GreenCape

Supporting the
business of green

# AMEU Good hope branch meeting

16 April 2023

# **Who** we are

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions.

We work with businesses, investors, academia and government to help unlock the investment and employment potential of green technologies and services, and to support a transition to a resilient green economy.

GreenCape was established in 2010 to support the development of the green economy in the region.

## Vision

GreenCape's vision is a thriving prosperous Africa mobilised by the green economy.

## Mission

We work at the interface between business, government and academia in order to identify and remove barriers to economically viable green economy infrastructure solutions in developing countries, thereby catalysing their replicable and large-scale uptake to enable each country and its citizens to prosper.

## Ambition

In the next 5 years, GreenCape aims to be globally relevant in driving the uptake of green economy infrastructure solutions in the developing world context.

# **Our impact** over 10 years

**> ~ 19 000 local jobs**

**> ~ 2 000 members**

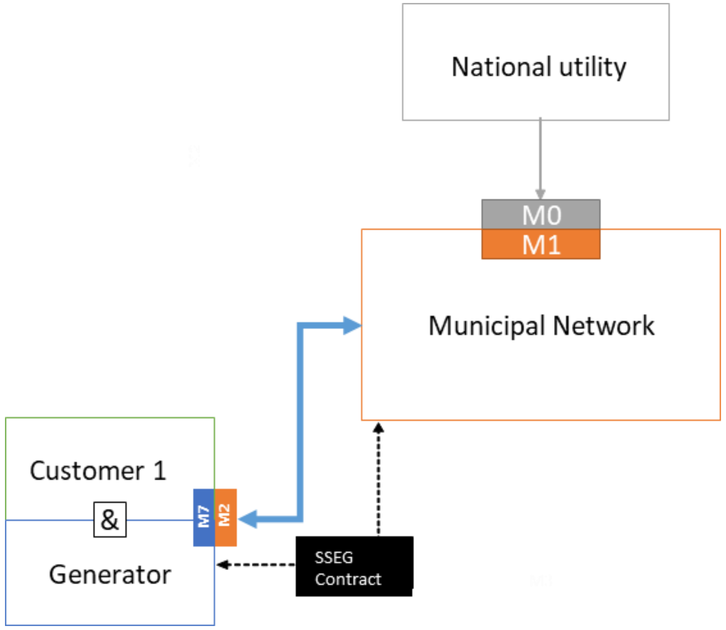
**~ R 42 billion**

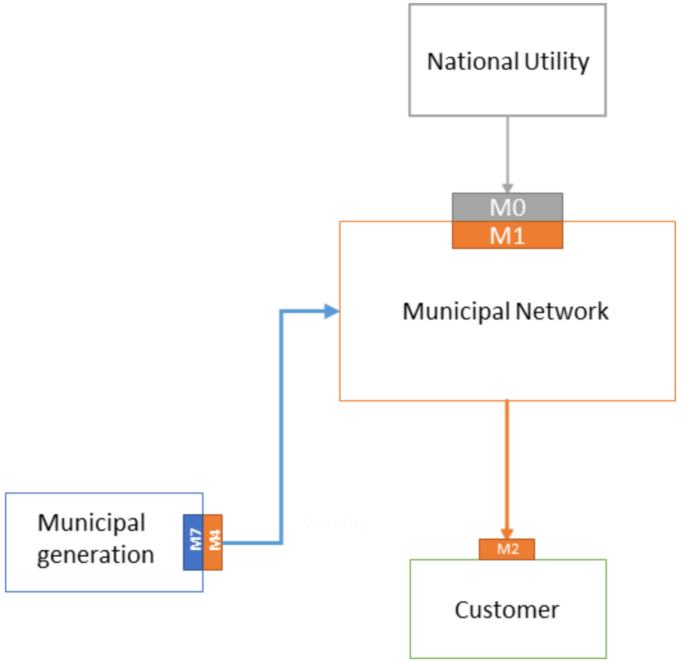
facilitated
investment in the
Green Economy

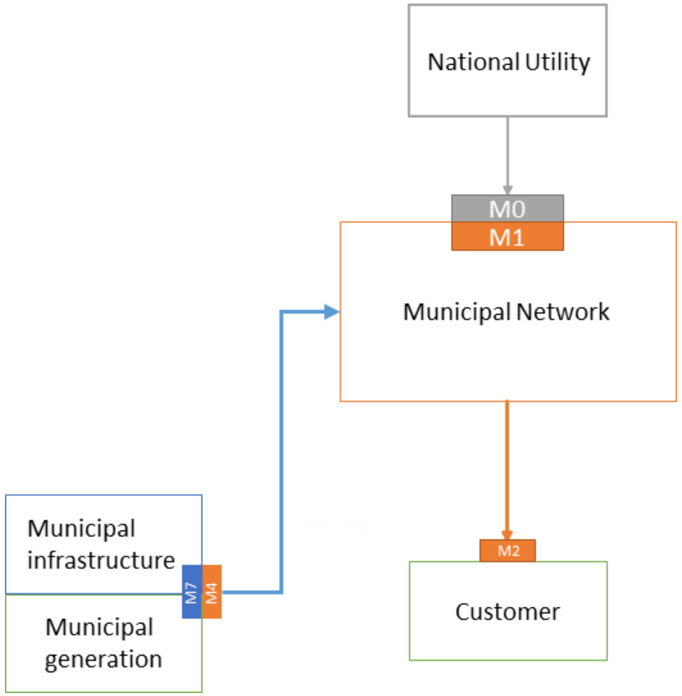
1st African Cleantech
cluster member of the
International Cleantech
Network

# What options do municipalities have to contribute to solving the energy crisis?

# Renewable energy scenarios




**Embedded Generation**

- Allow customers to generate their own power
- Municipality can purchase their excess power generated
- Has potential for revenue loss to the municipality

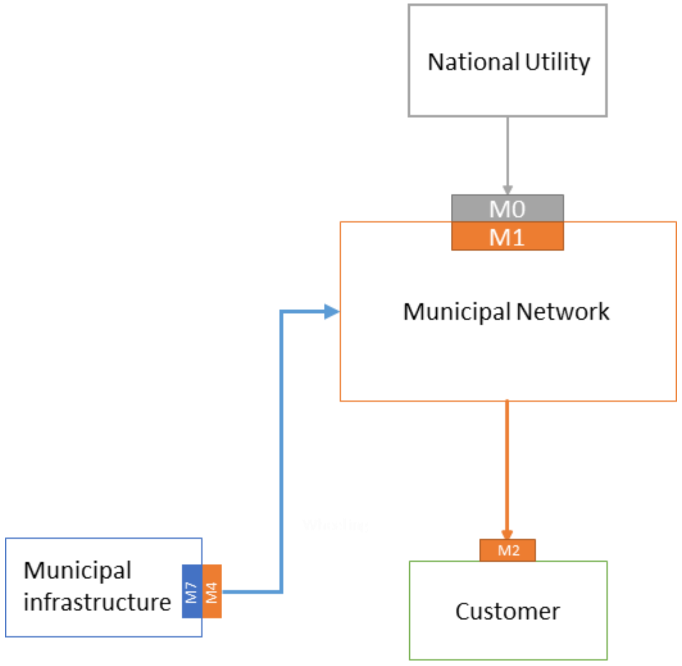
**Municipal own generation**

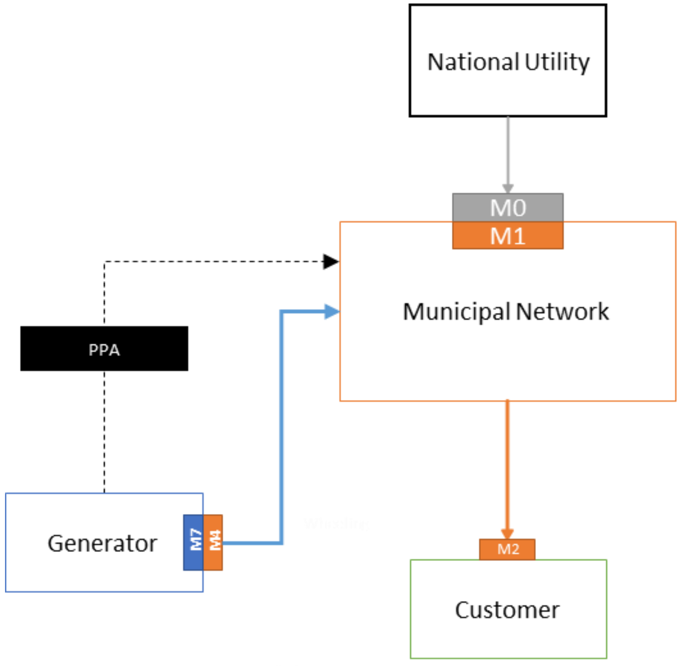
- Municipality builds and operates their own generation facility
- Municipality offsets their purchases from Eskom to improve their cost of supply

**Municipal offset**

- Municipality builds and operates EG at their own facilities
- Offsets the energy used by the facility

# Renewable energy scenarios



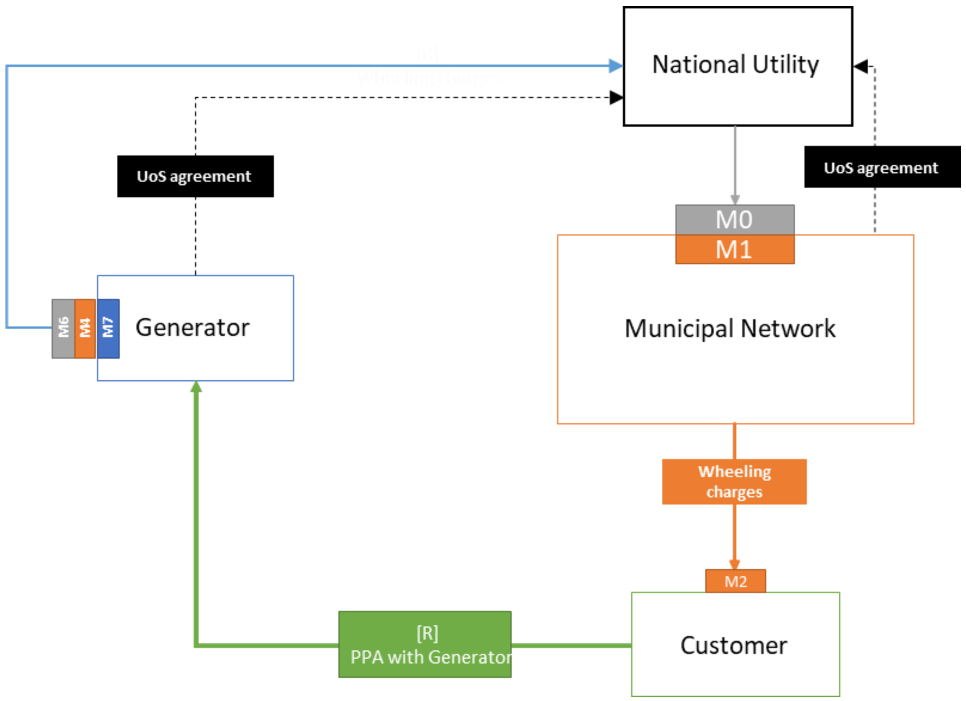

## Municipal Energy efficiency

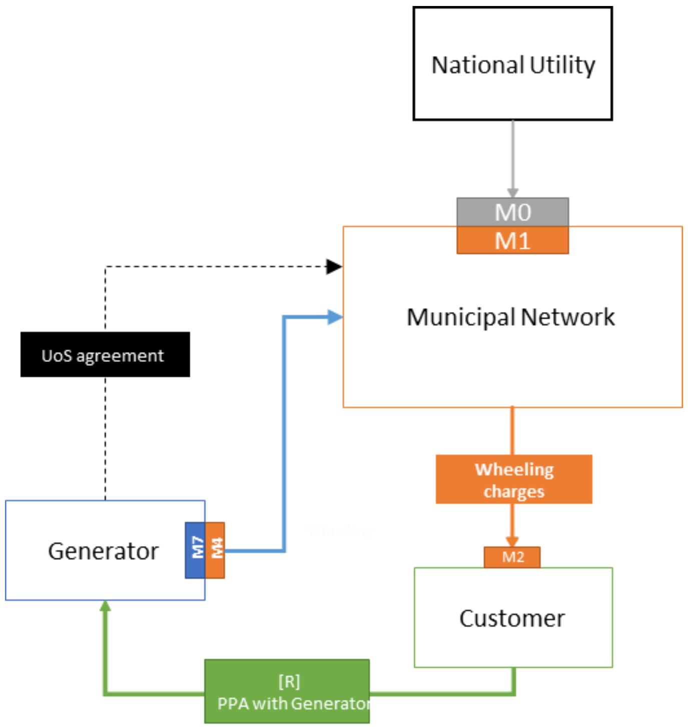
- Optimise the energy used by municipal processes
- Save on the cost of energy

## Municipal offtake

- Similar to Municipal own generation, but purchased from an third party generator
- Reduces the energy purchases from Eskom

# Renewable energy scenarios




## Wheeling from outside the municipality

- A customer purchases power from a third party outside of the municipal network
- Municipality rebates the customer and charges them for using their grid

## Wheeling within the municipality

- A customer purchases power from a third party within the municipal network
- Municipality rebates the customer and charges them for using their grid
- Municipality charges the generator to connect to their grid

# Key Concepts and Misconceptions

- Dispatchable, Variable, and Baseload Power

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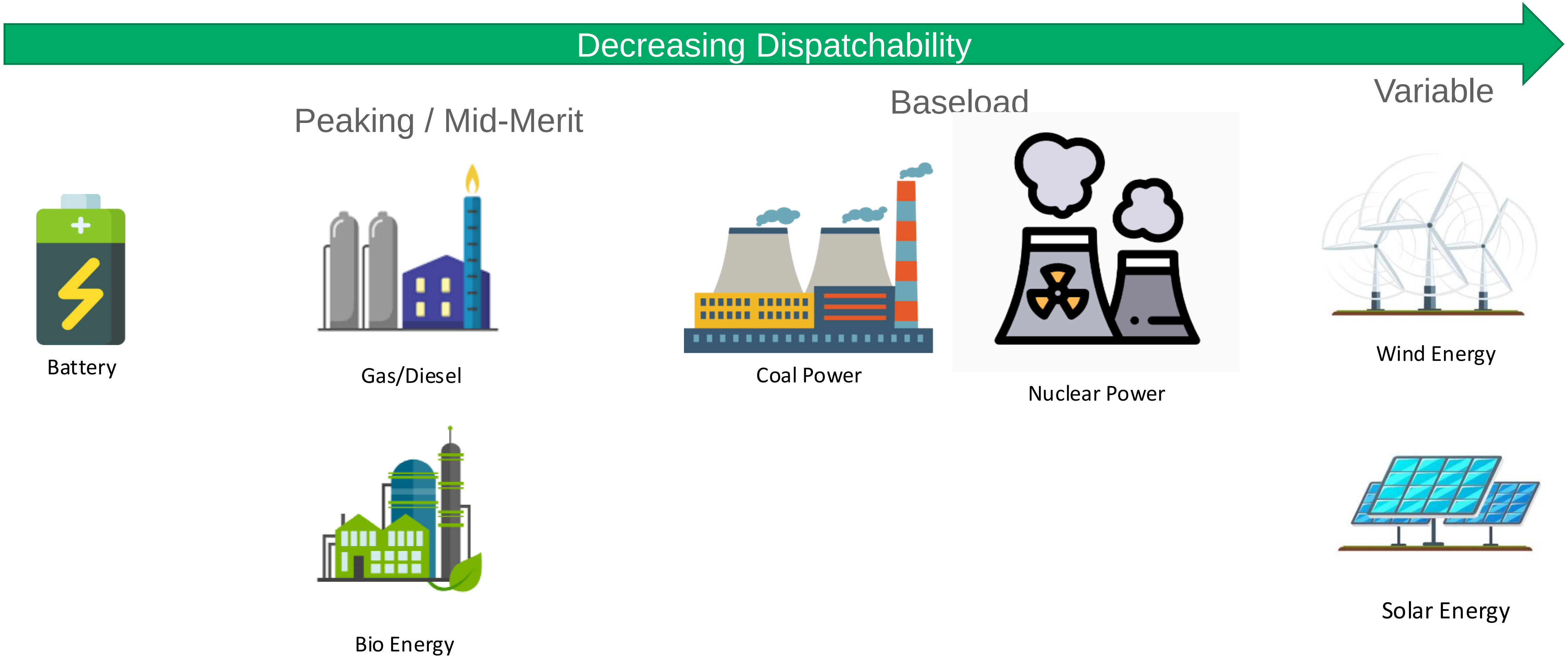
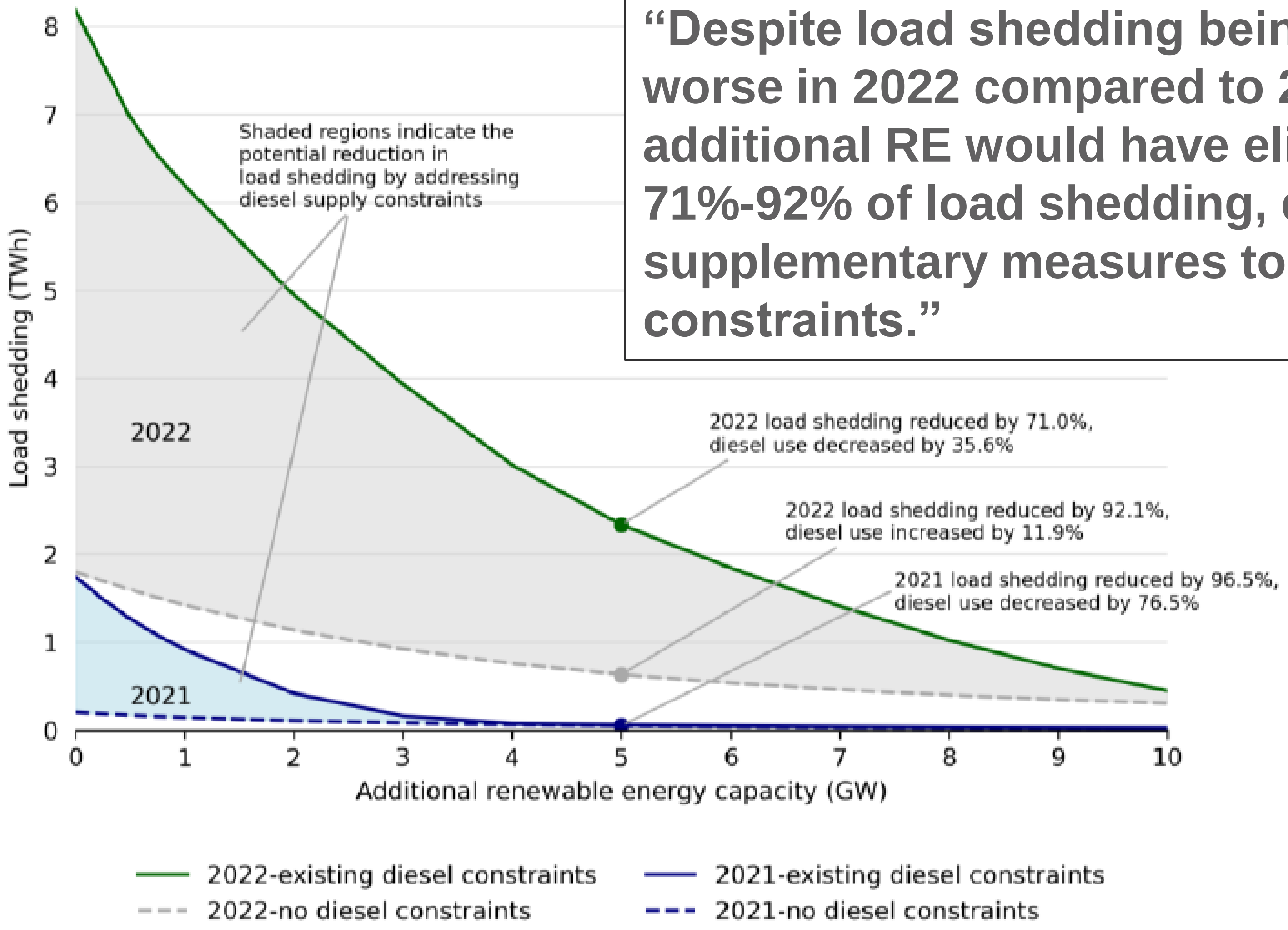
# Dispatchability



## Figure 1: Impact added renewables would have had on load shedding in 2021 and 2022




**"Despite load shedding being catastrophically worse in 2022 compared to 2021, 5GW of additional RE would have eliminated between 71%-92% of load shedding, depending on supplementary measures to relieve diesel supply constraints."**

Source : RESOLVING THE POWER CRISIS: INSIGHTS FROM 2022 - Meridian Economics

# What about batteries?

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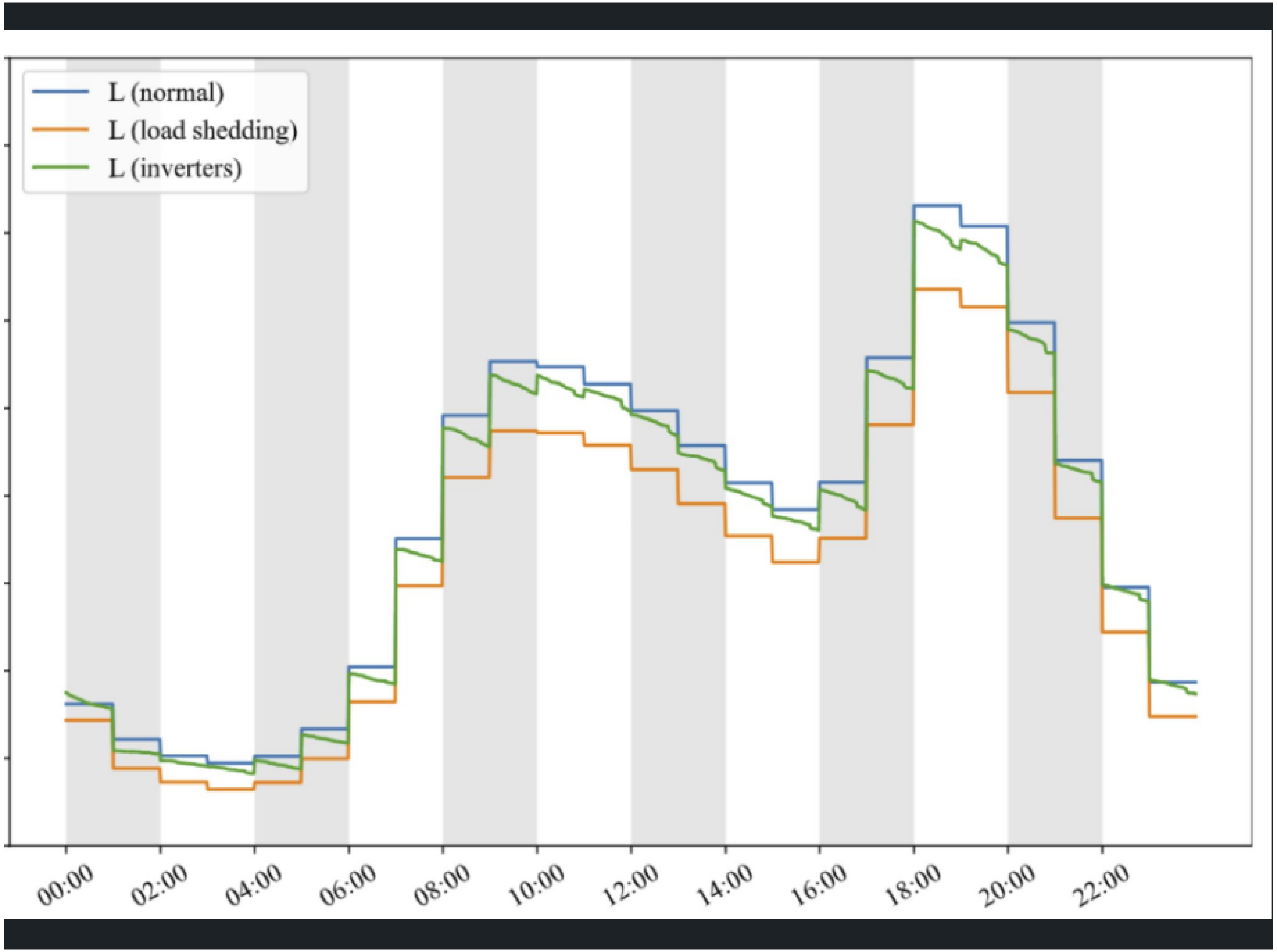


MJ (Thinus) Booysen • Following
Research Chair in the Internet of Things
26m • Edited •

These preliminary results show what will happen with household load during loadshedding if a mere 15% of households (the most affluent and therefore heaviest users) install inverters and batteries, but do not install solar power.

One key reason that almost 80% of houshold load during loadshedding is negated/curtailled with 15% penetration of inverters/batteries, is that the batteries charge at a fixed and fairly high rate (we assumed 0.5C), while the typical usage across all users tend to be at a rate lower than what the inverters are rated for during most hours.

Essentially, the "shed" load of one region is replaced by another reagion's charging after they were shed, essentially neutering Eskom's ability to establish grid stability through loadshedding, which will lead to an increase in loadshedding stages and could lead to grid instability.

It is crucial that the practice of charging batteries from the grid is addressed in legislation before it cripples our grid further. In developed countries (e.g., Germany),

Source : https://www.linkedin.com/posts/mj-booysen_loadshedding-eskom-gridstability-activity-7053623901657939968-bJ_v?utm_source=share&utm_medium=member_desktop

# Key Concepts and Misconceptions

- Dispatchable, Variable, and Baseload Power
- Municipalities going Off-Grid

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# These six municipalities are moving off Eskom's grid and away from load shedding

Staff Writer 16 March 2021

# Off the grid: Stellenbosch signs deal to 'break free' from Eskom

Stellenbosch is aiming to become the first municipality in South Africa to 'totally eliminate' load shedding, as it cuts ties with Eskom.

by **Tom Head** | 25-02-2021 12:42 | in **News**

# Key Concepts and Misconceptions

- Dispatchable, Variable, and Baseload Power
- Off-Grid
- SSEG “Small Scale Embedded Generation”

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# SSEG Definition

- SSEG was defined as Embedded generation < 1MW due to regulation that required licencing for plants above 1MW

- This regulation no longer exists, thus the arbitrary limit of 1MW is no longer relevant

- More relevant are the connection points
  - Embedded Generation = Inside Distribution grid
  - Typically: Medium and Low voltage

- Customer Types can also be relevant
  - Commercial
  - Industrial
  - Residential

Consider updating SSEG requirements to allow for above 1MW installations

# Key Concepts and Misconceptions

- Dispatchable, Variable, and Baseload Power
- Off-Grid
- SSEG “Small Scale Embedded Generation”
- Municipal Revenue loss

# Municipal revenue at risk if solar tax incentive takes off

Parliament warned incentive for households could strip municipalities of most of their paying customers

# Revenue Loss – the macro picture

- In a context of failing National Utility and Loadshedding, it doesn't make sense to argue that new generation threatens revenue
- Municipal Revenue has already been lost
  – The model of reselling Eskom power relies on there being power to sell.
  – Additional capacity is ultimately replacing loadshedding, not existing sales
- Even at a feed-in price of 1-1, on a macro level total municipal revenue is better off.

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# Revenue Loss – the macro picture

- There is a lot of work to do to build resilience into electricity business

- Need to shift to Cost–reflective tariffs
  – This means tariffs where sale price tends towards purchase price of energy
  – This means tariffs where the feed-in value of energy trends towards the sale price

- Feed-in Tariffs should be between Eskom purchase price and sale price

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# Key Takeaways

- Embedded Generation will be a key contributor to achieving a stable power system
- These need to be part of a national grid
- Appropriate feed-in tariffs and wheeling are vital to achieving this
- Revenue protection should not be seen as a barrier to embedded generation

# What should municipalities do to navigate the current energy crisis

- Enable their residents to respond to the crisis
  - SSEG
  - Wheeling

- Initiate internal mechanisms to protect municipal services
  - e.g. Embedded generation for WWTW

- Streamline municipal operations to enable the transition
  - Cost of Supply studies
  - Electrical master planning
  - Structural and tariff reform

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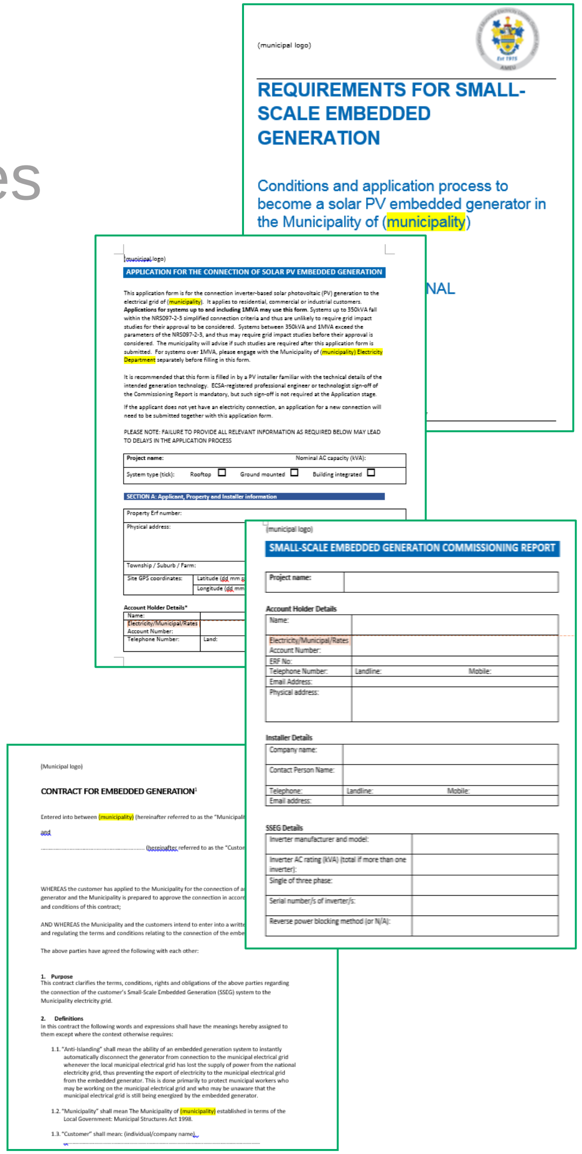
# AMEU/SALGA support pack

## Standardization of municipal regulations and processes

- **SSEG rules, regulations and guidelines**
- A municipal guidance document
- **Tariff guidelines (design principles)**
- **By-law recommendations & examples**
- Application forms
- Supplemental Contracts and forms



# Renewable Energy policy

## Overview

- Overarching policy that strengthens
  - Existing/New SSEG regulations
  - Wheeling framework
  - Enabling the growth of a Green economy within the municipality
  - Municipal mandate to invest in their grid
  - Takes into account the impact of climate change

| Renewable Energy Policy | | | | | | |
|---|---|---|---|---|---|---|
| SSEG Regulations | Wheeling framework | Self generation | IPP procurement | Grid investment | Climate change strategy | Spatial development framework considerations |

# Wheeling guideline

## Overview

– Guideline for municipalities
  - Legal and Regulatory framework
  - Wheeling scenarios
  - Technical overview
    - Generator connection process
    - Metering
    - Wheeling tariffs and billing
    - Payments due

XX
Municipality Logo
XX

**Draft Wheeling Guidelines**

XX Local Municipality

| |
|---|
| Guideline for allowing third-party access to XX Local Municipality's electrical network. |
| **Version: 10 May 2023** |

# Thank you

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