ENERGY COUNCIL OF SOUTH AFRICA

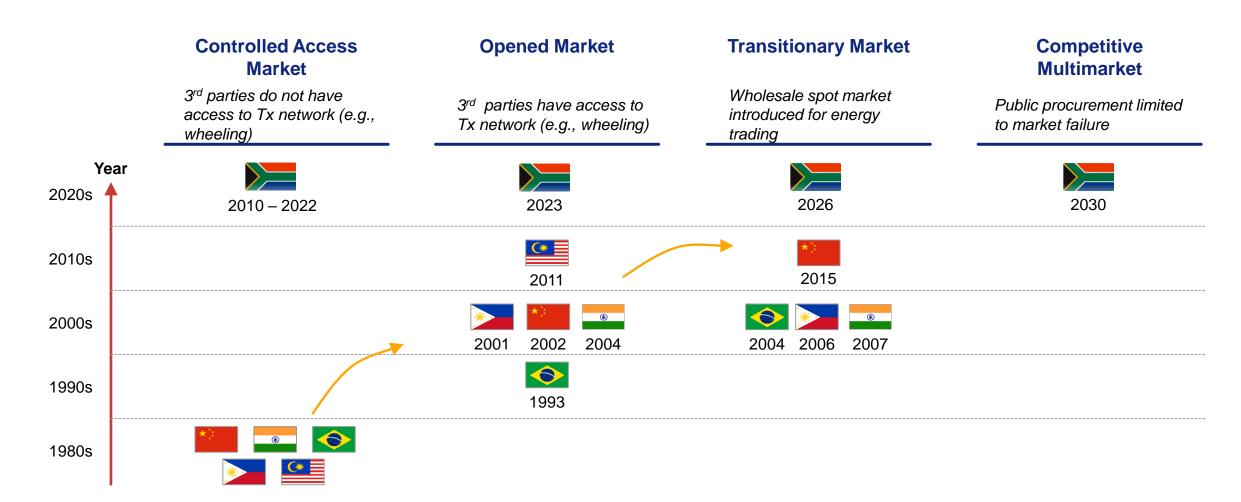
Operation Vulindlela Discussion



ENERGY COUNCIL

SA electricity market reform is 10-15 years behind peers





Note: Regulatory progression doesn't follow South Africa's exact steps, e.g., Malaysia introduced a single buyer model, but it does show the high-level progression

Source: National regulators, press search

Market reform was initiated by removing generation license threshold, but further reform needed to prevent two-tiered market



New generation capacity procurement

Controlled Access Market

3rd parties do not have access to Tx network (e.g., wheeling)

Prior to 2021

Opened Market

3rd parties have access to Tx network (e.g., wheeling)

2021 to ~2025

Transitionary Market

Wholesale spot market introduced for energy trading

~2025 to ~2030

Competitive Multimarket

Public procurement limited to market failure

~2030 and further



 Ministerial determinations inline with IRP Ministerial determinations inline with IRP Ministerial determinations inline with IRP Ministerial determinations only for market failures¹



Self-gen, wheeling, etc.

- Not possible as gen. license required ministerial approval for IRP deviation
- Private capacity can be installed at scale as gen. license not required
- Private capacity can be installed at scale, via NTCSA spot market or bilaterals
- NTCSA operates fair market that provides price signal to attract private investment



Generation license threshold removal

ERA: Establishment of NTCSA as separate legal entity in Eskom

Today

ERA: NTCSA functions operational & generation prices unregulated



Today, only individuals & companies with funds can procure and access new low-cost technologies

Estimate of only 3% of households can afford rooftop solar with BESS

Embedded Generation must grow at circa 1,5GW per annum



The amended ERA seeks to achieve:

- The Bill proposes amendments to the Electricity Regulation Act, 2007 (Act 28 of 2007).
- The proposed amendments broaden the national regulatory framework for the electricity supply industry.

Competitive energy	International	Decarbonisation	Private sector
market	alignment	commitments	investment

Q2 2024

Q3 2024

Q4 2024

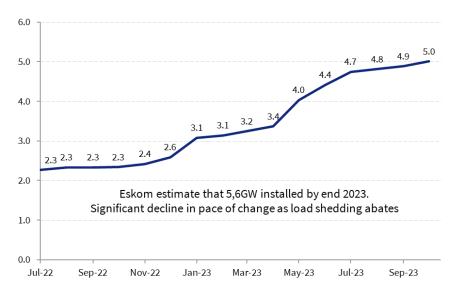
Q1 2025

Q2 2025

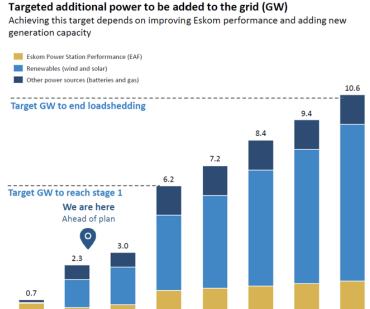
Q3 2025

Actual Growth in Solar

Installed Embedded PV Generation, July 2022 - September 2023 (in GW installed embedded generation capacity)



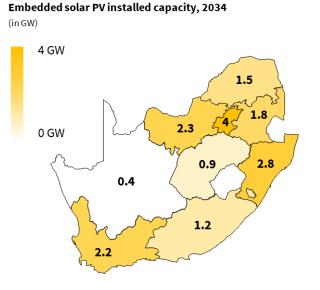
Projected 2-year Growth



Required Growth in Solar

Total embedded Solar PV target

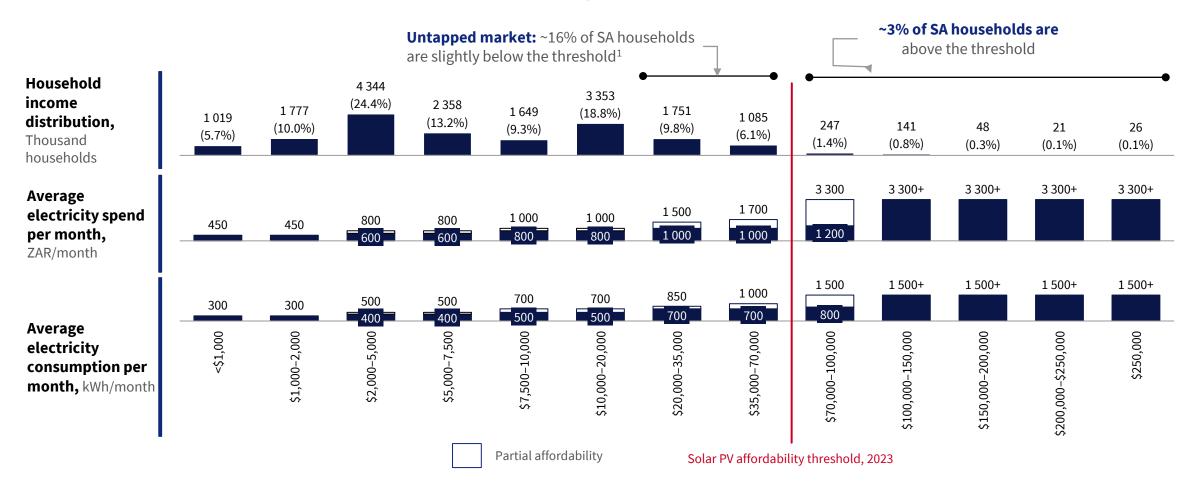
17 GW embedded Solar by 2034



Only 3% of SA households can currently afford solar PV



16% additional market could be unlocked through financial innovation



^{1.} Assumptions: Using avg. cost of R80k –R100k (\$5k - \$8k) for a 5-6 kW solar PV installation in SA. Affordability threshold is estimated at installation cost of ~10% of annual income. Estimated affordability threshold is ~R800k (~\$50k); Source: Energy Council Project Team



Need for continued policy reform



Reframing the energy debate from one of "threat" to "opportunity"



Energy Transition Roadmap (ETR) Project

Three delivery channels have emerged following detailed analysis work and member consultation



Communications

Detailed, simplified and factual information on key energy sector topics to inform and stimulate discussion



Focus areas critical to delivery

Interventions for the Energy
Council to implement in the next
two years to achieve the minimum
energy transition pathway



Platform providing data ranges and key modeling assumptions, independently benchmarked across industry role-players

and modelling

- 1. Energy as an integrated system Shifting from polarised "supply-mix" ideology to a practical, integrated system planning and delivery approach.
- 2. Our vital emissions obligations South Africa has committed to a net-zero. We are challenged by high emissions intensity and slow transition.
- 3. Our ongoing coal dependency Reliable and extended coal will be required for energy security, but decommissioning is fundamental to emissions reduction.
- 4. Bridging the transition with gas South Africa needs a balanced power system and has industrial gas needs. Indecisive planning and fossil fuel ideology have stalled the role of gas.
- 5. Scaling renewables and storage Achieving a five times increase in clean technology procurement requires total system modernisation and must deliver industrialisation and jobs.
- 6. We are moving to a market-led system –
 Energy is being decentralised but risk of market failures must be centrally planned and managed through efficient regulations.



2028–2030 highlights further energy security risk if we do not rapidly increase the speed and scale of investment



Energy growth requires over R1,8 trillion in investment through market-led structures and private-sector



Infrastructure/utility

- At least 34 GW of increased grid connection by 2030 (43 GW by 2035)
- Unbundling of Utility and related restructuring
- Modernisation and digital reform
- Municipal utility reform



Supply

- ~5 GW of RE per annum to 2035 (5 GW RE in interior by 2027. ~1,5 GW p.a. embedded RE)
- At least 5,4 GW of GtP by 2028
- At least 3 GW of BESS by 2030 (12 GW by 2035)



Demand

- At least 130 GWh p.a. of Demand Side Response by 2030
- Exponential demand outlook from electrification and Transport pivot (2–3 times growth by 2050)



Market transition

- Efficient and independent wholesale market and ancillary services market
- Reformed Regulatory functions
- Digital capability and innovative financial instruments

Note: 2023 realized 2600MW of rooftop solar, accelerated by load shedding and incentives. This is rapidly declining in 2024 with abatement of load shedding and estimate of circa 3% of households can afford rooftop solar and BESS

Source: Energy Council Project Team

Mobilising local supply chains and workforce is good for the economy and critical to delivery



+500K jobs upside from localising value chains

Potentially Potentially Potentially

• +126k jobs from transmission

Potentially +400k jobs

from localizing RE

Further modelling required to quantify job creation potential





Transmission

Lattice towers, wiring, transformers, phase conductors, insulators, optical ground wire and associated value chains

~R300 Bn





Solar

Poly silicon,
ingot/wafer, PV cells,
PV modules, balance of
system (mountings,
installation etc.) and
associated value
chains

~R480 Bn





Wind

Turbine Housing
(shafts, bearings,
gearboxes etc.), Rotors,
Towers, balance of
system (base
foundation,
installation etc.) and
associated value
chains

~R320 Bn





Battery Energy Storage Systems

Cell component production, cell manufacturing, module assembly, pack assembly, downstream integration services and associated value chains

~R150 Bn





Embedded Generation

Rooftop solar, mountings, smart inverters & meters, and other DSM components and services (incl. installation), and associated value chains

~R300 Bn





Gas-to-power and Gas supply

Gas turbines, balance
of plant (incl.
installation), gas
supply infrastructure
(pipeline networks
(control valves, FSRU
terminals etc.), and
associated value
chains

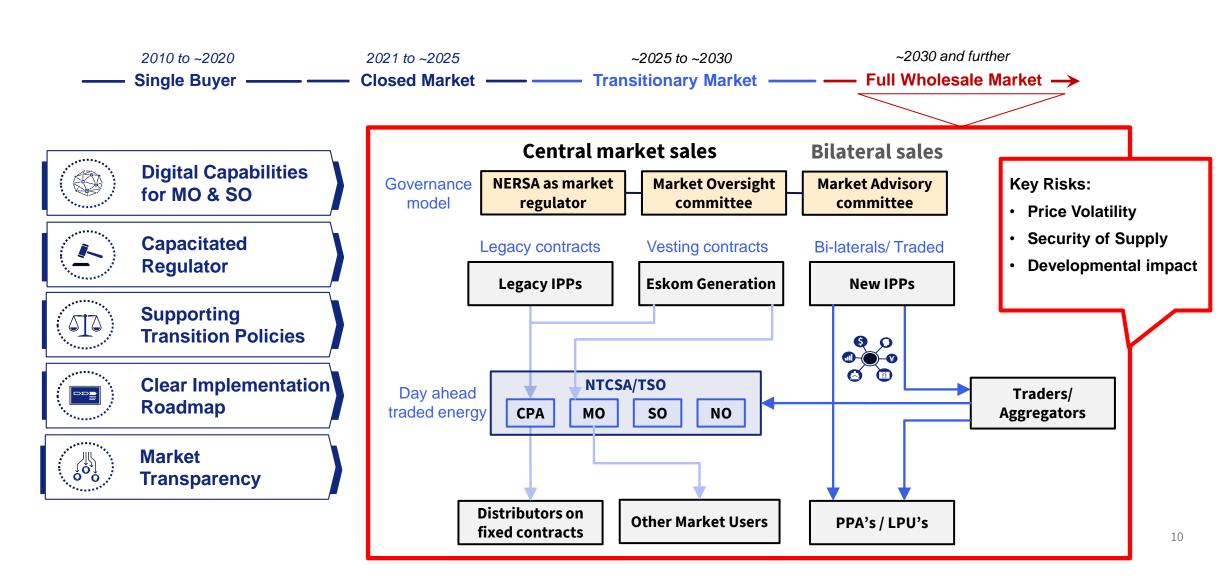
~R70 Bn

^{1.} Cost estimate for GtP only, not supporting gas infrastructure. Direct capital cost estimated at R1.6Tn excludes Source: Energy Council Plexos Model

5 success factors critical for South Africa's market reform



Market system prioritises transparency and efficiency but requires big data and high digitalisation



Thank you

