From Roadmap to Investment: Decarbonising Zimbabwe's cement and concrete sector

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Climate Innovation in Cement and Concrete

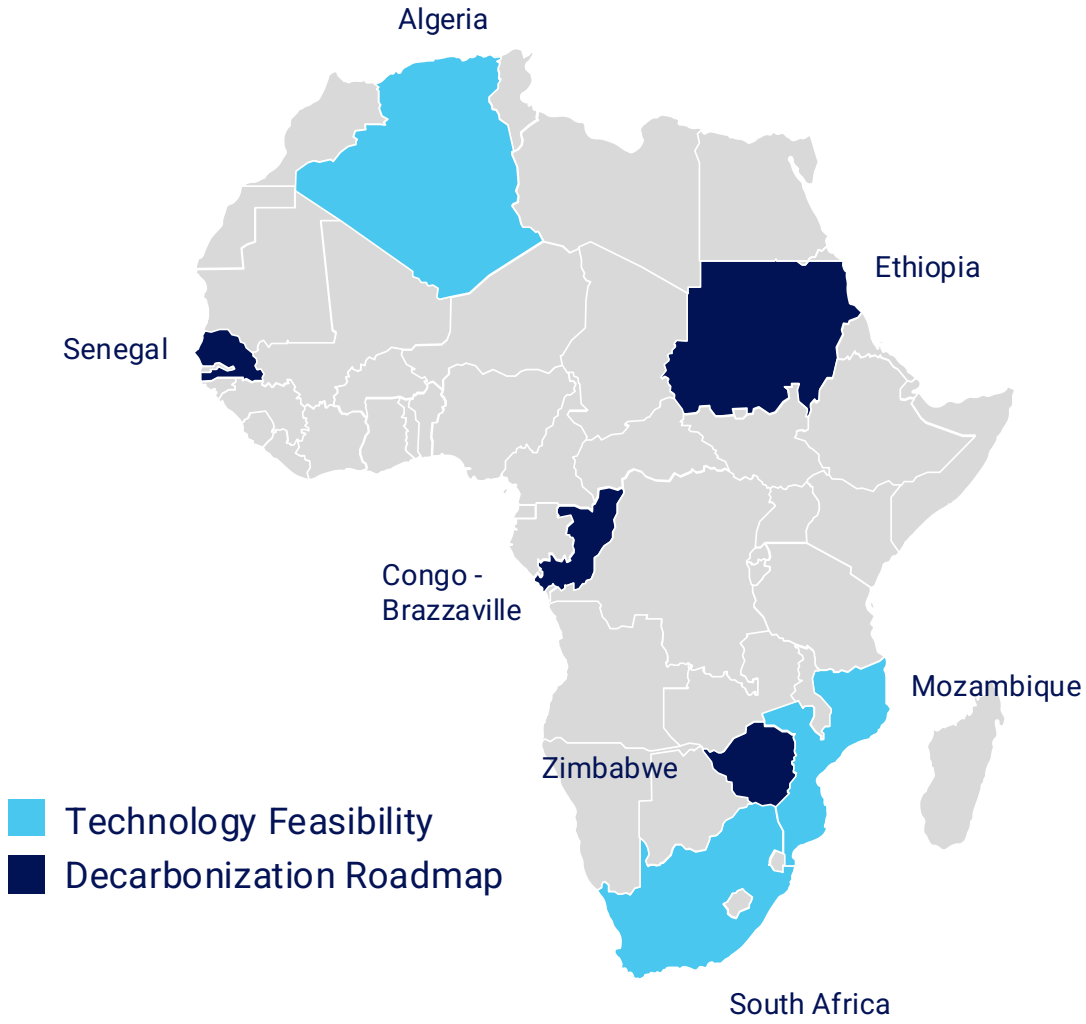
Climate Innovation in Cement and Concrete (CICC) Programme

Enabling innovation and implementation of climate technologies to decarbonize the cement and concrete sector.

- **Technical assistance:** National cement decarbonization roadmaps and technology implementation support
- **Capacity building:** Peer learning and knowledge sharing

Partner with us to scale climate technology support to countries

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A national roadmap, built to unlock finance

What	Zimbabwe's first national decarbonisation roadmap for cement & concrete — a hard-to-abate sector, ~7–8% of global CO_2.
How	CTCN technical assistance (July 2025 – November 2026, delivered for the Ministry of Industry and Commerce, in consultation with a national Technical Working Group.
Methodology	GCCA Net Zero methodology adapted to Zimbabwe; grounded in a plant-level baseline and industry consultation; aligned with NDC 3.0.

A roadmap abates zero tonnes on its own.

Its value is that it aligns government, industry and financiers on one pathway, turning ambition into an investable pipeline.

National context

Housing & demand growth

Population of ~17 million, urbanising at ~2.4%/yr, with a housing backlog of >1.5 million units. Vision 2030 and NDS1-NDS2 mandate 220,000 homes plus flagship infrastructure — **creating structural, long-term demand for cement and concrete**.

Energy & carbon intensity

A coal- and hydro-dominated power system with a grid emission factor of ~0.36 kg CO_2/kWh. Energy-related CO_2 reached ~14.3 Mt in 2023 (electricity ~41%, industry ~30%, transport ~17.5%) — **a carbon-intensive grid that raises the footprint of every tonne produced**.

Sector priority

Cement is named in NDC 3.0 as a priority within the IPPU sector, under a 40% per-capita economy-wide reduction target by 2035, with a specific commitment to clinker substitution — **a national mandate the roadmap turns into an actionable pathway.**

Industry baseline

~4.2 Mt/a
Active capacity

~2 Mt/a
Effective output

1.9 Mt
Demand in 2024

Active producers and installed capacity (Mt/a)

Producer	Type	Mt/a
PPC Zimbabwe	Integrated	**1.46**
Khayah (ex-Lafarge)	Integrated	**1.00**
Sino-Zimbabwe	Integrated	**0.25**
Livetouch	Grinding	**0.60**
JianQiang / Sinoma	Grinding	**0.50**
Huaxin	Grinding	**0.30→0.50**
Pacstar	Grinding	**0.10**
Zimsonc	Grinding	**0.03**

New entrants scaling fast

- Shuntai: USD 120 M, 0.8 Mt/a (2026)
- Dinson: USD 15 M, 0.3 Mt/a (2027)
- Whi-Zim: 1.8 Mt/a (delayed on EIA)
- West International & Dangote: USD 1 bn in MoUs

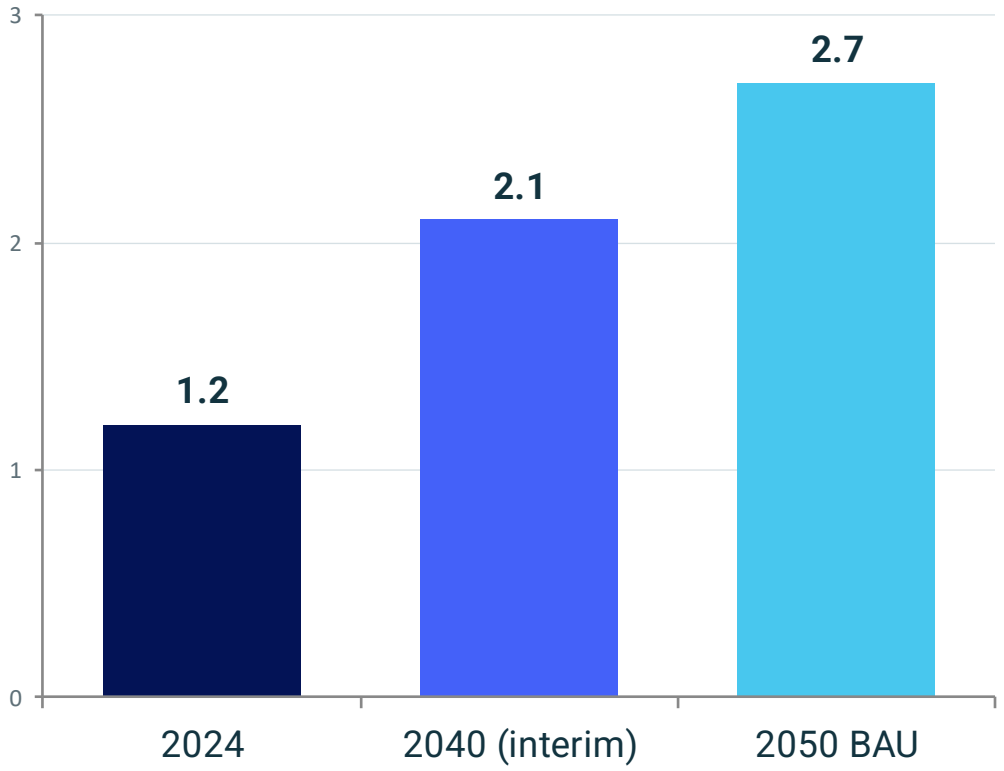
→ ***capacity could exceed 6 Mta this decade***

Current and projected GHG emissions

- Sector baseline (2024): ~1.2 Mt CO_2/yr
- Concentrated in clinker: calcination ~60%, kiln fuel ~35% (≈99% coal), electricity ~5%.
- Clinker factor ~75%; SCMs ~25% (limestone 17%, gypsum 4%, slag 3%, fly ash 1%) — no calcined clay.
- Demand pathway: ~2.0 Mt (2030) → ~3.3 Mt (2050), driving BAU GHG emissions up.

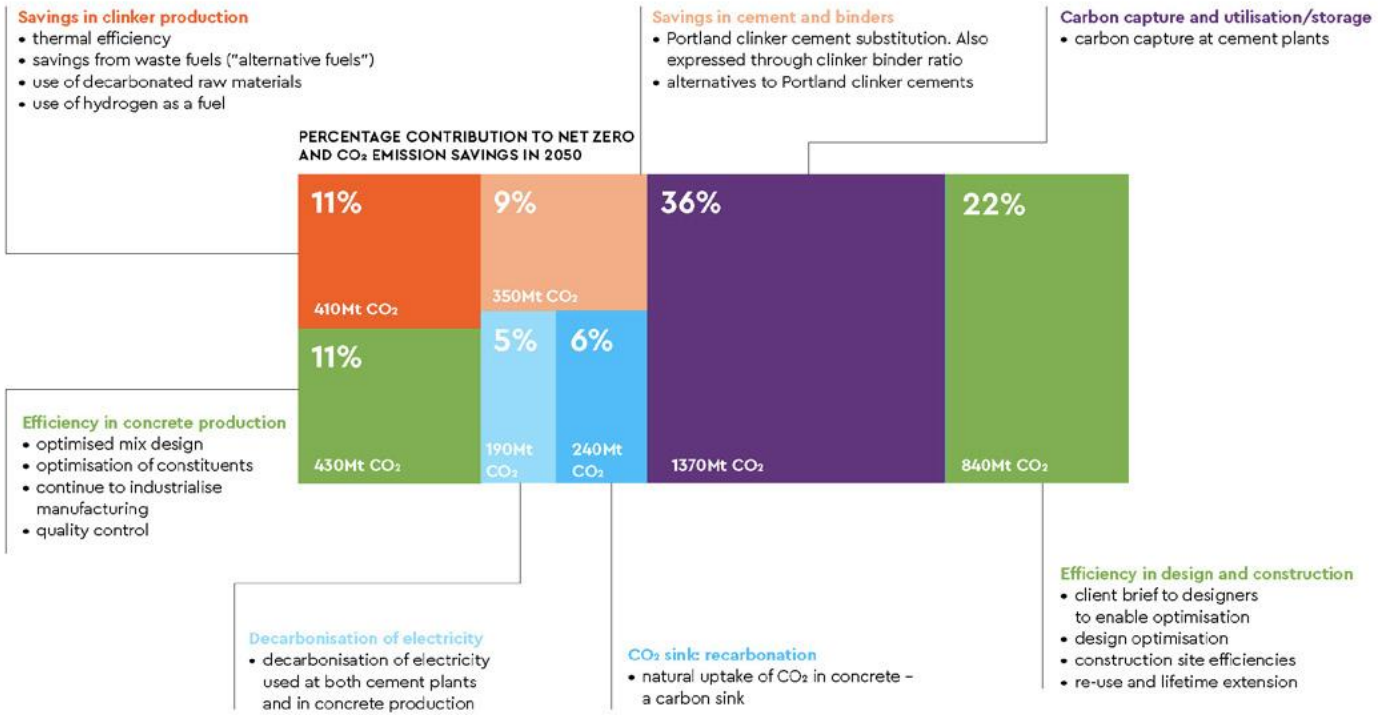
~60% is process emissions from calcination — you cannot fuel-switch your way out; you must attack the clinker itself.

Cement-sector CO_2 trajectory (Mt/yr)



Roadmap framework and methodology

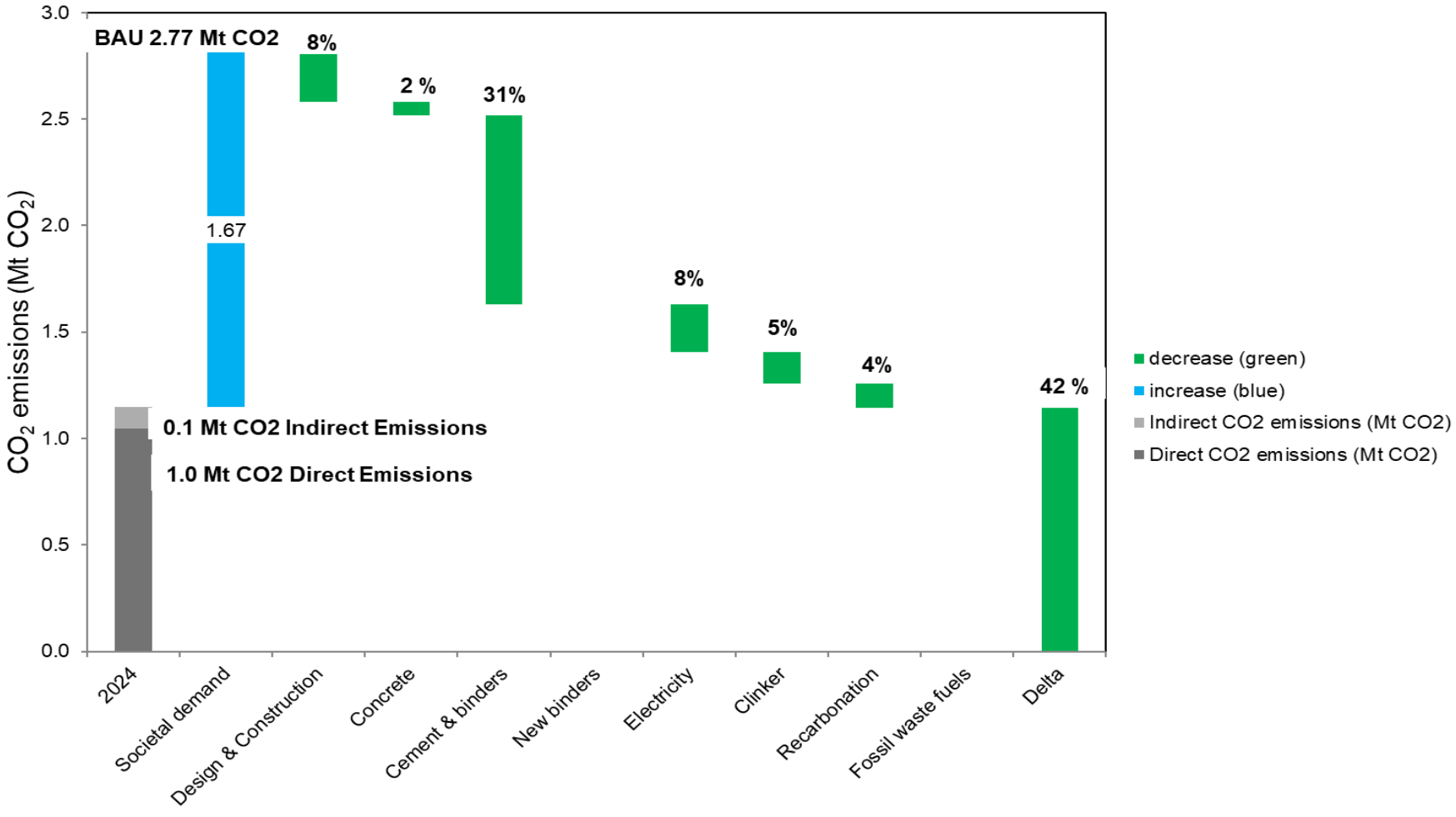
- **GCCA Net Zero 2050** ("Concrete Future") — the industry's 1.5°C commitment (~80% of world capacity outside China), structured around 7 decarbonisation levers.
- Zimbabwe roadmap follows the GCCA methodology **adapted to the national context**.
- Built through a **public–private Technical Working Group** to ensure shared ownership across ministries, regulators, producers and academia.



Zimbabwe roadmap overview

Zimbabwe Cement and Concrete Decarbonization Roadmap with a 2050 objective.

The roadmap will be launched in November 2026.



Overview of decarbonization levers

Lever (share)	Key technology action	Key policy / enabling action	Horizon
L1 Design efficiency (8%)	Carbon as a design parameter; right-sizing	Revise 1970s building codes; CO_2 in permits	**Now**
L2 Concrete efficiency (2%)	Ready-mix; 340→275 kg cement/m³	Ready-mix in public tenders	**Now**
L3 Clinker factor (31%)	LC3 / calcined clay + SCMs; clinker factor 75%→35–50%	Enforce cement standard; green procurement; exempt additives	**Now**
L4 Alternative fuels (5%)	Co-processing agri-residue & tyres to ~15%	Waste-collection points, EPR, co-processing permits	**Now**
L5 Electricity (8%)	105→80 kWh/t energy intensity reduction; captive solar / renewables	Net-metering, power-banking, PPA rules	**Now**
L6 Recarbonation (4%)	Passive CO_2 uptake (~20% of calcination)	Recognise in MRV / carbon accounting	**Now**
L7 Residual (42%)	Kiln electrification, green hydrogen, CCUS	Feasibility studies; carbon-market readiness	**2030–40+**

Lever 3: clinker factor reduction

0.86 Mt
CO_2 abated potential

31 %
of total abatement to 2050

- Single most effective, readily scalable lever with a mitigation potential of ~0.86 Mt CO_2 by 2050.
- Route: raise the SCM share, above all calcined clay (LC3) due to favourable geology; LC3 matches OPC performance at up to ~40% less CO_2.
- Target: reduce current clinker factor of ~75% to 35–50% by 2050.
- This is more ambitious than NDC 3.0 / LT-LEDS (17–20% substitution) — the roadmap pushes national policy forward.

SCM	Source	Availability	Typical clinker replacement	CO_2 reduction potential	Key consideration for Zimbabwe
Fly ash	Coal-fired power plants	Moderate	15–35%	High	Supply limited by ash quality and collection options
GGBFS (slag)	Steel-industry by-product	Low	30–70%	High	Scarce today; rising with Manhize steelworks
Natural pozzo-lans	Volcanic materials	Low - Moderate	15–35%	Moderate	Very limited, uncertain availability and variable quantity
Lime-stone filler	Crushed limestone	High	5–20%	Moderate	Lower reactivity
Calcined clay	Thermally activated clay	High	30–50%	High	Requires calcination infrastructure

Lever 7: Residual, hard-to-abate emissions

1.2 Mt
CO_2 abated potential

42 %
of total abatement to 2050

- After all available levers, ~1.2 Mt CO_2 (42%) remains hard to abate.
- All routes are emerging (low TRL); commercial availability ~2030–2040 — they must be prepared for now, through studies, finance and partnerships.
- First mover globally: Heidelberg's Brevik CCUS plant (400 kt/yr).

1. **Kiln electrification (~2030–40)**
2. **Green hydrogen (unproven in kilns)**
3. **CCUS (key for calcination of CO_2)**

Not bankable on commercial terms today.

Investment opportunity: The roadmap is an ambition setter

- A roadmap abates no tonnes on its own. It aligns government, industry, financiers and off-takers on one sequenced pathway with transparent milestones.
- The credibility is what gives investors the confidence to commit capital.
- Building low-carbon in now is far cheaper than retrofitting later.

The capital is already flowing

- Shuntai: USD 120 M integrated plant
- Livetouch: up to USD 100 M (phased)
- PPC: USD 40 M captive solar
- Dinson: USD 15 M grinding plant
- West International & Dangote: USD 1 bn MoUs

The roadmap steers this capital toward low-carbon options.

Matching the right capital to each lever

Capital type	What it funds	Levers
Grant / concessional TA (public good, non-revenue)	Standards & code revision, MRV, clay surveys & LC3 trials, feasibility studies (CCUS / electrification / H_2), capacity building, green procurement, waste / EPR systems	**Enablers for L1–L7**
Concessional debt / blended finance (capex, marginal bankability)	Calcined-clay / LC3 lines, alternative-fuel prep & handling, waste-heat recovery, captive solar, kiln efficiency upgrades	L3 · L4 · L5
Equity + carbon finance (first-of-kind, frontier)	Kiln electrification, green hydrogen, CCUS pilots — blended first-of-kind support plus carbon-market revenue	L7

Call to action

- Zimbabwe has a credible, industry-validated pathway from ~1.2 Mt of GHG emissions today to net zero by 2050.
- Near-term unlock: policy + grant-scale enablers release the 31% mitigation potential through clinker substitution at low cost.
- The frontier (42%) needs finance and partnerships prepared now.

Partner with us

- Grants for regulatory, feasibility and capacity building activities
- Blended finance for capex levers
- Carbon-market readiness
- …

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