



Western Cape
Government

FOR YOU

CABINET MEETS BUSINESS

The Western Cape's Drive for Energy Resilience

23 August 2022

Introductory comments

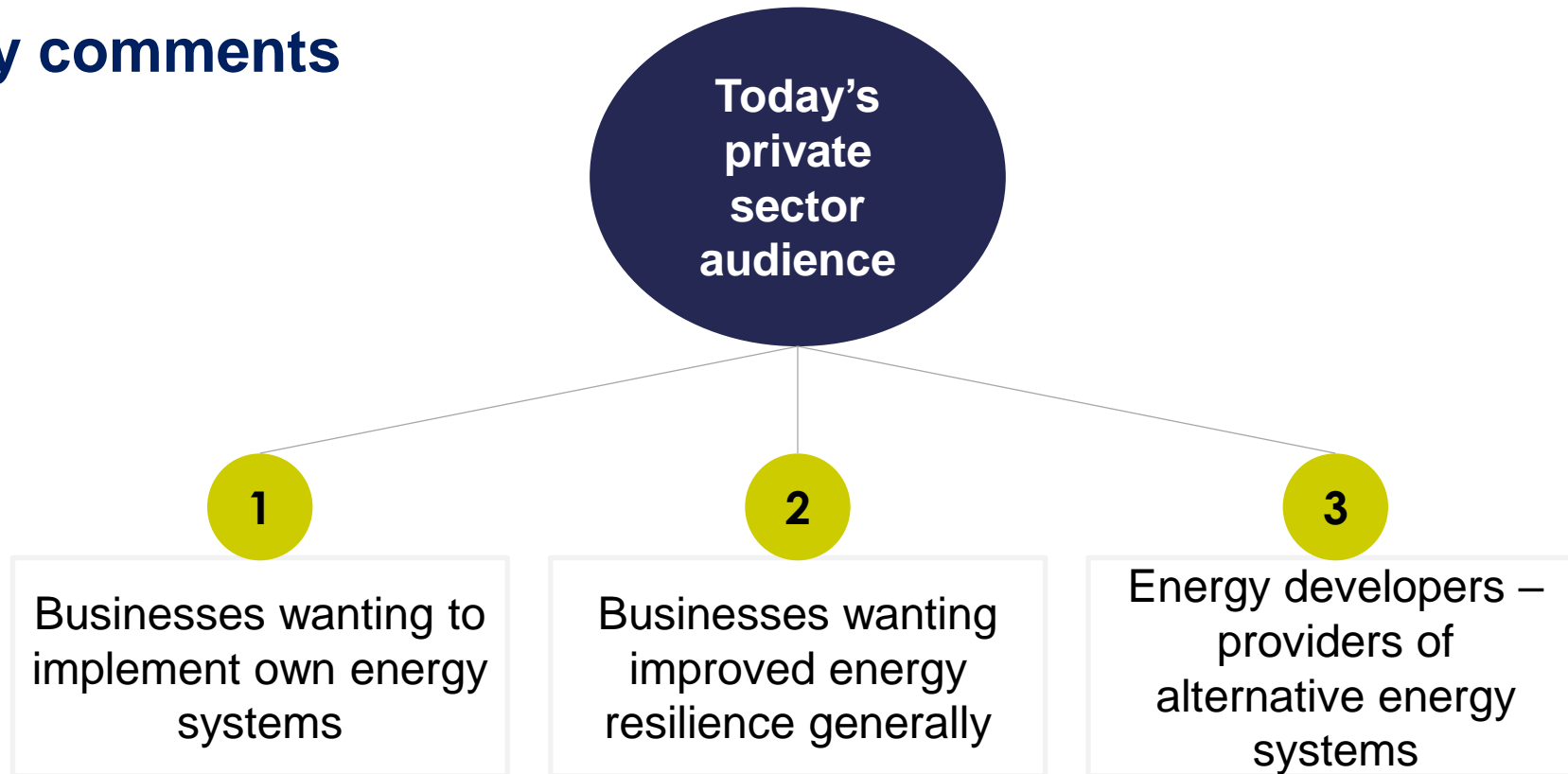
Energy continues to be a crisis in South Africa:

- This is **not a simple crisis** to resolve
- The situation will **not be resolved quickly**
- The solutions lie in a **complete overhaul of the power sector**, which is underway – including unbundling of Eskom & increasing diversification & decentralisation
- The regulatory, process & other **changes needed are radical** & are happening at an **unprecedented rate**



Energy resilience – energy security, affordability & lower carbon

Introductory comments



Key points for discussion:

- Alternative energy systems connected to grid or off-grid
- Financing of projects & infrastructure
- Collaborative solutions – private & public sector
- Effecting change beyond WC – working with National & other provinces

Context

What is the problem? Eskom outlook

The energy security and reliability future continues to look severe

1. Have had more load shedding in the 1st 6 months of 2022 than the whole of 2021
2. The likely scenario indicates that **stage 1 or stage 2 loadshedding will continue for the rest of the year** with higher stages to be expected from September onwards
3. Should **unplanned breakdowns continue**, the likely risk scenario will result in > stage 2 load shedding (i.e. a further 2000MW or more unavailable - **stage 4 & beyond**).
4. **Given age of plant, breakdowns, sabotage incidents and strike action there may be higher incident of likely risk scenario materialising.**
5. **Decommissioning of multiple Eskom coal plants by 2030 & further beyond.**

| Risk Level | Description |
|------------|---|
| Green | Adequate Generation to meet Demand and Reserves. |
| Yellow | < 1 000MW Possibly short to meet Reserves |
| Orange | 1 001MW – 2 000MW Definitely short to meet Reserves and possibly Demand |
| Red | > 2 001MW Short to meet Demand and Reserves |

| Week Start | Week | MW RSA Contracted Forecast | MW Residual Forecast | MW Available Dispatchable Capacity | MW Available Capacity (Less OR and UA) | MW Planned Maintenance | MW Unplanned Outage Assumption (UA) | MW Planned Risk Level (-14200 MW) | MW Likely Risk Senario (-16200 MW) |
|------------|------|-------------------------------------|----------------------------|---|---|------------------------------|--|--|---|
| 15-Aug-22 | 33 | 32246 | 30962 | 44812 | 30612 | 5213 | 12000 | Yellow | Red |
| 22-Aug-22 | 34 | 31621 | 30327 | 44689 | 30489 | 5336 | 12000 | Yellow | Red |
| 29-Aug-22 | 35 | 32514 | 30427 | 44346 | 30146 | 5679 | 12000 | Yellow | Red |
| 05-Sep-22 | 36 | 32005 | 29918 | 44256 | 29056 | 5769 | 13000 | Yellow | Red |
| 12-Sep-22 | 37 | 31910 | 29823 | 43771 | 28571 | 6254 | 13000 | Yellow | Red |
| 19-Sep-22 | 38 | 31548 | 29461 | 43296 | 28096 | 6729 | 13000 | Yellow | Red |
| 26-Sep-22 | 39 | 31491 | 29403 | 43533 | 28333 | 6492 | 13000 | Yellow | Red |
| 03-Oct-22 | 40 | 31580 | 29475 | 43751 | 28551 | 6274 | 13000 | Yellow | Red |
| 10-Oct-22 | 41 | 31429 | 29325 | 44404 | 29204 | 5621 | 13000 | Yellow | Red |
| 17-Oct-22 | 42 | 31228 | 29242 | 45514 | 30314 | 4511 | 13000 | Yellow | Red |
| 24-Oct-22 | 43 | 31158 | 29194 | 43819 | 28619 | 6206 | 13000 | Yellow | Red |
| 31-Oct-22 | 44 | 30831 | 28867 | 42495 | 27295 | 7530 | 13000 | Yellow | Red |
| 07-Nov-22 | 45 | 31255 | 29072 | 43682 | 28482 | 6343 | 13000 | Yellow | Red |
| 14-Nov-22 | 46 | 31613 | 29430 | 44199 | 28999 | 5826 | 13000 | Yellow | Red |
| 21-Nov-22 | 47 | 31292 | 29109 | 43527 | 28327 | 6498 | 13000 | Yellow | Red |
| 28-Nov-22 | 48 | 31015 | 28832 | 42519 | 27319 | 7506 | 13000 | Yellow | Red |
| 05-Dec-22 | 49 | 31023 | 28837 | 42346 | 27146 | 7679 | 13000 | Yellow | Red |
| 12-Dec-22 | 50 | 30633 | 28446 | 42210 | 27010 | 7815 | 13000 | Yellow | Red |
| 19-Dec-22 | 51 | 29318 | 27132 | 41285 | 26085 | 8740 | 13000 | Yellow | Red |
| 26-Dec-22 | 52 | 26867 | 24680 | 39805 | 24605 | 10220 | 13000 | Yellow | Red |
| 02-Jan-23 | 1 | 28588 | 26066 | 40380 | 25180 | 9645 | 13000 | Yellow | Red |
| 09-Jan-23 | 2 | 29704 | 27670 | 41603 | 26403 | 8422 | 13000 | Yellow | Red |
| 16-Jan-23 | 3 | 30496 | 28461 | 41966 | 26766 | 8059 | 13000 | Yellow | Red |
| 23-Jan-23 | 4 | 30174 | 28139 | 41948 | 26748 | 8077 | 13000 | Yellow | Red |
| 30-Jan-23 | 5 | 30383 | 28349 | 41980 | 26780 | 8045 | 13000 | Yellow | Red |
| 06-Feb-23 | 6 | 30997 | 29208 | 42570 | 27370 | 7455 | 13000 | Yellow | Red |
| 13-Feb-23 | 7 | 30835 | 29045 | 42370 | 27170 | 7655 | 13000 | Yellow | Red |
| 20-Feb-23 | 8 | 30909 | 29119 | 42427 | 27227 | 7598 | 13000 | Yellow | Red |
| 27-Feb-23 | 9 | 30721 | 29153 | 43105 | 27905 | 6920 | 13000 | Yellow | Red |
| 06-Mar-23 | 10 | 31153 | 29585 | 43924 | 28724 | 6101 | 13000 | Yellow | Red |
| 13-Mar-23 | 11 | 30805 | 29237 | 43355 | 28155 | 6670 | 13000 | Yellow | Red |
| 20-Mar-23 | 12 | 31014 | 29366 | 43900 | 28700 | 6125 | 13000 | Yellow | Red |
| 27-Mar-23 | 13 | 30853 | 29206 | 43260 | 28060 | 6765 | 13000 | Yellow | Red |
| 03-Apr-23 | 14 | 32219 | 30573 | 44888 | 30688 | 5137 | 12000 | Green | Red |
| 10-Apr-23 | 15 | 32493 | 30846 | 45238 | 31038 | 4787 | 12000 | Green | Red |
| 17-Apr-23 | 16 | 32984 | 31338 | 45999 | 31799 | 4026 | 12000 | Green | Red |
| 24-Apr-23 | 17 | 33668 | 32021 | 45999 | 31799 | 4026 | 12000 | Green | Red |
| 01-May-23 | 18 | 33601 | 32419 | 46716 | 32516 | 3309 | 12000 | Green | Red |
| 08-May-23 | 19 | 34531 | 33349 | 47356 | 33156 | 2669 | 12000 | Green | Red |
| 15-May-23 | 20 | 34704 | 33522 | 47356 | 33156 | 2669 | 12000 | Green | Red |
| 22-May-23 | 21 | 35031 | 33849 | 47556 | 33356 | 2469 | 12000 | Green | Red |
| 29-May-23 | 22 | 35849 | 34667 | 48074 | 33874 | 1951 | 12000 | Green | Red |
| 05-Jun-23 | 23 | 35053 | 33773 | 47578 | 33378 | 2447 | 12000 | Green | Red |
| 12-Jun-23 | 24 | 35055 | 33774 | 48093 | 33893 | 1932 | 12000 | Green | Red |
| 19-Jun-23 | 25 | 34886 | 33605 | 48073 | 33873 | 1952 | 12000 | Green | Red |
| 26-Jun-23 | 26 | 35391 | 34110 | 48408 | 34208 | 1617 | 12000 | Green | Red |
| 03-Jul-23 | 27 | 35153 | 33662 | 48001 | 33801 | 2024 | 12000 | Green | Red |
| 10-Jul-23 | 28 | 35127 | 33636 | 48001 | 33801 | 2024 | 12000 | Green | Red |
| 17-Jul-23 | 29 | 35242 | 33751 | 47921 | 33721 | 2104 | 12000 | Green | Red |
| 24-Jul-23 | 30 | 35288 | 33797 | 47978 | 33778 | 2047 | 12000 | Green | Red |
| 31-Jul-23 | 31 | 34476 | 32985 | 47442 | 33242 | 2583 | 12000 | Green | Red |
| 07-Aug-23 | 32 | 34026 | 32460 | 46945 | 32745 | 3080 | 12000 | Green | Red |
| 14-Aug-23 | 33 | 33679 | 32114 | 46364 | 32164 | 3661 | 12000 | Green | Red |
| 21-Aug-23 | 34 | 33602 | 32037 | 46936 | 32736 | 3089 | 12000 | Green | Red |

Summary of why energy resilience matters

Economic Impact & business confidence

- **GDP reduced** by 3% in 2021 because of load-shedding & results in 350 000 job losses*
- **Loadshedding costs** WC R75m /stage/day**
- **Cost of stage 6** loadshedding R400m p/d as companies' output drops to zero

Financial sustainability

- With electricity customers moving to own generation, **municipal financial sustainability** at risk unless municipalities become part of new system
- High **financial costs** (e.g. sunk costs and diesel) to address immediate electricity constraints
- Impact on consumers re **affordability** of rising electricity costs

Carbon Reduction Initiatives

- SA global rankings
 - CO₂/capita 3rd
 - CO₂/GDP 7th
 - CO₂ total 13th
- Price of **exported goods** may increase in markets that have carbon border adjustment mechanisms – reduced competitiveness & reduction of demand
- Increasing pressure in WC from multinationals & businesses in their supply chains towards **carbon neutrality**

The Western Cape's top 16 trading partners – Exports 2020

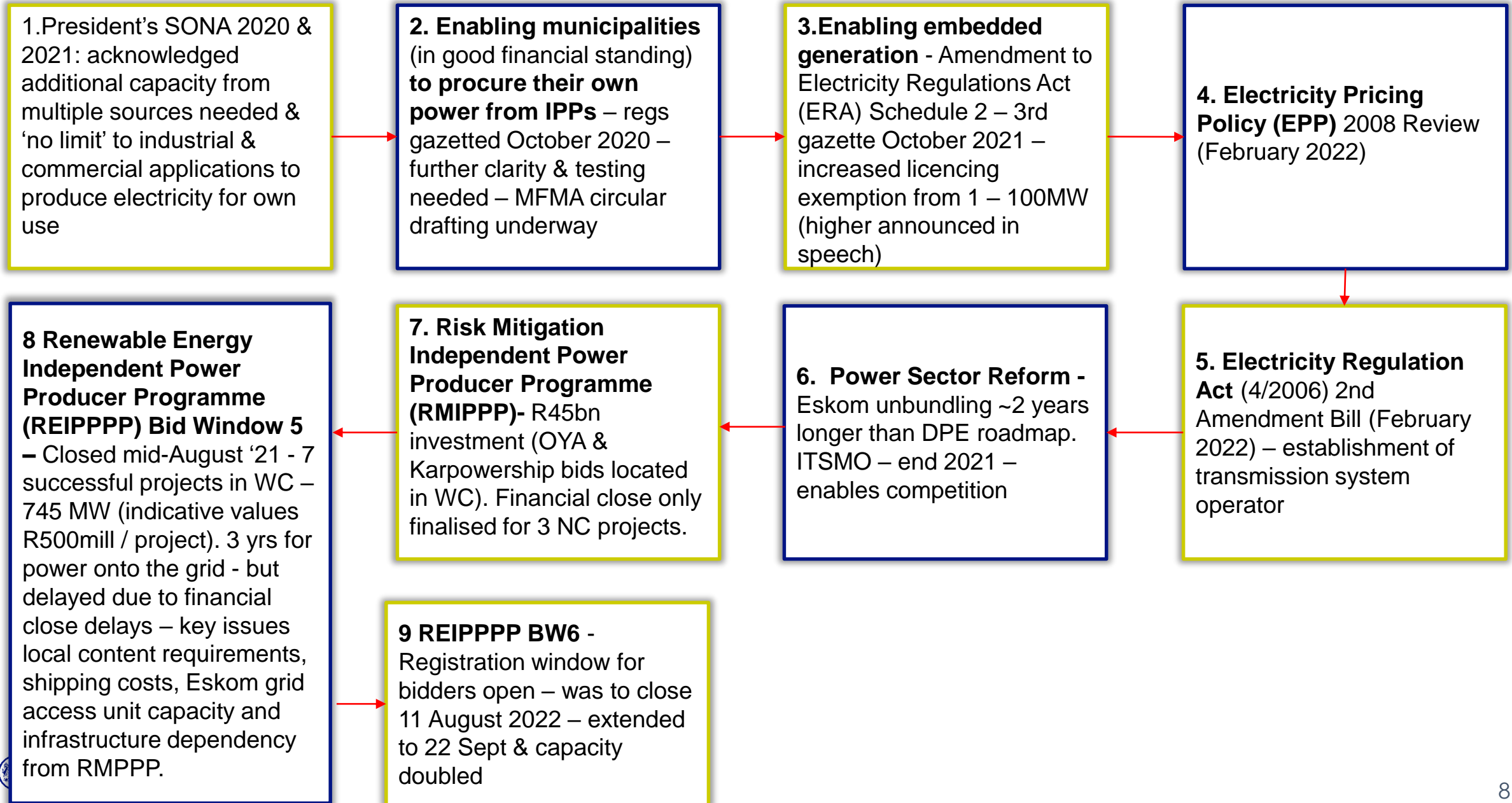
| Trading Partner | Rand value of exports | % of total WC exports |
|--|-----------------------|-----------------------|
| European Union | 42,549,561,880 | 31.1 |
| United Kingdom | 12,317,367,588 | 9 |
| United States | 10,781,109,734 | 7.9 |
| Namibia | 9,862,931,224 | 7.2 |
| China | 6,677,206,110 | 4.9 |
| Botswana | 6,641,470,040 | 4.9 |
| United Arab Emirates | 3,825,410,981 | 2.8 |
| Russian Federation | 3,410,374,592 | 2.5 |
| Lesotho | 2,836,357,290 | 2.1 |
| Canada | 2,411,403,279 | 1.8 |
| Zambia | 2,396,911,649 | 1.8 |
| Swaziland/Eswatini | 2,369,256,501 | 1.7 |
| India | 2,335,654,772 | 1.7 |
| Zimbabwe | 2,291,945,012 | 1.7 |
| Mozambique | 2,165,378,320 | 1.6 |
| Hong Kong Special Administrative Region of China | 2,104,600,849 | 1.5 |
| % of SA Total Exports | | 9.8 |

Top 6 trading partners (65%)

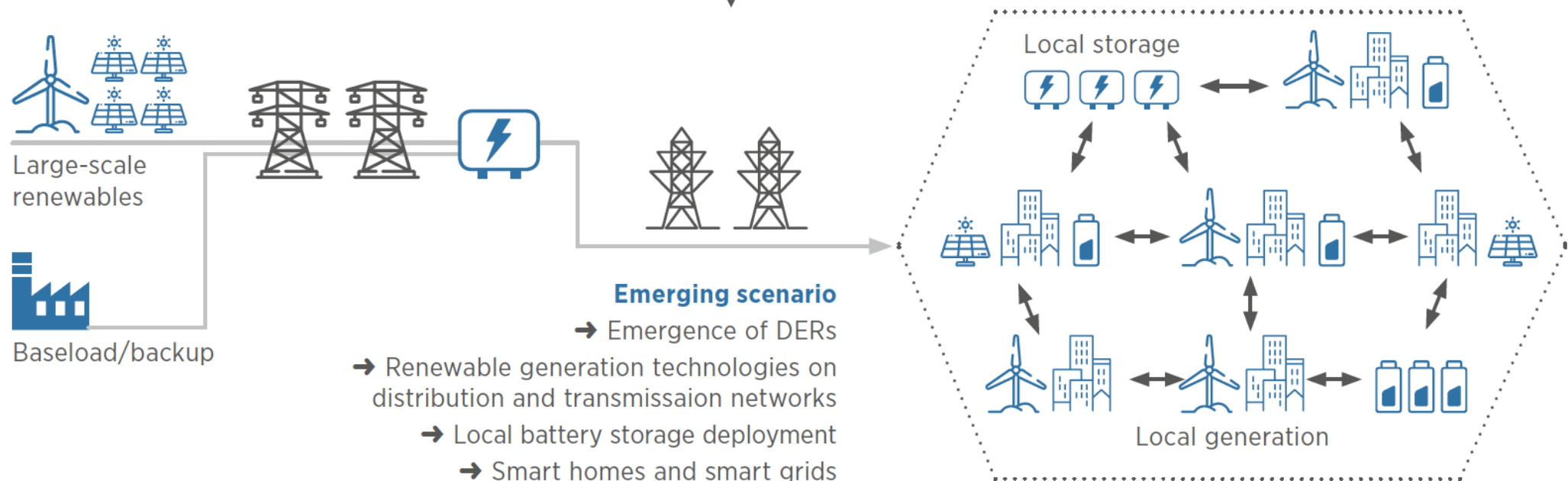
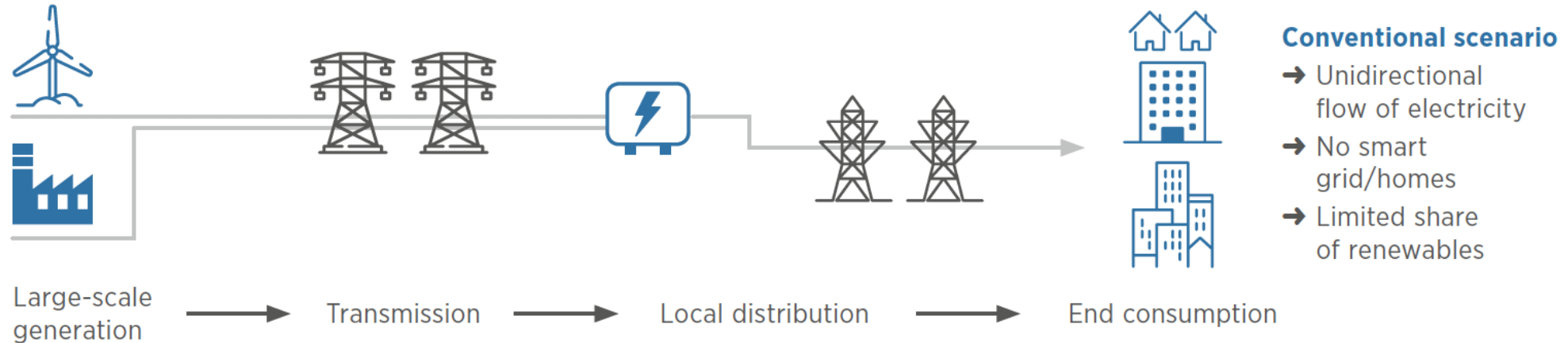
Other 10 trading partners (19.1% of exports)

4 of the WC's top 6 export markets have at least 2 carbon pricing tools

Shifts in energy structural matters & policy & regulatory since 2020

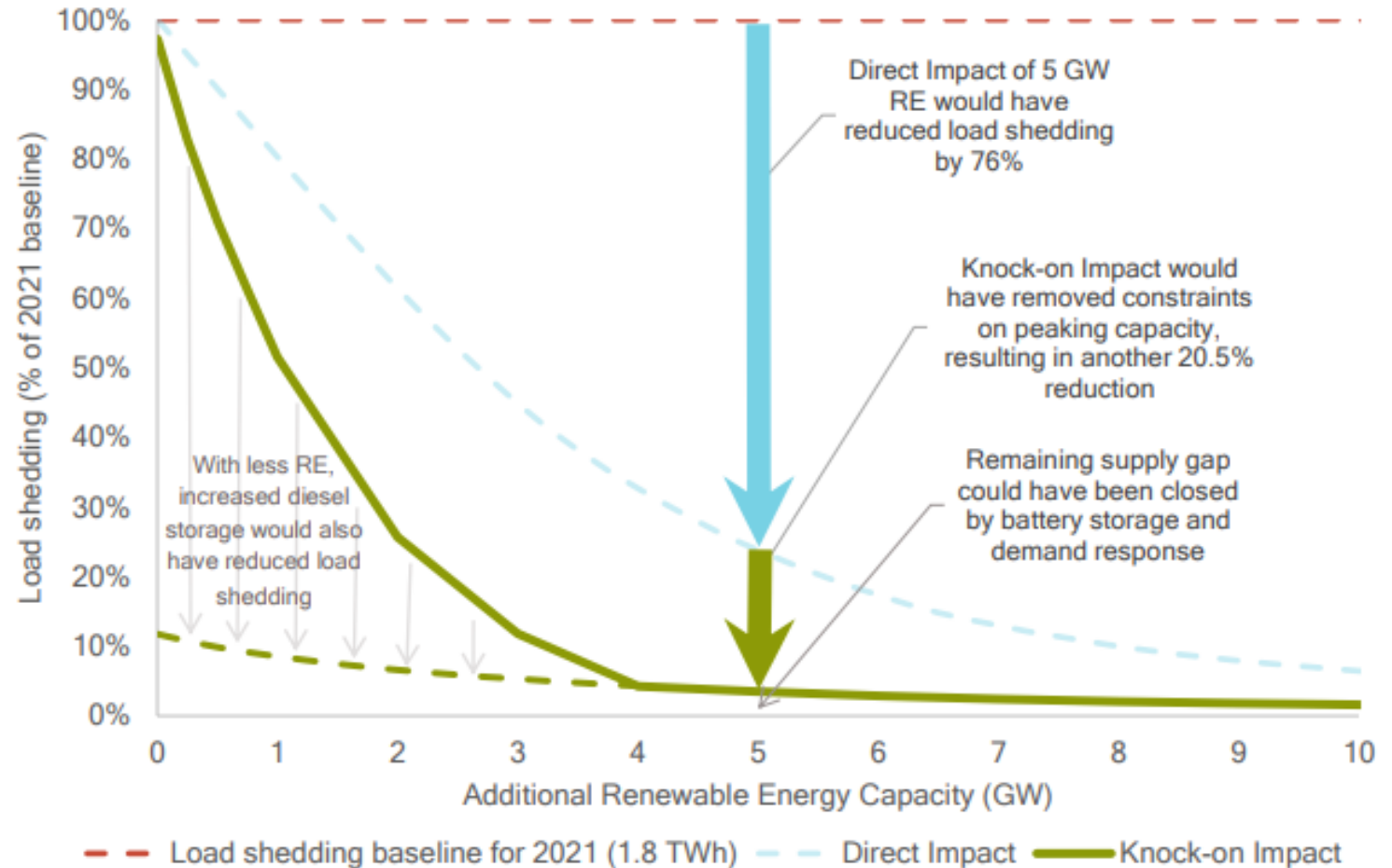


SA's traditional power system to be transformed by distributed energy resources

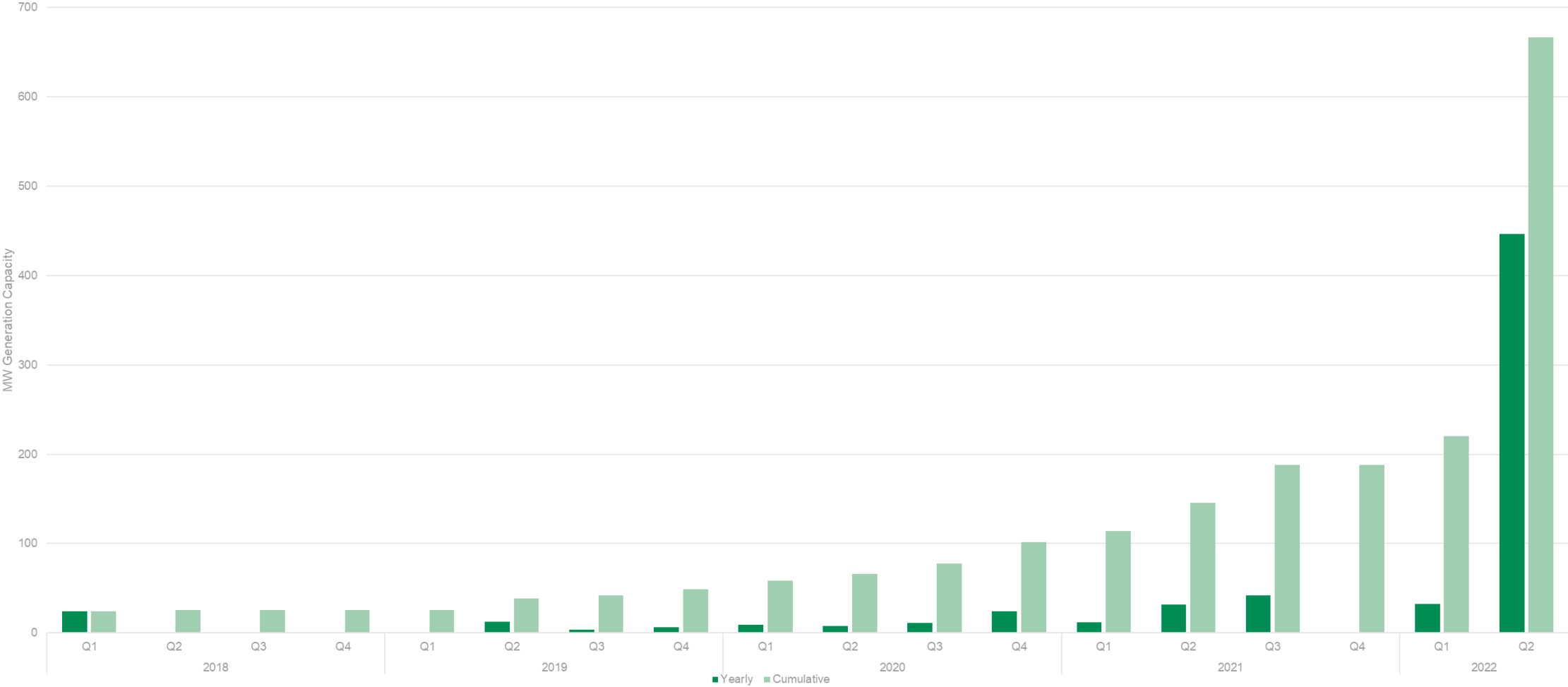


Meridian Economics analysis re resolving power crisis (June 2022)

1. **5 GW of renewables would have decreased load shedding by 96.5% in 2021** (WC 10% i.e. MER target of 500 MW)
2. These renewables would **have resulted in a R2.5 Bn cost savings for Eskom**
3. This saving, if passed through to the tariff (along with the additional sales possible), would have resulted in a **2.2 c/kWh reduction in the sale price of electricity**, based on the FY21 sales volumes & revenue.
4. The direct impact of additional renewables results in a **reduction in load shedding**, but importantly also results in **significant reduction in diesel usage** (diesel tank levels remain much higher) & generation from the pumped storage assets (**upper reservoirs remain fuller for more of the time**).



Huge increase in power generation registrations with Nersa following licensing exemptions → follow on requirements for those connecting to municipal grids



Source: NERSA Data; Collected and compiled by TIPS

Meridian Economics' national plan proposal for short-term relief from load shedding - Western Cape aims to deliver on more than its 'share'

| New Capacity | WC requirement* (proportional to energy use) | Progress in WC |
|--|---|--|
| Distributed generation in <1 MW segment | 125 MW | <ul style="list-style-type: none"> • >97.9 MW registered in WC munis in last 18 months • Continue support revision of feed-in tariffs • Streamlining registration processes (SAGEN) & reduce metering costs & intention to allow net generation (City) |
| Distributed generation in 100 MW segment | 200 MW | <ul style="list-style-type: none"> • CoCT 200 MW RFP underway • MER candidates - transaction advisory support being provided to Stellebosch Municipality – 50MW • Wheeling pilots underway (CoCT and George) – could unlock another 200 MW |
| Utility-Scale renewables | 167 MW PV 38.9 MW Wind 10.0 MW CSP | <ul style="list-style-type: none"> • 592 MW REIPPPP projects operational • 785 MW REIPPPP projects approved in BW5 • Significant WC projects expected in BW6 due to available Eskom grid capacity in WC |
| Demand Response** | 150 MW | No current information specific to WC available |
| Battery Storage | 84 MW | Eskom BESS Phase 1 – 114.5 MW (Jun '23) Eskom BESS Phase 2 – 34 MW (Dec ' 24) |
| Peaking Capacity | 150 MW | Existing Eskom capacity (Gas and Hydro) Steenbras 180 MW (CoCT) Additional supply through CoCT dispatchable RFP in 2023 |

* This is in addition to what is already completed

** Refers to a program where users can switch off demand at short notice to allow Eskom to refill reserves

Overview of the Western Cape Municipal Energy Resilience (MER) Initiative

The WCG has been driving energy resilience work for some time



SSEG (solar PV support to develop & update to all WC municipalities):

- SSEG frameworks (22 WC, 69 SA)
- SSEG feed-in tariffs (21 WC, 33 SA)
- WC work used nationally
- WC munis: 97.9 MW registered systems from December 2020 (est. only 50% of systems registered (City))



Support to drive businesses solar

PV uptake – total of 40 new businesses supported in 2020/21 & 2021/22 with technical & financial info, 20 of these with analysis of PV developer offers & follows ups to previously supported businesses. Success rate (i.e. businesses undertaking procurement of PV systems): 55% for 2020/21 & 70% for 2021/22.

>10 000 downloads of the energy & water market intelligence reports annually



Wheeling support

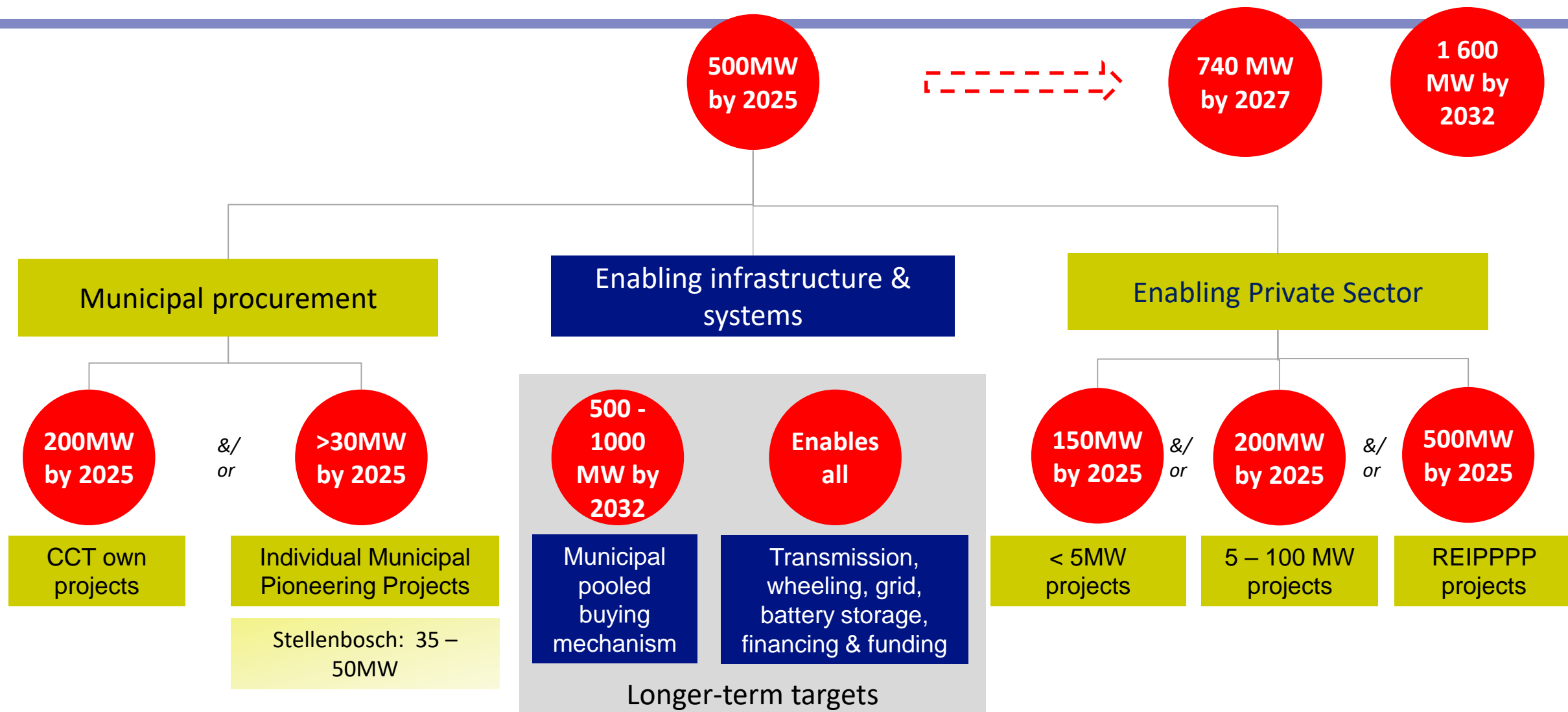
- Framework & wheeling tariff development for 7 municipalities – big interest from businesses – way of keeping on the grid & revenue for municipalities



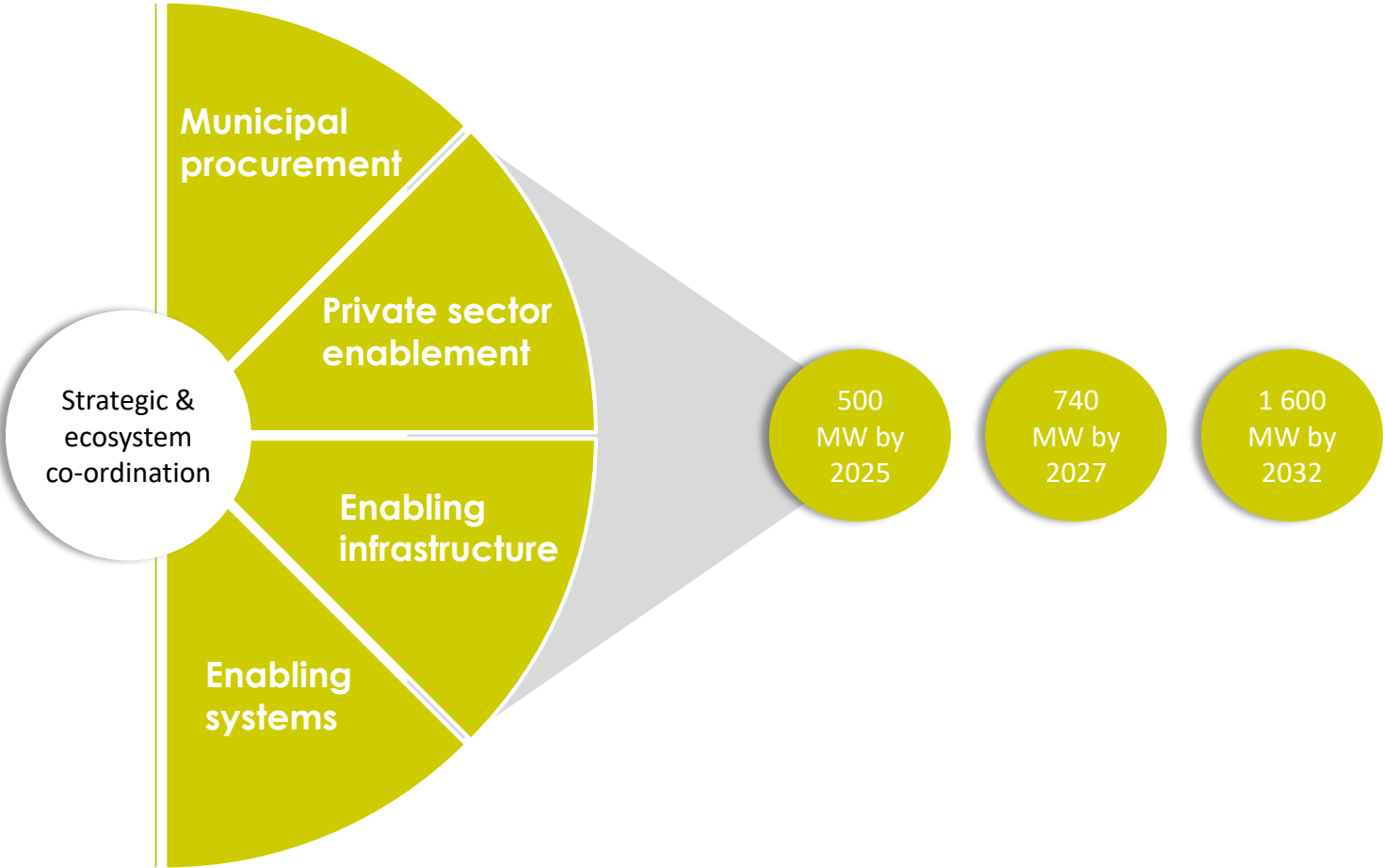
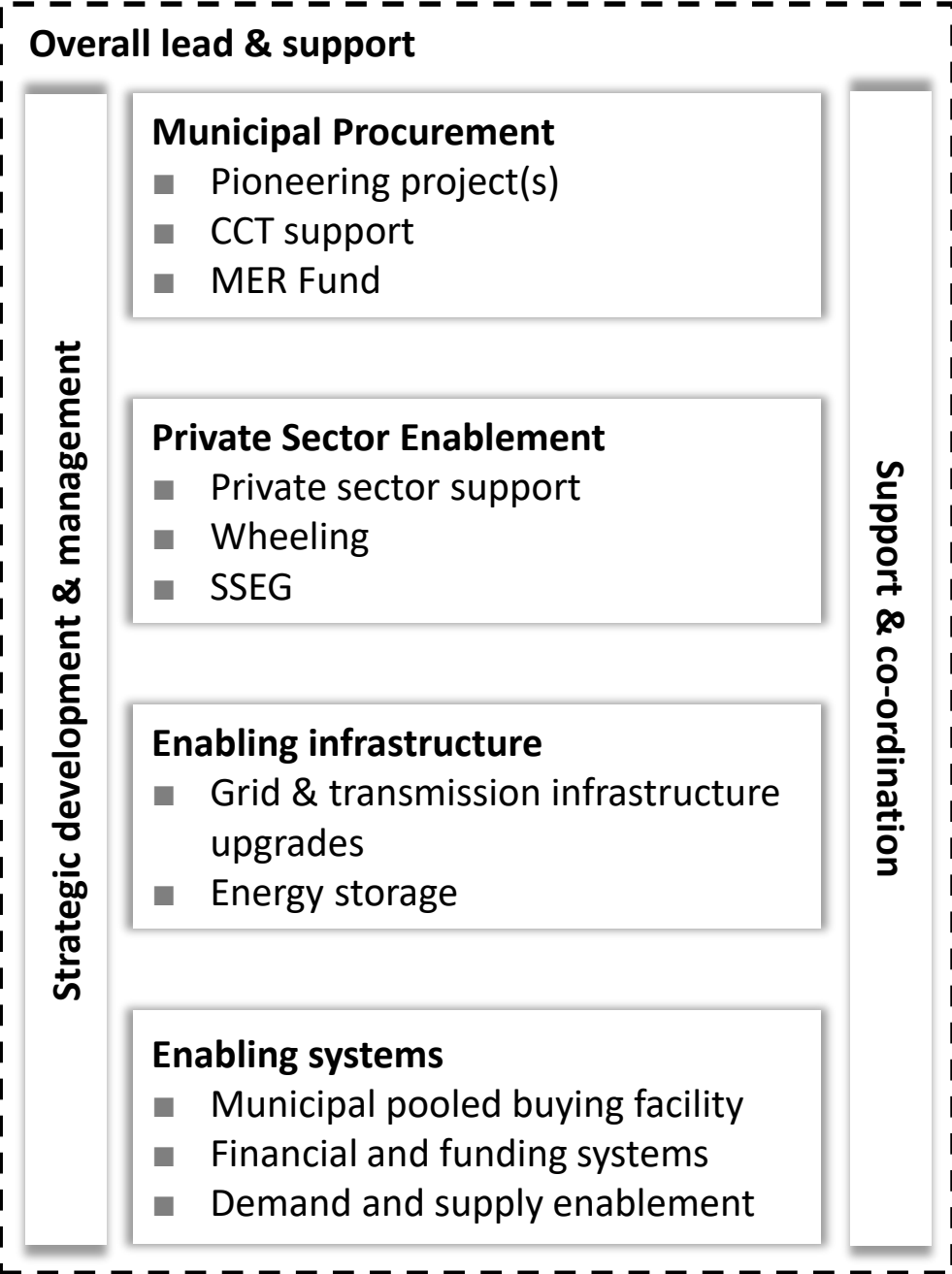
Support to green economy investors in WC:

- Establishment of the Atlantis SEZ for Greentech
- RE sector - 11 projects in WC between 2011 to 2021 -> R17.99 billion in FDI (Wesgro)
- Direct engagements

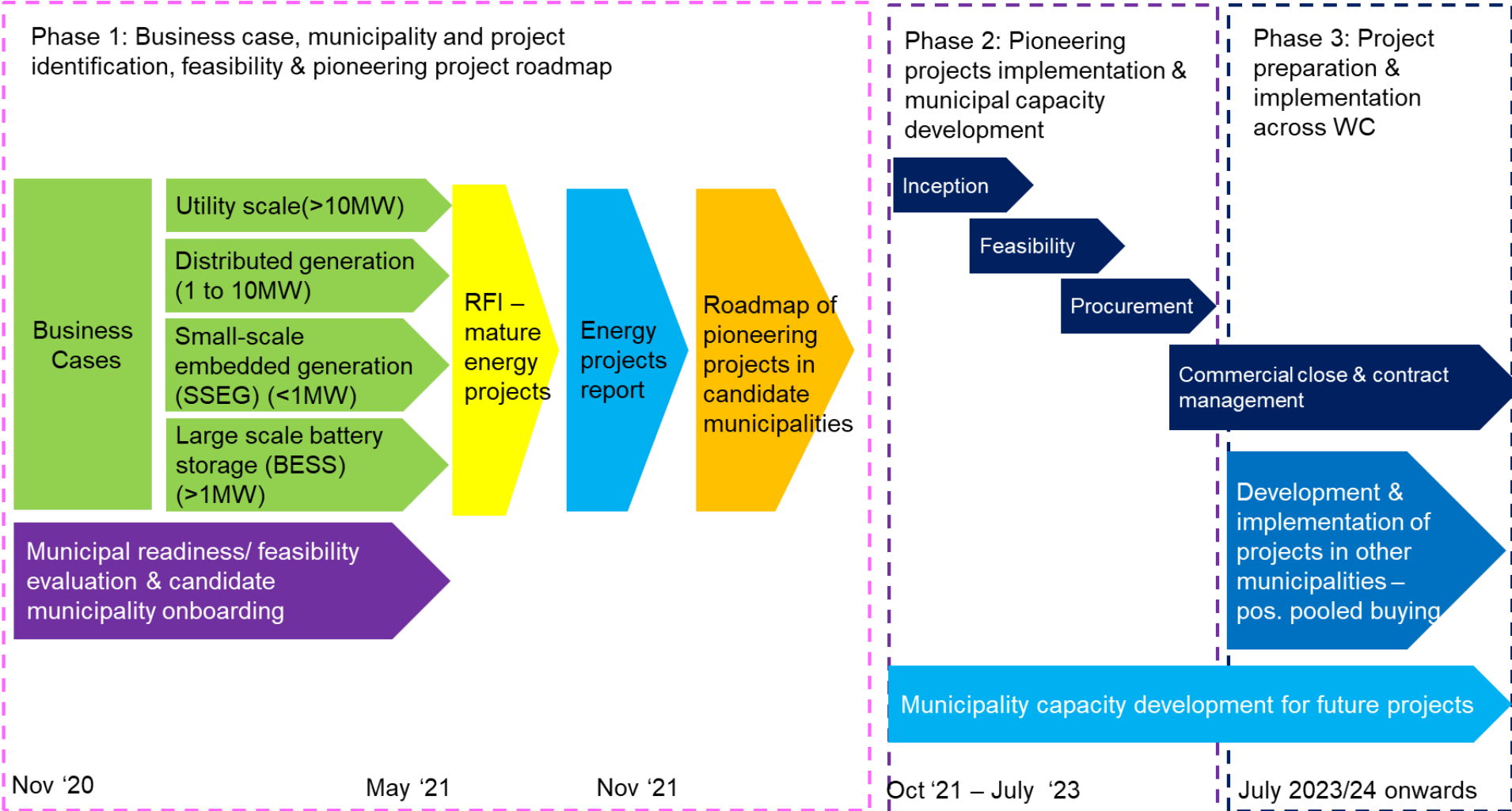
The WC Municipal Energy Resilience (MER) Initiative is aimed at reaching the 2025 target while gearing up for medium to longer term energy resilience needs & targets



Structure of MER Initiative



Municipal procurement component



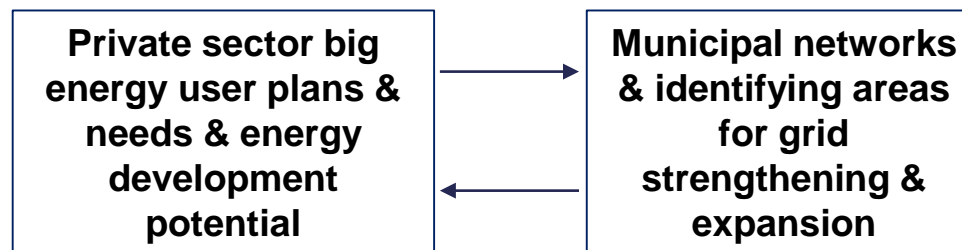
Also supports private sector enablement

Municipal Procurement: WC MER Fund – foundational energy studies for municipalities to enable private sector

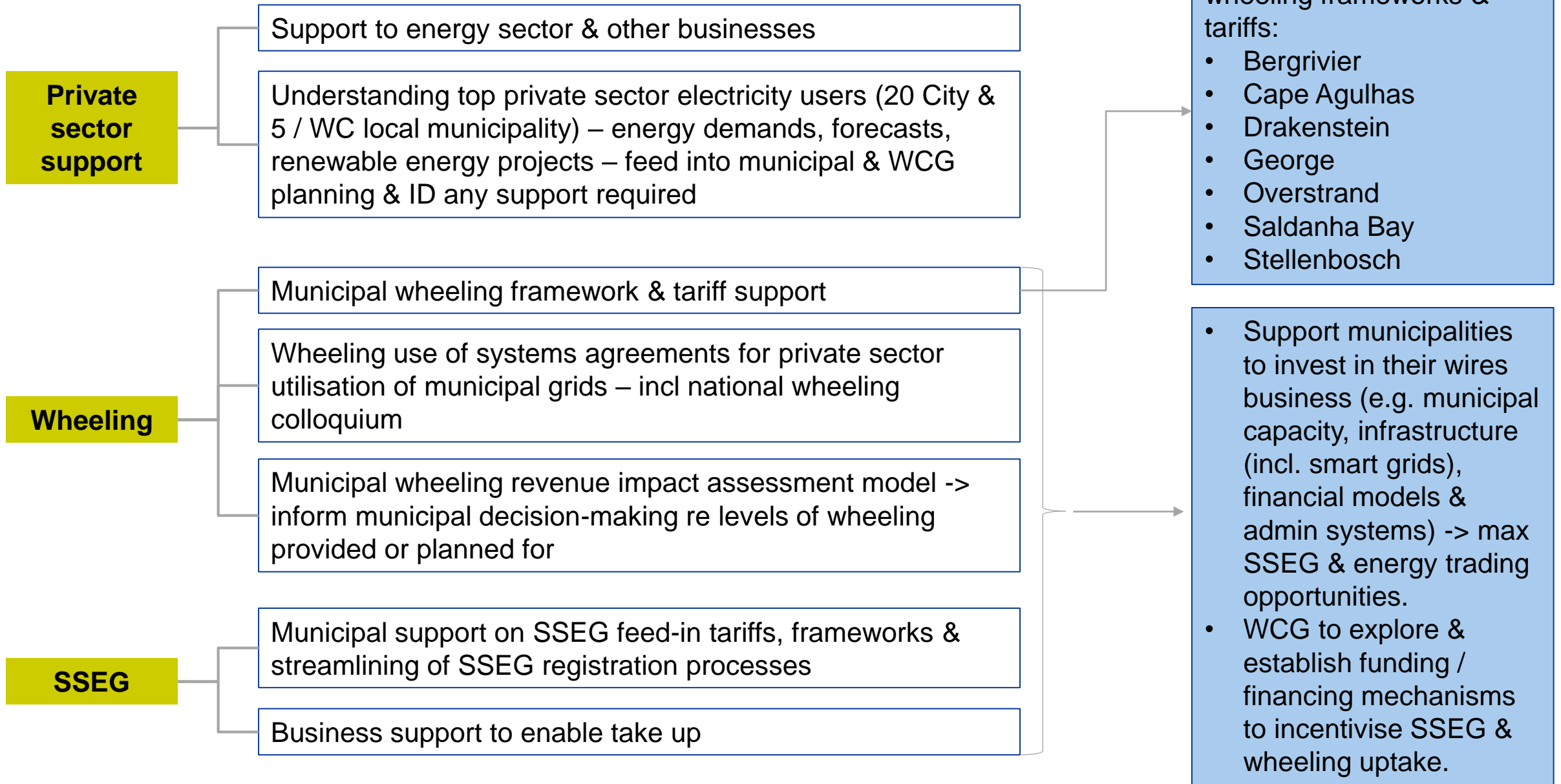
| | |
|---|---|
| Cost of Supply Study (CoSS) | To enable municipalities to move toward cost-reflective tariffs within the subsidised model towards enabling renewable energy implementation at scale. Incl. tariff application based on CoSS ready for submission to NERSA |
| Electricity Master Plan (EMP) | Mapping out the municipal electrical distribution grid to identify areas for strengthening, capacity constraints and capacity availability -> to enable renewable energy at scale. |
| Mini (local) Integrated Resource Plan (IRP) | ID preferred future pathways in the electricity sector -> allows municipality to meet forecasted demand & integrate into existing electricity network. |

| | CoSS | EMP | Mini IRP |
|--------------|------|-------------|----------|
| Stellenbosch | X | X | X |
| Mossel Bay | X | DLG FUNDING | |
| Saldanha Bay | | DLG FUNDING | |
| Overstrand | X | | |
| Swartland | | X | |
| Drakenstein | | DLG FUNDING | |
| Cape Agulhas | X | X | |
| George | | X | |
| Witzenberg | X | X | |
| Bitou | X | X | |

Next step

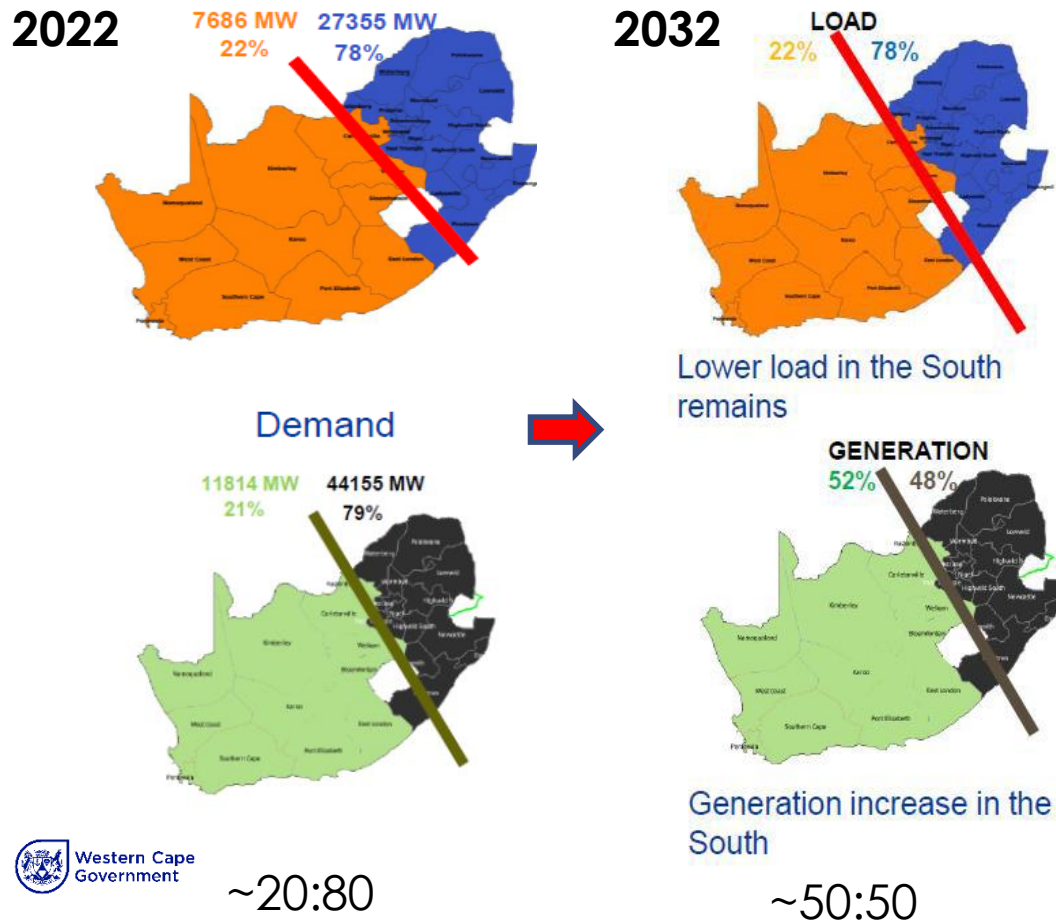


Private sector enablement

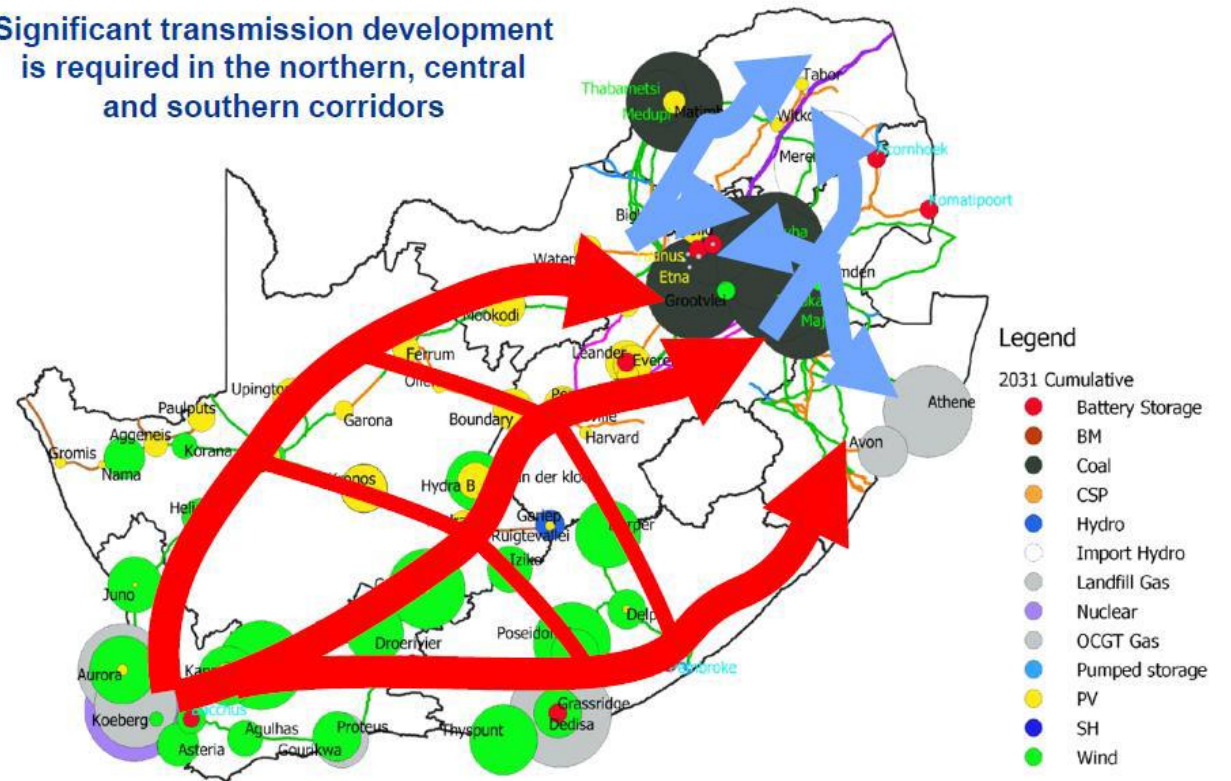


Enabling infrastructure – the changing shape of energy generation in SA

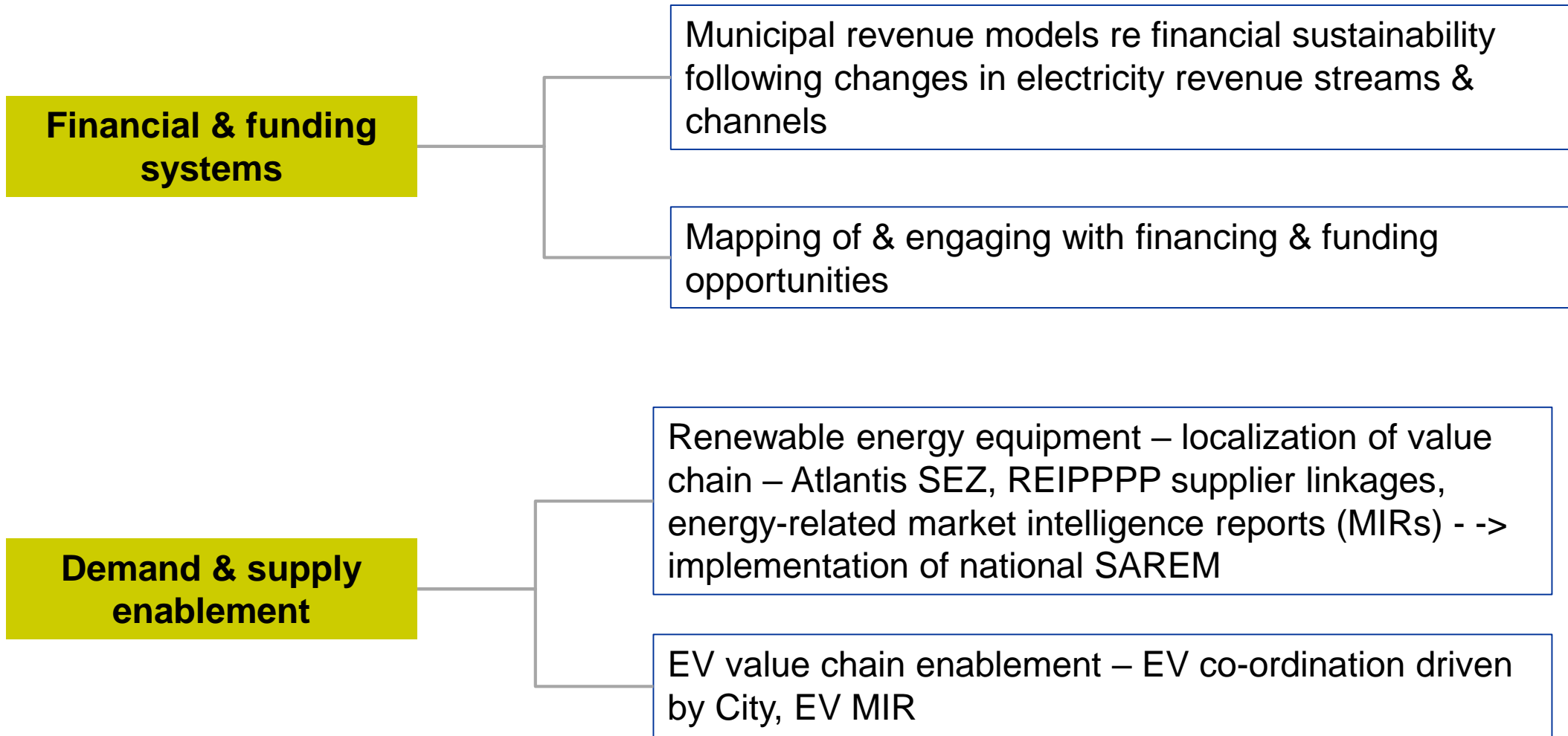
Detailed work & engagements to understand, quantify, strategize & ultimately implement upgrading &/or development of energy infrastructure & improved grid stability for increasing low carbon energy penetration.



Significant transmission development is required in the northern, central and southern corridors



Enabling systems



Key points for discussion



1. Alternative energy systems connected to grid or off-grid
2. SSEG & wheeling – mechanisms (incl. financial) for significant upscaling
3. Financing of projects & infrastructure
4. Collaborative solutions – private & public sector
5. Effecting change beyond WC – working with National & other provinces

Thank you

Discussion