How much would elimination of loadshedding improve economic growth?

Daan Steenkamp (Codera)

Tasneem Geldenhuys (UCT)

Damian Maart (BER)

Tshepiso Maroga (BER)

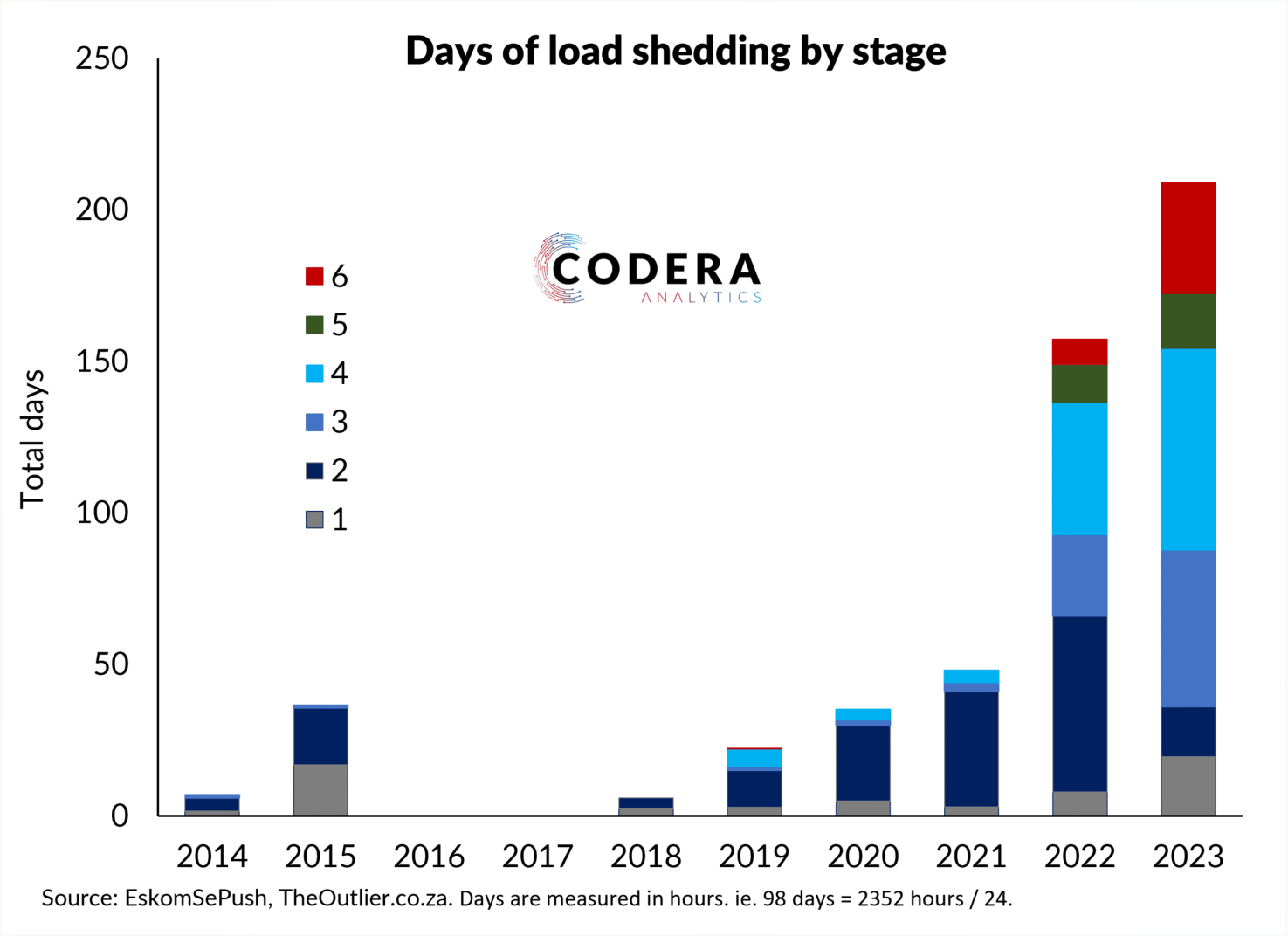
Lebohang Namo (BER)

CODERA ANALYTICS

Background

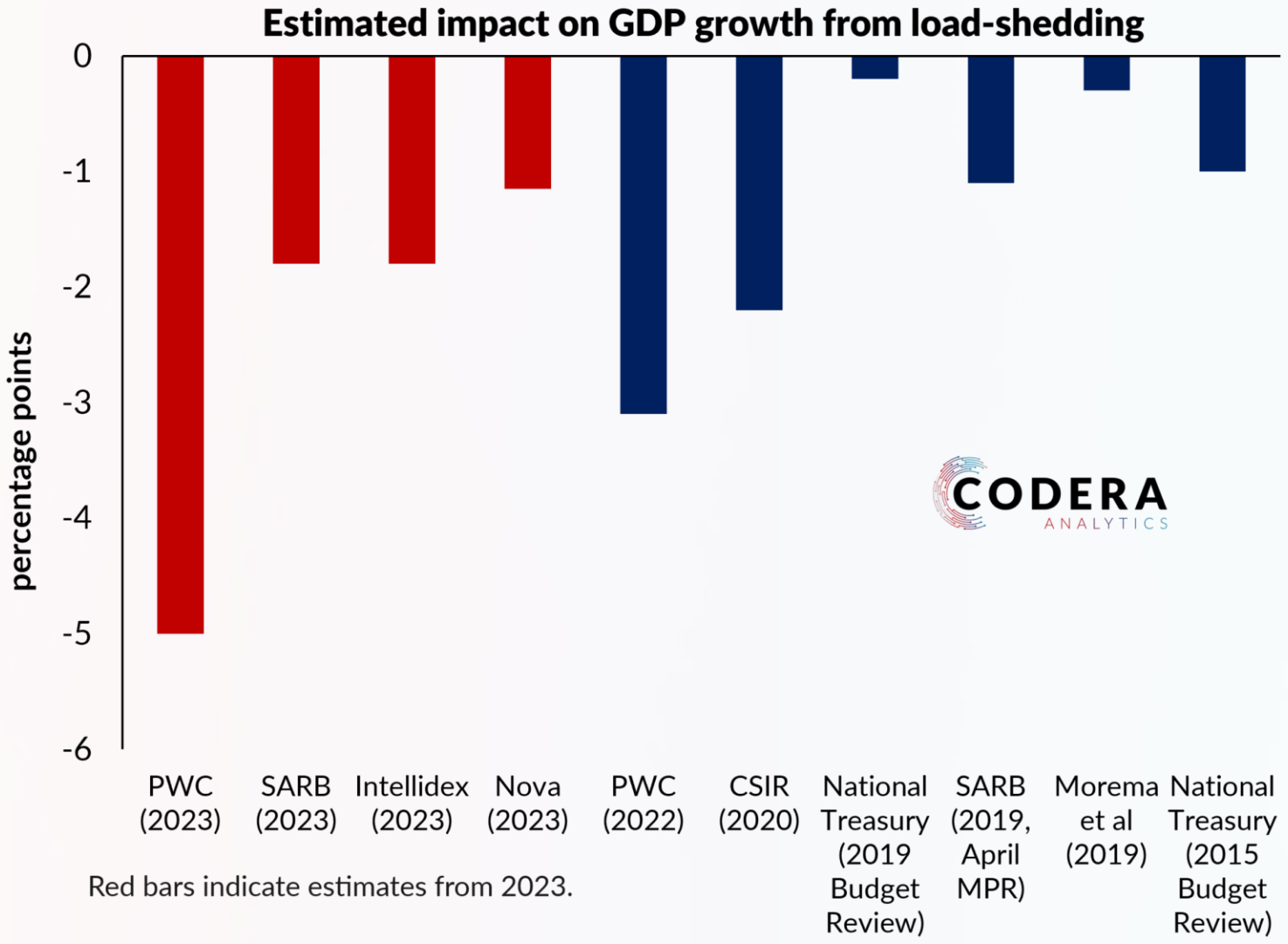
- South Africa has experienced unstable electricity supply since 2009 however picked up in 2019.
- Power outages are particularly expensive for SA's economy because the country has a relatively higher energy intensity.
- Frequent outages lead to decreased productivity as it causes a disruption to operations.
- Overall, disruptions can slow economic growth, particularly affecting energy-intensive sectors.
- The EAP was introduced in efforts to improve existing power station, increasing supply and promoting renewable energy.
- Although progress has been made, challenges remain.

Loadshedding got much worse 2020-2023



Source: EskomSePush, TheOutlier.co.za. Days are measured in hours. ie. 98 days = 2352 hours / 24.

Estimates of costs of loadshedding



But what would resolving the electricity constraint do for the economy?

As far as we are aware, there is no journal published research that has considered the implications of South African load-shedding on total factor productivity and potential growth using frameworks typically used to estimate these concepts in the literature.

ELIMINATION OF LOADSHEDDING SCENARIO IN OGZAF

Our scenario assumes elimination of loadshedding would return industry productivity growth to its long term growth rate:

$$Y_{m,t} = F(K_{m,t}, K_{g,m,t}, L_{m,t})$$

$$\equiv Z_{m,t}\left[(\gamma_m)^{\frac{1}{\varepsilon_m}}(K_{m,t})^{\frac{\varepsilon_m-1}{\varepsilon_m}} + (\gamma_{g,m})^{\frac{1}{\varepsilon_m}}(K_{g,m,t})^{\frac{\varepsilon_m-1}{\varepsilon_m}} + \right.$$

$$\left.(1-\gamma_m-\gamma_{g,m})^{\frac{1}{\varepsilon_m}}(e^{g_y t}L_{m,t})^{\frac{\varepsilon_m-1}{\varepsilon_m}}\right]^{\frac{\varepsilon_m}{\varepsilon_m-1}} \quad \forall m, t$$

DATA / CALIBRATIONS

- UN API data
- TFP is modelled as being lower than the baseline (period of loadshedding in South Africa). With a positive scenario of no loadshedding wherein TFP increases by 10% across all sectors.

ELIMINATION OF LOADSHEDDING SCENARIO IN OGZAF

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Initially, our baseline assumed 25% lower TFP across all sectors, compared to a return to SA's long term TFP growth (estimated before worsening loadshedding)

	TFP	
	Baseline	Ending Loadshedding
Primary	0.375	0.5
Energy	0.3	0.4
Tertiary	1.275	1.7
Secondary Ex Energy	0.75	1

REAL GDP PER CAPITA GROWTH RATE PICKS UP

Conclusion

Weakness:

- Have not included electricity into the production function despite electricity being a key factor of production.

Next steps:

- Electricity as intermediate input in industry production functions

- Improve calibrations with post-pandemic sample