Eskom
National Transmission
Company South Africa ™

NTCSA TUoS Network Forward Pricing Curve for 2024/25 to 2029/30

Contents

List of Figures

List of Tables

1. Executive Summary

- NTCSA publishes a Transmission Development Plan (TDP) annually, for the transmission infrastructure in South Africa over a 10-year period and in line with the code.
- The TDP outlines the investment plans required to meet the long-term grid requirements of electricity infrastructure to:
  - ✓ ensure the implementation of the IRP,
  - ✓ accommodate growth of supply and demand,
  - ✓ and maintain the legislated adequacy and reliability of the Transmission grid.
- Eskom is required to publish a forward pricing curve in line with the TDP investments.
- The development and publishing of the Forward Price Curve (FPC) is guided by the TDP and the South African Grid Code.
- The allowable revenue formula from the Multi-Year Price Determination (MYPD) methodology is used to determine the revenue associated with the new infrastructure. The forward pricing curve focuses on the Transmission Network Capacity Charge, since it is the only charge that currently recovers the cost of infrastructure investments
- The revenue requirement related to the new investment in the TDP plan is shown in the table below:

Cost Item (R'm)	2025	2026	2027	2028	2029	2030
Employee Benefits Costs	884	1,047	1,143	1,339	1,411	1,467
Maintenance	99	173	179	185	189	196
Other Opex	287	429	624	670	769	785
Overheads, recoveries and capitalisati	99	173	179	185	189	196
Return on Asset (Capex)	122	246	1,249	3,850	8,070	14,222
Total revenue	**1,491**	**2,068**	**3,374**	**6,230**	**10,628**	**16,866**
50% of Revenue Requirement	**745**	**1,034**	**1,687**	**3,115**	**5,314**	**8,433**

- The bulk of the TDP revenue requirement is for capex, the maintenance and overheads make up only 1% each, respectively.
- The indicative average TNOUS charges are shown in the table below:

Rate	2025	2026	2027	2028	2029	2030
Gen - R/KW	1.16	1.58	2.59	4.42	7.52	11.64
Loads - R/kVA	1.52	2.09	3.39	6.03	10.15	16.01

- Transmission expansion projects are expected to enter commercial operation from 2027, requiring accelerated cost recovery through the Regulatory Asset Base (RAB).

2. Introduction

Clause 5.1 of the Tariff Code requires NTCSA to annually publish a five-year rolling forward pricing curve, emphasising a clear and methodical representation of future network charges based on detailed transmission system development and investment plans.

The purpose of the forward pricing curve is to provide indicative impact of the Transmission Development Plan (TDP) infrastructure on the tariff. The Forward pricing curve does not provide full tariffs for the NTCSA's revenue requirement.

The publishing of the Forward Price Curve (FPC) by the National Transmission Company South Africa (NTCSA) plays a fundamental role in providing a view of long-term planning and investment decisions within the regulatory frameworks and the economic impact on the South African electricity market. The development and publishing of the FPC is guided by the Transmission Development Plan and the South African Grid Code: Transmission Tariff Code. The publishing of the FPC is in line with the objectives outlined in the Tariff Code, including ensuring open access to transmission services at equitable, non-discriminatory prices, and creating price predictability which supports the integration of new generation sources into the grid.

3. Applicability

The FPC is applicable to all TNSPs, and all network customers connected to the transmission system.

4. Interpretation

The Curve represents the impact of the TDP on the overall NTCSA network tariff and should not be interpreted as the tariff application for NTCSA.

5. Legal Basis

This document outlines the development of a Forward Price Curve (FPC) for transmission tariffs. This initiative follows recent amendments to The South African Grid Code: The Transmission Tariff Code version 10.1 (hereinafter referred to as the Tariff Code) aimed at clarifying provisions related to the annual publication of the five-year rolling FPC. Clause 5(1) of the approved amended mandates the National Transmission Company (NTC) to publish annually a five-year rolling forward pricing curve for transmission network charges based on the TS development and investment plans as described in The South African Grid Code: The Network Grid Code version 10.1, section 7.7 (hereinafter referred to as the Network Code).

NTCSA is a licensed entity responsible for national transmission planning in accordance with the South African Grid Code (SAGC) and under the regulatory oversight of the National Energy Regulator of South Africa (NERSA). NTCSA's planning framework is designed to ensure the long-term adequacy, reliability, and stability of the transmission network, while also considering funding constraints and resource limitations.

6. Objectives of the Transmission Forward Pricing Curve

The Transmission Tariff Code mandates that the National Transmission Company design tariffs to achieve several objectives including but not limited to:

1. Ensuring open access to transmission services at fair, non-discriminatory prices.
2. Setting pricing levels that recover the approved revenue requirements of service providers.
3. Providing customers with predictable prices over time.
4. Defining pricing signals that reflect the cost structure of the services provided.
5. Promoting optimal asset utilisation.

The objective of a forward pricing curve is to provide customers with 5 years forecast of the tariffs resulting from the TDP investments. This tariff impact will enable investors, customers, and developers to make informed operational and investment decisions. The prices shown in this document are additional Transmission Use of Systems (TUoS) Network capacity charges that relate only to the costs of the new infrastructure.

7. Transmission Forward Price Curve Modelling

The allowable revenue formula from the MYPD methodology is used to determine the revenue associated with the new infrastructure. The forward pricing curve focuses on the TUoS Network Capacity Charge, since it is the only charge that currently recovers the cost of infrastructure investments.

7.1 Allowable revenue

The network allowable revenue is calculated using the following formula:

$$Network\ allowable\ revenue = (RAB * WACC) + E + D$$

Where:

RAB is the regulatory assets base,

WACC is the weighted average cost of capital,

E is the operating and maintenance related cost,

D is the depreciation,

The service quality incentive and regulatory clearing account adjustment are not applicable and therefore excluded in the FPC revenue calculation.

7.2 Revenue Requirement Components

This section covers the regulated asset base (RAB) and components of the RAB (return on assets and depreciation) as included in the allowable revenue formula.

- **The Regulatory Asset Base (RAB)** is defined as assets of the regulated business that are used or usable in the production of regulatory services. The MYPD methodology specifies that the RAB of the regulated business operations must only include assets necessary for the provision of regulated services based on the net depreciated value (residual value) of allowable fixed assets necessary to allow the utility reasonable return to be financially viable and sustainable while preventing unreasonable price volatility and excessive sustainability.
- **Depreciation and return on the RAB** provide the regulatory mechanisms under which capital investment costs are recovered on a cost reflective basis over the course of their regulatory economic life. Return on assets is calculated on all assets including work under construction and working capital, at a rate determined by NERSA.

7.2.1 Regulated Asset Base

In accordance with the MYPD methodology, the regulatory asset base is comprised of the following:

- **Depreciated replacement cost assets:** The valuation includes assets already in use in the transmission of electricity in the first year of the FPC projection. All other assets in construction are not included in the valuation but rather in the WUC.
- **Assets transferred to commercial operations:** This refers to transmission assets transferred into Commercial Operation. Once commissioned, these assets are then depreciated by dividing the cost of the asset over the number of years that the asset is to be used for i.e. the useful life of the asset.
- **Work under construction (WUC):** In accordance with the MYPD methodology, for assets that constitute the ‘creation of additional capacity’, the capital project expenditures or WUC values (excluding IDC) incurred prior to the assets being placed in Commercial Operation (CO) are included in the RAB and earn a rate of return.
- **Asset purchases:** All movable items that are purchased and ready to be used are included in this category e.g. Equipment and vehicles, production equipment etc.

7.3 Existing allowed revenue recovery mechanism

The NTCSA recovers its costs through network charges levied on both generators and load customers, splitting these costs equally to reflect their interdependent needs for the transmission network. This cost allocation mechanism, outlined in the Tariff Code, ensures that both generators and load customers contribute equally to the funding of transmission services.

8. Transmission Forward Price curve inputs and assumptions

The development of the forward price curve classifies infrastructure into the following three primary asset categories:

- Transmission lines (km)
- Substations and equipment including compensation equipment) (MVA)
- Capital expenditure (Capex) and Operational expenses (Opex) related to the expansion projects only.
- All other costs are excluded.

8.1 General assumptions

- The base year for modelling the forward pricing curve is FY2025
- Duration/span of the curve – five (5) years starting from FY 2026 to FY 2030

8.2 Key inputs assumptions

To calculate the RAB for the forward pricing curve, only costs associated with new assets are considered. These assets include the TDP capital expenditure, assets transferred to CO and the WUC are considered. The other costs considered are the manpower, operations and maintenance costs associated with the new assets.

8.2.1 TDP Capital Expenditure

The capital expenditure presented in the table below represents the unconstrained plan. This plan includes projects that can be implemented without resource constraints. The first table lists integration costs for two project categories: New Generation Integration and Network Strengthening.

Table 1: NTCSA Capital expenditure related to new generation integration as per 2024 TDP .

Item (R'm)	2025	2026	2027	2028	*2029*	2030
New Generation Integration	1,898	4,419	25,937	35,934	*29,795*	29,939
Network Strengthening	1,160	1,878	5,649	11,611	*13,427*	10,609
Total Expansion	**3,058**	**6,297**	**31,585**	**47,545**	***43,222***	**40,548**

The table below categorises the capital expenditure in terms of technology and project goal.

Table 2: NTCSA Capital expenditure for the different categories as per 2024 TDP

Item (R'm)	2025	2026	2027	2028	2029	2030
Eskom Gx integration	1,106	208	425	651	1	313
Reliability	710	1,189	4,678	10,411	12,551	8,562
IPP integration	803	4,211	25,512	35,283	29,794	29,626
Safety	82	81	0	3	166	1,063
QOS	0	0	0	0	0	3
Load Customer	357	608	970	1,197	710	981
Total Expansion	**3,058**	**6,297**	**31,585**	**47,545**	**43,222**	**40,548**

8.2.2 Transfers to Commercial Operation

Transfer to commercial operation starts in 2025 for lines and 2028 for transformers as indicated in the table below.

Table 3: Lines and Transformers transferred to commercial operation.

Asset (R'm)	2025	2026	2027	2028	2029	2030
Lines	0	0	0	12,434	52,007	26,147
Substations	12	1,854	830	1,587	3,391	7,093
Total Transfer to CO	**12**	**1,854**	**830**	**14,021**	**55,397**	**33,240**

The table below shows the different categories of these assets that are transferred to CO.

Table 4: Categories of the assets transferred to commercial operation.

Assets (R'm)	2025	2026	2027	2028	2029	2030
Eskom Gx integration	0	1,210	0	133	956	405
Reliability	0	36	0	2,098	7,760	16,984
IPP integration	12	391	468	11,118	46,682	13,590
Safety	0	24	12	0	0	423
QOS	0	0	0	0	0	0
Load Customer	0	193	350	673	0	1,838
Total Transfer to CO	**12**	**1,854**	**830**	**14,021**	**55,397**	**33,240**

8.2.3 Work under construction (WUC)

WUC reflects the costs incurred prior to the assets being placed in Commercial Operation (CO) and is calculated as the cumulative sum of the projects executed annually. The costs accumulate until the assets are transferred to commercial operation.

Table 5: Work under construction forming part of the 2024 TDP.

	2025	2026	2027	2028	2029	2030
WUC Balance (R'm)	3,047	7,489	38,244	71,769	59,593	66,901

9. Depreciation assumptions and net book value

The depreciation is calculated and deducted from the assets that are in commercial operation. The method used in this exercise is a straight-line method. The accounting life of assets is

required for the calculation of depreciation. For this assessment, lines were assumed to have a 30-year lifespan. Substations, which include all electrical assets and equipment except transmission lines, were assigned a 20-year lifespan. The net book value of transmission lines and substations transferred to commercial operation is presented in the table below.

Table 6: Nett-book values of assets (lines and transformers) transferred to commercial operation.

Asset (R'm)	2025	2026	2027	2028	2029	2030
Lines	0	0	0	12,434	52,007	26,147
Substations	12	1,854	830	1,587	3,391	7,093
Total Transfer to CO	**12**	**1,854**	**830**	**14,021**	**55,397**	**33,240**

10. ROA

A weighted average cost of capital (WACC) of 4% was used for the starting year, and increased by 1% annually. The first 3 years corresponds with the WACC used in the MYPD 6 application and the assumption to increase by 1% is extrapolated from the increases in the application and decision.

11. Revenue requirement

The revenue requirement formula used in the calculation of the revenue for FPC excludes cost of existing assets, incentives and the RCA. Costs that are used for this revenue requirement are indicated in the table below. The total revenues are also shown for each year. These revenues indicate the contribution of new assets to the total revenue requirement, and not the total revenue required by NTCSA. This means that new investment projects will contribute R485,32 million in 2025, split equally between loads and generators (R242,6 million each will be recovered from Generators and loads).

Table 7: Cost elements of the revenue requirement that relates to the TDP

Cost Item (R'm)	2025	2026	2027	2028	2029	2030
Employee Benefits Costs	884	1,047	1,143	1,339	1,411	1,467
Maintenance	99	173	179	185	189	196
Other Opex	287	429	624	670	769	785
Overheads, recoveries and capitalisati	99	173	179	185	189	196
Return on Asset (Capex)	122	246	1,249	3,850	8,070	14,222
Total revenue	**1,491**	**2,068**	**3,374**	**6,230**	**10,628**	**16,866**
50% of Revenue Requirement	**745**	**1,034**	**1,687**	**3,115**	**5,314**	**8,433**

The bulk of the TDP revenue requirement is for capex, the maintenance and overheads make up only 1% each, respectively. Employee benefits relate to employees' hours linked to the TDP projects.

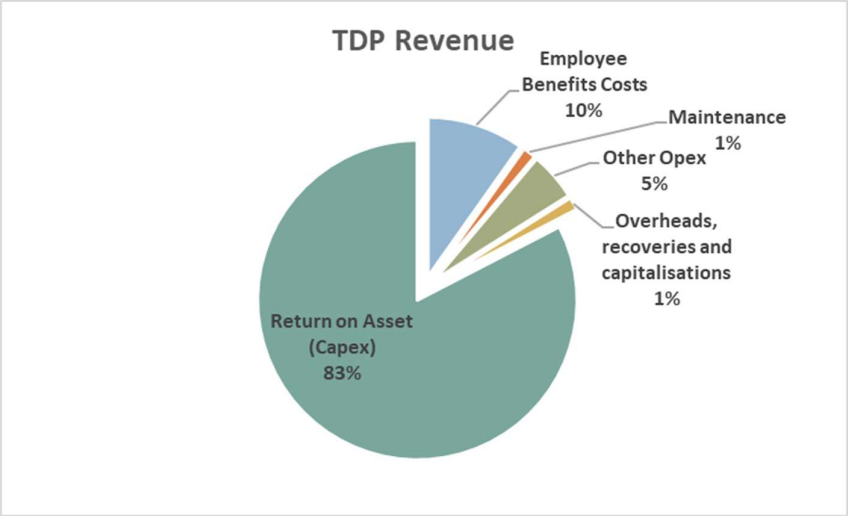

Figure 1: Pie chart indicating the contribution of each cost element linked to the new infrastructure's (TDP) revenue requirement.

The IPP integration projects are leading in terms of capex requirement at 78% followed by reliability or statutory requirement projects which a below 20%. The remining 10% is shared by load customer integration, safety and QOS related projects.

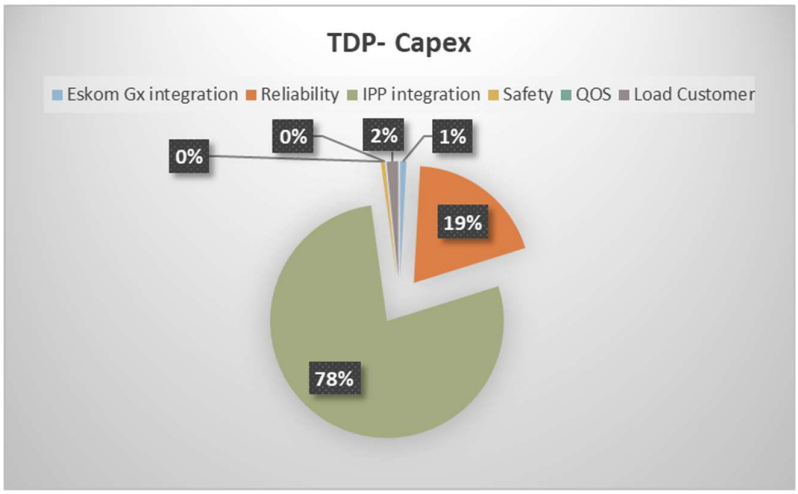

Figure 2: Project categories and their contribution to the TDP capital expenditure.

12. Capacities and energy assumptions

The total reserved or declared capacities for generators and loads are indicated below.

Table 8: Generators maximum export capacities and load reserved capacities used in the calculation of the price curve.

Item	2025	2026	2027	2028	2029	2030
Eskom Generation (MIC-MW)	53592	54497	54365	58685	58898	60370
Loads Reserved Capacities (MVA)	40 994	41 188	41 405	43 067	43 615	43 886

13. Indicative prices

13.1 Indicative TUoSN

Indicative TUoSN in R/kW/month and R\kVA/month for generators and loads respectively, are shown in table.

Table 9: Indicative average prices/tariffs associated with TDP for each year for the next 5 years.

Rate	2025	2026	2027	2028	2029	2030
Gen - R/KW	1.16	1.58	2.59	4.42	7.52	11.64
Loads - R/kVA	1.52	2.09	3.39	6.03	10.15	16.01

The cumulative tariff increases per annum are shown in the table below.

Table 10: Indicative cumulative prices associated with the TDP for the next 5 years.

Rate	2025	2026	2027	2028	2029	2030
Gen - R/KW_cumulative		2.74	4.17	7.01	11.94	19.16
Loads - R/kVA_cumulative		3.61	5.49	9.42	16.18	26.17

13.2 Sensitivity analysis

The sensitivity examines the effects of key cost parameters on the TUoS tariffs for the period 2026 to 2030. The analysis indicates a progressive increase in TUoS charges, where generator tariffs escalate from R1.58/kW in 2026 to R11.64 0/kW in 2030, and load tariffs from R1.52/kVA to R16.01/kVA. The rise in tariffs is primarily due to major transmission expansion projects entering commercial operation from 2027, which requires accelerated cost recovery through the RAB.

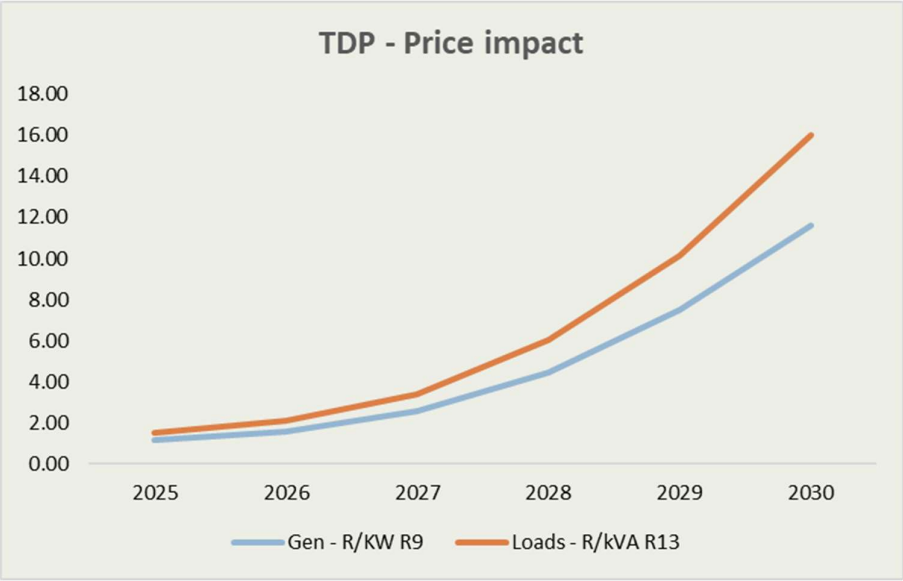

Figure 3: Analysis of the generator and load tariffs linked to the TDP

After 2028, there will be further increase in tariffs due to the impact of depreciation schedules and return on asset calculations. These adjustments are made in accordance with regulatory guidelines that dictate asset valuation and the methodology for investment recovery. The analysis also shows the pass-through impact on energy unit costs. By 2030, it is expected that the cost generators pay for each cent per kWh of energy will increase from 0.03 c/kWh to 0.40 c/kWh and for load customers 0.03 c/kWh to 0.41 c/kWh. This increase is primarily due to rising costs associated with transmitting electricity. As transmission infrastructure expands and costs are recovered, these costs get passed through to both generators and consumers.

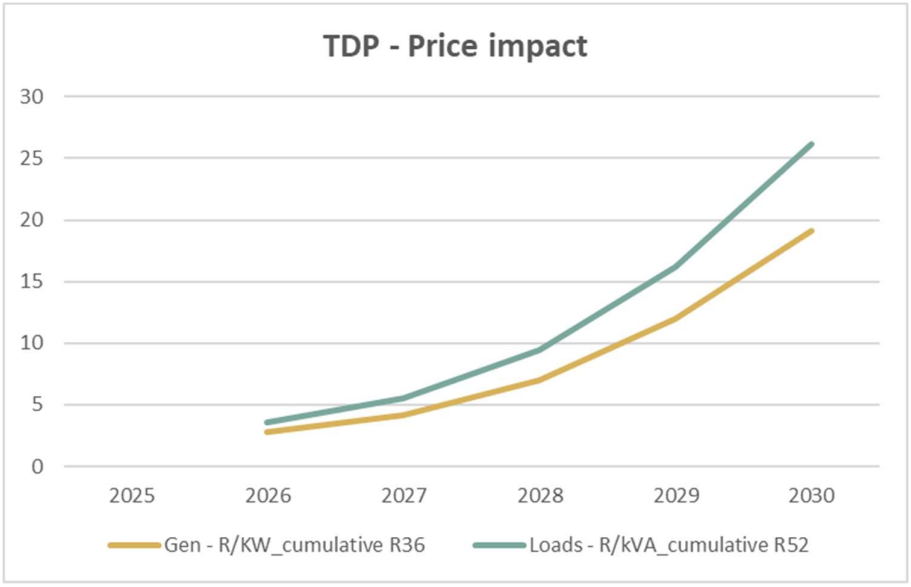

Figure 4: Analysis of the generator and load cumulative tariffs linked to the TDP

14. Conclusion

The Transmission Forward analysis for the period 2024/25 to 2029/30 projects a steady increase in TUoS charges, affecting both electricity generators and load customers. The increase is necessary to recover the costs associated with major infrastructure projects and ensure the grid can meet growing energy demand, particularly from renewable energy sources. Transmission expansion projects are expected to enter commercial operation from 2027, requiring accelerated cost recovery through the RAB. By 2030, generator tariffs are expected to escalate. These cost escalations result from capital expenditures related to integrating new power generation, strengthening the grid, and improving network reliability. Additionally, as assets depreciate and return-on-asset calculations are applied, tariff

adjustments beyond 2028 will aid continued investment recovery and ensure NTCSA's financial sustainability.