Quasi Fiscal Deficits and the price of electricity

UNISA Economics Department
Departmental Seminar Series

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‘Quasi-Fiscal Deficits’ and ‘Hidden Costs’

“Saavalainen and ten Berge (2006) and Ebinger (2006) extended the approach of Petri, Taube, and Tsyvinski to provide estimates of the quasi-fiscal deficits (QFDs) of the power sectors in countries in Europe and Central Asia. Saavalainen and ten Berge defined the QFD of state-owned public utilities as

> *[t]he value of the implicit subsidy computed as the difference between the average revenue charged and collected at regulated prices and the revenue required to fully cover the operating costs of production and capital depreciation.*[1]

This QFD, or implicit subsidy, was termed a hidden cost[2] by Ebinger.”

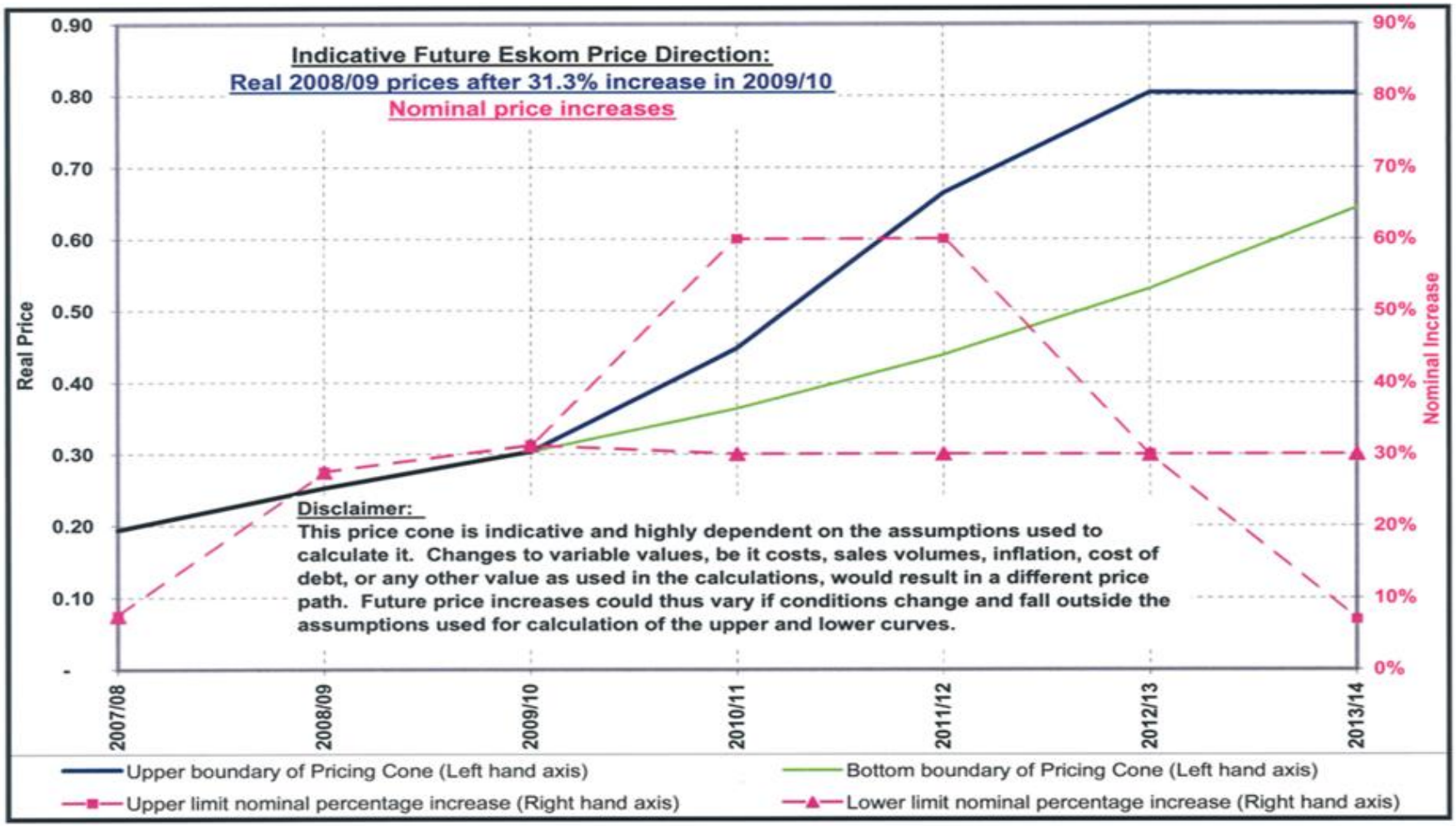
SOURCE: World Bank’s Policy Research Working Paper 7788 -- Financial Viability of Electricity Sectors in Sub-Saharan Africa

Eskom's actual and projected electricity price from 2010 to 2024 compared to external references

NERSA estimate of Future Price Path (FPP) – Reasons for Decision June 2009

Indication of the future price path

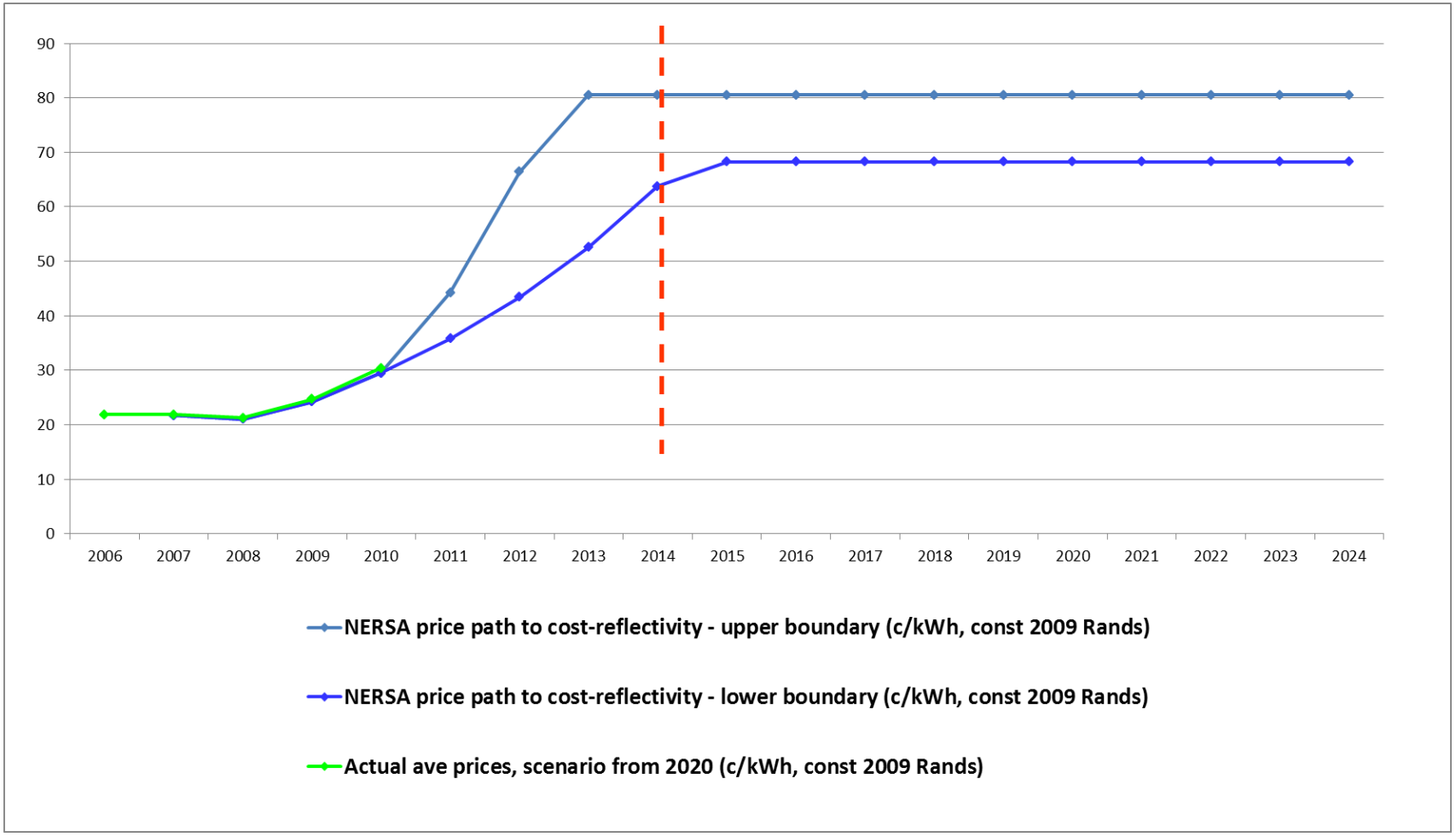
Figure 1: 5 Year Expected Price Cone



Source: NERSA Modelling of Price Path

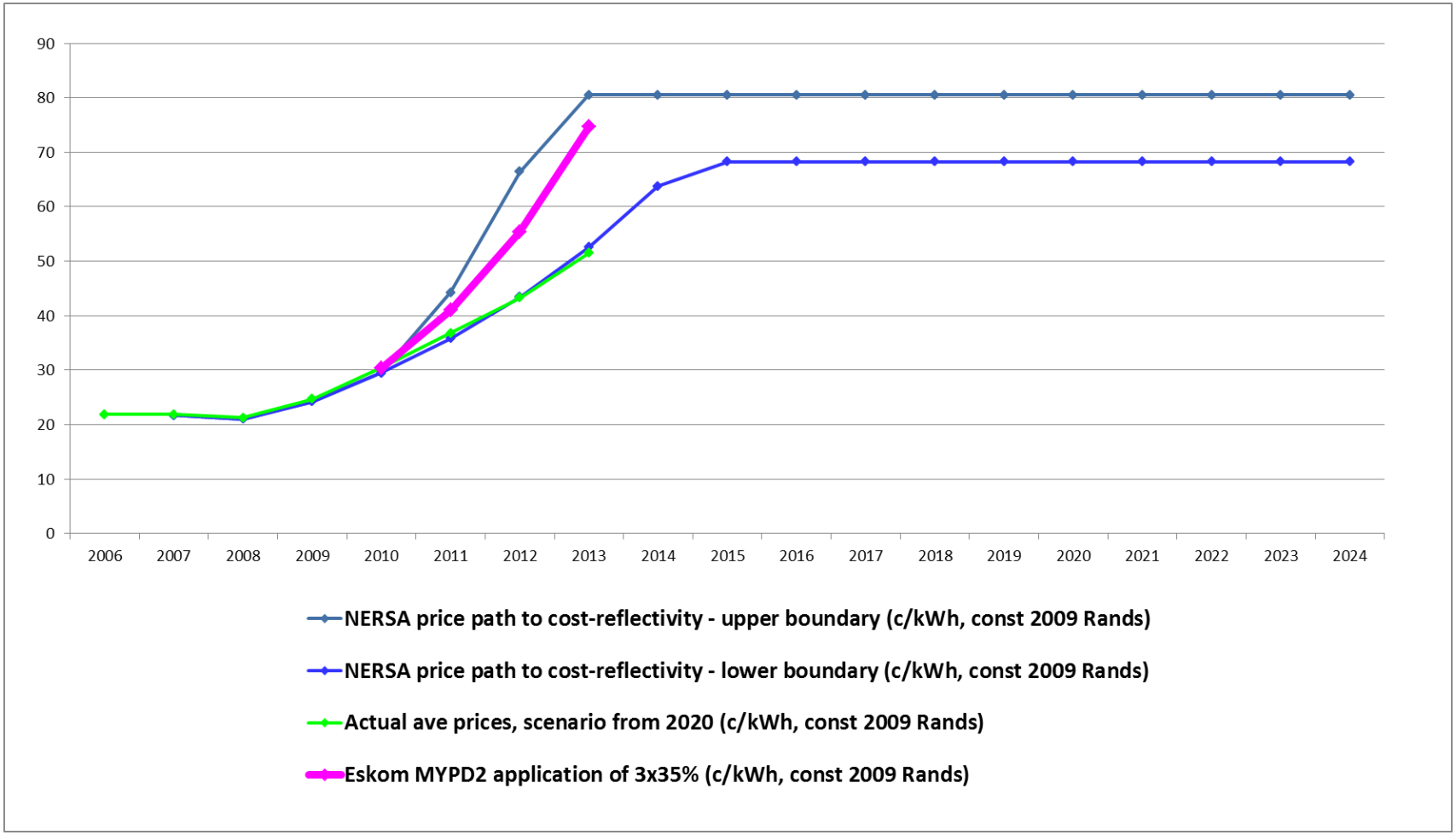
Replication of NERSA's FPP
(constant 2009 Rands)

The information provided by NERSA in their RfD was used to replicate their Future Price Path in a financial model (the opportunity was used to extend it to 2024). Graph indicates upper / lower price levels required to recover prudent / efficient costs :



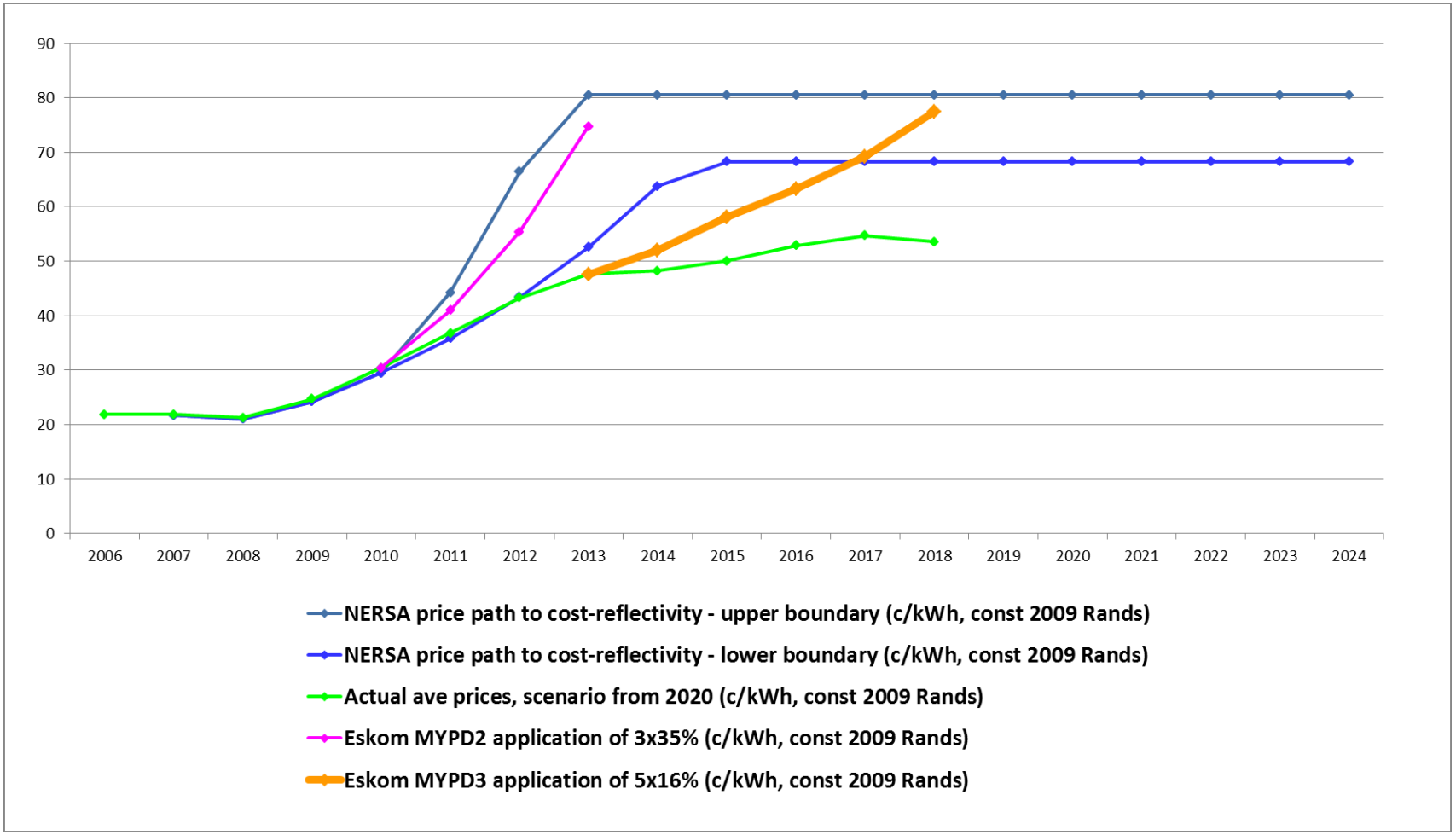
MYPD2 vs. NERSA's FPP
(constant 2009 Rands)

*FPP vs. **MYPD2** revenue application vs. actual prices : MYPD2 revenue application intended to reach prices reflective of prudent/efficient costs by 2012/13. NERSA decision and actual prices tracked FPP lower boundary (until 2012/13 …..) :*



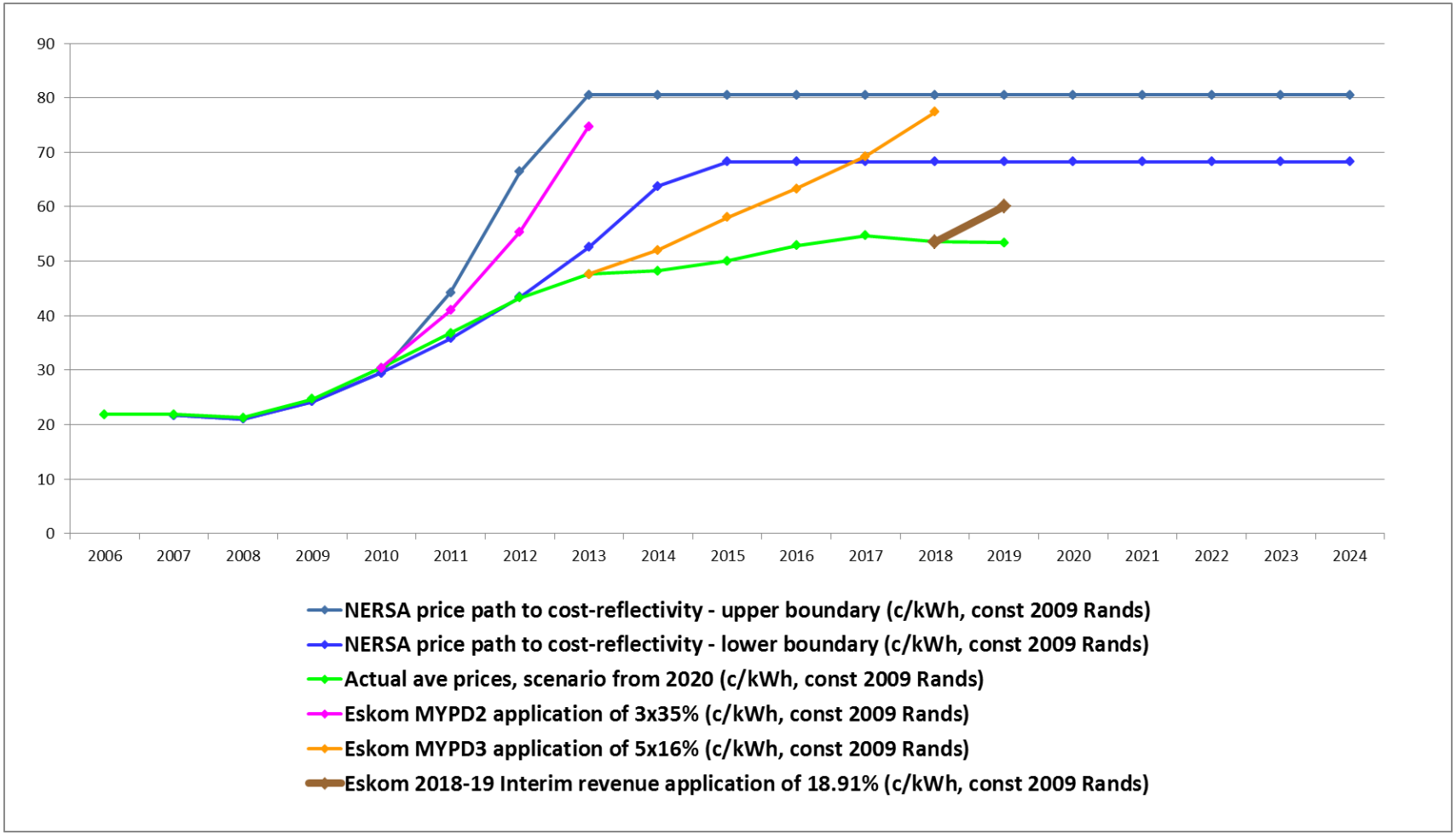
MYPD3 vs. NERSA's FPP
(constant 2009 Rands)

*FPP vs. **MYPD3** revenue application vs. actual prices : MYPD3 revenue application intended to reach prices reflective of prudent/efficient costs by 2017/18. Actual prices at 8% increases p.a. (plus RCA liquidation in two years) did not make significant progress toward that level:*



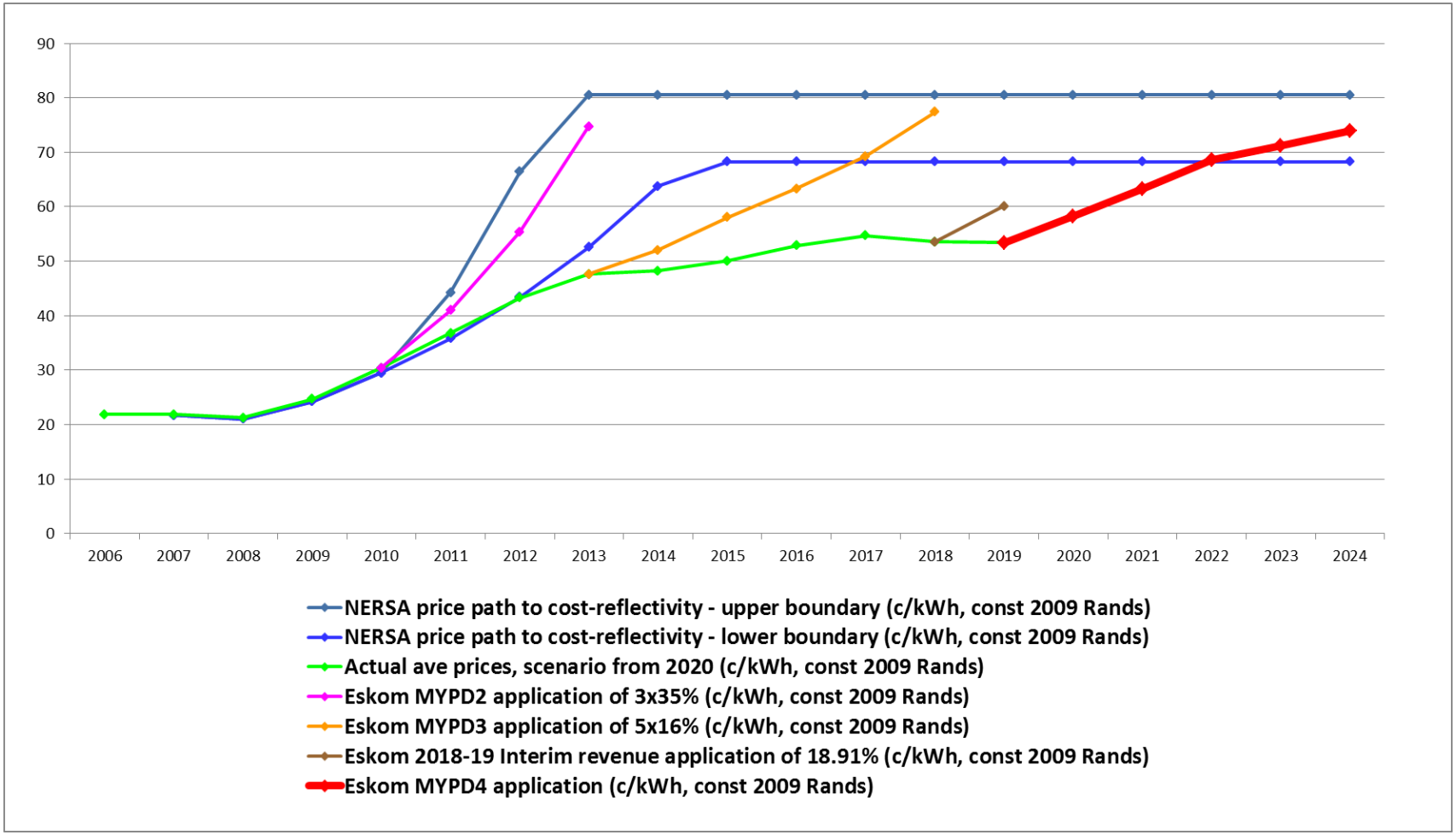
2018/19 vs. NERSA's FPP
(constant 2009 Rands)

*FPP vs. **2018/19** revenue application vs. actual prices : 2018/19 revenue application intended to progress toward prices reflective of prudent/efficient costs to address financial challenges (mainly caused by low prices). Actual price at 5% increase made no progress to that level:*



MYPD4 vs. NERSA's FPP
(constant 2009 Rands)

*FPP vs. **MYPD4** revenue application vs. actual prices : MYPD4 revenue application intends to reach bottom edge of NERSA FPP by 2021/22. Moderate further price increases will be required beyond 2021/22 to reach prices reflective of prudent / efficient costs **:***



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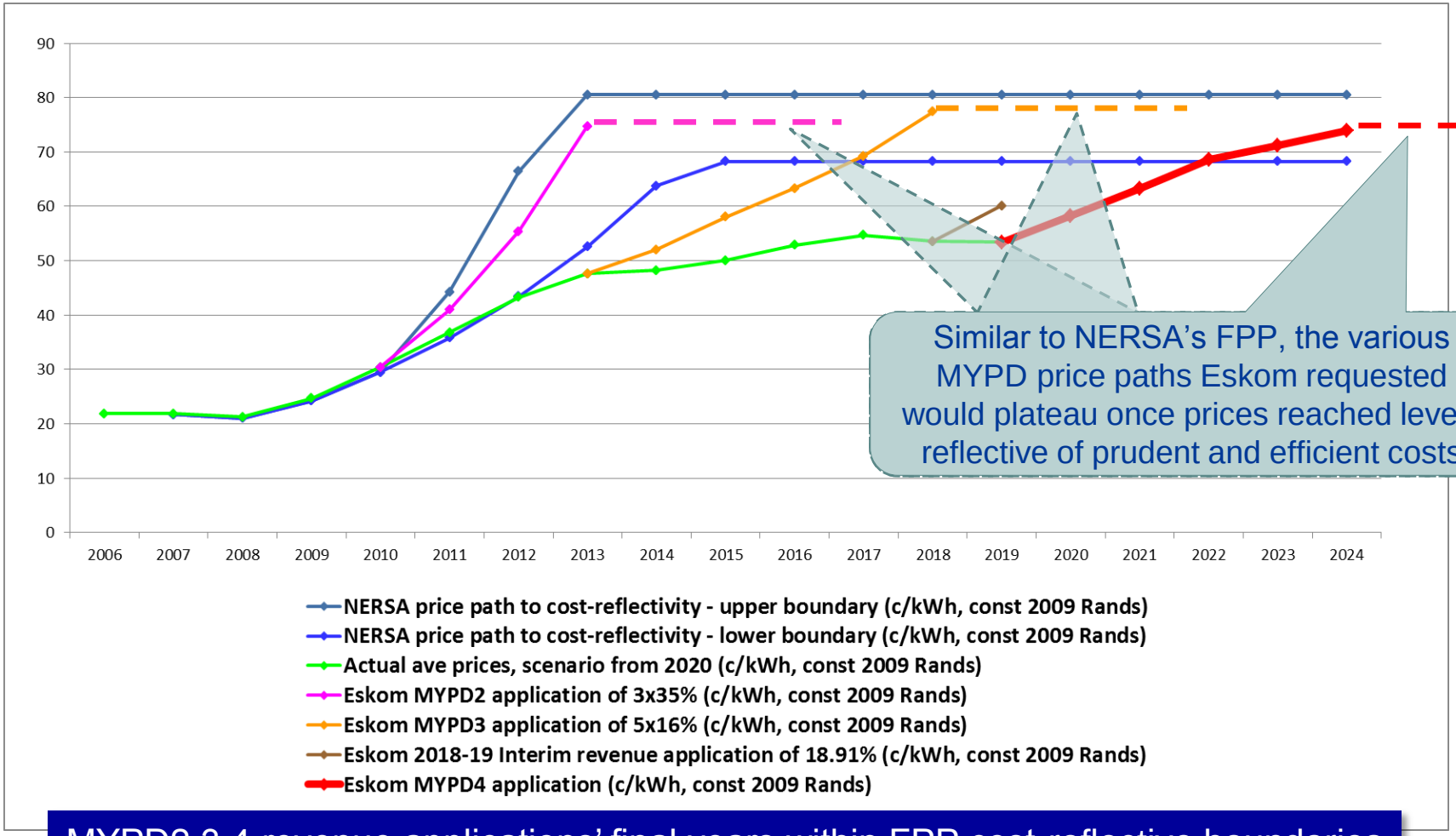
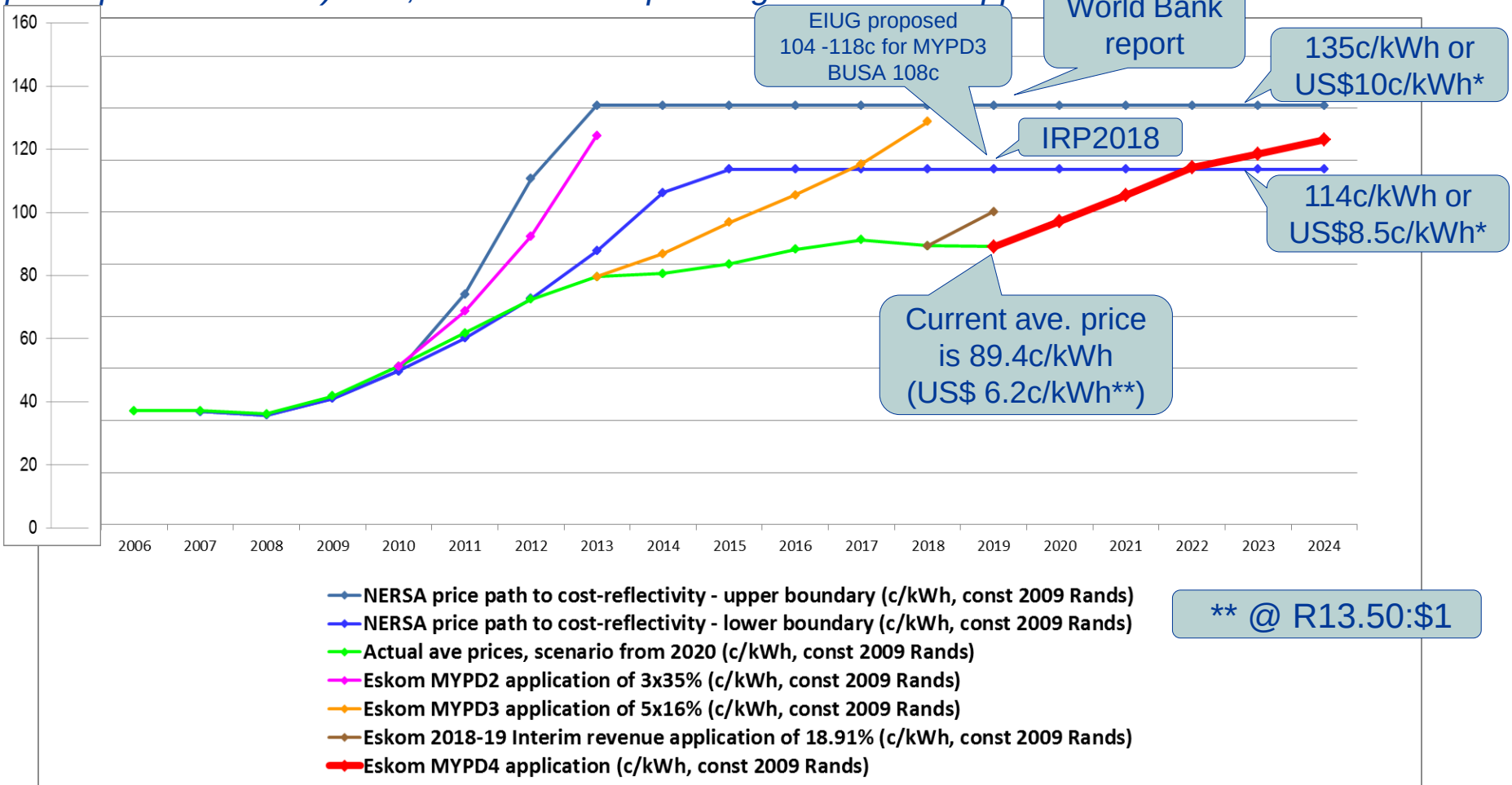


MYPD2,3,4 revenue applications' final years within FPP cost-reflective boundaries

'Benchmarking' of NERSA's FPP
(constant 2018/19 Rands)

NERSA 'lower boundary' is very low by any international benchmark. However, it is in line with EIUG / BUSA proposals to NERSA for MYPD3's 5th year 2017/18 (with moderate increases still required post - 2017/18). IRP, World Bank report aligned to mid / upper

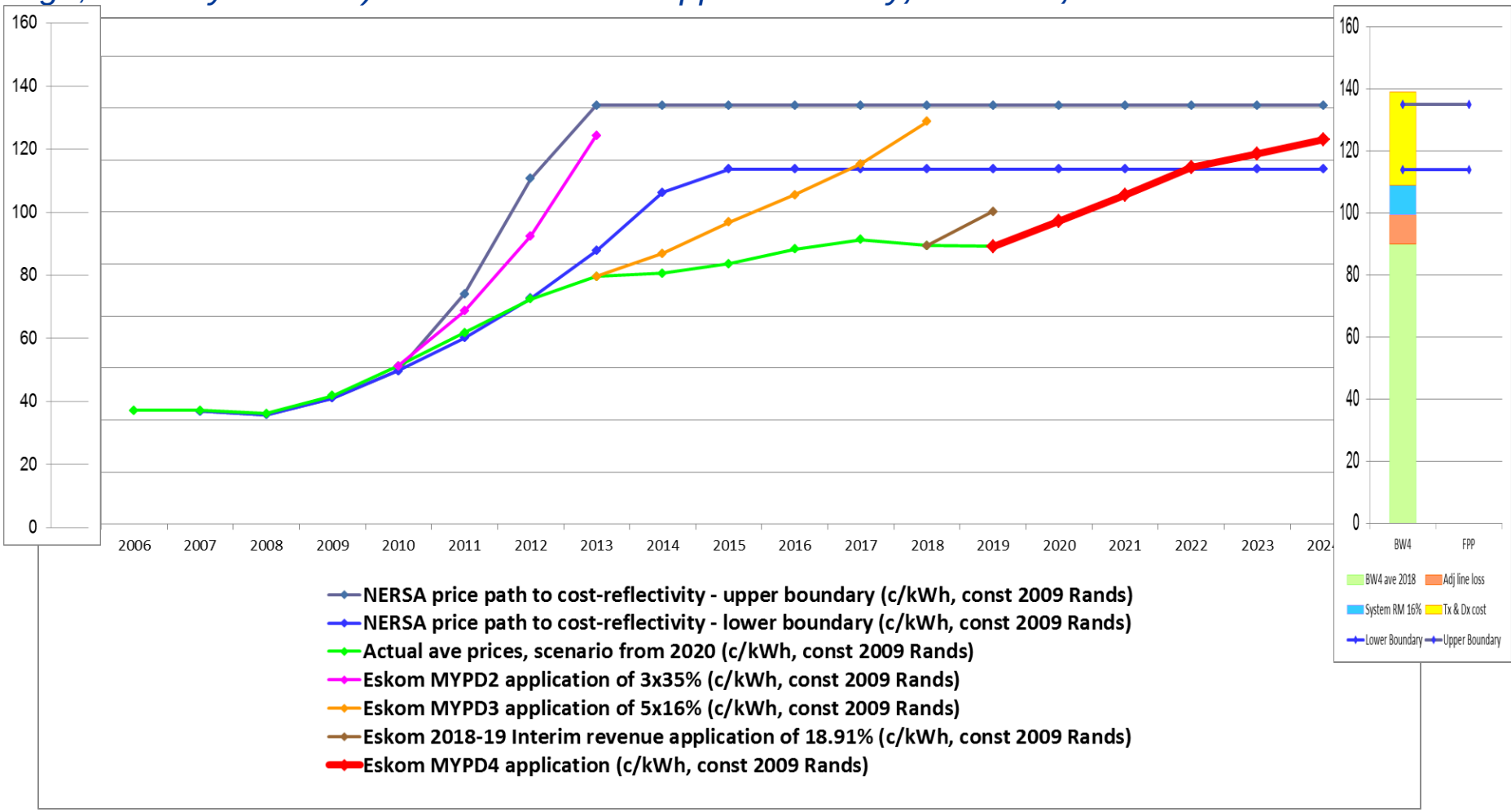


** @ R13.50:$1

FPP's upper / lower boundaries confirmed by numerous recent benchmarks

REIPPPP BW4 vs. NERSA's FPP
(constant 2018/19 Rands)

*FPP vs. MYPD4 vs. **BW4 :** Adjusted BW4's ave. 2018 prices for line losses, added System Reserve Margin, added Tx/Dx = **139c/kWh** (excluding incremental system cost for back-up, storage, ancillary services) – in line with FPP upper boundary, draft IRP, well above MYPD4:*



Renewable energy electricity price as reflected by draft IRP's least cost scenario (2017 ZAR c/kWh)

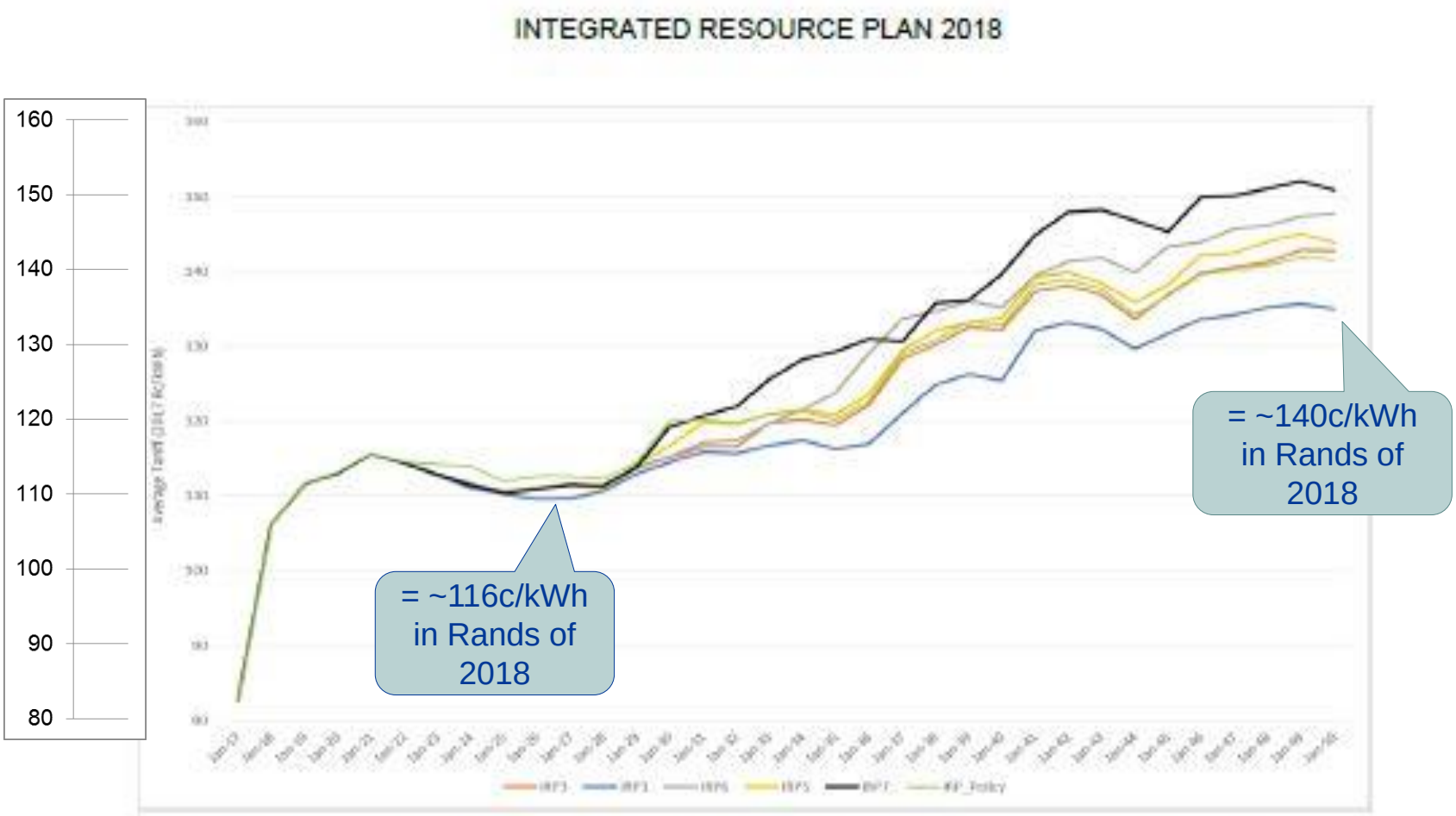
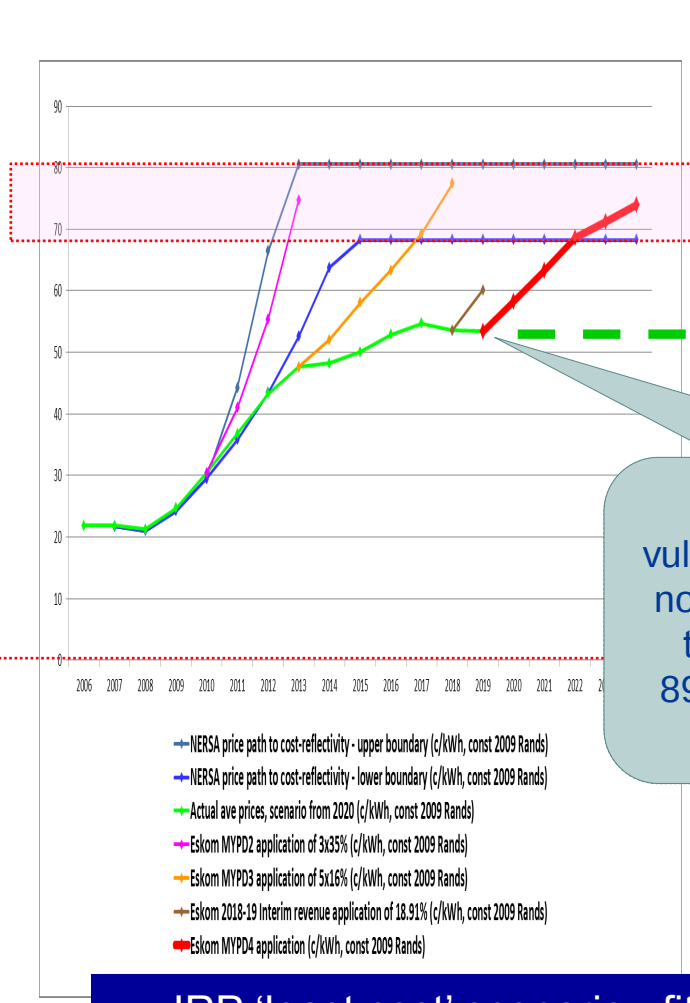
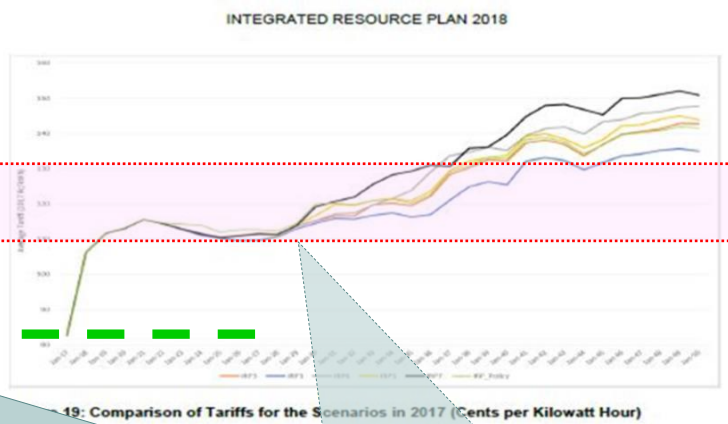


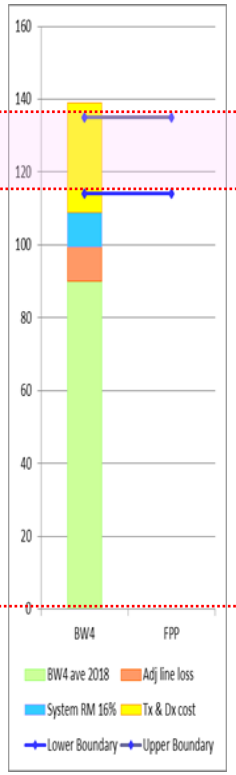
Figure 19: Comparison of Tariffs for the Scenarios in 2017 (Cents per Kilowatt Hour)

Draft IRP and REIPPPP BW4 confirm NERSA's FPP

FPP vs. MYPDs vs. BW4 vs. ***draft IRP*** *vs. BUSA/EIUG's proposals:* ***all*** *provide outcomes within NERSA FPP upper/lower boundary, regarding price required for financial sustainability. Also aligns to international and Africa benchmarks* ***:***







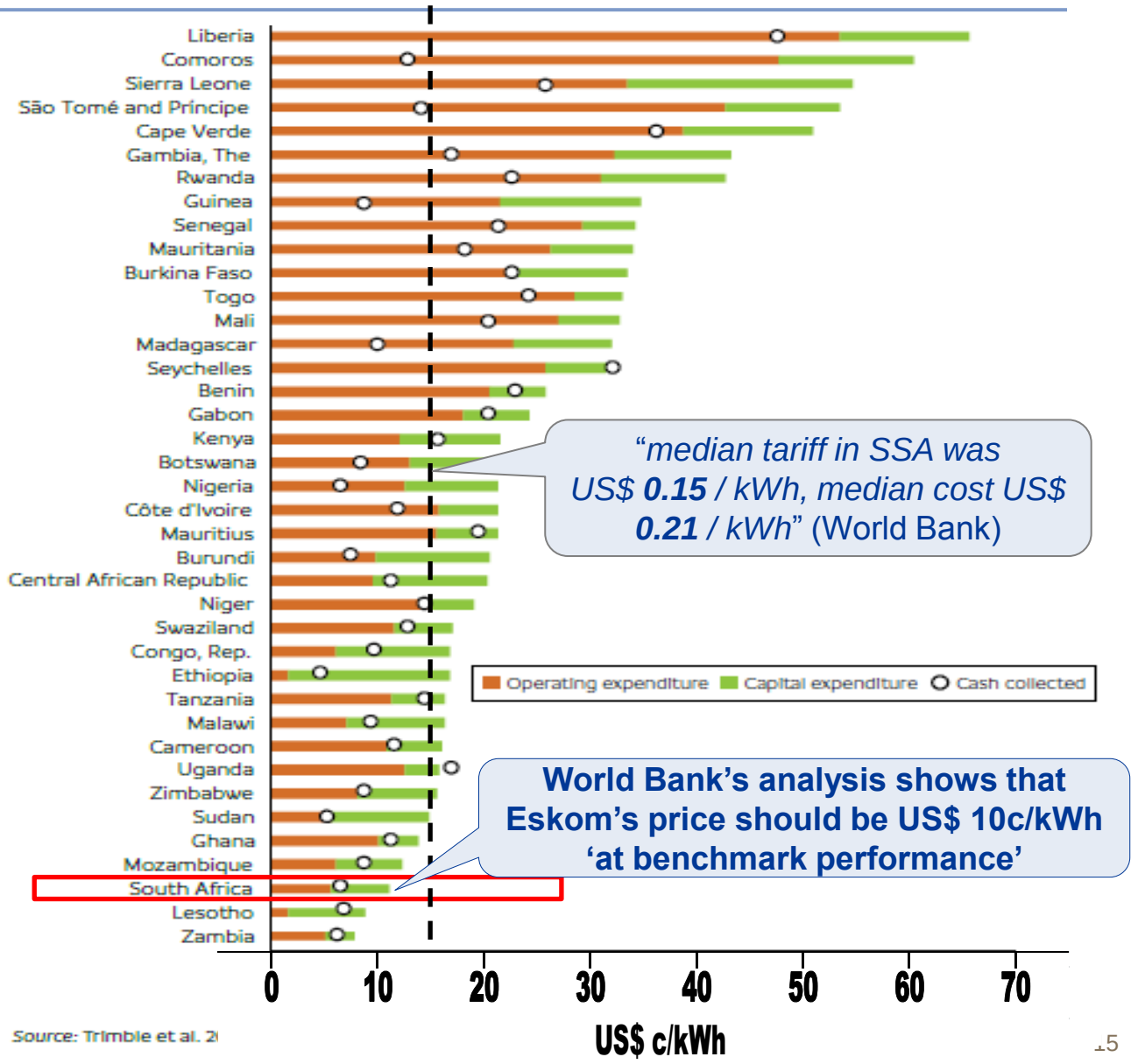
Although there would be some vulnerable industries, if it was true that no industry can tolerate prices higher than Eskom's current ave.price of 89.4c/kWh (US$ 6.2c/kWh) it makes the IRP totally academic

Note **:** all three graphs have been calibrated to the same tariff scale

IRP 'least cost' scenario ~fits within FPP boundaries, other scenarios higher

World Bank's 2016 report says Eskom's price should be US$ 10c/kWh 'at benchmark performance'

- The World Bank undertook an analysis of electricity utilities in 39 countries in Sub-Saharan Africa, which included an assessment of their opex and capex.
- The analysis concluded that Eskom's unit **costs** are very low relative to other SSA utilities (3rd lowest).
- Similarly, Eskom's average **price** is very low relative to other SSA utilities – but they are all pricing their electricity at unsustainably low levels thus are in (or heading to) significant financial difficulties.

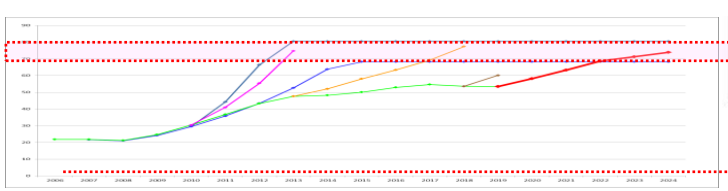


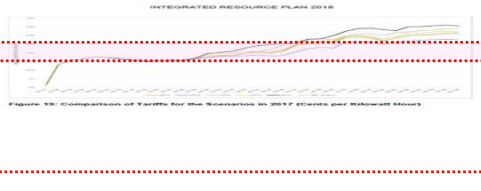
World Bank price for Eskom 'at benchmark performance' is at upper boundary of price cone

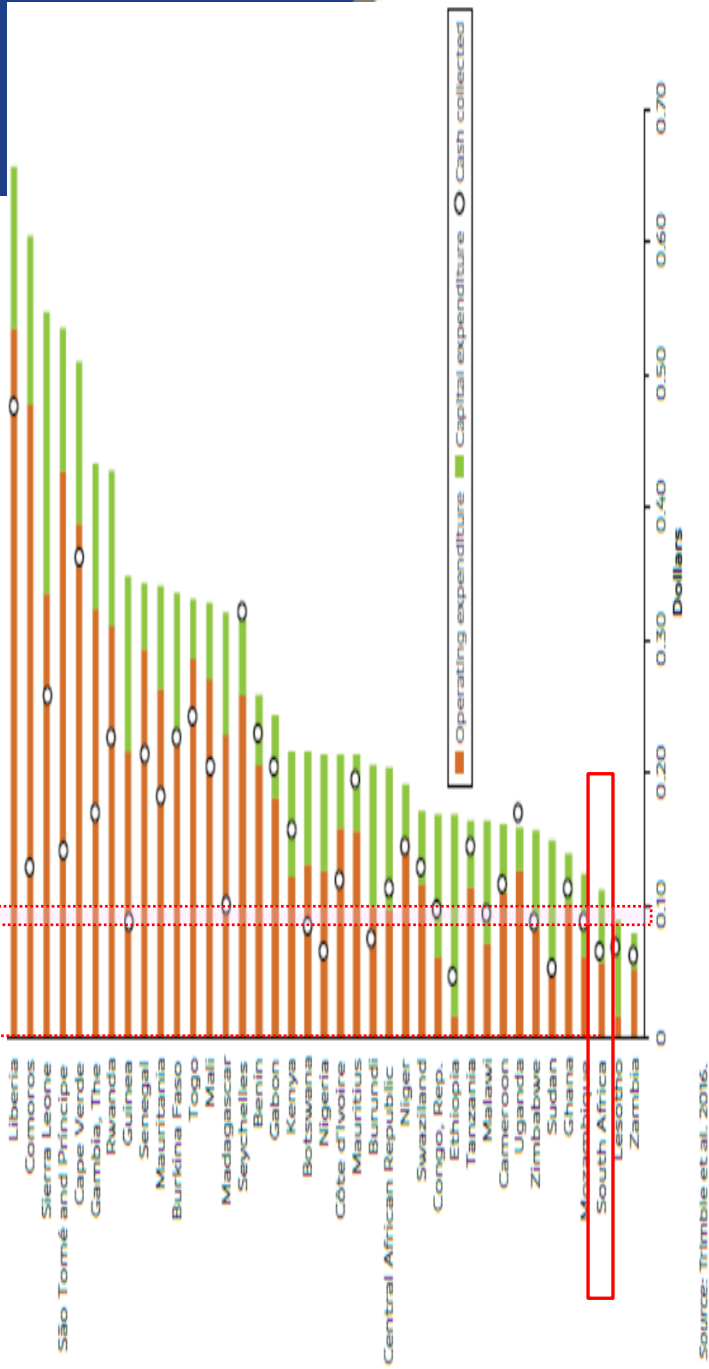
FPP vs. MYPDs vs. draft IRP vs. BUSA/EIUG's 2013 proposals to NERSA vs. **World Bank* : *all*** these sources provide outcomes within NERSA FPP upper / lower boundary, regarding electricity price required for financial sustainability

(*at 'benchmark performance' the World Bank calculates that Eskom's ave. price should be at the FPP *upper* boundary**)

Note **:** all three graphs have been calibrated to the same tariff scale







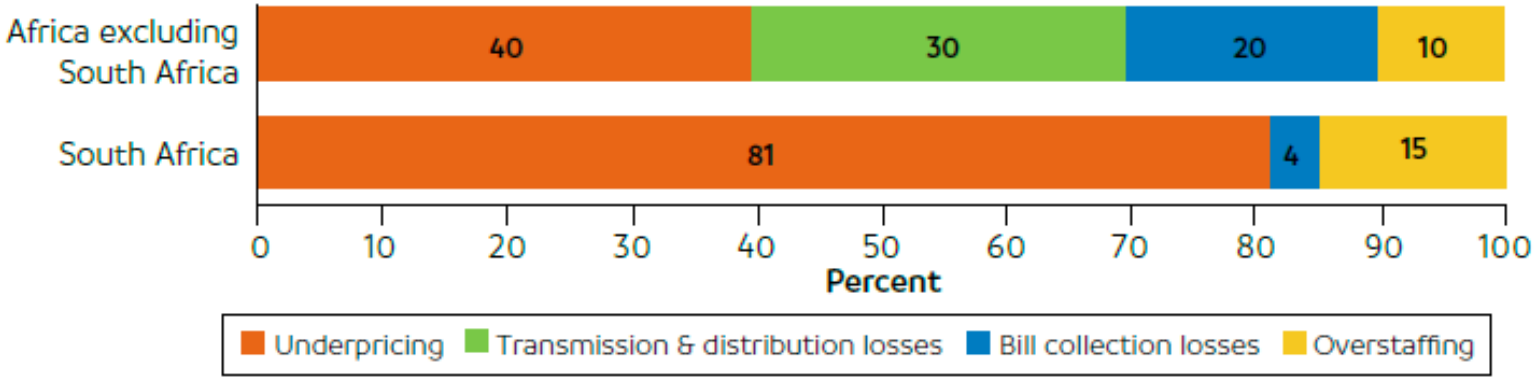
Source: Trimble et al. 2016.

** Note that the WB's 'benchmark performance' calculation regarding Eskom's 'optimal staffing' contains significant data and other errors which resulted in under-stating the 'optimal staffing' by orders or magnitude

World Bank Report 2016 – 'hidden costs'
(hidden from consumers by not being reflected in price)

- The World bank study defined certain parameters that reflect efficient operations. Any deviation from these norms are seen to be inefficient
- The norms are
  - Transmission & distribution losses (both technical and commercial) should be <10% of dispatched electricity
  - 100% bill collection
  - Same staffing level as in well-performing, comparable utilities in Latin America
- The graph below illustrates the factors that contribute to hidden costs

Breakdown of hidden costs in Africa

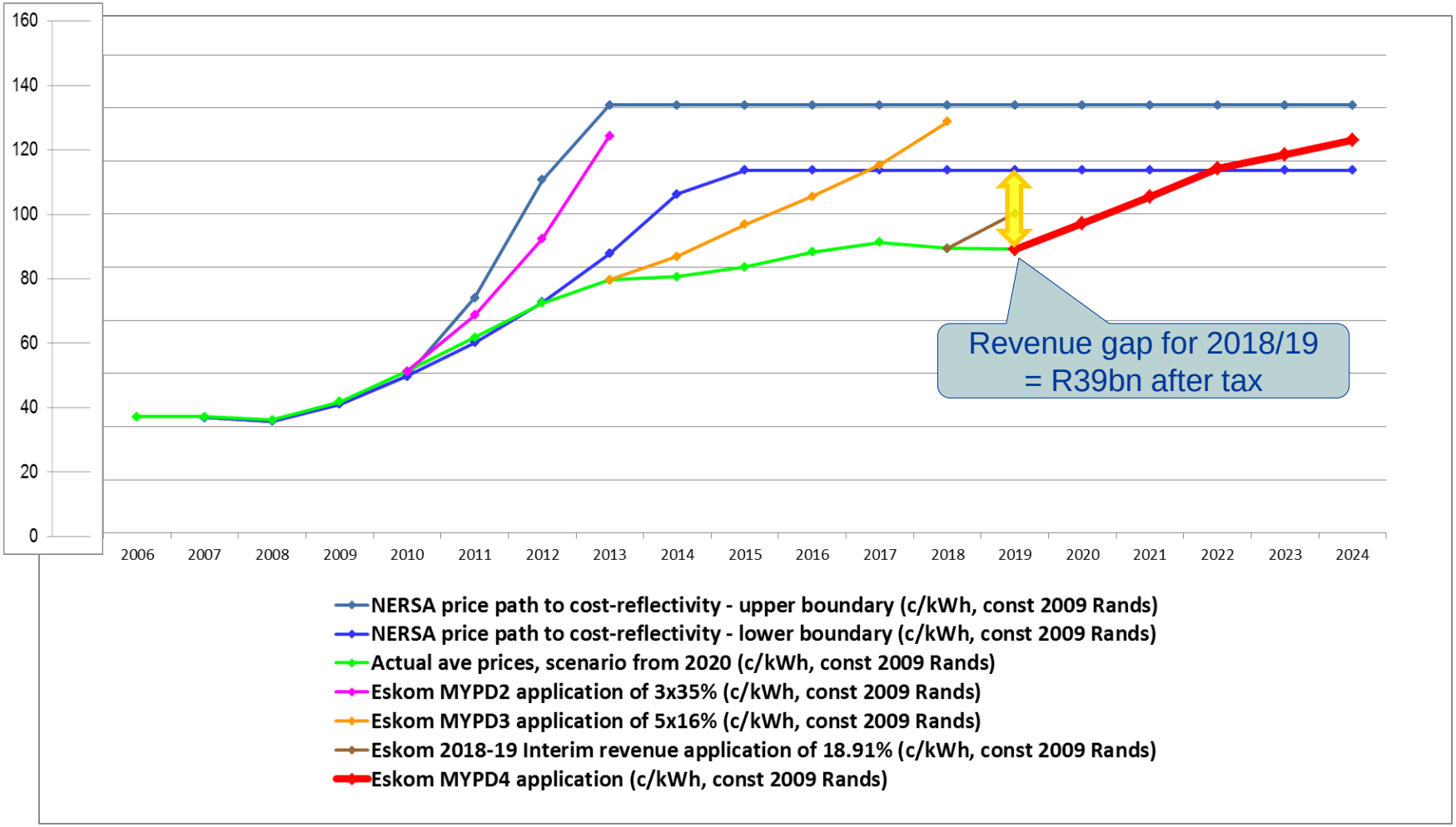


Source: Trimble et al. 2016.

WB says Eskom's current low price of 6.2c/kWh is >80% due to **underpricing**

Balance sheet impact due to price gap

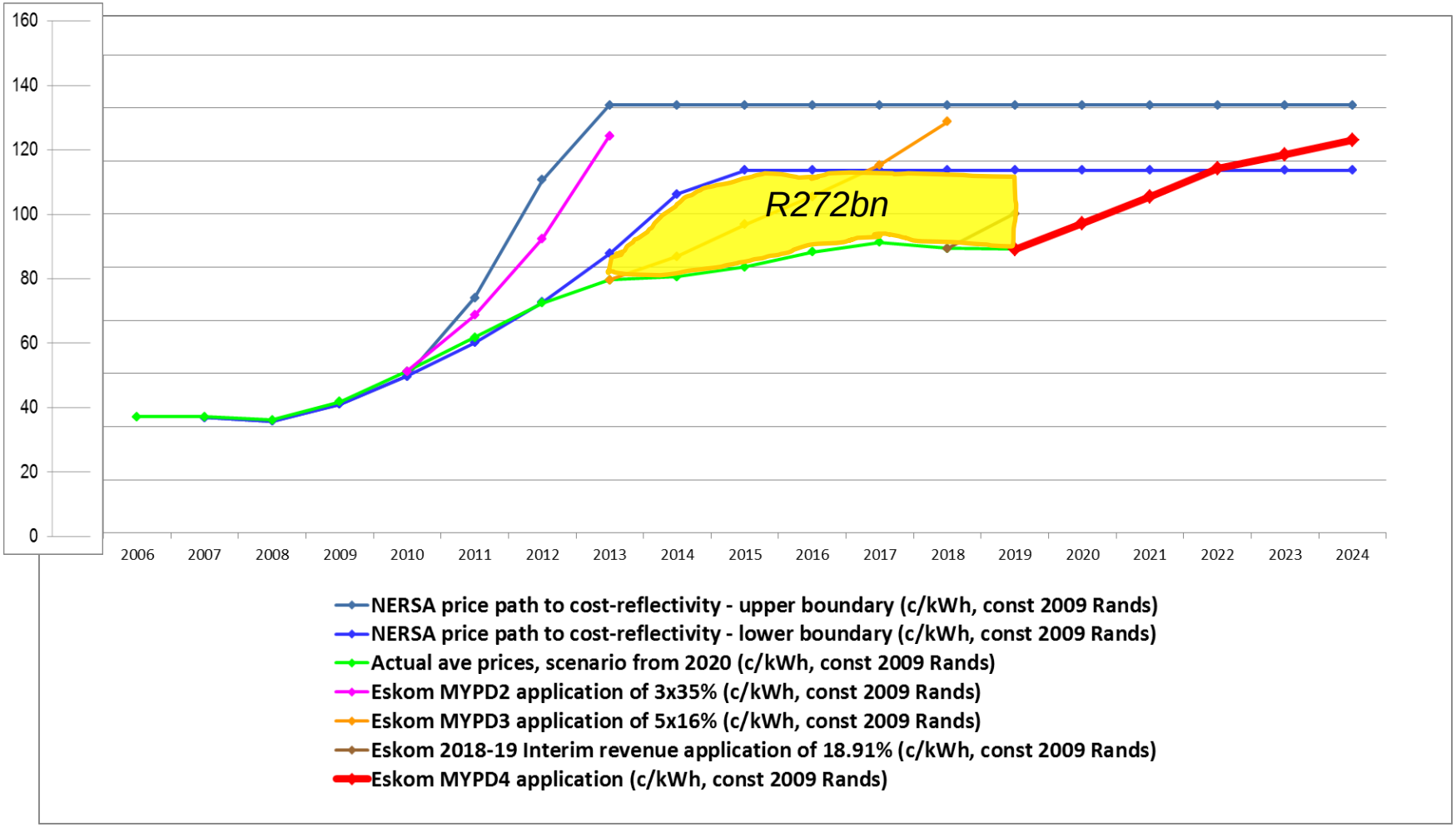
Balance Sheet impact: actual prices vs. NERSA FPP lower boundary:



Balance sheet impact due to price gap

Balance Sheet impact: actual prices vs. NERSA FPP lower boundary:

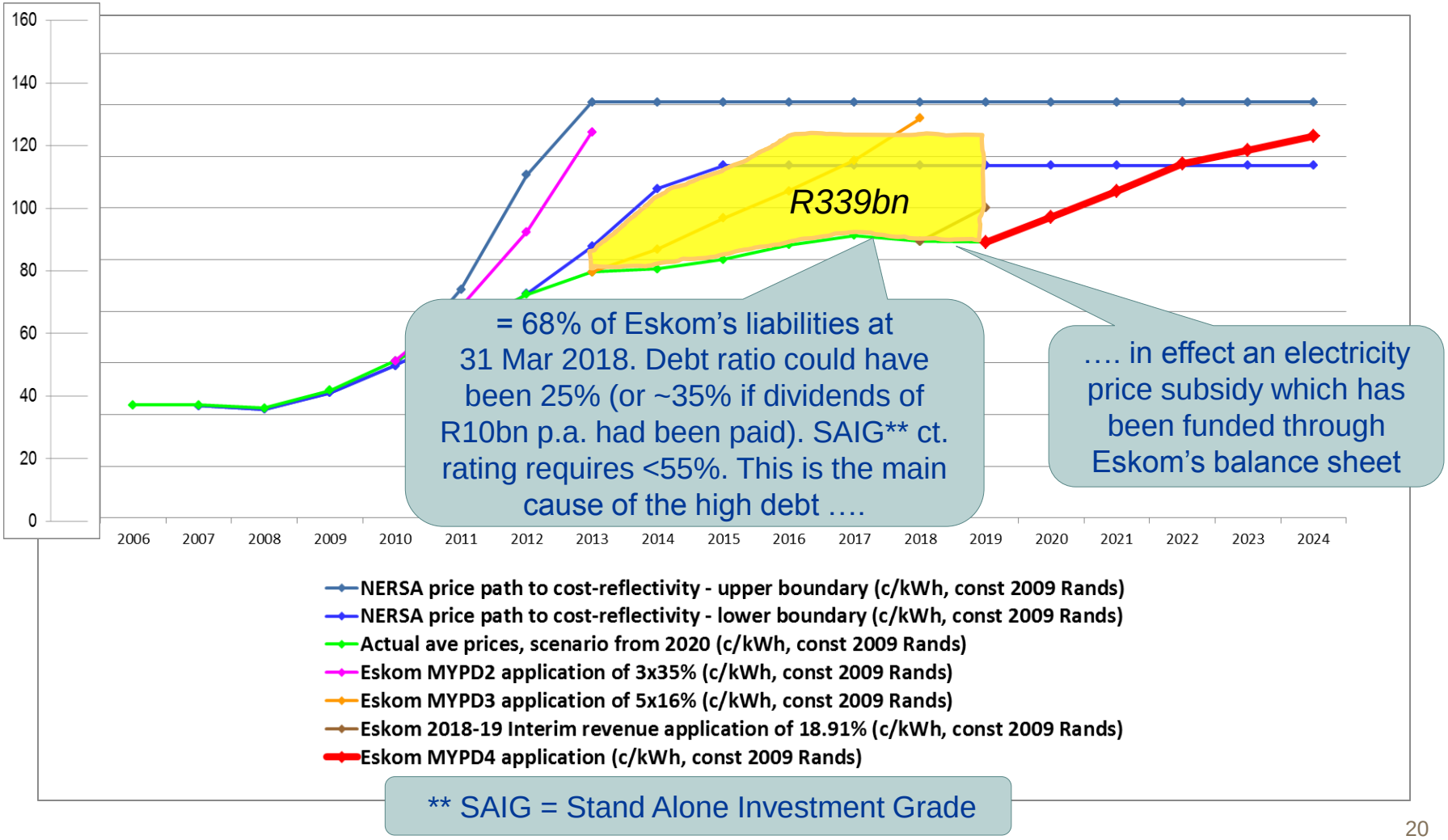
- Total revenue shortfall = **R272bn** (incl. interest at 9% p.a. and deduction of Company Tax)



Balance sheet impact due to price gap

Balance Sheet impact: actual prices vs. NERSA FPP lower boundary to midway:

- Total revenue shortfall = **R339bn** (incl. interest at 9% p.a. and deduction of Company Tax)

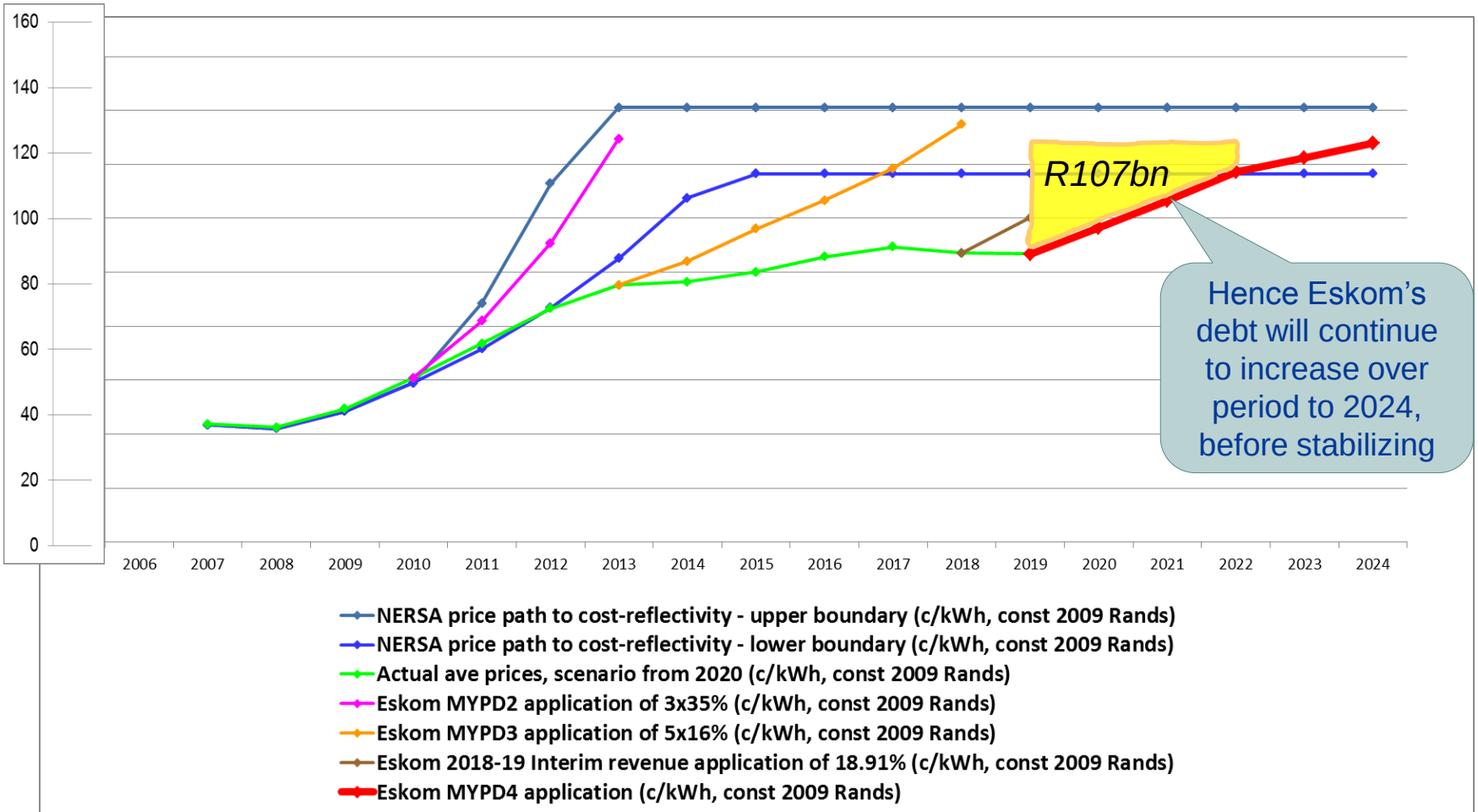


** SAIG = Stand Alone Investment Grade

Balance sheet impact due to price gap

Balance Sheet impact **:** MYPD4 application vs. NERSA FPP mid-boundary**:**

- Total revenue shortfall = **R107bn** (incl. interest at 9% p.a. and deduction of Company Tax)

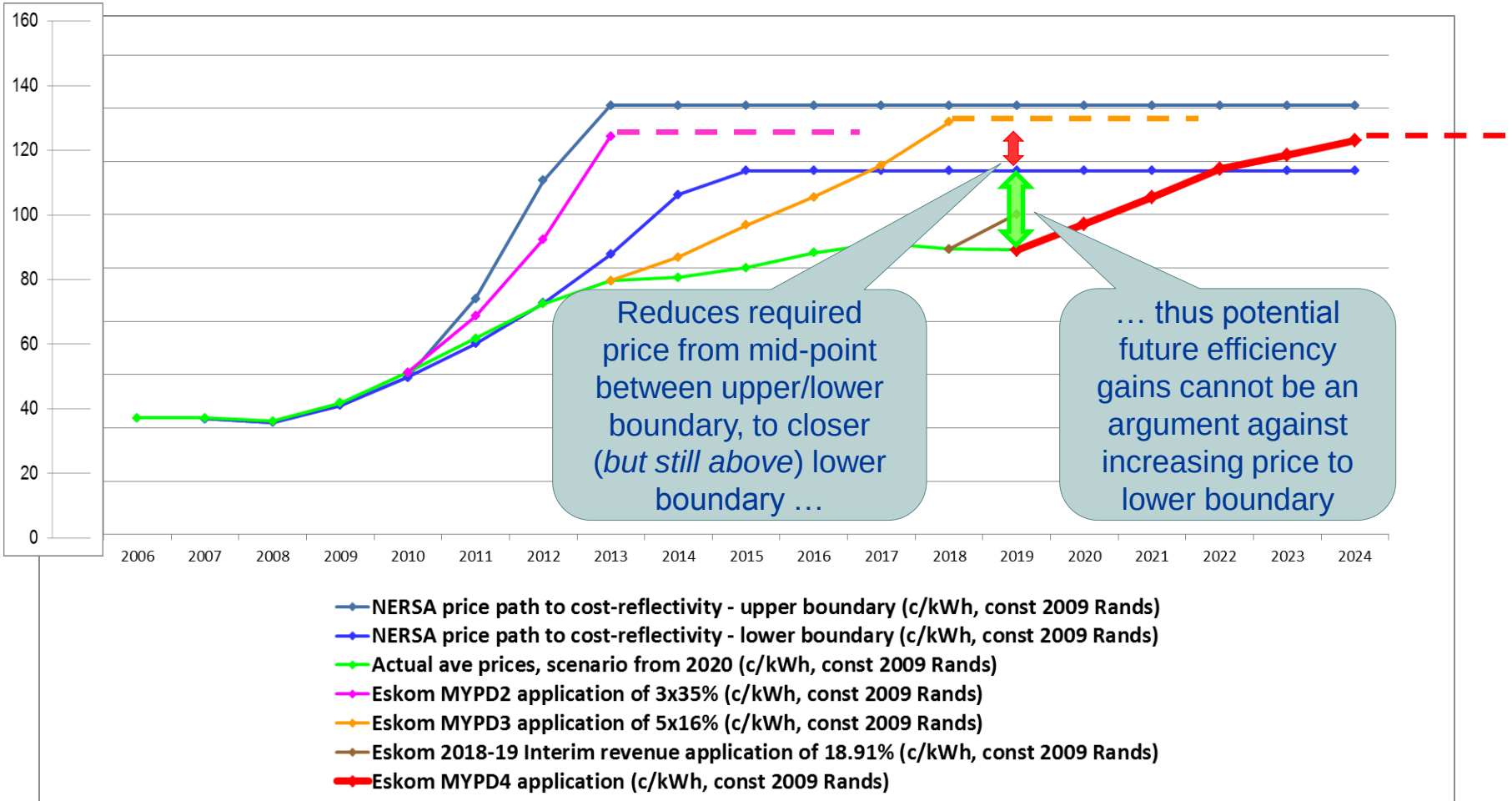


By end of MYPD4 the cumulative effect of pricing below FPP is ~**R520bn**

Cost-efficiency remains crucial but be viewed in overall context

Illustrated below is price effect of (beyond plausible) R15bn p.a. reduction in O&M and PE **:**

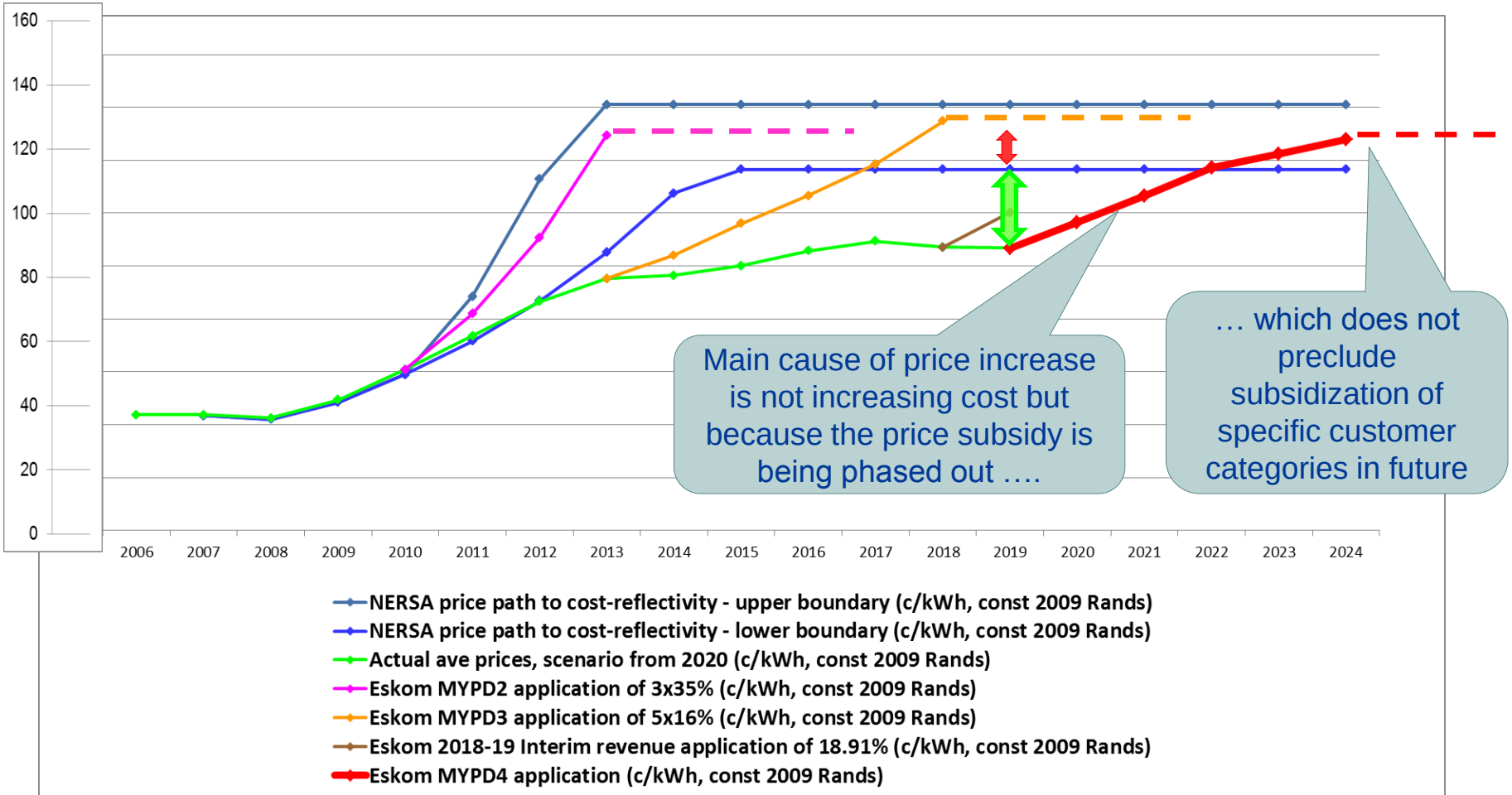
- Would reduce required price by ~8c/kWh (Rands of 2018), from ~124c to 116c/kWh



At *benchmark performance* the price required to cover efficient costs **>114c/kWh**

Main cause of the required price increase is the phasing-out of the current price subsidy

…. which does not preclude subsidization of specific targeted customer categories, through direct, targeted and transparent subsidies, in a way that leaves Eskom revenue-neutral



Eskom cannot any longer fund the price subsidy / underpricing with debt

NERSA's FPP vs. MYPD4 – conclusions (1of2)

1. Electricity is a highly capital/asset intensive, high fixed and sunk cost business (=75% of cost) i.e. **main cost driver is assets being operated**

2. Eskom of 2018 is essentially the same as Eskom of 2009, just larger – same power stations plus 6GW more, with construction programme underway for further 6GW**;** same network plus 36000km more lines**;** same customer base plus 1.9 million more**. No reason that the FPP estimated in 2009 would be any lower in 2018**

3. For lower boundary of FPP NERSA stipulated a number of conditions to be fulfilled – of which virtually none has happened. **In addition NERSA did not price-in the cost increases due to REIPPPP BW1-3**

4. However **Eskom's required price by 2024 is still around mid-way between upper and lower boundaries of NERSA's FPP** (and very competitive with the lowest-cost IRP scenario)

5. Further efficiency gains in future might at most reduce the level to which the price is required to migrate by ~6%

NERSA's FPP vs. MYPD4 – conclusions (2of2)

6. Whilst Eskom has not been perfect regarding fuel cost, operational cost, capital expenditure or technical performance, objective analysis indicates that debt situation is mainly (>80%) a function of having had to take responsibility for the build programme, without the electricity price responding as was required. Even with a price path at the lower boundary of NERSA's FPP Eskom's debt ratio would have been ~35% today

7. Phasing-out of overall price subsidy does not preclude subsidization of specific targeted customer categories, through direct, targeted and transparent subsidies – i.e. fair revenue for Eskom does not dictate the price to poor people in South Africa, or to certain vulnerable industries.

   These two propositions can thus be true at the same time**:**

   (a) Eskom needs to receive enough revenues to be sustainable, thus able to meet all debt commitments and cover all prudent and efficient costs**;**

   (b) poor people and vulnerable industries could be protected (this could include government-funded production or consumption subsidies – which is of course a matter of government policy)

8. **However the model of Eskom accumulating the underpricing effect on its balance sheet as debt is unsustainable and has reached its limit. It is crucial for the sake of Eskom, the ESI and South Africa that this be rectified urgently – it cannot be delayed beyond MYPD4**

Pricing vs. funding or borrowing for capex and opex

"*The Electricity Supply Industry (ESI) is highly capital-intensive, has very durable assets, and delivers a service that is of crucial importance to consumers, whether domestic, commercial or industrial. The network is a natural monopoly, directly connecting consumers to the source of power, and the potential exploitative power of an unregulated monopolist is such that regulation is inevitable. The fundamental governance problem is that consumers want cheap power, while investors want secure future profits if they are to sink large sums in durable capital.* [Investors fear that after such investment consumers will successfully press for lower prices, eroding profits and making such investments unattractive.] *Without secure title to a reasonable future profit flow, private investors will be loath to invest and state ownership will be the default option. The state has access to funds that can be invested, but finds it hard to resist calls for lower electricity prices.*

Internationally, the classic conflict is between a finance ministry reluctant to pour money into a bottomless pit, sceptical that the engineers in charge are working to minimise costs, and other parts of a government wanting to preserve low electricity prices for electoral advantage. Their reluctance to raise prices hinders the ability either to fund investment and maintenance out of profits, or the creditworthiness to borrow against future profits. In extreme cases the ESI cannot even maintain existing equipment; reliability and availability drop, and power outages become the norm. India is a classic example of this unsatisfactory equilibrium."

SOURCE: "South African Network Infrastructure Review: ELECTRICITY", by professors David Newbery and Anton Eberhard, -- 2007, updated 2008

End