#CCSA 2023 @ WORK

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Update on Cement and Concrete Industry Issues

Bryan Perrie

CEO

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Structure

- Background
- Environmental
- Governmental
- Technical

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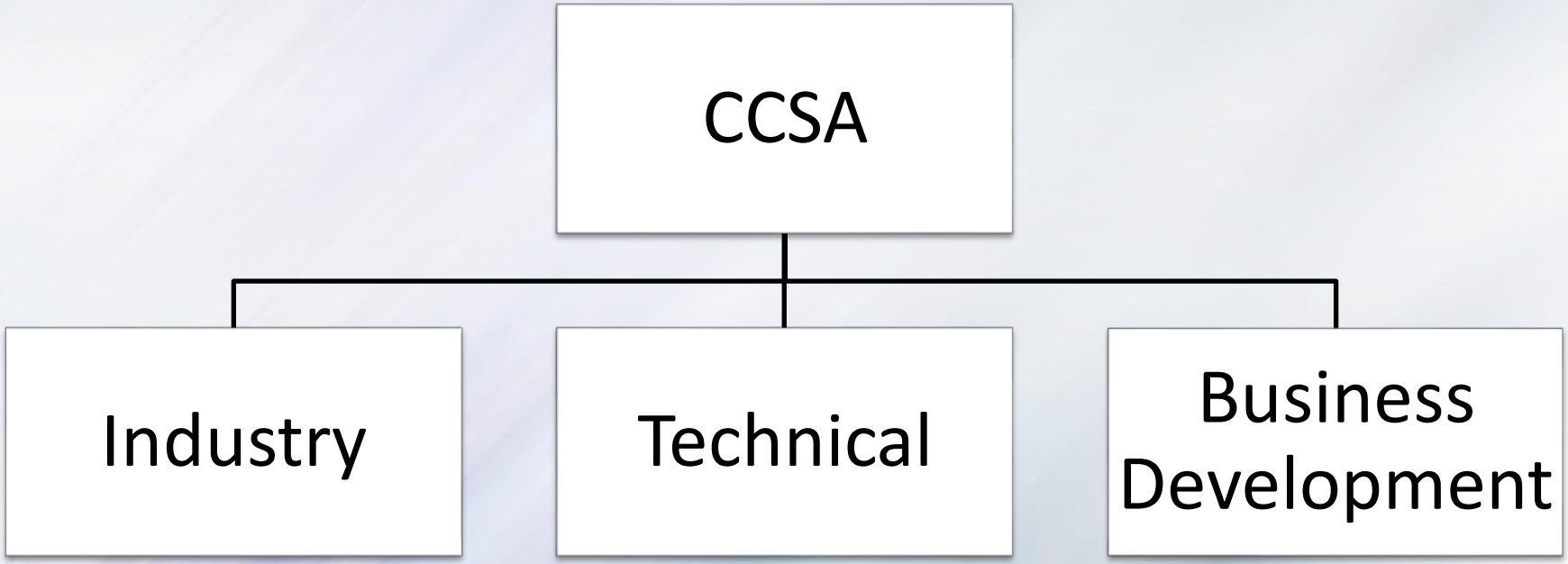
CCSA Operating Structure



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Industry

- Environmental
- Governmental
- Standards

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Environmental

- "Vision: Net Zero Carbon" by 2050 with an initial milestone set by 2030. Press Release on CCSA website.
- Well represented on government steering committees to inform policies and legislation

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Environmental

- Government engagement on:
  - Climate change

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Environmental

- Government engagement on:
  - Climate change
  - Air quality

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Environmental

- Government engagement on:
  - Climate change
  - Air quality
  - Water management

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Environmental

- Government engagement on:
  - Climate change
  - Air quality
  - Water management
  - Rehabilitation of mining activities

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Environmental

- Government engagement on:
  - Climate change
  - Air quality
  - Water management
  - Rehabilitation of mining activities
  - Waste management including waste tyres

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Environmental

- SABS engagement on:
  - Air quality emission standards

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Environmental

- SABS engagement on:
  - Air quality emission standards
  - Dust management and fugitive emissions

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Environmental

- SABS engagement on:
  - Air quality emission standards
  - Dust management and fugitive emissions
  - Carbon capture and utilisation

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Environmental

- Actively involved in BUSA committees:
  - Environment sub-committee
  - Waste sub-committee
  - Water sub-committee
  - Climate change sub-committee
  - Just transition committee

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Industry

- Environmental
- Governmental
- Technical

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Governmental

- Protection of local industry
- National Regulator for Compulsory Standards (NRCS)
- Consumer Goods and Services Ombud (CGSO)
- Department of Trade, Industry and Competition (DTIC)

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Governmental

- Protection of local industry
  - Anti-dumping tariff applications

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Governmental

- Protection of local industry
  - Anti-dumping tariff applications
  - Safeguard Application for general import tariff

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Governmental

- Protection of local industry
  - Anti-dumping tariff applications
  - Safeguard Application for general import tariff
  - Designation of cement

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Governmental

- NRCS
  - Background

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Governmental

- NRCS
  - Background
  - Lack of response to complaints

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Governmental

- NRCS
  - Background
  - Lack of response to complaints
  - Claims of confidentiality

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Governmental

- NRCS
  - Background
  - Lack of response to complaints
  - Claims of confidentiality
  - Lack of transparency in fee determination

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Governmental

- CGSO
  - Background
  - Actions

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Governmental

- CGSO
  - Background

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Governmental

- CGSO
  - Background
  - Actions

Governmental

- DTIC
  - Background

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Governmental

- DTIC
  - Background
  - Request

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Technical

- School of Concrete Technology
- Information Centre
- Standards
- Consulting

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Standards

- Currently CCSA chairs the SABS Technical committee TC81 SC01 which covers Cement, Lime, Concrete and Concrete Products
- Total of 147 standards

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Standards

- SANS 3001 series
- SANS 1083 Aggregates for Concrete
- SANS 10100-2 and SANS 2001
- SANS 50197-5

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SANS 3001 Series

- Currently no standard numbering
- All civil test methods moved to SANS 3001 series eg Bi, Ag, Gr etc. SANS 3001 AG ???

SANS 1083 Aggregates for Concrete

- In future SANS 1083 Aggregates for Construction with 5 parts
  - Concrete
  - Mortar and plaster
  - Gabions and ballast
  - Bitumen products
  - Surfacings

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SANS 10100-2 and SANS 2001

- Currently SANS 10100-1 and 2 and SANS 2001 CC1 (SANS 1200 G)
- SANS 10100-1 replaced by EN1991-1-1 (SANS 51991-1-1)
- No equivalent Part 2

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SANS 10100-2 and SANS 2001

- Adopting and modifying EN 206 Concrete and EN13670-1 Execution of Works
- Intended to replace SANS 2001 CC1 and 1200 G

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SANS 50197-5

- Currently SANS 50197-1 and SANS 50413-1
- New standard SANS 50197-5 for LC3 cements

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SANS 50197-5

- Currently SANS 50197-1 and SANS 50413-1
- New standard SANS 50197-5 for LC3 cements
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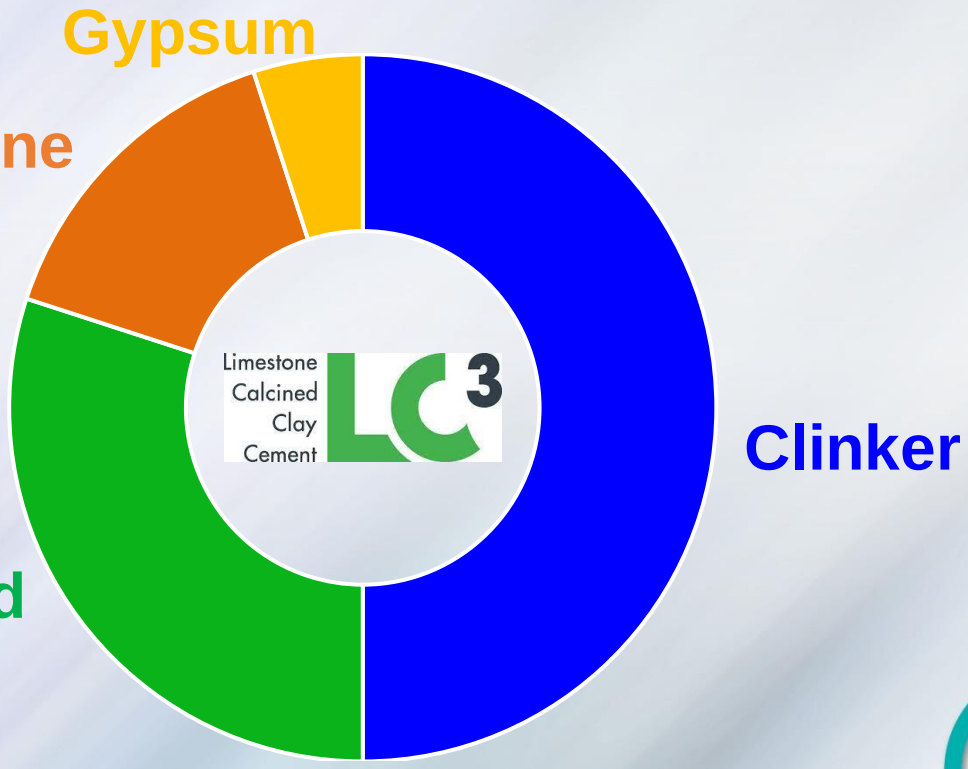
What is LC³?



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Why the LC^3 system?

Production of Portland cement

- Contributes about 8% of global anthropogenic CO_2 emissions

Blended cement

- A promising option for lowering costs and environmental impact of concrete (UNEP report, 2016)
- Clinker content - partially replaced by Supplementary Cementitious materials (SCMs)

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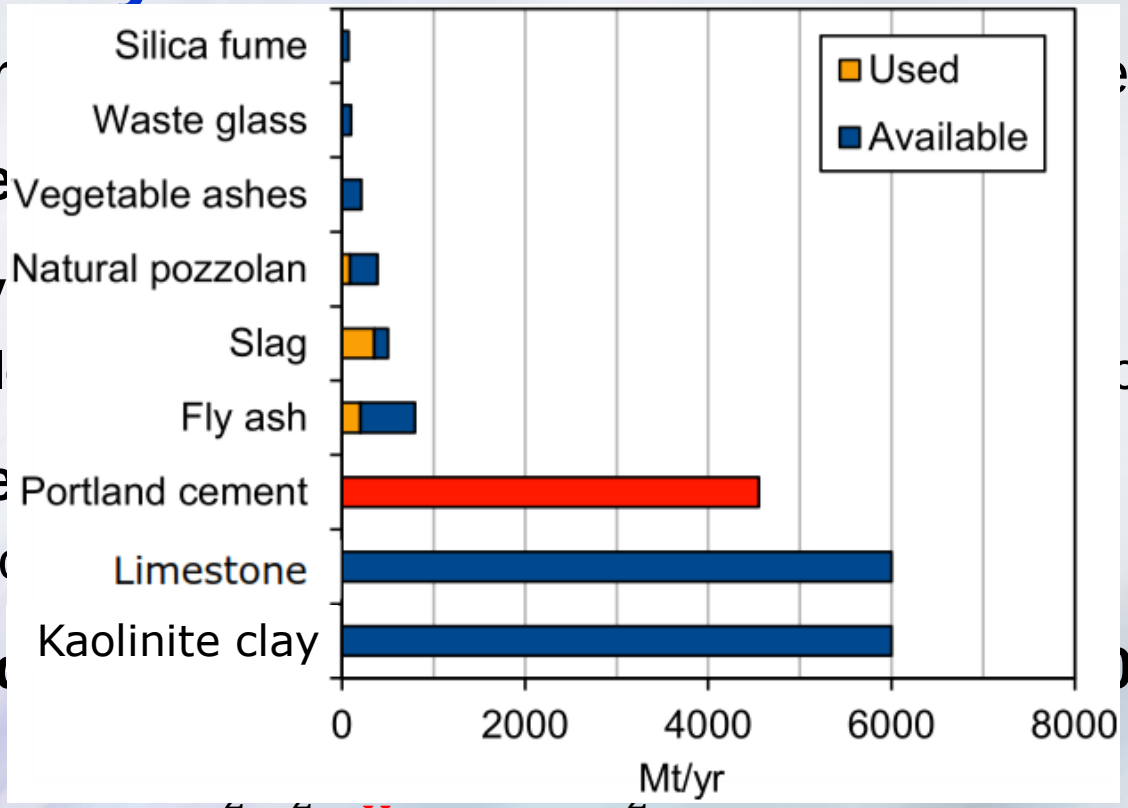
Why LC³ system

- **Slag ar** …es
- **Source**
- **Energy**
  - Cal… clinker
- **Calcine**
  - Str…
- **Can re…** …0%)



Estimated availability of SCMs versus amount of cement produced
(UNEP report on eco-efficient cements, 2016)

~~Kaolinite~~ Heat ~~Metakaolin~~

Table 1 — The 27 products in the family of common cements

Main types	Notation of the 27 products (types of common cement)		Composition (percentage by mass[a])										
			Main constituents										Minor additional constituents
			Clinker	Blast-furnace slag	Silica fume	Pozzolana		Fly ash		Burnt shale	Limestone		
						natural	natural calcined	siliceous	calca-reous				
			K	S	D[b]	P	Q	V	W	T	L	LL	
CEM I	Portland cement	CEM I	95-100	–	–	–	–	–	–	–	–	–	0-5
CEM II	Portland-slag cement	CEM II/A-S	80-94	6-20	–	–	–	–	–	–	–	–	0-5
		CEM II/B-S	65-79	21-35	–	–	–	–	–	–	–	–	0-5
	Portland-silica fume cement	CEM II/A-D	90-94	–	6-10	–	–	–	–	–	–	–	0-5
	Portland-pozzolana cement	CEM II/A-P	80-94	–	–	6-20	–	–	–	–	–	–	0-5
		CEM II/B-P	65-79	–	–	21-35	–	–	–	–	–	–	0-5
		CEM II/A-Q	80-94	–	–	–	6-20	–	–	–	–	–	0-5
		CEM II/B-Q	65-79	–	–	–	21-35	–	–	–	–	–	0-5
	Portland-fly ash cement	CEM II/A-V	80-94	–	–	–	–	6-20	–	–	–	–	0-5
		CEM II/B-V	65-79	–	–	–	–	21-35	–	–	–	–	0-5
		CEM II/A-W	80-94	–	–	–	–	–	6-20	–	–	–	0-5
		CEM II/B-W	65-79	–	–	–	–	–	21-35	–	–	–	0-5
	Portland-burnt shale cement	CEM II/A-T	80-94	–	–	–	–	–	–	6-20	–	–	0-5
		CEM II/B-T	65-79	–	–	–	–	–	–	21-35	–	–	0-5
	Portland-limestone cement	CEM II/A-L	80-94	–	–	–	–	–	–	–	6-20	–	0-5
		CEM II/B-L	65-79	–	–	–	–	–	–	–	21-35	–	0-5
		CEM II/A-LL	80-94	–	–	–	–	–	–	–	–	6-20	0-5
		CEM II/B-LL	65-79	–	–	–	–	–	–	–	–	21-35	0-5
	Portland-composite cement[c]	CEM II/A-M	80-88	‹———— 12-20 ————›									0-5
		CEM II/B-M	65-79	‹———— 21-35 ————›									
CEM III	Blast furnace cement	CEM III/A	35-64	36-65	–	–	–	–	–	–	–	–	0-5
		CEM III/B	20-34	66-80	–	–	–	–	–	–	–	–	0-5
		CEM III/C	5-19	81-95	–	–	–	–	–	–	–	–	0-5
CEM IV	Pozzolanic cement[c]	CEM IV/A	65-89	–	‹———— 11-35 ————›					–	–	–	0-5
		CEM IV/B	45-64	–	‹———— 36-55 ————›					–	–	–	0-5
CEM V	Composite cement[c]	CEM V/A	40-64	18-30	–	‹—— 18-30 ——›			–	–	–	–	0-5
		CEM V/B	20-38	31-49	–	‹—— 31-49 ——›			–	–	–	–	0-5

a The values in the table refer to the sum of the main and minor additional constituents.

b The proportion of silica fume is limited to 10 %.

c In Portland-composite cements CEM II/A-M and CEM II/B-M, in pozzolanic cements CEM IV/A and CEM IV/B and in composite cements CEM V/A and CEM V/B the main constituents other than clinker shall be declared by designation of the cement (for examples, see Clause 8).

Table 1 — Portland-composite cement CEM II/C-M and Composite cement CEM VI

Main types	Notation of the products (types of cement)		Composition (percentage by mass[a])										
			Main constituents										Minor additional constituents
			Clinker	Blast-furnace slag	Silica fume	Pozzolana		Fly ash		Burnt shale	Limestone		
						natural	natural calcined	siliceous	calca-reous				
	Type name	Type notation	K	S	D[b]	P	Q	V	W	T	L[c]	LL[c]	
CEM II	Portland-composite cement[d]	CEM II/C-M	50-64	‹---------- 36-50 ----------›									0-5
CEM VI	Composite cement	CEM VI (S-P)	35-49	31-59	–	6-20	–	–	–	–	–	–	0-5
		CEM VI (S-V)	35-49	31-59	–	–	–	6-20	–	–	–	–	0-5
		CEM VI (S-L)	35-49	31-59	–	–	–	–	–	–	6-20	–	0-5
		CEM VI (S-LL)	35-49	31-59	–	–	–	–	–	–	–	6-20	0-5

a The values in the table refer to the sum of the main and minor additional constituents.
b The proportion of silica fume is limited to 6-10 % by mass.
c The proportion of limestone (sum of L, LL) is limited to 6-20 % by mass.
d The main constituents other than clinker shall be declared by designation of the cement (for examples, see Clause 6).

5 REQUIREMENTS

Conclusion

- LC^3 system – Low-Cost and Low-Carbon system
- All selected clays composed mainly of quartz, illite and kaolinite
- 'Optimum' proportion 55% Clinker, 35% Calcined clay, 10% LS
- LC^3 mixes perform similar to, or better than, the reference mixes
- Kaolinite clays are not the same – each source must be examined

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SANS 50197-5

- Process
  - Currently with SABS and awaiting publication
  - NRCS VC9085 needs amending
  - All relevant SABS standards need updating

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Thank You

Questions?

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