MINERALS COUNCIL
SOUTH AFRICA

ENERGY AND MINES
AFRICA VIRTUAL SUMMIT

ENERGY CHALLENGES

and Self-Generation for South African Mines

ROGER BAXTER

CEO, MINERALS COUNCIL

5 May 2021

#MakingMining
Matter

ENERGY CONSUMPTION

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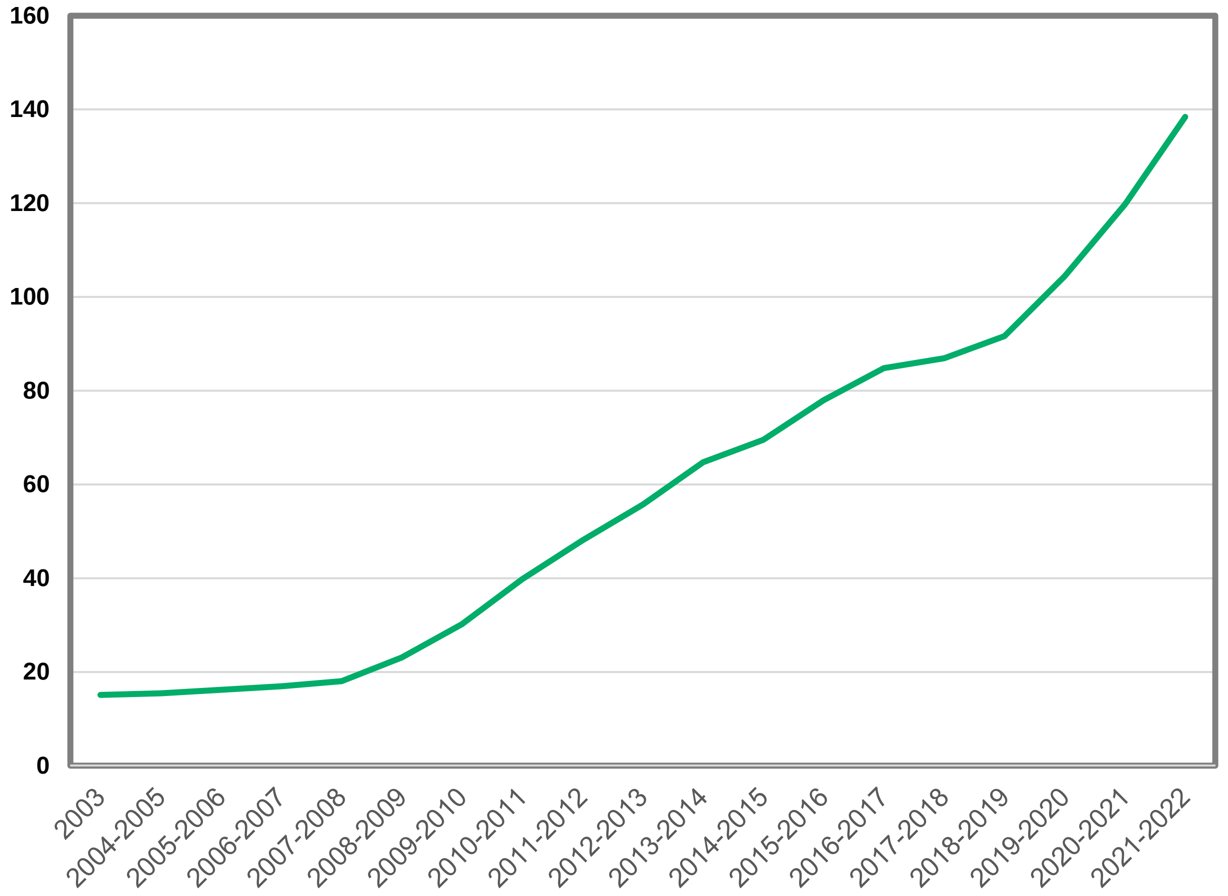
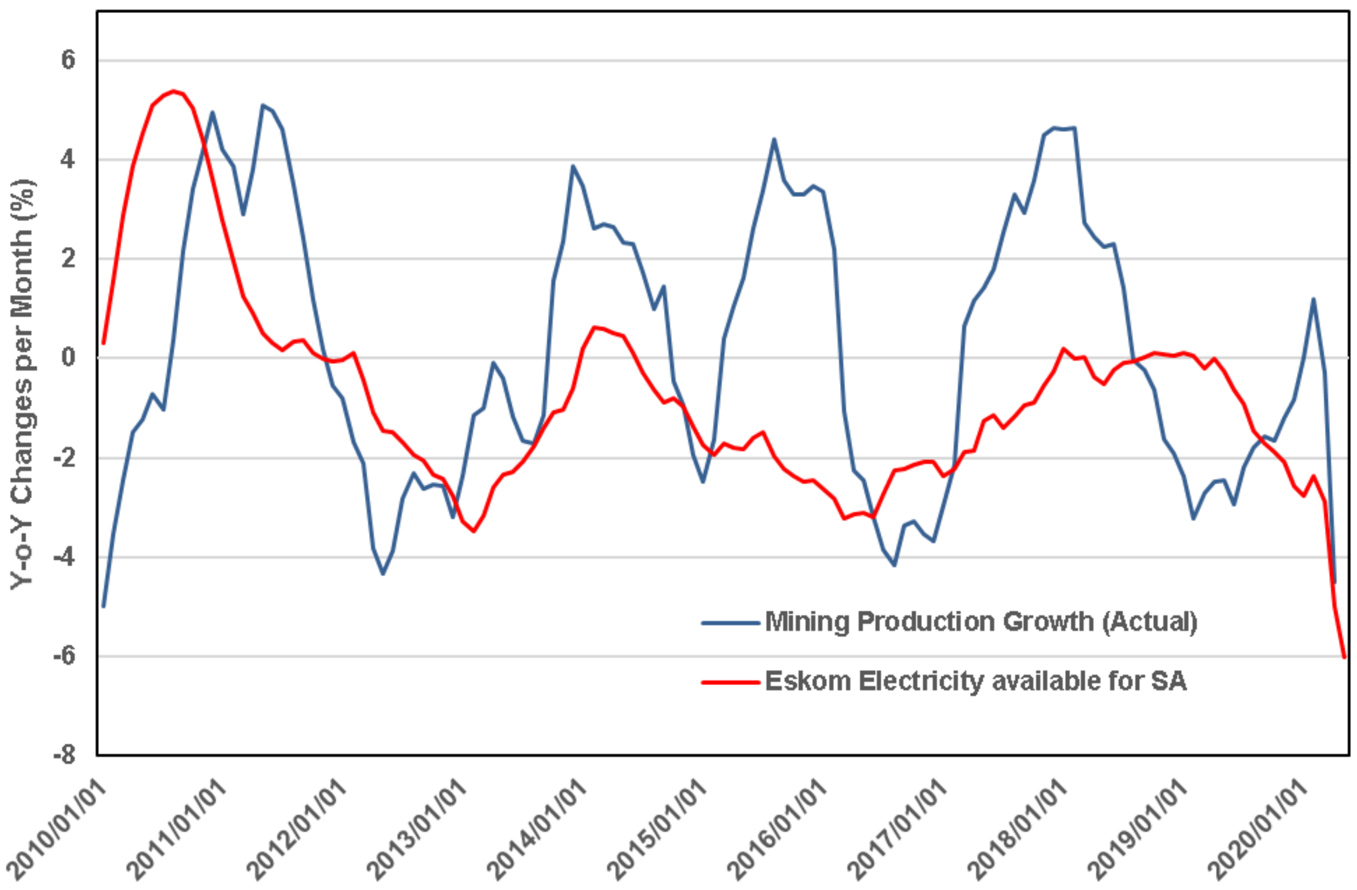
Average price of electricity (c/kWh)



Variation in mining production and electricity availability factor



Sources: Stats SA, Eskom, Minerals Council South Africa

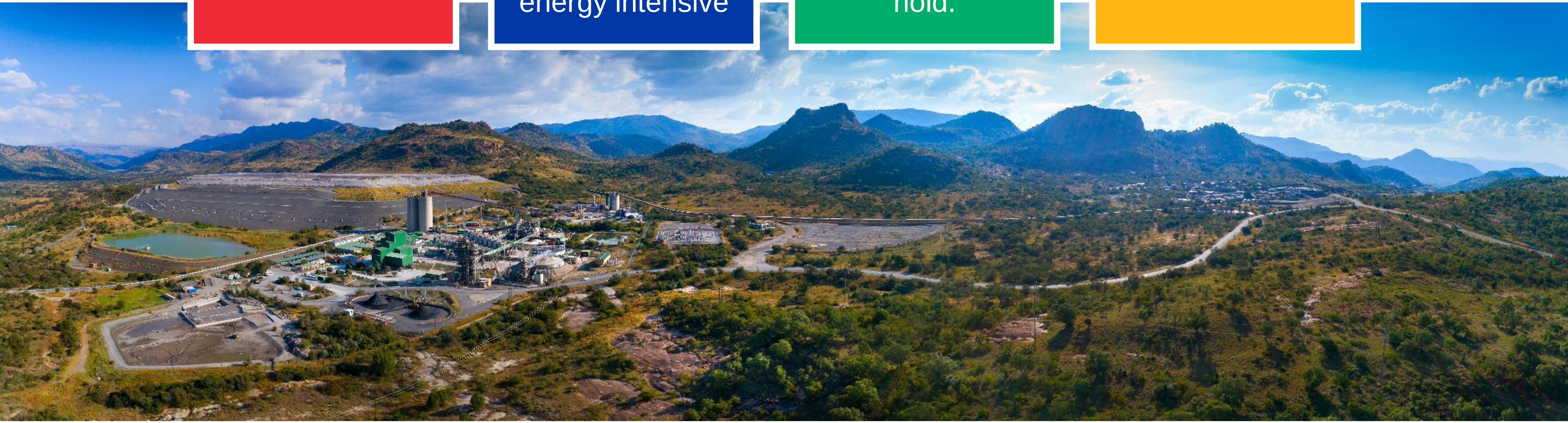
IMPACT ON INDUSTRY

Spiraling costs and load shedding

Industry has adapted to become less energy intensive

Smelters have closed. New mining projects on hold.

Self-generation



WHAT NEEDS TO BE DONE

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Address Eskom operating and capital structure	Update IRP via revised update process and in line with IEP	Enable short-term negotiated pricing and reform overall tariff landscape	Fast-track renewables deployment via REIPPPP Round 5	Provide policy certainty and regulatory clarity on self-generation	Align G2P targets to updated demand projections
Accelerate unbundling to enable expansion of IPP programme and allow for improved operational performance	Creates single-source of truth of SA energy landscape reflecting latest tech. trends	Provide immediate relief to eligible businesses, build competitive industry tariff landscape	Accelerates deployment of RE as per IRP and build of local supply chains	Enables private sector and municipalities to ensure reliable and affordable energy supply	Creates certainty on expected gas demand from power sector to drive investments in gas

Full potential 2021 - 2025

- **Up to 64,000 – 82,000 jobs protected**
- **Up to72,000 jobs created**
- **Up to R157bn in Capex deployed**

Source: B4SA

ELECTRICITY AVAILABILITY FACTOR & SHORTFALLS (FORECASTED)

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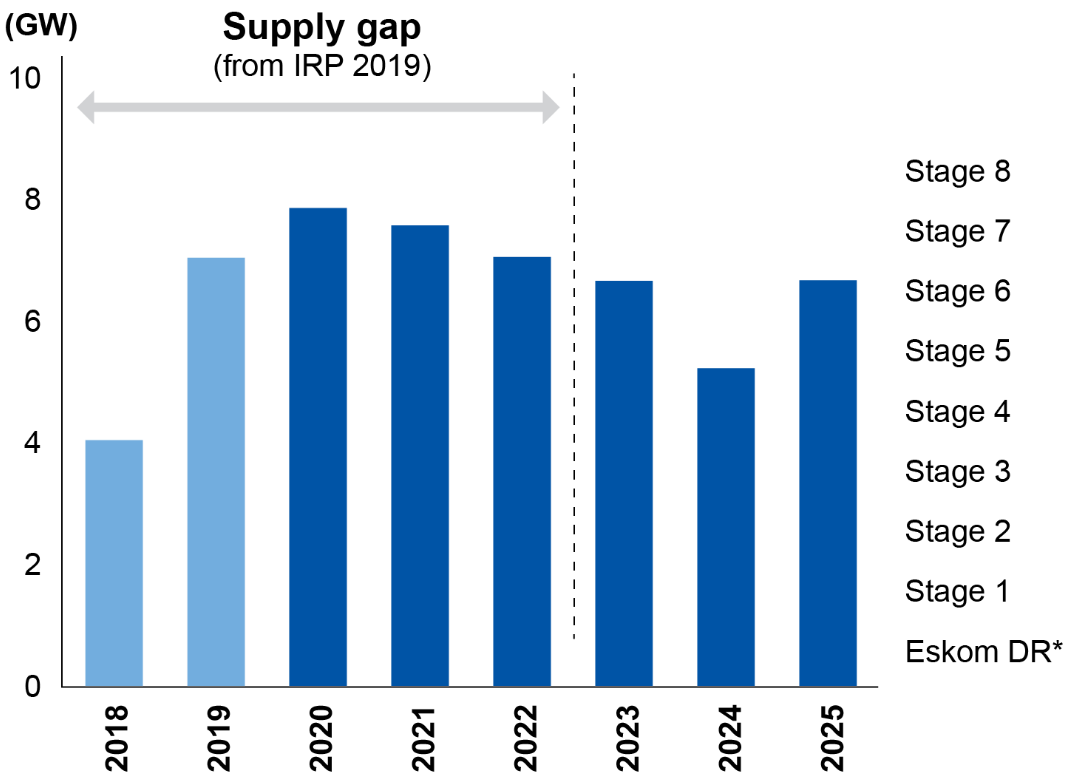
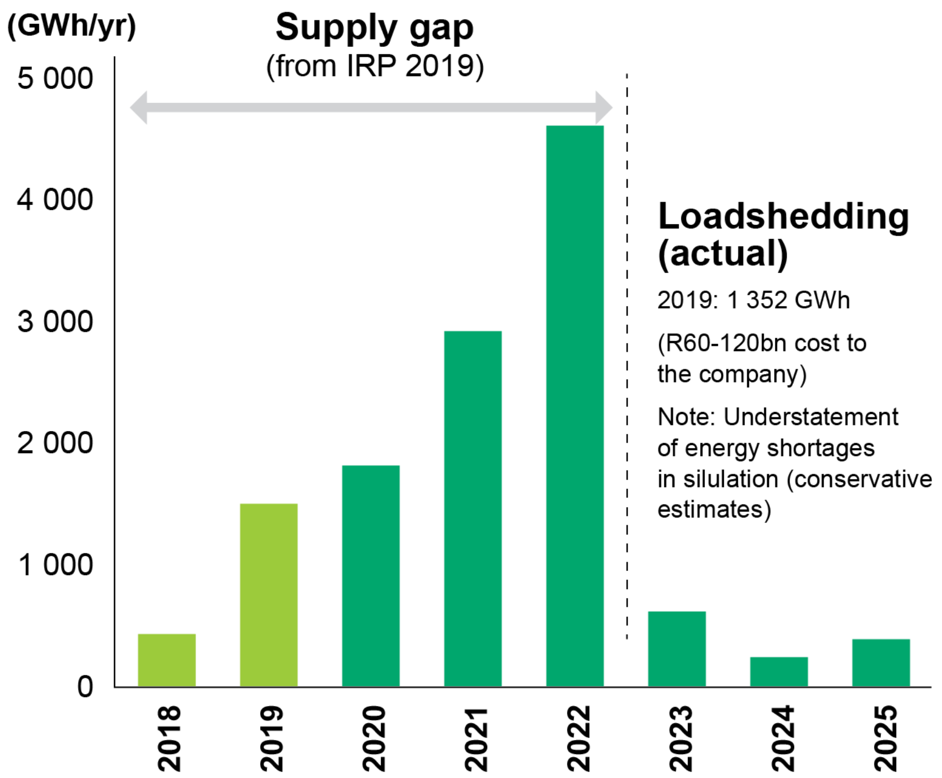
Capacity (shortage)



Energy (shortage)

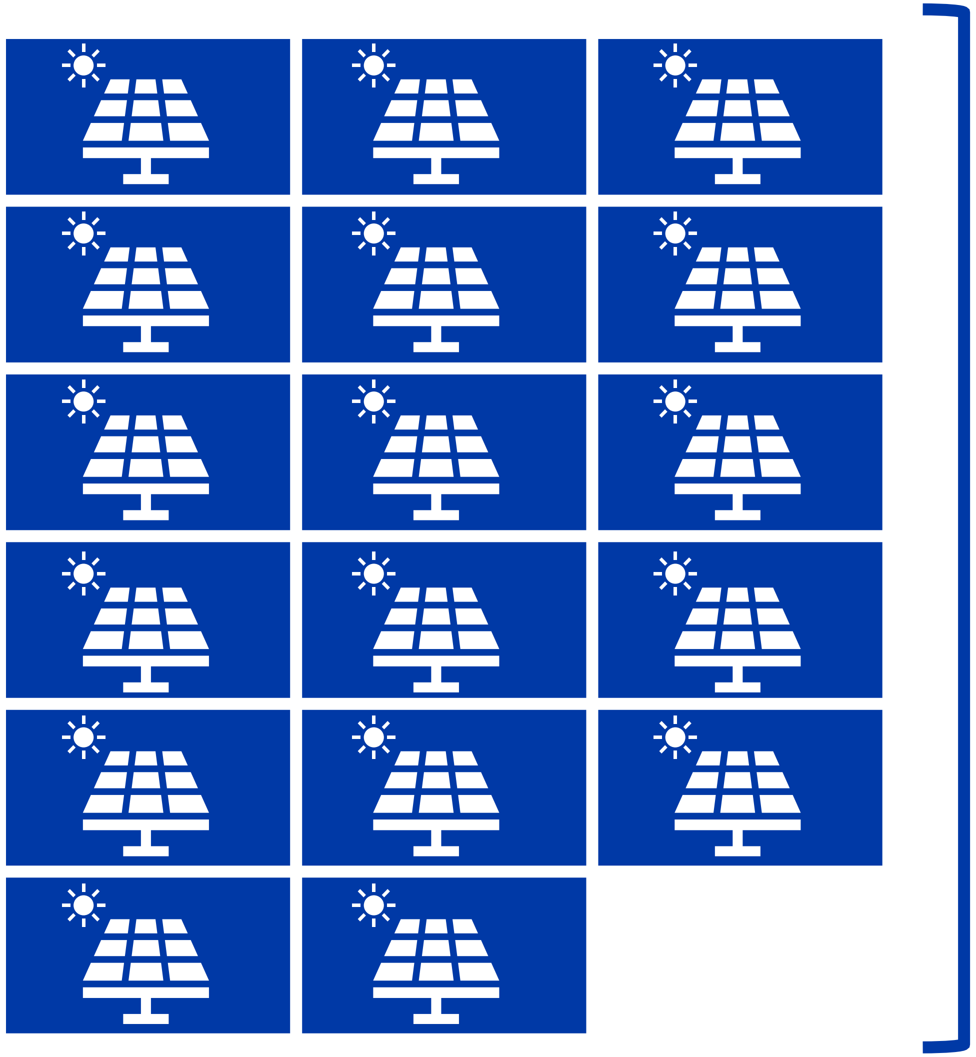


Updated EAF and updated demand forecast

EAF from = 67% by 2024. Demand forecast initially flat and growth 20 267 TWh by 2025.

Source: **CSIR**

TOTAL SELF-GENERATION PROJECTS

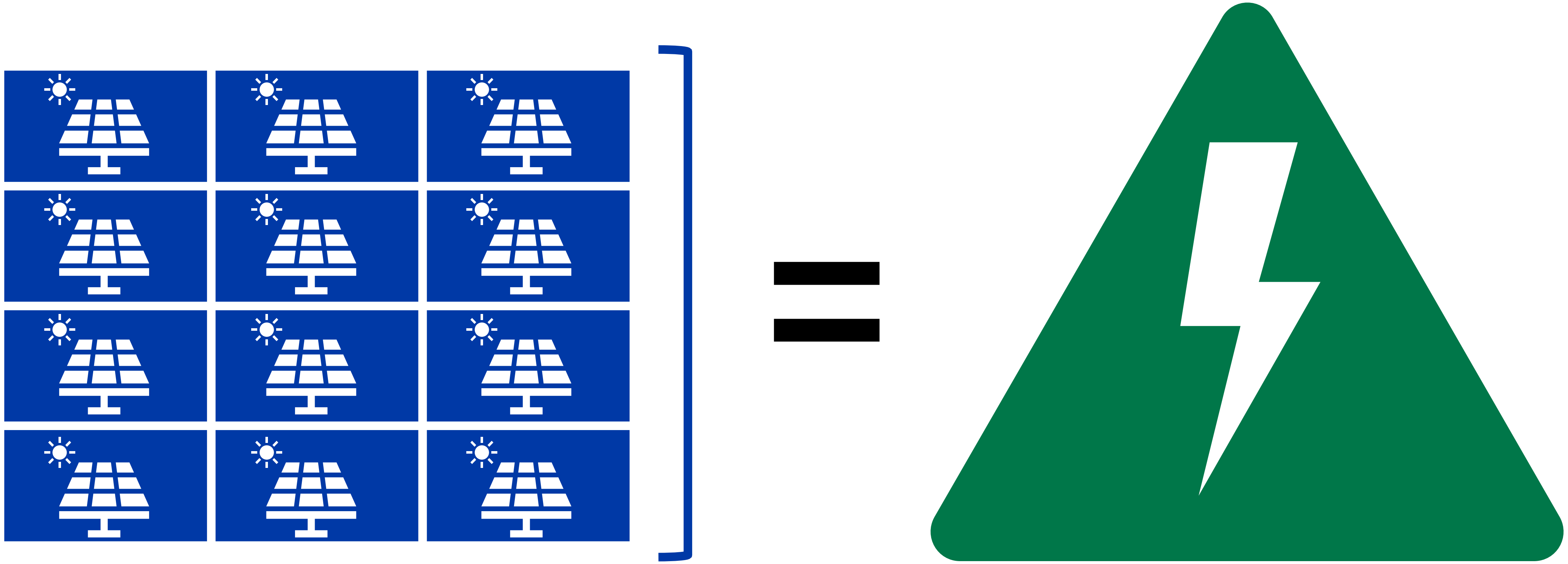


=

17 self-generation projects in various stages

2.4GW

RENEWABLE SELF-GENERATION PROJECTS



12 renewable self-generation projects in various stages

1.6GW

RED TAPE

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No documented process for the licensing of generation plants (no distinction between size of plants)

- Streamlining and simplifying of national and local government, NERSA and Eskom processes for self-generation
- NERSA must publish documented process (flow chart)
- Licensing lite is required for smaller plant (under 120 days)

Economic size of a plant and misalignment between the life of mine and the life of the electricity generation plant

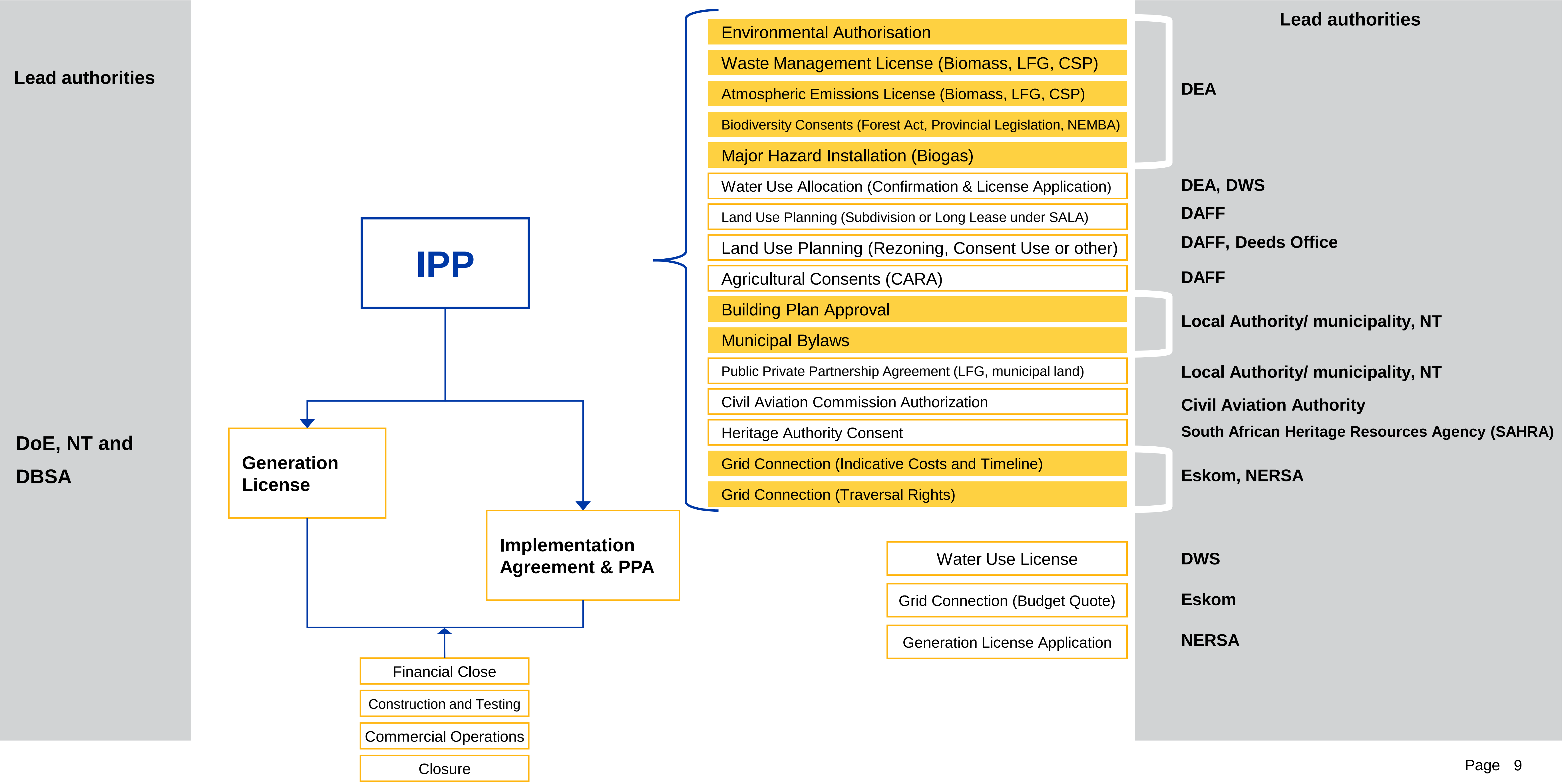
- Economically viable generation plants are often larger than a mines' electricity needs
- Without the ability to sell excess electricity to the grid, the plant remains uneconomical and will not be built
- Selling of self-generated electricity to other parties should be clarified

Other concerns relating to self-generation

NERSA should assist the industry to expedite the resolution of the bottlenecks listed below:

- Approval of grid connection letter from a licensed distributor
- Wheeling of power (ideally in the form of a national wheeling framework)
- The rules, procedures and timing for Grid Code Advisory Committee (GCAC) need to be understood and possibly reviewed
- DMRE needs to facilitate the resolution of the approval of the EIA amendment application
- Water Use Licenses lodged with the DEFF and DWS should be expedited

REGULATORY PROCESS TO INVEST IN SELF GENERATION



CRITICAL SOLUTIONS TO ENABLE ADDITIONAL SELF-GENERATION (1)

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Establish a "one stop shop" mechanism coordinated by the DMRE to accelerate licensing of private sector generation for own use

- We need smart tape, not red tape
- All licensing (environmental, water, land use, generating, IRP exemptions, etc.) should be approved within 90 days
- This mechanism should comprise senior bureaucrats from all relevant departments and regulators
- Senior bureaucrats should be given a specific instruction and mandate to finalise a streamlined process
- Progress should be reported to Cabinet

50MW

Increase cap to 50MW

- Schedule 2 published in October 2020 allows for self-generation of 100kW to 1MW not to be licensed but registered with the NERSA
- Off-grid generation, irrespective of capacity, where the facility does not have a Point of Connection does not require licensing
- The President announced in February that the cap of 1MW would be reviewed and regulated within three months
- An increase of the cap to 50MW will free up more than 5 000MW of electricity generation

Introduce licensing lite

- Currently small self-generation plants above 1MW undergo the same licensing regime as large coal fired power stations

CRITICAL SOLUTIONS TO ENABLE ADDITIONAL SELF-GENERATION (2)

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Take economies of scale into consideration

- Economies of scale of each plant enables greater benefits (financial and non-financial) than would otherwise be possible
- Life of Mine/Project might be less than the life of the generation plant which would necessitate the IPP to find other customers which is not allowed as the electricity is for self-consumption

Address other potential constraints

- A number of other potential constraints which involve government authorities exist which could cause delays
- These include the need to conclude surface lease agreements that involves the Department of Rural Development and Land Reform, environmental authorisations under NEMA (can take up to 300 days to obtain) and permitting obligations such as Water Use Licenses, sub-division of agricultural land, lack of processes for approval of captive power producer agreements, enabling wheeling and allowing IPP to upgrade network infrastructure as it is cheaper

Address wheeling

Wheeling agreements are long and drawn out and the charges sometimes lead to the project being uneconomical

WHAT IS BEING DONE

- Actively engaging with the DMRE to resolve issues
- Engaging with Eskom directly on system related, pricing and regulatory related matters
- Issues also raised through BUSA and Nedlac

ANGLO AMERICAN SECURES 100% RENEWABLES ACROSS SOUTH AMERICAN OPERATIONS

15 April, 2021

Anglo American has delivered on its commitment to source 100% renewable energy for all its operations in Brazil, Chile and Peru. Having already secured renewable energy to meet all its power requirements for its iron ore and nickel operations in Brazil from 2022, and for its copper operations in Chile from 2021, Anglo American has now signed an agreement with Engie Energía Perú to provide 100% renewable energy for the Quellaveco copper operation in Peru that is expected to begin production in 2022.

Tom McCulley, CEO of Anglo American in Peru, said: "Copper has such an important role to play in enabling the global transition to a low carbon economy, so it is important for Anglo American's new world-class copper mine in Peru – Quellaveco – to lead the way by minimising its own carbon and broader environmental footprint. The combination of renewable energy and our FutureSmart Mining™ programme's higher precision technologies which target the required metals and minerals more precisely, with reduced water, energy and capital intensity, is changing the very nature of mining and how our stakeholders experience our business – for the better."

GOLD FIELDS

MEDIA RELEASE

GOLD FIELDS WELCOMES NERSA APPROVAL OF SOUTH DEEP SOLAR PLANT

Johannesburg, 25 February 2021: Gold Fields Limited (Gold Fields) (JSE, NYSE: GFI) welcomes the electricity generation licence approved today by the National Energy Regulator of South Africa (NERSA) for the construction of a 40MW solar power plant at its South Deep mine.

The acting CEO of NERSA now has to authorise the license, a decision that should be forthcoming over the next two weeks. All the regulatory approvals to proceed with the project are then in place.

Gold Fields will update its definitive costings and finalise all the required internal processes to commence the project as soon as possible. The solar plant has the potential to provide around 20% of South Deep's average electricity consumption.

Says Nick Holland, Gold Fields' CEO: "The solar power plant will increase the reliability and affordability of power supply to South Deep, ultimately enhancing the long-term sustainability of the mine.

"The approval of this licence sends a strong, positive message to mining companies and their investors, potentially leading to decisions being taken to sustain and grow mining operations in the country, especially in deep-level, underground, marginal mines. Enabling companies to generate their own power also gives Eskom room to address operational issues at its power plants."

Gold Fields' energy objectives are based on four pillars – energy must be reliable, available, cost-effective and clean – which promote a shift to self-generation using renewable energy sources. "We are fully committed to making our contribution towards net-zero emissions," says Holland.

During 2020, Gold Fields successfully implemented solar and wind power plants, backed by battery storage, at two of its Australian mines, Agnew and Granny Smith, and committed to renewables at its other Australian mines, Gruyere and St Ives, as well as the Salares Norte project in Chile when it starts operations in 2023. All its other mines are also reviewing renewable energy options.

Since full commissioning of the Agnew microgrid, renewable electricity averages over 55% of total supply at the mine. During

Gold Fields Limited
Reg. 1968/004880/06
150 Helen Road,
Sandown, Sandton,
2196

Postnet Suite 252
Private Bag X30500
Houghton, 2041
South Africa

Tel +27 11 562 9700
Fax +27 11 562 9838
www.goldfields.com

Investor Enquiries

Avishkar Nagaser
Tel +27 11 562 9775
Mobile +27 82 312 8692
email Avishkar.Nagaser@goldfields.com

Thomas Mengel
Tel +27 11 562 9849
Mobile +27 72 493 5170
email Thomas.Mengel@goldfields.com

Media Enquiries

Sven Lunsche
Tel +27 11 562 9763
Mobile +27 83 260 9279
email Sven.Lunsche@goldfields.com

Directors: C A Carolus (Chair), N J Holland†^** (Chief Executive Officer), P A Schmidt** (Chief Financial Officer), A Andani *, P J Bacchus†, T P Goodlace, C E Letton^, P Mahanyele –Dabengwa, R P Menell. S P Reid^, Y G H Suleman
^Australian, †British, *Ghanaian, ** Executive Director
Company Secretary: A Weststrate

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HYDROGEN

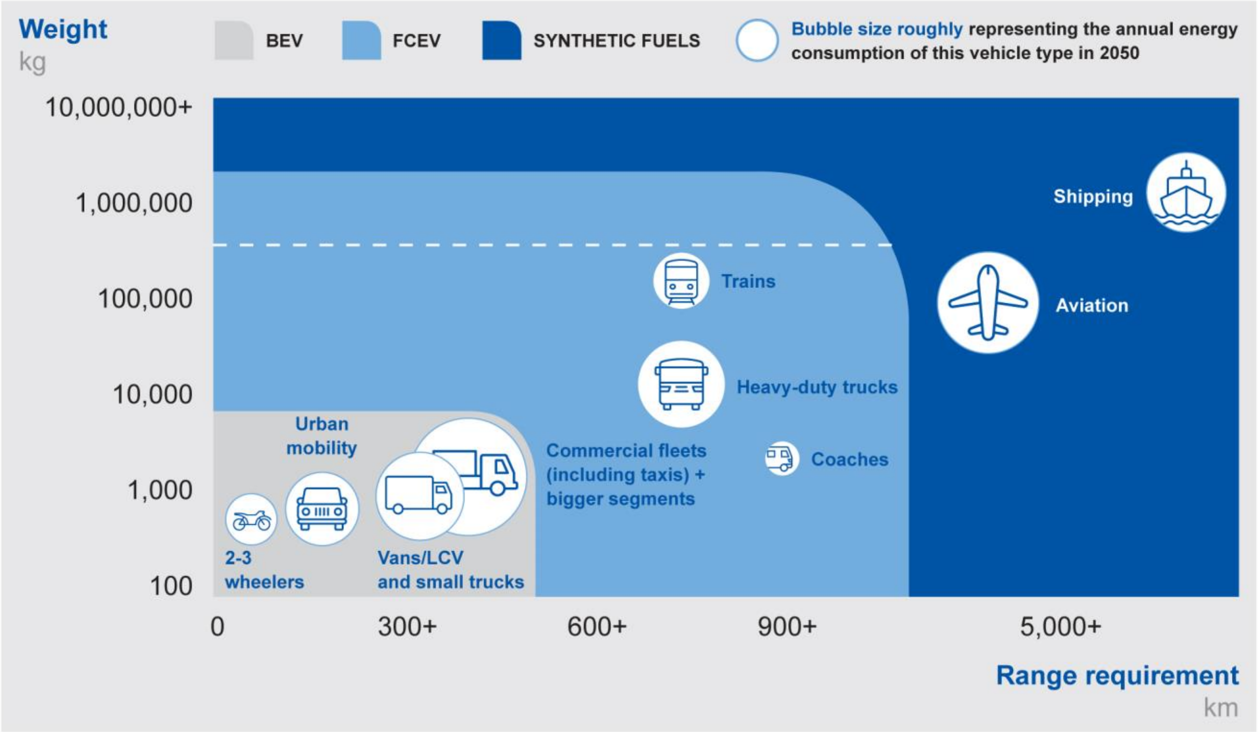
Hydrogen - poised for greater adoption globally

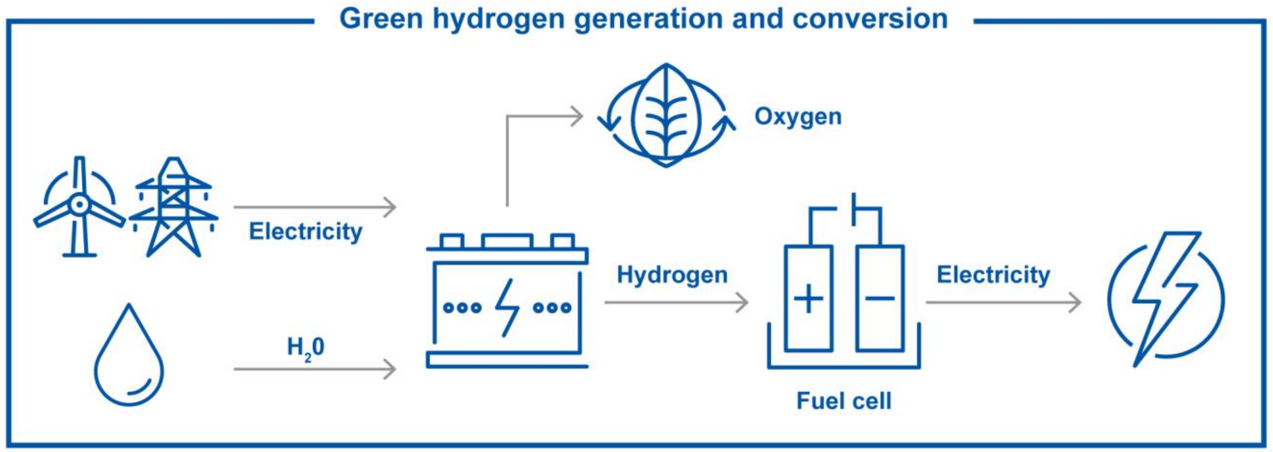
BENEFITS

- Zero emission sustainable energy source
- Can be generated locally
- Outperforms in heavy duty, high utility mobile applications
- Refuelling speeds similar to diesel
- Ability to store energy when compared to batteries

CHALLENGES

- Not as energy dense as diesel
- More expensive today compared to diesel
- Adoption of hydrogen technology is not widespread





Source: Hydrogen Council, Anglo American Platinum

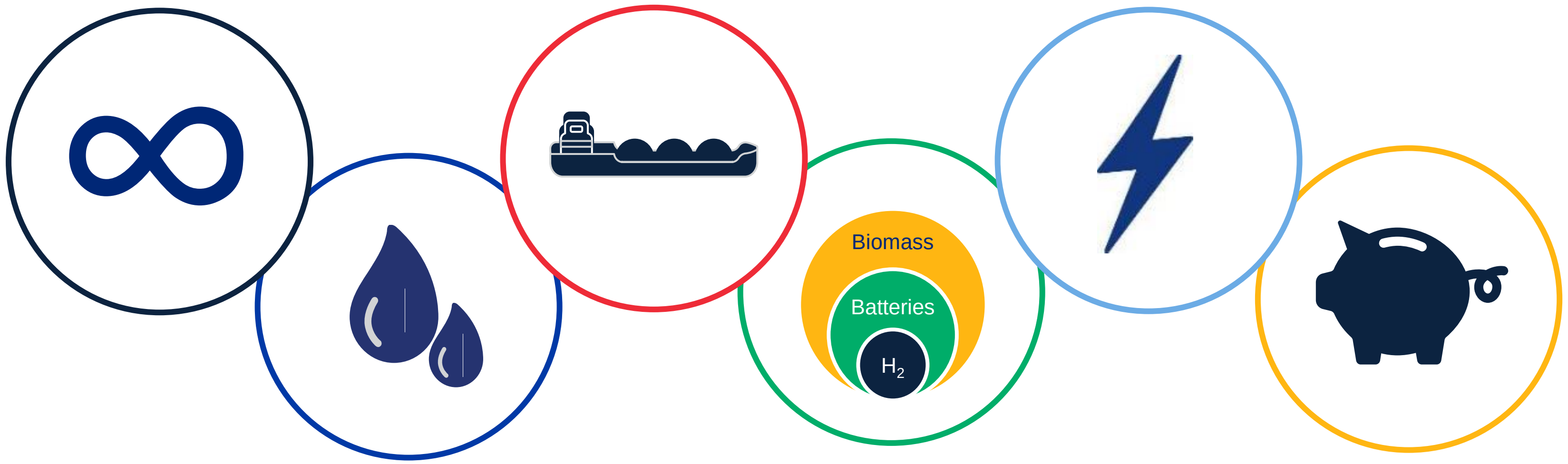
THE HYDROGEN ECONOMY

H_2 will play a significant role in decarbonising the world's energy system

Infinite supply

Easily transported
in large volumes

Produces **clean power**
and/or heat at the point of use



Can be produced with
no carbon footprint
from multiple sources

High **energy density**

Can be stored
in large quantities
and for long periods

Source: Hydrogen Council, Anglo American Platinum

H_2 ENABLES MULTI-SECTOR DECARBONISATION

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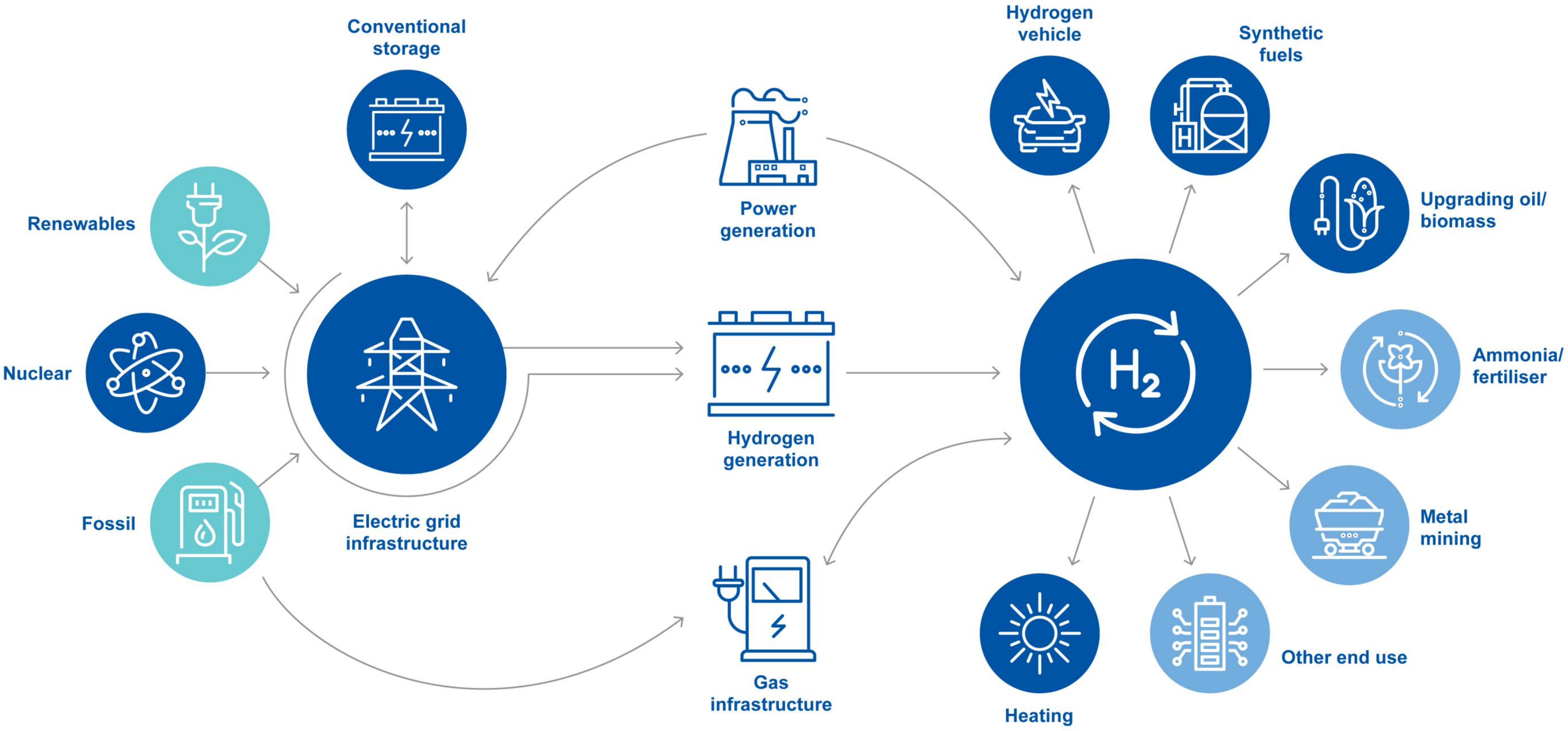
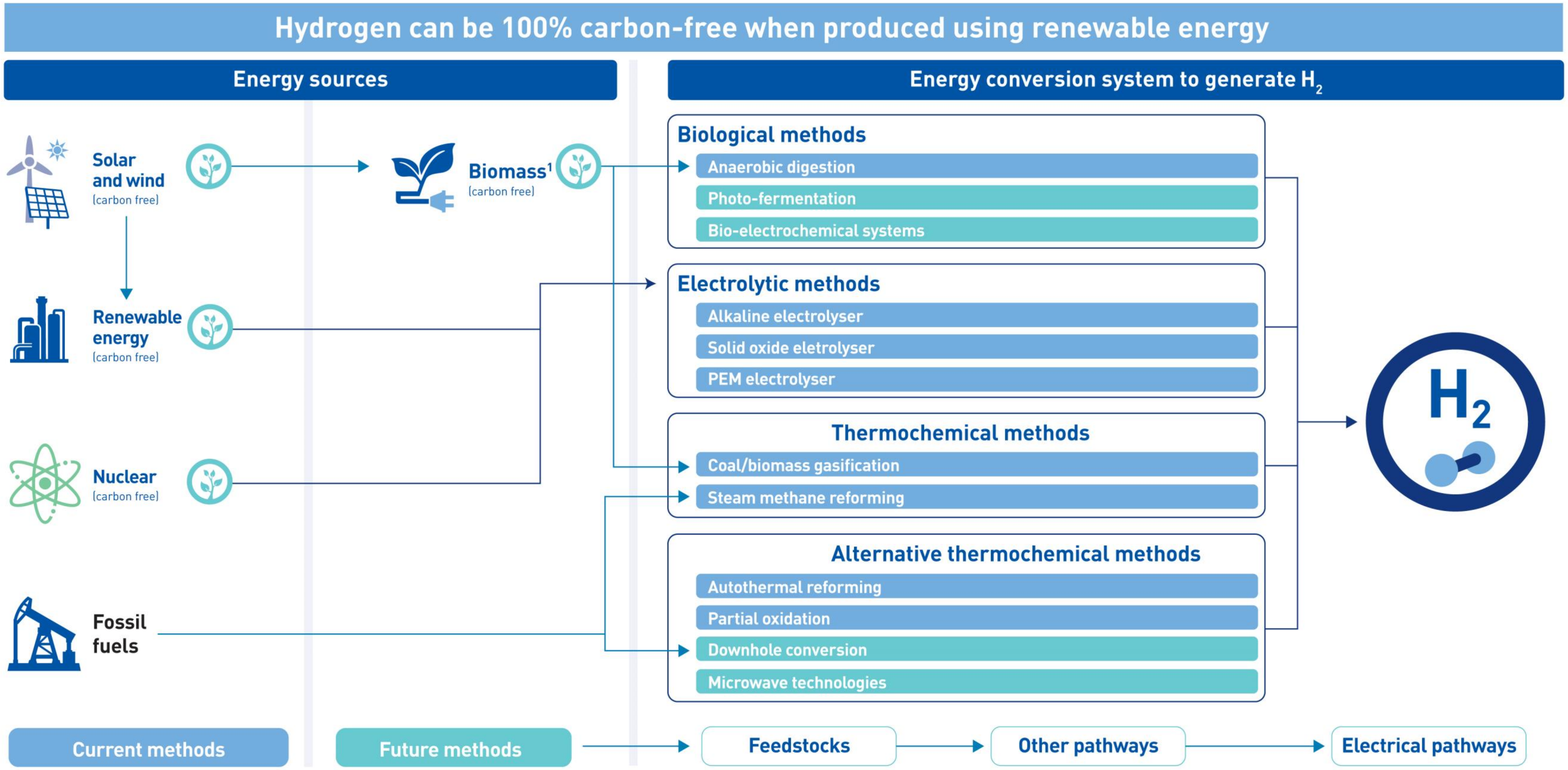


Source: US Department of Energy, “H2@SCALE”, Anglo American Platinum

H_2 PRODUCED FROM MULTIPLE SOURCES, IN MULTIPLE WAYS



Source: : The Royal Society: Options for producing low-carbon hydrogen at scale, Jan 2018. [1.] Biomass: organic matter used as a fuel

T +27 11 498 7100 **E** info@mineralscouncil.org.za **W** www.mineralscouncil.org.za

5 Hollard Street, Johannesburg, 2001, PO Box 61809, Marshalltown 2107