A and 1B (W1), SSEG residential (W1), 2A and 2B (W2), 3A, 3A alternative, 3C and 4A (W3), and 3B, 3B alternative, 4C and IDZ (W4).
- Not eligible: indigent (1C), pensioner (1C-3), social housing (1C-4), municipal internal supplies, street lighting and traffic signals, and temporary supplies. These tariffs are subsidised, and wheeling would remove the energy margin that funds them.
- The generator may be embedded in the BCMM network at 400 V or 11 kV, or connected to Eskom's network outside BCMM and wheeled through Eskom to a BCMM intake point (HV).
- BCMM does not supply wheeling to a customer whose account is in arrears, unless a payment arrangement is in place and being honoured.
- BCMM does not buy or sell the wheeled energy and is not a party to the price agreed between the customer and the generator.

5. Principles

- **Cost-reflective.** Every wheeling charge comes from the wires/retail split of the NERSA cost of supply study at the customer's connection voltage.
- **Revenue-neutral.** Wheeling must not reduce BCMM's net revenue or shift cost to other customers. The wheeling network contribution and the Eskom credit for energy wheeled through Eskom achieve this.
- **Network charges are always payable.** A wheeling customer keeps its connection and BCMM's network capacity is reserved for its full demand, so the network and upstream capacity charges are payable whether or not energy is wheeled in a month.
- **Technical losses settled in kind.** The energy pays for every network level it crosses, through the credit factor. Non-technical losses are not charged to wheeled energy.
- **No banking.** Energy is settled month by month. Excess energy is bought by BCMM at the approved feed-in rate or forfeited.
- **Metered and verifiable.** Both the generator and the customer must have remotely read interval (time-of-use) meters, so that every month can be settled from actual data.
- **Approved tariffs only.** All charges are as approved by NERSA and Council each year (ERA s15(2)).

6. Wheeling classes and charges, 2027/28

Class	Connection	Network access (R/month)	Network capacity	Upstream Eskom capacity	Service and settlement (R/month)	Top-up energy (R/kWh)
W1	LV homes (1A, 1B, SSEG)	132.14	R1.2757/kWh	R0.2304/kWh	241.08	3.182
W2	LV small business (2A, 2B)	938.40	R0.9786/kWh	R0.1765/kWh	946.78	3.182
W3	LV large power 400 V (3A, 3C, 4A)	1,988.61	R372.93/kVA	R67.37/kVA	2,370.63	3.182
W4	MV 11 kV (3B, 4C, IDZ)	3,326.35	R229.00/kVA	R46.08/kVA	3,792.65	2.122
G-LV	Embedded generator at 400 V	1,988.61	none on export	–	1,000.00	–
G-MV	Embedded generator at 11 kV	3,326.35	none on export	–	1,500.00	–

Plus the wheeling network contribution of R0.230 per kWh credited, for all classes W1 to W4 (subject to NERSA's approval). For W3 and W4 the capacity charges are on the billed maximum demand (kVA) in the month; for W1 and W2, which have no demand meter, they are per kWh on all energy consumed. G charges are paid by an embedded generator that sells to a BCMM wheeling customer.

7. Calculation methodology

7.1 Monthly bill to the wheeling customer

- Network access = rate × 1 point of delivery
- Network capacity = rate × billed kVA (W3, W4), or rate × kWh consumed (W1, W2)
- Upstream Eskom capacity = rate × billed kVA (W3, W4), or rate × kWh consumed (W1, W2)
- Service and settlement = rate × 1 point of delivery
- Wheeling network contribution = R0.230 × kWh credited (up to the consumption in the month)
- Top-up energy = top-up rate × max(kWh consumed – kWh credited, 0)
- Excess energy credit = R1.90 × max(kWh credited – kWh consumed, 0), at the approved feed-in rate (R3.00/kWh in the high-season peak where interval data allows)
- BCMM bill = sum of the six charges, less any excess energy credit, plus VAT

7.2 Technical losses: the credit factor

kWh credited = kWh generated × credit factor, where the credit factor = $1 \div (\text{product of the loss factors of every BCMM network level the energy crosses})$. Level loss factors from the cost of supply study: 1.034 (HV / Eskom intake), 1.053 (11 kV network) and 1.085 (400 V network). The energy pays at least for the level at which it is delivered, and an embedded generator is not credited with avoided upstream losses (the credit factor is never above 1).

Generator connected at	Customer at 11 kV	Customer at 400 V
Outside BCMM (Eskom network, HV intake)	0.918	0.846
11 kV in the BCMM network	0.949	0.921
400 V in the BCMM network	0.921	0.921

For a generator outside BCMM, the energy is first reduced by Eskom's own losses to the BCMM intake point, as set in the Eskom wheeling agreement (0.967 is assumed in the examples).

7.3 How the cost-based charges are derived

For each wheeling class, the cost of supply model (sheet "Wheeling Tariffs (Year 2)") takes the unbundled 2027/28 cost to serve of the customer categories in the class and divides it by the class billing units, plus a contribution m of 8.6% to the social cross-subsidy:

Charge	Formula
Network access (R/POD/month)	Wires customer-related cost ÷ (12 × customers) × (1 + m)
Network capacity	Wires demand-related cost ÷ billed kVA-months (W3, W4) or ÷ kWh sold × 100 (W1, W2), × (1 + m)
Upstream Eskom capacity	Retail demand-related Eskom cost ÷ kVA-months or ÷ kWh, × (1 + m)
Service and settlement (R/POD/month)	Retail customer-related cost ÷ (12 × customers) × (1 + m) + settlement adder (R150, R300, R1,000, R1,500 for W1 to W4)
Top-up energy (c/kWh)	(Wires cost of allowable losses + retail energy cost) ÷ kWh sold × 100

Without wheeling, these components add back to the full cost to serve of the class.

7.4 Wheeling network contribution

The normal tariffs that wheeling customers leave (for example Scale 3B) carry a margin above cost that funds the social cross-subsidy and the network. The cost-based wheeling charges do not. The contribution is set so that, for the reference transaction in the cost of supply study (Annexure I), BCMM's revenue with wheeling equals its revenue without it, after the Eskom credit: (revenue on the normal tariff – revenue on the wheeling charges – Eskom energy credit) ÷ kWh credited, rounded to R0.230/kWh. It is reviewed every year with the tariffs. If NERSA does not approve it, BCMM reserves the right to withdraw the wheeling tariffs.

7.5 Settlement for energy wheeled through Eskom

Where the generator is on the Eskom network, Eskom credits BCMM's Municflex account for the wheeled kWh at the BCMM intake, at the energy rate of the time-of-use period in which they were generated. BCMM's notified maximum demand, network and capacity charges and levies are not credited. BCMM then credits the customer with the kWh after its own network losses (section 7.2) and bills the customer under section 7.1. Finance reconciles the Eskom credit to the generator and customer meter data every month.

7.6 Top-up by time-of-use period

Daytime solar displaces Eskom standard-period energy, which is cheaper than the all-hours average top-up rate. Where the customer is on a time-of-use tariff (4A, 4C, IDZ) or has a time-of-use meter, BCMM may bill the top-up energy at the time-of-use energy rates of the customer's tariff period by period, to keep wheeling revenue-neutral.

8. Applying to wheel

1. **Application.** The customer and the generator apply jointly to the Electricity Department on the wheeling application form, with the generator's NERSA registration or licence, the energy sales agreement term, the expected monthly energy profile, and the metering points.
2. **Technical assessment.** Electricity Planning confirms network capacity, protection and grid-code compliance. Embedded generators must also be approved and registered under BCMM's SSEG / embedded generation process (apply.sseg.org.za for systems up to 1 MVA).
3. **Metering.** BCMM installs, or approves, remotely read bi-directional interval meters at the generator and the customer, at the applicant's cost.
4. **Agreement.** BCMM, the customer and the generator sign a tripartite wheeling agreement, covering the charges, settlement, metering, curtailment, liability and termination. For generators outside BCMM, the Eskom wheeling agreement must also be in place.
5. **Billing set-up.** Finance loads the wheeling class, the credit factor and the generator meter on SOLAR, and runs a test settlement before the first live month.
6. **Monthly settlement.** Meters are read; kWh credited, top-up and excess energy are calculated; the customer and the generator are billed; the Eskom credit is reconciled.

9. Responsibilities

Role	Responsibility
Head: Electricity & Energy Business Unit	Owns the policy; approves wheeling agreements; reports to Council annually
Electricity Planning	Technical assessment, grid connection and network capacity
Revenue Protection / Metering	Meter installation, remote reading, data validation and audits
Finance (Billing)	SOLAR set-up, monthly settlement, Eskom credit reconciliation
Legal Services	Wheeling agreement template

10. Review and approval

The charges in section 6 are reviewed every year with the cost of supply study and the tariff application to NERSA. The policy itself is reviewed at least every three years, or earlier when national wheeling rules or the Eskom wheeling framework change. Council is requested to approve this policy framework with the 2027/28 tariffs.

ANNEXURE A: WORKED EXAMPLES

Monthly bills for 2027/28, excluding VAT, at the proposed rates. The normal-tariff comparison uses the 2027/28 tariff book: 1B (R3.638/kWh up to 2,000 kWh and R497.93/month), 2B (R4.076/kWh and R1,183.47/month), 3A (R2.545/kWh, R533.46/kVA and R6,937.75/month) and 3B (R1.792/kWh, R452.24/kVA and R22,672.81/month). The break-even generator price is the most the customer can pay the generator per kWh generated and still be no worse off than on its normal tariff.

Low voltage (LV)

Example A1. LV domestic home (W1), buying from a neighbourhood solar generator at 400 V

Input	Value	
Wheeling class / normal tariff	W1 / Scale 1B	
Consumption in the month	600 kWh	
Energy generated	350 kWh, generator 400 V in BCMM	
Credit factor (customer at 400 V)	0.921	
kWh credited	322	
Top-up kWh from BCMM	278	
Charge	Calculation	Amount
Network access	1 point of delivery	R132.14
Network capacity	600 kWh × R1.2757	R765.42
Upstream Eskom capacity	600 kWh × R0.2304	R138.24
Service and settlement	1 point of delivery	R241.08
Wheeling network contribution	322 kWh credited × R0.230	R74.06
Top-up energy	278 kWh × R3.182	R884.60
BCMM wheeling bill		R2,235.54
Normal tariff bill (no wheeling)		R2,680.73
Saving on the BCMM bill		R445.19
Break-even generator price	saving ÷ kWh generated	R1.27/kWh

Example A2. LV small business (W2), buying from a rooftop solar generator at 400 V

Input	Value	
Wheeling class / normal tariff	W2 / Scale 2B	
Consumption in the month	3,000 kWh	
Energy generated	2,000 kWh, generator 400 V in BCMM	
Credit factor (customer at 400 V)	0.921	
kWh credited	1,842	
Top-up kWh from BCMM	1,158	
Charge	Calculation	Amount
Network access	1 point of delivery	R938.40
Network capacity	3,000 kWh × R0.9786	R2,935.80
Upstream Eskom capacity	3,000 kWh × R0.1765	R529.50
Service and settlement	1 point of delivery	R946.78
Wheeling network contribution	1,842 kWh credited × R0.230	R423.66
Top-up energy	1,158 kWh × R3.182	R3,684.76
BCMM wheeling bill		R9,458.90
Normal tariff bill (no wheeling)		R13,411.47
Saving on the BCMM bill		R3,952.57
Break-even generator price	saving ÷ kWh generated	R1.98/kWh

Example A3. LV large power factory at 400 V (W3), buying from a solar farm connected at 11 kV in BCMM

Input	Value	
Wheeling class / normal tariff	W3 / Scale 3A	
Consumption in the month	120,000 kWh, billed demand 300 kVA	
Energy generated	80,000 kWh, generator 11 kV in BCMM	
Credit factor (customer at 400 V)	0.921	
kWh credited	73,680	
Top-up kWh from BCMM	46,320	

Charge	Calculation	Amount
Network access	1 point of delivery	R1,988.61
Network capacity	300 kVA × R372.93	R111,879.00
Upstream Eskom capacity	300 kVA × R67.37	R20,211.00
Service and settlement	1 point of delivery	R2,370.63
Wheeling network contribution	73,680 kWh credited × R0.230	R16,946.40
Top-up energy	46,320 kWh × R3.182	R147,390.24
BCMM wheeling bill		R300,785.88
Normal tariff bill (no wheeling)		R472,375.75
Saving on the BCMM bill		R171,589.87
Break-even generator price	saving ÷ kWh generated	R2.14/kWh

Medium voltage (MV, 11 kV)

Example A4. MV 11 kV industrial customer (W4), buying from a solar farm connected at 11 kV in BCMM

Input		Value
Wheeling class / normal tariff		W4 / Scale 3B
Consumption in the month		400,000 kWh, billed demand 1,000 kVA
Energy generated		300,000 kWh, generator 11 kV in BCMM
Credit factor (customer at 11 kV)		0.949
kWh credited		284,700
Top-up kWh from BCMM		115,300
Charge	Calculation	Amount
Network access	1 point of delivery	R3,326.35
Network capacity	1,000 kVA × R229.00	R229,000.00
Upstream Eskom capacity	1,000 kVA × R46.08	R46,080.00
Service and settlement	1 point of delivery	R3,792.65
Wheeling network contribution	284,700 kWh credited × R0.230	R65,481.00
Top-up energy	115,300 kWh × R2.122	R244,666.60
BCMM wheeling bill		R592,346.60
Normal tariff bill (no wheeling)		R1,191,712.81
Saving on the BCMM bill		R599,366.21
Break-even generator price	saving ÷ kWh generated	R2.00/kWh

High voltage (HV): generator on the Eskom network

Example A5. HV: 11 kV customer (W4), buying from a wind or solar IPP on Eskom's HV network, wheeled to a BCMM intake

Input		Value
Wheeling class / normal tariff		W4 / Scale 3B
Consumption in the month		400,000 kWh, billed demand 1,000 kVA
Energy generated		300,000 kWh, generator Outside BCMM (Eskom HV)
At the BCMM intake after Eskom losses (× 0.967)		290,100 kWh
Credit factor (customer at 11 kV)		0.918
kWh credited		266,312
Top-up kWh from BCMM		133,688
Charge	Calculation	Amount
Network access	1 point of delivery	R3,326.35
Network capacity	1,000 kVA × R229.00	R229,000.00
Upstream Eskom capacity	1,000 kVA × R46.08	R46,080.00
Service and settlement	1 point of delivery	R3,792.65
Wheeling network contribution	266,312 kWh credited × R0.230	R61,251.76
Top-up energy	133,688 kWh × R2.122	R283,685.94
BCMM wheeling bill		R627,136.70
Normal tariff bill (no wheeling)		R1,191,712.81
Saving on the BCMM bill		R564,576.11
Break-even generator price	saving ÷ kWh generated	R1.88/kWh

Example A6. HV: 400 V factory (W3), buying from an IPP on Eskom's HV network

Input		Value
Wheeling class / normal tariff		W3 / Scale 3A
Consumption in the month		120,000 kWh, billed demand 300 kVA
Energy generated		80,000 kWh, generator Outside BCMM (Eskom HV)
At the BCMM intake after Eskom losses ($\times 0.967$)		77,360 kWh
Credit factor (customer at 400 V)		0.846
kWh credited		65,447
Top-up kWh from BCMM		54,553
Charge	Calculation	Amount
Network access	1 point of delivery	R1,988.61
Network capacity	300 kVA $\times$ R372.93	R111,879.00
Upstream Eskom capacity	300 kVA $\times$ R67.37	R20,211.00
Service and settlement	1 point of delivery	R2,370.63
Wheeling network contribution	65,447 kWh credited $\times$ R0.230	R15,052.81
Top-up energy	54,553 kWh $\times$ R3.182	R173,587.65
BCMM wheeling bill		R325,089.70
Normal tariff bill (no wheeling)		R472,375.75
Saving on the BCMM bill		R147,286.05
Break-even generator price		saving $\div$ kWh generated R1.84/kWh

What the examples show

- Wheeling pays off for a customer only if the generator's price is below the break-even price: about R1.27/kWh for a home (A1), R1.98/kWh for a small business (A2), R2.15/kWh for a 400 V factory (A3) and R2.00/kWh for an 11 kV customer (A4). Small LV customers gain little, because most of their bill is network cost that they still pay.
- Generators further away earn less per kWh: the HV examples (A5, A6) lose 3.3% to Eskom losses plus 8.2% (to 11 kV) or 15.4% (to 400 V) on BCMM's network, so the break-even price falls to about R1.84–R1.88/kWh.
- The network and capacity charges are the same with or without wheeling; only the energy changes. In A4 the 11 kV customer still pays R282,199 a month for the network and upstream capacity.

Example A7. Excess energy in a month (no banking)

A W1 home uses 300 kWh in a month in which the 400 V generator produces 400 kWh for it. Credited: $400 \times 0.921 = 368$ kWh, so 68 kWh are excess. They are bought by BCMM at the feed-in rate (or forfeited, if the agreement says so) and not carried to the next month.

Charge	Calculation	Amount
Network access	1 point of delivery	R132.14
Network capacity	300 kWh $\times$ R1.2757	R382.71
Upstream Eskom capacity	300 kWh $\times$ R0.2304	R69.12
Service and settlement	1 point of delivery	R241.08
Wheeling network contribution	300 kWh (up to consumption) $\times$ R0.230	R69.00
Top-up energy	0 kWh	R0.00
Less: excess energy bought by BCMM	68 kWh $\times$ R1.90	R-129.20
BCMM wheeling bill		R764.85

Example A8. BCMM's position (revenue neutrality), using A5

For energy wheeled through Eskom, BCMM loses the customer's normal-tariff revenue but receives an Eskom credit for the energy at its intake. Eskom credit assumed at the Municflex time-of-use energy rates for a solar profile (85% standard, 15% off-peak), average R1.820/kWh, as in the cost of supply study (Annexure I).

Item	Amount a month
Revenue on Scale 3B (no wheeling)	R1,191,712.81
Revenue on W4 wheeling charges	R627,136.70
Reduction in revenue	R-564,576.11
Eskom credit: 290,100 kWh × R1.820	R527,982.00
Net effect on BCMM with the network contribution	R-36,594.11
Of which: wheeling network contribution recovered	R61,251.76
Net effect without the network contribution	R-97,845.87

The remaining shortfall of about R37,000 a month arises because daytime solar displaces Eskom standard-period energy (about R1.98 per kWh credited), while the top-up it replaces is billed at the all-hours average of R2.12. Billing the top-up by time-of-use period (section 7.6) closes it, which makes wheeling revenue-neutral for BCMM. Without the network contribution, BCMM would lose about R98,000 a month on this one customer.

ANNEXURE B: SUMMARY OF FORMULAS

Quantity	Formula
Credit factor	$1 \div (\text{product of loss factors of the levels crossed}): \text{HV } 1.034, 11 \text{ kV } 1.053, 400 \text{ V } 1.085$
kWh credited	$\text{kWh generated (after Eskom losses, if outside BCMM)} \times \text{credit factor}$
Top-up kWh	$\max(\text{kWh consumed} - \text{kWh credited}, 0)$
Excess kWh	$\max(\text{kWh credited} - \text{kWh consumed}, 0)$; bought at R1.90/kWh or forfeited
BCMM bill	$\text{Access} + \text{capacity} + \text{upstream capacity} + \text{service \& settlement} + \text{R0.230} \times \min(\text{kWh credited, consumed}) + \text{top-up rate} \times \text{top-up kWh} - \text{excess credit}$
Normal-tariff bill	$\text{Basic charge} + \text{demand charge} \times \text{kVA} + \text{energy charge} \times \text{kWh (per the tariff book)}$
Break-even generator price	$(\text{normal-tariff bill} - \text{BCMM wheeling bill}) \div \text{kWh generated}$
BCMM net effect (Eskom-connected generator)	$\text{Eskom credit} - (\text{normal-tariff revenue} - \text{wheeling revenue})$