

# SOLAR POWER AFRICA

## ENERGY STORAGE:

*Drivers and levers for accelerating uptake in the African Market*

Beth O'Connor

18 February 2022

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EVENTS

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South African Photovoltaic Industry Association

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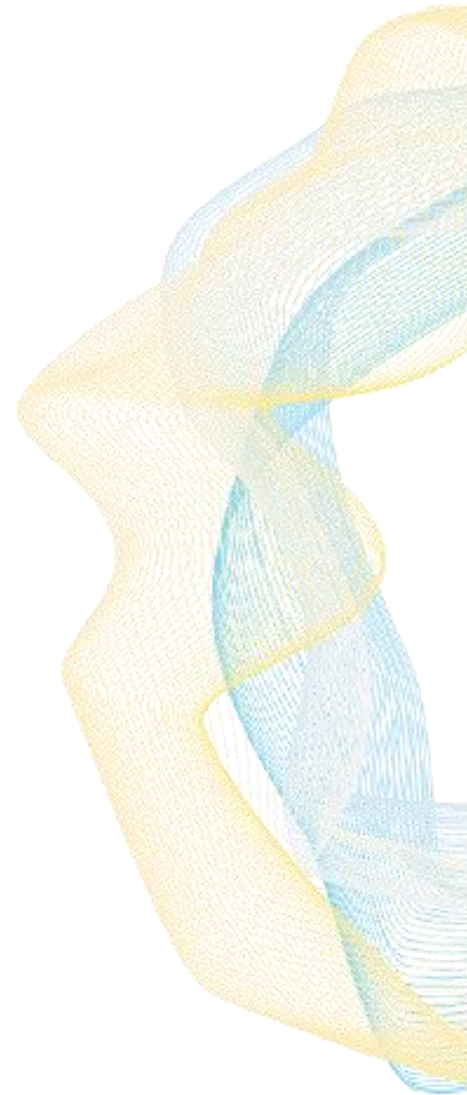
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ENERGY STORAGE:

Drivers and levers for accelerating uptake in the African Market

- 01 Solar and Storage: Working together
- 02 Drivers of Energy Storage Uptake
- 03 Levers for unlocking energy storage markets
- 04 Way forward



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# Solar and Storage – the chicken or the egg?

- Falling Solar Prices
- GHG Reduction Commitments

Globally

- Falling battery prices
- Intermittency of Solar



- Electricity Tariffs
- Return on Investment
- Financing opportunities

Africa and South Africa

- Load Shedding
- Grid Constraints

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## SONA 2022

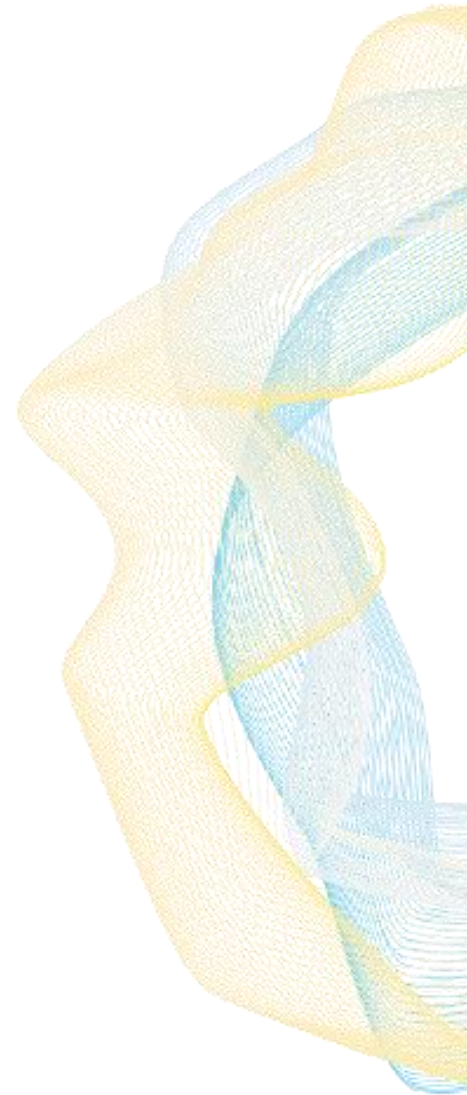
Around **R270 billion** – value of the green hydrogen pipeline being developed as part of the Green Hydrogen Strategy for the Northern Cape.

### SONA 2022:

**500MW** of battery storage for which requests for proposals will be released later this year

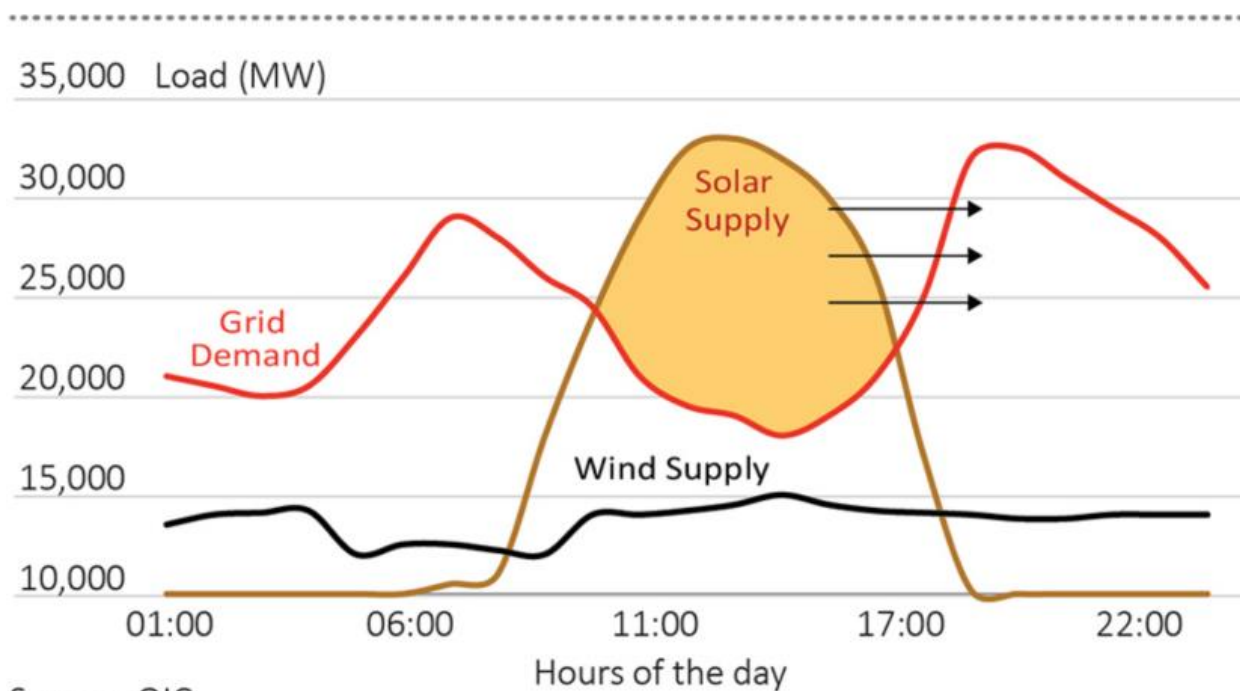
### CITY OF CAPE TOWN 2022:

Request for proposals for **320MW** of solar and storage released



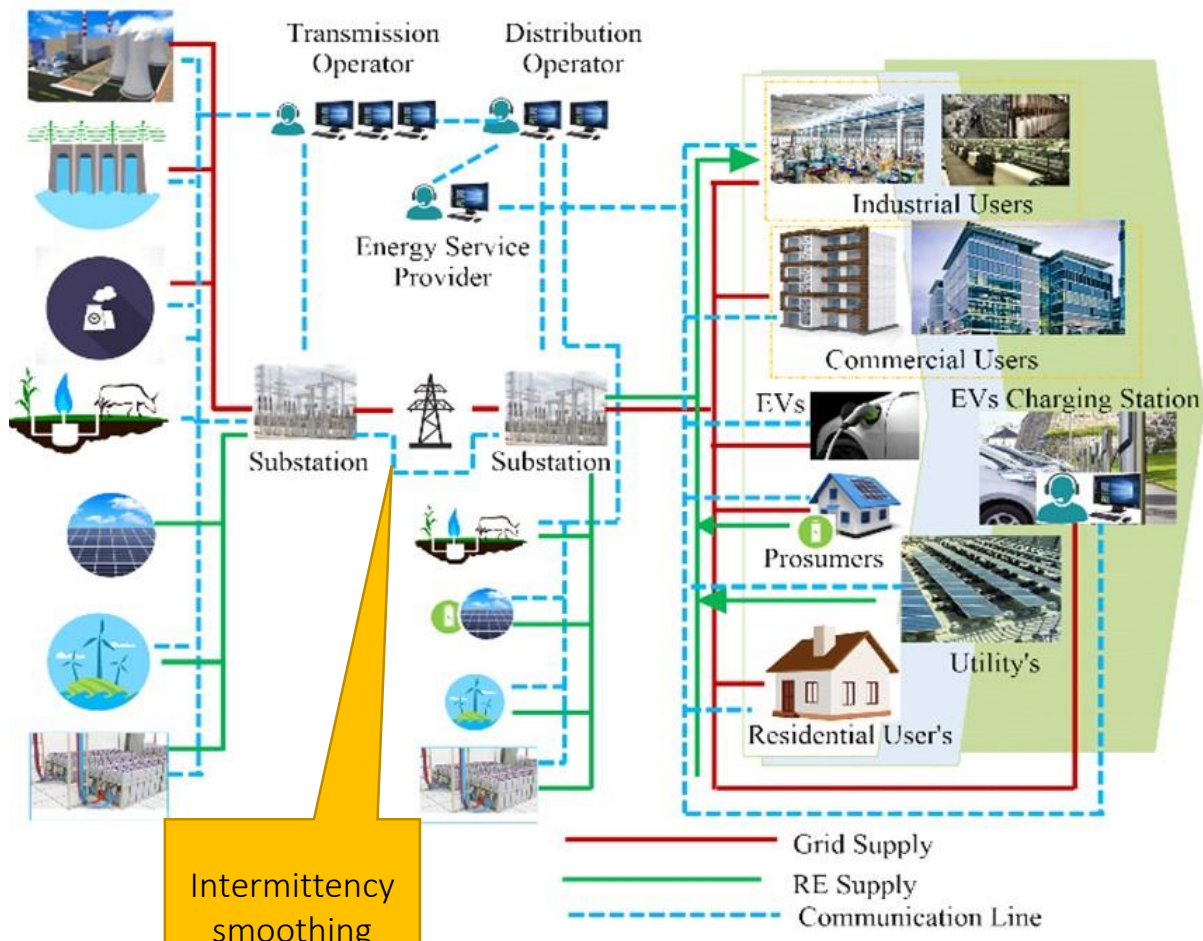
# Using Energy Storage to address the intermittency of renewables

Time-shift benefits of energy storage



- Energy storage assists in the role of **balancing** the electricity grid particularly the **intermittency of renewables**
- Grid scale battery storage can quickly come online assisting with time **shifting, spinning reserve, frequency regulation and load following**

Energy Storage can increase the existing transmission and distribution equipment and eliminate the need for expensive T & D additions



Advances in renewable energy could make it cheaper to generate your own power than buying it from the grid.

**Essentially, anyone will be able to be an energy producer!**

Any home, business or school can become a mini power plant that links to other energy producers to form a **microgrid**.

These grids will allow peer-to-peer electricity trading, so you can sell, buy and even share electricity with your neighbours. A **decentralised** structure builds grids from the bottom up, instead of from the top down.

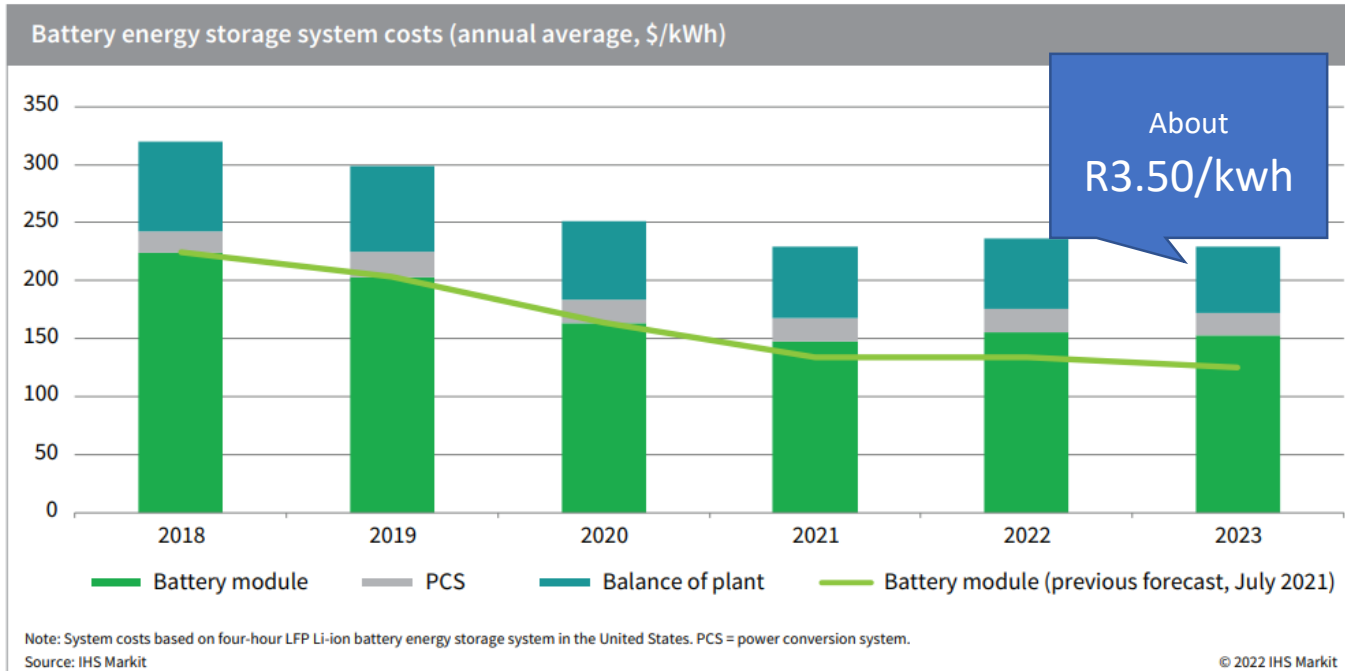
**Benefits of Energy Storage in the Grid**

- Deferral of the construction of new distribution lines, transformers, capacitors banks, substations
- Transmission line stability preventing possible system failure
- Increasing power quality of the service which would result in protection of customer equipment





# Driver 1: Raw Materials



Lithium-ion (Li-ion) battery prices have increased by 10–20% in the later months of 2021, impacted by a wide range of both global and industry-specific factors:

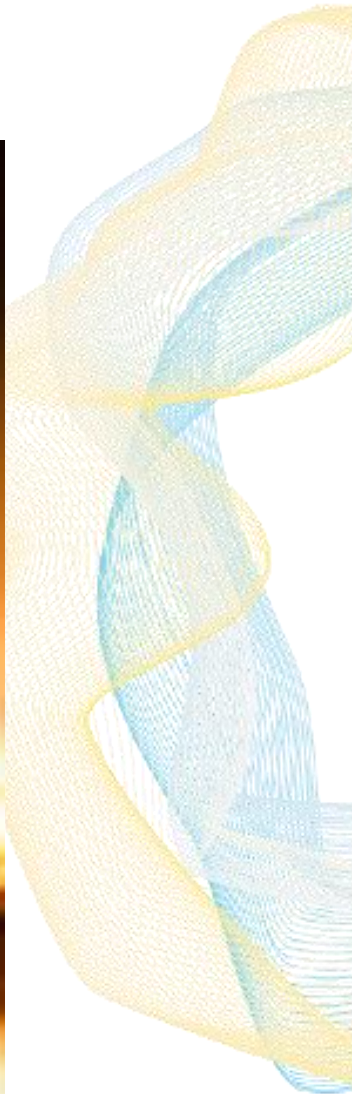
- A surge in raw material prices across the board, with all metals’ prices rising significantly throughout 2021
- Greater demand for LFP batteries from the automotive industry as the technology is increasingly adopted in lower cost, shorter range EVs
- Short supply exacerbating the relative lack of purchasing power of energy storage system integrators
- Geographic concentration of LFP supply in China – making it particularly vulnerable to high costs and disruption to logistics

Price declines are not predicted to resume again until 2024—



# Driver 2: User Grid Access

- Rural electrification
- Constrained systems
- Load shedding
- Load reduction



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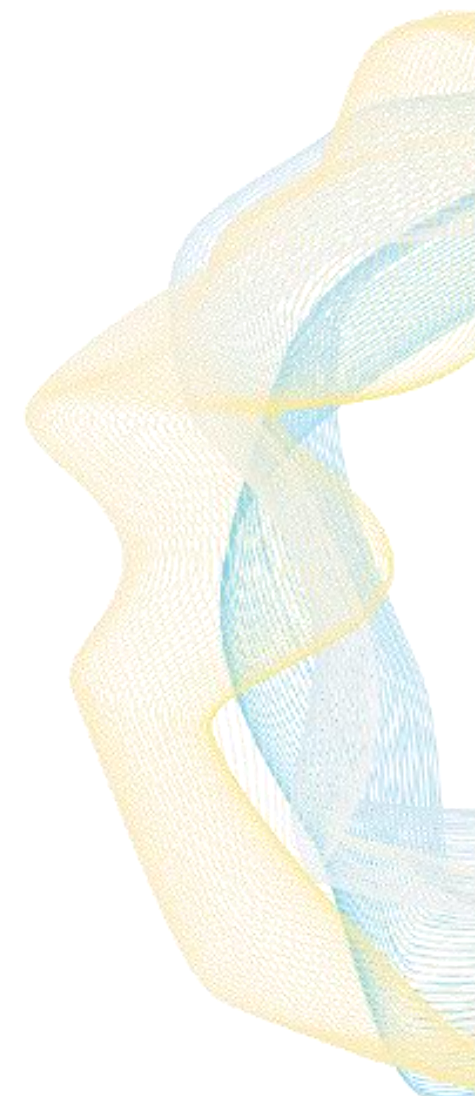
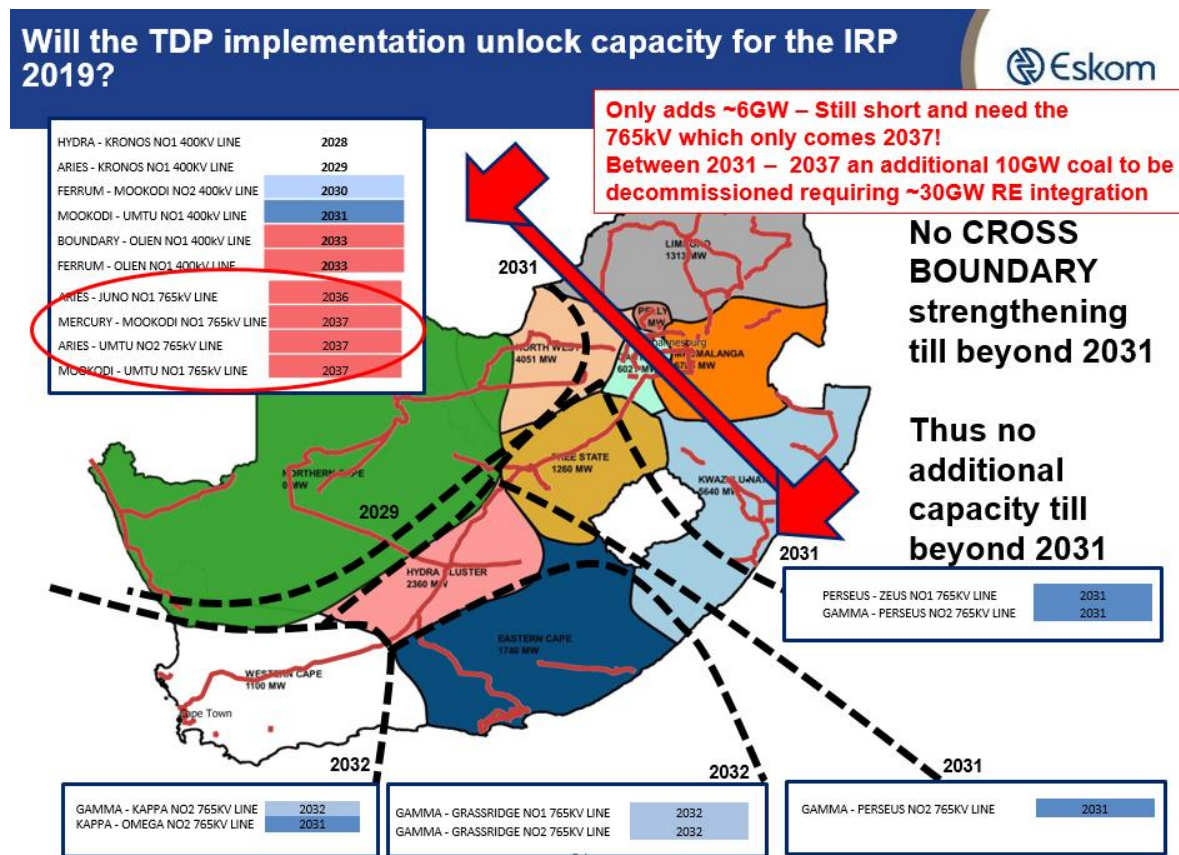


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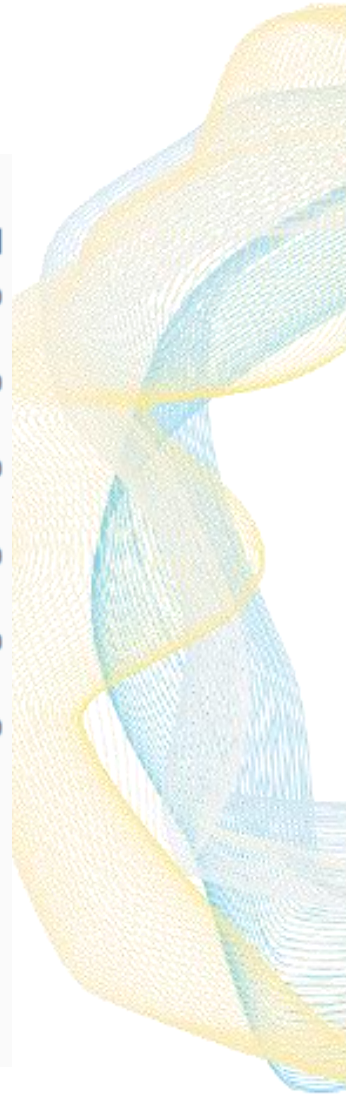
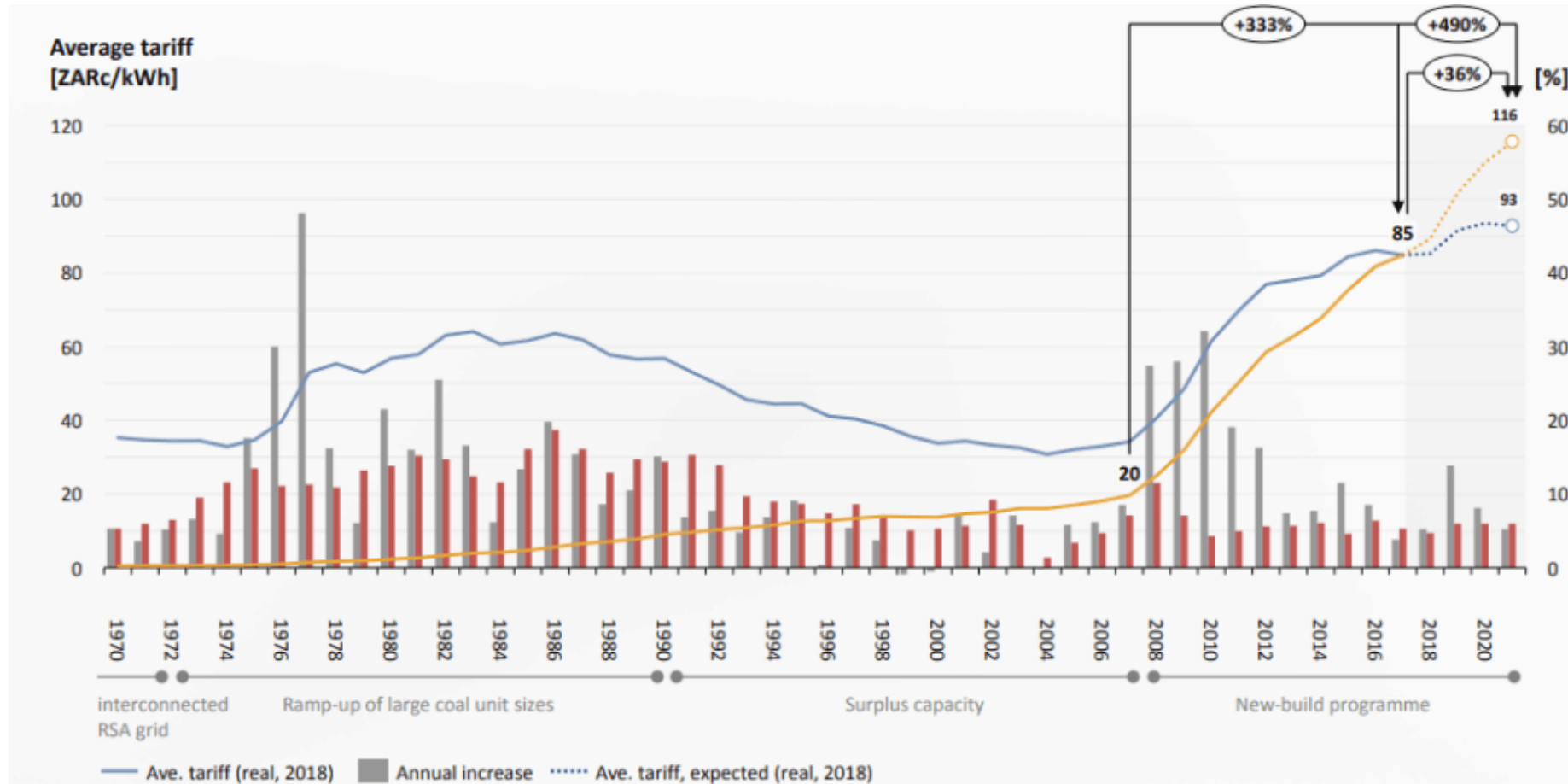


# Driver 3: Generator Grid Access

- Ability of the TDP to deliver the IRP?

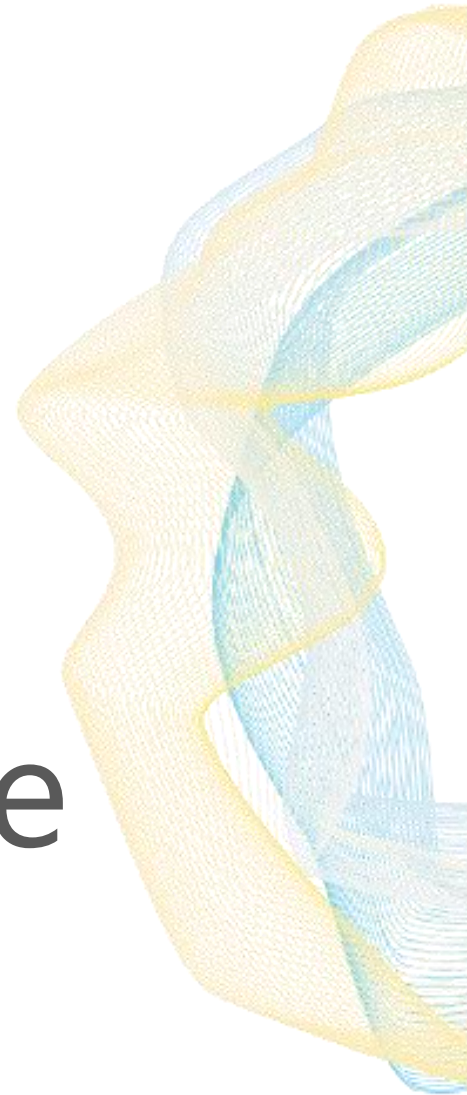


# Driver 4: Electricity Tariffs





# Levers to enable the uptake of energy storage in Africa



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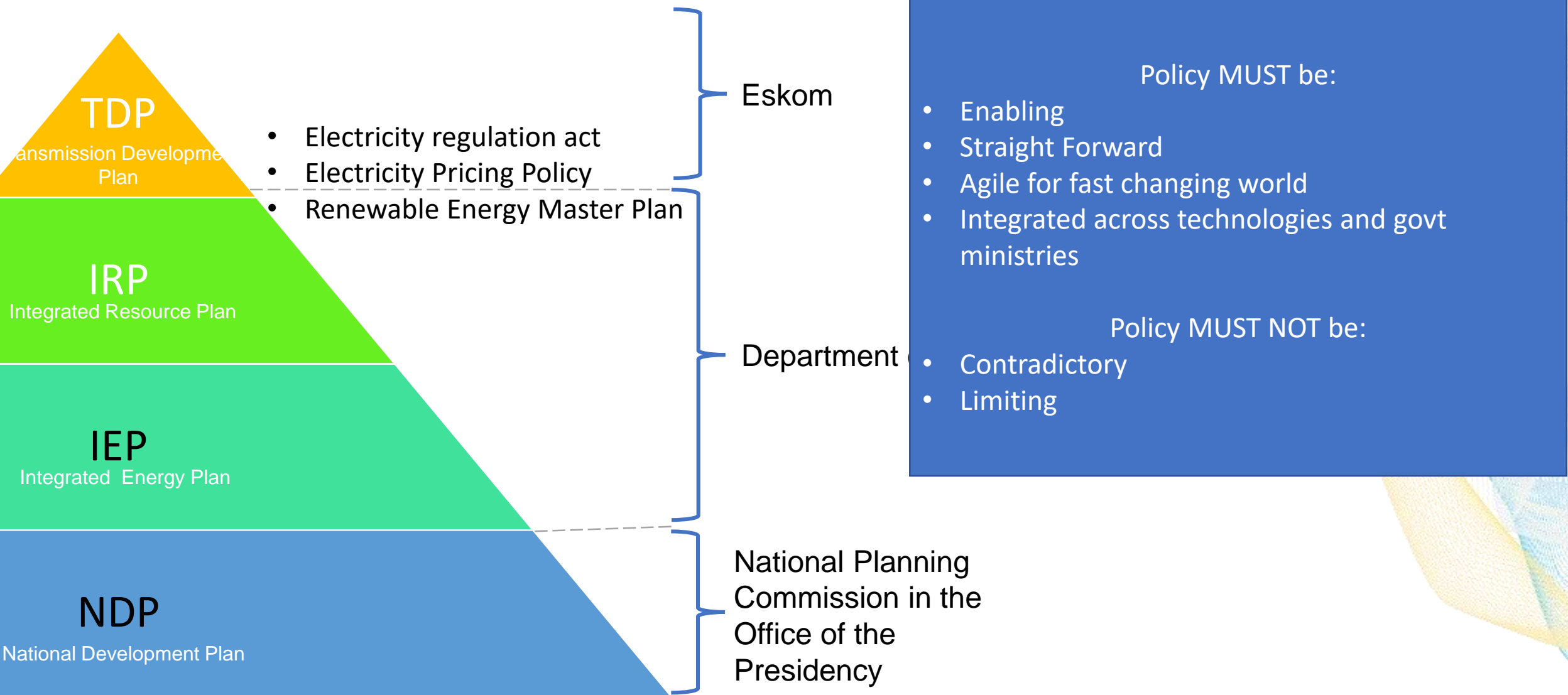
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# Lever 1: Policy



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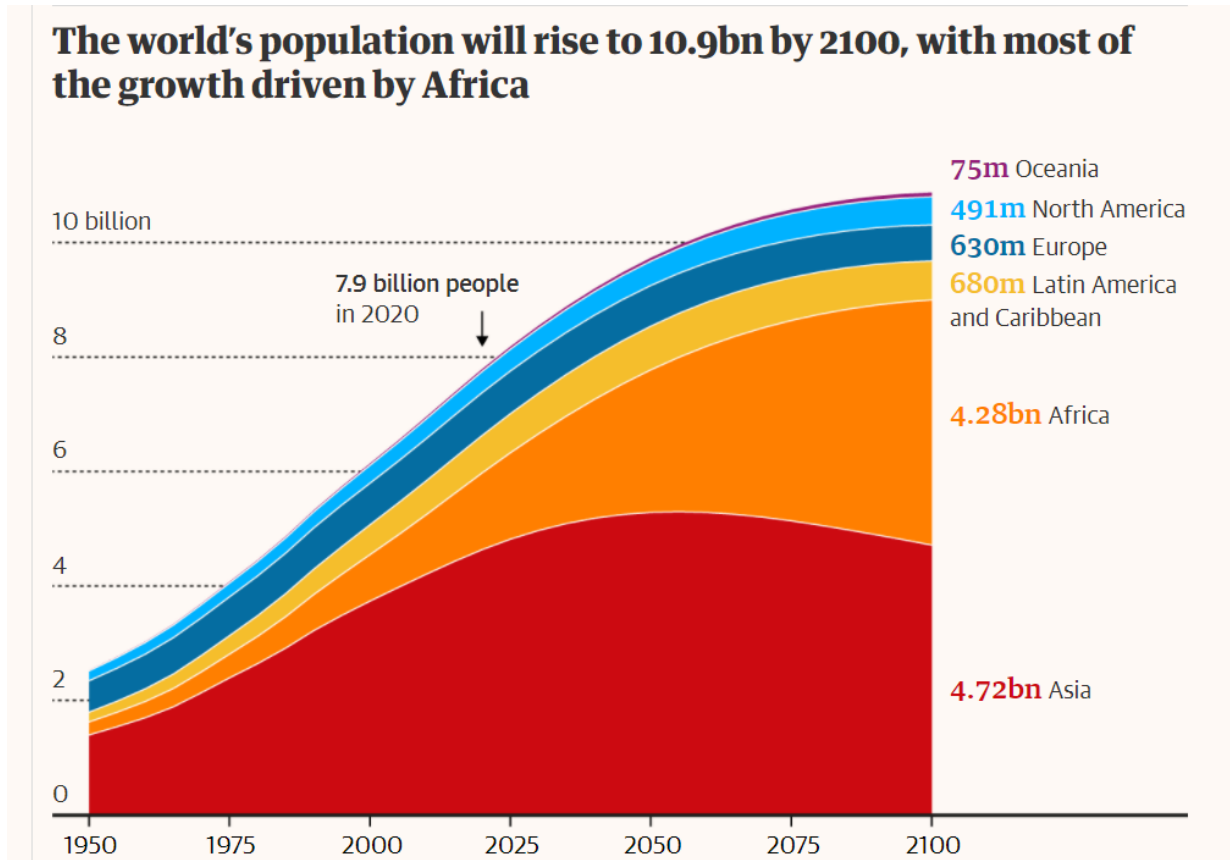
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## Africa will be a major consumer market going forward



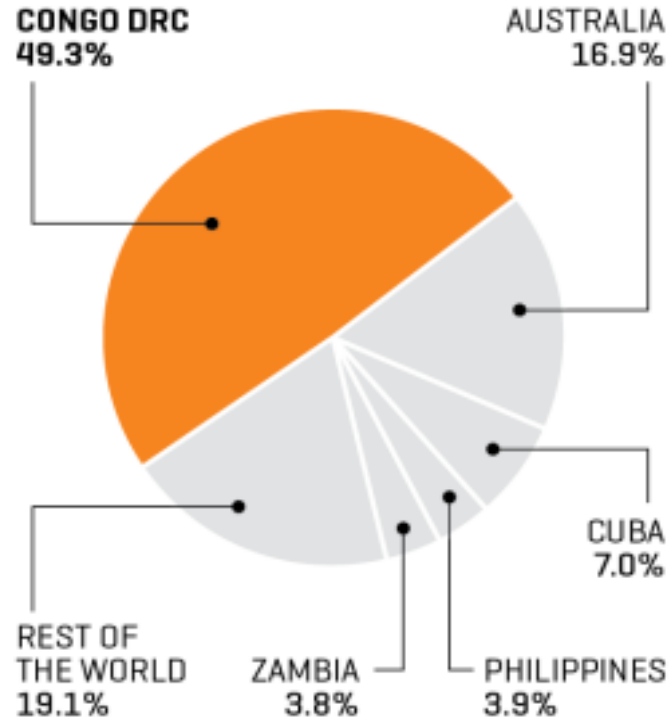
- The populations of more than half of Africa's 54 nations will double – or more – by 2050,
- 40% of all Africans are children under the age of 14 and in most African countries the median age is below 20.
- 40% of all children born worldwide by 2050





# The Role of Cobalt in the DRC

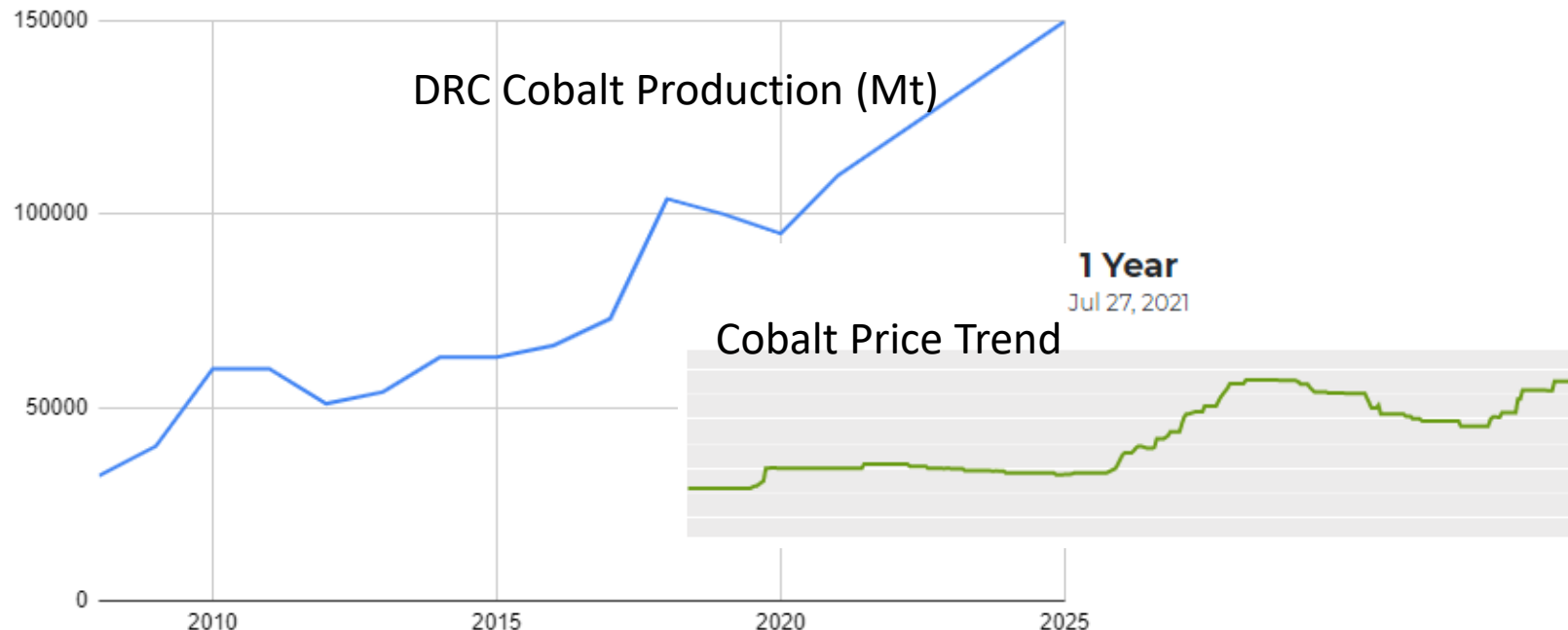
## WORLD COBALT RESERVES



SOURCES: BLOOMBERG; BP

## FEEDING A GLOBAL HUNGER FOR BATTERIES

Cobalt is a key component in lithium-ion batteries, helping to provide high energy density and stability. Soaring demand for smartphones, tablets, and now electric vehicles has caused the price of cobalt to spike. The DRC remains the biggest source of the mineral. But concerns about the country's labor conditions are pushing companies to explore elsewhere for the commodity.



- [Western abhorrence](#) to cobalt mining practices has put pressure on innovators to find ways to make clean energy batteries [without cobalt](#).

Manufacturers like Samsung and Panasonic and car makers like Tesla are embracing cobalt-free batteries

# Global Platinum Players

**World Mine Production and Reserves:**

	Mine production				PGMs Reserves <sup>9</sup>
	Palladium		Platinum		
	2017	2018 <sup>e</sup>	2017	2018 <sup>e</sup>	
United States	13,600	14,000	3,980	4,100	900,000
Canada	17,000	17,000	9,500	9,500	310,000
Russia	85,200	85,000	21,800	21,000	3,900,000
South Africa	86,800	68,000	143,000	110,000	63,000,000
Zimbabwe	12,000	12,000	14,000	14,000	1,200,000
Other countries	10,800	11,000	6,510	6,100	NA
World total (rounded)	225,000	210,000	199,000	160,000	69,000,000



South Africa and Russia deliver around 40% of the world's palladium

South Africa's Bushveld Complex hosts approximately

**80%**  
of PGM-bearing ore

Note falling PGM production in South Africa

## KEY FACTS AND FIGURES

- Six metals, all of them silvery-white in appearance, make up the suite of platinum group metals (PGMs)
- These metals occur together in PGM-bearing ore



## EV battery leasing trial service

Type



Tax operator: buy EVs



sell battery ownership



lease batteries on monthly fees

<b>Effect</b>	buy EVs at lower prices (excluding the battery price)
<b>Additional Business</b>	produce ESS with used-up batteries for EV charging
<b>Participant</b>	Hyundai Motor: sell Kona EV to KST Mobility
	Hyundai Glovis: manage battery leasing service, retrieve used-up battery
	LG Energy Solution: buy used-up battery, produce ESS for charging facility
	KST Mobility: operate electric taxi service
	Industry ministry: run project committee, monitor progress quarterly

Graphics by Lee Ha-yeon and Song Ji-yoon

# RENT TO OWN!

## IN-HOUSE FINANCE FOR BUSINESSES

**PAY-OFF** A COMPLETE SOLAR SYSTEM IN SMALL MONTHLY PAYMENTS

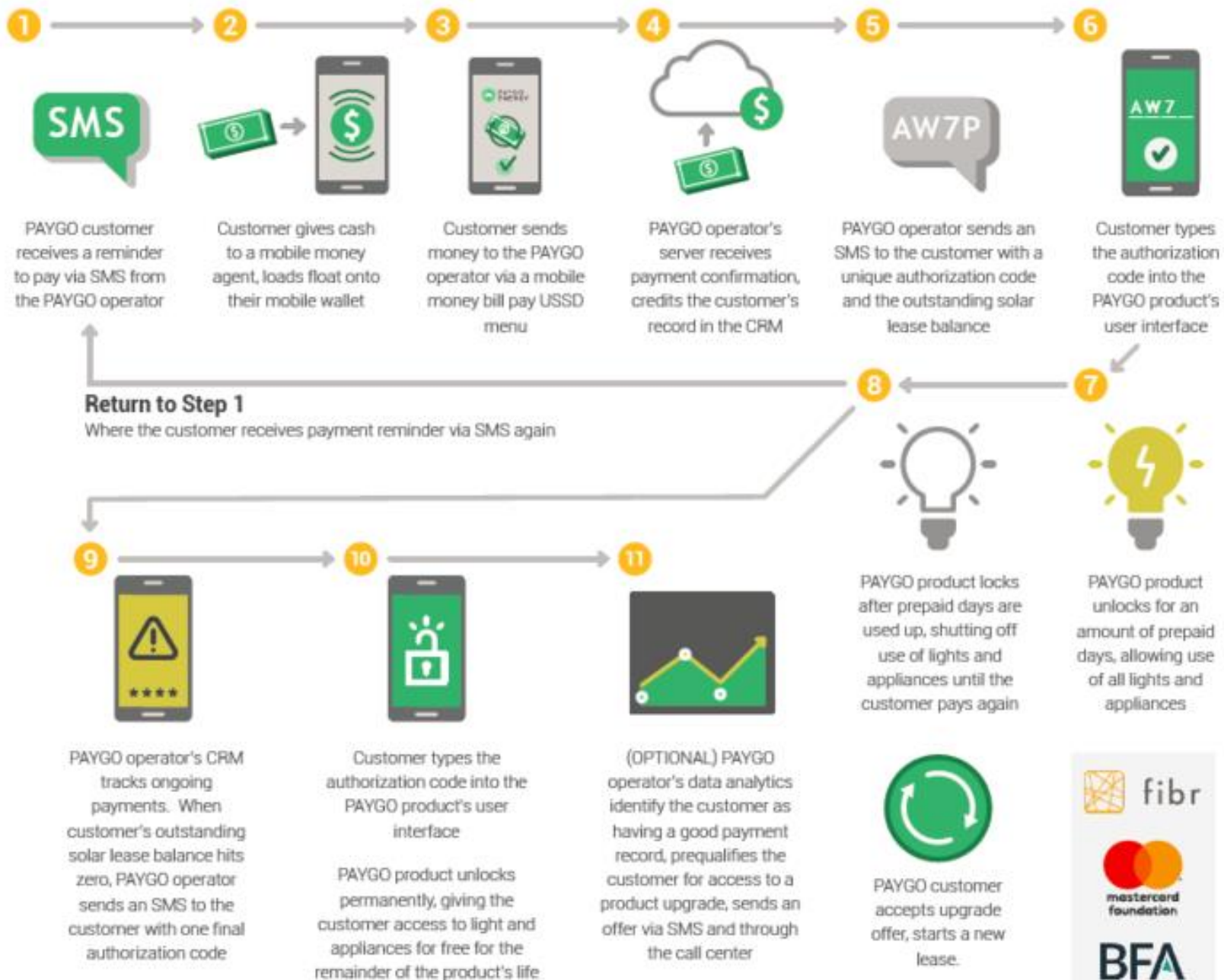
HYBRID INVERTER | SOLAR PANELS | LITHIUM STORAGE | FULL INSTALLATION

**Ferro Energia** | info@ferroenergia.com

Bboxx rents out offgrid PV systems and TVs to rural villagers across Africa. Customers can buy electricity under a mobile-based pay-as-you-go model.

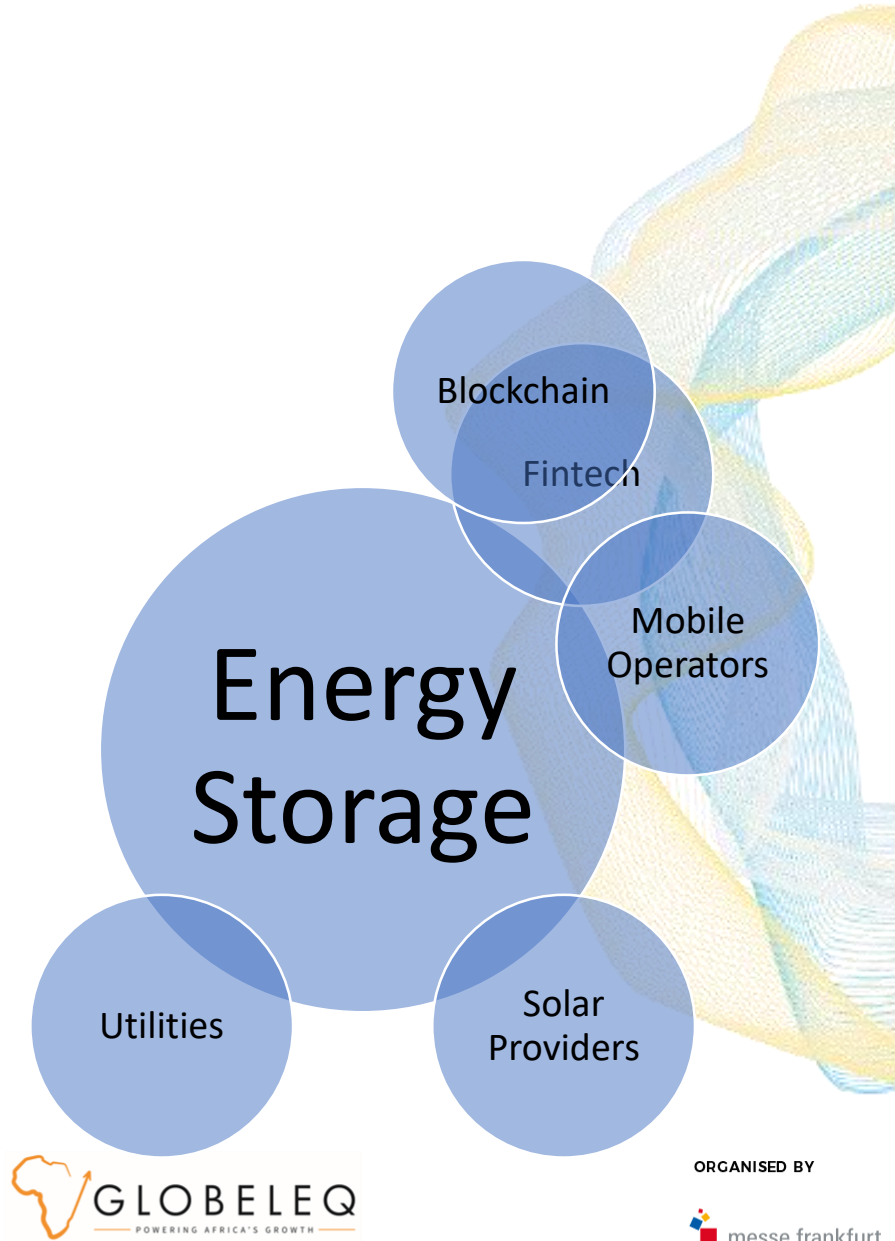
Energy distribution firm Tata Power, in partnership with India Smart Grid Forum and Australian technology firm Power Ledger, has launched a first-of-its-kind peer-to-peer solar energy trading project in Delhi





## Way forward

- Leverage the opportunities
- Match products to markets
- Partner for growth
- African solutions for African problems



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## AFRICA

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