SOLAR POWER AFRICA

GRID RELIABILITY: Challenges & Opportunities

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IN PARTNERSHIP WITH SOLAR POWER EVENTS
POWERED BY SAPVIA South African Photovoltaic Industry Association
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Industry Challenges with Grid Connection

01 Grid Reliability – Facts & Common Misconceptions

02 Challenge 1: An ambitious RE programme needs a robust grid

03 Challenge 2: Getting access to the grid

04 Opportunities & the Way Forward

Grid Reliability – Facts & Common Misconceptions

- ✗ The Eskom grid is very unreliable
- ✗ In South Africa, we experience frequent load shedding because we have a [illegible] grid
- ✗ Integrating renewables onto the grid will make it more reliable
- ✗ We should focus on building more renewables rather than investing in the grid
- ✗ Industrial/commercial customers and municipalities can establish their independence from the grid by wheeling renewable power from IPPs

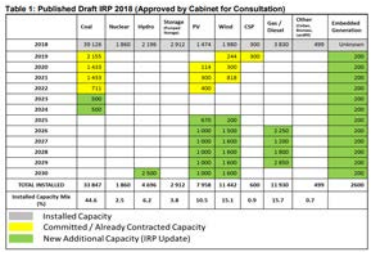
- ✓ The South African electricity grid is a high-performing national asset
- ✓ Load shedding, as we know it, is as a result of insufficient generation, not insufficient grid capacity – this may change in the future though!
- ✓ Renewables do not preclude / eliminate the need for investments in grid reliability
- ✓ Wheeled power requires reliable grid connection near the generator, near the load, and on the complete network in between!

Challenge 1: An ambitious RE programme needs a robust grid

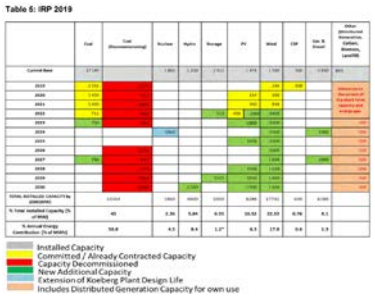
Integrated Resource Plan

2010

2018_ draft

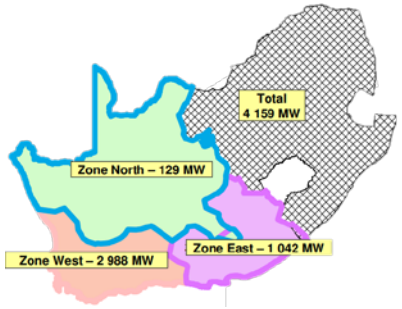


2019

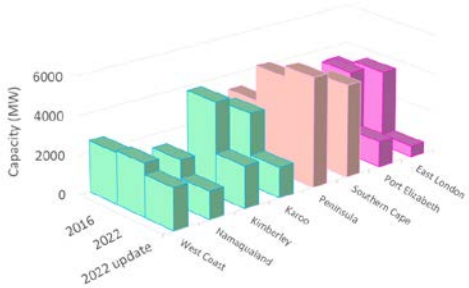


GCCA

2012

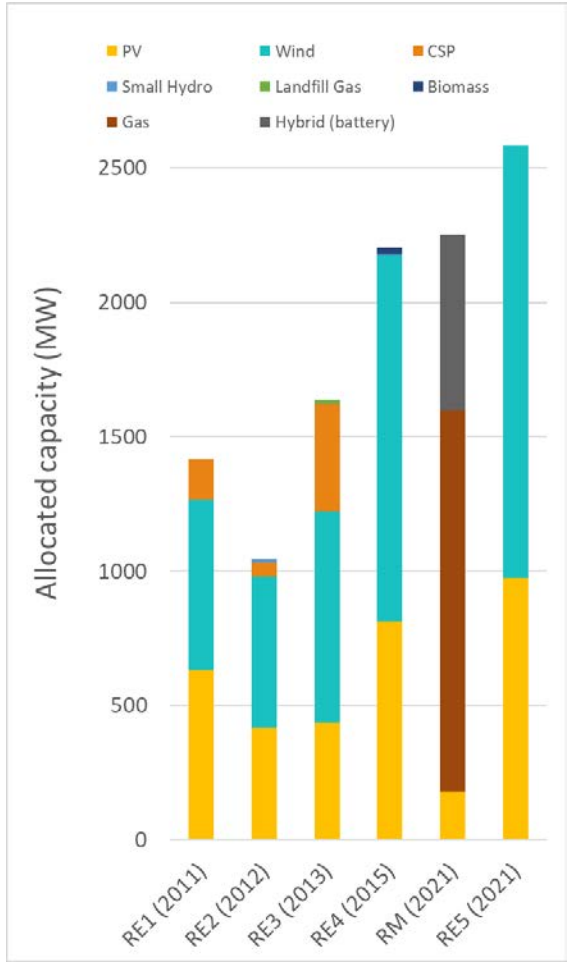


2016/ 2022/ 2022 update



2023

REIPP/RMIPP Allocations



TDP Completed Projects

2021
- Ankerlig-Sterrekus 400 kV line (WC)
- Kappa MTS (WC)
- Komsberg MTS (NC)
- Groeipunt MTS (NC)

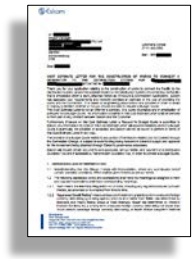
2019
- Upington MTS (NC)
- Upington-Nieuwehoop 400 kV line (NC)
- Ferrum-Nieuwehoop line (NC)
- Gromis-Oranjemond 400 kV line (NC)
- Pinotage MTS (WC)
- Everest-Merapi 400 kV line (FS)
- Ngwedi MTS (NW)

2018
- Grassridge-Dedisa 132 kV line (EC)

2017
- Spitskop MTS (L)
- Borutho MTS and 400 kV lines (L)
- Kusile integration (Mp)
- Kronos MTS (NC)
- Aries-Nieuwehoop 400 kV line (NC)
- Vuyani MTS and 400 kV lines (KZN)
- Gamma-Kappa-Sterrekus 765 kV line (WC)

2016
- Thuso MTS (Gau)
- Medupi integration (L)
- Mercury-Mookodi-Ferrum 400 kV line (NW)
- Kappa 765/400 kV MTS (WC)
- Gamma-Kappa 765 kV line (WC)
- Gamma 765 kV Sw/S (WC)

Challenge 2: Getting access to the grid



Apply for CEL

Receive CEL

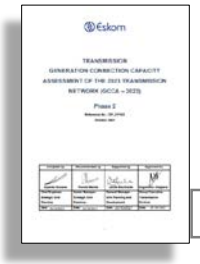
Bid project

Preferred bidder; Accept CEL and request BQ

Accept BQ; Financial Close

GCCA published

RFP/RFB



GCCA published

Ideal

0-30 days

> 30 days

< 90 days

TDP commits to unlocking constraints in GCCA, with clear funding mechanisms

Committed

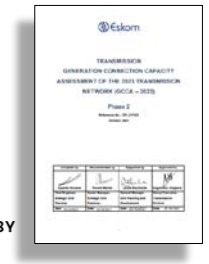
90-120 days

Valid for 12 months but not reserved

apacity reserved?

Worst case

GCCA published



> 180 days

~ 12 months

Non PBs still have "valid" CELs

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Opportunities & the Way Forward

The opportunities for solar remain fantastic!

- The grid has plenty of short-term capacity in previously-undeveloped provinces.
- Developments in high-resource areas will still be favoured long-term, once grid is unlocked.

Reliability of the grid is in everyone's best interests

Grid Codes will need to adapt to developments on the system – higher penetration of RE will likely require more onerous technology capabilities

The industry needs to work together as a community to achieve holistic success:

- Remembering that strengthening the grid to unlock high resource areas is better for everyone than incentivising development in lower-resource areas with available grid capacity
- Finding appropriate funding mechanisms for large, forward-looking Transmission grid projects
- Filling the gaps left by decommissioned thermal generation

Generation projects will need to be resilient to progress delays while grid is being unlocked

Thank you!

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