

SIEW 2023 – Thinktank Roundtable Session

Opportunities for Net Zero in Existing Buildings

Close to 55% of Singapore buildings have been “greened”

Source: BCA



**make
everyday
better.**

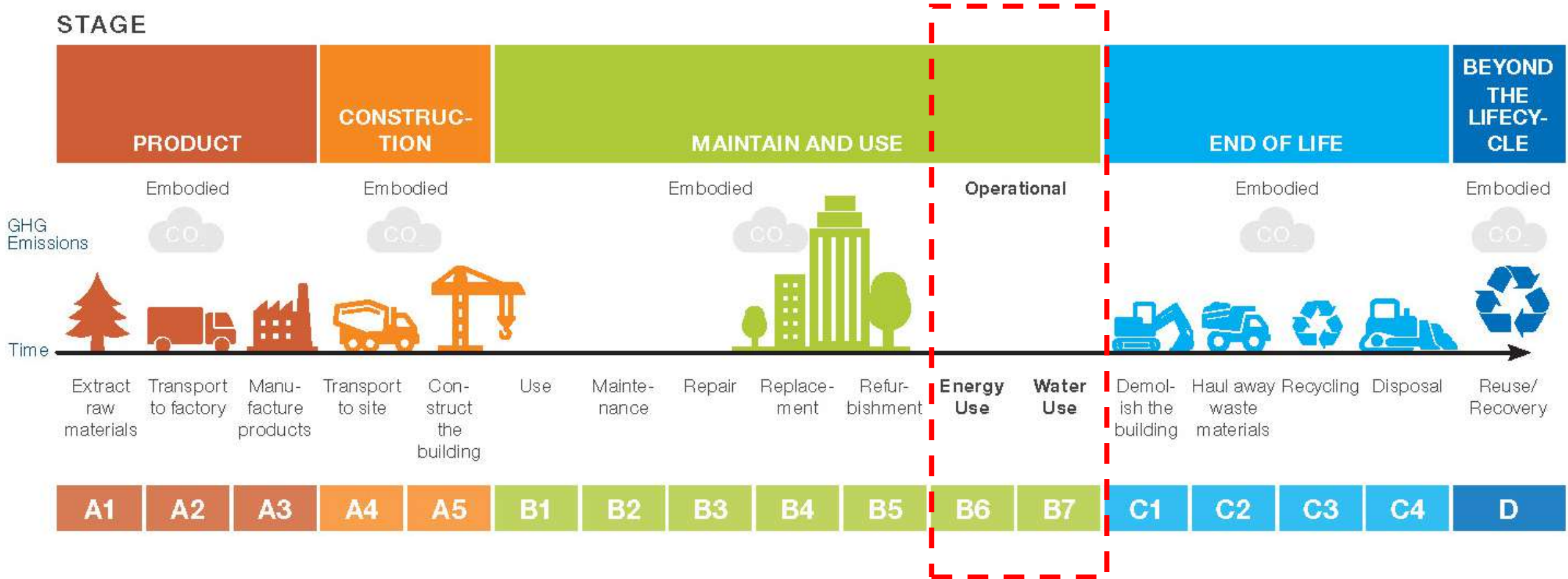


Built Environment $\approx$ 40% global carbon emission

- 28% Operational
- 12% Embodied

Source: World Green Building Council

Data source: BS EN 15978:2011



Understanding the Barriers.....

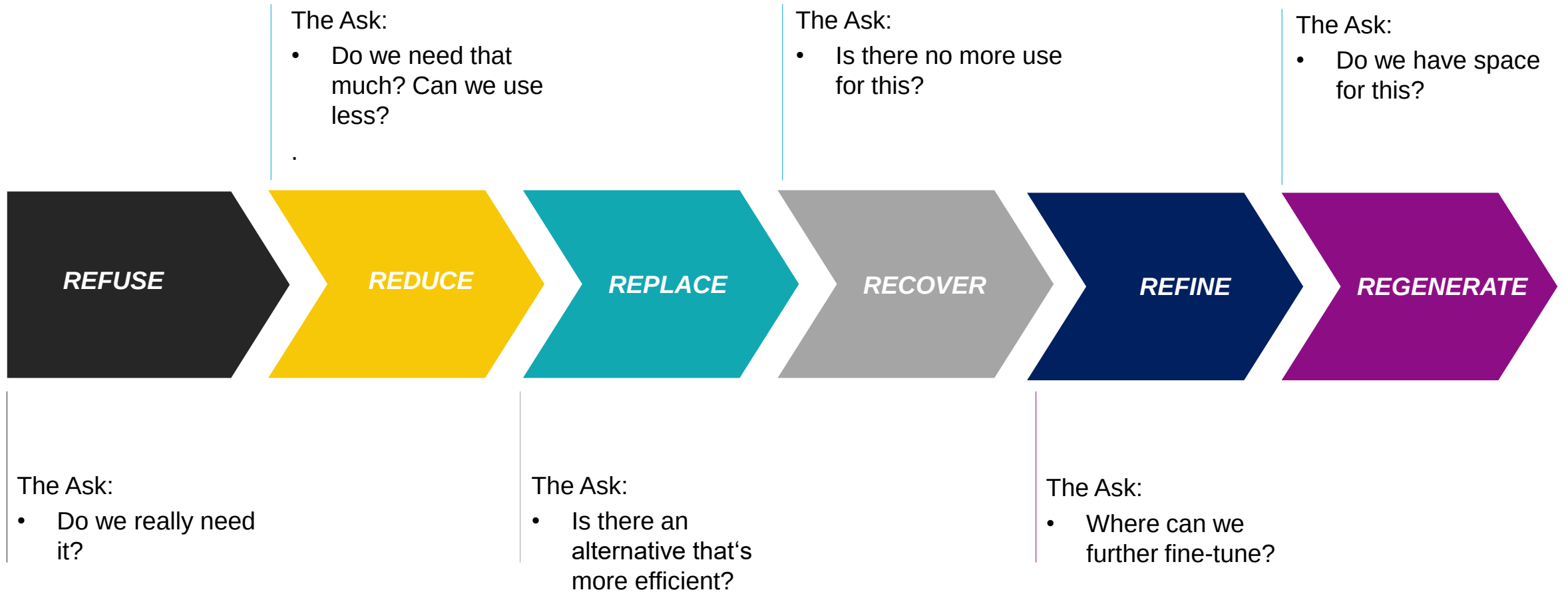
- Cost, Cost and Cost
 - Capital Expenditure
 - Perceived insignificant tangible benefits
 - Operational disruption
- Space Constraints
 - Creating new space
 - Enlarging existing space
 - Existing services
- Acceptance to change
 - Building managers
 - Tenants
 - Building users



Understanding the Trend

- Operational carbon
 - Entities
 - Services
 - Tenant vs. landlord





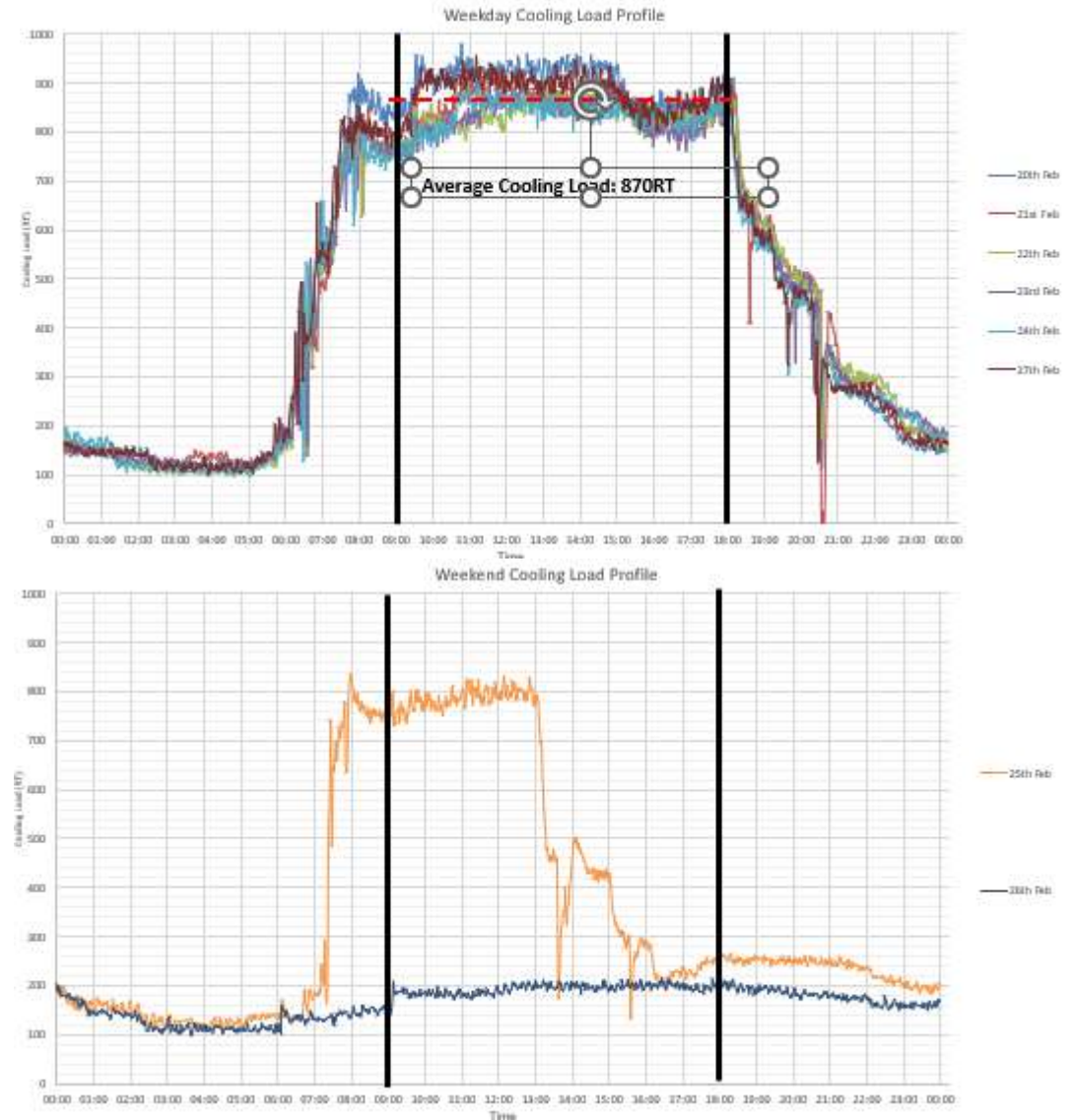
Refuse

- Don't use it if you don't need to
- Requires a change of mindset
- Enable the change



Reduce

- Understand performance profile
 - Weekday vs. weekend
 - Day vs. night
- Right sizing
 - Chillers
 - Pumps
 - Cooling towers
 - Air Handling Units
 - MV fans
 - Lighting
 - Hot Water System



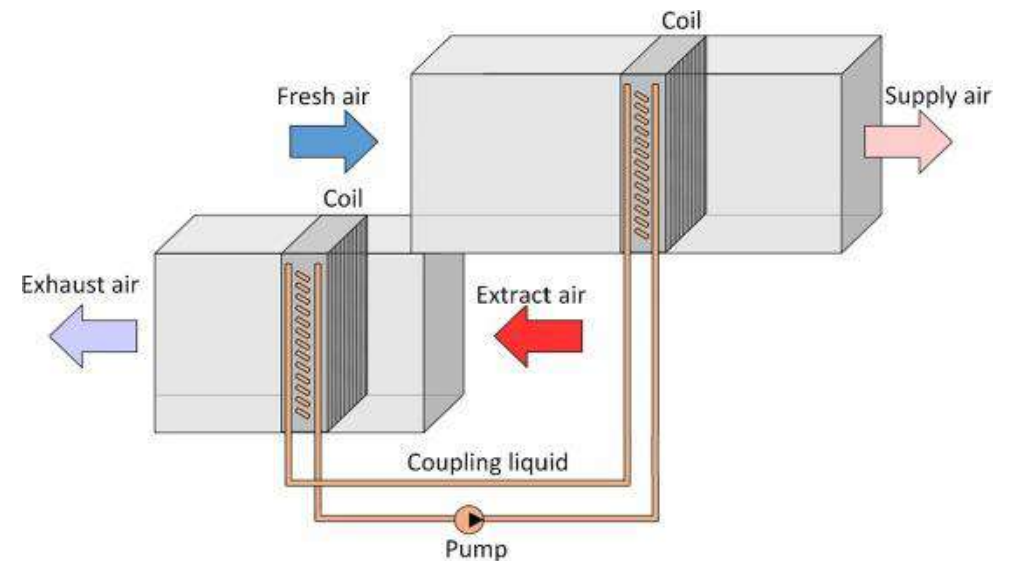
Replace (Substitute)

- Technology selection
 - Multi-compressor magnetic bearing chillers
 - Electronically commutated fans
 - LED lights



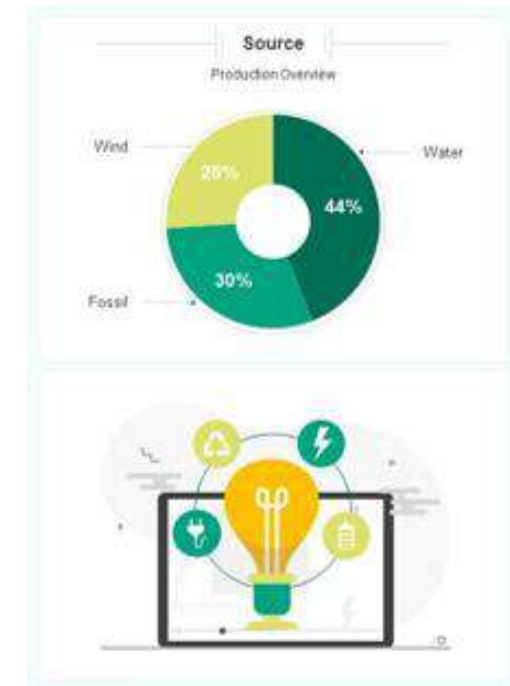
Recover

- Cool exhaust air from buildings
- Cool discharge air by-product of air source heat pump
- Cooling from condensate discharge



Refine

- Control strategy
 - Staging of chillers/ cooling towers/ pumps
 - Chilled water temperature reset
 - Space temperature reset
 - Lighting controls system (switching, dimming, timer)
- Continuous tuning of systems for optimization
 - Fault detection
 - Out-of-range settings



Regenerate

- Photovoltaic panels
- Available roof space
- Best efficient panels





The Activist is not the person who says the river is dirty. He is the one who cleans up the river

- *Ross Perot*

The background is a solid teal color with a complex, abstract pattern. It features several overlapping arrows pointing in various directions, some of which are filled with a fine hexagonal grid. The pattern is dense and creates a sense of movement and connectivity.

Thank you

**make
everyday
better.**