

# Progress in Power Market & Regulatory Reform in South Africa

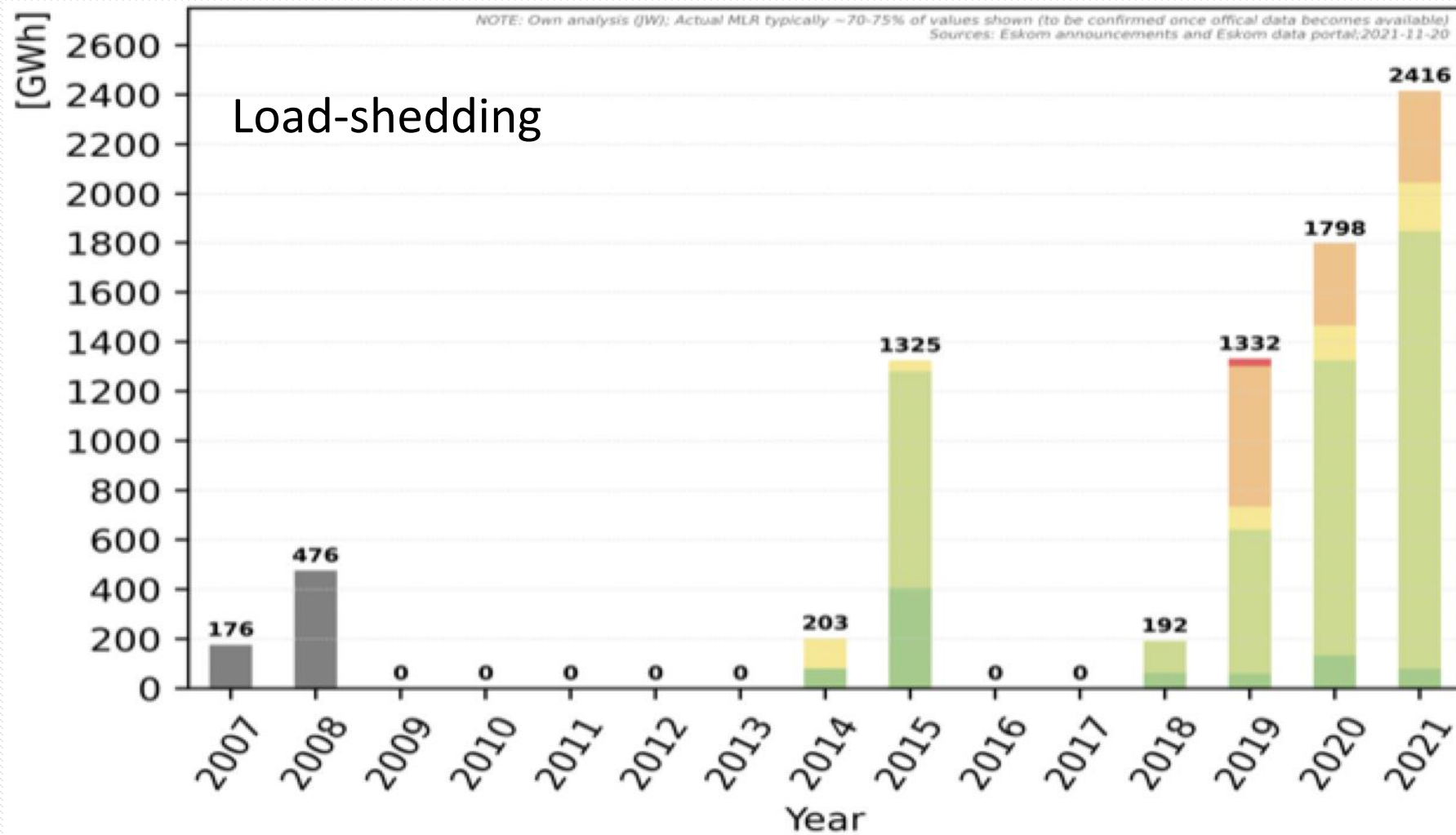
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Anton Eberhard & Wikus Kruger

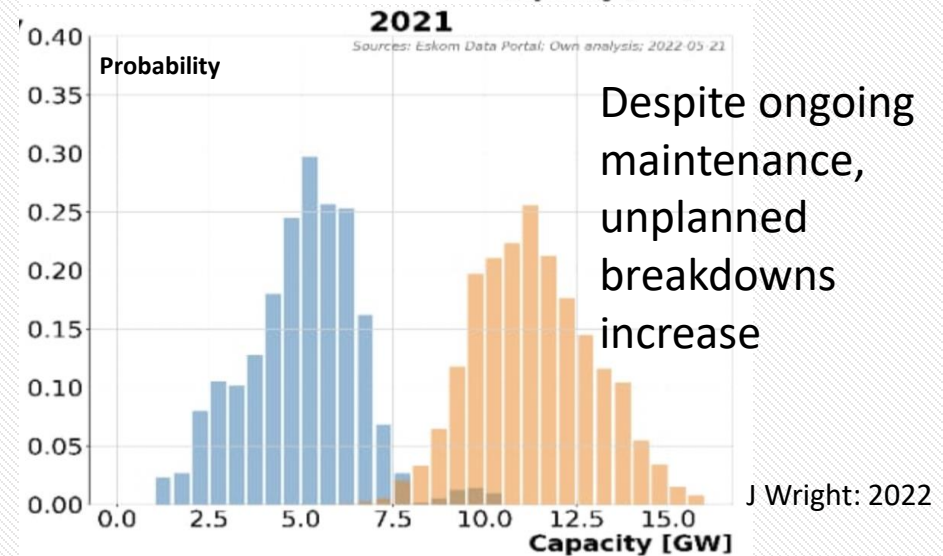
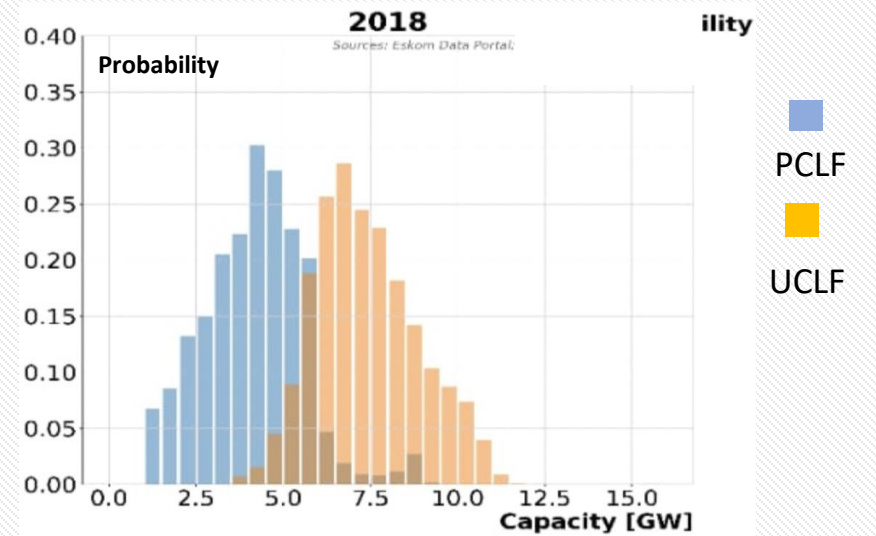
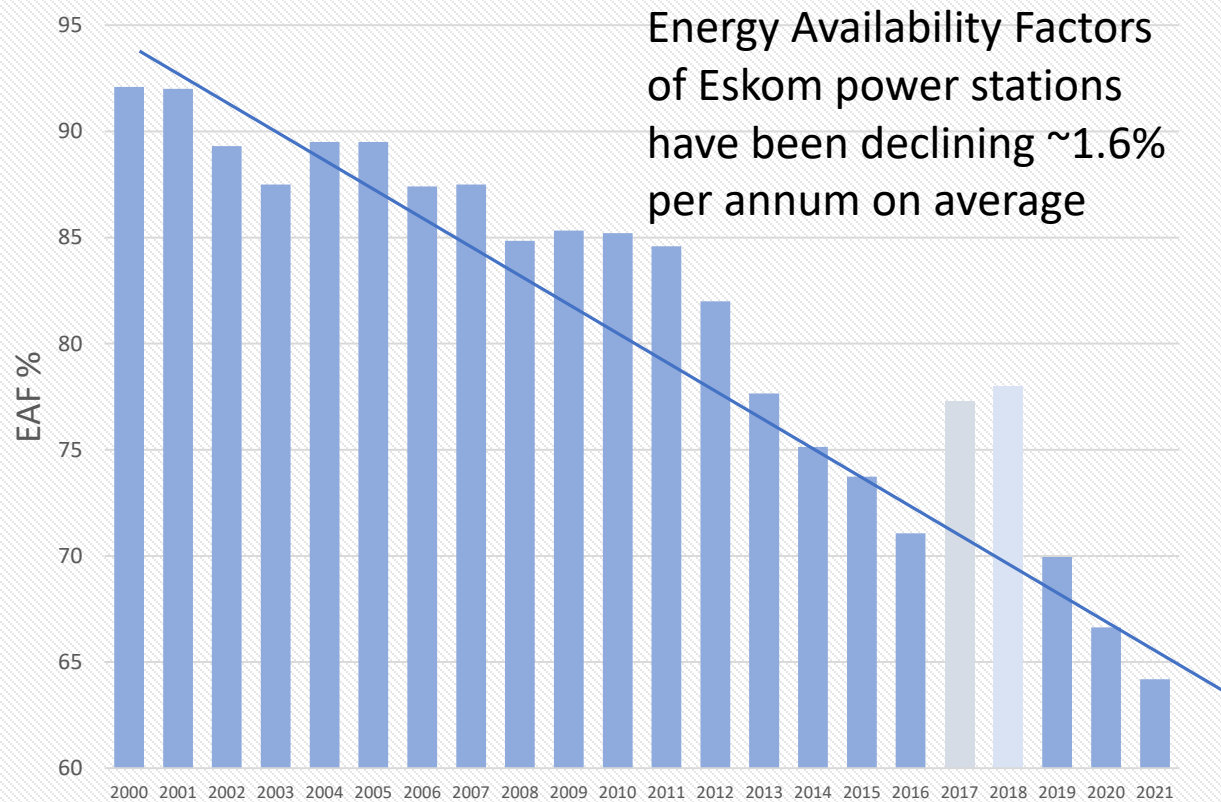
Power Futures Lab  
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# Power market & regulatory reforms spurred by Eskom failure



# Eskom is unable to reverse long term deterioration in plant performance

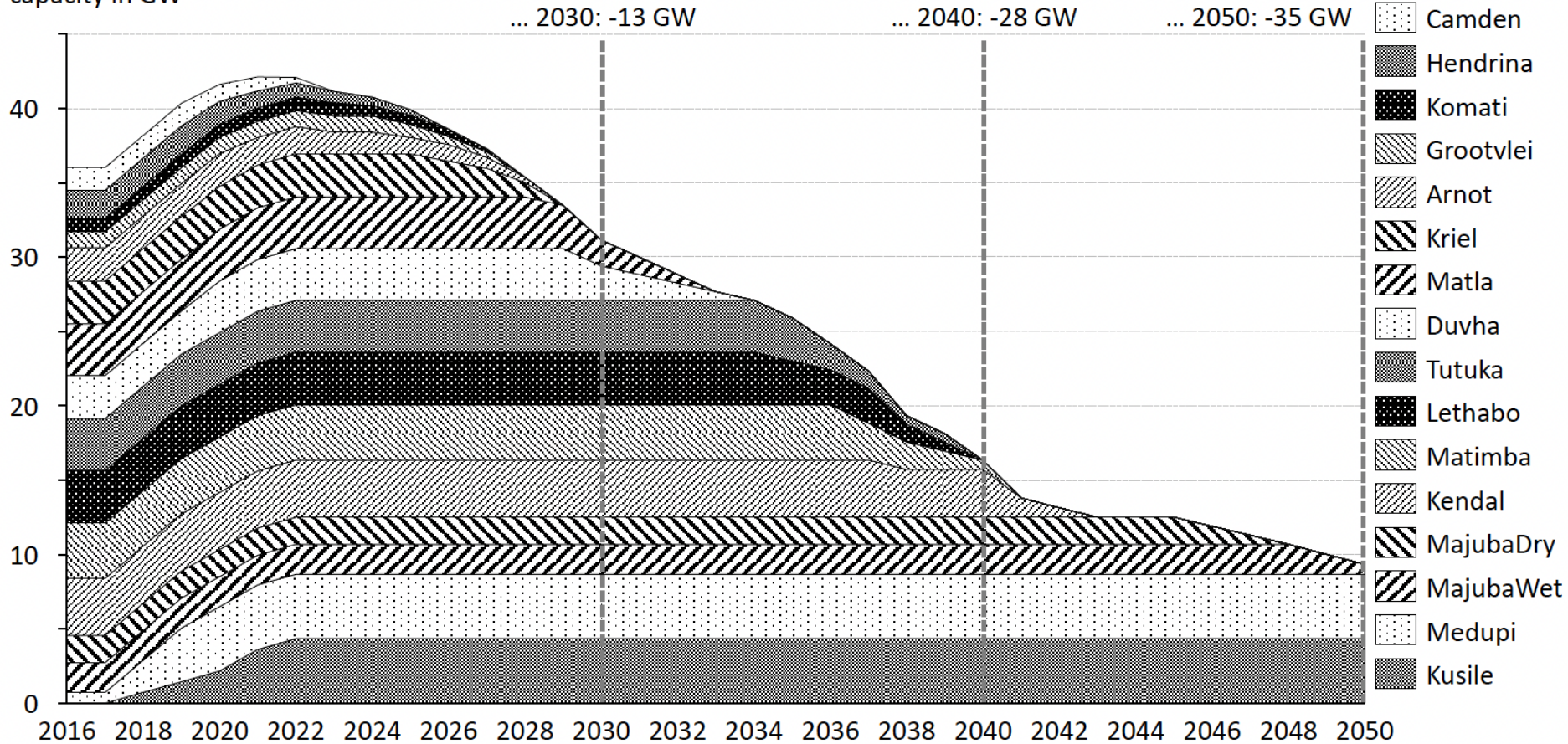


# Generation capacity shortfall will increase

## 11 GW of Eskom coal plant needs to be decommissioned by 2030

Operational coal-fired capacity in GW

Scheduled decommissioning until...



SA global rankings










CO<sub>2</sub>/cap 3<sup>rd</sup>

CO<sub>2</sub>/GDP 7<sup>th</sup>

CO<sub>2</sub> total 13<sup>th</sup>

Eskom power stations are not compliant with Minimal Emission Standards

# Eskom's financial performance also continues to deteriorate

Financial year	2007	2019	2020	2021	
Total installed capacity (MW)	42,618	44,172	45,117	46,466	
Electricity sales (GWh)	218,121	208,319	205,635	191,852	
Electricity revenue (R millions)	39,389	177,312	197,307	202,643	
Average tariff (+env levy) (c/kWh)	18	90,01	101,86	111,04	
Coal purchases (Mt)	117.4	113.8	108,6	104,9	
Coal costs (R millions)	10,000	58,500	66,600	68,200	
Employee costs (R millions)	9,451	33,272	33,158	32,887	
Employee numbers (group)	32,674	46,665	44,772	42,749	 
Debt securities and borrowings (R millions)	40,455	440,610	483,682	401,826	 
Debt service cover ratio		0,46	0,49	0,28	

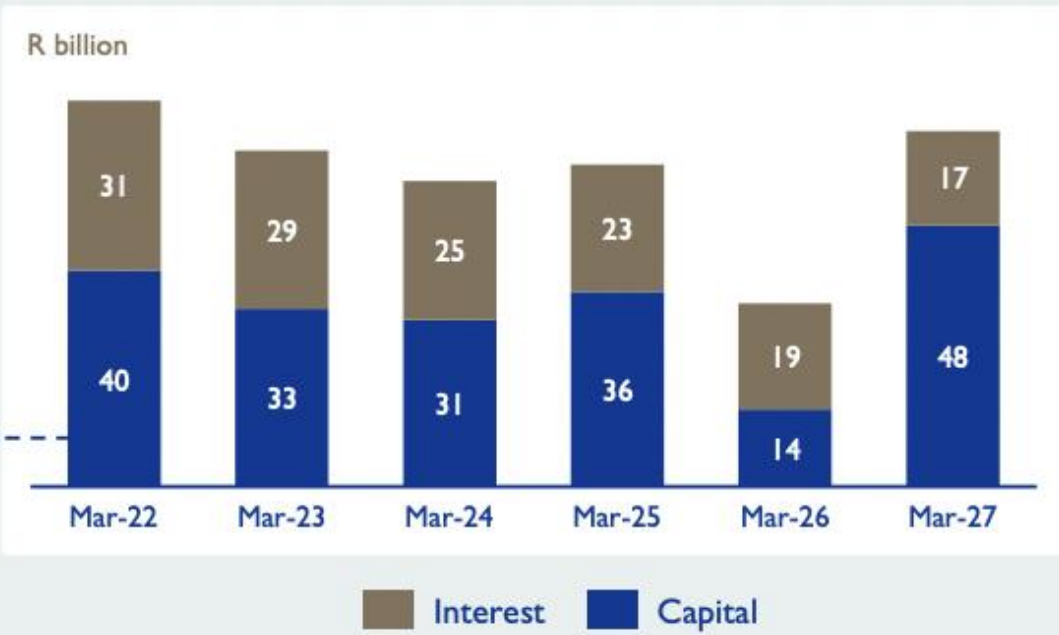


# Eskom is technically insolvent, too large to fail, too large to continue bailing out

Financial indicator	2021		2020 <sup>1</sup>
Revenue, R million	204 326	●	199 468
EBITDA, R million	32 813	■	36 816
EBITDA margin, %	16.06	■	18.46
Operating profit (EBIT), R million	5 797	■	9 037
Net loss after tax, R million	(18 934)	●	(20 769)
Pre-tax nominal return on assets, %	0.98	■	1.56
Cash interest cover, ratio	0.85	■	0.94
Debt service cover, ratio	0.30	■	0.52
Gross debt/EBITDA, ratio	13.96	●	14.46
Debt/equity (including long-term provisions), ratio	2.03	●	2.45
Gearing, %	67	●	71
Free funds from operations (FFO) as % of gross debt	9.53	●	7.72

● Performance improved ■ Performance declined

## Debt maturity profile at 31 July 2021<sup>4</sup>



- Eskom generates less than a third of the cash it needs to service interest and principal
- Survives through bailouts

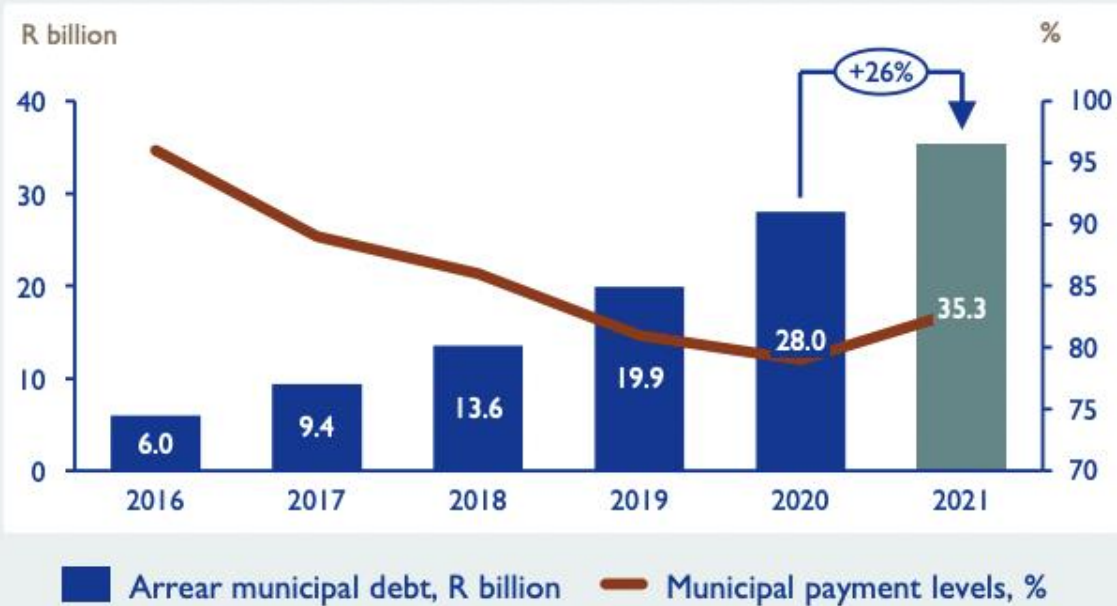
FY 20 FY21 FY22

R49bn R56bn R32bn

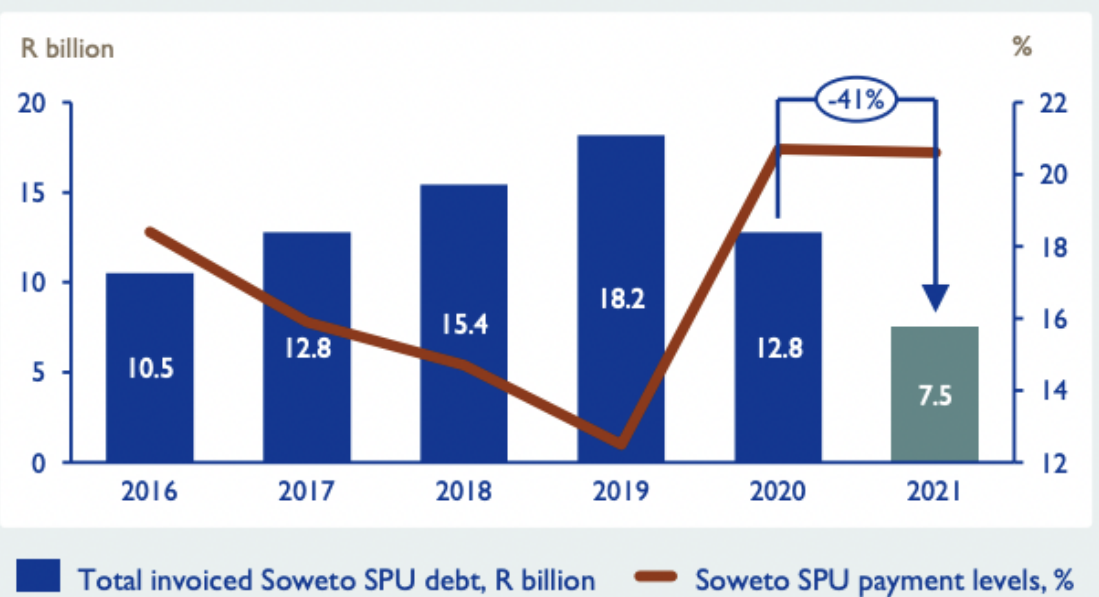
Total R220 billion since 2008

# Municipal debt arrears are out of control: continue to increase by R 6 – 9 billion per year

## Invoiced municipal arrear debt



## Soweto small power user (SPU) debt



# Eskom – in its own words (in 2019 – what’s changed?)

Eskom in its current form is unsustainable



## Debt

Debt approaching R450B

Unable to service from own EBITDA

Must borrow to service debt



## Revenue

Volume declining 1% per year, not coming back

Tariffs not cost reflective

R38Bn in receivables outstanding



## Costs

Opex increased 30% in 5 years, reaching R151B in FY19

Large increases in employee, coal costs and IPP payments



## Operations

EAF below 70% during FY19

Load shedding, increased costs, lost revenue, lost credibility



## Outdated Business Model

Utility death spiral

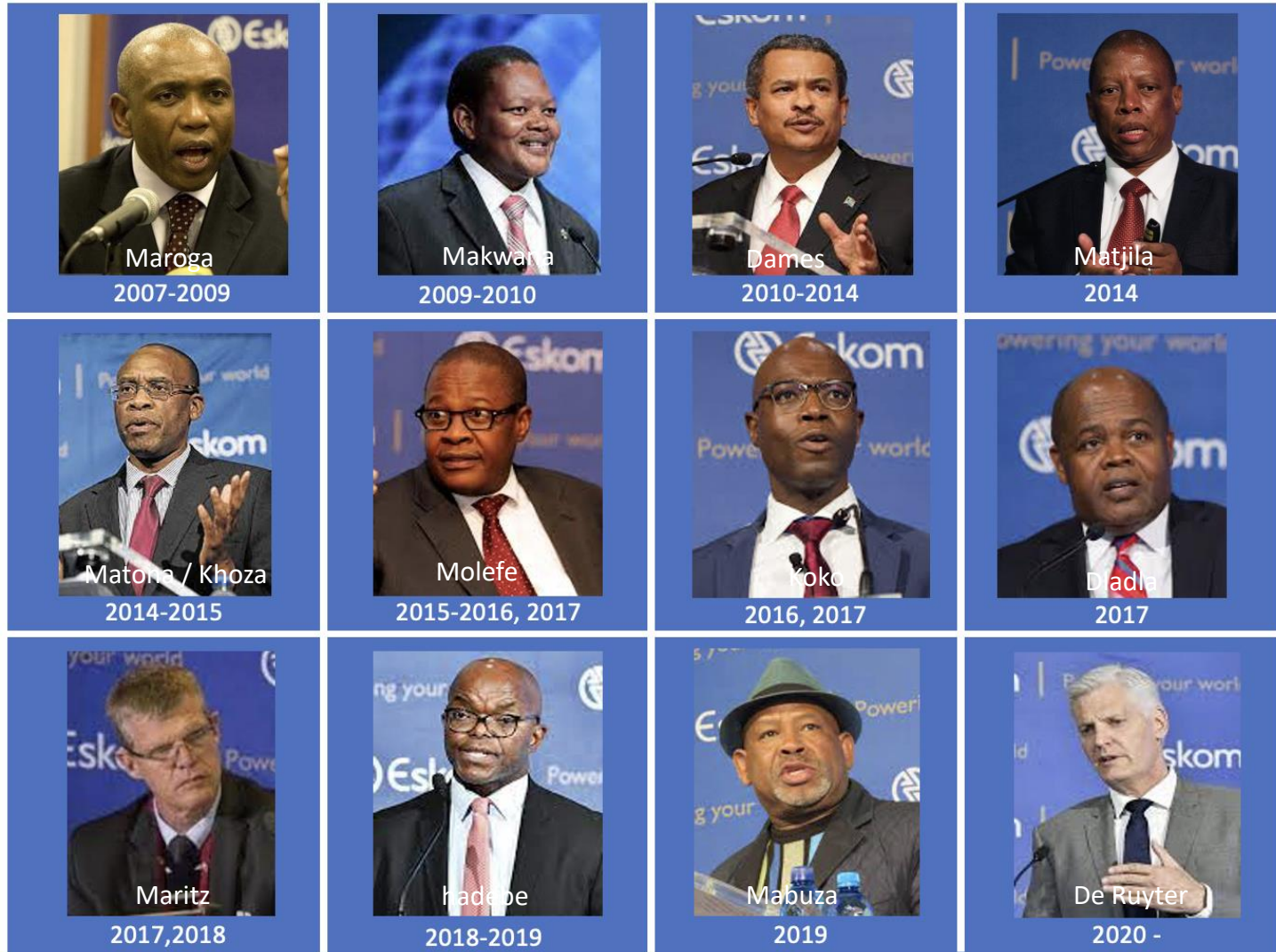
Operational and structural inefficiencies

Lack of transparency

Change in energy landscape



# Cannot forget or dismiss impact of governance and management instability



- Eskom is SA's largest SOE by far and was targeted in state-capture years
- De-stabilization of governance facilitated rent-seeking and corruption
- Eskom had 13 CEOs in 13 years
- Calls to replace current CEO reckless

# President's announced interventions to address electricity crisis including power market and regulatory reforms

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1. Further Eskom interventions
2. Acceleration of utility-scale IPP procurements
3. Further easing of distributed energy generation regulations
4. Acceleration of roof-top solar PV through feed-in tariffs
5. Sustainable transformation of power market

# 1. Further Eskom interventions

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- Will continue to try to improve availability of existing fleet
- Eskom will increase its maintenance budget (how?)
- Cutting red tape to make it easier to contract OEMs, buy spares.
- Fast track recruitment of skilled personnel including former senior Eskom plant managers
- Purchase surplus energy from private generators
- More SAPP imports (already maxxed?)
- Interim power solutions – e.g. mobile generators – for limited period
- Energy efficiency and demand side resources
- Climate funding for grid investments and repurposing old power stations
- SAPS special law enforcement team to assist Eskom
- Sustainable debt solution from National Treasury (been saying that for years)

## 2. Accelerate procurement of utility-scale RE, gas and batteries

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- Move BW5 to construction, including relaxing local content requirements (but financial close difficult as costs have increased).
- BW6 - double capacity on offer to 5200MW
- RfP for battery storage by September
- RfP for gas asap thereafter
- Energy Minister to issue Sec34 determination for remaining IRP allocations, and announce further BWs
- IRP being reviewed
- “We also changed the regulations to allow municipalities to procure power independently”

### 3. Accelerate private investment in distributed generation

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- Lifting licensing threshold to 100MW has unlocked development of more than 80 projects, totalling more than 6,000MW. Operation Vulindlela smoothing their path.
- Will remove licensing threshold for embedded generation completely (but “embedded” needs to be defined – probably means distributed generation for own use or selling to others)
- Waive or streamline certain regulatory requirements (where possible within existing legislation – e.g. easing environmental approvals for solar projects in areas of low and medium environmental sensitivity)
- Special legislation to be tabled to address legal and regulatory obstacles to new generation (for a limited period)
- One stop shop to facilitate regulatory approvals and improve coordination across government
- Regulatory reform preferable to declaring a state of disaster or emergency



## 4. Expand roof-top solar PV

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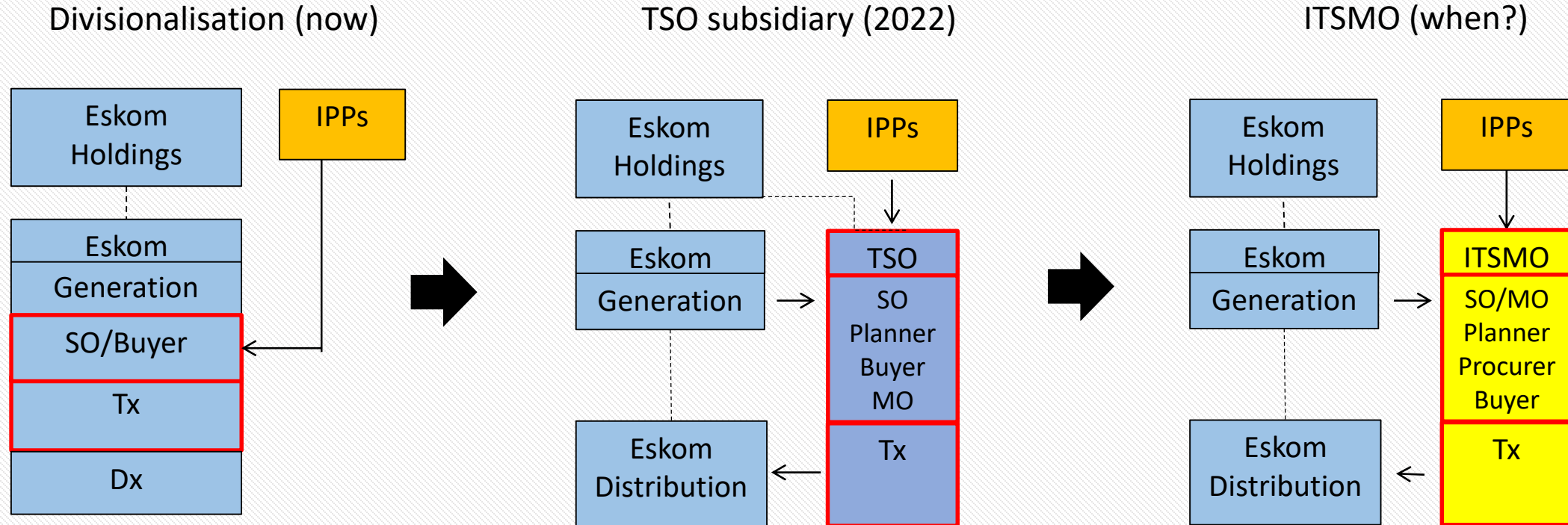
- Eskom to develop rules and pricing for feed-in tariffs – HUGE POTENTIAL
- (NERSA will need to approve, how long will this take?)
- (What about municipalities – Cape Town forging ahead, allowing commercial and industrial customers to be net producers – when will this be extended to residential customers?)

## 5. Fundamental and sustainable transformation of electricity sector

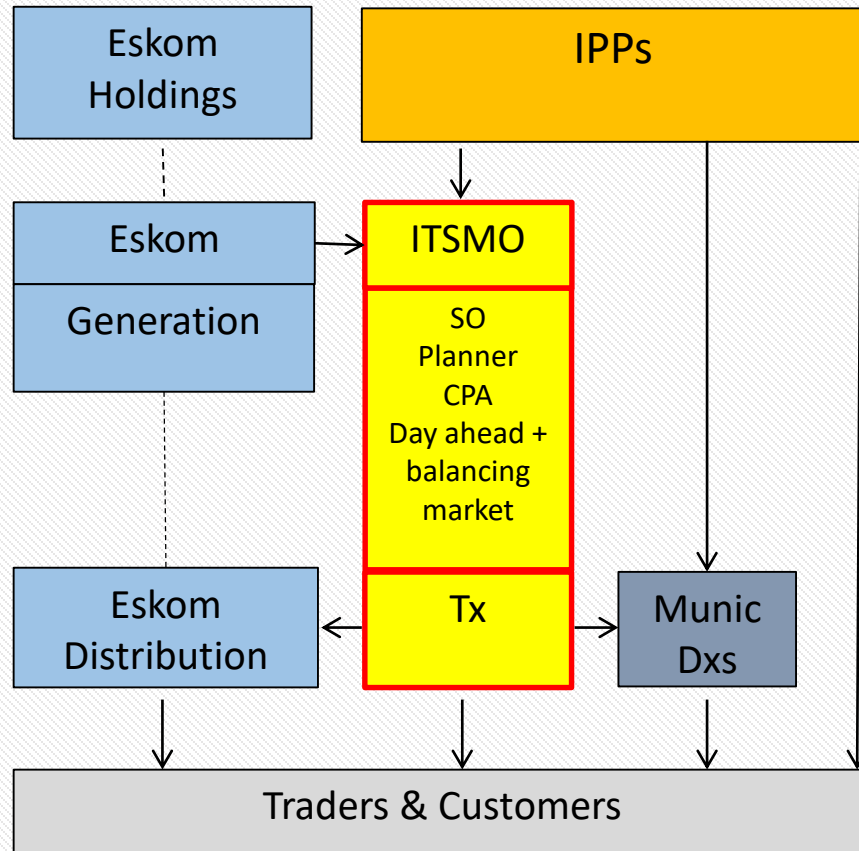
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- Eskom unbundling - GX, TX, Dx - continues
- “Eskom has established an independent transmission company and is on track to separate GX and Dx by end 2022” (not true, transmission company not yet operational, and doesn’t yet have an independent board)
- Grid will remain state-owned
- Finalisation of Electricity Regulation Amendment Bill to establish competitive electricity market
- Aim is to diversify supply to improve security

# Eskom and power market restructuring steps



# South Africa will move from a mostly single-buyer to a multi-market



## Regulated market

- Central Purchasing Agency
  - Eskom generation PPAs
  - Legacy IPP PPAs
  - Balance Responsible Party
- Transmission and System Operation
- Distribution
- Captive Customers

## Unregulated Market

- Direct supply agreements between generators and customers who will have choice of supply
- Day ahead and balancing market trades
- Own use

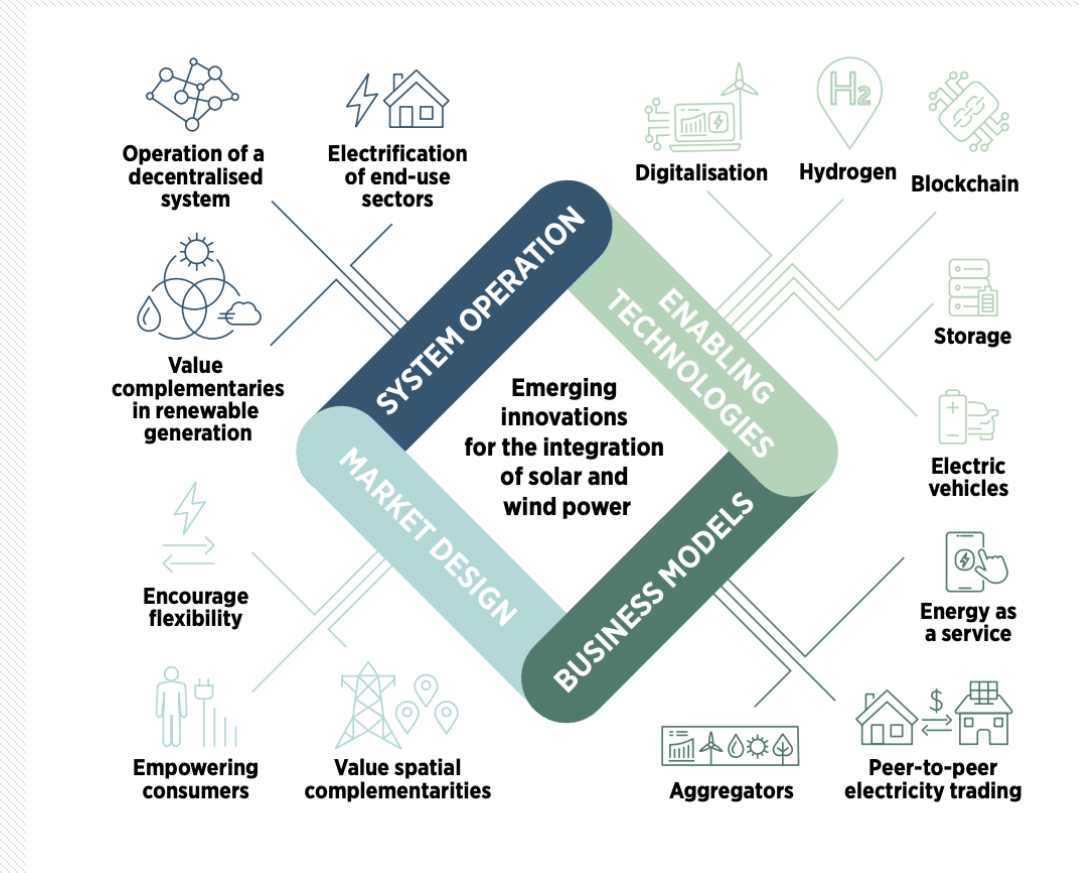
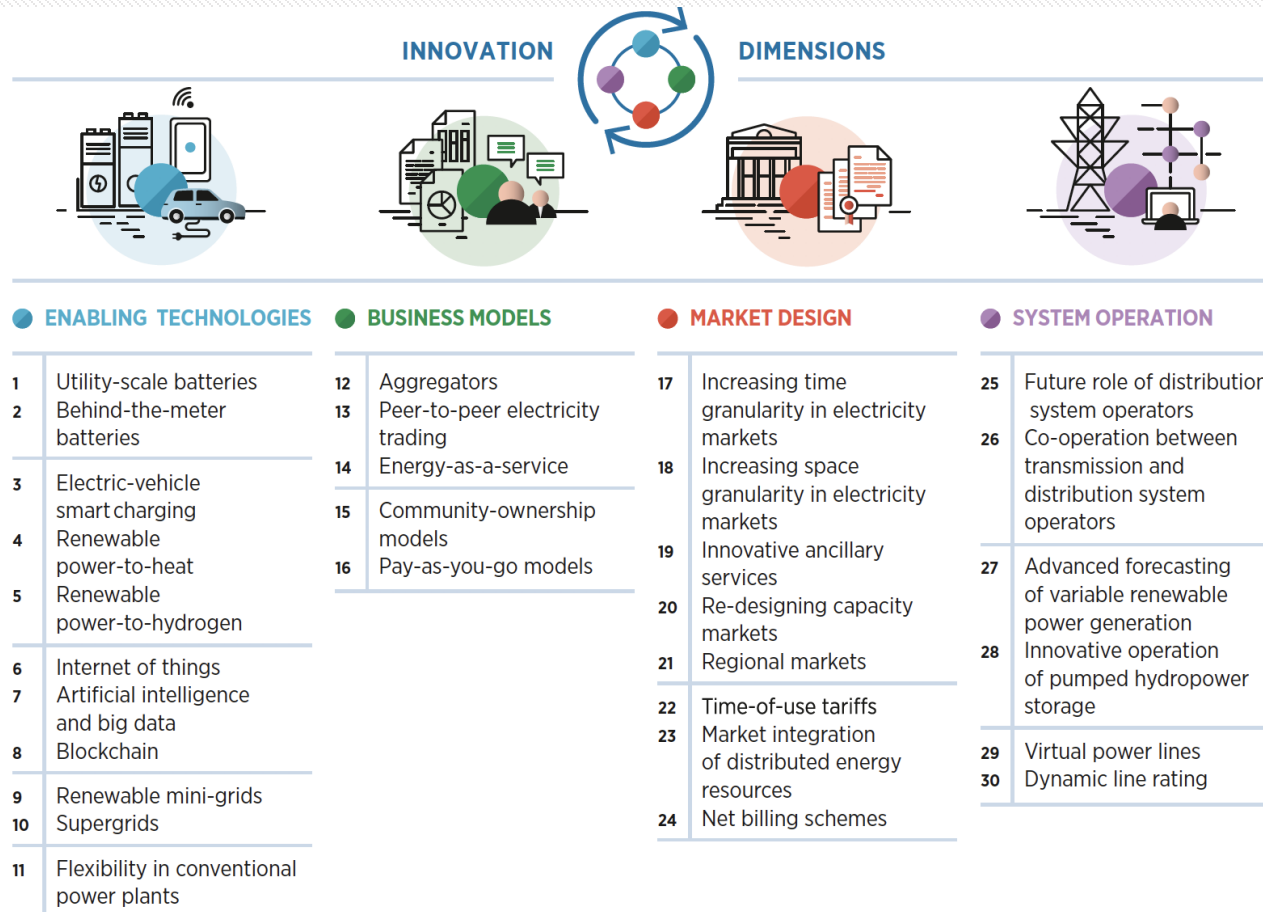
# Implementation of Reforms and Interventions

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- Implementation coordinated by a new National Electricity Crisis Committee chaired by DG in Presidency, with participation from all relevant departments and will draw on outside expertise
- Ministers to report progress to President
- This is the biggest risk - previous reforms and restructuring has been SLOW, and certain ministers far from enthusiastic. If implementation is not urgent and purposeful, load-shedding will continue

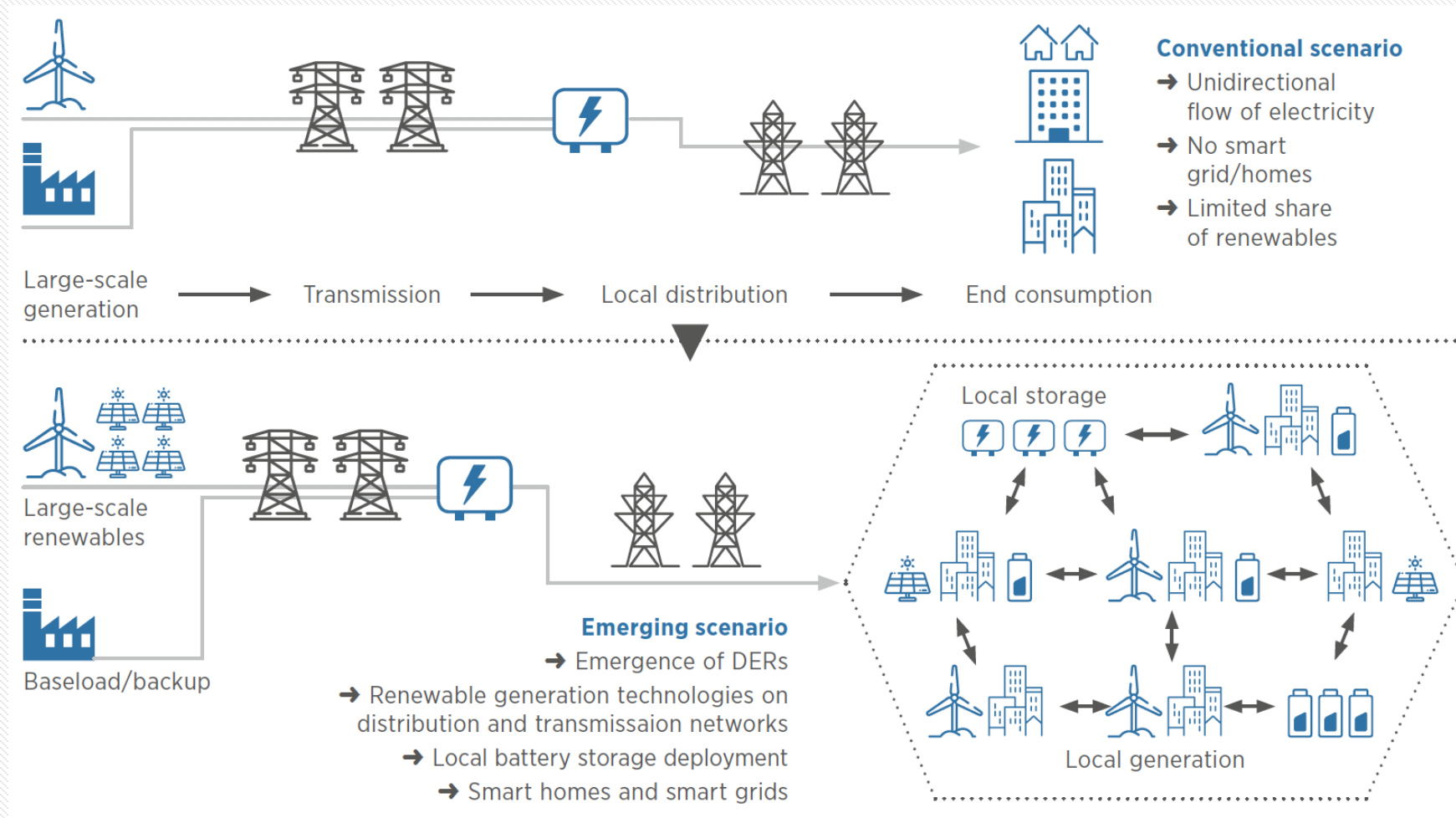


# Innovation in enabling technologies and business models has implications for future power market design, system operation and regulation



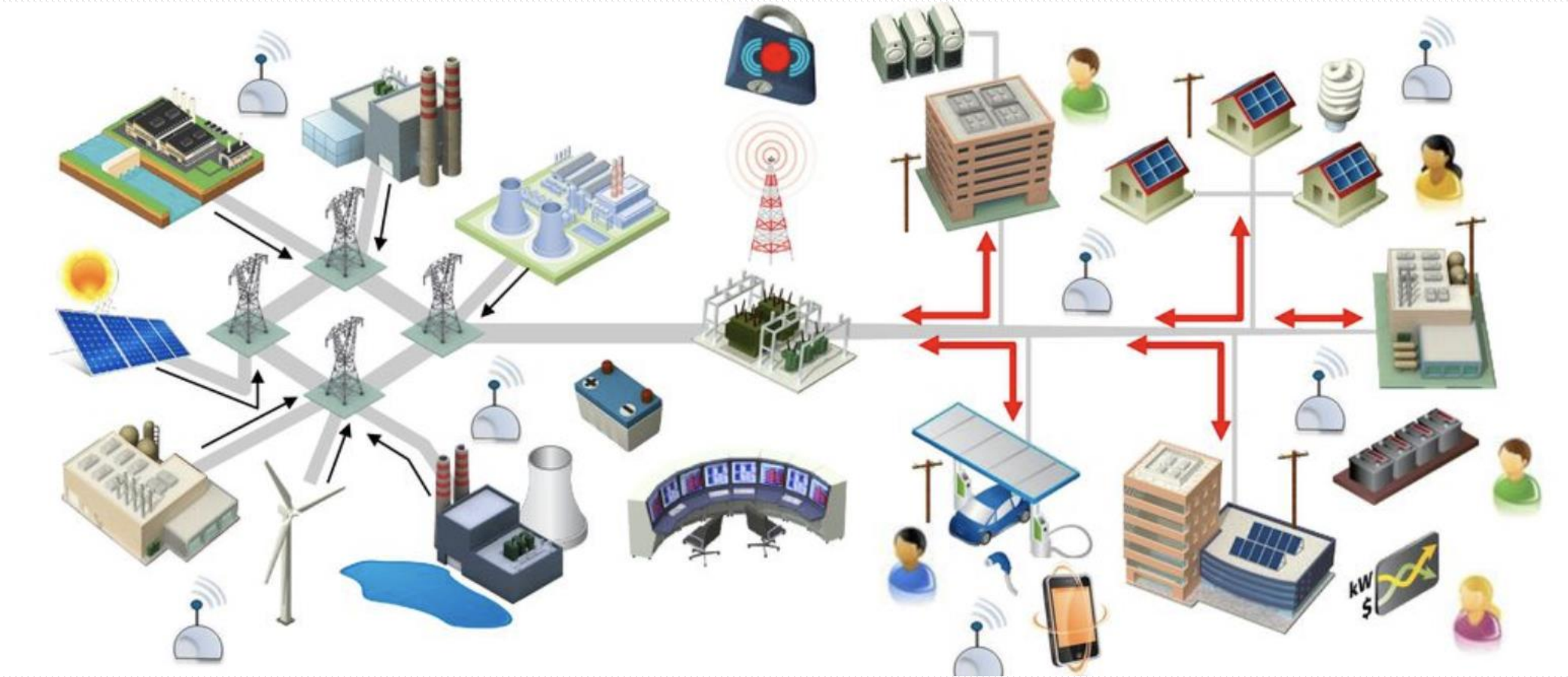
Source: IRENA

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



Source: IRENA

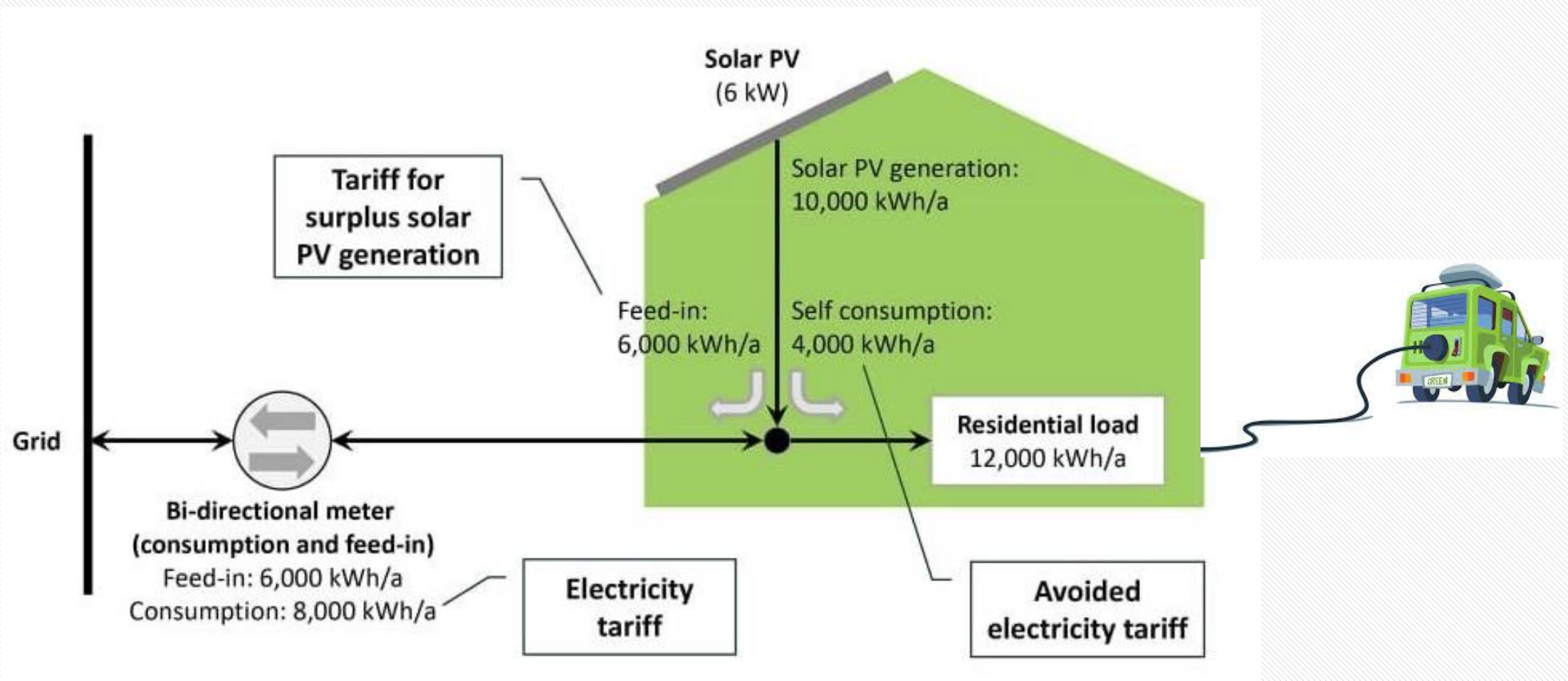
# Traditional grids will be transformed as consumers become also producers



Source: EPRI

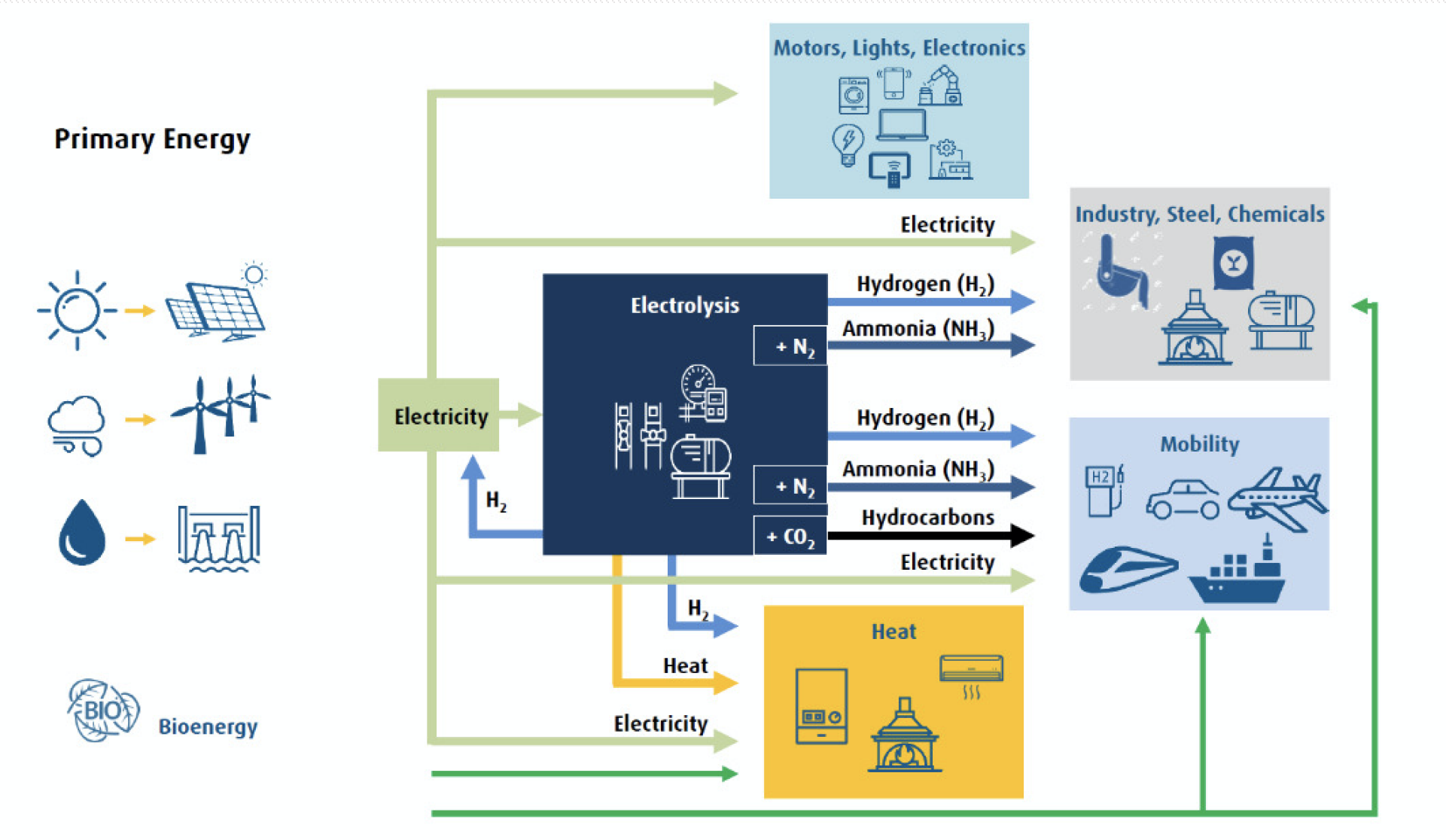
The ITSMO will enable a power system that is highly flexible, resilient and connected and optimizes resource including from competitively procured balancing and ancillary services, voltage/frequency/inertia support, DSM, virtual power station, private utilities

# Utility business models will need to change to accommodate prosumers





# Clean energy transition and sector coupling (e.g. green hydrogen) will lead to increased demand for electricity





# South Africa's future power sector (next few years)

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1. Eskom will have been unbundled and the **Independent Transmission System and Market Operator** (ITSMO) will have been established as a separate state-owned enterprise
2. A **multi-market** will have been established with a combination of centrally procured IPPs selling to the grid as well as many more IPPs selling directly to traders or qualifying customers
3. The **share of low-cost, variable solar and wind on the grid will increase substantially** - at least 30 GW by 2030, contributing at least 30% of South Africa's electricity.
4. System reliability will be achieved through the ITSMO contracting adequate and **competitive flexible and ancillary services**
5. **Distributed energy resources will multiply** with implications for transmission and distribution planning, business models, investments, system operation and tariff structures

# South Africa's future power sector (next few years)

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6. More electricity consumers will become producers as well (i.e. **prosumers**)
7. As power flows both ways, advanced metering and payment systems will provide greater **spacial and temporal granularity**
8. **Peer to peer trading** between prosumers will have started, also across connected minigrids
9. **Distributed system operators** will play an important role
10. **Sector coupling** (including EVs, green hydrogen, ammonia etc) will lead to substantial growth in electricity demand

# Implications for the Western Cape

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- Excellent solar and wind resources – but lacks grid capacity; requires urgent investment in new transmission and distribution infrastructure. Role for climate finance?
- Municipalities *can* procure renewable energy directly from IPPs – but need support (perhaps centralized procurement?)
- Municipalities can set feed-in tariffs for ALL consumers and allow net feedback
- Municipalities require a standardized wheeling framework
- Municipalities need to finalise wheeling tariffs.
- Municipal distribution system operation capacity needs to be strengthened, supported.
- Municipalities cannot continue relying on electricity sales for revenue; alternative funding is crucial.
- Western Cape can push through further reforms and innovations (e.g. tariff unbundling at municipal level, time of use tariffs, trading platforms)

# Thank you for your attention

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