How much cement can we do without?

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Outline

Introduction

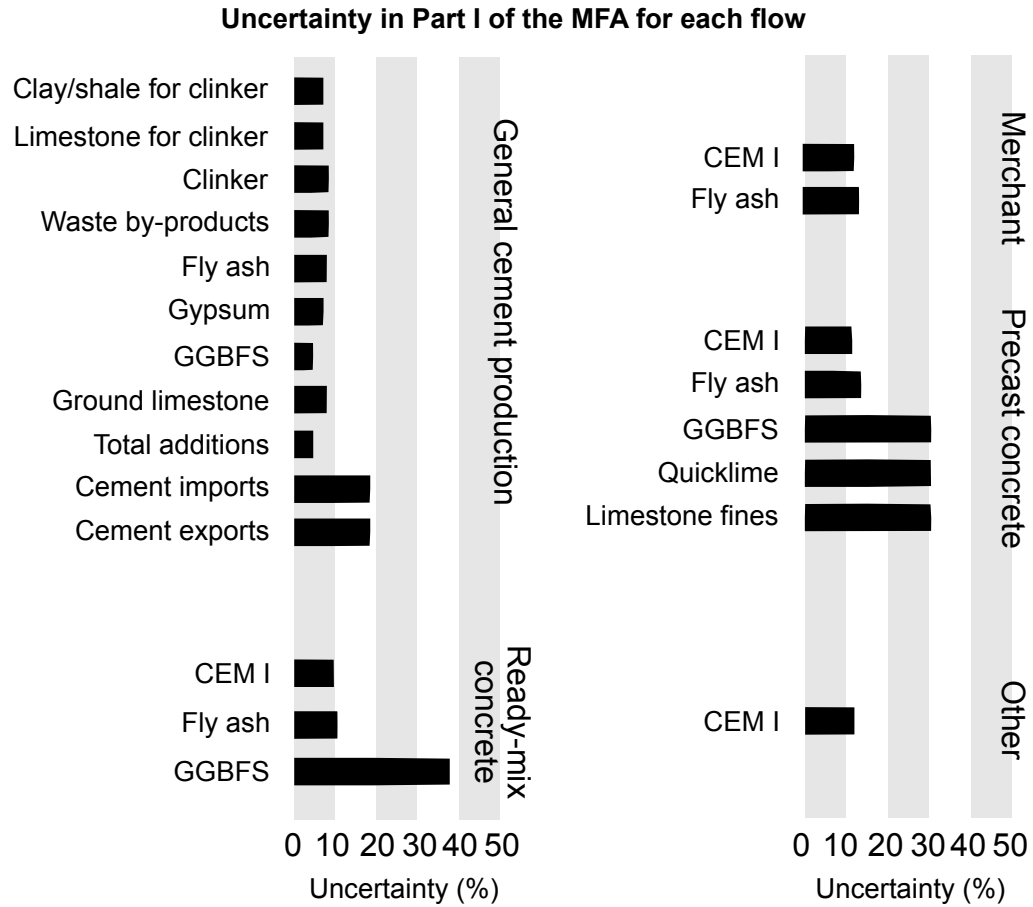
The project

- Mapping material flows
  - From raw materials to cement
  - From cement to applications
- Find out how much abatement potential there is
  - From cement technology improvement
  - From favouring certain design typologies
  - From optimising designs

1. W. Shanks et al. — Res Conc Rec, 2019

How? — *Caveat emptor*

- Published data on production
- Expert interviews
- Modelling, Harmonising, verifying.

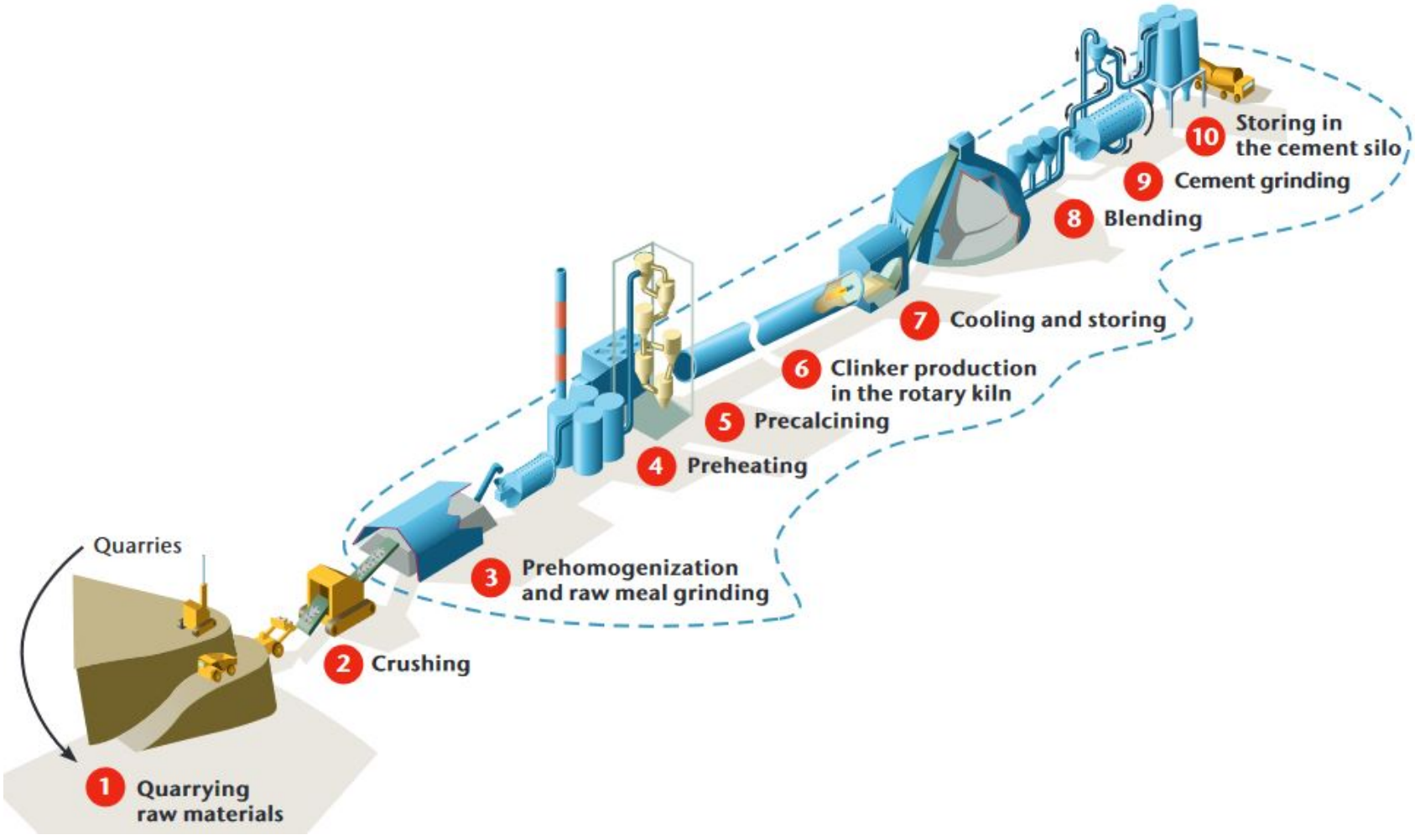


The typical uncertainty is around 8%

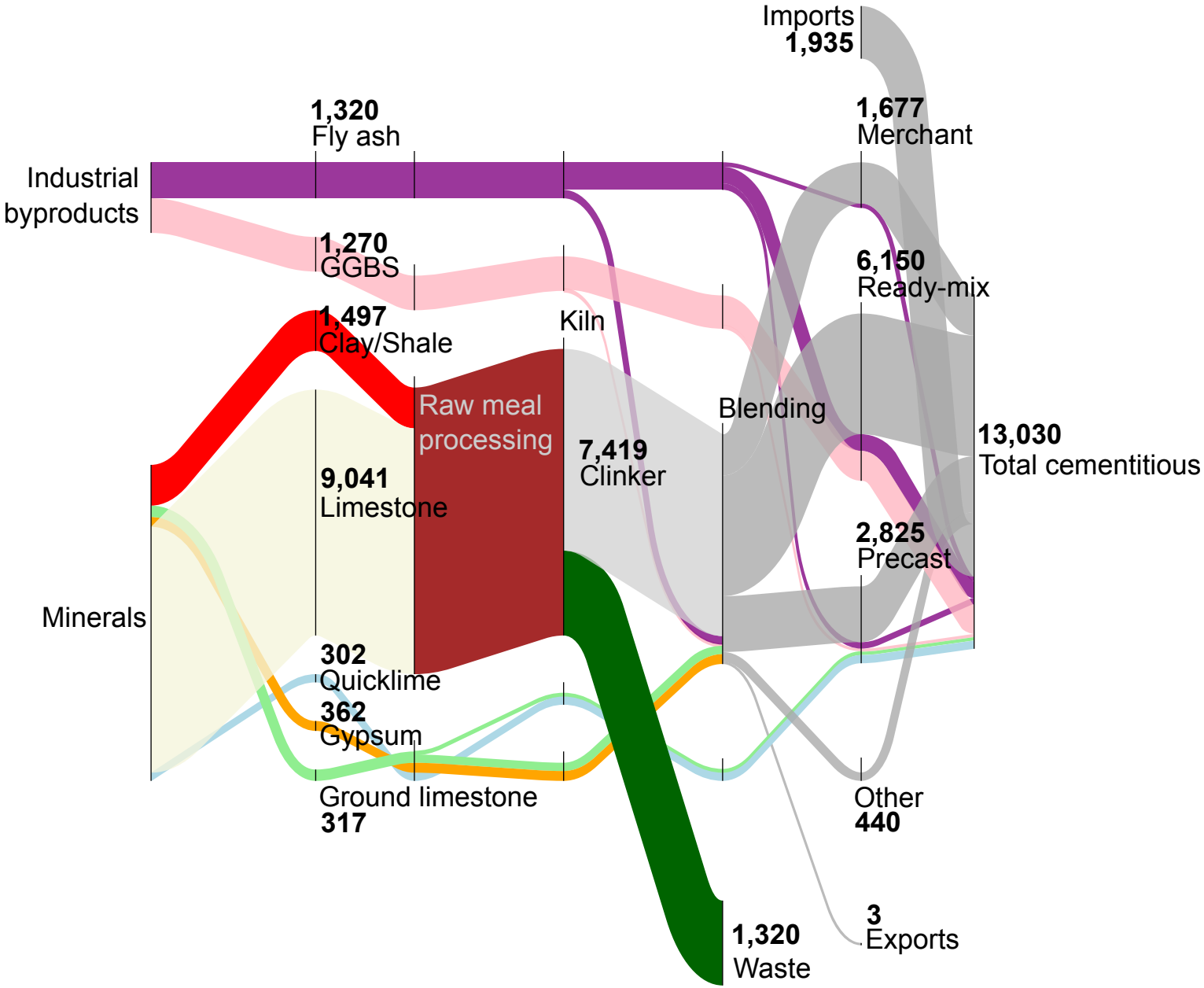
1. W. Shanks et al. — Res Conc Rec, 2019

Material Flows

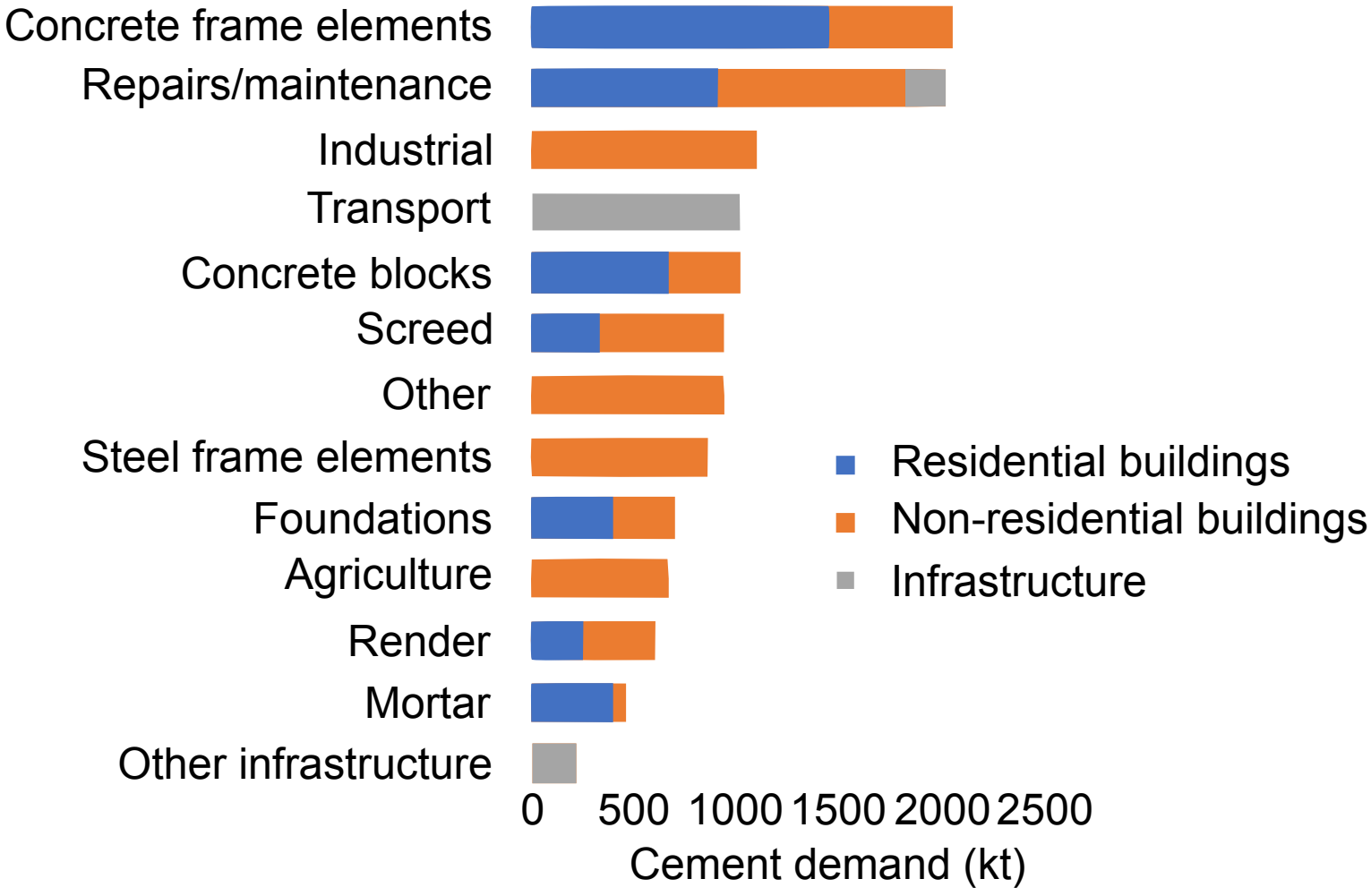
Cement Production



Material flows — Cement Production



Cement End Use



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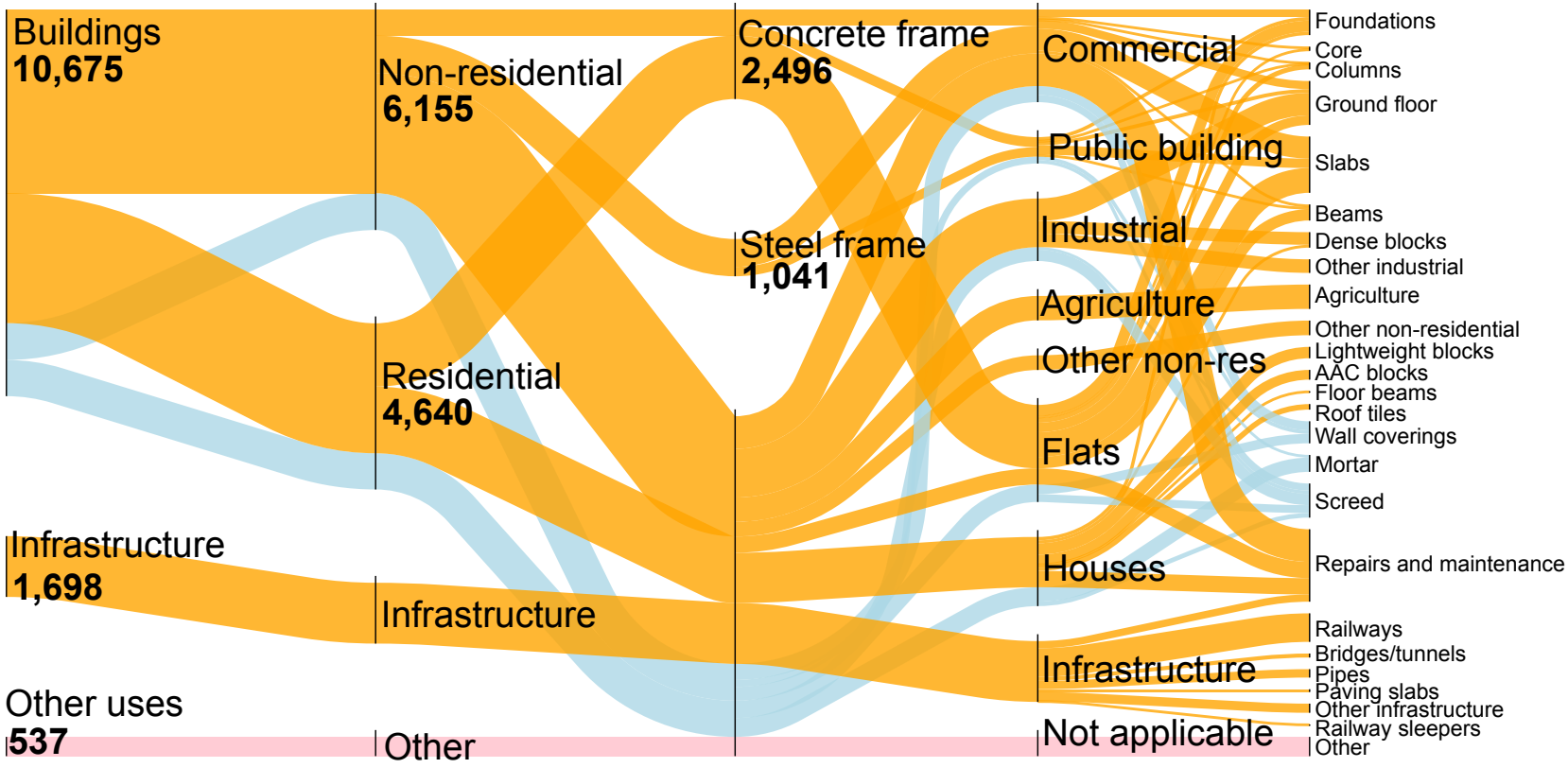

Material Efficiency Measures

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- Material Efficiency Measures chosen to represent a large fraction of the potential
- Cover construction methods, design, materials.
- Because for the first time we have a sufficiently precise material flow map, we can assess the abatement potential
- Abatement attribution depends on the order of method application

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- Calcined Clay + Limestone
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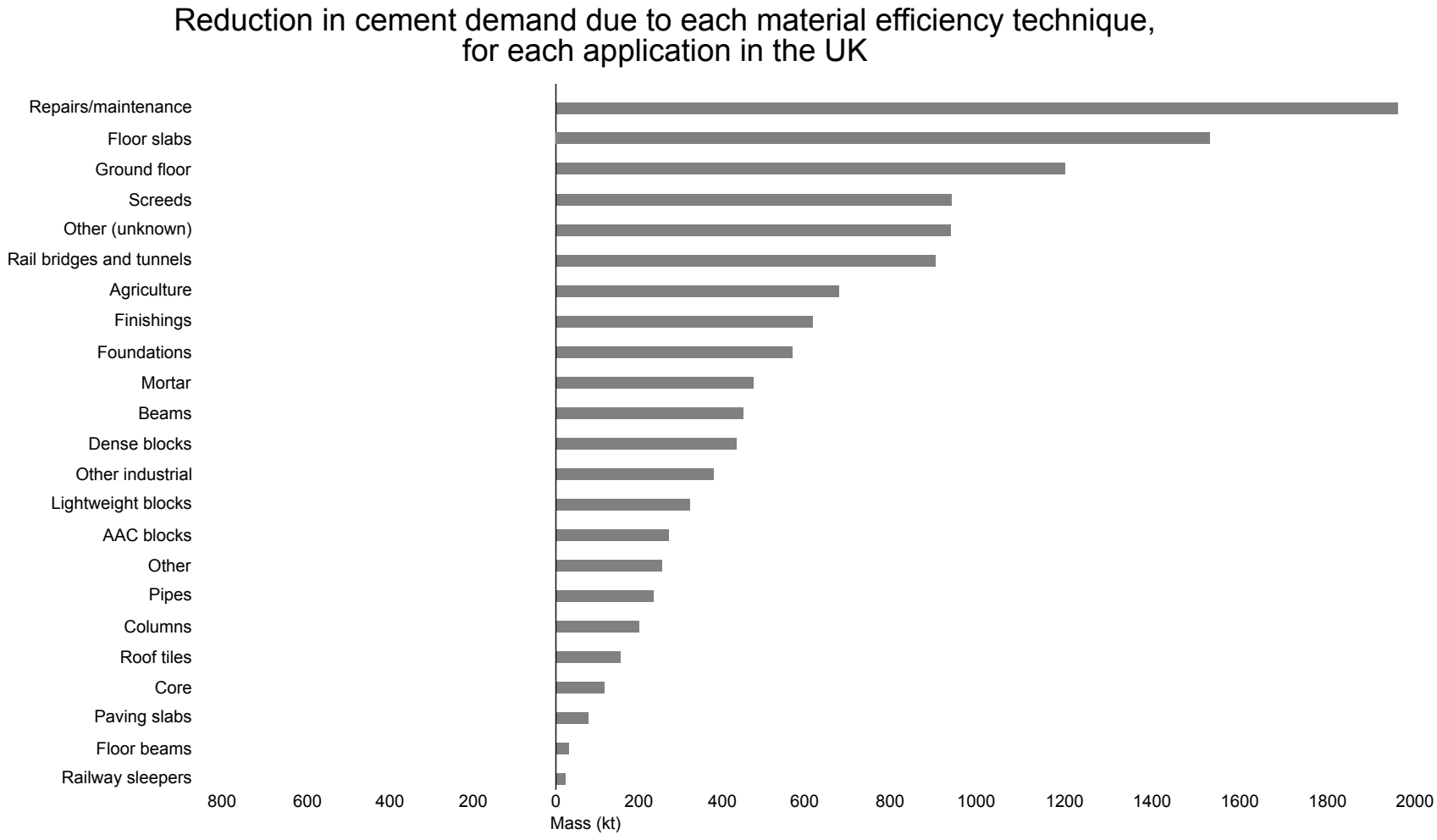
Optimised design	Steel construction 'wastes' about 40% of the material. We estimate that savings of 20% are possible.

Curent and potential use



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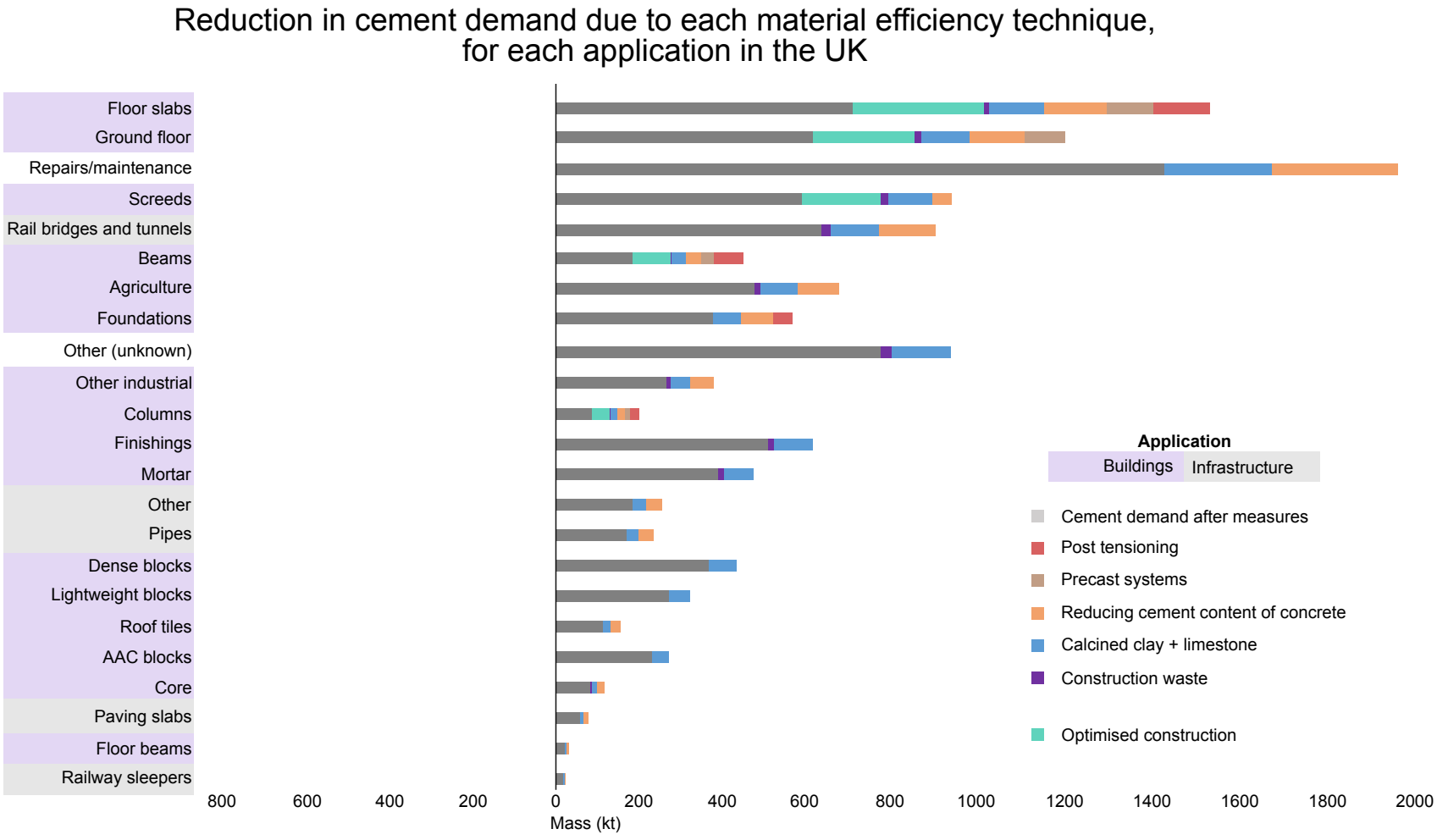

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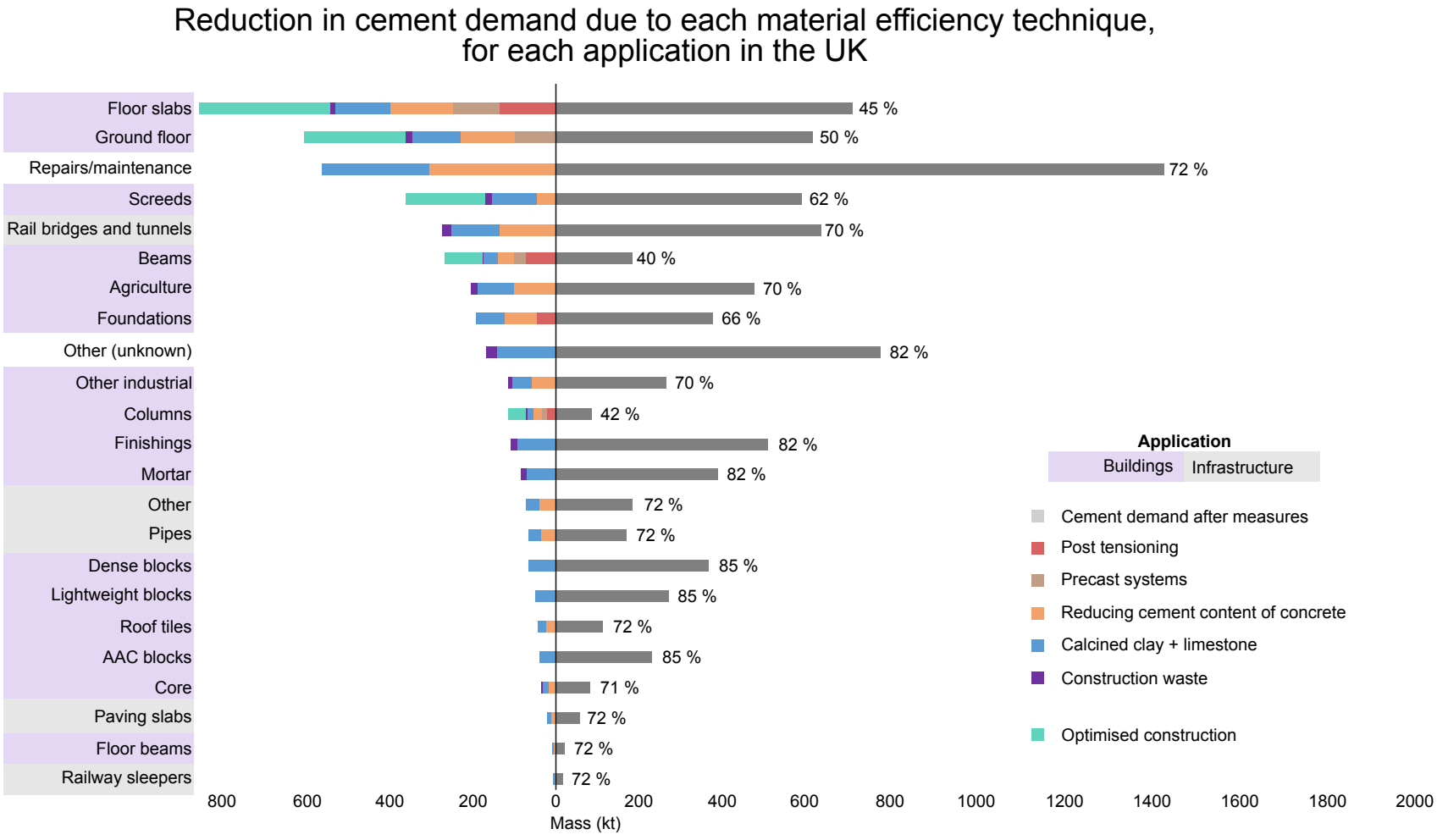

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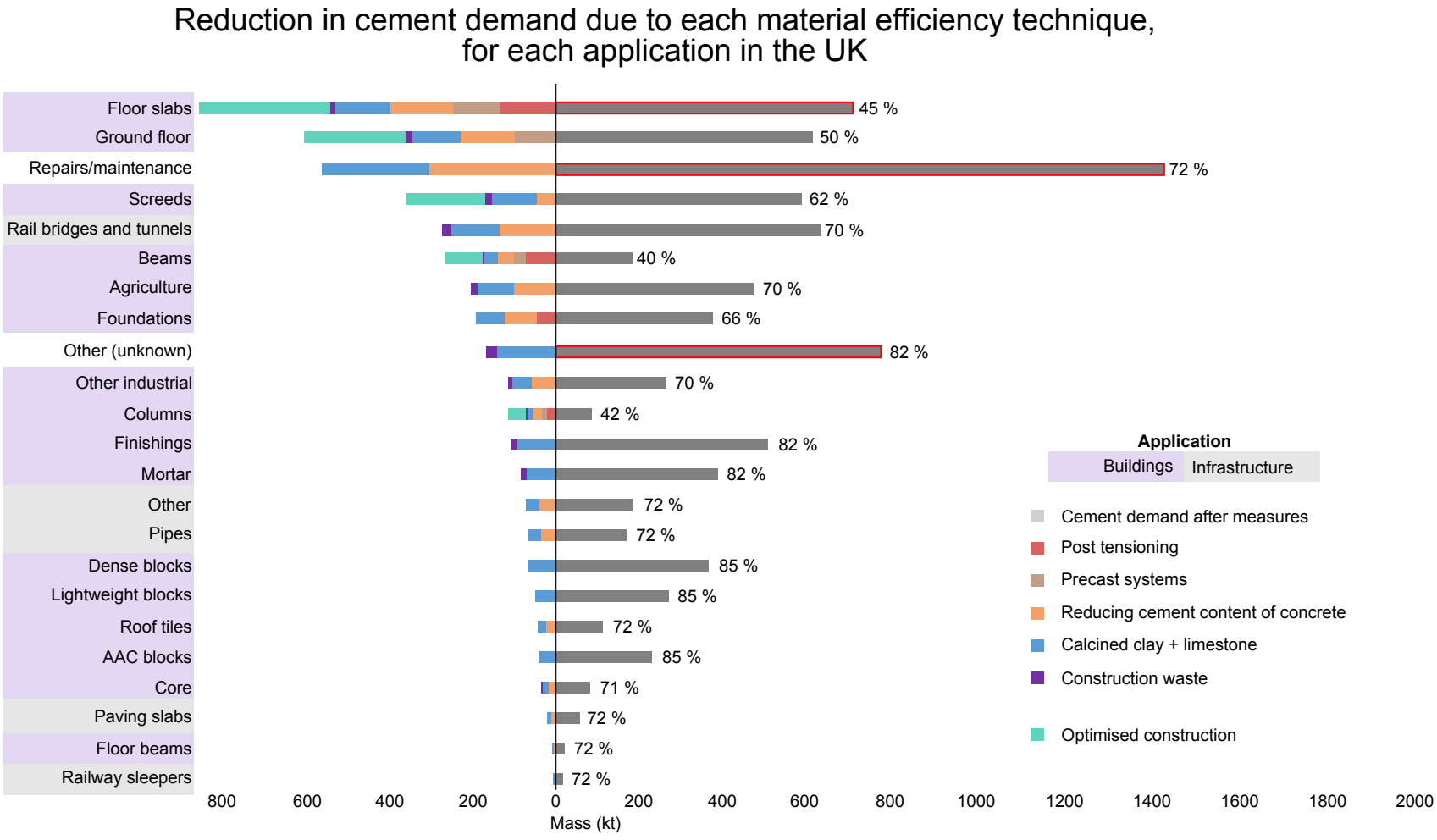
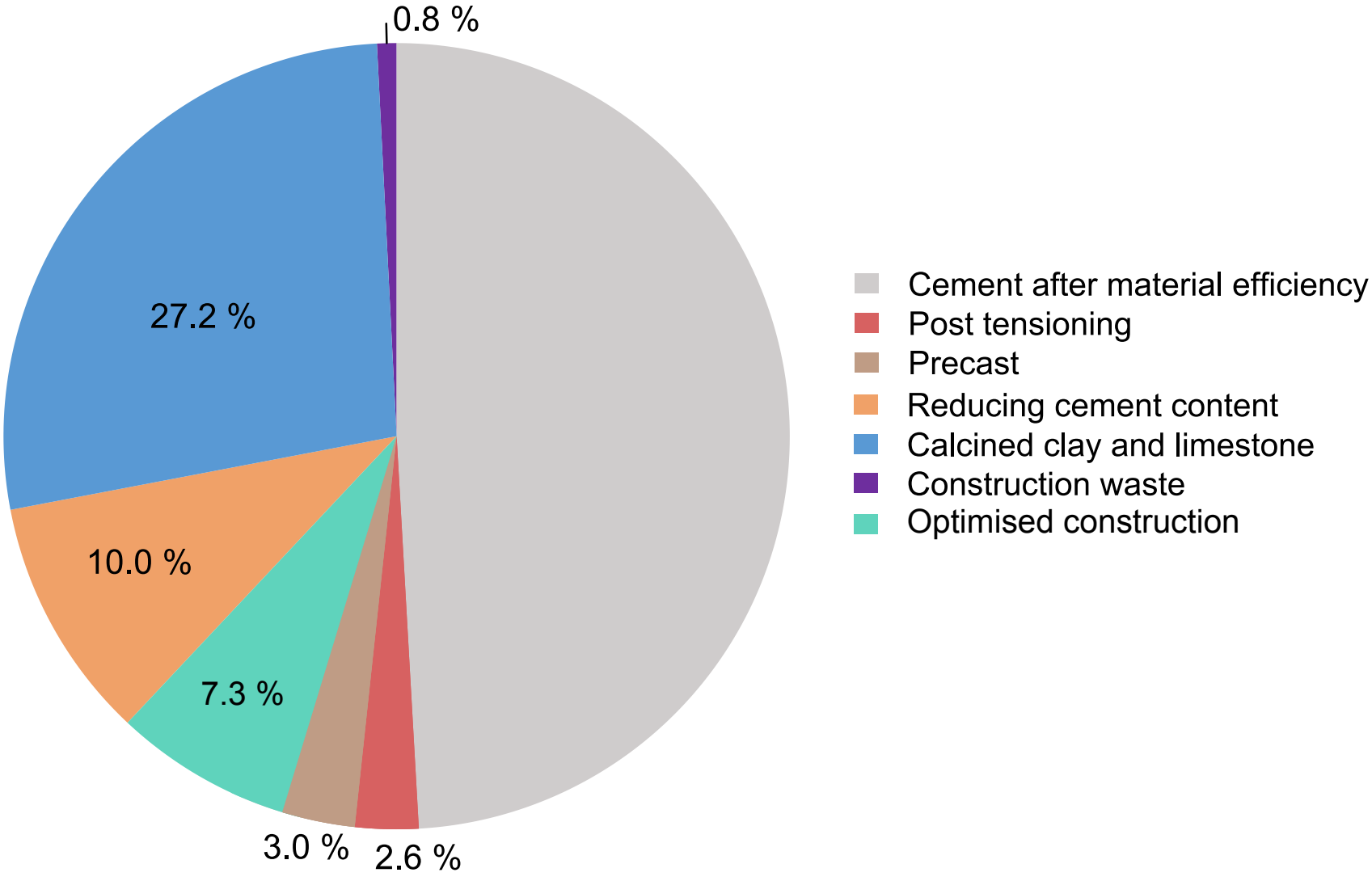


52% of emissions from cement use could be avoided

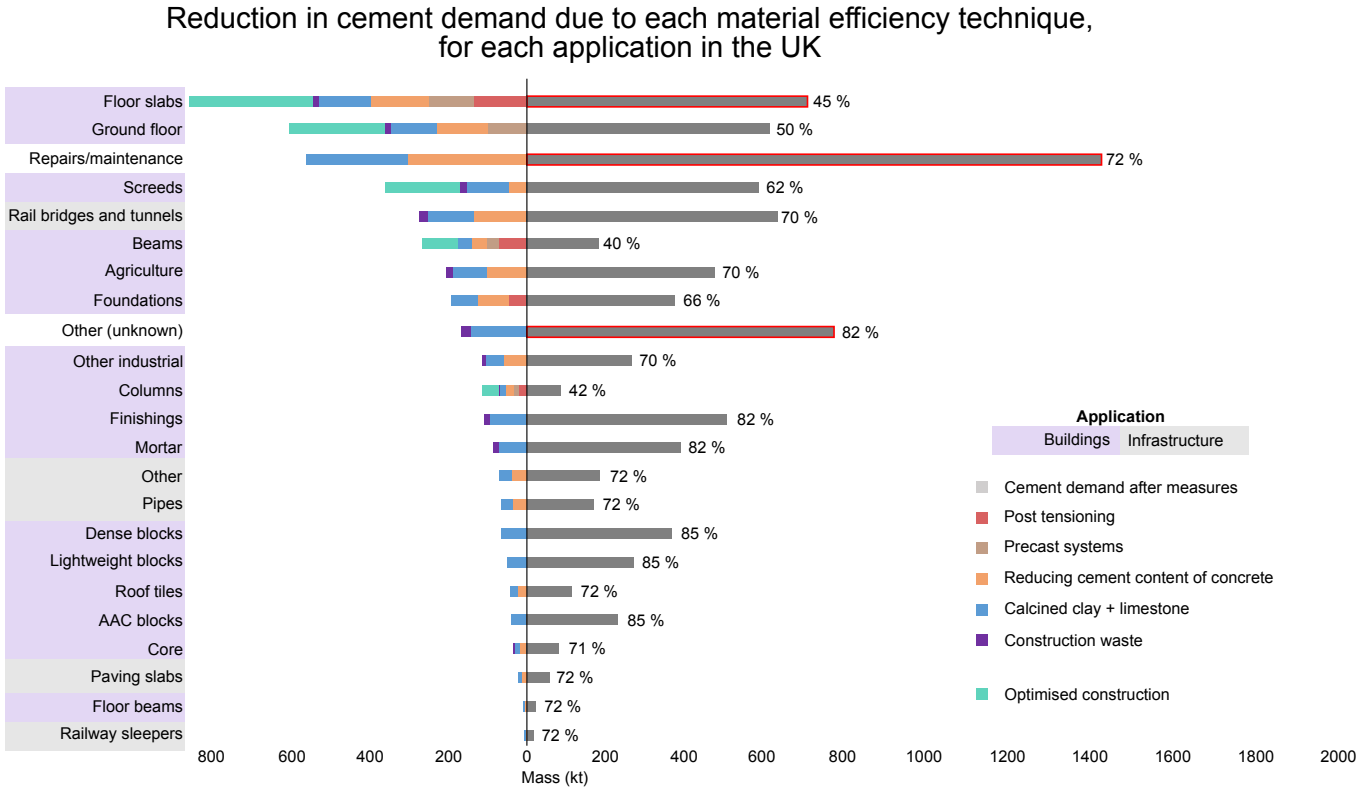
With no change in construction output



Conclusion

Directions for the future

- Why so much repairs?
- Can we design floor slabs better?
- Where is the cement unaccounted for used for?



Thank you