

As a 1.5°C aligned company, we have set ourselves ambitious science-based emissions reductions targets.



The reduction of greenhouse gas emissions from business activities as far as possible, with the remainder offset with an approved carbon offset scheme.

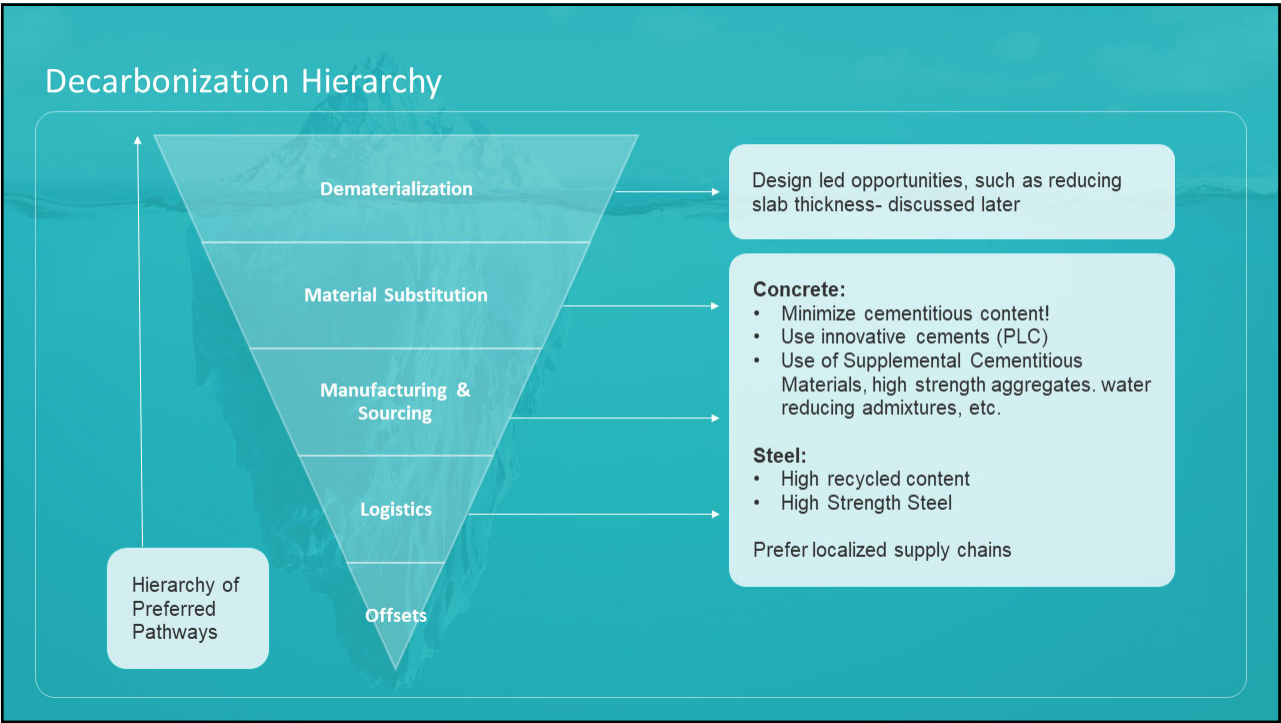
Our net zero target applies to scope 1 & 2 emissions.



The mitigation of all greenhouse gas emissions produced from business activities to absolute zero, without the use of offsets.

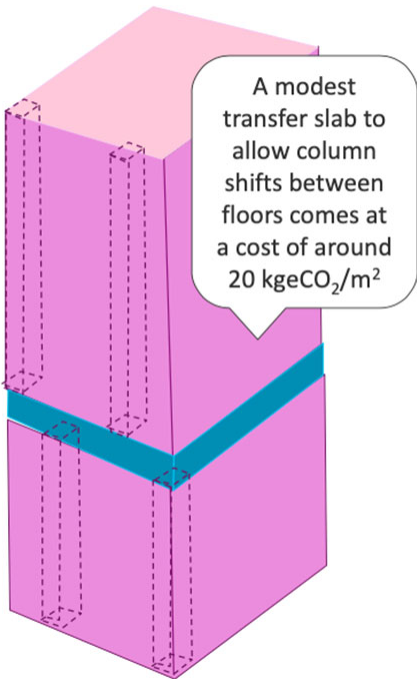
Our absolute zero target applies to scope 1, 2 & 3 emissions.





Design decisions

- Remove 600 deep transfer floor by aligning columns
- 1 transfer deck of 600mm equates to additional 22 kgeCO₂/m² (5% of 2020 target budget, 17% of 2025)
- The same value would apply for slabs supporting landscaping and increases with span between columns
- Transfer/deep slabs to enable structural changes cost a lot in carbon**



Concrete opportunities for % C02 eq reduction

Concrete Opportunities	% CO2 eq Reduction	New York Relations	Chicago Relations	San Francisco Relations	Los Angeles Relations
Supplementary Cementitious Materials (SCMs)	(15-70% cement replacement = ~15-60% GWP reduction Increase service life by 20-30 years (refer to appendix)	Available Slag & Ash	Available Slag & Ash	Imported Slag and Ash from Asia	Imported Slag and Ash from Asia
High Quality Aggregate	10-20%	Tilcon	Recycled aggregate. Local aggregates considered excellent	Orca (from British Columbia)	Orca (from British Columbia) port of Long Island
CarbonCure	5-8% cement replacement	Testing Underway	Yes – Ozinga	Yes – US Concrete, Cemex	Yes
Improved Durability through SCMs	Add 20-30 years to structure through reduced chlorine permeability	US Concrete; Gotham	Ozinga	US Concrete Central Concrete	Cemex
ReadyMix Suppliers with Decarbonization Capability	Sum of the Above	US Concrete; Gotham	Ozinga Oremus	US Concrete Central Concrete, Cemex	Cemex US Concrete
Type 1L - Portland Limestone Cement (Lehigh Hanson - 'Eco cem') – refer appendices	10-15%	Approved	DoT Approved Available in Logansport Indiana. C5 95 1L	Approved by CalTrans Nov '21	Approved by CalTrans Nov '21

Chicago mix design examples & C02-eq

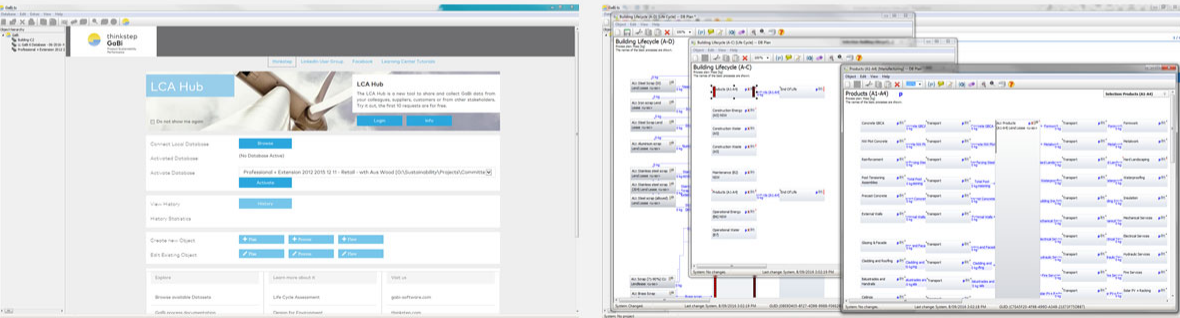
Project	Strength (psi)	Mix ID	Use	Kg CO2e/m3
493 N La Salle	4000	1109SX	Struct. Curbs above Ground, Arch Fills & Equipment Pads	201 (21% less than NRMCA)
494 N La Salle	4000	1097SX	Struct. Curbs, Arch Fills & Equipment Pads Exposed to Weather	244
489 N La Salle	4500	2664SX	Slab on Grade	246
Cooper	6000	4248	Caisson Caps, Foundation Walls, Columns	257
KL	5000	Prairie 6116318	Partial Basement/Retaining Wall	258
KL	4000	Prairie 6114028	Interior SOG	263
The Cooper	4000	1097	Interior Slab on Grade	264
Cooper	4000	2595	Exterior Window Wall curbs	266
491 N La Salle	8000	4246SX	Shearwalls, Link Beams, Columns	270 (29% less than NRMCA)
490 N La Salle	6000	3411SX	Shearwalls, Link Beams, Columns	272 (15% less than NRMCA)
KL	9500	Prairie 6172124	Caissons	278
KL	8000	Prairie 61115621	Foundations	278
KL	8000	Prairie 61115621	Podium + Tower Columns	278
KL	12000	Prairie 6115562	Shear Walls 1 thru 7	286
The Cooper	4000	2448	Exterior Slab on Grade, Crash Walls	290
The Cooper	8000	4246	Shear Walls, Columns	292
KL	10000	Prairie 6113025	Shear Walls 8 thru 42, Ramp Walls, Crash Barriers	296
The Cooper	10000	4320	Shear Walls, Columns	311
The Cooper	12000	4321	Shear Walls, Columns	322
KL	5000	Prairie 6114464	Exterior Pavement	337
488 N La Salle	6000	19151S	Grade Beams, Foundation Walls	348 (8% less than NRMCA)
KL	8750	Prairie 6134482	Supported Slab (PT and Mild)	370
492 N La Salle	8750	1145S	Framed Slabs and Beams	379
The Cooper	8750	1145	PT Slabs / Framed Slabs & Beams	382





Develop a flexible model

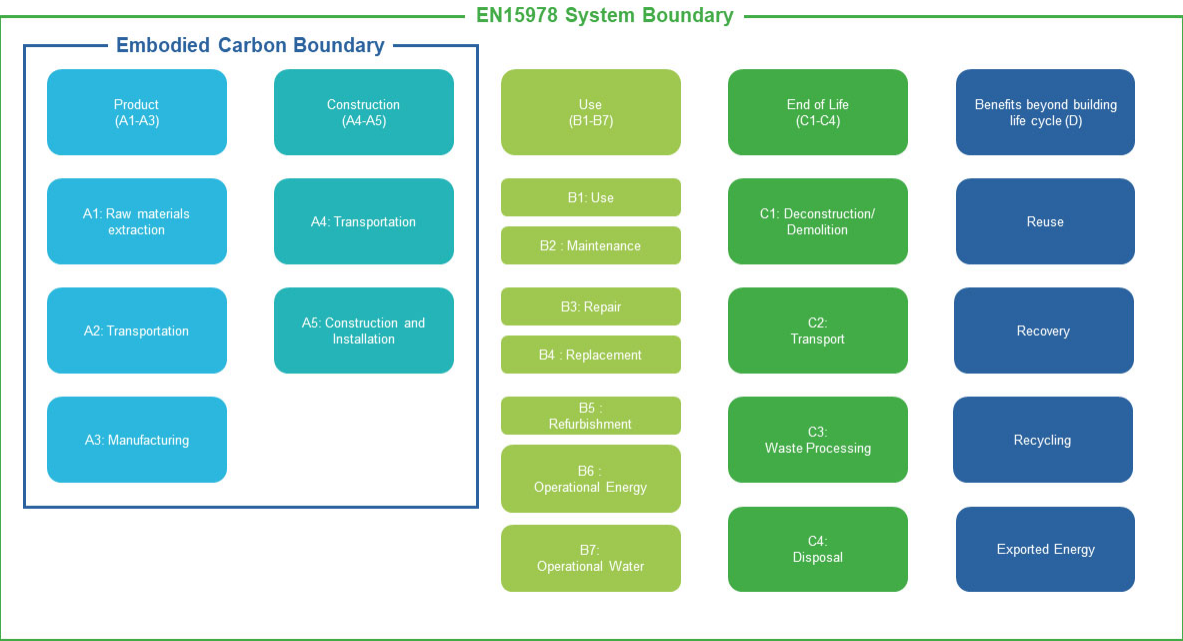
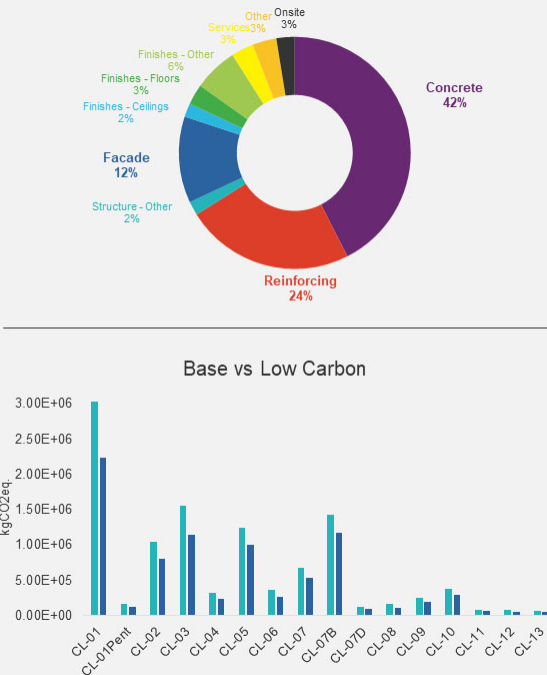
Develop a workflow and model that works for you. Needs to be agile and adaptable for quick element level sprints and large rigorous whole of building assessments. Must connect to existing processes e.g. cost planning/QS, energy modelling

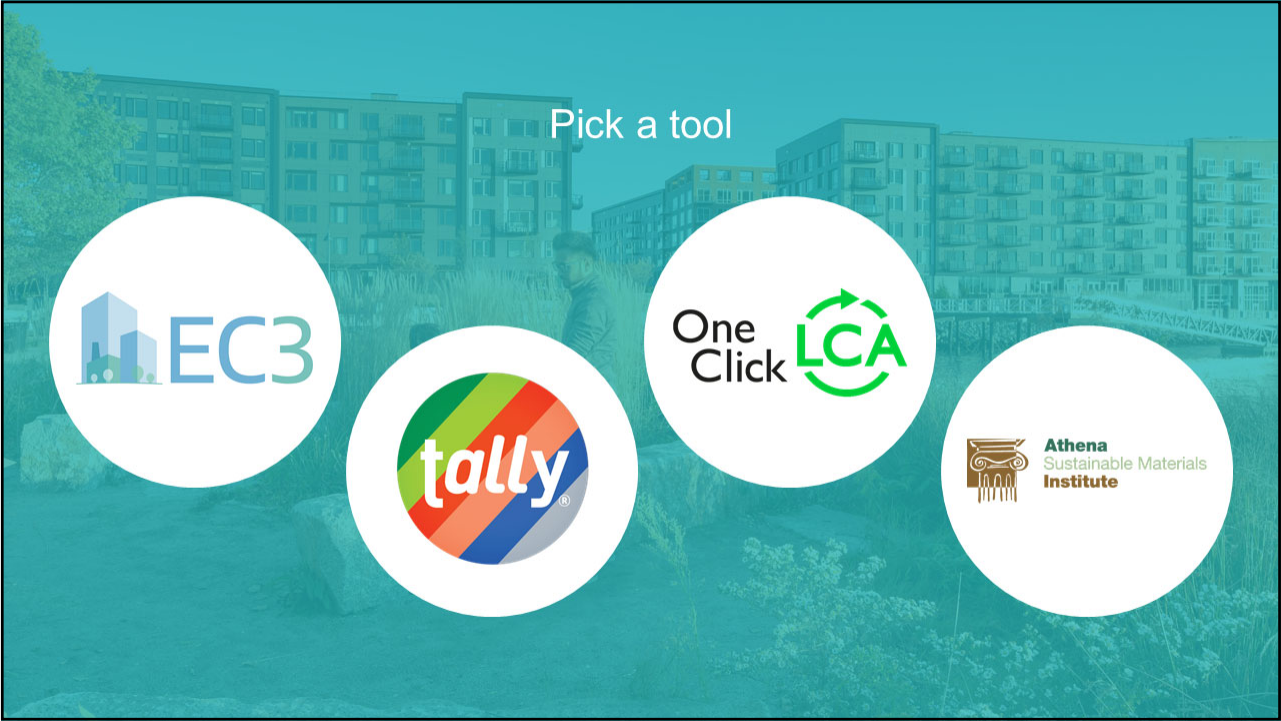


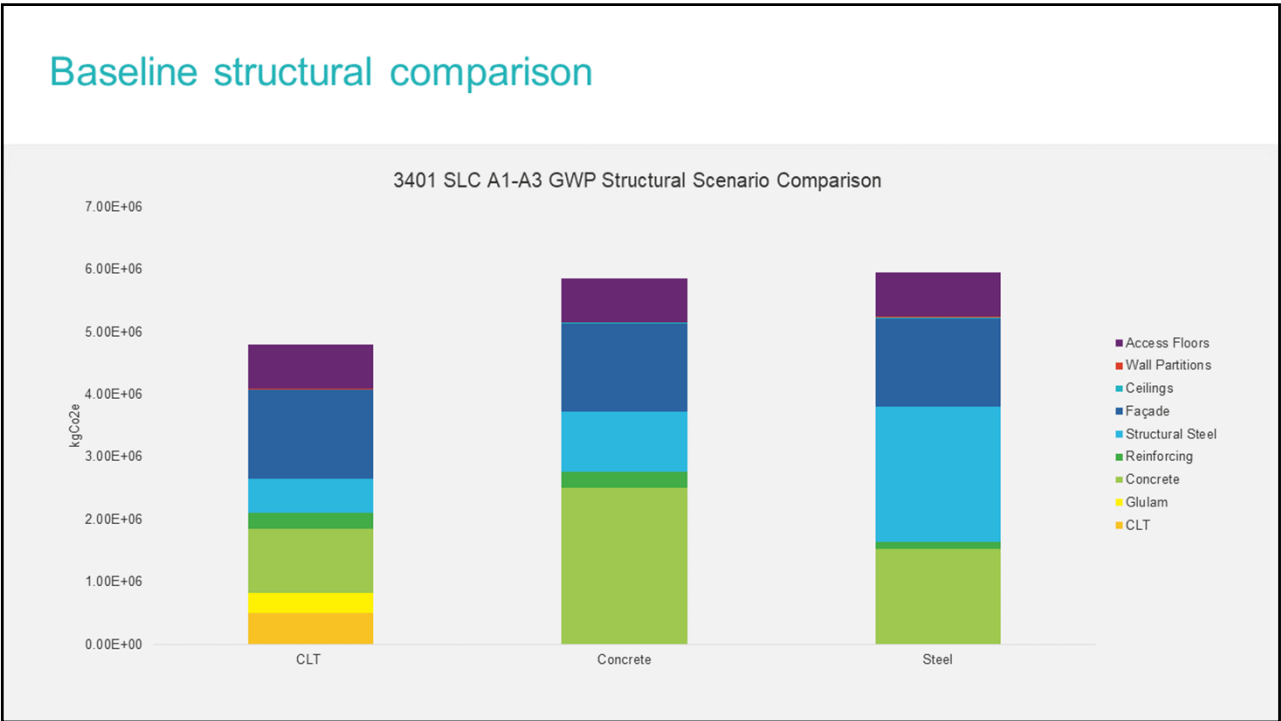
Understand materiality

Use your model to identify the things that matter and the areas where you can exert maximum influence. Map these to key trade packages based on projects planned procurement strategy

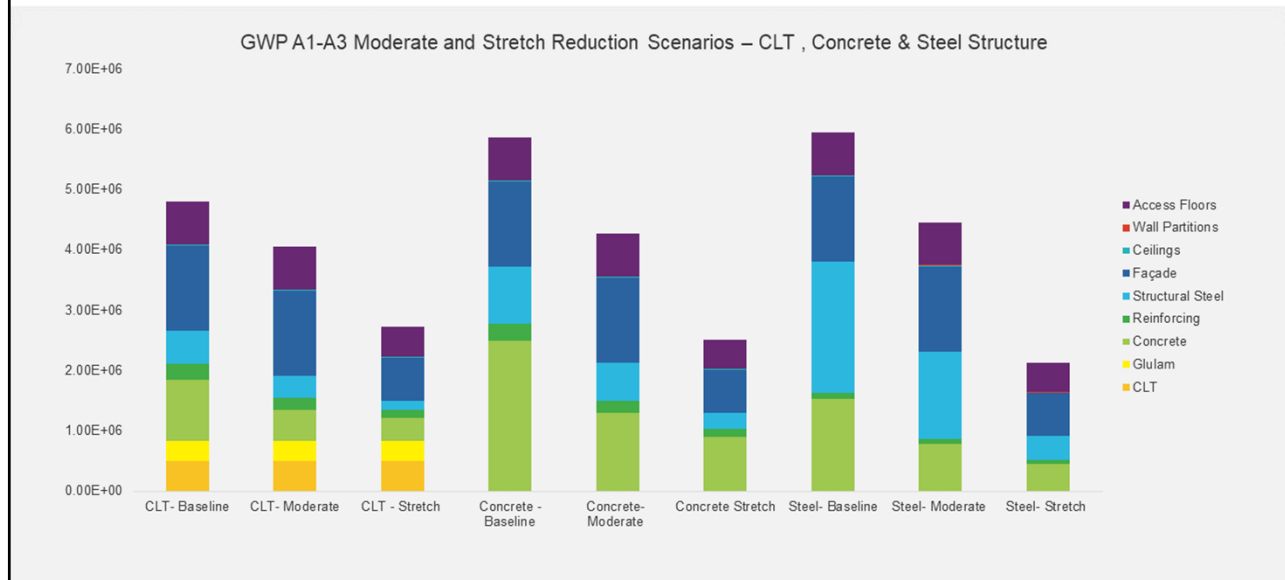
- Identify the **material impacts**
- Focus on the areas where you can have **influence** (trade packages)
- Optioneering – LCA sprints on smaller elements to test sensitivity of the design to different **options**
- Develop a simple **Road Map**
- Engage with decision makers and **supply chain**
- Present **solutions** not problems
- **Don't wait** for perfect data / information (act on what you know not on what you don't)







Reduction scenario summary



Lessons learned

- Baselines and **data** are king
- **Focus** on what matters
- **Timing** is everything – the earlier the better
- **Link** yourself to **existing workflows** – integrate with existing processes
- **Make it easy** for people - communicate what is important to them
- Become **comfortable with uncertainty** – test and re-test assumptions
- **Vertical integration helps** - build and flip mentality can be more challenging
- Engage **cost planning**
- Don't forget the **importance of education and communication**



