

A Sustainable Grid for All

Urban Energy Network Meeting

2 – 3 June 2022 (Day 1)

Pretoria Botanical Gardens



SALGA Energy Summit 2018 Declaration

- Global energy/electricity sector transition
- We have to take collective action in implementing the Nationally Determined Climate Commitments.
- We can benefit: health, livelihoods, economy – if municipalities position themselves well.
- Viable distribution utilities, able to increase reliability and access to affordable basic services are critical in the transition.





**Day 1: Decarbonising the Grid –
RE implementation for Local
Government**

**Sustainable
Grid 4 All: CC,
Just urban energy
transition**

**Day 2: Communicating to
ensure a Grid 4 All**

Energy

Transportation
& Land Use

Urban Forest
& Open Space

Water
& Waste

Public
Involvement



‘A Grid for All’

What does the concept of a ‘Grid for All’ mean for you as:

- An Official
- As a citizen

Driving RE: Municipal Mandates and Mechanisms



Johannesburg Needs \$1.6 Billion for Power Supply, Mayor Says

- South African cities are seeking to source own electricity
- Eskom is unable to supply South Africa's power needs



[De Ruyter: "Eskom needs HELP"](#)

YouTube · Centre For Risk Analysis
2 days ago



The big switch-off: This is eThekweni's vision to dump Eskom

Get a load of this – these South African cities have a plan to ditch Eskom and end power cuts

<https://www.dailymaverick.co.za/article/2022-05-30-get-a-load-of-this-these-south-african-cities-have-a-plan-to-ditch-eskom/>

The big metros...

Johannesburg

- **Goals:** Energy security and climate change – Energy Indaba May 2022
- Notes, affordability and access objectives
- **Sustainable Energy Strategy** – which includes leasing land to independent power producers (IPPs), wheeling, and small-scale generators.
- **Targets:** short term 28% reduction in carbon gas emissions, and longer term goal of zero emissions by 2050.
- **Action**
- Technologies identified include solar, battery storage, waste-to-energy and gas
- Needs private sector financing-partnerships

Cape Town

- **Goals** of security (loadshedding), cleaner and affordability
- **Energy 2040 Vision and E&CC Strategy**
- IPPs, wheeling and SSEG
- **Action**
- Tender process for the first round of IPP procurement was under way.
- Wheeling pilot underway
- draft energy budget, the City has R15-million to pay for small-scale embedded generators

eThekweni

- **Goal:** mitigate load shedding and climate response
- **Energy Transition Policy** adopted June 2021 to mitigate impact of load shedding on economy.
- **Targets:** 40% from RE sources by 2030, and 100% by 2050
- RfI to the market for procurement of 400MW of new generation from IPPs (July 2021)
- **Action**
- Huge response: 104 project plans, representing capacity of 16.5GW, with R10-billion worth of private investment, majority able to reach commercial operation by July 2025.
- City finalising concurrence processes with national govt (NT, COGTA, Econ Dev).

Lots of expectation...

- “Energy security interventions will be used as catalysts for economic growth and job creation while reducing municipal bulk operating expenditure.” eThekweni spokesperson
- Mayor Phalatse said diversifying energy acquisition would make it much cheaper because of competitive pricing.
- “We would love to see our residents, including the poorest of the poor, able to access cheap energy from the City through our various partnerships.”

Lots of grey areas...

- “Local government is still a highly regulated sphere and requires careful assessment of skills and capacity to manage a project of this magnitude. Mayisela, eT spokesperson

Local Government Policy Commitments



Priority Areas

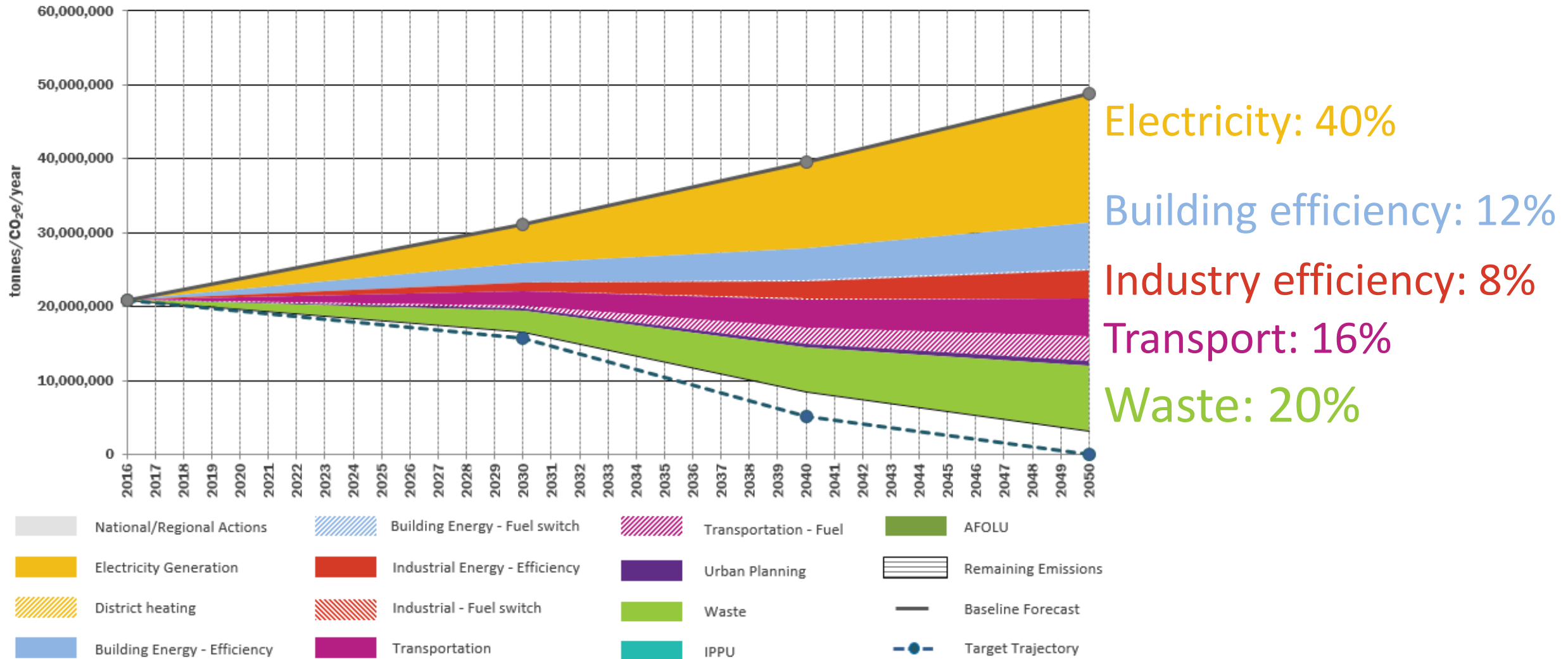
Climate Change

Energy Security

Just Transition

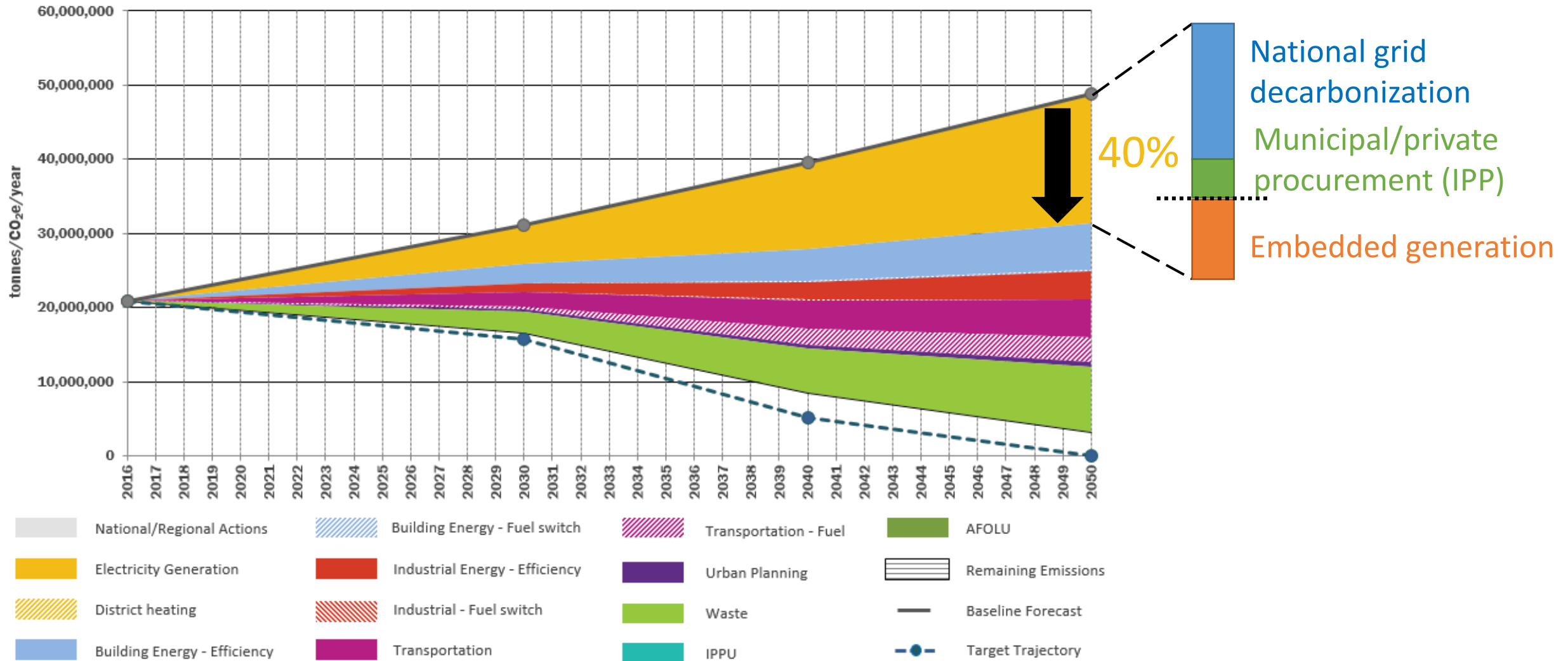
Reaching net zero carbon cities: pathways

Emission reduction potential of selected actions



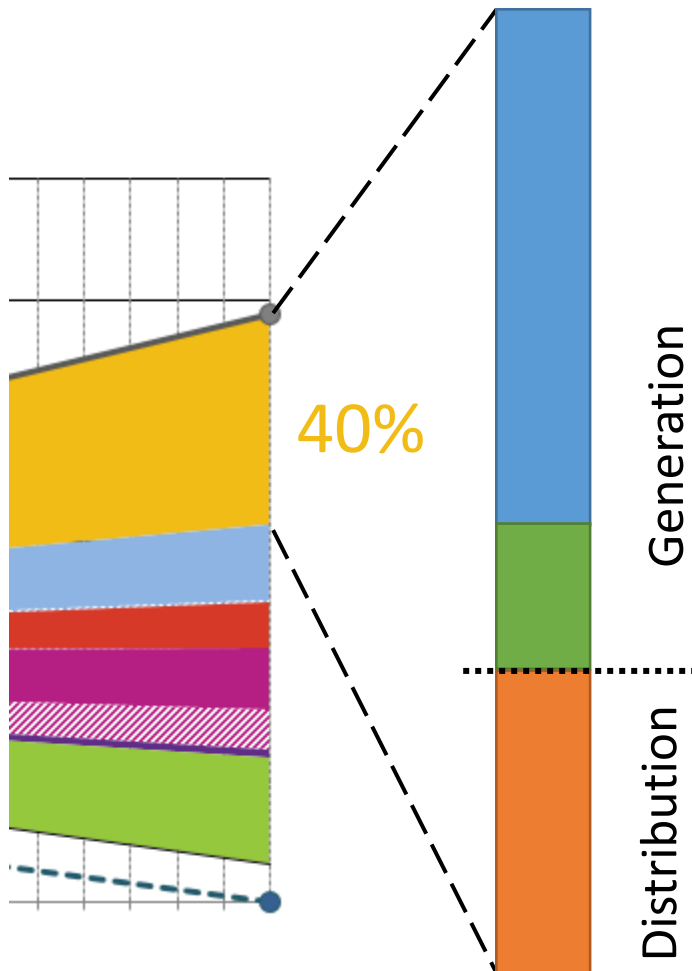
City Climate Actions

Emission reduction potential of selected actions



City Climate Actions

Exceeds the City's existing maximum demand (~1,2GW)

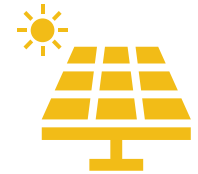


National grid
decarbonization

Municipal/private
procurement

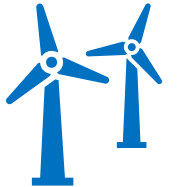
Embedded
generation

2 GW utility solar



+

2,7 GW wind



+

0,4 GW gas



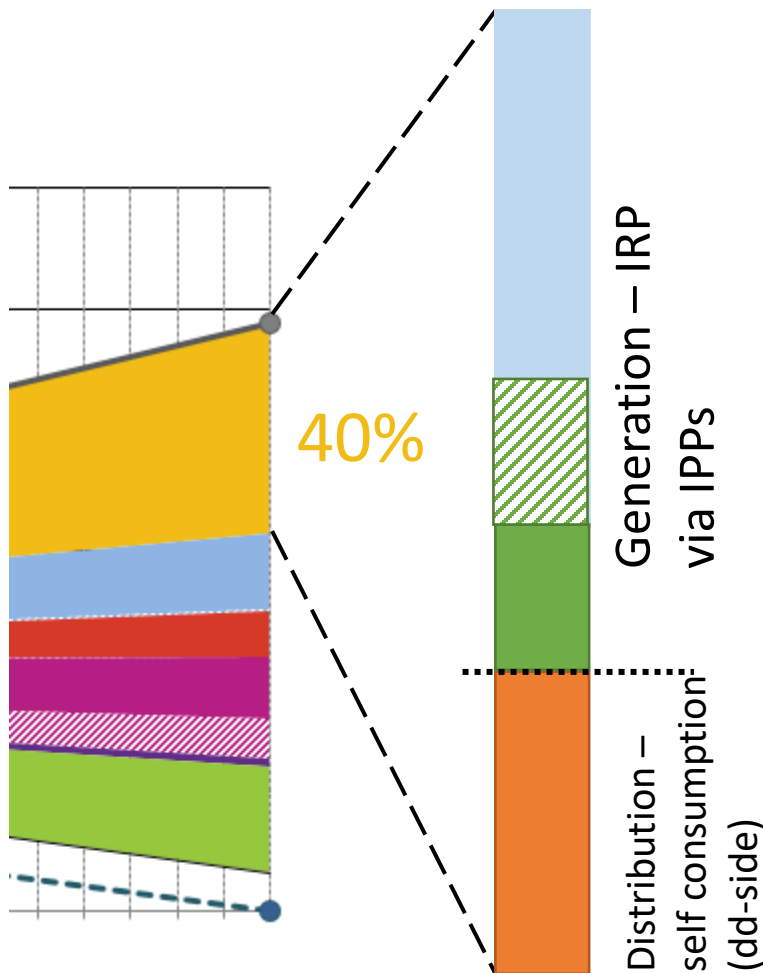
3,7 GW

rooftop solar



Municipal Authority

Are wheeling and IPP procurement allocated from IRP “Embedded Generation”?

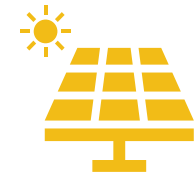


National grid decarbonization

Municipal/private procurement

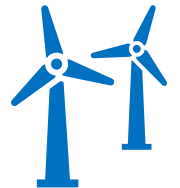
Embedded generation

? of 2 GW utility solar



+

? of 2,7 GW wind



+

? of 0,4 GW gas



3,7 GW rooftop solar



Unpacking Municipal 'decarb' Actions



Action	Regulatory overview	Contribution to Emissions Reduction	Contribution to Energy Security	Contribution to Just Transition
Embedded Generation (behind the meter)				
Private Procurement (wheeling)				
Municipal Energy: Efficiency and Own Consumption				
Municipal IPP Procurement				
Energy Access: efficiency and RE alternatives				

Unpacking Municipal 'decarb' Actions

Ease of implementation

Action	Regulatory overview	Contribution to Emissions Reduction	Contribution to Energy Security	Contribution to Just Transition
Embedded Generation (behind the meter)	Fully operational in most major municipalities	Significant	Significant but only for those with capital	Local jobs created, economically optimal (equivalent to Utility scale)
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Municipal IPP Procurement				
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Municipal Energy: Efficiency and Own Consumption	Only major hurdle is MFMA procurement, but it has been done!	Small	Small	Efficiency creates jobs, RE small but some local jobs created
Municipal IPP Procurement				
Energy Access: efficiency and RE alternatives				

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Municipal IPP Procurement	ERA allows, but S34? And extremely legally complex (PPAs, etc)	Potentially transformational	Significant if more generation can be brought online	Significant if local content is prioritized.
Energy Access: efficiency and RE alternatives				

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Municipal Energy: Efficiency and Gen for own Consumption	Only major hurdle is MFMA procurement, but it has been done!	Small	Small	Efficiency creates jobs, RE small but some local jobs created
Larger Gen: Municipal IPP Procurement/Munic	ERA allows, but S34? And extremely legally	Potentially transformational	Significant if more generation can be	Significant if local content is prioritized.

Cost of Supply study is the foundation underpinning all of these developments if distribution utility to remain viable

Regulatory framework at a glance



Government

- ERA: function sits with national government to plan and commission power generation (IRP)
- Schedule 2 enlarged this up to 100 MW without a license for 'behind the meter' or 'own consumption' (slightly grey area for LG)

- For LG to generate or procure 'other side of the meter' (within Tx grid, or very large scale or for sale purposes...) it must get national approval via S.34 determination
- Does it/should it trigger S. 34 = some grey area here still...

Private sphere

- ERA: non discriminatory access to the grid
- 'behind the meter/embedded gen' allowed
- Schedule 2 enlarged this up to 100 MW (i.e. 'own consumption')
- 'other side of the meter' - IPP may 'wheel' power to a private off taker (up to 100MW this does not require a license)
- BUT LIMITED by market (in some countries, limited by regulation 'contestable customers')

Embedded Generation:

Legal Framework

✓	Embedded Generation Policy
✓	Technical Standards
✓	Electricity By-Law
✓	Municipal Finance Management Act
✓	Electricity Pricing Policy
✓	Electricity Regulation Act

Embedded Generation Policy highlights the municipalities requirements.

The amendment to the Electricity By-law makes the policy enforceable.

Schedule 2 of ERA:

- Systems > 100 MW need a generation licence from NERSA
- Systems 1 - 100 MW need to register with NERSA

Technical Standards:

NRS 097- 2-1: Power quality and safety aspects at point of utility connection (inverter)

NRS 097- 2-3: Specifies generation sizes that can be installed without additional grid impact studies

Municipal Finance Management Act and Electricity Pricing Policy

- Payment of export credits and development of EG tariffs

Embedded Generation:

Key Actions

1.	Export Credit
2.	SSEG Policy
3.	Electricity By-law Amendment
4.	Metering and Billing
5.	Communications Campaign

Designing an EG Export Credit and getting NERSA approval

Developing an EG Policy and getting it approved by Council.

Making amendments to the Electricity By-Law

Providing capacity to municipal officials to deal with installations.

Revision of metering and billing system.

Developing a system to monitor, record and report on EG systems.

Developing a communication campaign for EG (encouraging registrations).

WHAT NOT TO DO:

Ignore SSEG installations without regulating them.

Wheeling:

Legal Framework

✓	Electricity Regulation Act
✓	Use of System Agreement
✓	Connection Agreements
✓	Trading Licences
✓	Amended Off-taker agreement

The Electricity Regulation Act stipulates that, “ .. A licensee must to the extent provided for in the licence, provide non-discriminatory access to the transmission and distribution power systems to third parties”.

Schedule 2 of ERA:

- Systems > 100 MW need a generation licence from NERSA
- Systems 1 - 100 MW need to register with NERSA

Systems larger than 100MW need Section 34 Determination

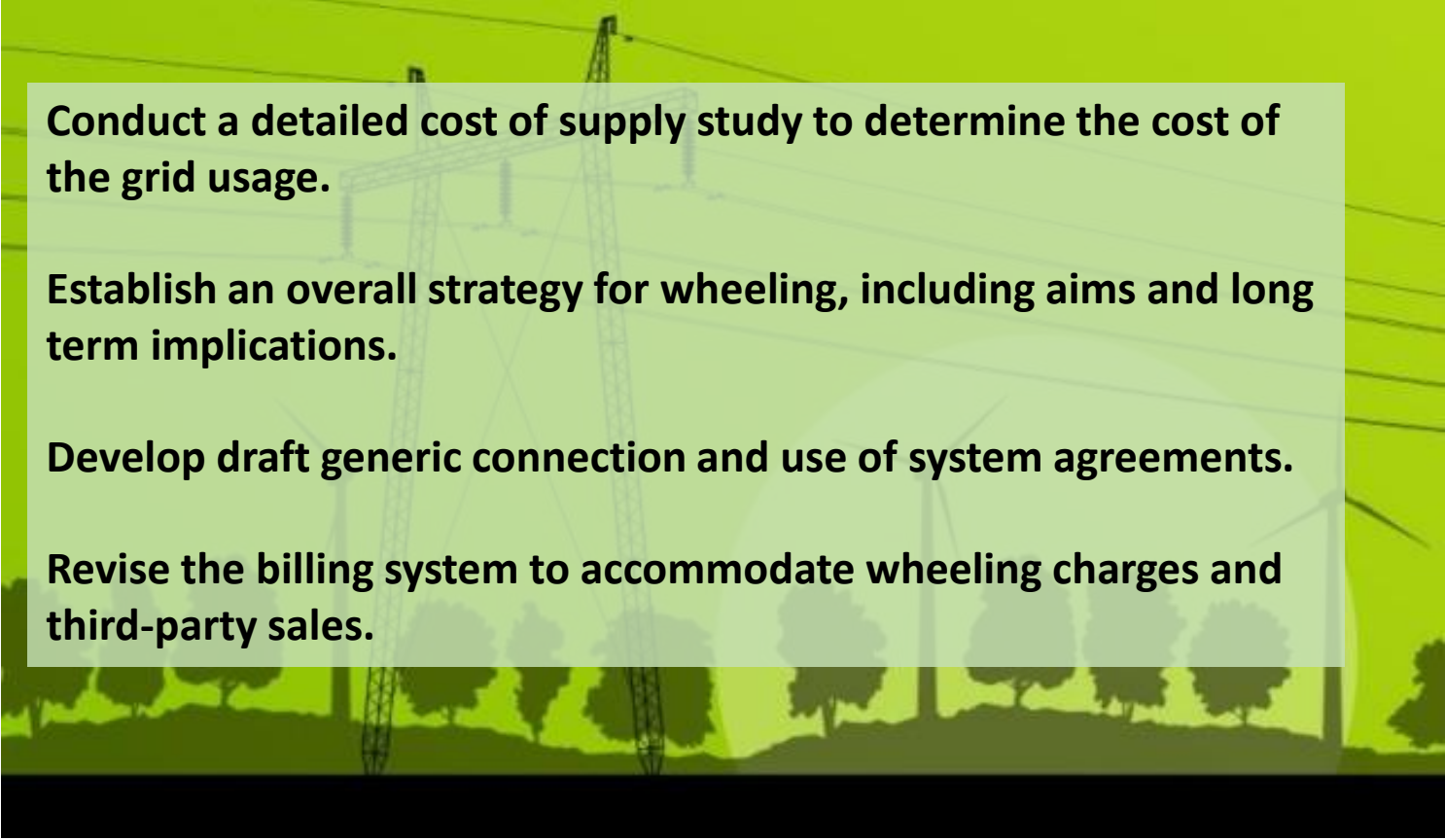
Contractual Agreements:

- Use of System Agreement
- Connection Agreement
- Trading Licences
- Amended off-taker agreement

Wheeling:

Key Actions

- | | |
|----|-----------------------------|
| 1. | Cost of Supply Study |
| 2. | Wheeling Framework/Strategy |
| 3. | Use of System Agreement |
| 4. | Billing System Revision |



Conduct a detailed cost of supply study to determine the cost of the grid usage.

Establish an overall strategy for wheeling, including aims and long term implications.

Develop draft generic connection and use of system agreements.

Revise the billing system to accommodate wheeling charges and third-party sales.

WHAT NOT TO DO:

Allow service providers to use the grid for wheeling without paying for usage.

Municipal Generation + Procurement from IPPs:

Legal Framework

✓	Electricity Regulation Act
✓	Municipal Finance Management Act
✓	Municipal Services Act

ELECTRICITY REGULATION ACT

SCHEDULE 2:

- Systems > 100 MW need a generation licence from NERSA
- Systems 1 - 100 MW need to register with NERSA

NEW GENERATION CAPACITY

Municipalities are enabled to procure or buy new generation capacity i.e. buy from IPPs or own build.

Processes to follow existing processes as outlined by MSA/MFMA.

Municipalities are required to apply to the Minister for a Section 34 Determination supported by:

- Feasibility study approved by Municipal council
- Evidence of alignment with IRP & IDP.
- Proof of compliance with MSA and MFMA.

Municipal Generation:

Key Actions

- | | |
|----|---|
| 1. | Assess renewable energy resources available |
| 2. | Assess energy targets and needs |
| 3. | Infrastructure/Network Assessment |
| 4. | Potential installation feasibility study |
| 5. | Term of reference for installation |

Assessment of the renewable energy resources available in the municipality

Assess the needs and set targets for alternative electricity generation/procurement

Assessment of infrastructure for possible integration of alternative electricity technologies.

Conduct a feasibility study of potential installations

Ensure a budget allocation for the installation

Issue a terms of reference for installation and conduct a procurement process.

WHAT NOT TO DO:

Install systems with long payback periods, and systems that do not match available resources.

Municipal IPP Procurement:

Key Actions

1.	Assess alternative energy targets
2.	Local energy supply plan
3.	Standard PPA for IPPs
4.	ToR for electricity procurement
5.	Grid Connection Assessments

- 
1. Assess needs + set targets for alternative electricity procurement and generation.
 2. Develop local energy supply plan
 3. Ensure NERSA + Treasury are aware of municipalities intention to procure from IPPs
 4. Develop standard PPA that can be used for IPPs
 5. Draft ToR for procurement of electricity from IPPs (size and technology limits)
 6. Conduct procurement process and assess offers
 7. Award preferred IPPs, subject to Section 33 of the MFMA.
 8. Conclude final agreement on a PPA between municipality and the IPP
 9. Conduct grid connection assessment.

WHAT NOT TO DO:

Municipalities should not enter into PPAs with IPPs without a formal procurement process. This includes signing MoUs.

Support and Resources

Action	Support	Resources
Cost of Supply	Introduction to Cost of Supply Studies Training (SEA/SALGA/GIZ) Advanced Cost of Supply Study Development for Metros (Ricardo/GIZ)	Simplified Cost of Supply Tool Cost of Supply Resources
Renewable Energy Policy	Renewable Energy Policy Development (GreenCape to Western Cape + Mpumalanga)	Renewable Energy Policy Template
Embedded Generation	Municipal Embedded Generation Training (SALGA/GIZ/SEA): - Technical - Financial - Capacity Building	SSEG Website SSEG Training Platform AMEU-SALGA Resource Pack
Wheeling	Wheeling Support (GreenCape to Western Cape Municipalities) Wheeling Information Sessions (SALGA/GIZ/SEA)	Wheeling framework (GreenCape) Wheeling Discussion Paper

Action	Support	Resources
Municipal Generation + IPP Procurement	SALGA IPP Office (To be launched)	
Municipal Energy: Efficiency and Generation for Own Consumption	Energy Efficiency Municipal Energy Efficiency Management Systems and EPC Readiness Training (Tbc) MEMS Training (SANEDI with UP)	Energy Efficiency MEMS Booklet Energy Performance Certificates for SA municipalities Implementing Municipal Energy Management Systems SAGEN website on MEMS Guide for Energy Savings in Motor-Driven Systems at Municipal Wastewater Treatment Plants Generation for Own Consumption CSIR Municipal PV Procurement Biogas to Energy
Energy Access: efficiency and RE alternatives		Informal Electrification Booklet Tackling Urban Energy Poverty SALGA RE + EE Guide The financial case for Low and Middle Income SSEG

City RE / 'decarb' Policy and Action Plan Development

Working Session



A RE Policy: Steps

Why? Creates the enabling framework (council approval) for the municipality to put in place the requirements to achieve RE implementation necessary to respond to technology change, environmental protection and local economic development

Steps:

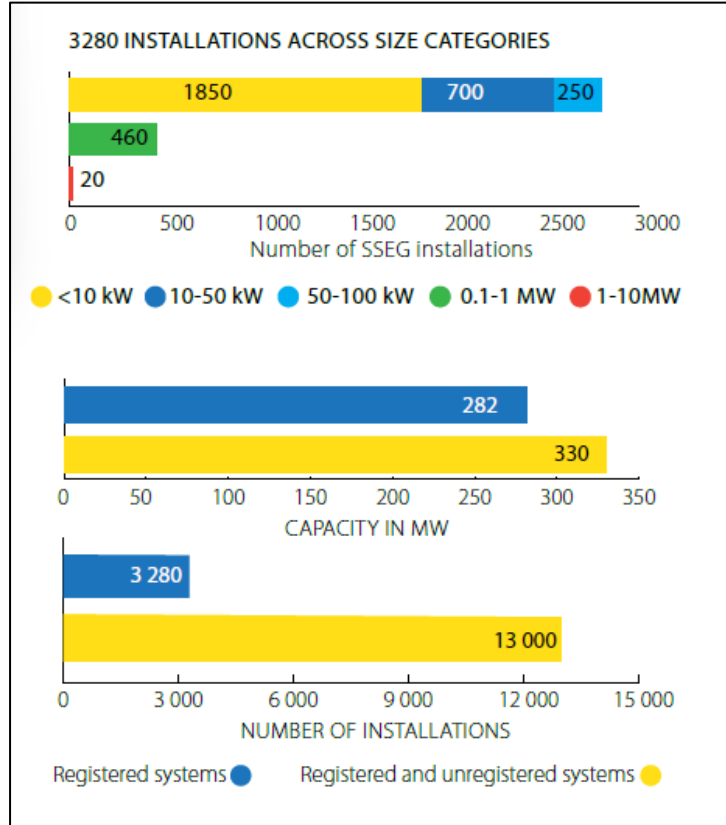
1. Policy development
2. Action Plan: ensure operational readiness, e.g. application procedures, tariffs
3. Build staff capacity
4. Communication with citizens, installers and customers to engage their participation and 'leave nobody behind'



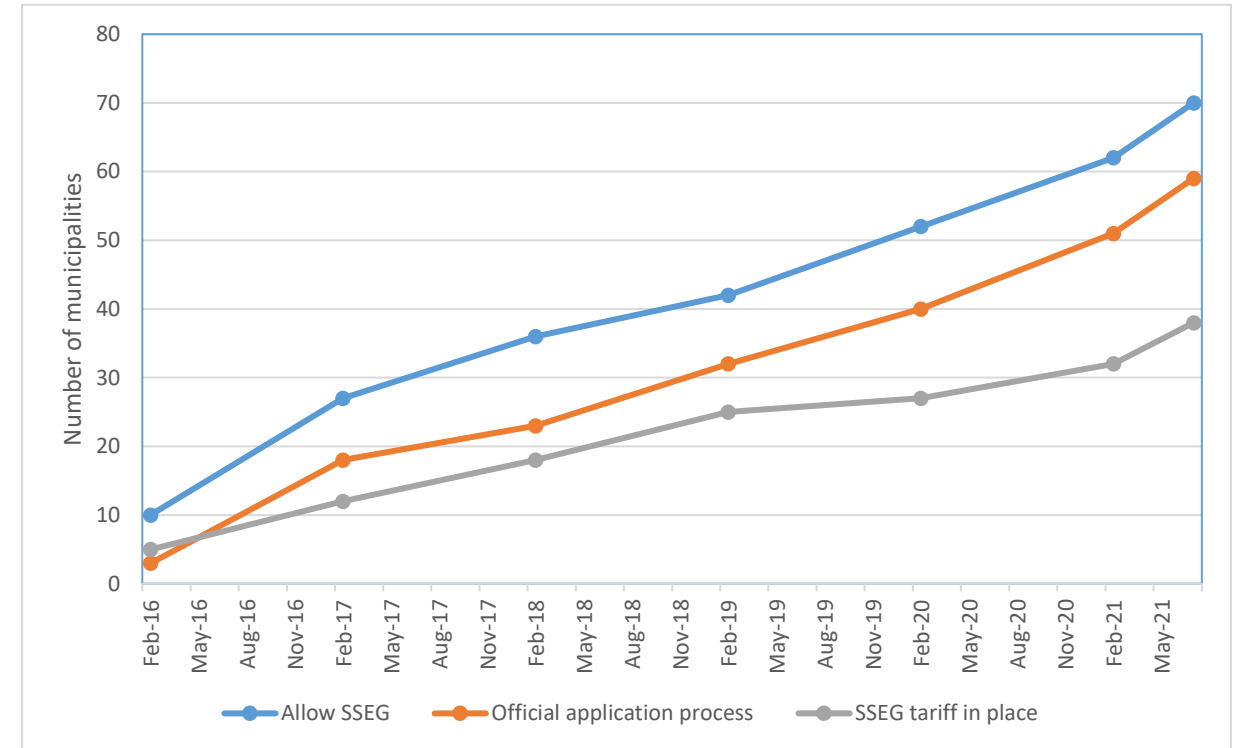
Small-Scale Embedded Generation Case Study

SSEG in South African Municipalities.

Total Number of registered SSEG installations
(SALGA, 2020)



Uptake of SSEG processes in municipalities (SALGA, 2021)



About 90 out of ~ 160 municipal distributors do not accept SSEG

What % of systems do you think are registered in your municipality? What are the challenges around registration – and what is your municipality doing about these challenges?

How can we incentivise SSEG connections and registration?

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Communications 101

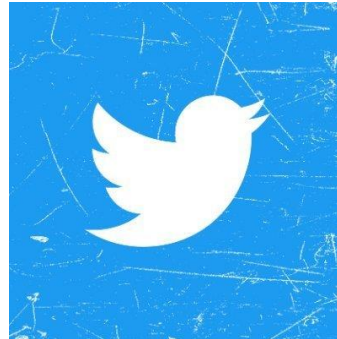




What is the
Grid for all?

Communications Toolkit

Aim: To address frequent asked questions about electricity.
To address misconceptions about electricity pricing.





**Frequently
Asked Questions**
about Electricity
in South Africa

Narrated Videos

1. What am I paying for?
2. What is a grid for all?

Languages:

English, Afrikaans, Sepedi, Setswana, Xhosa, Zulu



**Frequently
Asked Questions**
about Electricity
in South Africa

Videos with Text

1. How is my bill calculated
2. Can municipalities set whatever tariffs they like?
3. Do municipalities make a huge profit from electricity?
4. Is energy generated from the sun free?
5. Why am I being taxed for using the sun?
6. Is going off-grid cheaper?

Languages:

English, Afrikaans, Sepedi, Setswana, Xhosa, Zulu



**Frequently
Asked Questions**
about Electricity
in South Africa

Infographics

1. Electricity Saving Tips
2. How is my bill calculated?

Languages:

English, Afrikaans, Sepedi, Setswana, Xhosa, Zulu

The full communications toolkit will be disseminated once finalised.