

Climate Change Act Implementation and the Updated LT-LEDs

Regulatory updates and sector net-zero pathways to 2050

Minerals Council Climate Change Day of Learning | October 2026

Climate Change Mitigation and Specialist Monitoring Service



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Outline

From the legal framework, to the reporting rules that feed it, to the 2050 pathway it serves

01

Climate Change Act and the mitigation system

- Purpose and objects of the Act
- Chapter 5 provisions
- Carbon budgets, sector targets and M&E

Slides 3–6

02

GHG Emission Reporting Regulations

- Why amendments are proposed
- Changes for the Energy sector
- Changes for IPPU, AFOLU and Waste

Slides 7–10

03

Updated LT-LEDS

- Approach, products and modelling
- Sector net-zero pathways
- Co-benefits and socio-economic outcomes
- Way forward

Slides 11–24



01. Climate Change Act and the Mitigation System

The legal basis for South Africa's mitigation response and how its instruments fit together

Climate Change Act, 22 of 2024

The legal foundation for a coordinated climate response and a just transition

PURPOSE OF THE ACT

Enable the development of an effective climate change response and a long-term, just transition to a low-carbon and climate-resilient economy and society.

OBJECTS OF THE ACT

- 1 Provide for a coordinated and integrated response to climate change and its impacts
- 2 Provide for effective management of inevitable climate change impacts
- 3 Make a fair contribution to the global effort to stabilise greenhouse gas concentrations
- 4 Give effect to the Republic's international commitments and obligations on climate change
- 5 Protect and preserve the planet for the benefit of present and future generations

Chapter 5: Emissions and Removals

Six provisions turn the national goal into enforceable limits, targets and tracking

s24

National GHG emissions trajectory

Long-term pathway for the country's aggregate emissions that guides all mitigation planning

s25

Sectoral emissions targets

Targets for specific sectors, such as energy and transport, aligned with the national trajectory

s26

Listed GHGs and activities

Identifies which greenhouse gases and activities are regulated and monitored under the Act

s27

Carbon budgets

Limits on emissions over a set period that emitters must comply with to stay within the trajectory

s28

Synthetic GHGs

Phase-down and eventual phase-out of certain synthetic greenhouse gases, with formal declarations

s29

National GHG inventory

A system for tracking emissions and removals that ensures transparency and monitoring

How the Mitigation System Fits Together

Company carbon budgets and sector targets both answer to the national emissions trajectory

1 Carbon budgets and mitigation plans

Industry GHG emissions management

- Companies above 30 000 tCO₂e a year are allocated a carbon budget
- A budget is issued only once aligned with the company's mitigation plan
- Mitigation plans show how the budget will be met; reviewed every five years

2 Sectoral Emission Targets (SETs)

Policy sector emissions management

- Set for three rolling 5-year periods; reviewed every five years with the NDC
- Derived from sector Policies and Measures: regulation, incentives and taxes, procurement, public investment
- e.g. IRP, Energy Efficiency Strategy, Green Transport Strategy, Waste Strategy, Carbon Tax

3 Monitoring and evaluation

Emission targets and M&E

- GHG Emission Reporting Regulations: one national reporting framework
- National GHG inventory, data collection and M&E system
- Tracks actual emissions against the trajectory and international obligations

National GHG emissions trajectory range (s24): the yardstick against which the outcome of all mitigation action is measured



02. GHG Emission Reporting Regulations

Proposed amendments to improve the accuracy, consistency and completeness of emissions data

Why the Reporting Regulations Are Changing

After eight years of reporting, the amendments target more reliable and transparent data

HOW WE GOT HERE

2017

Promulgated on 3 April 2017 (Notice 275 of 2017) under the National Environmental Management: Air Quality Act, 2004

2024

Continue as a regulation under the Climate Change Act, 22 of 2024, in terms of section 37(1)

2026

Eighth year of implementation: amendments identified to improve accuracy, consistency and comprehensiveness, in line with UNFCCC commitments

A single national reporting framework to:

- Implement Chapter 5 of the Climate Change Act
- Analyse emission trends and GHG intensity in the economy
- Compare actual emissions with the national trajectory and obligations

Provisions proposed for amendment

Regulations: definitions; classification of sources and data providers; registration; reporting requirements; reporting boundaries; methods; verification and validation

Annexure 1: list of activities that must be reported

New Annexures 6–9: monitoring plan template; third-party registration and reporting; source and end-user of GHGs; standby generators

Proposed Amendments: Energy

Higher-tier methods, clearer thresholds and more supporting data from fuel-combustion reporters

Amendment	What changes	Instrument
10 MWth threshold	Applies across all activities combined, not per activity (e.g. 1A1b at 11 MWth and 1A4 at 2 MWth must both report)	Methodological Guidelines
Voluntary registration	Activities registered below the threshold become subject to all mandatory reporting	Regulation 5
Higher-tier methods	Tier 2 or higher for all fuel combustion; no reverting to a lower tier once chosen	Regulation 10; Annexure 1
Supporting documents	Monthly breakdown of all fuels used, and other evidence, submitted with each report	Regulations 1 and 7; new annexure
Scope 2 emissions	New activity code: indirect emissions from electricity (Tier 2), steam, heat and cooling consumed	Annexure 1; Guidelines
Emission factors	Applications made during a reporting period are approved for the following period only	Regulation 10; Guidelines
Additional data	Non-energy use of fuels; production data per combustion activity; generators reported at provincial level	Regulation 7; new annexure
Pipeline transport	Report under 1A3e(i) (Tier 1–3, no threshold) instead of 1A1cii	Annexure 1; Guidelines

Proposed Amendments: IPPU, AFOLU and Waste

New activities are brought in and several reporting thresholds are lowered or removed



IPPU

Higher-tier methods

All process activities reported at Tier 3 unless a Tier 2 factor is developed

HFC use (2F1a, 2F1b)

Threshold removed: all use reported

Rare earths

Primary production added; threshold of 50 t a month

New data

CO₂ storage and use; non-energy use of fuels; process flow sheets and calculations



AFOLU

Third parties

Registration with DFFE becomes mandatory, including area harvested and geospatial reference

Sequestration

Third-party sequestration must be independently verified

Poultry (3A2i)

40 000 places clarified as the farm's housing capacity

Feedlots (new)

8 000 head of cattle or 1 000 head of sheep, with days kept in the feedlot



Waste

Solid waste disposal

5 t/day or 25 000 t capacity → 2 t/day or 15 000 t

Incineration

1 t/hour → 10 kg/hour, general and hazardous waste

Wastewater

4.D.1: 2 → 1 million litres/day;
4.D.2: 1 000 m³/day → no threshold

Methane recovery

Must be reported explicitly



03. The Updated LT-LEDs

Approach, sector net-zero pathways, co-benefits and socio-economic outcomes

LT-LEDs: Approach and Vision

A 2050 pathway that tackles the triple challenge while reaching net-zero CO₂



Triple challenge

Poverty, inequality and unemployment



Climate change

Disproportionate effects on vulnerable groups



LEDs

Low emissions, net-zero development pathways



2050 vision for a just transition: a low-carbon, climate-resilient economy and society that provides a quality life for all and leaves no one behind

FOUR ANALYTICAL STEPS

1

Development pathways

What society and 'good life' do we want in 2050?

2

Emission scenarios

Which net-zero CO₂ scenarios match the chosen pathways?

3

Systems dynamics

Unintended consequences, gaps, policy needs and reinforcing outcomes

4

Net-zero aligned SETs

Which Policies and Measures set the targets, and at what level?

Indicators aligned with the SDGs and other sustainable development frameworks track each step

Seven Systems, Four Delivery Phases

System pathways and a holistic pathway feed the net-zero roadmap and 2031–2035 targets

PATHWAYS FOR SEVEN SYSTEMS



Energy



Human
settlements



Food systems



Production
and
consumption



Land use



Transport and
mobility



Water



Holistic
pathway

2026 LT-LEDs UPDATE: DELIVERABLES

PHASE

1

Development objectives

Development pathways · benchmarking · systems dynamics

PHASE

2

Net-zero emissions pathways

Emissions pathways · LT-SETs · socio-economic impact analysis · adaptation implications

PHASE

3

Net-zero implementation tools

Net-zero development roadmap · LEDS investment plan · tracking indicators

PHASE

4

LT-LEDs documentation

LT-LEDs report · summary for policymakers · M&E framework

How the Pathways Are Modelled

Linked models compare four policy pathways against a growing population and economy

TOOLS

DFFE Integrated Emissions Model (IEM)

Emissions, energy and technology choices for every sector



SESAME socio-economic model

Output, jobs, household consumption, public finances and imports

Life-cycle assessment and narratives

Environmental co-benefits, and 'Good Life' stories for each system in 2050

FOUR PATHWAYS, RISING AMBITION

WEM With Existing Measures:
the baseline

CPI Current Policy Implementation

FPI Full Policy Implementation

Net-Zero Net-zero CO₂ by 2050

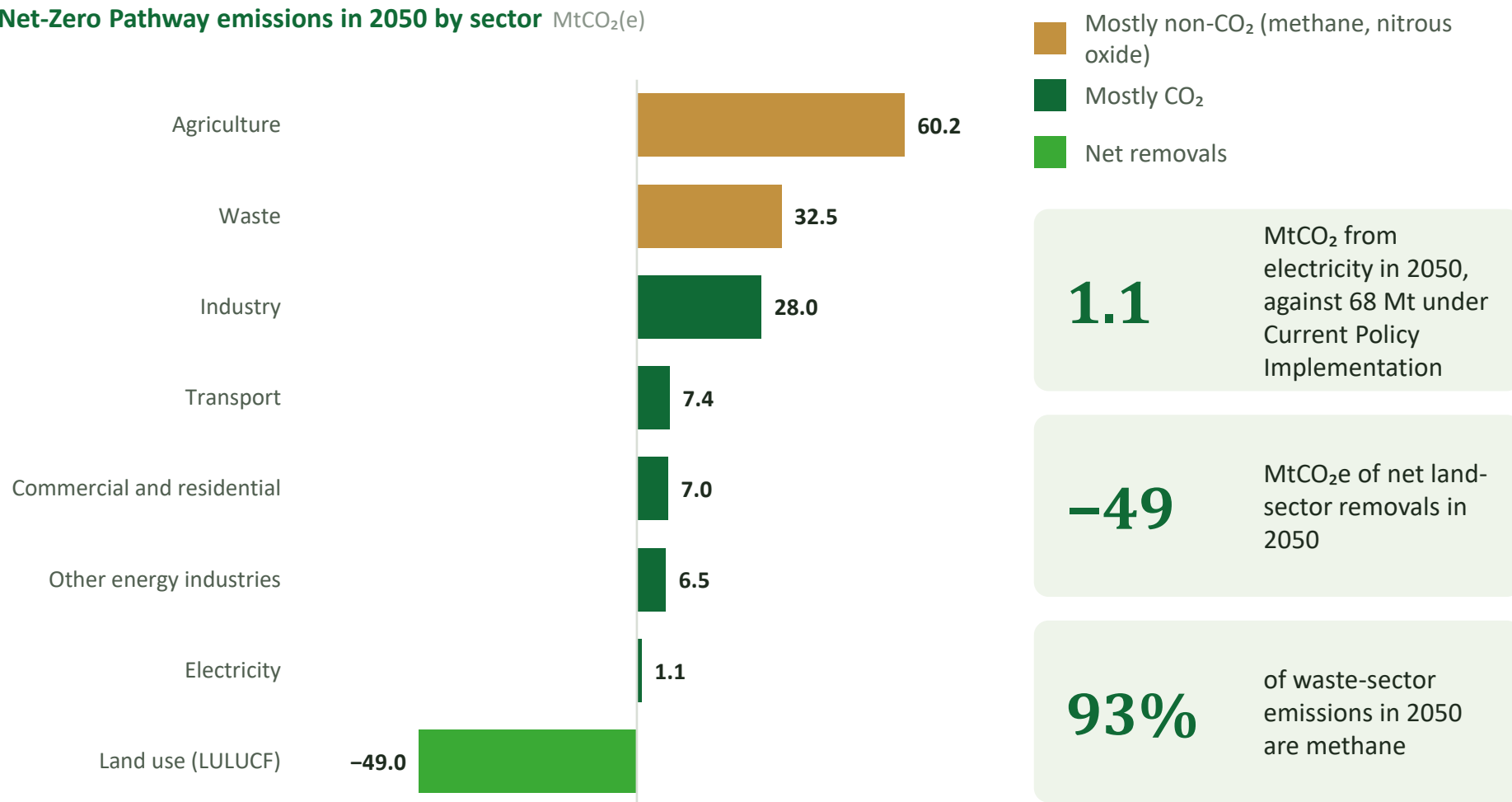
Reading the results

- The 2050 target is net-zero CO₂, not all GHGs: methane and nitrous oxide from agriculture and waste are not measured against it
- Results are scenario comparisons relative to WEM, not forecasts

Where Emissions Remain in 2050

Residual emissions sit mostly in agriculture, waste and industry, offset by the land sink

Net-Zero Pathway emissions in 2050 by sector MtCO₂(e)



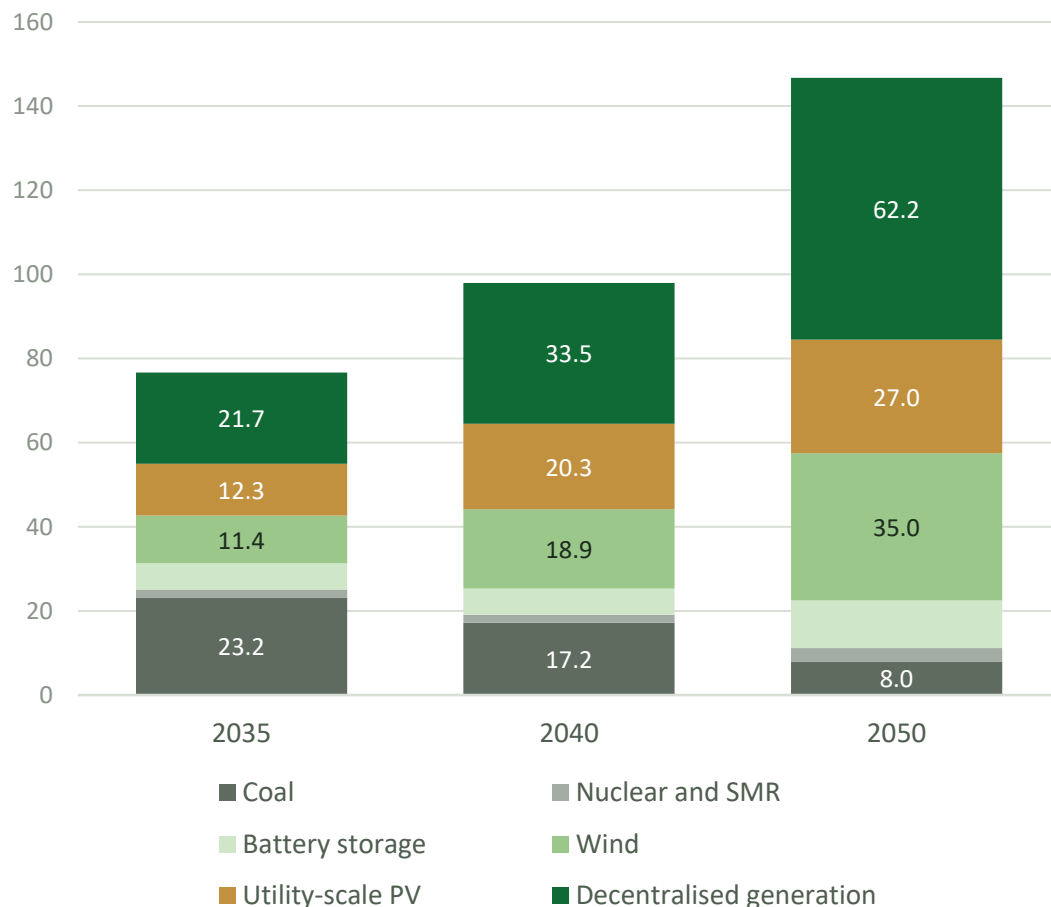
Source: DFFE-IEM, Net-Zero Pathway. Other energy industries = solid fuels, refining and fugitive emissions.

Electricity: the Backbone of the Transition



Coal retires, decentralised solar scales up and power emissions fall to 1.1 MtCO₂ by 2050

Installed capacity, GW total 77 → 98 → 147 GW



47%

of the pathway's
power-sector cut
happens in 2031–2040
(139 → 48 MtCO₂)

~8 GW

coal left by 2050:
Medupi and Kusile,
with CCS from 2045

62.2 GW

decentralised
generation: rooftop PV
meets 64% of
commercial and 62% of
industrial demand

2.5 g

CO₂/kWh grid intensity
in 2050, down from
376 g in 2035

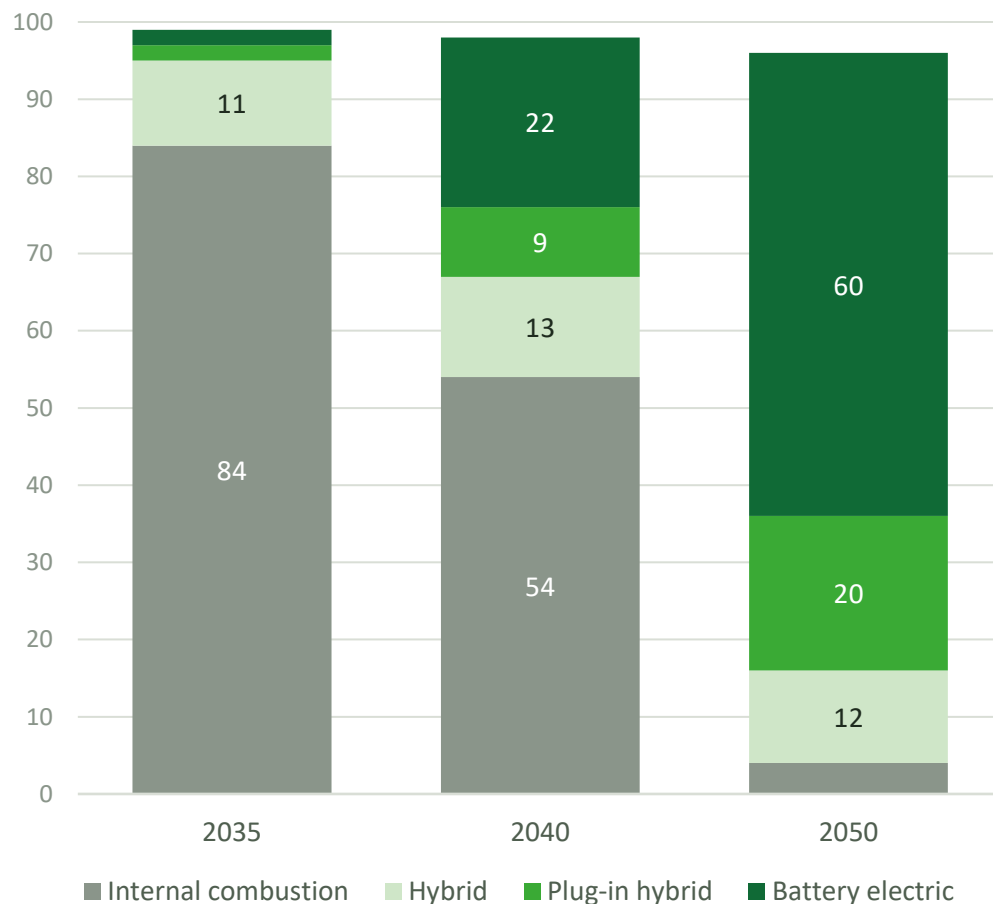
Source: DFFE-IEM, Net-Zero Pathway. Battery and nuclear labels omitted for legibility; values in chart data.

Transport: Electrify, Shift Modes, Cleaner Fuels



Emissions fall from about 48 to 7.4 MtCO₂e as EVs, public transport and rail take over

Share of private vehicle-km, %



42%

of transport energy from electricity by 2050, up from near zero

58%

of passenger-km on public transport (46% in 2035)

55.5%

of corridor freight on rail (40% in 2035)

48%

of domestic aviation energy from sustainable fuels

Watch: pace of fleet turnover, grid decarbonisation, and rail and freight logistics reform

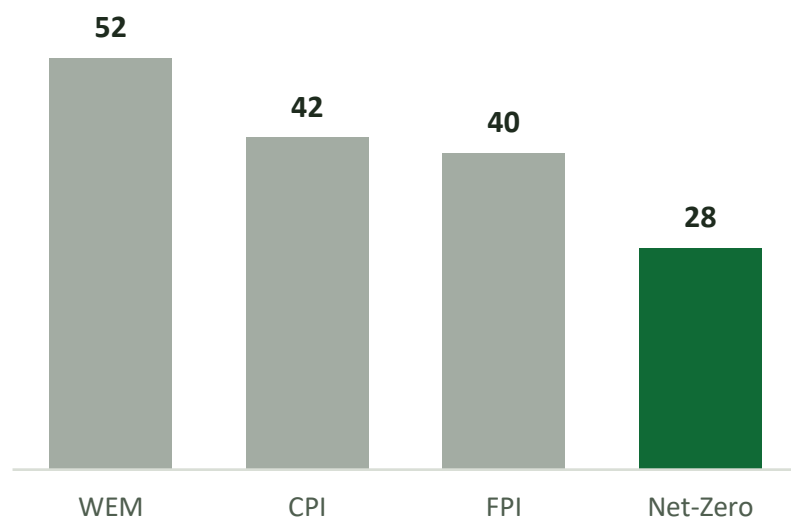
Source: DFFE-IEM, Net-Zero Pathway. Shares of vehicle-km, not of new sales or the fleet.

Industry and Innovation



Industry falls to ~28 MtCO₂, but the last mile needs technologies not yet at scale

Industrial emissions in 2050, MtCO₂



Main abatement levers

Fuel switching (largest), energy efficiency and production-process changes, with CCS and DAC for residual process emissions

Last-mile technologies in the pathway

Technology	2035	2040	2050
Green hydrogen, Mt/yr	1.0	3.8	7.0
H ₂ share of industrial fuel	3%	10%	28%
CC(U)S and DAC, MtCO ₂ /yr	0	0	18
Energy storage, GWh	21	21	50

0.62%

of GDP is South Africa's gross R&D spend, well below what the pathway needs

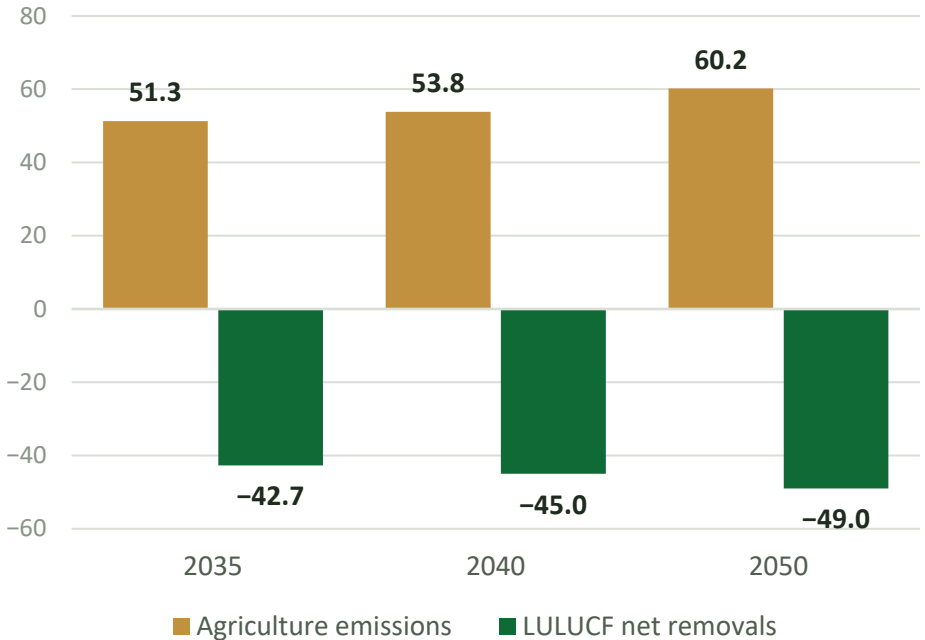
- CC(U)S jumps from zero in 2040 to 18 Mt a year by 2050: demonstration, storage assessment and regulation must start in the 2030s
- Localise selectively, where South Africa has real capability and advantage

AFOLU: a Real but Uncertain Land Sink



Farm emissions keep rising; the deepening land sink carries AFOLU's net-zero CO₂ role

Net-Zero Pathway, MtCO₂e



Rebuilt LULUCF baseline: sink deepens from -31.9 (2022) to about -39 MtCO₂e by 2050 (range -27 to -45) with no flip to a net source. Wildfire emissions are excluded and remain a key risk.

Mitigation by 2050

Measure	2050 level
Conservation agriculture	9 million ha (65% uptake)
Grassland restoration	1.6 million ha
Thicket and woodland restoration	885 713 ha
Additional commercial forestry	99 060 ha
Mangrove and blue carbon	1 450 ha
Wildfire suppression	98%
Nitrogen inhibitors	65% uptake
Inorganic fertiliser use	-50%

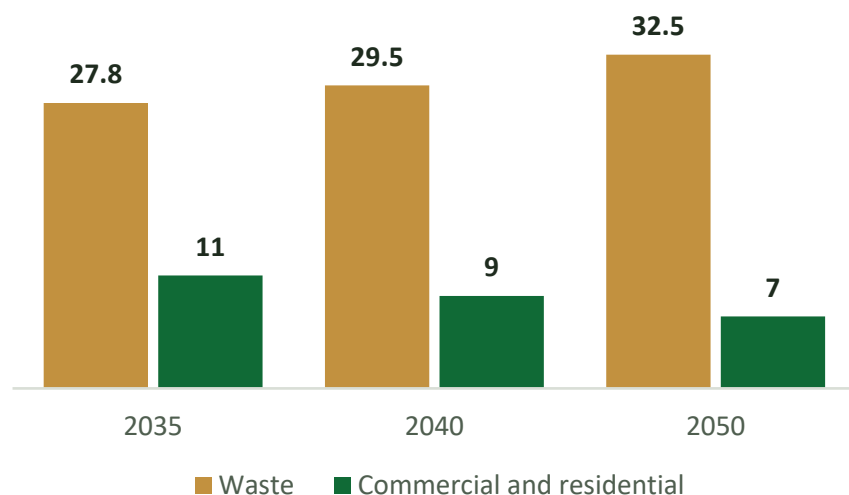
Agricultural emissions are mostly methane and nitrous oxide, so measures moderate growth (-5.5% vs WEM) rather than reverse it

Waste, Water and Human Settlements



Waste methane still rises with population; building emissions fall as rooftop solar grows

Net-Zero Pathway emissions MtCO₂(e)



40%

of waste diverted from landfill, flat to 2050

93%

of 2050 waste emissions are methane

64%

of commercial electricity from rooftop PV by 2050 (27% residential)

>40%

fall in direct fuel use in buildings, 2035–2050

Circular economy

Source separation, stronger EPR, recycling and composting, waste pickers integrated, industrial symbiosis

Water and sanitation

Methane capture at treatment works, efficient pumping, renewable energy, fewer losses, reuse

Settlements

Building standards, RDP and social housing retrofits, rooftop PV, water-sensitive design, informal settlement upgrading

Common challenge: delivery runs through municipalities' finances, skills, infrastructure and planning capacity

Source: DFFE-IEM, Net-Zero Pathway; LT-LEDS development pathway.

Co-benefits and Trade-offs

Cleaner air and better health in energy and transport; water and land are the pressure points

Net-Zero vs WEM, 2050	Climate change	Particulate matter	Human health	Freshwater use	Freshwater ecotoxicity	Land use	Metals demand
Electricity	▼ 63%	▼ 36%	▼ 31%	▼ 14%	▼ 8%	▲ 23%	▼ 25%
Transport	▼ lower	▼ lower	▼ lower	▲ slight	▼ lower	▼ lower	▼ lower
Industry	▼ much lower	▼ modest	▼ modest	▲ much higher	▲ much higher	▲ higher	≈ similar

▼ lower impact (better) ▲ higher impact (worse)



AFOLU

Strongest link between mitigation and adaptation: soil health, water retention, biodiversity and rural jobs. Must protect food security, smallholders and land rights.



Hydrogen and water

Hydrogen production raises freshwater use, ecotoxicity and land use: siting must follow water-resource planning.



Minerals and metals

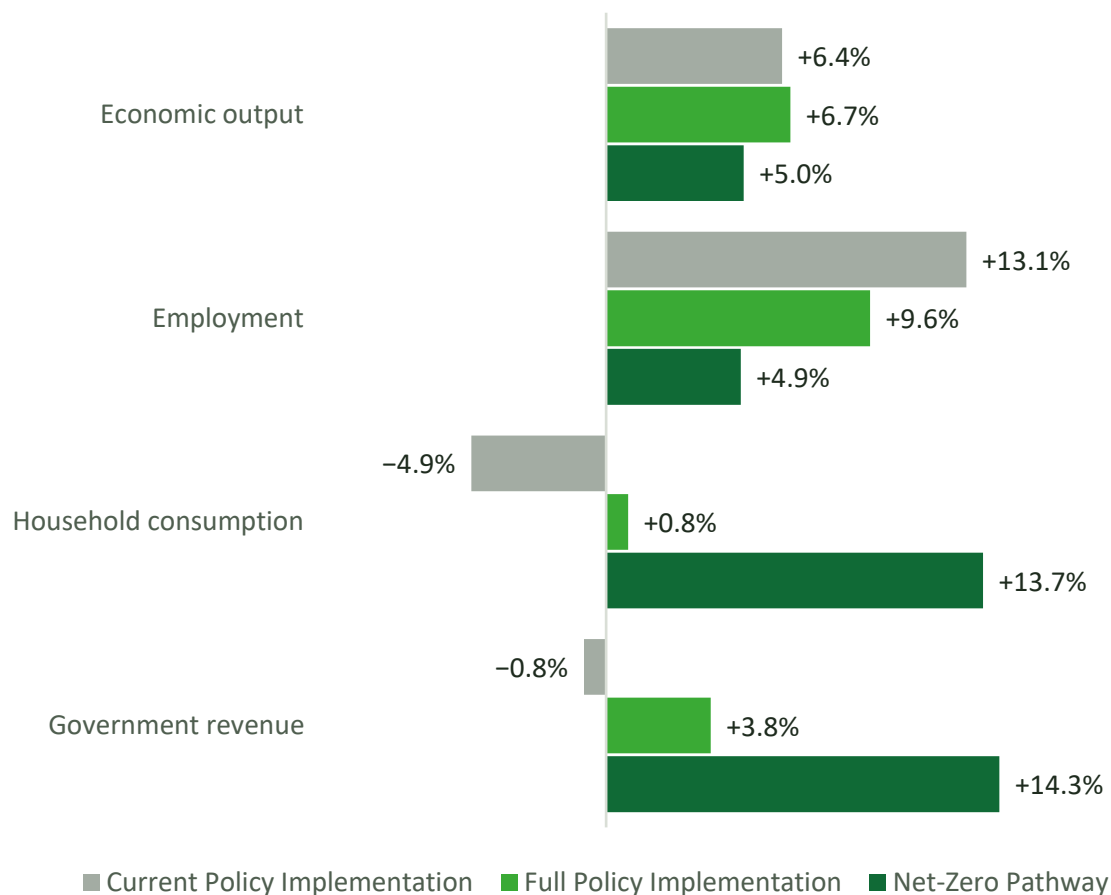
Mining stays central; transition technologies add metals demand. Responsible sourcing, recycling and circularity are needed.

Source: DFFE prospective life-cycle assessment; results are indicative and pathway-dependent.

Socio-economic Outcomes of the Pathways

Every pathway lifts output and jobs above the baseline; net zero lifts households and revenue most

Change relative to WEM in 2050, %



Not a forecast

Each result compares a pathway with WEM under the same assumed GDP and population growth

Lowest public debt

Efficiency and decentralised generation cut investment needs and borrowing under net zero

Imports and localisation

Net zero needs the most imported equipment, though the increase is small; localisation sets how much value stays

Who Gains, Who Is Exposed

National gains do not automatically reach affected workers, households and regions



Workers and regions

- Services and construction add the most jobs
- Petroleum, chemicals, and coal and gas power shed jobs
- Coal regions, especially Mpumalanga, risk job, income and municipal-revenue losses
- Delay compresses losses into a shorter, harsher period



Households

+13.5–14%

- Consumption gain in every income decile by 2050
- Upfront costs of solar, efficiency and vehicles favour richer households
- Lifeline tariffs, subsidised transport and accessible finance needed



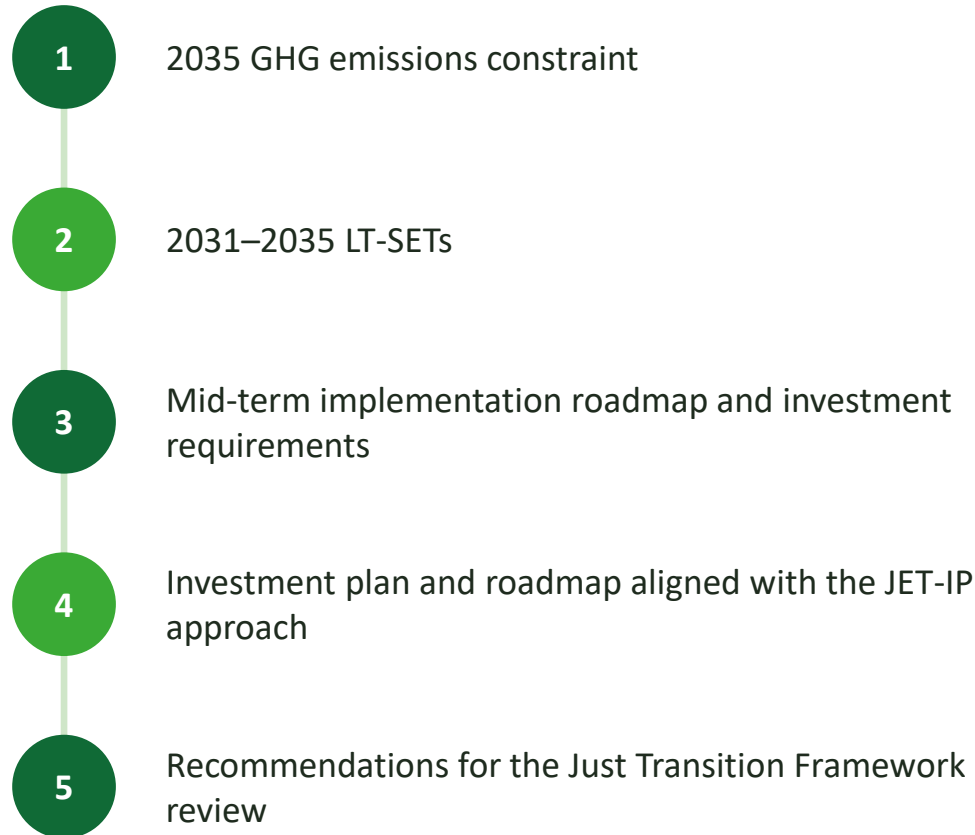
'Good Life' outcomes to test

- Decent work and affordable essential services
- Inclusion of women, youth and rural areas
- Local ownership and manufacturing
- Health and time savings; skills from ECD to TVET
- Secure land tenure and capable institutions

Way Forward

The LT-LEDS will inform the 2035 constraint, the next sector targets and the investment plan

LINKAGES WITH THE NDC AND JUST TRANSITION



Input we are seeking

- Are the assumptions, rates of change and mitigation drivers credible for your sector?
- Which risks, barriers and dependencies need more visibility?
- Which groups or outcomes are missing from the 'Good Life' vision?
- Which indicators should track progress?
- Comments on the proposed reporting amendments

Contact: LEDS@dffe.gov.za

Thank You!

Ngiyabonga!

Ndiyabulela!

Dankie!

Ndi a livhuwa!

Ke a leboga!

Ke a laboha!

Ndzi khense ngopfu!

Ngiyabonga ngiyabonga kakhulu!

thank you



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