UNIVERSITY OF CAMBRIDGE

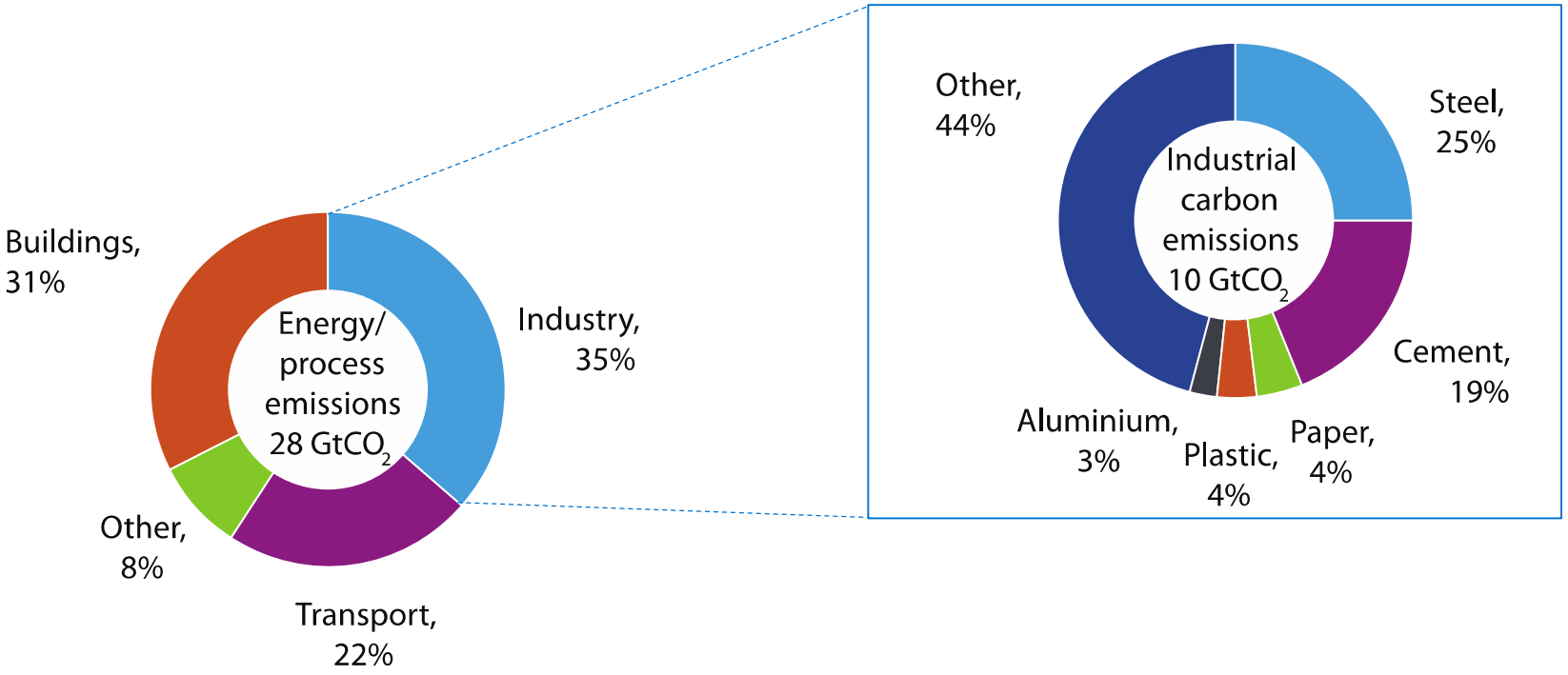
Adding more value to less material

Dr. André Cabrera Serrenho, Research Associate

Prof. Julian Allwood, Professor of Engineering and the Environment

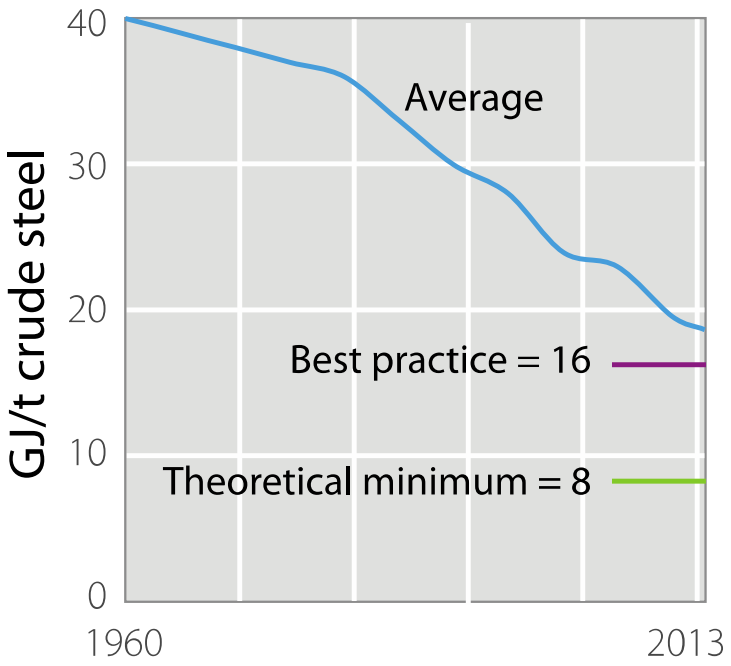
European Parliament, Brussels
25th May 2016

Global CO_2 emissions, 2005



(Allwood, J. et al., Sustainable Materials with Both Eyes Open, 2012)

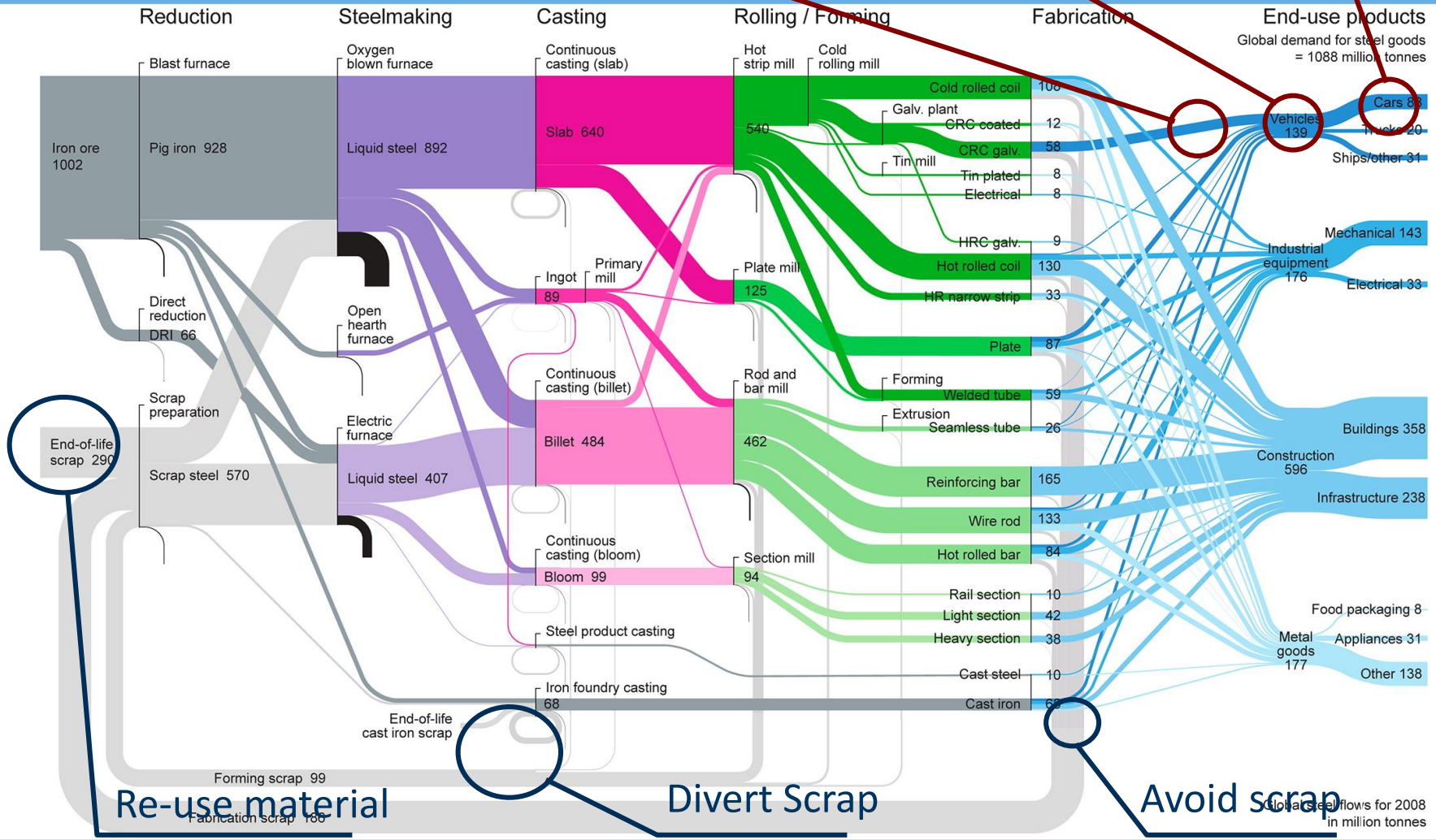
Energy intensity of crude steel production



- The steel industry is the world's **largest industrial source of GHG emissions**;
- There is **no material substitute for steel**;
- Global crude steel **production has grown ~60%** over the last decade;
- Steel making is already a **very efficient** process.

(Allwood, J. et al., Sustainable Materials with Both Eyes Open, 2012)

Global steel flows, 2008



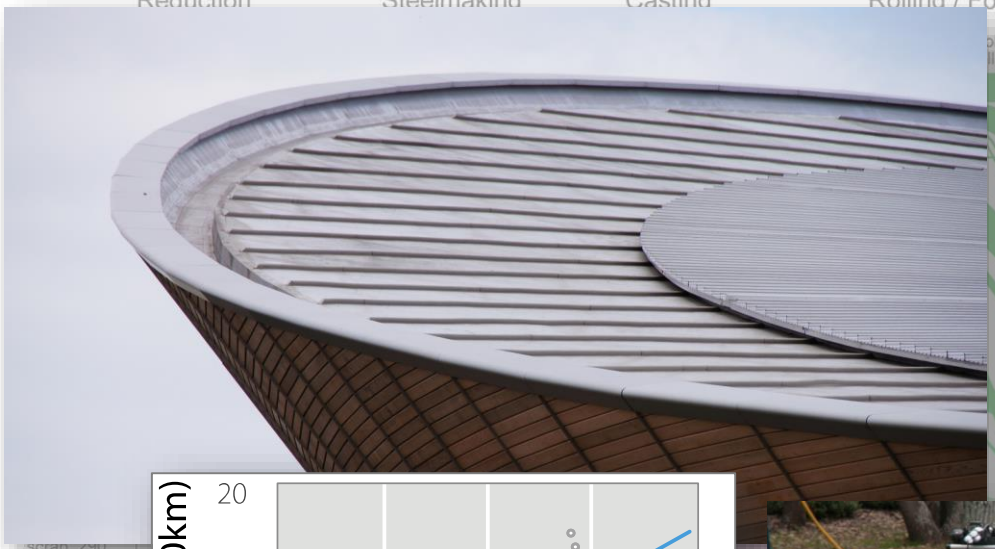
(Cullen, J. et al., Mapping the global flow of steel: from steelmaking to end-use goods, 2012)

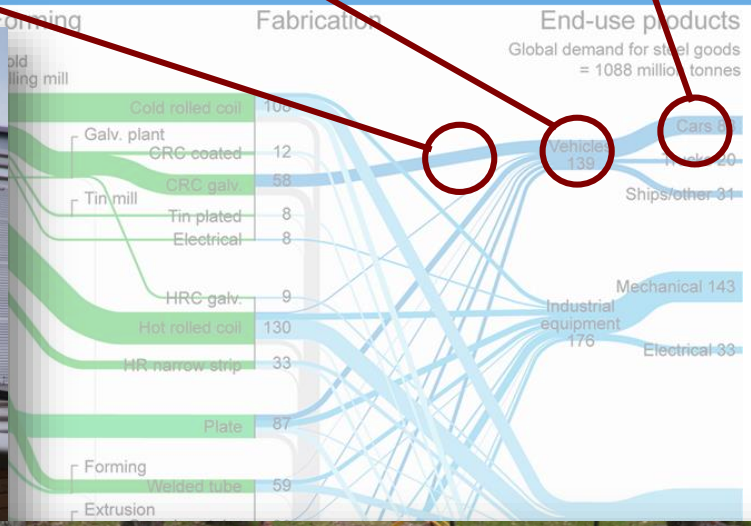
Material demand reduction

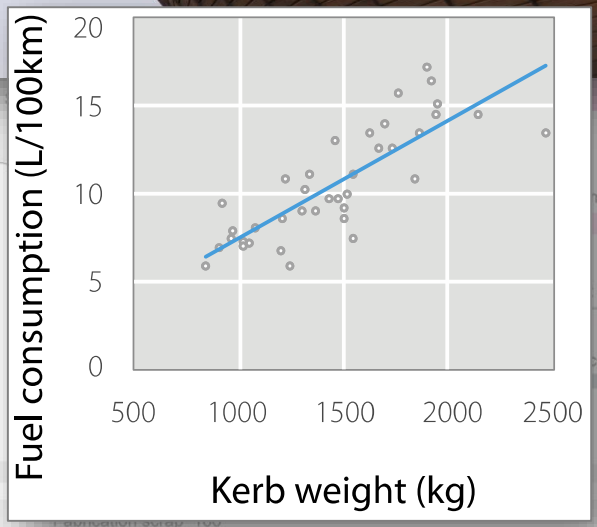
Make it lighter

Keep it longer

Use it more

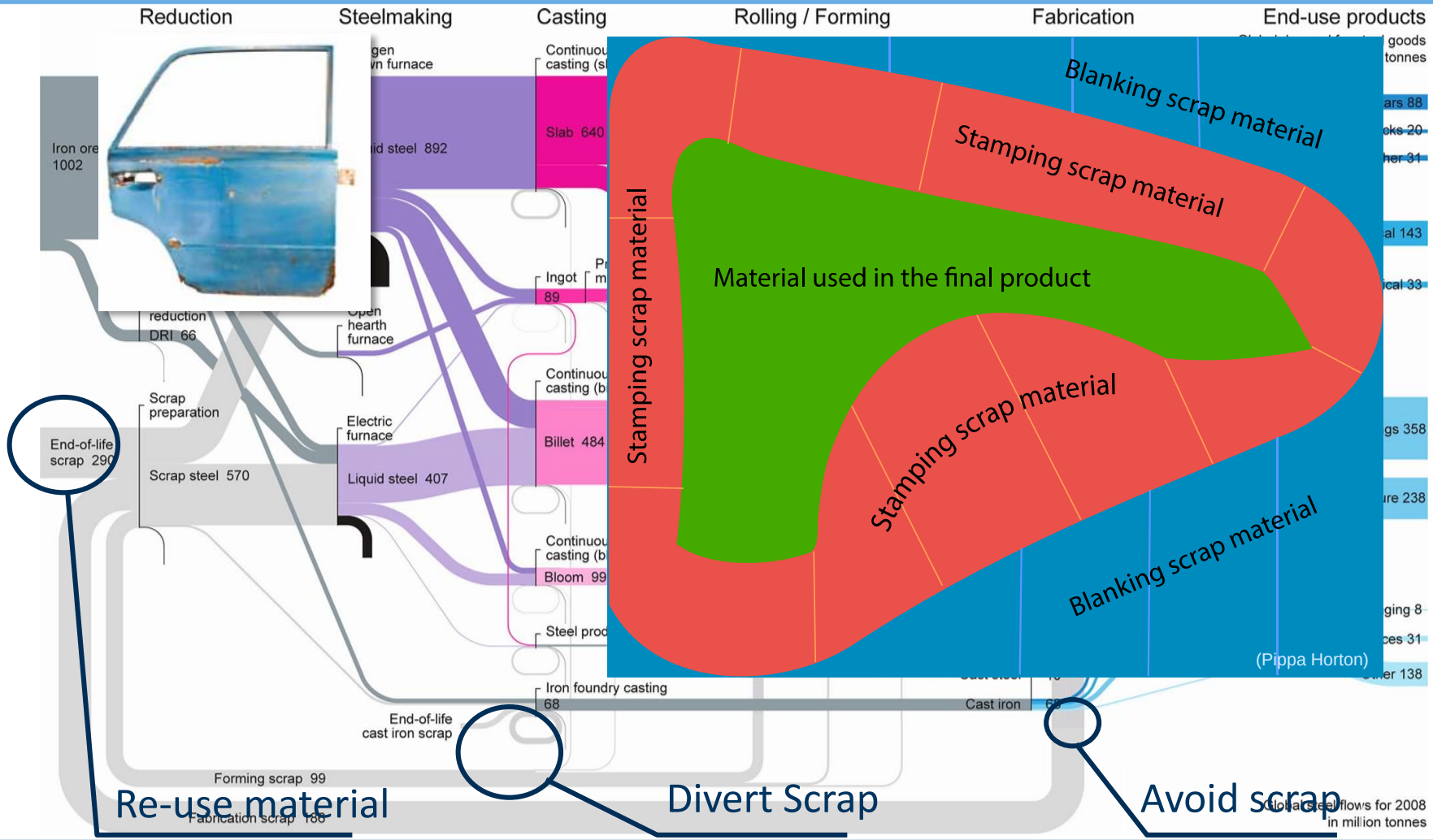






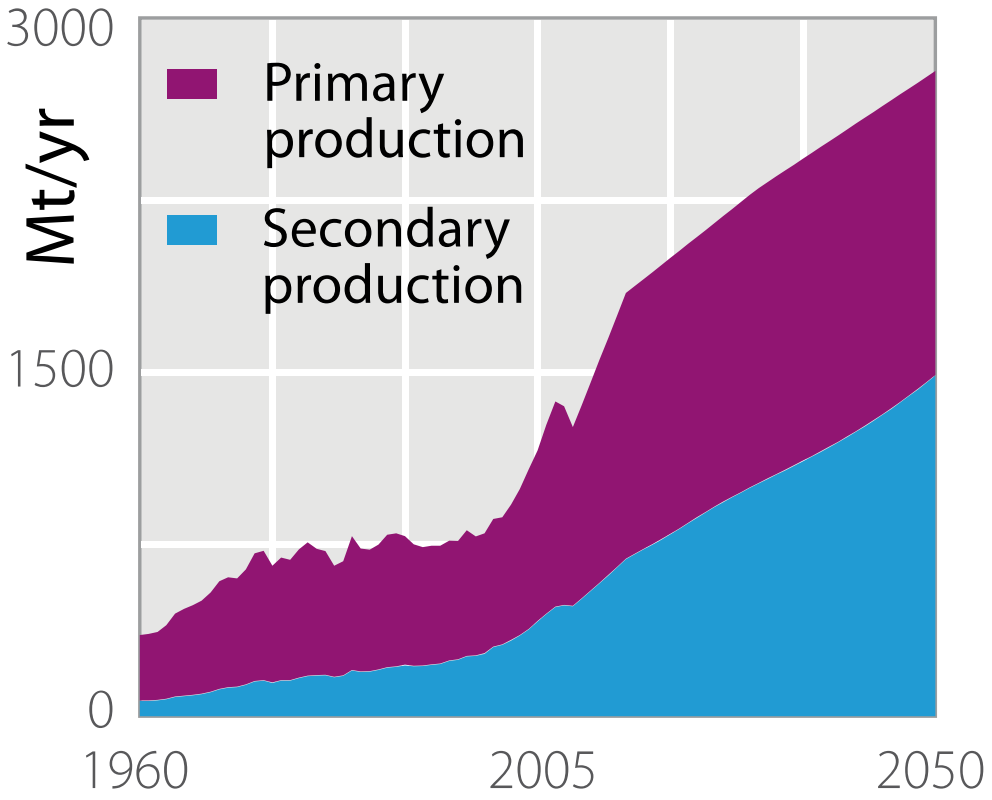
(Cullen, J. et al., Mapping the global flow of steel: from steelmaking to end-use goods, 2012)

Material demand reduction



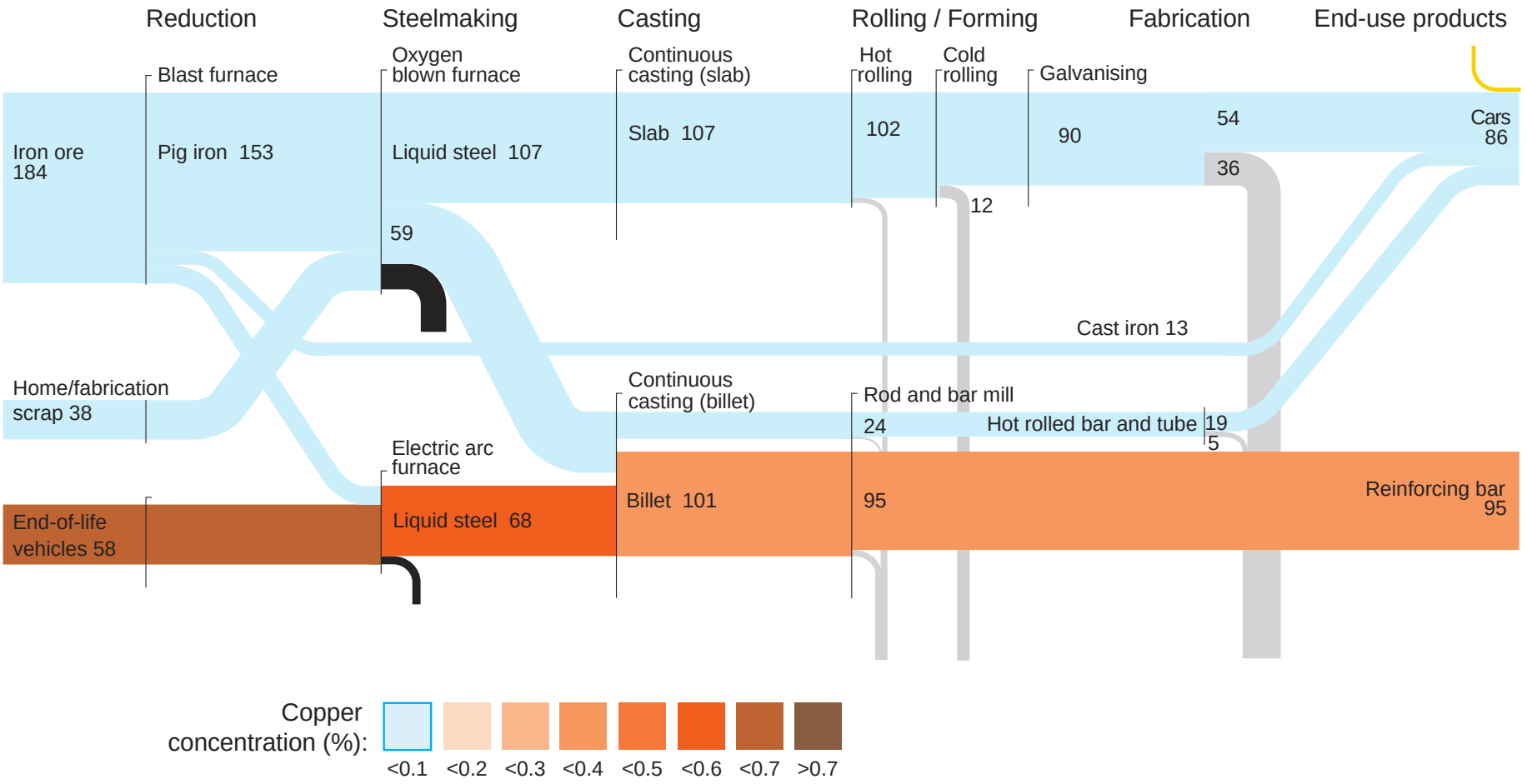
(Cullen, J. et al., Mapping the global flow of steel: from steelmaking to end-use goods, 2012)

Global production of steel

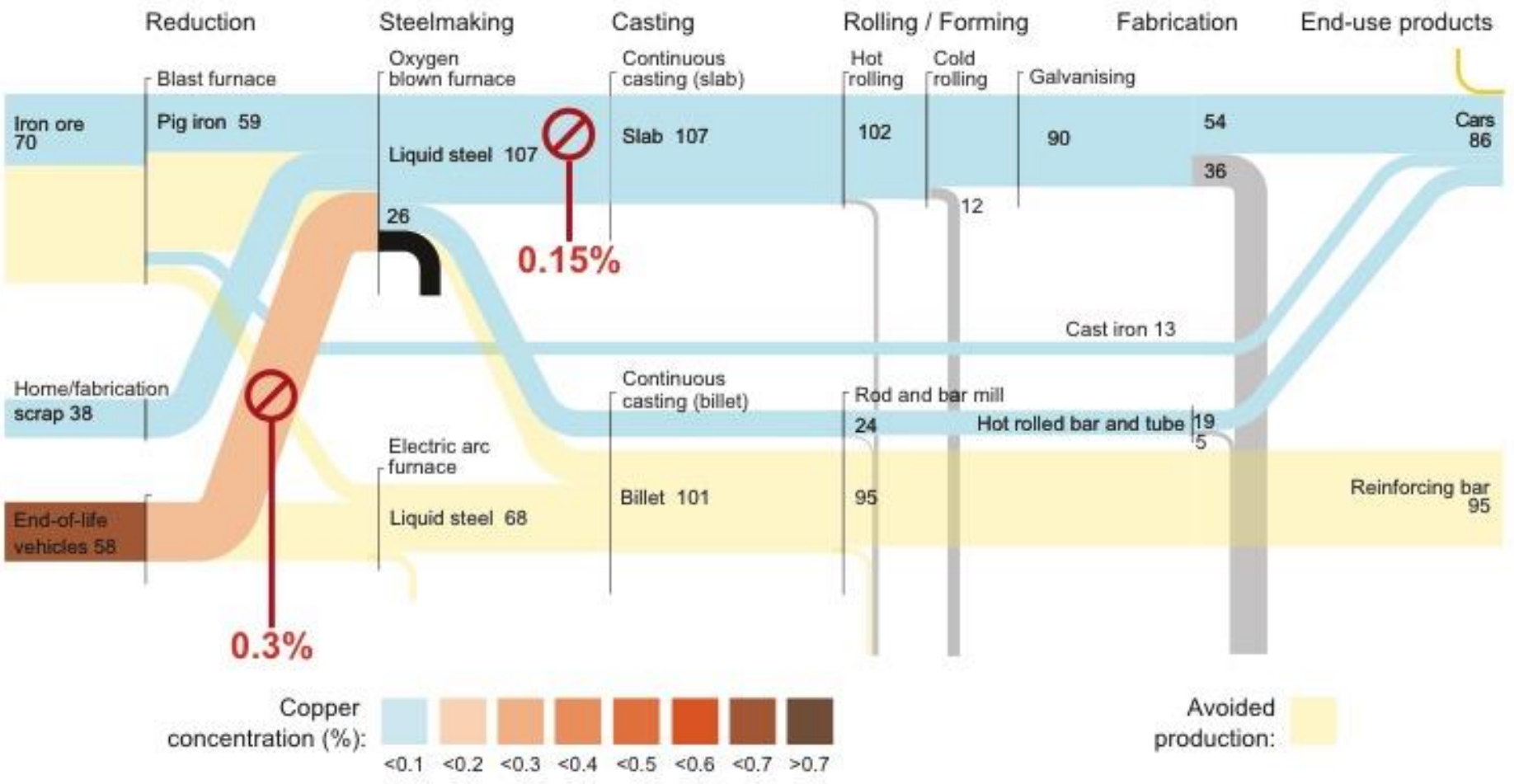


- Scrap availability will treble by 2050;
- We will never need to build new blast furnaces.

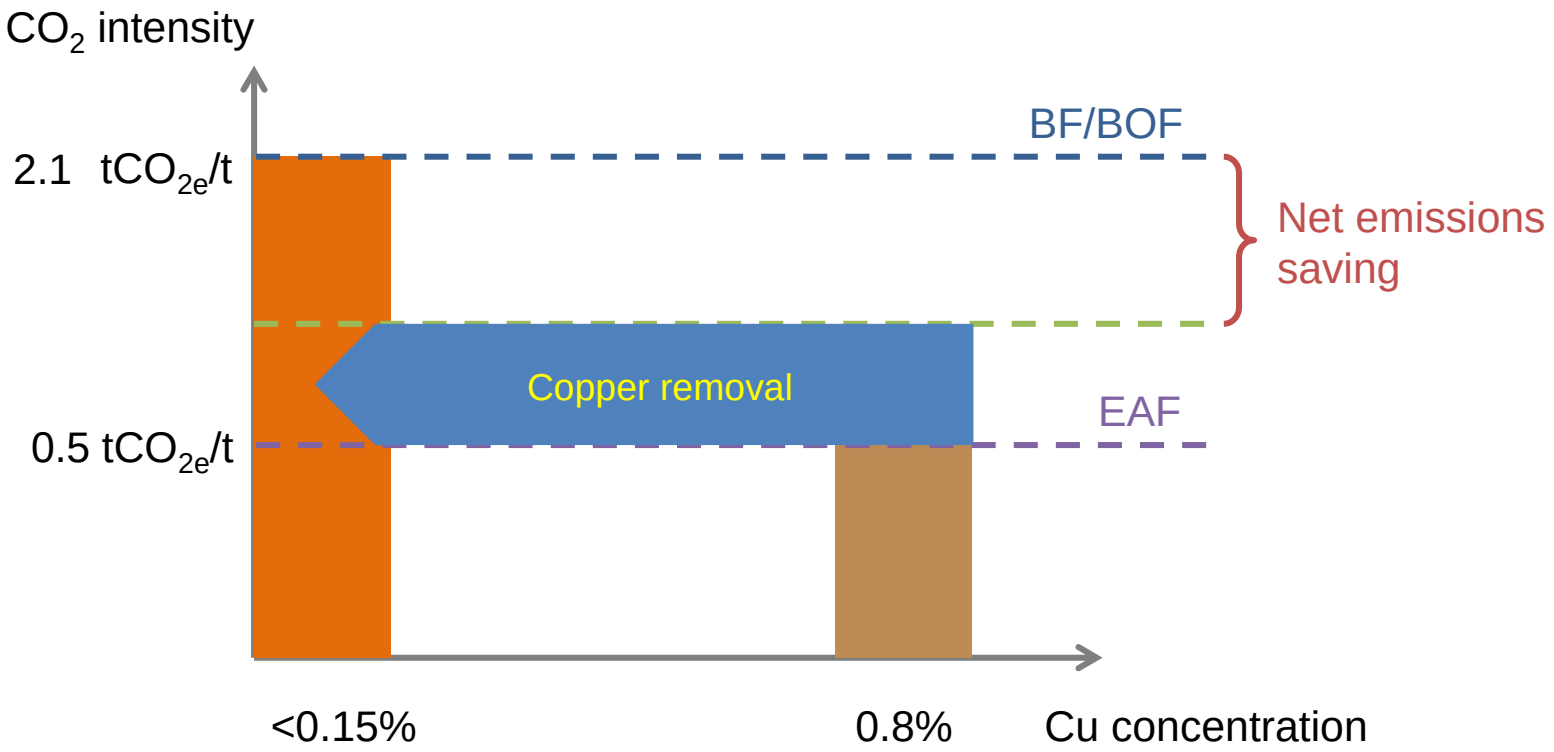
Global secondary steel-making



Global secondary steel-making: the opportunity



Global secondary steel-making: emissions savings



Conclusions

www.withbotheyesopen.com

- **Technological transformation is difficult** and depends mainly on electricity generation;
- **Innovation should focus downstream**, where most added value and jobs can be created;
- Innovation support is required to **reduce contaminants** in end-of-life scrap.

UNIVERSITY OF CAMBRIDGE

Adding more value to less material

Dr. André Cabrera Serrenho, Research Associate

Prof. Julian Allwood, Professor of Engineering and the Environment

European Parliament, Brussels
25th May 2016