

Embodied carbon: top down targets

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Past experience







more examples at www.jannikgiesekam.co.uk

Presentation structure

- What is net zero?
- Current emissions
- Past attempts at top-down targets
- Global to national budget
- National to sectoral budget
- Sectoral to project budget
- Other approaches
- How we fill the gaps







What is net zero construction for a project?







What is net zero for the UK?







UK greenhouse gas emissions & targets





EPSRC

Territorial emissions & carbon footprint from 2019 official statistics to 2018 and 2017 respectively. Others from CCC (2019) Net Zero. The UK's contribution to stopping global warming & 2020 Annual Progress Report to Parliament; DBEIS Energy and emissions projections and last Green Construction Board Low Carbon Routemap update (2017).

CCC net zero scenario







Figure 6.5 from CCC (2019) Net Zero. The UK's contribution to stopping global warming

Additional 'speculative options'



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Figure 5.7 from CCC (2019) Net Zero. The UK's contribution to stopping global warming

Current status of BECCS







Picture of ongoing C-Capture full pilot demonstration at Drax, capturing ~1tCO2/day

Potential role for construction in removals









see CCC (2018) Biomass in a low carbon economy - and associated evidence base

CCC current position

Specific recommendation for MHCLG in 2020 to:

"Develop plans to rapidly scale up the levels of wood used in construction and support the assessment and benchmarking of whole-life carbon in buildings."







CCC (2020) Progress Report to Parliament

Some past attempts at top-down targets

Report to the BRE Trust in 2014 'Linking construction embodied carbon assessment to the UK carbon budget – from the top-down'

proposed year-on-year construction carbon budgets, followed by economic allocation of construction carbon budget to building types, these type budgets were then translated to /m² project targets using quantities of annual construction work

Heathrow White Paper in 2020 'Setting a Capital Carbon reduction target. An evidencebased approach for major infrastructure projects'

proposed approach for pop-up infrastructure clients using combination of top-down link to UK targets and bottom-up estimate of mitigation potential

and my academic papers...



Top down allocation of budgets







Icons from the Noun Project (Andrei Yushchenko, Tom Walsh, Vectors Point & Randomhero)

Global to national is already covered







see CCC (2019) Net Zero. The UK's contribution to stopping global warming

National to sectoral







Sectoral to project







Doesn't the Science Based Targets initiative do this already?



DRIVING AMBITIOUS CORPORATE CLIMATE ACTION





What SBTi do...



DRIVING AMBITIOUS CORPORATE CLIMATE ACTION







IEA pathways are not consistent with national/sectoral goals







Figure adapted from Giesekam et al. (2018) Aligning carbon targets for construction with (inter)national climate change mitigation commitments

BBP Climate Change Commitment

Launched in September 2019, includes:

- Development of net zero carbon pathways by end of 2020 for new & existing buildings including embodied carbon of development, refurbishment and fit-out works
- Annual disclosure of progress against pathways
- The 23 signatories have >£300bn of real estate assets & >11,000 properties under management







A net-zero roadmap

Previous proposals for a new roadmap that:

- 1. Includes carbon removal
- 2. Development of a **new scenario** for the built environment in 2050 which is compatible with net zero national emissions
- 3. Program for further **routine updates** *and more...*

Should facilitate national, company & project carbon targets and pathway alignment



Presentation at ICE in 2019 - slides available at:

www.jannikgiesekam.co.uk/research/presentations/Presentation_271119.pdf





How we fill the gaps

Scope and compile brief for project which might include:

- 1. Definition of sectoral boundary
- 2. Estimate of sectoral mitigation potential
- 3. Estimate of sectoral negative emissions potential
- 4. Replicable means of allocation of sectoral budget
- 5. Replicable means of allocation of project budgets
- 6. Suggested programme for updates
- 7. List of known issues/questions (e.g. how would targets be assigned for adaptive re-use/retrofit projects?)
- 8. and ...[insert all of your great ideas]

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Thank you

Please get in touch with any queries J.Giesekam@leeds.ac.uk







slides available from www.jannikgiesekam.co.uk