

# What the City allows and will allow (C&I)

## Currently:

Grid connection with reverse power flow:

- Must have AMI bi-directional meter,
- must be on tariff with daily service charge,
- no payment will be made for reverse power flow.

## In Future

- As above, but will be compensated for reverse power

**Note:** Size of generation will be limited at time of application so that consumers remain average “net consumers” over 12 months.

# What the City allows and will allow (Residential)

## Currently:

- Reverse power flow with decrementing prepayment meter, must be on non-lifeline domestic tariff

## In Future

- Reverse power flow, with decrementing prepayment meter, no tariff change required

OR

- on SSEG tariff - SSEG at City's discretion, with bi-directional meter

**Note:** Size of generation will be limited at time of application so that consumers remain average “net consumers” over 12 months.

# Generation Size Limitations

## Residential

(no grid studies required ito NRS 097-2-3)

1	2	3	4
Number of Phases	Service Circuit Breaker Size (A)	Notified Maximum Demand (kVA)	Maximum Individual Generation Capacity (kVA)
1	40	9.2	2.3
1	60	13.9	3.5
1	80	18.5	4.6
3	40	27.7	6.9
3	60	41.6	10.4
3	80	55.4	13.9
3	100	69.3	17.3

## Commercial & Industrial

- < 1 MVA  
(will depend on grid capacity, consumer load & generation size in grid context in compliance with proposed NRS 097-2-3)

# Metering Solutions

Need separate measurements of imported and exported energy-excludes “in meter off-setting” e.g. Electro-mechanical meters running backward (also not accurate).

## Commercial and Industrial

- Bi-directional AMI credit meters (off the shelf)

## Residential (Current options- not finalised.)

A Prepayment meter (PPM) which decrements on forwards AND reverse power flow, or either

- Single phase and three phase- Bi-directional AMI credit meters
- or
- Bi-directional PPM - with facility to remotely read generation register (“semi-developed”)

**Note:** IRP revision might affect metering choice.

# “Down the road” Residential Metering Solution ??

- Smart meter which can operate in prepaid and post paid modes
- Can accommodate Time of use tariffs
- Local keyboard for coupon loading of units if communication line is down.
- Main barriers-
  - open communication protocol to prevent one supplier getting a monopoly,
  - cost of replacing all meters and installing a communication infrastructure
  - security (hack proof)

# VAT

- VAT- Consumers do not have to issue the City a VAT invoice for payment for excess generation.
- Vat on payments for excess generation only payable to registered VAT vendors (excludes most residential customers)

# Generation licences

- Electricity Regulation Act : all generators to have a generation licence from NERSA unless generation is “for own use.”
- “Own use” not defined: If someone exports at times onto the grid, but their net power flow is consumptive- are they generating “for own use”?
- NERSA Guidelines for generation less than 100kW imply that a licence is not required. However they are ONLY GUIDELINES. They cannot override the Act
- The City will allow grid connection up to 1 MW without evidence of a generation licence.
- >1 MW: City will require consumer to have a generation licence before processing application
- The City will report all embedded generation to NERSA.
- Consumer is responsible to NERSA- and takes risk if NERSA requires, and then refuses, to issue generation licence

# Technical Specifications

- Low voltage: NRS 097-2-1:2010 Utility interface (being revised)
- Medium voltage: Eskom specification DST 34-1765 (will be superseded by NRS 097-1 when finalised)
- Grid code for renewable electricity (grid code will override other specifications where there are clashes)

Outstanding:

- NRS 097-1 (for MV grid connection)
- NRS 097-2-2 (2014 edition in particular type-testing requirements)  
In the interim inverters must be type-tested by an accredited test house.
- NRS 097-2-3 (2014 edition for simplified utility connection criteria-imminent)
- NRS 097-2-4 (implementation procedures and application – future development)

Consumers connecting now will need to prove compliance with new standards as they emerge.



# Technical Specifications cont'd

## SANS 10142-1

- Compulsory specification SANS 10142-1 does not cover dc circuits but does cover connection of generators to the grid.
- SANS 10142-3 is being drafted and will cover the dc requirements. In the interim the City will require a professional engineer and a COC sign-off of all SSEG's.

# Business Processes

Business Processes being implemented to :

- Integrate with other supply applications processes
- Initiate Grid capacity studies when required
- Track and record design, testing and handover approvals and Supply Agreements
- Handle reading dual meter registers and manage billing
- Provide data for NERSA reporting etc.
- Provide consumer advice

# Application Process

- Consumer guidelines are being drafted and are 90% complete (In the interim, the City provides a summary document with its requirements)
- Consumer must complete and submit an application form
- Consumer must sign a special supply connection agreement
- Grid studies may be required for C&I applications.
- Customer pays for all related costs (network studies, metering and network changes, tests ...)
- No grid approval without prior approval of installation by other City departments

# Site Acceptance

## Acceptance

- Installation compliance with all requirements to be signed off by a professional engineer/technologist
- Certificate of Compliance required
- Inverters set in accordance with NRS 097-2-1