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Industry Perspective

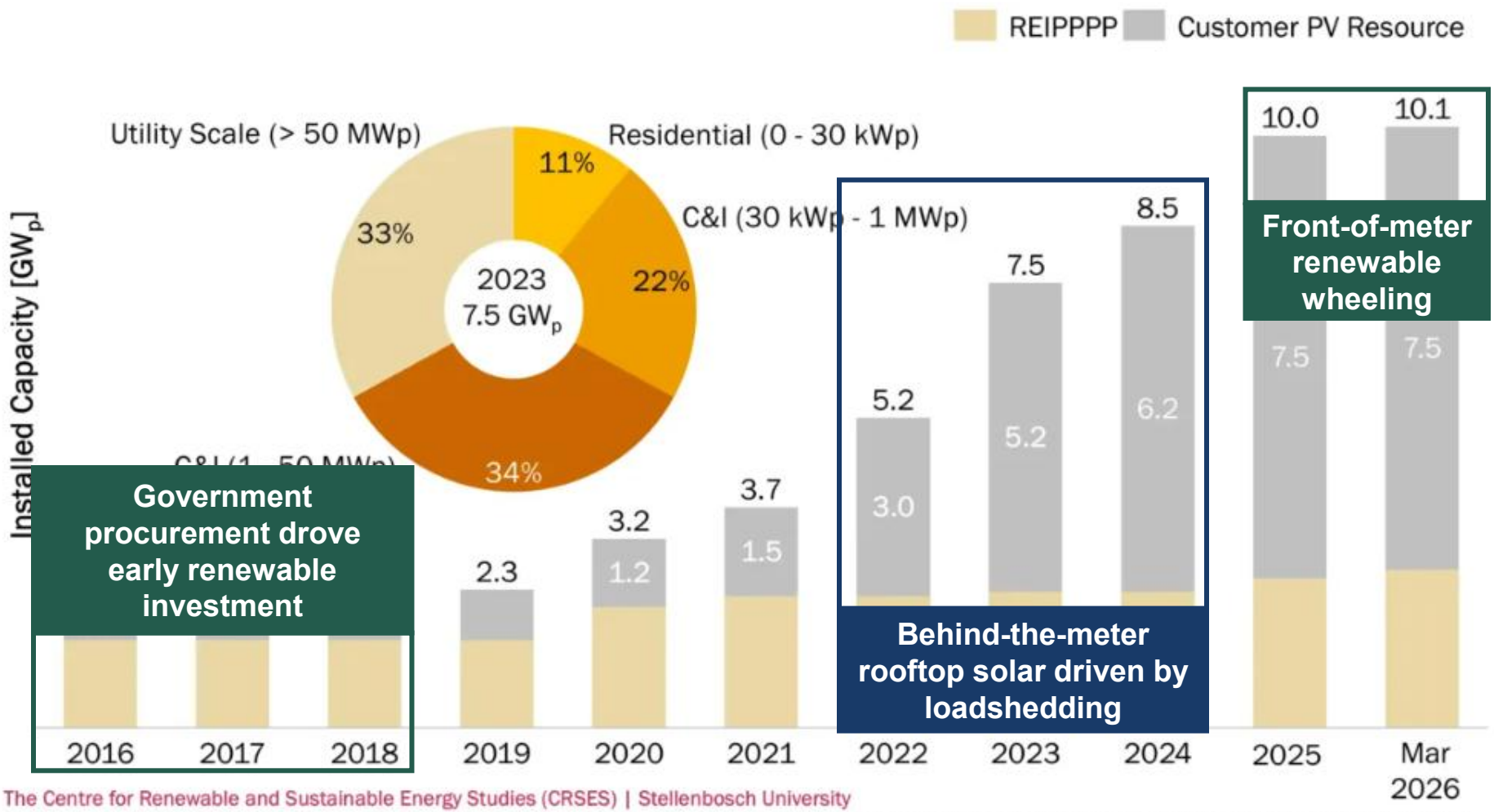
Utility Distributed Generation Training

Josh Dippenaar

25 June 2026

South African energy sector overview

South Africa's renewable energy story



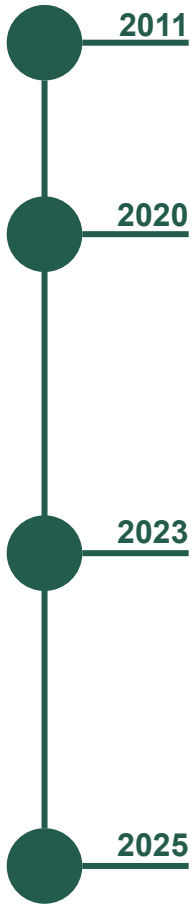
The Centre for Renewable and Sustainable Energy Studies (CRSES) | Stellenbosch University

Source: Eskom 2025b; SAPVIA 2023. **Notes:** C&I: Commercial and Industrial; REIPPPP: Renewable Energy Independent Power Producer Procurement Programme.

Government IPP procurement programs

The South African Government has run several public procurement programmes to facilitate the Just Energy Transition

REIPPPP (Renewables)	**Renewable Energy Independent Power Producer Procurement Programme** • Utility scale wind and solar PV (10 MW – 240 MW) • Highly successful and the model for other IPP programmes • Power purchase agreement was the basis for the broader market • National Treasury backed guarantee provided lenders with confidence to invest in the JET
RMIPPPP (Dispatchable hybrid)	**Risk Mitigation Independent Power Producer Procurement Programme** • Emergency procurement programme to address sever electricity shortages and load-shedding • Focus was on novel, dispatchable, hybrid energy solutions – combining gas, solar, wind and battery storage
BESIPPPP (Battery Storage)	**Battery Energy Storage Independent Power Producer Procurement Programme** • Utility scale battery energy storage, typically lithium-ion and related technologies • Store excess electricity and discharge it during peak demand to stabilise the grid and support renewable energy integration • Compensated as a “capacity payment”, where projects are paid based on availability to provide grid support
GASIPPPP (Gas)	**Gas independent Power Producer Procurement programme** • Dispatchable gas generation, which can complement renewables, discharging in period of low solar/wind generation • Designed to support the development of a domestic gas market and enable generation from LNG
ITPPP (Transmission)	**Independent Transmission Project Procurement Programme** • The newest programme, designed to relieve grid constraints by inviting private investment into the transmission system build out, as required by the Transmission Development Plan • Grid constraints are the biggest roadblock to the JET, hampering the development of renewable energy and storage projects



Mulilo & IPP programmes

Mulilo is an active participant in most public procurement programmes, keeping them as a core part of its business model

REIPPPP	• Mulilo has participated in REIPPPP since Round 1, with participation in nearly every round thus far
	• Several of Mulilo's operational projects were procured under REIPPPP
	• Most recently, Mulilo bid 4 projects in Round 7 – 1 wind and 3 solar PV
	  – Mulilo was successful with Middlepunt Solar PV, a 240 MW project, due to reach Financial Close in March 2026
	• REIPPPP has been affected by grid constraints as late. The lack of grid capacity in the Northern, Eastern and Western Cape Provinces has driven project development into lower resource provinces.
	  – As a result, projects have been bidding with higher prices. This has notably affected wind projects, which have not been procured since Round 5
	• Mulilo continues to keep REIPPPP as a core part of its business model, with intentions to participate should further rounds be announced

RMIPPPP	• Prior to acquisition by CIP, Mulilo participated in RMIPPPP, successfully bidding 2 projects • The projects were carved out of the CIP acquisition and thus do not form part of Mulilo's current portfolio

BESIPPPP	• Mulilo is one of the most successful BESS IPPs in the South African market, having successfully bid:
	  – 3 projects in BESS BW1 with EDF, currently under construction
	  – 5 projects in BESS BW2, due to reach Financial Close in 2026
	  – 4 Projects in BESS BW3, due to reach Financial Close in 2026
	• Mulilo sees the BESIPPPP programme as a vital part of South Africa's future, by shifting non-dispatchable solar generation to peak load times and relieving grid constraints

ITPPP	• Mulilo bid into the pilot programme of the ITPPP, but was not appointed as a pre-qualified bidder • Successful bidders required extensive Independent Transmission Project experience, while retaining the typical IPP programme 49% South African ownership requirement • Mulilo considers the ITPPP a key avenue to bolster the South African grid and reduce reliance on Eskom to expand transmission infrastructure

Mulilo & the private market

Given the infrequency and challenges associated with REIPPPP and BESIPPPP, Mulilo also actively participates in the private energy market, through various avenues

Large energy users	• Large energy buyers in South Africa procure renewable energy because it offers a saving/discount relative to Eskom's tariff structure and meets emission requirements • Request for Proposals (RFPs) are often issued to the market, seeking to drive competition across IPPs and drive competitive pricing • Mulilo proactively engages with buyers and shares project information and unsolicited offers as projects become available • Some buyers will request more bespoke offerings, such as hybrid (solar + BESS), or blended solutions (solar + wind), to match their load profile
Energy traders & Aggregators	• In recent years, NERSA has begun issuing trading licenses, which allow the purchase and on-selling of energy from private generators to private customers • Traders (or Aggregators) function on a many-to-many model, procuring energy from multiple generators, and selling to multiple offtakers. This model essentially decreases reliance on matching generation to load, and allows for more flexibility on the offtake side • Traders can procure energy at scale and term (20-year PPAs), given certain offtake guarantees they put in place, which provides comfort to lenders and IPPs • Traders cater to more flexible energy offerings and smaller/mid tier customers, as many IPPs are not structured to facilitate multiple PPAs
SAWEM	• The South African Wholesale Energy Market is due to launch in 2026, and will allow generators additional flexibility to allocate energy • On the market, generators will be able to sell energy at a price set by the market on an hourly basis (“the system marginal price”), which should represent the true value of the energy at that particular moment, rather than a price prescribed by a Power Purchase agreement which may be higher or lower than the value the energy actually represents • IPPs may be able to reach Financial Close on projects with unallocated capacity, banking on the cash flows from selling the energy on the open market • Mulilo is currently preparing to integrate the market into its business model, although the extent of this integration remains to be seen

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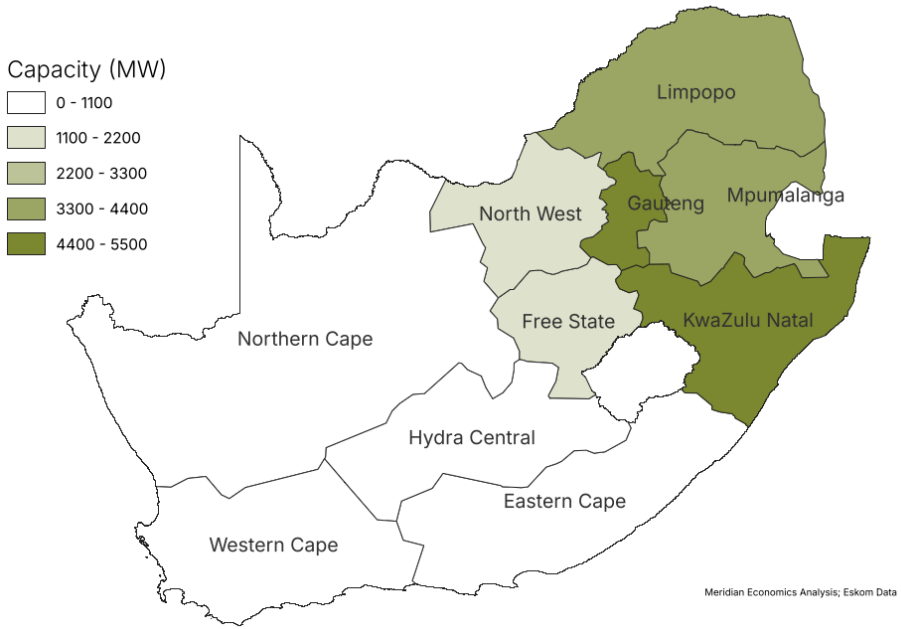
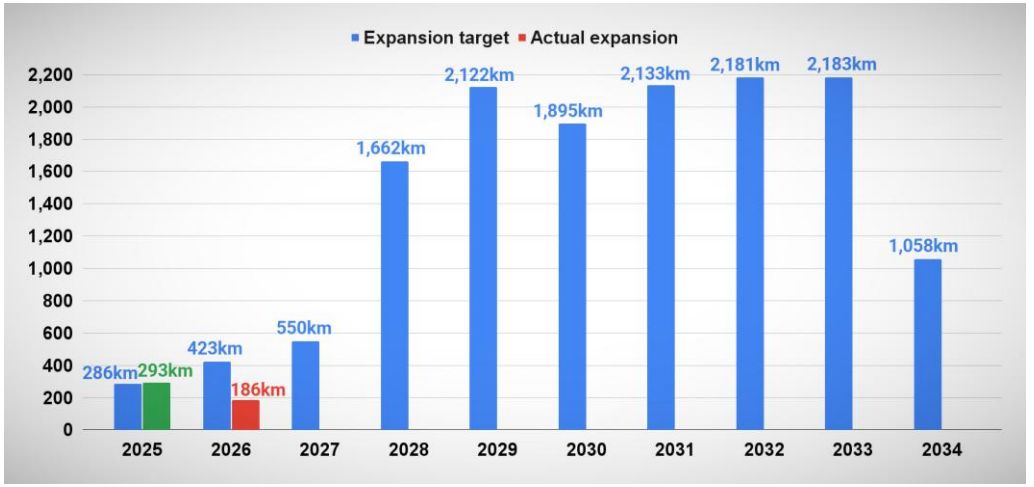
The grid as a major bottleneck

Grid capacity is and will continue to be the main constraint to new generation

Only poorest renewable resource areas have grid available





Source: Meridian Economics, My Broadband

Indicative renewable energy project development timeline

Section	Phase / approval	Lead institution	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Predevelopment	Site identification and feasibility	Developer							
	Environmental screening	DFFE							
	Pre-application meetings	DFFE, DWS, Eskom, municipality							
Environmental	EA for REDZ/SIP (basic assessment)	DFFE							
	EA – standard basic assessment	DFFE							
	EA for SIP (full scoping + EIA)	DFFE							
	Full EIA and EA (>20MW / non-REDZ)	DFFE							
	EIA appeal (if lodged)	DFFE							
	Heritage impact assessment	SAHRA							
	Biodiversity/specialist assessment	Provincial authority							
	Water use licence	DWS							
Land use	Land acquisition and rights	Local govt, DALRRD, DPWI							
	Section 53 consent (mining land)	DMPR							
	Civil aviation obstacle consent	SACAA, ATNS							
	Astronomy management clearance	Dept of Science and Innovation							
	Weather services clearance	SA Weather Services							
Grid connection	Grid access application (Eskom GAU)	Eskom / NTCSA							
Financial close	Legal close (PPA with off-taker)	IPP, off-taker							
	Financial close (lender due diligence)	Lenders							
Construction	Municipal consents (building, fire, waste)	Local government							
	Transport permits (wayleaves, abnormal loads)	Provincial roads / Sanral							
	Construction (solar 18–24m / wind 24–30m)	EPC contractor, Eskom							
	Commissioning and grid synchronisation	Eskom / NTCSA							

Source: Krutham, Back to Basics paper

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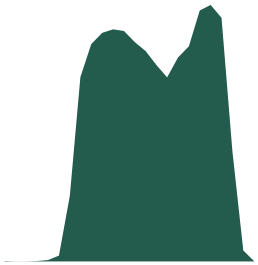
How we think about solar-BESS hybrids

Solar-BESS hybrid design

DC-AC ration and BESS capacity fundamentally impact the generation profile

Scenario description	Optimised for highest savings	Optimised for lowest tariff	Market standard hybrid	Night-time supply
DC-AC ratio	2.1	1.8	1.4	2.1
Storage capacity (hours)	4h	2.3h	2.3h	8h
Year 1 yield (GWh)	1,118	961	820	1,135
Capture price / savings (R/kWh)	1.80	1.69	1.79	1.62
Average day generation profile				

My research emerging from the SSEG Program

Publications

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Josh A. Dippenaar *, Bernard Bekker

Department of Electrical Engineering, Stellenbosch University, Stellenbosch 7600, South Africa

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Josh A. Dippenaar *, Bernard Bekker

Department of Electrical and Electronic Engineering, Stellenbosch University, Stellenbosch, 7600, South Africa

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Full-length article

A synthesis of distributed energy resource impacts and regulatory responses with a focus on soft law

Josh A. Dippenaar [a,*], Bernard Bekker [a], Kevin Foster [b], Megan Davies [b]

[a] *Department of Electrical Engineering, Stellenbosch University, Stellenbosch, 7600, South Africa*
[b] *Centre for Sustainability Transitions, Stellenbosch University, Stellenbosch, 7600, South Africa*

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Managing the Revenue Impact of Distributed Generation: Lessons from South Africa's Thriving Market

Joshua Dippenaar[1], Bernard Bekker[2]
[1,2] Department of Electrical and Electronic Engineering
[1,2] Stellenbosch University
[1,2] Stellenbosch, South Africa
[1] joshdippenaar@gmail.com

The impacts of DG uptake by penetration level

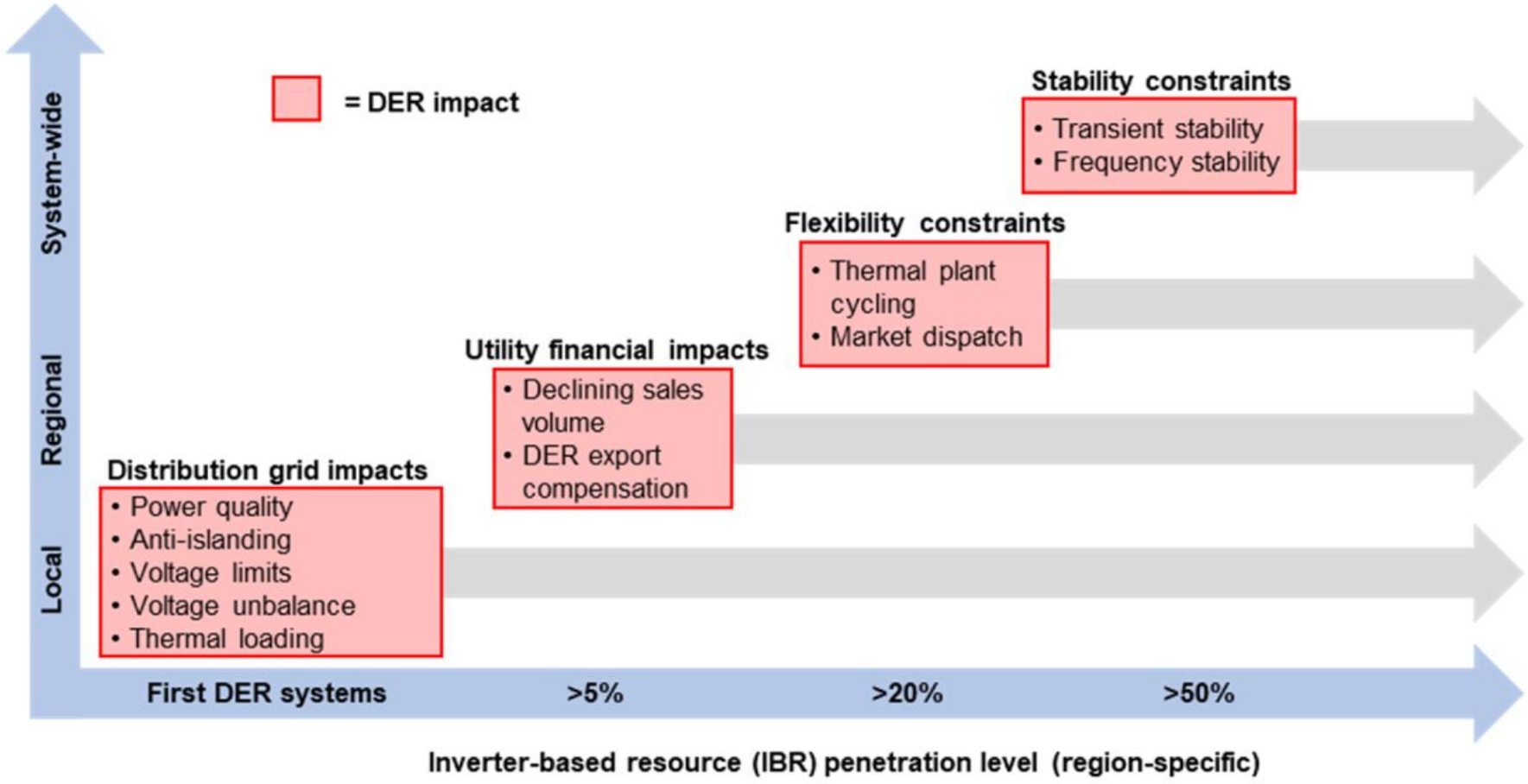
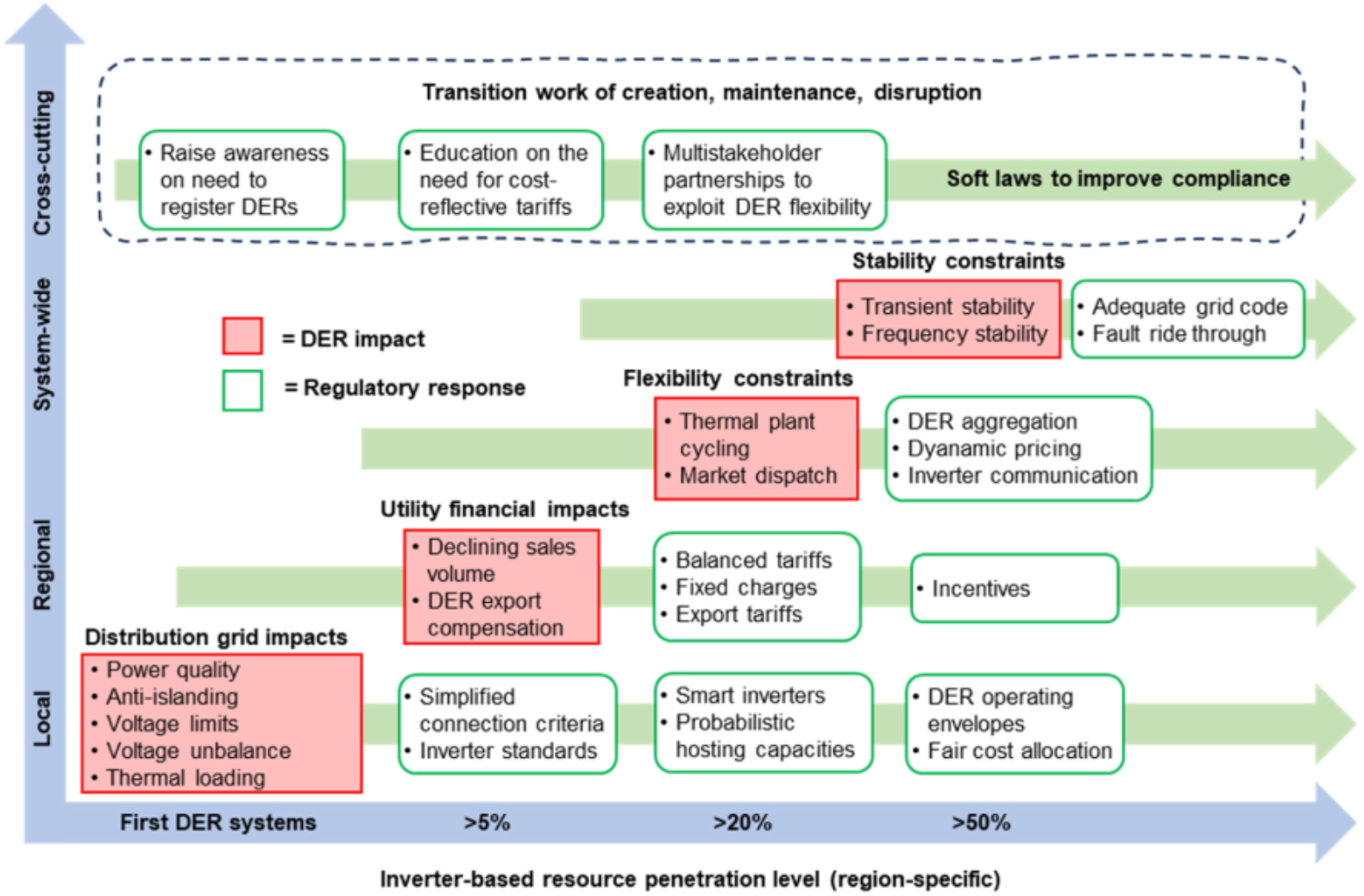
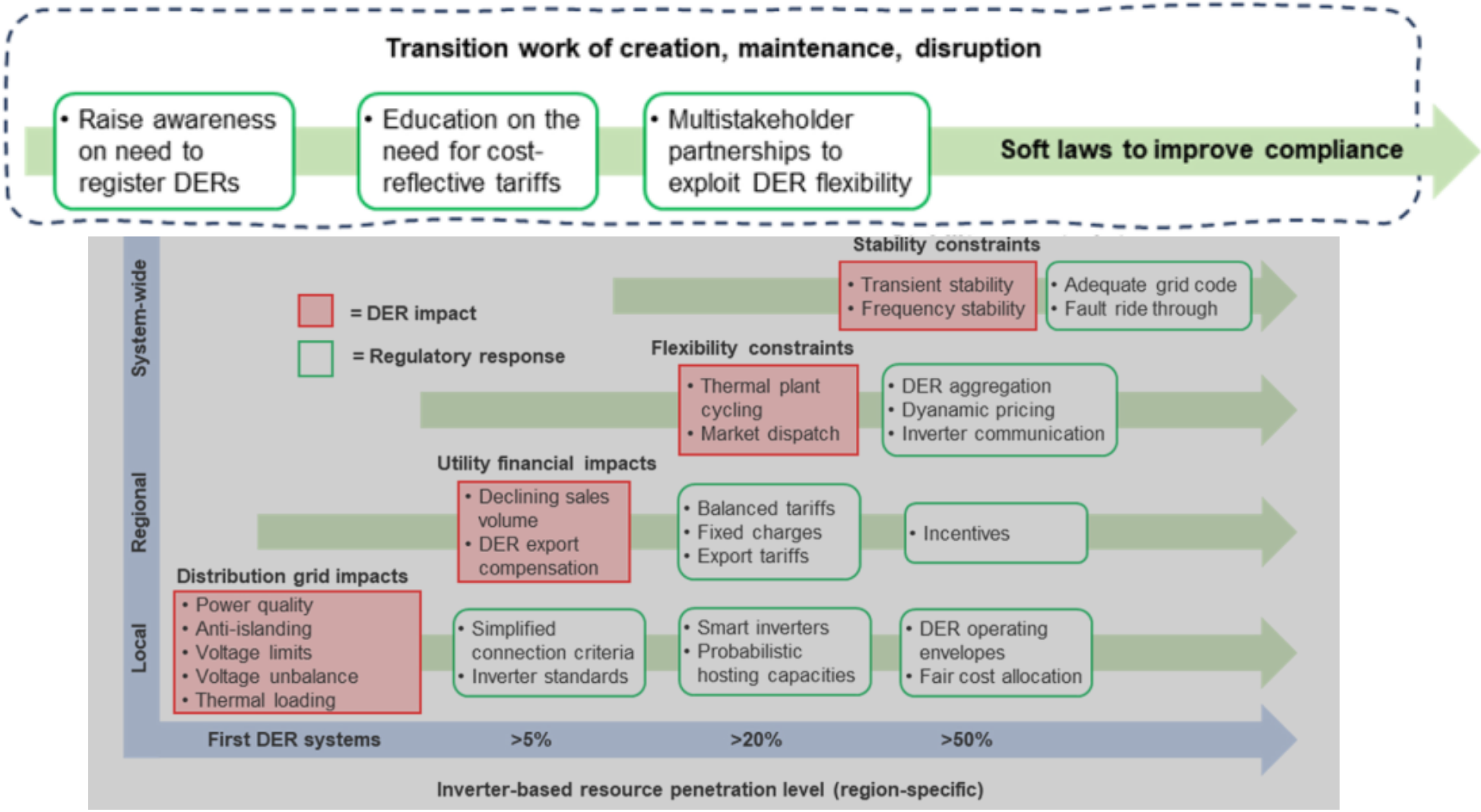


Fig. 2. Summary of DER impacts and the penetration level at which each impact typically occurs.

Regulatory responses to each DG impact



Soft law approaches must underpin regulatory response to DG in the African contaxt



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Headquarters
Portside, 21st Floor,
5 Buitengracht St,
Cape Town City Centre,
Cape Town, 8001, South Africa
Tel +27 (0) 21 685 3240
info@mulilo.com