



Mislæg gatnamót í N. Ameríku og hér heima

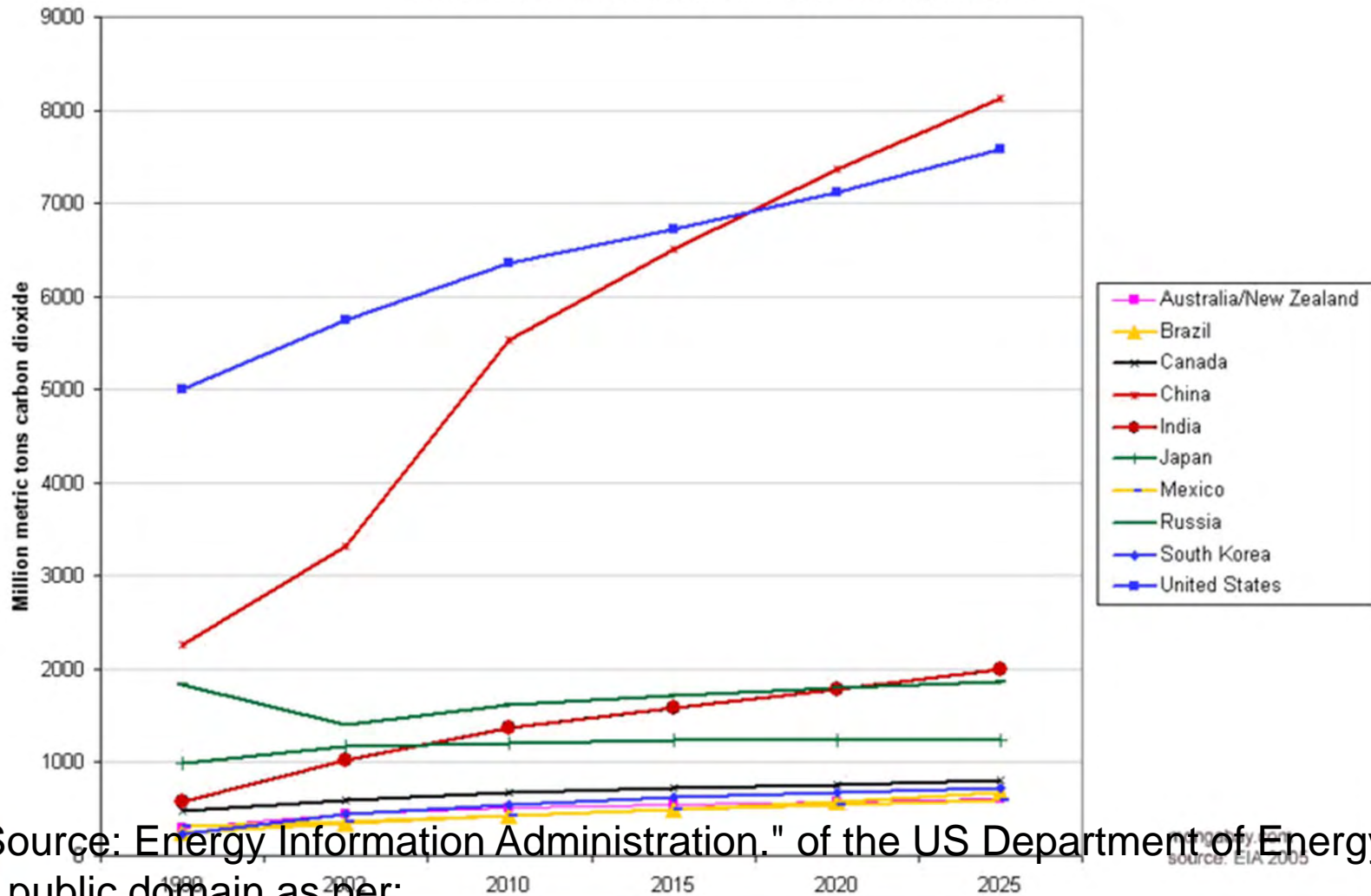


Próf. Ólafur H. Wallevik et al.
Nýsköpunarmiðstöð Íslands og HR
Shrebrooke Háskóli Kanada



IBRI
Rheocenter

World Carbon Dioxide Emissions by Country, 1990-2025



author: "Source: Energy Information Administration," of the US Department of Energy (DOE); in public domain as per:

http://www.eia.doe.gov/ncic/aboutFIA/copy_right.html

The seven sources of CO₂ from fossil fuel combustion are (with percentage contributions for 2000–2004):^[27]

Solid fuels (e.g., [coal](#)): 35%

Liquid fuels (e.g., [gasoline](#), [fuel oil](#)): 36%

Gaseous fuels (e.g., [natural gas](#)): 20%

[Flaring](#) gas industrially and at wells: <1%

[Cement](#) production: 3%

Non-fuel hydrocarbons: < 1%

The "international [bunkers](#)" of shipping and air transport not included in national inventories: 4%



Heildarúststreymi af mannavöldum, án bindingar 4.234

Útstreymi lofttegunda sem valda gróðurhúsaáhrifum eftir uppruna 1990-2006

	2006
Heildarúststreymi af mannavöldum, án bindingar	4234
Eldsneytisbrennsla, alls	2.008
Iðnaður og byggingastarfsemi	408
Vegasamgöngur	900
Aðrar samgöngur	80
Fiskveiðar	555
Önnur eldsneytisbrennsla	66
Iðnaðarferlar, alls	1.341
Málmiðnaður	1.210
Annar iðnaður	132
Efnanotkun	9
Landbúnaður	512
Jarðhitavirkjanir	156
Úrgangur	207
Millilandaflug	394
Millilandasiglingar	139
	8.117

Útreikningar eru samkvæmt samræmdum alþjóðlegum leiðbeiningum (IPCC).

Útreikningar hafa verið endurskoðaðir frá síðustu útgáfu.





which causes more greenhouse gas emissions, rearing cattle or

led by the United Nations Food and Agriculture Organization, the greenhouse gas emissions as measured in CO2 equivalent – 18 a major source of land and water degradation.

FAO's Livestock Information and Policy Branch and senior author of the most significant contributors to today's most serious climate change. "Action is required to remedy the situation."

are consuming more meat and dairy products every year. Global meat production is set to double from 229 million tonnes in 1999/2001 to 465 million tonnes by 2050. Output is set to climb from 580 to 1043 million tonnes.



Food and Agriculture Organization of the United Nations



The flatulence of cows is only a small portion of cows methane release. Cows also burp methane

due to the physiology of their digestive systems.

The tax would target the release of methane by farm animals, which in New Zealand account for over 50% of the greenhouse gas emissions.

and land use change are included, the livestock sector accounts for 14.5 percent of human-related greenhouse gas emissions, but produces a much larger share of even more. It generates 65 percent of human-related methane, which has a global warming potential (GWP) of CO2. Most of this comes from manure.

18 percent of all human-induced methane (23 times as warming as CO2) is produced by the digestive system of ruminants, and 64 percent of ammonia, a major contributor to acid rain.



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the earth's entire land surface, mostly permanent pasture but also cropland used to producing feed for livestock, the report notes



Innihald

- 🌳 Hæl
- 🌳 Kanada
- 🌳 Boston
- 🌳 Hér heima
- 🌳 Alverk
- 🌳 Má bæta



Sumarið hjá Ólafi H. Wallevik

frá 31. maí til 6 september



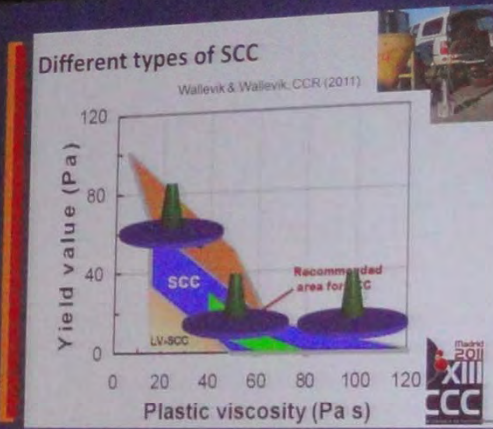


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31. maí 2011



7. júlí 2011







8. ágúst 2011





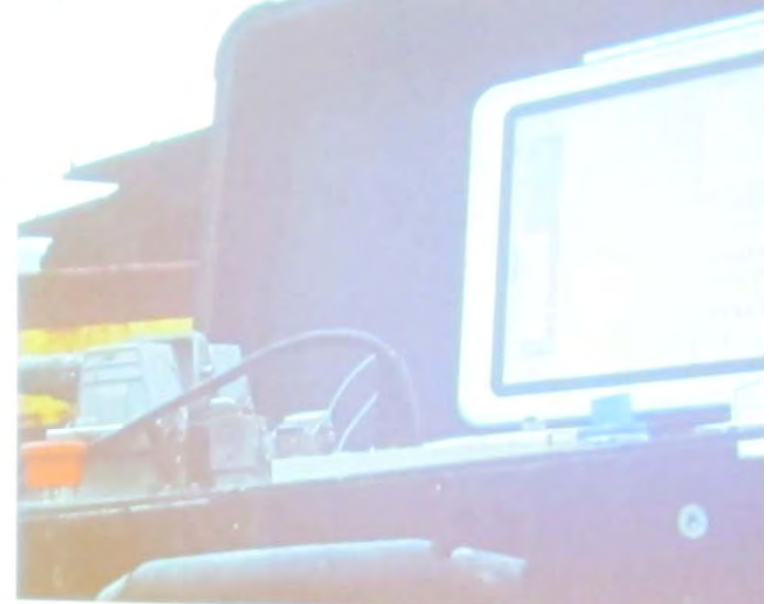
15. ágúst 2011



15. ágúst 2011



Rheometer-4SCC to control
production of HPC (+100)



17. ágúst 2011



17. ágúst 2011



Hong Kong

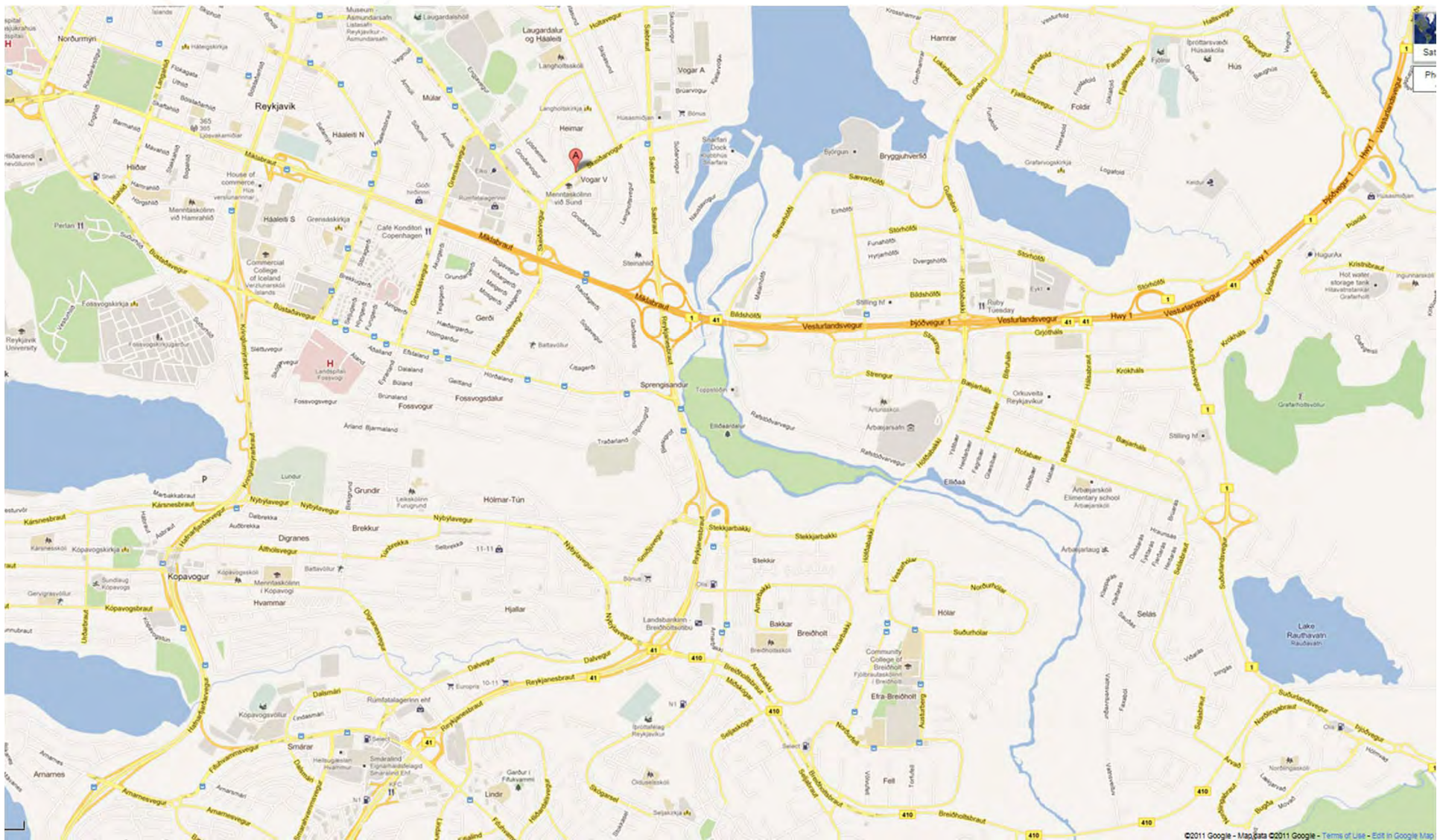
6. september 2011



6. september 2011



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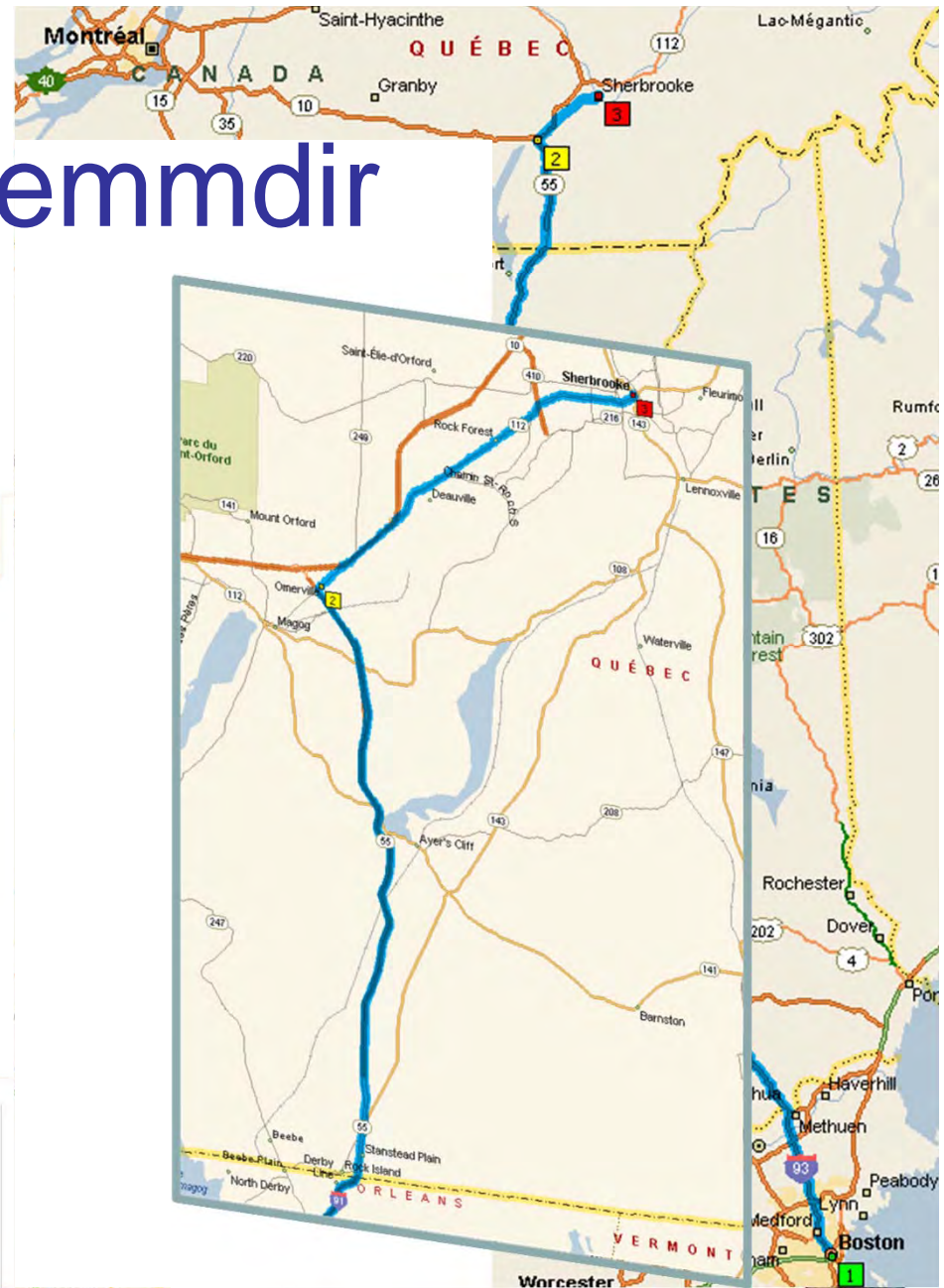
Brúarskemmdir

🌳 Frá Sherbrooke

● Til USA eru 50 km

🌳 Og yfir 15 brýr

● Allar þræl ryðgaðar

































Chemin BENOÎT





















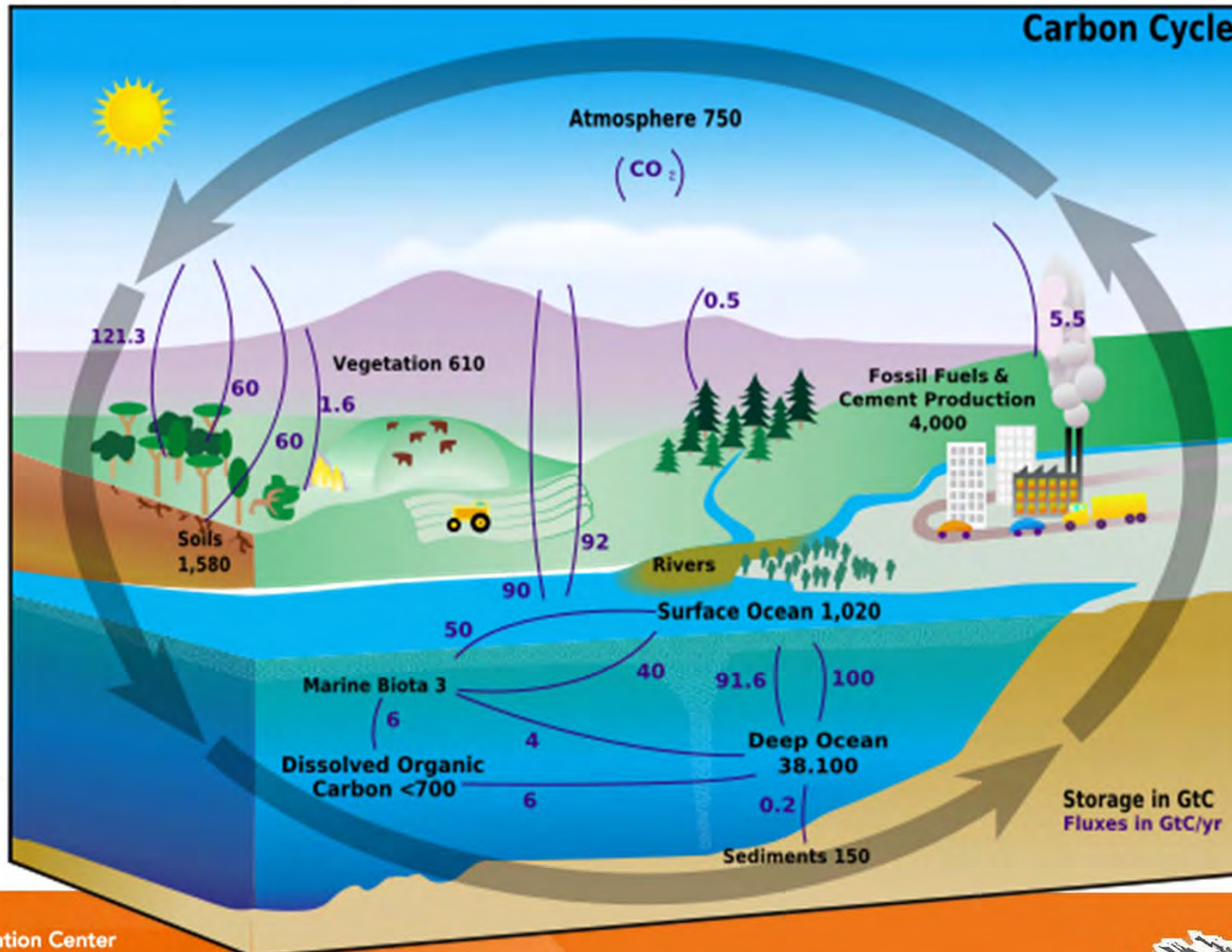




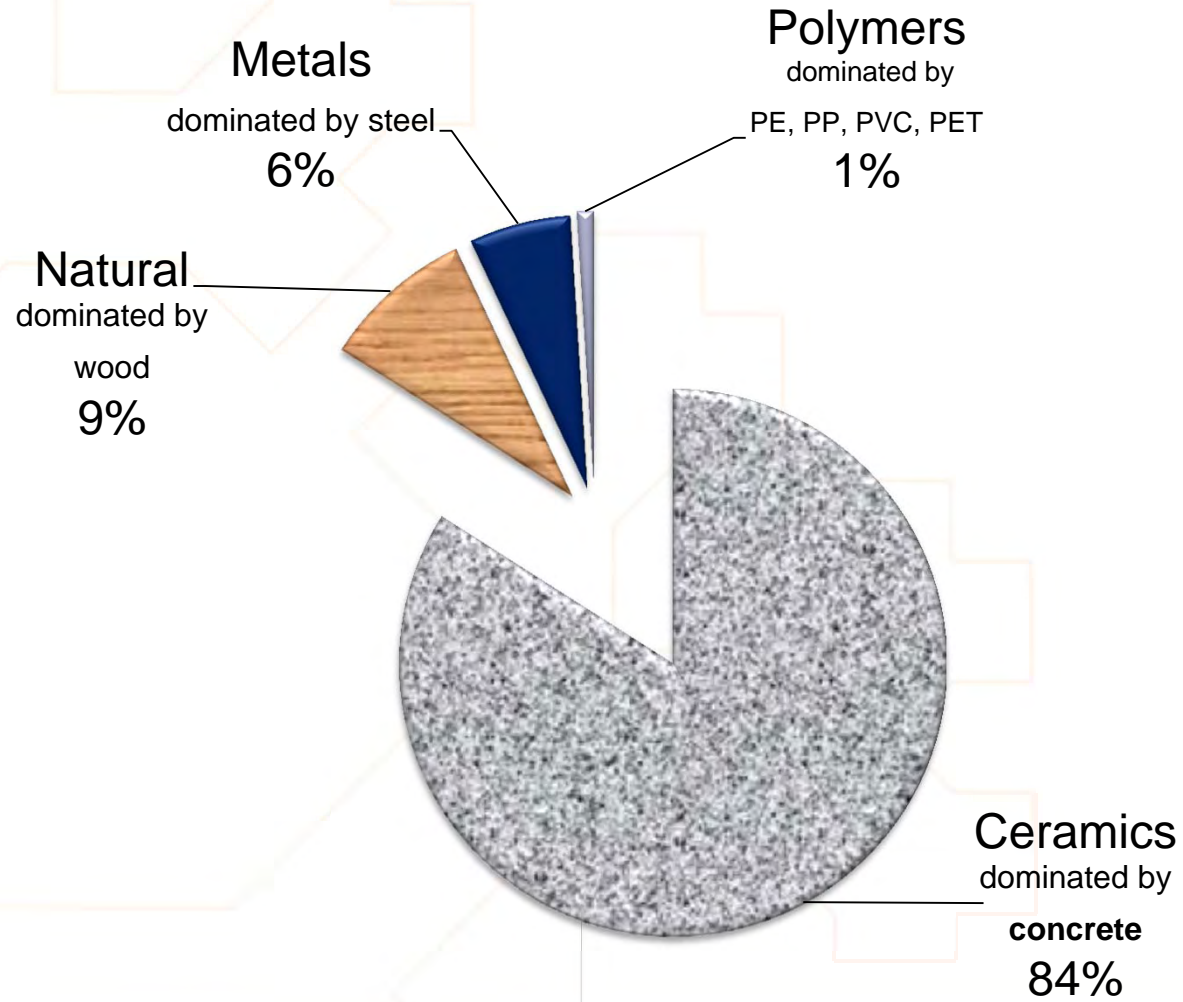
Boston



The worlds impression

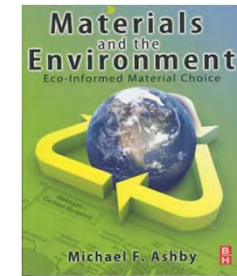


Material use (tonnes) by family



Concrete

CO₂ footprint: ~0,14 kg/kg



Ceramics and glasses 335

plex one. The matrix is gravel ("aggregate") occurs the stiffness and). Concrete is strong in countered by adding steel ("rebar"), often with sur-concrete can carry useful er performance is gained oned before the concrete crete into compression.

se aggregate

1600	kg/m ³
0.062	USD/kg

0.5	GPa
1	MPa
0.5	MPa
	%
1.3	HV
1.84	MPa
0.45	MPa.m ^{1/2}

1230	°C
510	°C
2.4	W/m.K
1050	J/kg.K
13	μstrain/°C

0.8 × 10 ¹³	μohm.cm
2	

Reinforced concrete enables large structures and complex shapes.

Ecoproperties: material

Annual world production	15 × 10 ⁹ – 15.5 × 10 ⁹	tonne/yr
Reserves	~500 × 10 ⁹ – 510 × 10 ⁹	tonne
Embodied energy, primary production	1 – 1.3	MJ/kg
CO ₂ footprint, primary production	0.13 – 0.15	kg/kg
Water usage	*1.7 – 5.1	l/kg
Eco-indicator	3.6 – 4	millipoints/kg

Ecoproperties: processing

Construction energy	*0.0182 – 0.022	MJ/kg
Construction CO ₂	*0.0018 – 0.0022	kg/kg

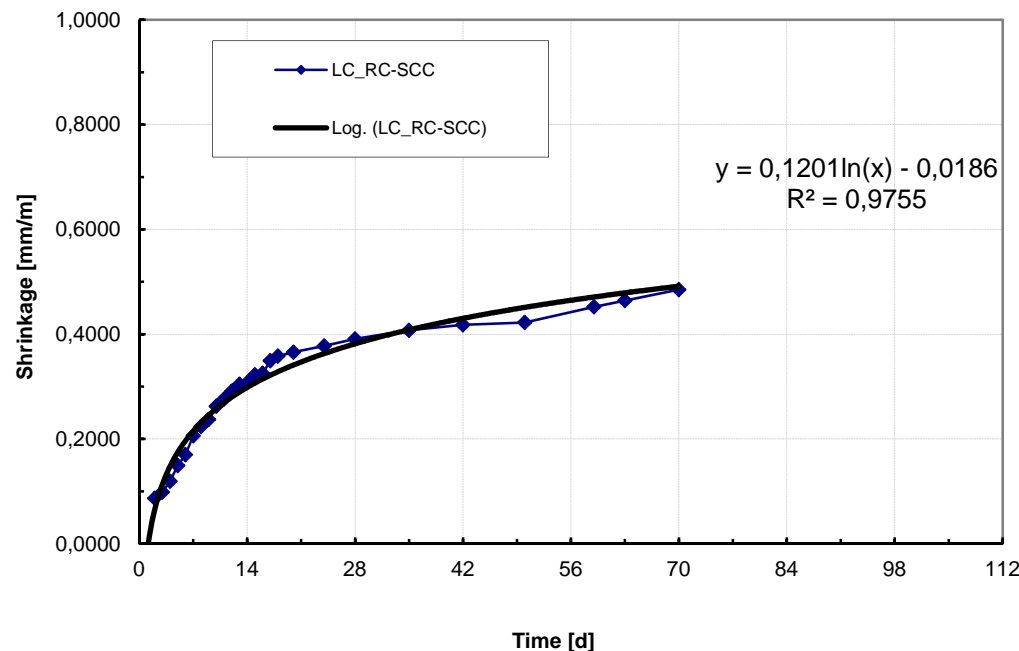
Recycling

Embodied energy, recycling	0.015 – 0.018	MJ/kg
CO ₂ footprint, recycling	0.063 – 0.07	kg/kg
Recycle fraction in current supply	12.5 – 15	%

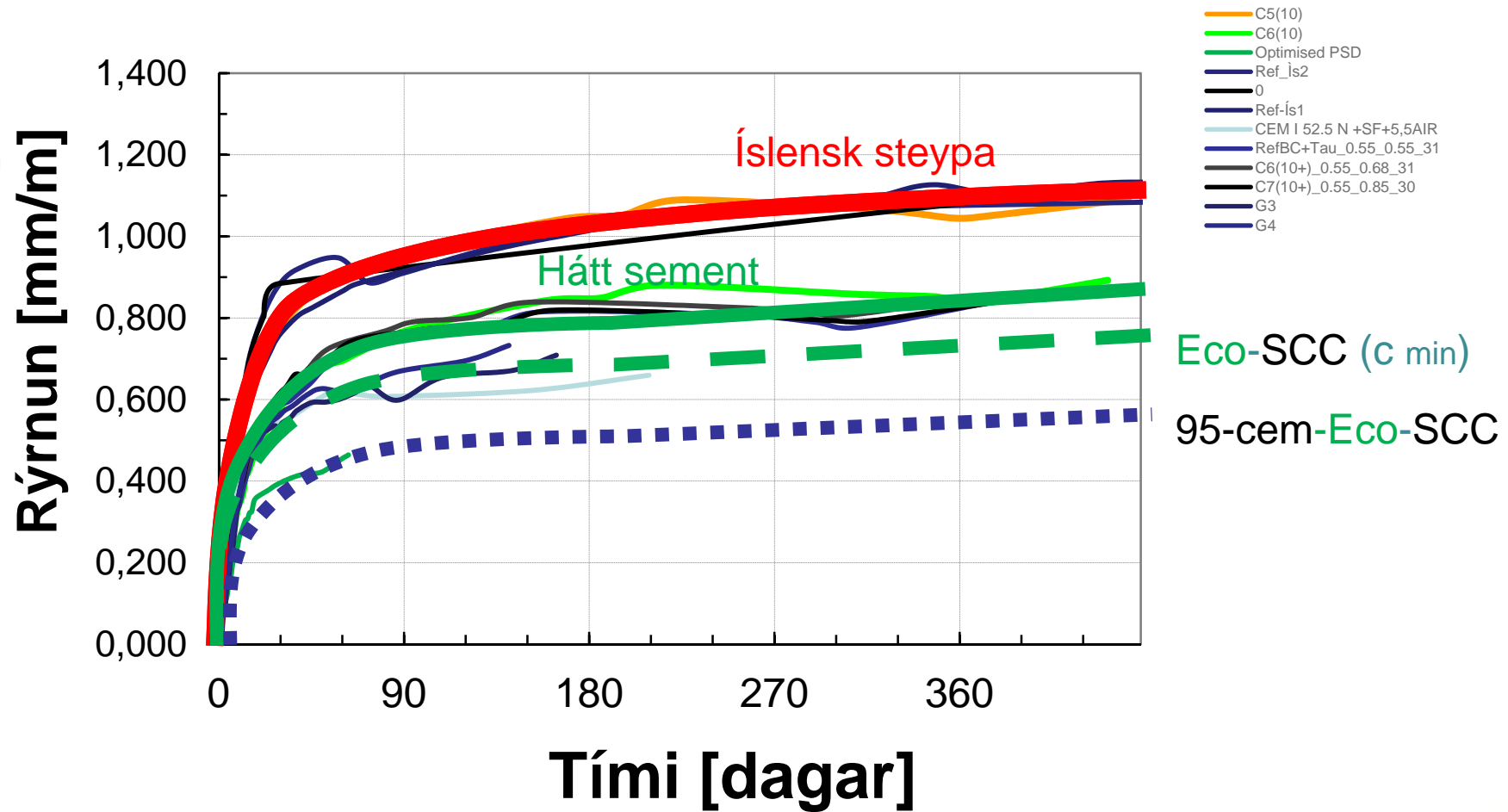


Total shrinkage on beams (ASTM C157)

- Reduction of “cement paste” reduces total shrinkage strain, relative to other mixes with pure cement



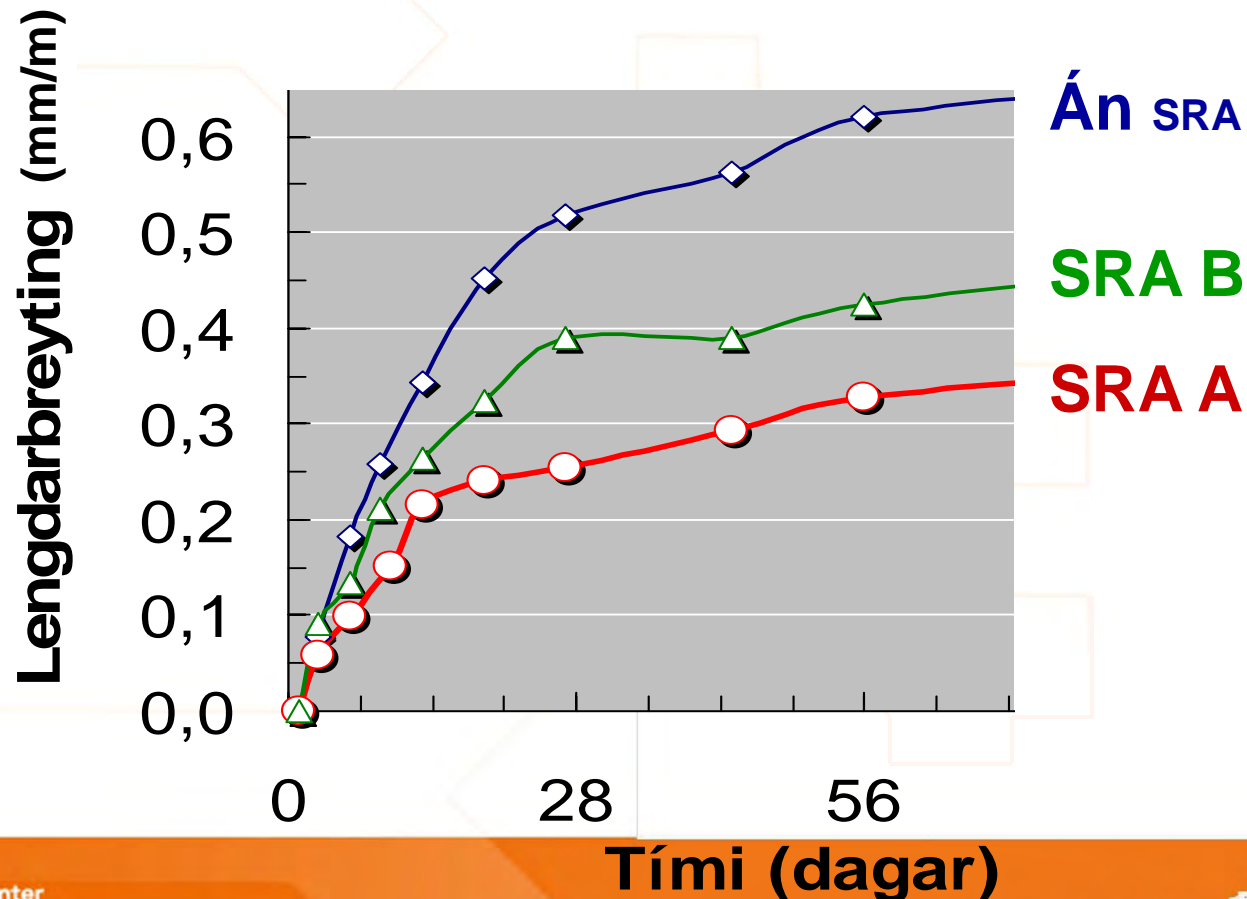
Rýrnun í steinsteypu



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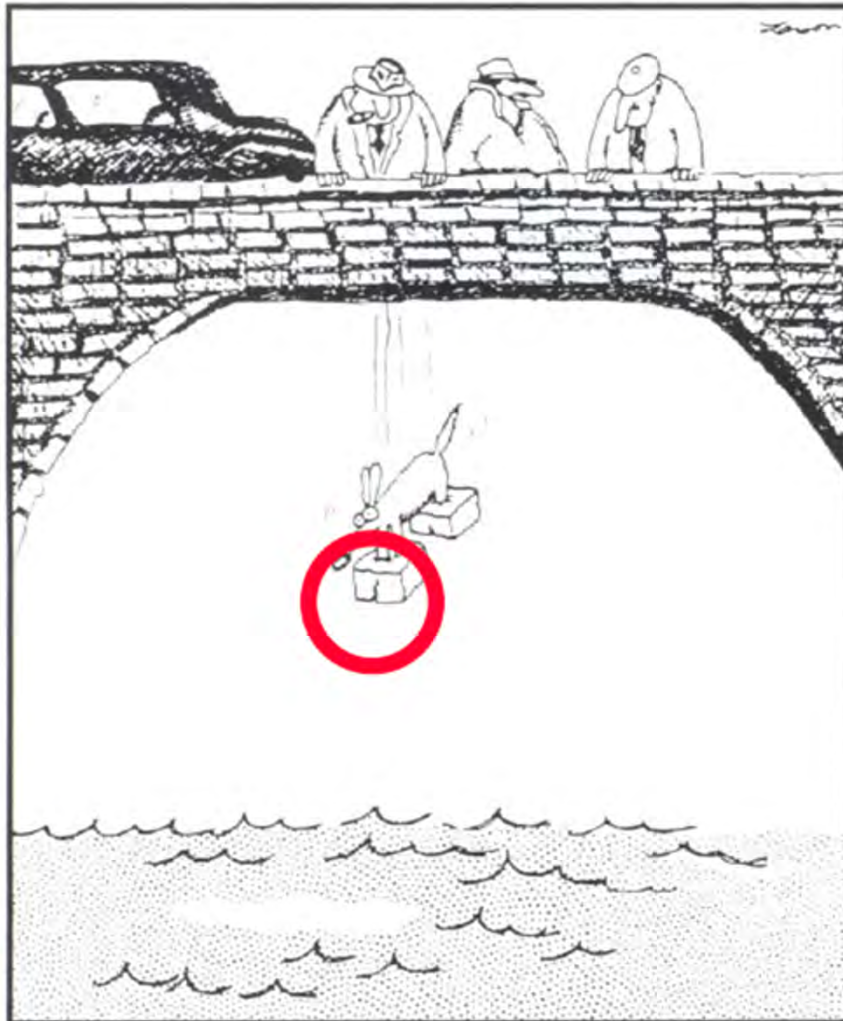
* ~315 til 350 kg/m³; w/b=0,5 - 0,6

Rýrnunarvarar minnka hreyfingar um allt að helming

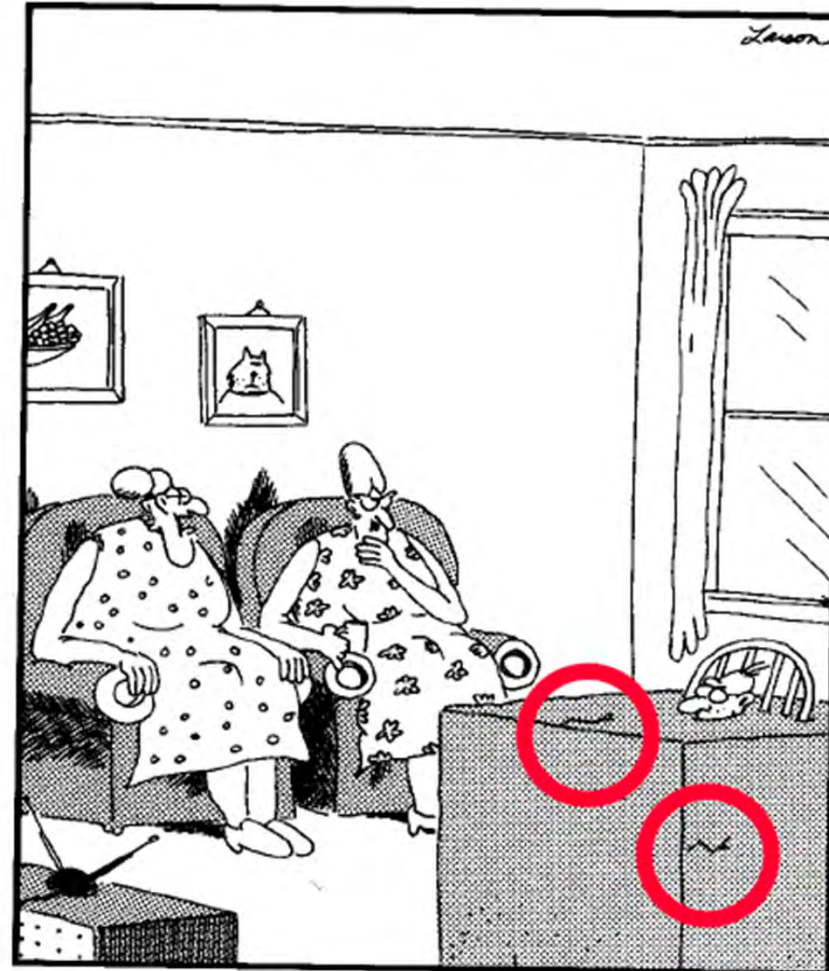


The public opinion about concrete

J. Weiss



"He bit the Godfather."



"I built the forms around him just yesterday afternoon when he fell asleep, and by early evening I was able to mix and pour."

Rósa



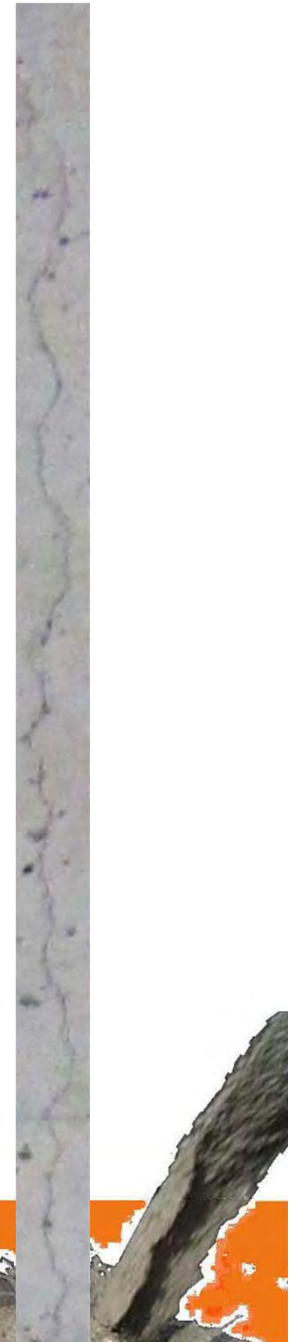
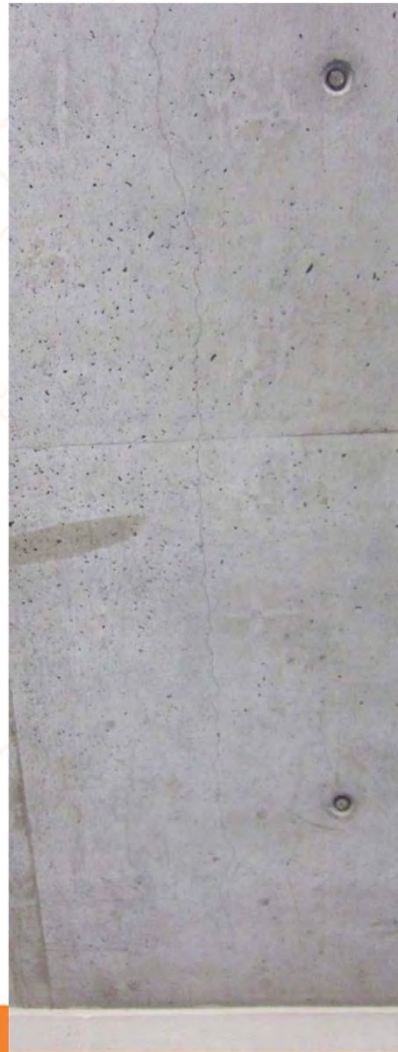
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Gangur



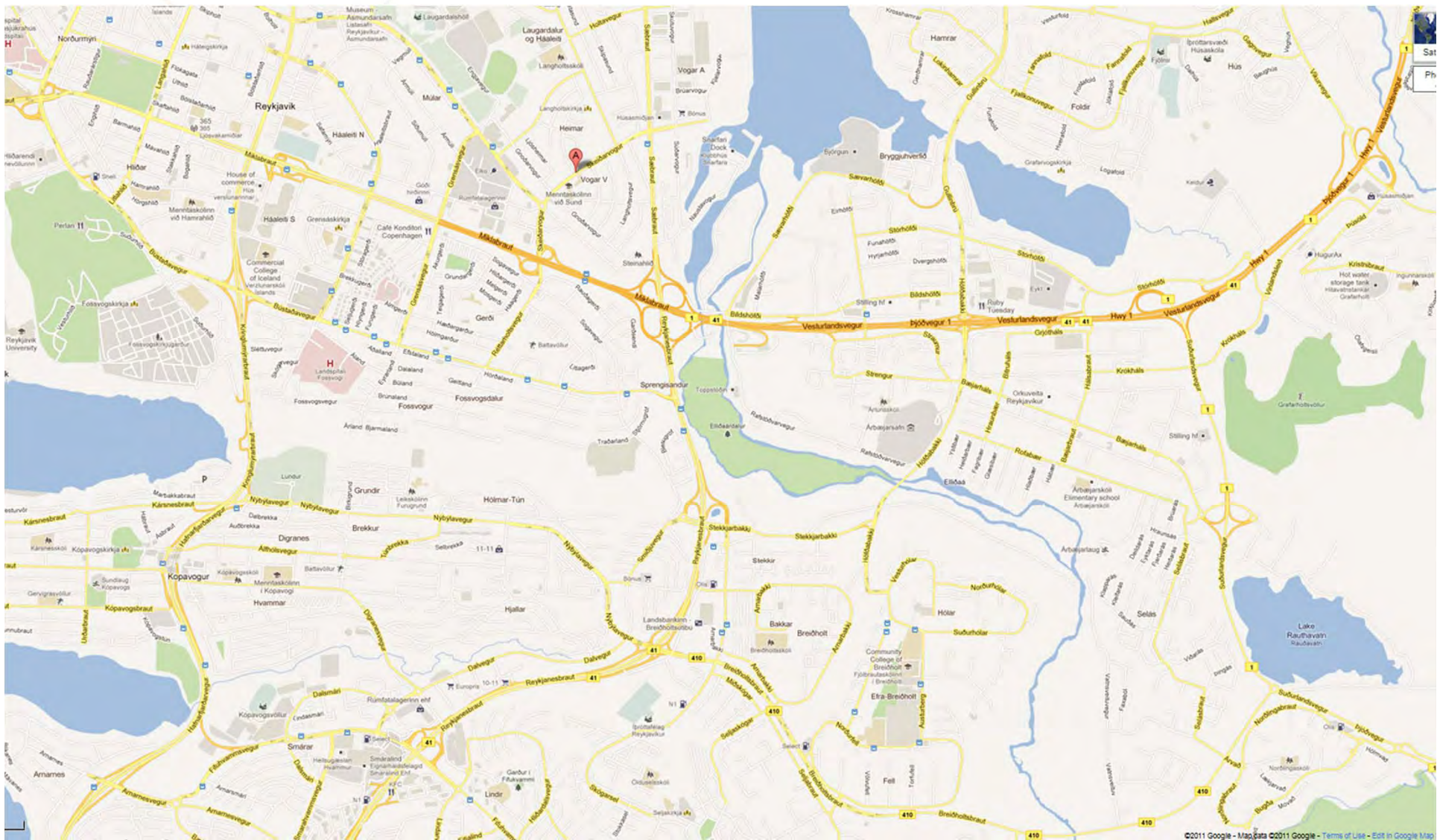
Veggur



Gólf







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Hafnafjarðarvegur – Arnarnesvegur



Miklubraut - Skeiðarvogur



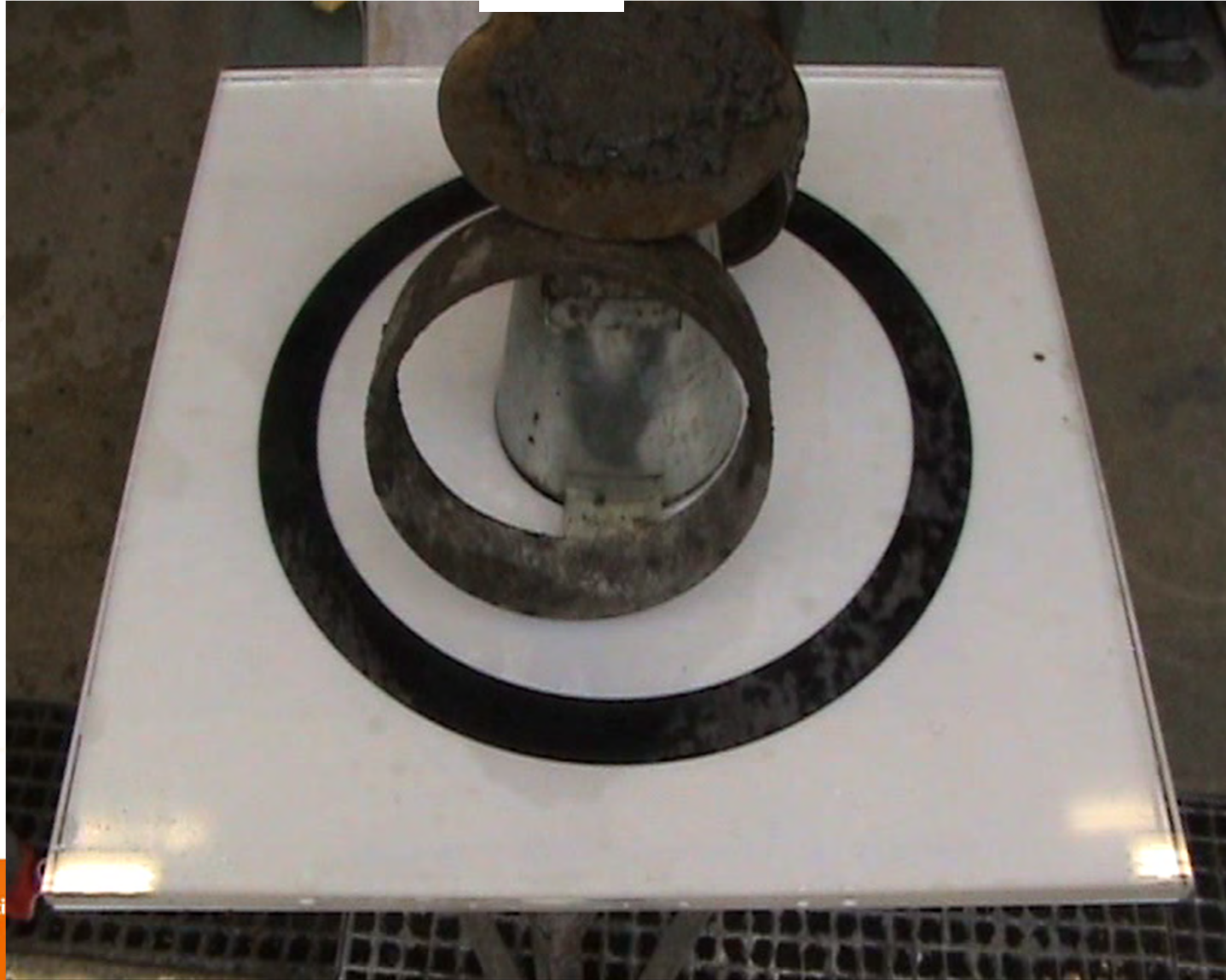
Reykjanesbraut - Breiðholtbraut





Lean Eco-SCC

95 kg/m³ cement + **150** kg/m³ FA + **35** kg/m³ SF



$$E = mc^2$$
$$E = sc^2$$

Umhverfisvæn



**E²
Eco**

Environmental

Economical

concrete

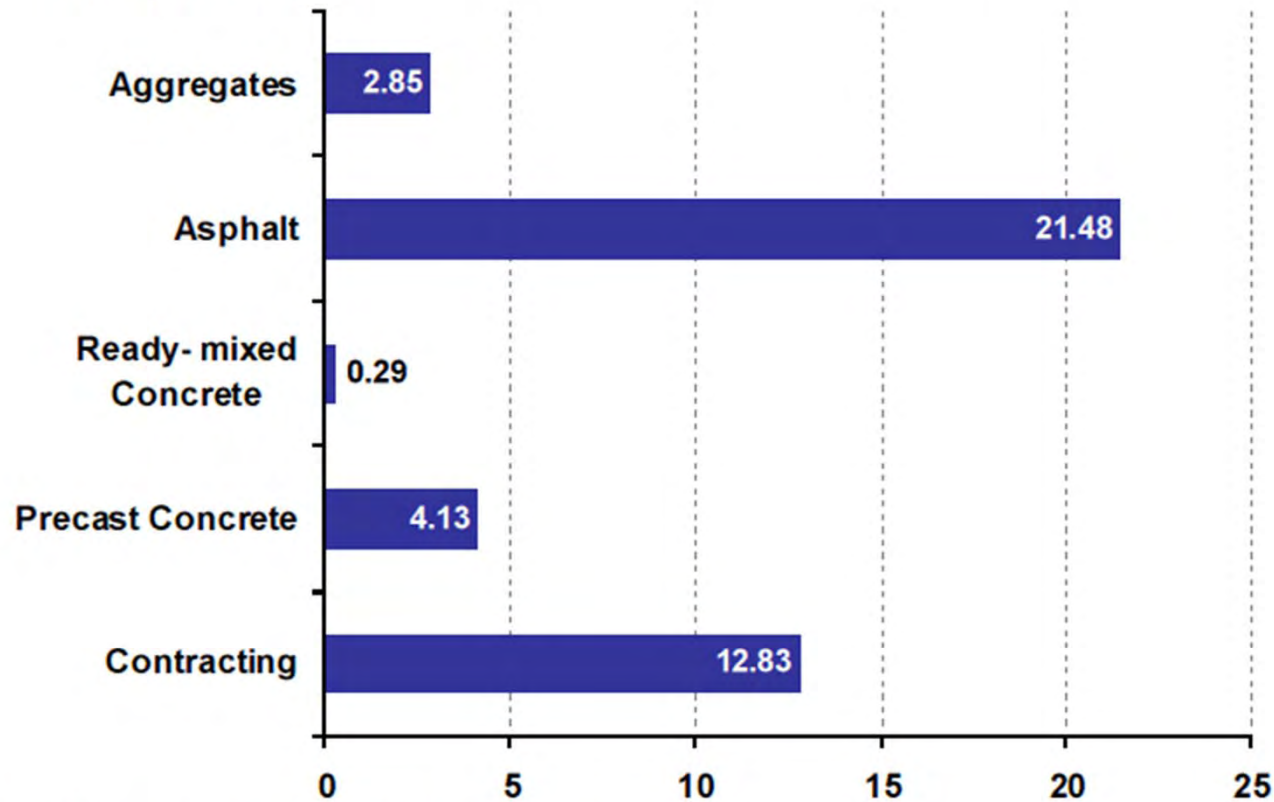
obtention



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Asphalt contributes the most Carbon per tonne

- Asphalt production is a hot process and consumes energy to dry and heat aggregates and to maintain the bitumen at the right temperature

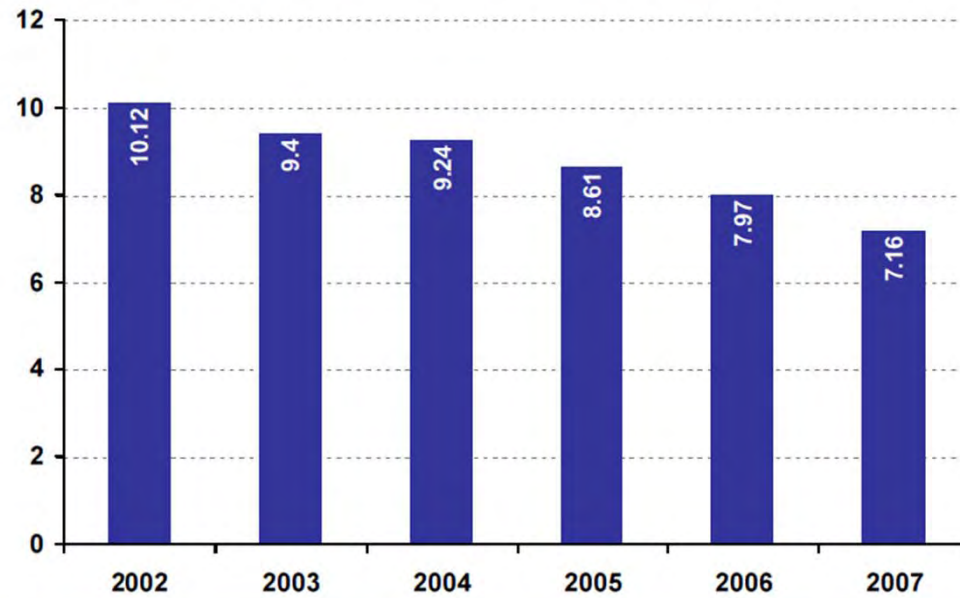


Kg CO₂ per tonne by business activity 2007



Aggregate Industries continues to reduce Carbon year on year

Kg CO₂ per tonne of production
(comprising process energy and product transport and distribution)



A member of the Holcim Group

5



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Industry must not lose focus of the Carbon Issue especially in difficult times.

- Sustainability is an integral part of business development
- So called 'Greenwash' is being challenged
- Changing legislation in relation to Carbon trading
- Simple calculator and tools for materials selection





Alverk '95

8. Brýr og önnur steypd mannvirki 84.4 Steypa

Umhverfisflokkur	2b	4b
Styrkleikaflokkur	C30	C35
Lágmarks sementsmagn	400 kg/m ³	400 kg/m ³
Loftmagn	6 %	6 %
Mesta steinastærð	32 mm	32 mm
Steypuhula	30 mm	50 mm
v/s-tala	0,45	0,40
Yfirborð loftbóla	25 mm-1	25 mm-1
Fjarlægðarstuðull	< 0,2	< 0,2
Frostþol (SS 137244)	Flögnun eftir 28 frostþíðuumferðir skal vera undir 0,5 kg/m ² yfirborðs til þess að steypan teljist veðrunarþolin	Flögnun eftir 28 frostþíðuumferðir skal vera undir 0,5 kg/m ² yfirborðs til þess að steypan teljist veðrunarþolin



Gott, en það **má** gera mun betur

- 🌳 Hækka í C40
- 🌳 Leifa að minnka sement með „pozzólönnum“
 - En kísilryk má ekki vera minna en 5% af heild
- 🌳 Gera kröfu um **rýrnun**
- 🌳 Gera kröfu um klórleiðni
- 🌳 Gera kröfu um sjálfútleggjandi steinsteypu
 - High Performance Concrete
 - ✓ Ef ekki hægt þá gefa undanþágu

Niðurstaða



Vel gert vegagerð



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Niðurstaða

Vel gert vegagerð

