



BRIEFING TO THE PORTFOLIO COMMITTEE ON ENERGY **DRAFT** **INTEGRATED** **RESOURCE PLAN 2018**

BY JEFF RADEBE, MP, MINISTER OF ENERGY

4 SEPTEMBER 2018

TOGETHER WE MOVE SOUTH AFRICA FORWARD

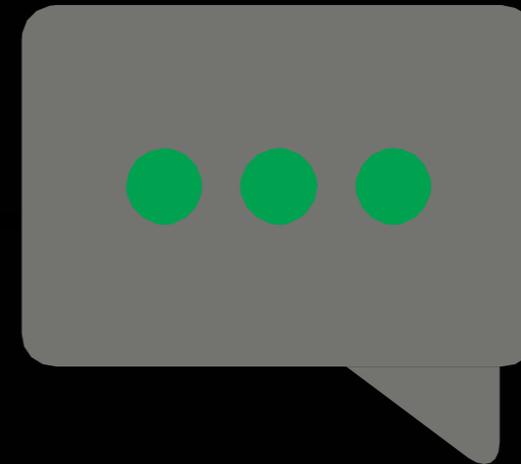


energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



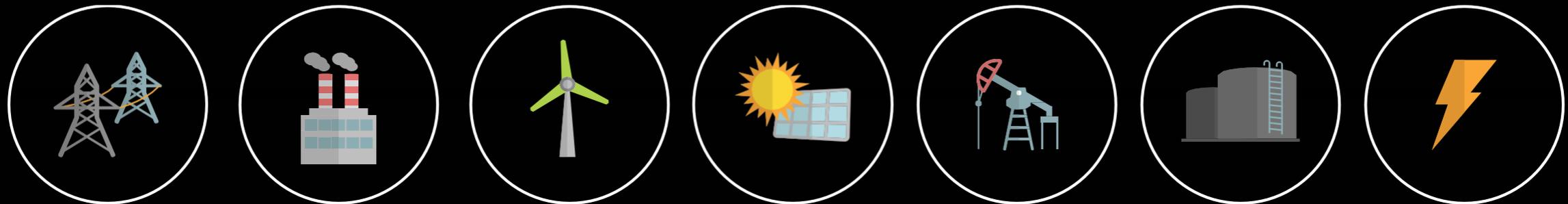
Thank you for the invitation
and opportunity to come
and share with the
committee some of the key
findings in the Draft Integrated
Resource Plan we have
published for comments.





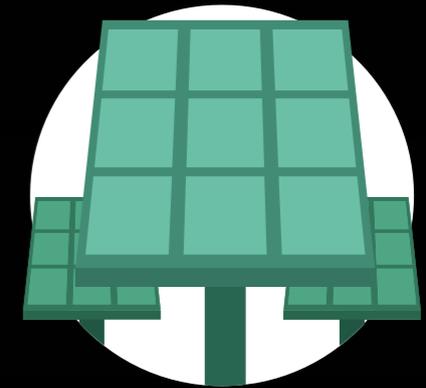
The National Development Plan (NDP) identifies the need for South Africa to invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives.

Energy infrastructure is a critical component that underpins economic activity and growth across the country; it needs to be robust and extensive enough to meet industrial, commercial and household needs



The electricity generation and distribution landscape in South Africa is changing at a rapid pace compared to the period before 2010.

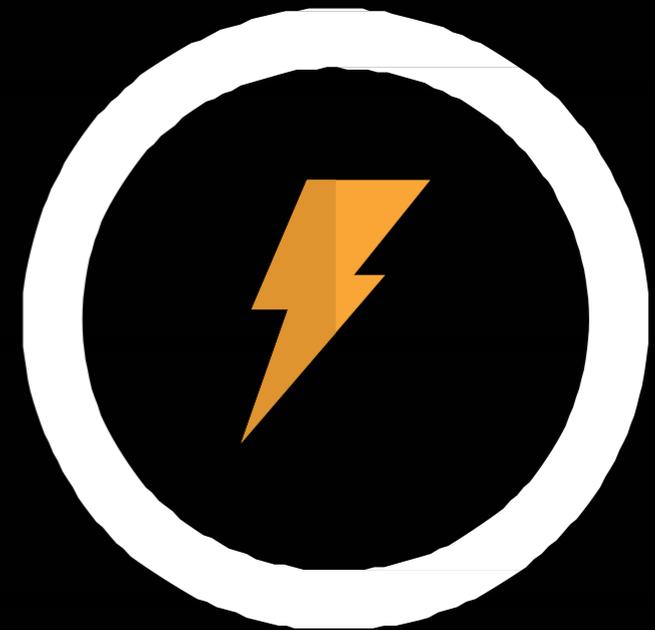
In keeping to our climate change commitments, the country has also introduced renewable energy through independent power producers.



Technology advancements and the decline in cost make it possible for end users to now generate their own electricity. Increasing electricity prices have also made substitutes such as LP Gas a viable alternative for cooking and heating. Electricity demand is therefore no longer captive to the national grid (Eskom or municipalities) which impacts on current and projected electricity supply and demand planning.

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While we have since 1994 made significant progress regarding access to electricity, rising electricity prices are of concern to us as they threaten to reverse our energy access gains.



Many of our people are struggling to pay for the services and are therefore reverting back to using wood for cooking and so forth. This is not the case only in rural areas but also in urban areas. These cost pressures do not only affect households but they also affect industry with some on the verge of closing down.

In June this year the Department approved a framework developed in consultation with the Regulator (NERSA) which enables Eskom and the NERSA to consider temporary special pricing agreements which assist in avoiding some of the companies from closing down and jobs being lost.



It is important to note that this special pricing framework will not only help these companies but it will also go a long way in curbing the Eskom's falling electricity sales volumes.

It is for this reason and the fact that electricity powers our economy that our electricity planning philosophy aims to minimise the cost of electricity while keeping up with our environmental commitments.

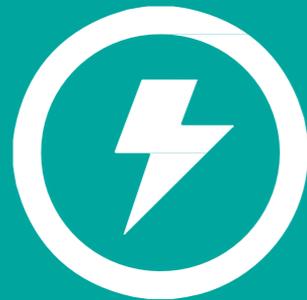
The first IRP for South Africa was promulgated in March 2011.
It was indicated at the time that

that the IRP should be a “living plan” which would be revised by the Department of Energy (DoE) frequently.



The promulgated IRP, commonly referred to as the IRP 2010 is currently being used to roll out electricity infrastructure development in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation Act.

A number of assumptions used in the IRP 2010 have since changed or not materialised. The following are noticeable changes:



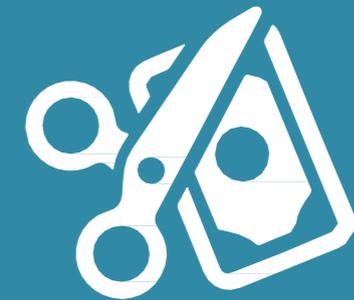
The electricity demand on the grid continues to decline on an annual basis and we are currently sitting at volumes similar to those of the year 2007. For the financial year ending March 2018 the actual total electricity consumed is about 30 percent less than what was projected in the IRP 2010.



Eskom existing generation plant performance is not at expected levels. Eskom's own reports show that plant availability is below the IRP 2010 assumptions of 80 percent and above.



To date additional 18 000 megawatts of new generation capacity in the form of coal, pumped storage and renewable energy has been committed to, with most of the capacity already connected to the grid and the rest to be realised between now and year 2022.



Cost of new generation technologies has significantly come down and this can be seen in the costs of wind and PV based on the projects procured to date

The Department started with the IRP review and update process in 2015. The review and update process had four milestones and they are:

1

The development of the Input Assumptions;

2

The modelling of a reference case or base case and scenario cases including analysis of results;

3

The production of balanced scenario; and

4

Policy adjustment taking into account government priorities, policies and commitments.

The Department between December 2016 and March 2017 published for public consultation the assumptions.

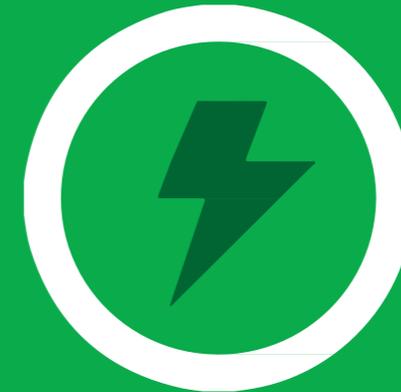
A preliminary base case or reference case was also published but for information only.

Key comments received from those consultations were mainly on the consultation process, the projected electricity demand, assumed technology costs, as well as imposing of annual build limits on renewable technologies.



The public during the consultation process asked for another opportunity to comment on the updated IRP before final publication and that is the reason we have released the report for public input and comments.

The electricity demand forecast published then was said to be outdated and not aligned to the prevailing economic conditions. The demand forecast was revised accordingly and detailed report has also been made public.



The technology costs used in the plan have also been updated accordingly.



The concern raised about the constraining of renewables has also been addressed by including as one of the scenarios tested; a case where annual built limits on renewables are removed. In summary, the report we have published has where applicable taken into account public input and comments on the assumptions.

The period after consultations was spent modelling and analysing the various scenarios and their impact on the energy mix going into the future. Scenarios were analysed in line include:



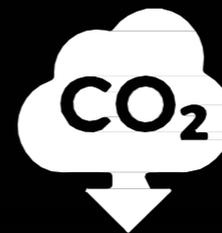
The electricity demand scenario which tested the impact of varying electricity demand projections;



The gas scenario, which tested the sensitivity of the plan to the assumed gas price projections;



The renewables scenario, which tested the impact of removing annual build limits placed on the renewable technologies; and



The emissions constrain scenario, which tested the impact of using a carbon budget approach to constrain emissions from electricity generation compared to an annual ceiling like with peak plateau decline.

At a high level, the review of the IRP review undertaken indicates the following:

That the pace and scale of new capacity developments needed up to year 2030 must be curtailed compared to what was projected in the IRP 2010.

Without a policy intervention, some of the technologies in the IRP 2010 together with new technologies will not be deployed as the “Least Cost” plan contains PV, Wind and Gas only;

Imposing annual build limits on renewables does not impact the total installed capacity of renewable energy technology for the period up to 2030; and

There is significant change in the energy mix post 2030 which is mainly driven by decommissioning of old coal power plant that reach their end of life.

While the IRP review considered a period up to year 2050, the approach taken in the draft updated IRP is to adopt a plan for the period ending 2030 and for detailed studies and engagements to be undertaken to better inform the energy mix or path post 2030.



This approach provides policy certainty

while creating the space for all of us to engage in detail on the impending energy transition and the options available to us as South Africa.

Some of the studies we have identified already include:

- Detailed socio-economic impact analysis of the decommissioning of old coal fired power plants that would have reached their end of life;
- Detailed analysis of gas supply options (international and local) to better understand the technical and financial risks and required mitigations for a renewable energy and gas dominated electricity generation mix post 2030;
- Detailed analysis of the appropriate level of penetration of renewable energy in the South African national grid to better understand the technical risks and mitigations required to ensure security of supply is maintained during the transition to low carbon future; and
- Detailed technical, cost and economic benefit analysis of other clean energy technologies such clean coal technology, nuclear and others.

The recommended plan for the period ending 2030 uses the least cost plan as starting point.

The least cost plan being a plan without renewable energy constraints.

The following policy adjustments have been incorporated into the recommended plan for the period up to 2030:

The retention of annual build limits for the period up to 2030. This provides for consistent and sustained roll out of Renewable Energy for the period.

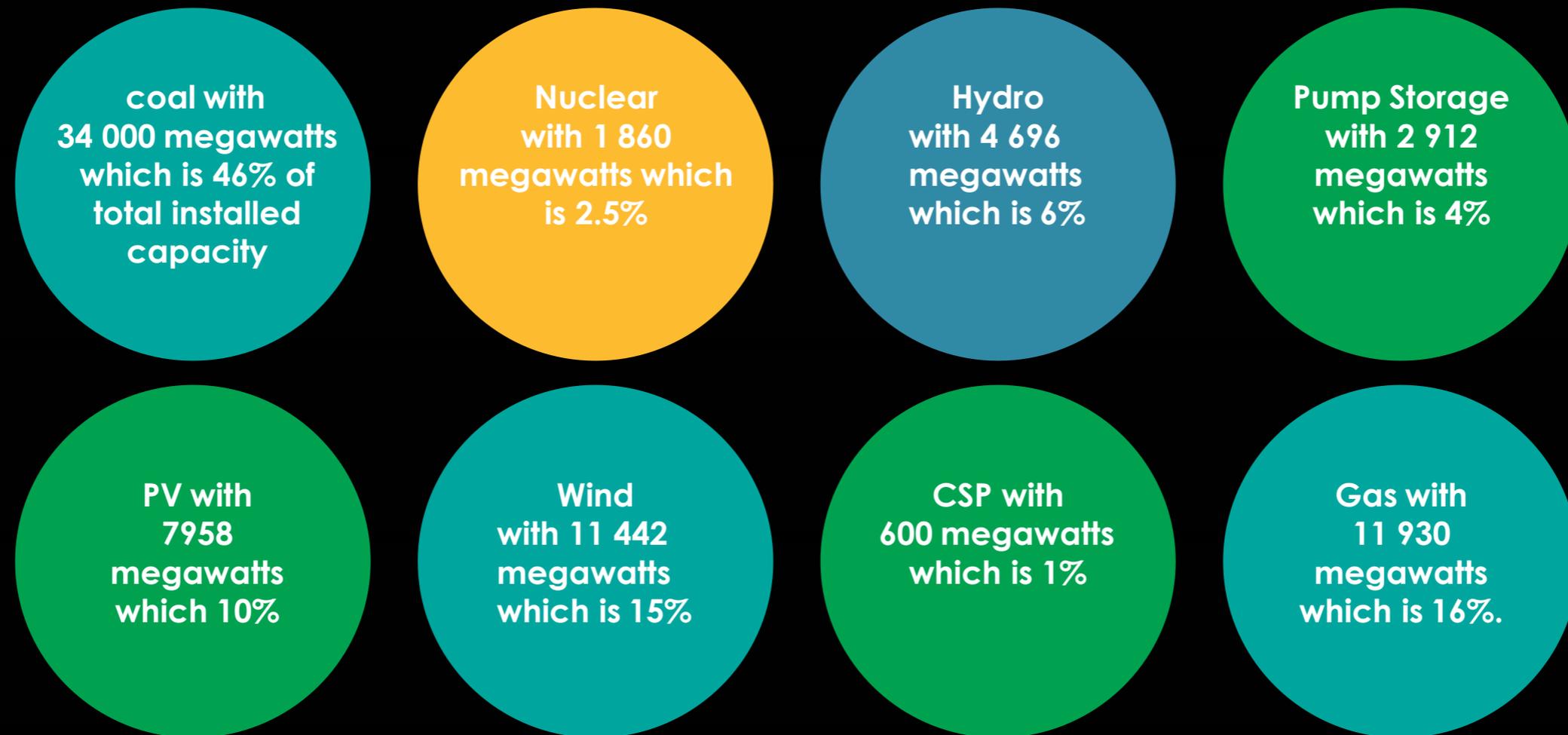
The inclusion of 1000MW of coal-to-power in 2023–2024, based on two already procured and announced projects.

The inclusion of 2500MW of hydro power in 2030 to facilitate the RSA-DRC treaty on the Inga Hydro Power Project. The project is key to energising and unlocking regional industrialisation.

The utilisation the existing PV, Wind and Gas allocations in the plan to enable through Ministerial Determinations, renewable energy technologies identified and endorsed for localisation and promotion. Technologies as contained in the plan are therefore a proxy for technologies that provide similar technical characteristics at similar or less cost to the system.

The allocations of 200MW per annum for certain categories of generation-for-own-use of between 1MW to 10MW, starting in 2018. These allocations will not be discounted off the capacity allocations in the plan, but will be considered during the issuing of Ministerial Determinations. This will help address requests for deviations from the IRP for qualifying plants.

The policy adjusted plan therefore includes the following new additional capacity by 2030: 1 000 MW of generation from Coal, 2 500 MW from Hydro, 5 670 MW from PV, 8 100 MW from Wind and 8 100 MW from Gas. The resultant installed capacity mix in year 2030 consist of



It must be noted that while the coal installed capacity will be lower than current installed base, it will still contribute more than 65% of the energy volumes with nuclear contributing about 4%.

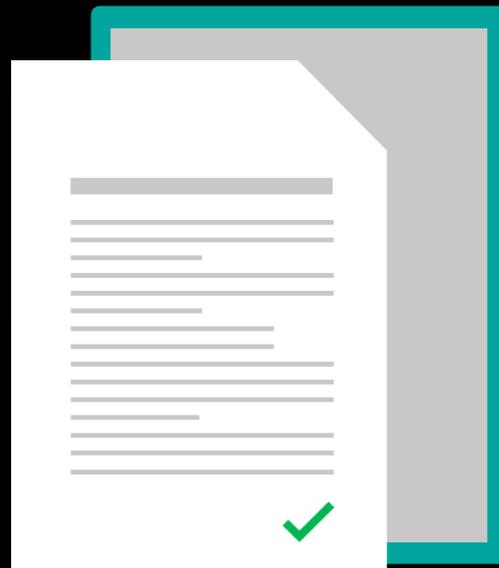
Summary of the recommended policy adjusted plan for the period ending 2030 uses the least cost plan as starting point.

| | Coal | Nuclear | Hydro | Storage (Pumped Storage) | PV | Wind | CSP | Gas / Diesel | Other (CoGen, Biomass, Landfill) | Embedded Generation |
|-----------------------------------|---------------|--------------|--------------|--------------------------------|--------------|---------------|------------|-----------------|---|------------------------|
| 2018 | 39 126 | 1 860 | 2 196 | 2 912 | 1 474 | 1 980 | 300 | 3 830 | 499 | Unknown |
| 2019 | 2 155 | | | | | 244 | 300 | | | 200 |
| 2020 | 1 433 | | | | 114 | 300 | | | | 200 |
| 2021 | 1 433 | | | | 300 | 818 | | | | 200 |
| 2022 | 711 | | | | 400 | | | | | 200 |
| 2023 | 500 | | | | | | | | | 200 |
| 2024 | 500 | | | | | | | | | 200 |
| 2025 | | | | | 670 | 200 | | | | 200 |
| 2026 | | | | | 1 000 | 1 500 | | 2 250 | | 200 |
| 2027 | | | | | 1 000 | 1 600 | | 1 200 | | 200 |
| 2028 | | | | | 1 000 | 1 600 | | 1 800 | | 200 |
| 2029 | | | | | 1 000 | 1 600 | | 2 850 | | 200 |
| 2030 | | | 2 500 | | 1 000 | 1 600 | | | | 200 |
| TOTAL INSTALLED | 33 847 | 1 860 | 4 696 | 2 912 | 7 958 | 11 442 | 600 | 11 930 | 499 | 2600 |
| Installed Capacity Mix (%) | 44.6 | 2.5 | 6.2 | 3.8 | 10.5 | 15.1 | 0.9 | 15.7 | 0.7 | |

| |
|---|
| Installed Capacity |
| Committed / Already Contracted Capacity |
| New Additional Capacity (IRP Update) |
| Embedded Generation Capacity (Generation for own use allocation) |

A closer monitoring of the IRP update assumptions by the Department through the Medium Term System Adequacy Outlook filed with NERSA annually by the Eskom's System Operator will ensure we are alive to the prevailing supply and demand balance and we can accelerate or decelerate implementation if necessary or even revise the plan if necessary.

In conclusion, there are a number of implementation issues brought about by the changing electricity industry that we will also have to look at in details outside of the IRP update process. These include levels of participation of the previously marginalised South Africans in energy sector, the structure of the industry taking into account the decentralisation of electricity demand which is no longer totally captive to the national grid, the sustainability of licenced electricity distributors taking into emerging trends such as micro-grids etc. A “just transition” requires that while we need to move with speed to respond to the changing landscape, we must not leave anyone behind.



The document is available for comments for a period of 60 days starting Monday, 27th August 2018.

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Thank you