



Gross Domestic Product (GDP) - IRP 2010 Input Parameter Data Sheet

(Demand input)

This sheet is to be used as the primary stakeholder engagement tool. This document provides the information that will allow the stakeholders to make a meaningful contribution to the IRP Input parameters

| Parameter | Gross Domestic Product (GDP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-------------------------------|-------|------|----------|------|------|--|--|------|----------|------|-----|------|----------|------|-----|------|------|------|------|------|------|------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Purpose | Projected economic growth rates are crucial to determine the electricity demand growth rates in conjunction with Energy Intensity. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impact on the IRP | The relationship between GDP and demand. An increase in GDP creates and increase in demand for electricity. This relationship is discussed in the Energy Intensity Parameter. The range of parameters is crucial in determining the number of scenarios to be studied. Currently it is a low growth rate, medium growth rate and high growth rate. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assumptions included in establishing the parameter values in this sheet | <p>The following factors are included in the GDP growth rate assumptions:</p> <ul style="list-style-type: none">• Impact of electricity price increases of 25% for the next three years• Impact on production resulting from demand for South African resources by developing countries such as India and China• Impact of infrastructure constraints and skills shortages• GDP Growth will not be constrained by electricity shortage in the long-run | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parameter Value | <p>The GDP growth assumptions for low-, moderate-, and high-growth scenarios are shown in the Table and graphically represented the Figure below .</p> <table><tr><th colspan="8">GDP - growth rate assumptions</th></tr><tr><th>Year</th><th>Moderate</th><th>High</th><th>Low</th><th>Year</th><th>Moderate</th><th>High</th><th>Low</th></tr><tr><td>2008</td><td>3.68</td><td>3.68</td><td>3.68</td><td>2022</td><td>4.90</td><td>5.90</td><td>3.90</td></tr><tr><td>2009</td><td>-1.70</td><td>-1.70</td><td>-1.70</td><td>2023</td><td>4.80</td><td>5.80</td><td>3.80</td></tr><tr><td>2010</td><td>2.50</td><td>3.50</td><td>1.50</td><td>2024</td><td>4.80</td><td>5.80</td><td>3.80</td></tr><tr><td>2011</td><td>3.70</td><td>4.70</td><td>2.70</td><td>2025</td><td>4.80</td><td>5.80</td><td>3.80</td></tr><tr><td>2012</td><td>4.00</td><td>5.00</td><td>3.00</td><td>2026</td><td>4.70</td><td>5.70</td><td>3.70</td></tr><tr><td>2013</td><td>4.00</td><td>5.00</td><td>3.00</td><td>2027</td><td>4.70</td><td>5.70</td><td>3.70</td></tr><tr><td>2014</td><td>4.00</td><td>5.00</td><td>3.00</td><td>2028</td><td>4.70</td><td>5.70</td><td>3.70</td></tr><tr><td>2015</td><td>4.50</td><td>5.50</td><td>3.50</td><td>2029</td><td>4.60</td><td>5.60</td><td>3.60</td></tr><tr><td>2016</td><td>5.00</td><td>6.00</td><td>4.00</td><td>2030</td><td>4.60</td><td>5.60</td><td>3.60</td></tr><tr><td>2017</td><td>5.00</td><td>6.00</td><td>4.00</td><td>2031</td><td>4.50</td><td>5.50</td><td>3.50</td></tr><tr><td>2018</td><td>5.00</td><td>6.00</td><td>4.00</td><td>2032</td><td>4.50</td><td>5.50</td><td>3.50</td></tr><tr><td>2019</td><td>5.00</td><td>6.00</td><td>4.00</td><td>2033</td><td>4.40</td><td>5.40</td><td>3.40</td></tr><tr><td>2020</td><td>5.00</td><td>6.00</td><td>4.00</td><td>2034</td><td>4.40</td><td>5.40</td><td>3.40</td></tr><tr><td>2021</td><td>4.90</td><td>5.90</td><td>3.90</td><td>2035</td><td>4.30</td><td>5.30</td><td>3.30</td></tr></table> | GDP - growth rate assumptions | | | | | | | | Year | Moderate | High | Low | Year | Moderate | High | Low | 2008 | 3.68 | 3.68 | 3.68 | 2022 | 4.90 | 5.90 | 3.90 | 2009 | -1.70 | -1.70 | -1.70 | 2023 | 4.80 | 5.80 | 3.80 | 2010 | 2.50 | 3.50 | 1.50 | 2024 | 4.80 | 5.80 | 3.80 | 2011 | 3.70 | 4.70 | 2.70 | 2025 | 4.80 | 5.80 | 3.80 | 2012 | 4.00 | 5.00 | 3.00 | 2026 | 4.70 | 5.70 | 3.70 | 2013 | 4.00 | 5.00 | 3.00 | 2027 | 4.70 | 5.70 | 3.70 | 2014 | 4.00 | 5.00 | 3.00 | 2028 | 4.70 | 5.70 | 3.70 | 2015 | 4.50 | 5.50 | 3.50 | 2029 | 4.60 | 5.60 | 3.60 | 2016 | 5.00 | 6.00 | 4.00 | 2030 | 4.60 | 5.60 | 3.60 | 2017 | 5.00 | 6.00 | 4.00 | 2031 | 4.50 | 5.50 | 3.50 | 2018 | 5.00 | 6.00 | 4.00 | 2032 | 4.50 | 5.50 | 3.50 | 2019 | 5.00 | 6.00 | 4.00 | 2033 | 4.40 | 5.40 | 3.40 | 2020 | 5.00 | 6.00 | 4.00 | 2034 | 4.40 | 5.40 | 3.40 | 2021 | 4.90 | 5.90 | 3.90 | 2035 | 4.30 | 5.30 | 3.30 |
| GDP - growth rate assumptions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Year | Moderate | High | Low | Year | Moderate | High | Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2008 | 3.68 | 3.68 | 3.68 | 2022 | 4.90 | 5.90 | 3.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2009 | -1.70 | -1.70 | -1.70 | 2023 | 4.80 | 5.80 | 3.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2010 | 2.50 | 3.50 | 1.50 | 2024 | 4.80 | 5.80 | 3.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2011 | 3.70 | 4.70 | 2.70 | 2025 | 4.80 | 5.80 | 3.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2012 | 4.00 | 5.00 | 3.00 | 2026 | 4.70 | 5.70 | 3.70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2013 | 4.00 | 5.00 | 3.00 | 2027 | 4.70 | 5.70 | 3.70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2014 | 4.00 | 5.00 | 3.00 | 2028 | 4.70 | 5.70 | 3.70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2015 | 4.50 | 5.50 | 3.50 | 2029 | 4.60 | 5.60 | 3.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2016 | 5.00 | 6.00 | 4.00 | 2030 | 4.60 | 5.60 | 3.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2017 | 5.00 | 6.00 | 4.00 | 2031 | 4.50 | 5.50 | 3.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2018 | 5.00 | 6.00 | 4.00 | 2032 | 4.50 | 5.50 | 3.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2019 | 5.00 | 6.00 | 4.00 | 2033 | 4.40 | 5.40 | 3.40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2020 | 5.00 | 6.00 | 4.00 | 2034 | 4.40 | 5.40 | 3.40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2021 | 4.90 | 5.90 | 3.90 | 2035 | 4.30 | 5.30 | 3.30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA

Table 1: Historical and forecasted GDP

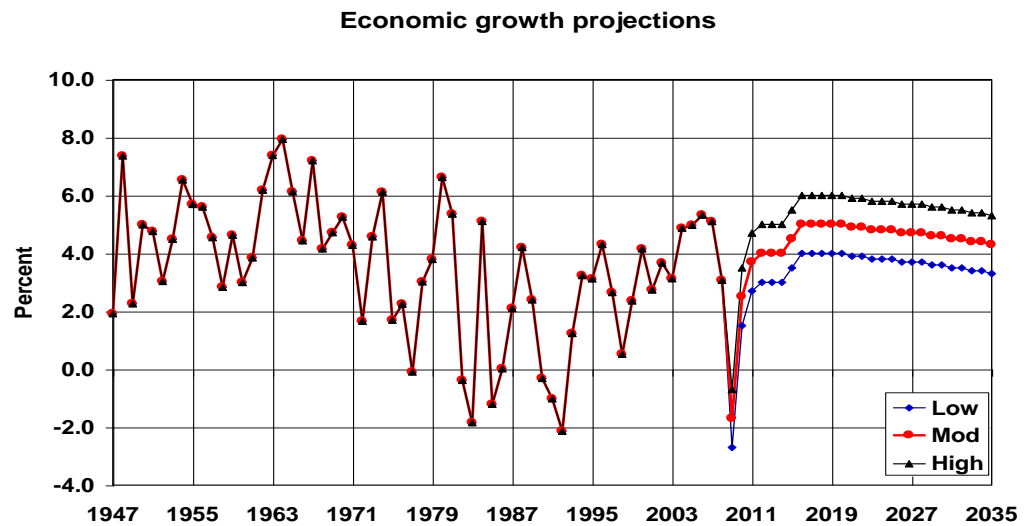


Figure 3: Economic growth assumptions

- **Assumptions applicable to economic sectors:** Figure 4 shows the expected production indices over the forecast period.

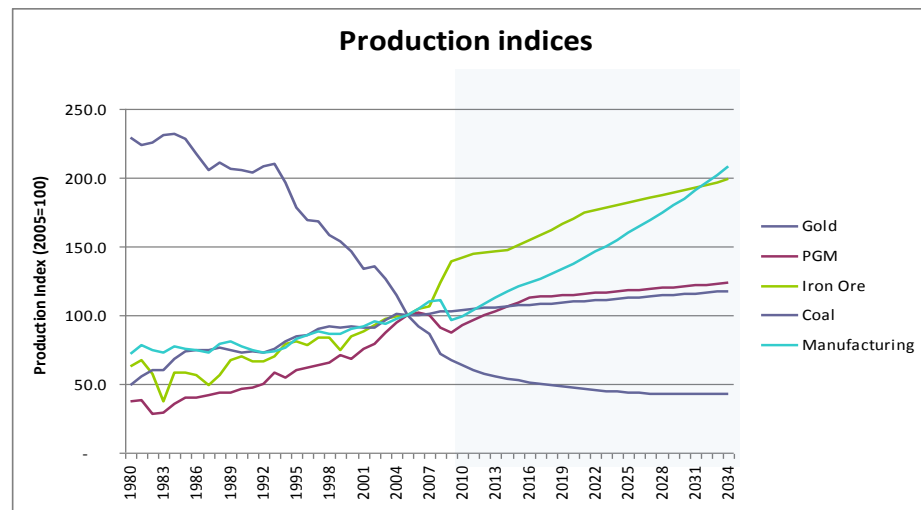


Figure: Production indices



- **Gold sector:** South Africa's known gold reserves are depleted to a large extent. Major technology innovation, very high increases in the rand gold price, or the discovery of new gold deposits is required to reverse the current downward trend of gold production. It is likely that we will see the current decreases in gold production continuing for the next 10 years, and thereafter, gold production will stabilise at a level of between 150 tons and 100 tons per annum. This view was confirmed in discussions with reliable sources. An interesting article was published in the *SA Journal of Science* in September/October 2009, focusing mainly on the Witwatersrand Basin gold resources, which also supports this view.
- **Platinum group metals (PGM) sector:** development of alternative technologies that can replace the use of PGM in, for instance, autocatalysts, can affect the South African production. At the same time, research on new uses for PGM is ongoing and can increase the demand for PGM. South Africa still has the highest PGM reserves in the world. Based on the views reflected in the previous paragraph, we assume that the world demand for platinum will remain strong over the planning horizon of the IRP. Platinum production will increase above current levels and will remain at the higher levels for the remainder of the forecasting period.
- **Coal, chromium, manganese, diamonds, and iron:** South Africa has ample reserves in the above commodities, and production will continue from the current base and increase in line with the addition of new projects. This will be more relevant in the coal sector, where South Africa has huge reserves, and with the new build programme by Eskom, higher growth will be expected.
- **Temperatures:** the moderate forecast assumes normal (average) weather conditions.
- **Gas:** the discovery and production of natural gas on the subcontinent will not materially impact the load, since gas resources are assumed to be employed for electricity generation.



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| Range of Parameter Value | Forecasts between 2.7% - 5.3% |
| Preconditions necessary to make possible for this parameter to be included in the IRP | <ul style="list-style-type: none">• That growth will not be constrained during the current electricity supply constrained period• Linked to Price Elasticity (See separate fact sheet)• Energy Intensity (See separate fact sheet)• GDP numbers will be provided by National Government |
| Parameter Owner | National Treasury |