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**Process for generating the
emission factors in the tool?**

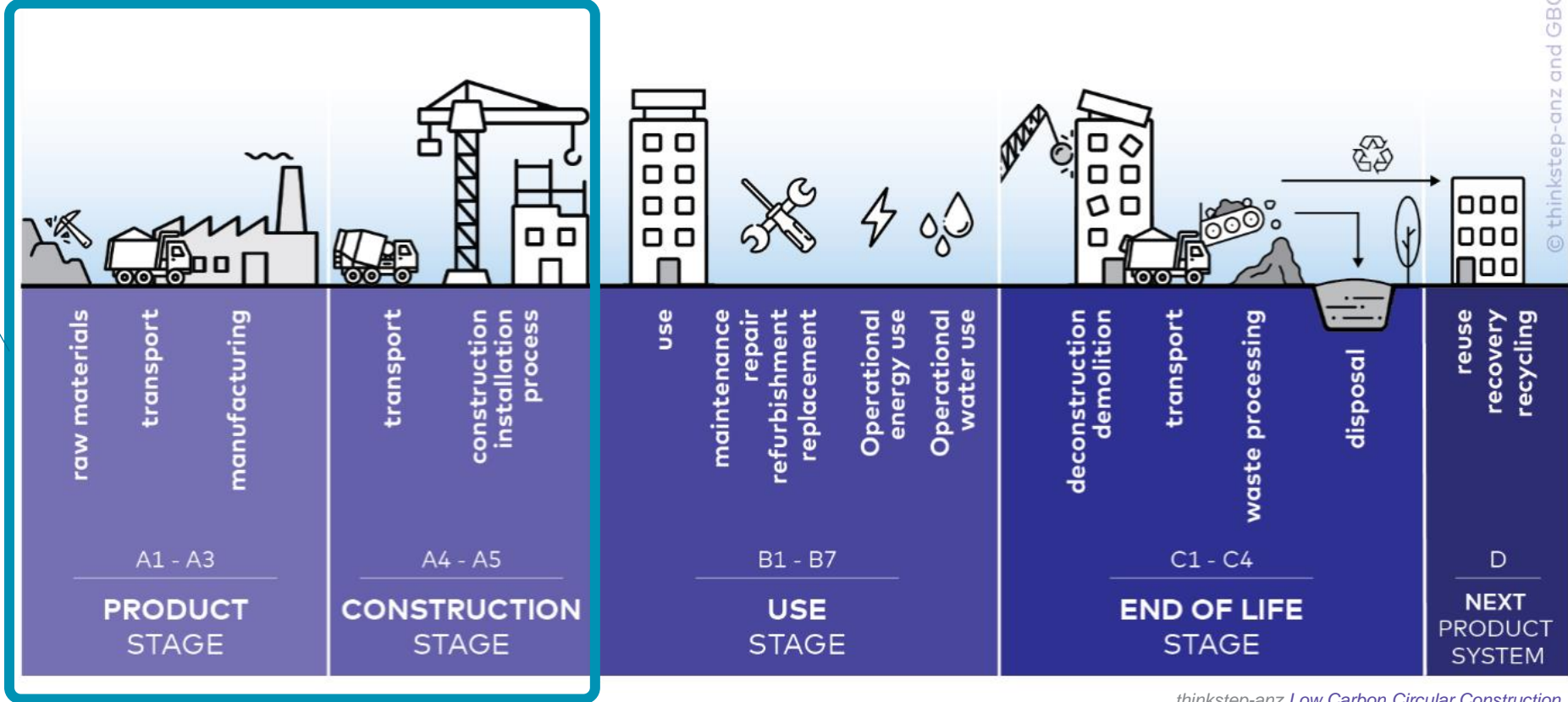
What makes up the emission factor?

- **Upfront carbon emissions only**
- **Emission factors will include all carbon emissions** (fossil, biogenic, LULUC)
- **Does not include carbon removals** (stored, offsets)



What will emission factors relate to?

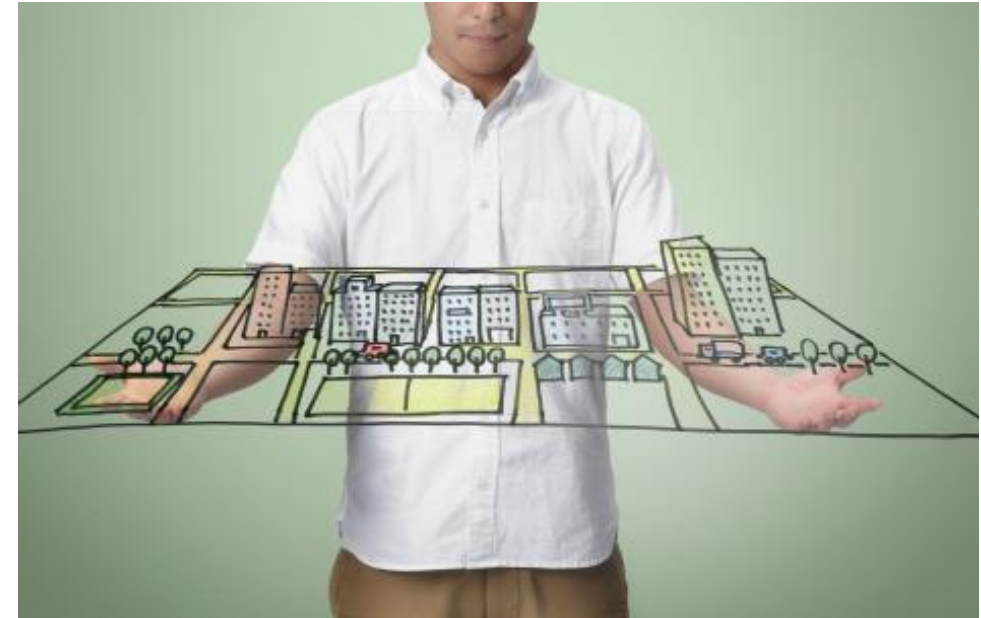
A1-A5 included



thinkstep-anz [Low Carbon Circular Construction](#)

What emission factors are being sourced?

- **A1 - Raw materials**
 - Extraction
 - Processing
 - **A2 – Transport**
 - Truck, train, ship
 - **A3 – Manufacturing**
 - Further processing
 - Factory floor
 - **A4 – Transport**
 - Truck, train, ship
 - **A5 - Construction of building**
 - Construction energy
 - Commissioning energy
 - Waste
- Material EF**
- Transport EF**
- Energy EF**
- Waste EF**



What will emission factors be based on?

- Independently verified EFs (Environmental Product Declarations, Carbon Footprint)
- Includes product specifications, producer and region

Where above not possible:

- National level data (NGA Factors, AusLCI)
- Global literature scan

C	D	E	F	G	H
Table heading	Table subheading	Product code	Material	Quantity basis	Embodied carbon (kg CO2eq/quantity)
in-situ, no cement - generic		PR_20_31_16_1_1_2_1	Concrete, 17.5 MPa, in-situ, no reinforcement, (25% GGBS)	kg	0.09
in-situ, no cement - generic		PR_20_31_16_1_1_2_2	Concrete, 17.5 MPa, in-situ, no reinforcement, (50% GGBS)	kg	0.07
in-situ, no cement - generic		PR_20_31_16_1_1_2_3	Concrete, 17.5 MPa, in-situ, no reinforcement, (75% GGBS)	kg	0.05
in-situ, no cement - generic		PR_20_31_16_1_1_3_1	Concrete, 17.5 MPa, in-situ, no reinforcement, (20% PFA)	kg	0.09
in-situ, no cement - generic		PR_20_31_16_1_1_3_2	Concrete, 17.5 MPa, in-situ, no reinforcement, (35% PFA)	kg	0.08
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_1	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (OPC)	kg	0.19
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_2_1	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (25% GGBS)	kg	0.17
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_2_2	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (50% GGBS)	kg	0.15
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_2_3	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (75% GGBS)	kg	0.13
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_3_1	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (20% PFA)	kg	0.17
in-situ, with cement - generic	50 kg/m ³ steel reinforcing	PR_20_31_16_1_2_1_3_2	Reinforced concrete, 17.5 MPa, in-situ, inc. 50 kg/m ³ steel reinforcing, (35% PFA)	kg	0.16
in-situ, with cement - generic	100 kg/m ³ steel reinforcing	PR_20_31_16_1_2_2_1	Reinforced concrete, 17.5 MPa, in-situ, inc. 100 kg/m ³ steel reinforcing, (OPC)	kg	0.27

How will default emission factors be derived?

NABERS EF database will include:

- **Conservative defaults**
- **Average values** (median or weighted average)

Calculated by:

- Grouping like products
- Product-, region- and technology-specific
- Eliminating outliers



Emission factor principles

- Transparent
- Hierarchy of sources (verified data prioritised)
- Conservative in the first instance (conservative defaults)

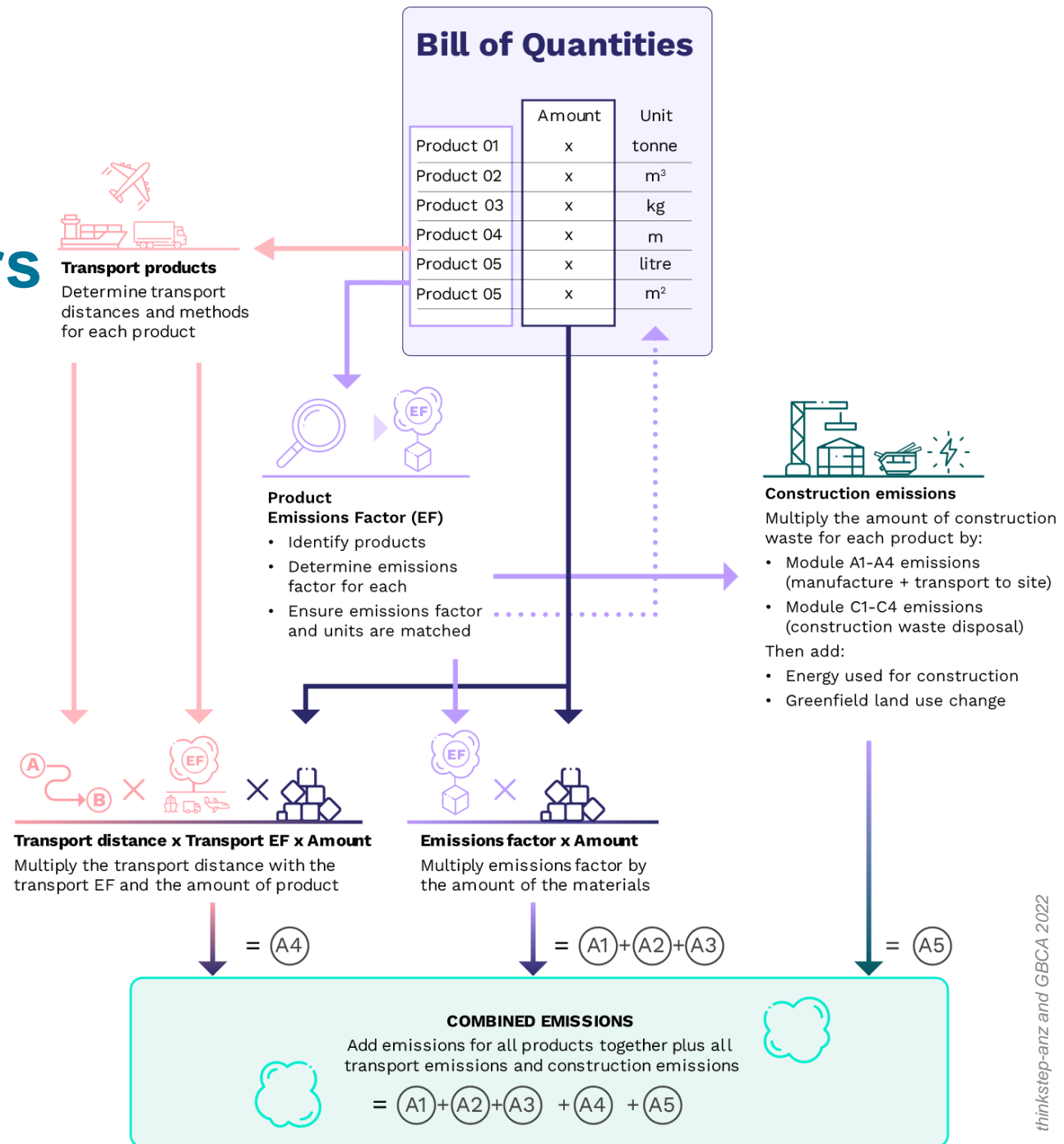




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**How emission factors will be used in the
new tool?**

How will emission factors be applied?



Choice of emission factors

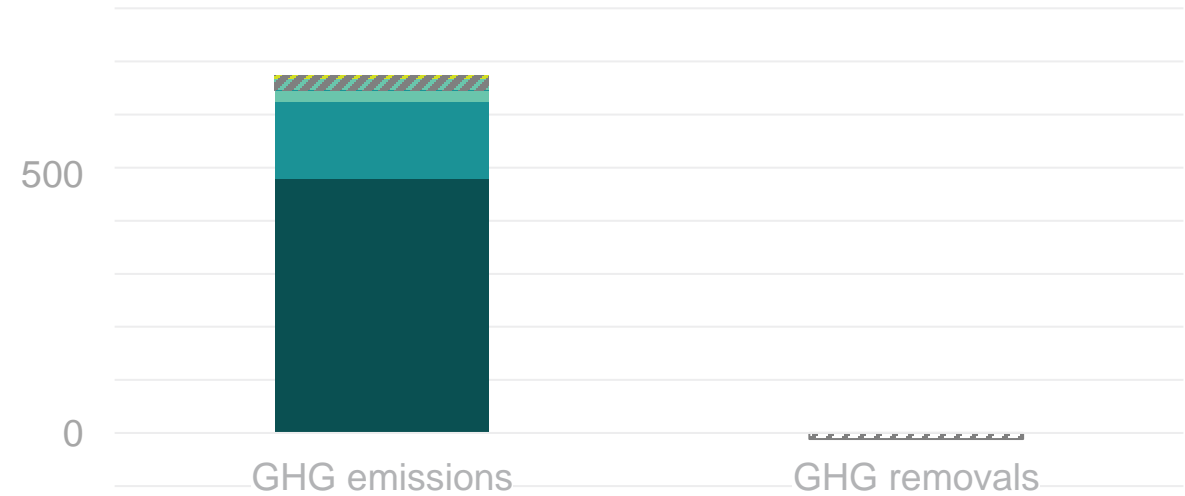
- **Conservative default material EFs**
(material known but not the specific product)
- **Conservative default transport EFs** (A4 calculations)
- **Conservative default construction waste and energy EFs** (A5 calculations)
- Average Material EFs available for comparison
- **Users can add their own verified EFs** (i.e. EPDs)



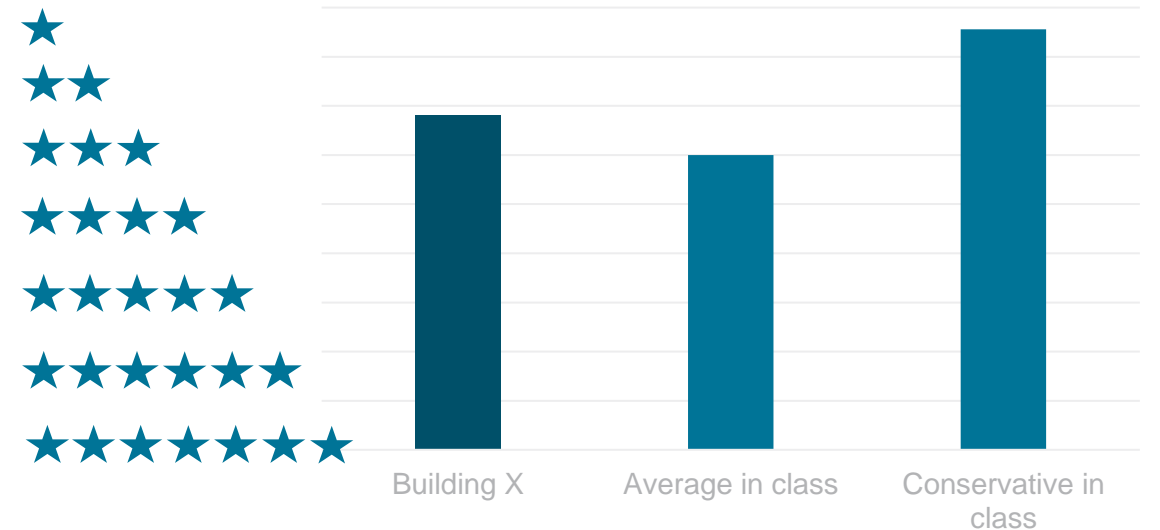
Outputs

- Removals (stored and offset) excluded from total and reported separately
- Total emissions translated to a star rating
- Benchmarking result
- Display proportion of default vs product-specific data used

Emissions and removals (kg CO₂e/m²)



Benchmarking of 'building x' (kg CO₂e/m²)





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