

International Dimension LC³

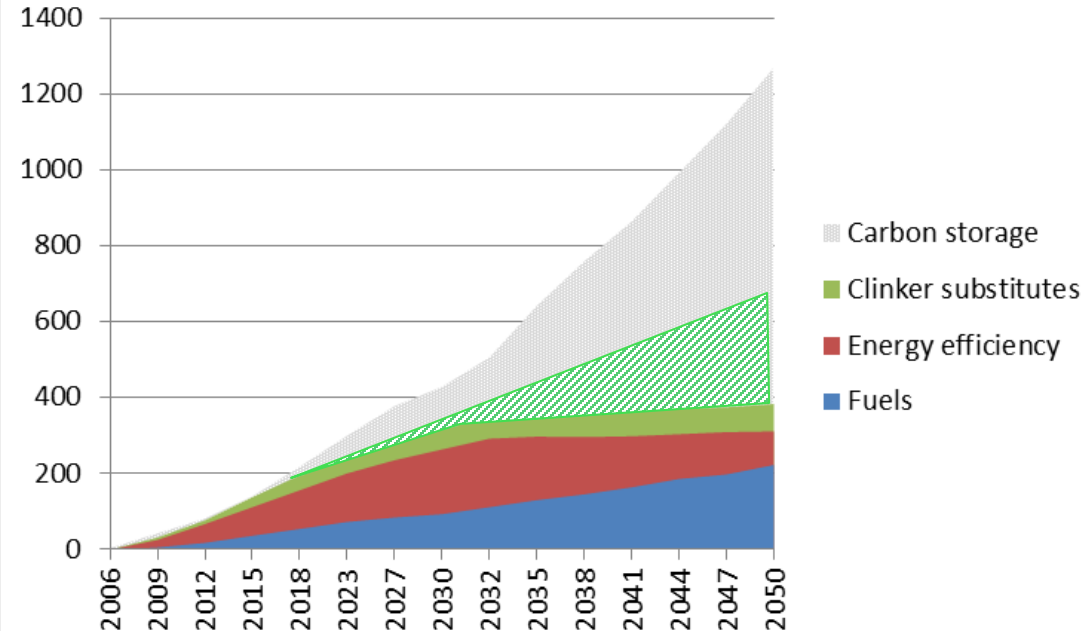
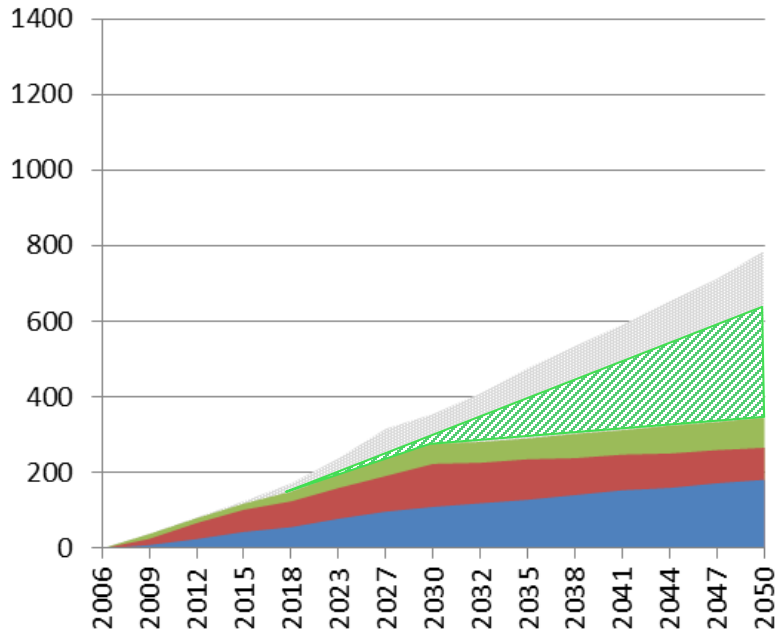
Professor Karen Scrivener, FREng

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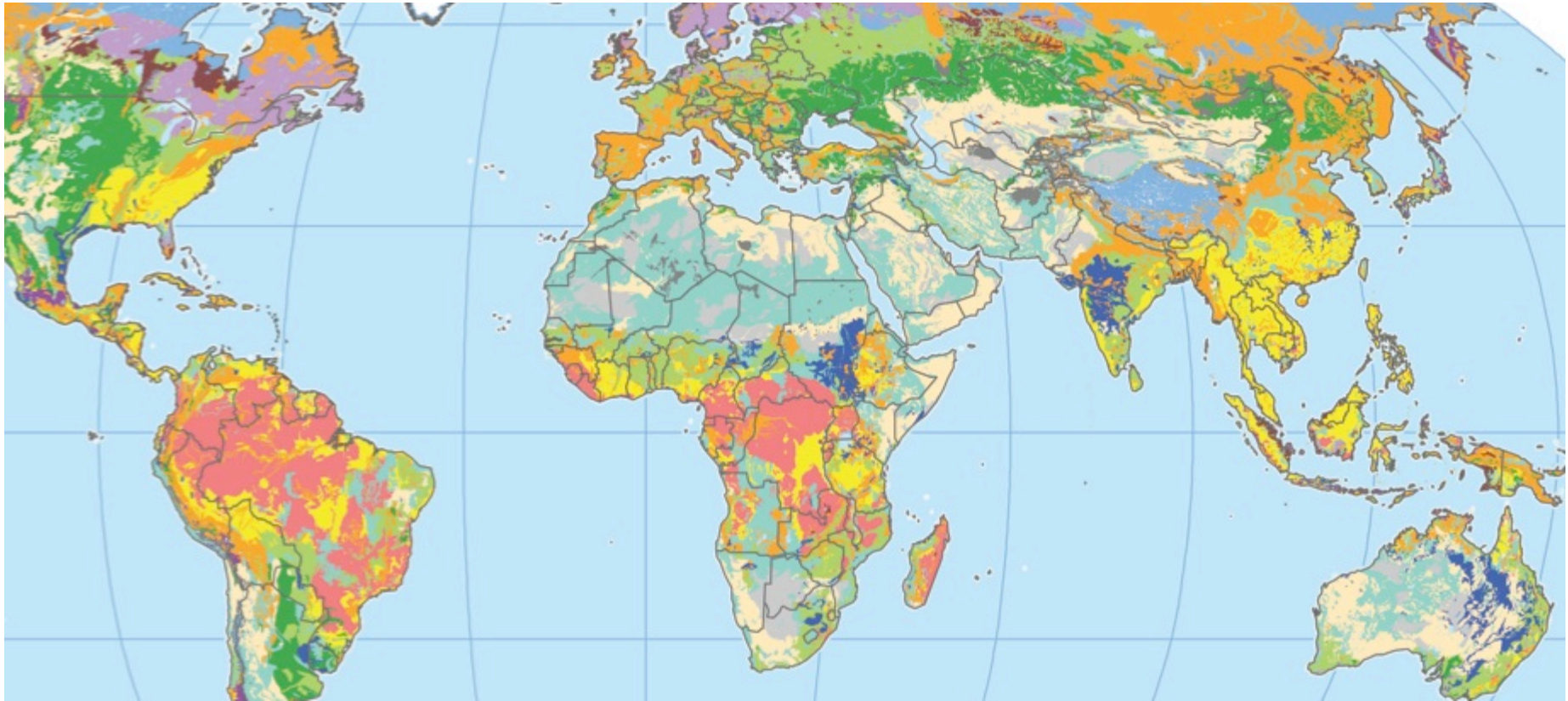
IEA study for CSI of WBCSD

	Global cement production Billion tons/year	Clinker factor, global average %	Global SCM volume Billion tones/year	Global CO ₂ reduction Million tones/year
2006	2.6	79	0.5	
2050 (CSI study)	4.4	73	1.2	200
2050 (with LCC)	4.4	60	1.8	500

Global potential of LC³
 $\Delta = 300$ million tonnes per yr
 ~ whole of CO₂ emissions of France

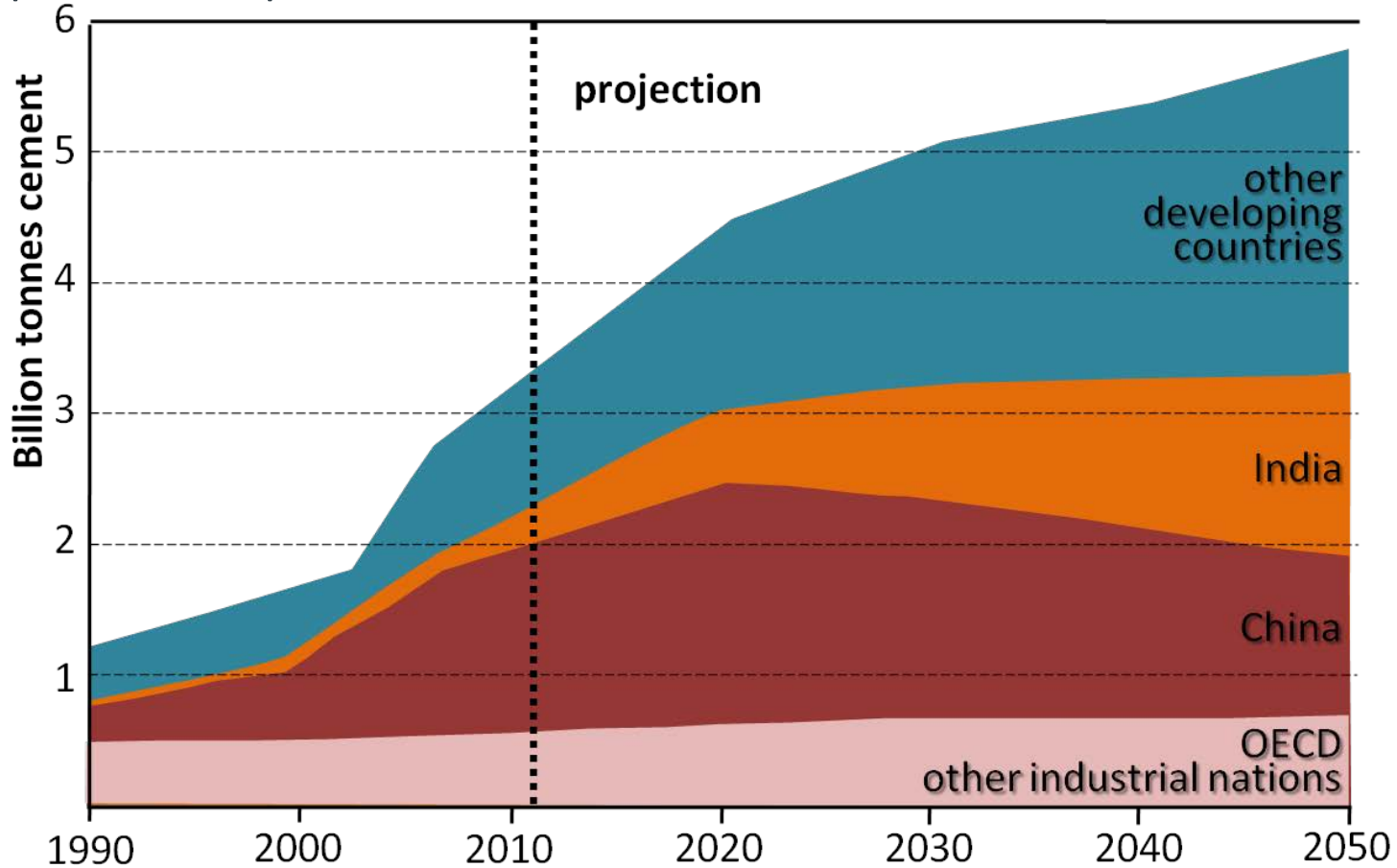


Availability of suitable clays, yellow and pale green regions, and others



Demand for cement is forecast to rise: to meet the demands of a developing world

Today 60% of consumption in China,
per capita consumption 6 times lower in India than China



International dimension of LC3 project

- » India is lead country where research projects are supported directly
- » Aim is to develop partnerships with countries with self financed research:
 - » **Thailand**, SCG financing PhD at EPFL
 - » **China**, partnership with Sinoma and National research project on concrete
 - » **South America** – Advanced collaborations with several companies
 - » **Africa**
- » Encourage all interested parties to participate in research effort
- » International conferences and workshops
- » Scientific research at EPFL to answer fundamental questions

Standardisation

China – very open standard. Clinker factors ~ 0.6

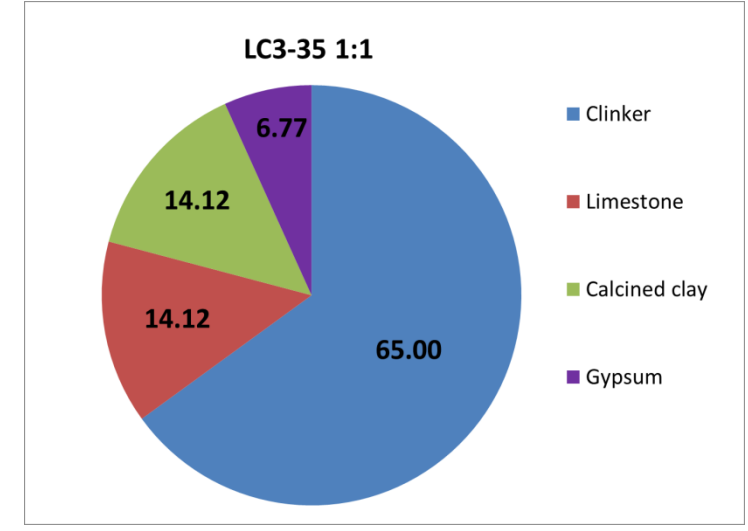
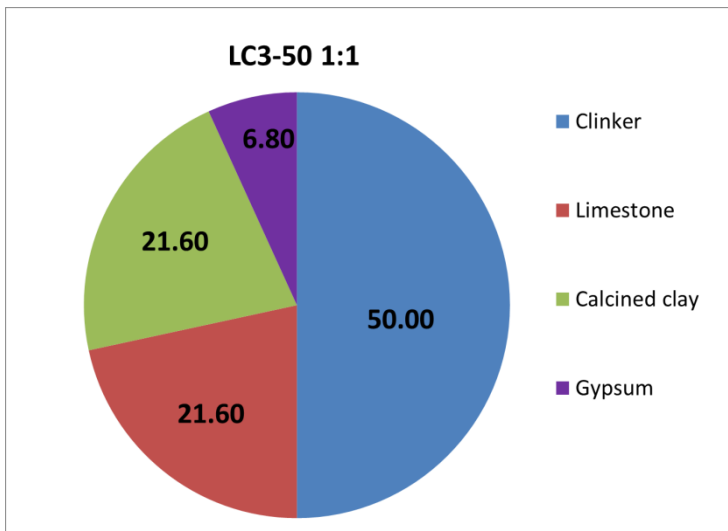
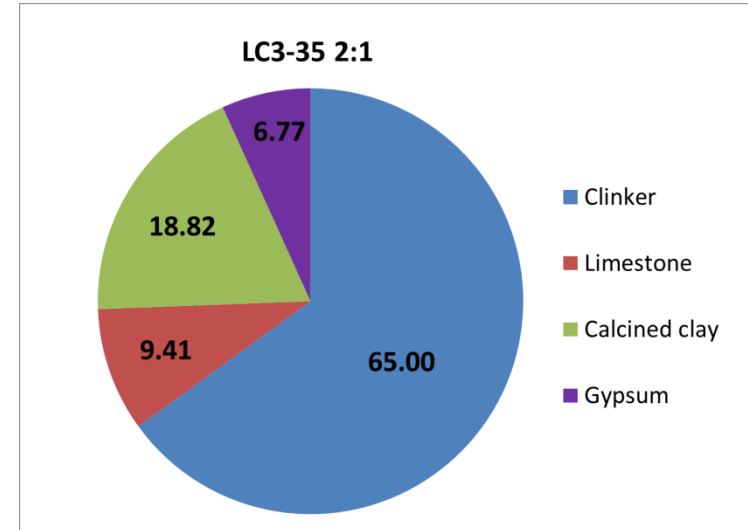
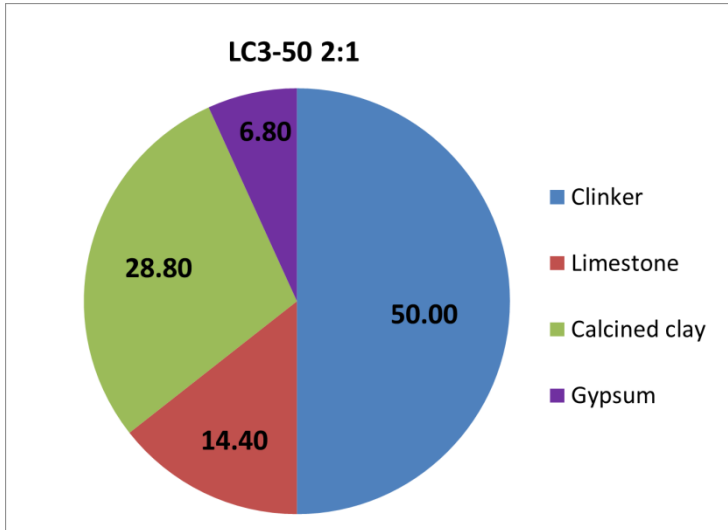
Thailand – open, only strength performance, but no tradition of blended cements – clinker factor ~ 1

EU standard widely used in many countries – allows LC³ 65

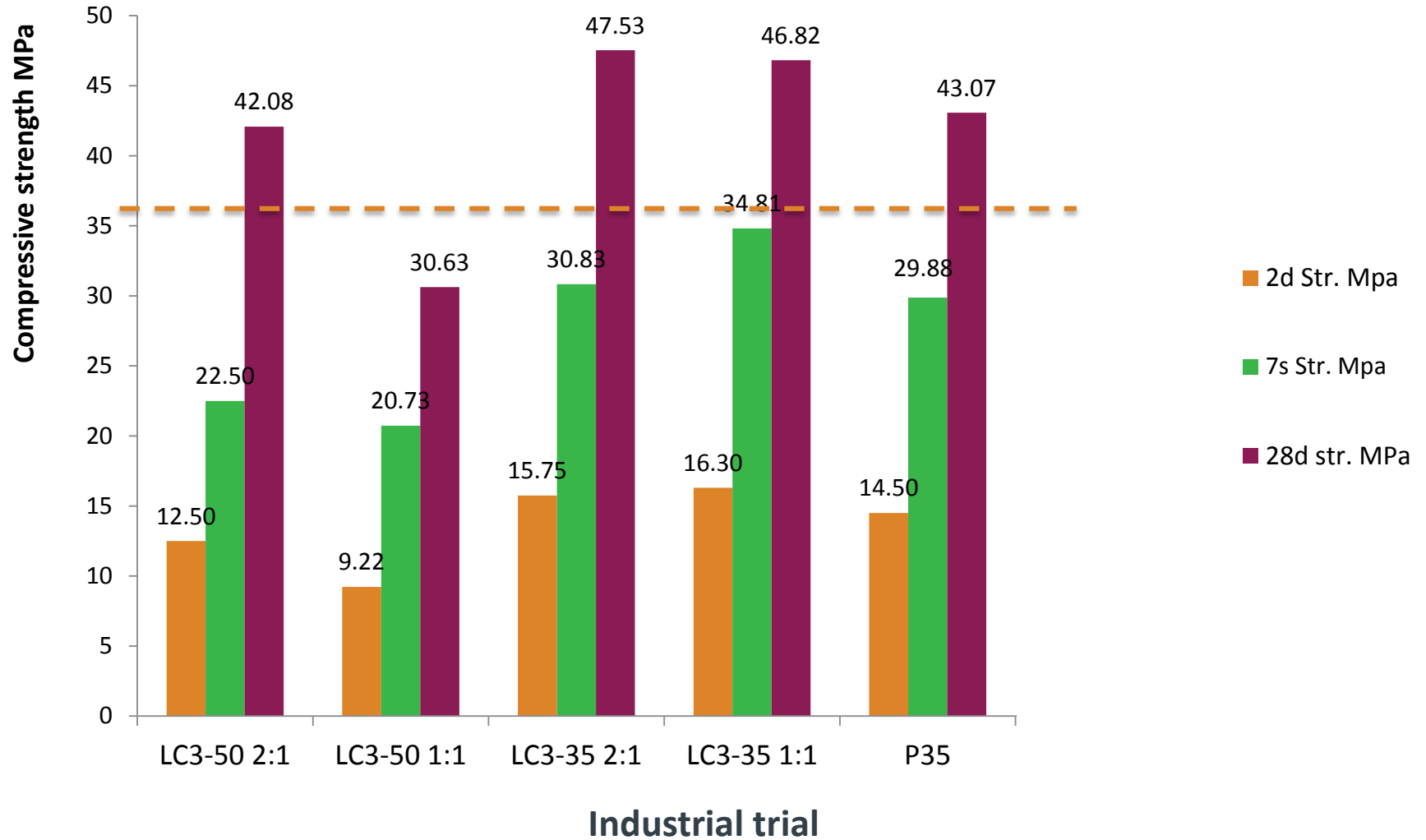
ASTM C595 – clinker factor down to 0.3 up to 15% limestone

Cuba – on track for standardisation by end 2016

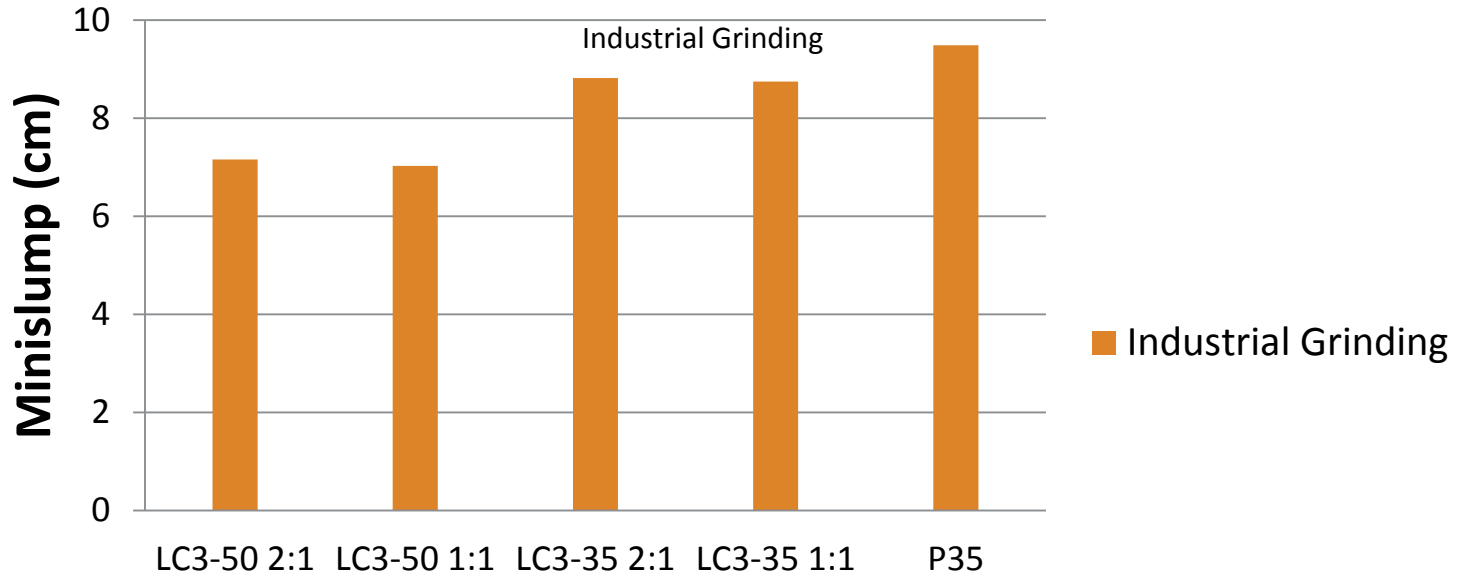
Family of cements



Strengths



Rheology: industrial grinding



Series		Blaine	Passing 90 μm
P	P-35	3852.16	96
2	LC3-50 2:1	8267.52	95
6	LC3-50 1:1	7118.61	96
8	LC3-35 2:1	4416.23	95
11	LC3-35 1:1	4925.64	96

Conclusions

- » Partners in several countries investing in LC³
- » LC³ a family of products:
LC³ 50 is the most eco-efficient under study
- » Standard vary widely around the world,
but many possibilities for LC³ now
- » Opportunity for India to lead this important technology