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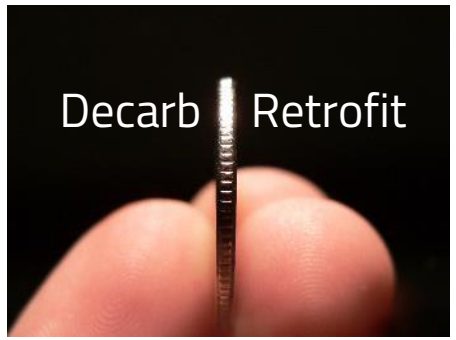
Together, for excellent university estates & facilities

Retrofit or decarbonisation?

Should we prioritise spending on the retrofit of legacy buildings or on creating and implementing decarbonisation plans?

The last slide first…

Ultimately, the answer is ‘both’ but…



Decarb-led can seem:

- Hard to fund, difficult and blind to co-benefits

Retrofit-led can feel:

- More intuitive, less risky and more beneficial

Retrofit your legacy; decarbonise your future

Abstract global polycrisis?

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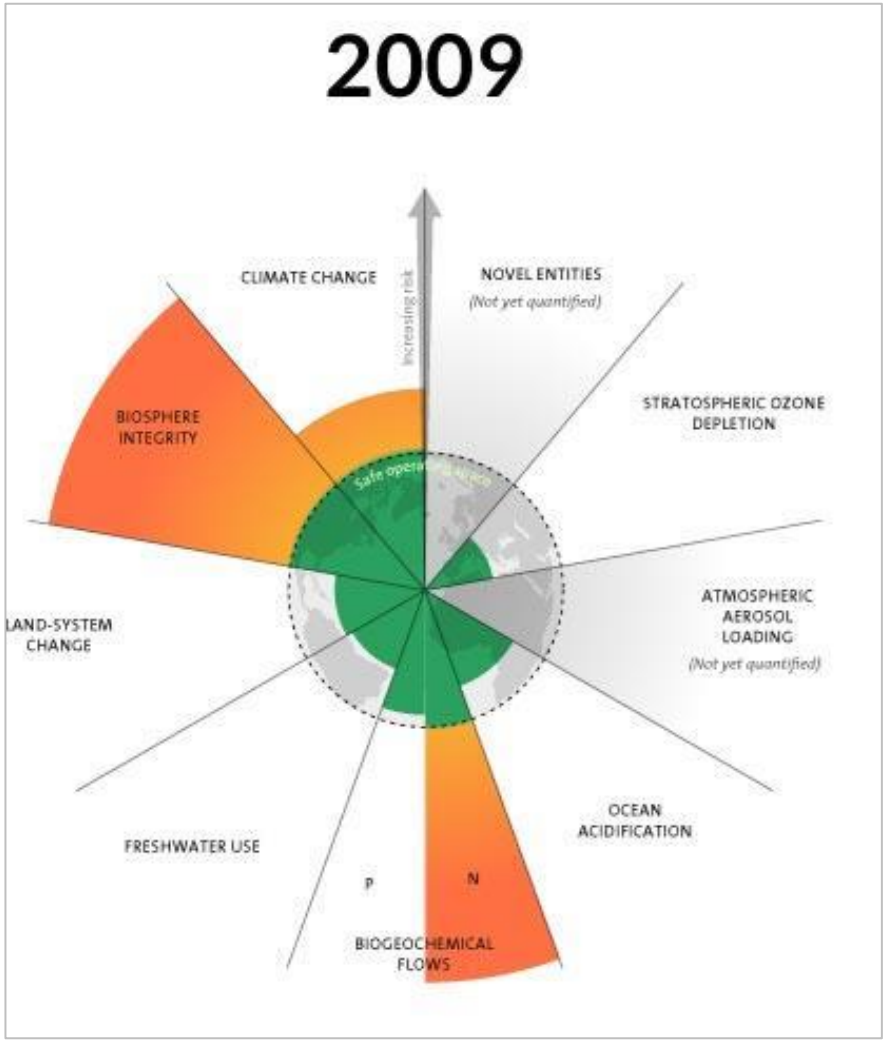
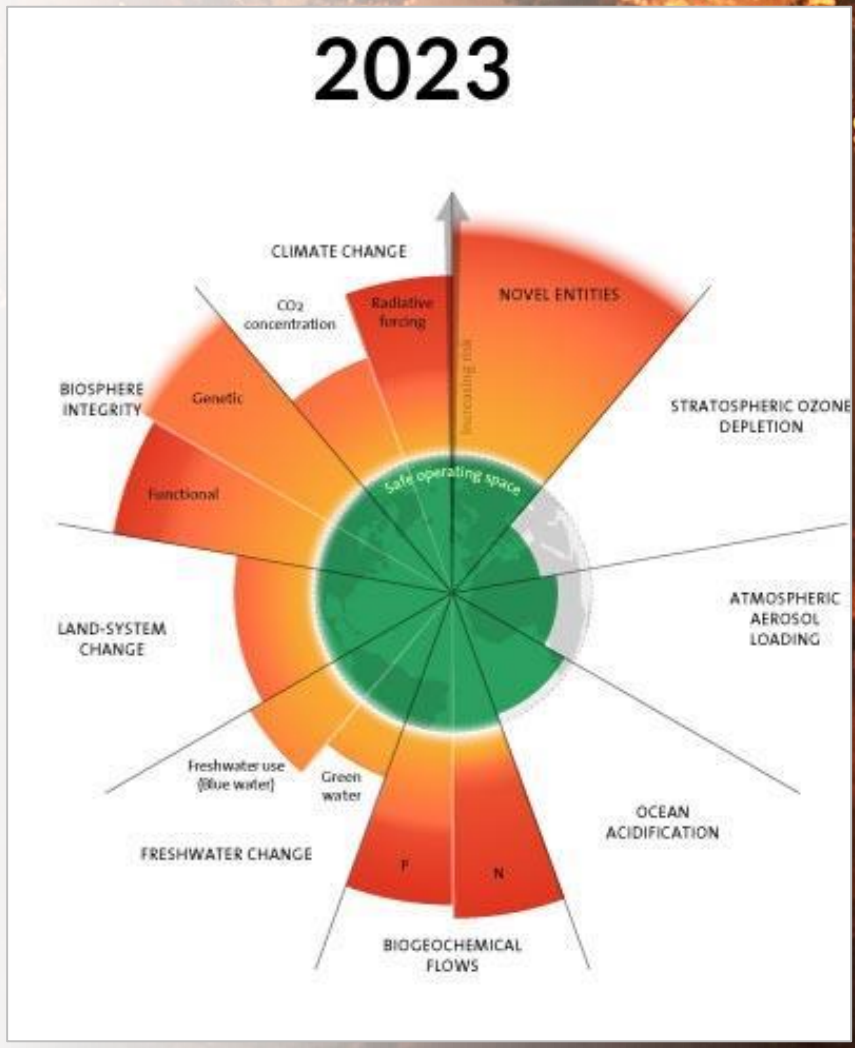
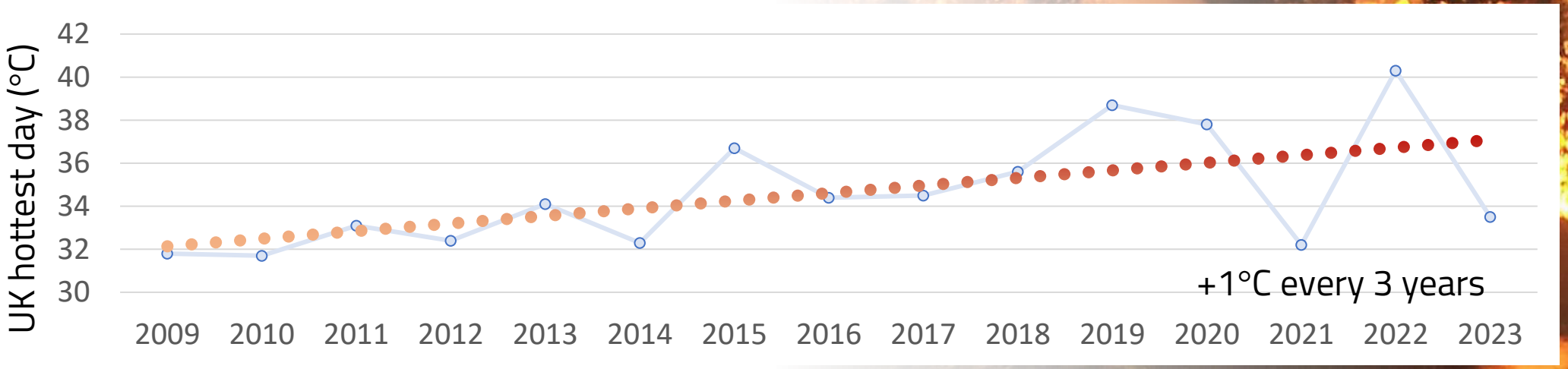




Real local impact



Key climate hazards*	Overheating	Flooding	Storms	Drought	Wildfires
Operational risk	Higher energy consumption, system failure	Infrastructure reliance, direct impacts	Storm surge, wind damage, access	Subsidence, utility costs, restrictions	Asset damage, risk to life, perceived safety

* Key hazards drawn from UKBGC Resilience Roadmap (Draft for Consultation) Nov 2024

Long term strategic direction

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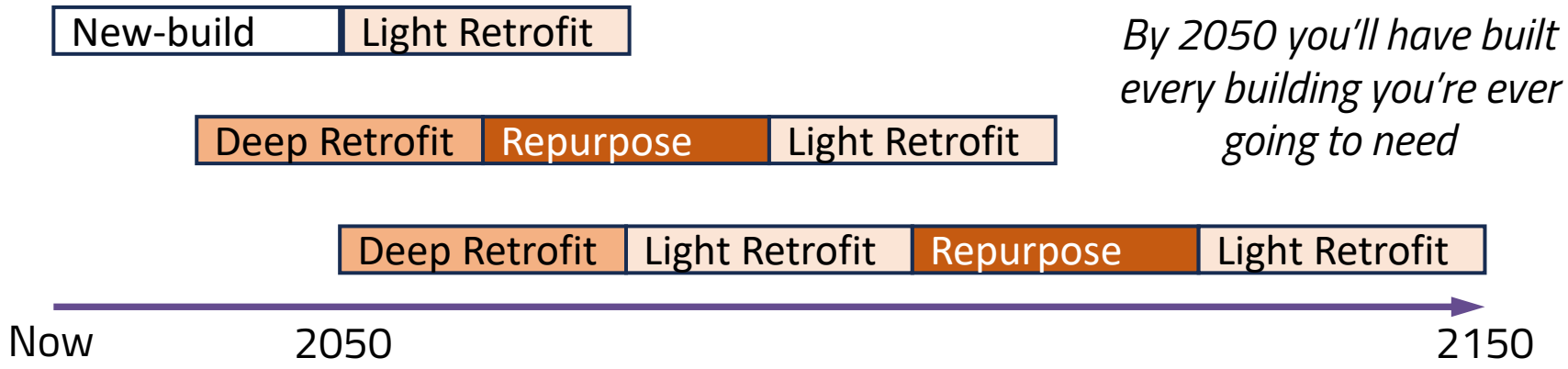
Direction

- Vision
- Priorities
- Mission
- Values

Enablers

- Student experience
- Prestige/market share
- Fundraising/ROI
- Learning/research excellence

Transitioning from the current medium-life (c.50yrs) to long-life (c.100yrs) buildings



By 2050 you'll have built every building you're ever going to need

For examples of useful, adapted long-life buildings, look at the listed register.

From now, consider <u>every</u> building to be a listed heritage asset with high intrinsic value

Risk minimisation

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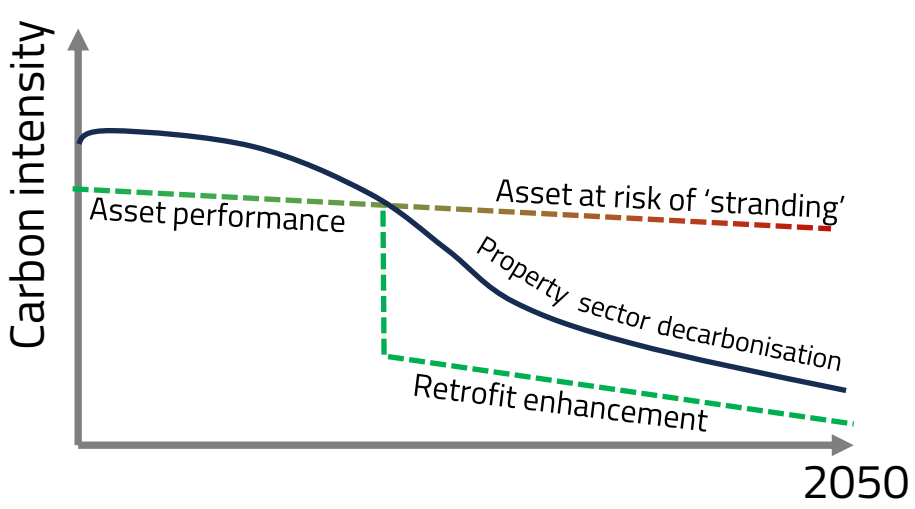
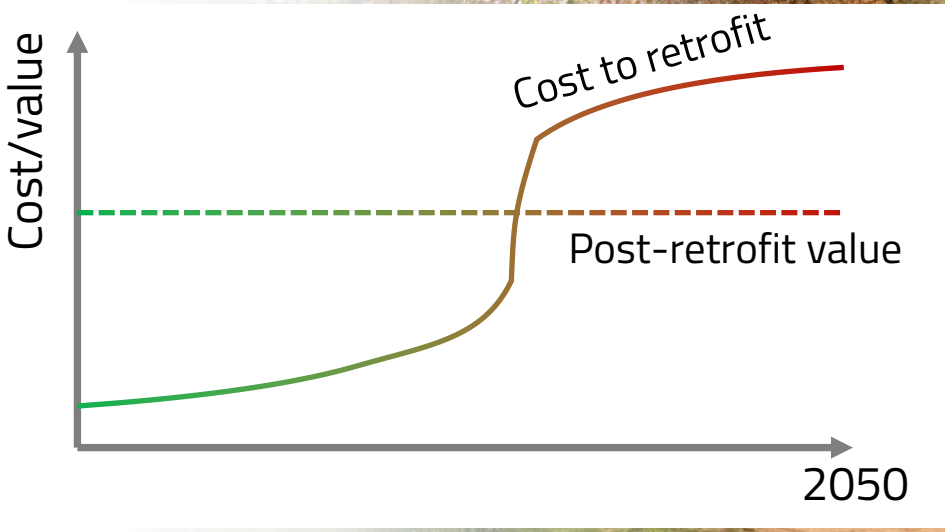
Decarb expansion (example)	Risk	Legacy expansion (example)
Exposure to volatile energy prices	Commercial	Capital project risk profile
Accused of greenwashing	Reputational	Tired-looking existing buildings
Carbon taxes or energy minima	Legislation	Embodied carbon
Heating/cooling failures	Operational	Increased maintenance costs
Decarbonisation costs too high	**Stranded Assets**	**'Tipping points' of feasible reuse**





ARUP

bufdg
british universities
finance directors group

HESPA
HIGHER EDUCATION STRATEGIC PLANNERS ASSOCIATION

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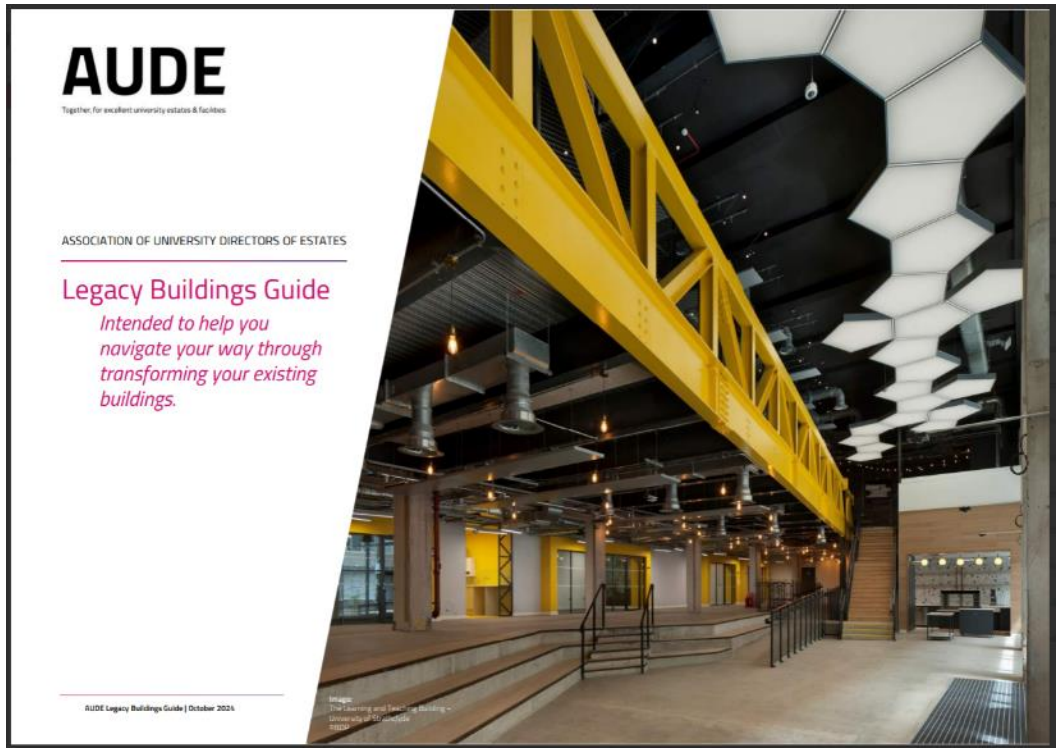

Combined recommendations

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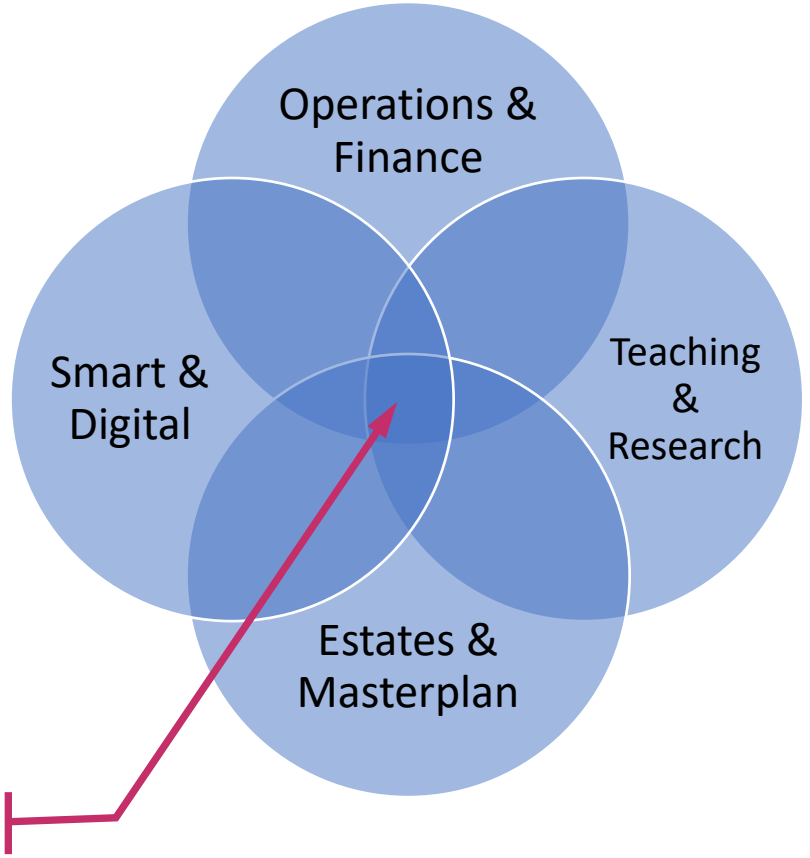
Decarb expansion	Core issue	Legacy expansion
Decarbonisation as a change programme that captures all corners of institution	**Act now** to improve over decades	Change briefing process and success factors of projects to embrace working with assets
Decarbonisation must expand out of Estates and be integrated with long-term strategies	Take an **integrated** approach	Compromises and restrictions inherent in refurbs require more careful future planning
Decarbonisation works provide a once-in-a-generation opportunity for a step-change	Chase all **co-benefits**	Balance condition, maintenance load, reputation, operational cost improvements
Simple payback periods don't capture the whole picture of operational improvements	Understand impact of '**do nothing**'	Both risks of shocks (failures) and stresses (flexibility/utilisation) & direct cost increases
Emissions savings can come from unlikely (and unglamorous!) places	Make **evidence**-based decisions	Whole-life carbon accounting must inform decisions
Future legislation and expectations will change faster than can be reacted to.	Plan for **changes** in circumstances	Grid decarbonisation is chancing the embodied/operational balance

Integration across strategies

Strategy/Plan	Decarbonisation	Condition	EDI	Wellbeing	Biodiversity	Reputation	Experience	Operational cost	Resilience
Operations/Finance	2nd	2nd	2nd					1st	
Teaching/Learning						1st	1st	2nd	
Estates & Masterplan	2nd	1st	1st	1st	2nd	1st	1st	1st	2nd
Smart & Digital Campus	2nd		2nd	2nd	2nd	2nd	1st	2nd	2nd
Decarbonisation Plan	*1st*		*2nd*	*2nd*	*2nd*	*2nd*	*2nd*	*1st*	*2nd*



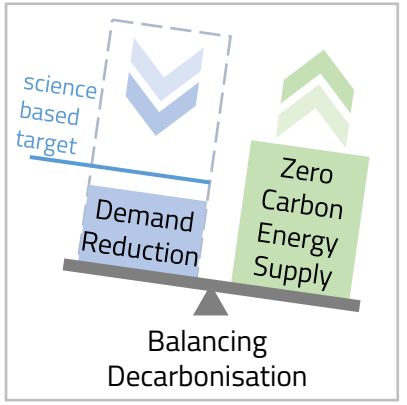
Retrofit vs decarbonisation?

	Cost	Embodied carbon	Retrofit needs	Co-benefits
Decarb-led	Hard to justify against 'do nothing' due to **long paybacks**	**Hard to justify** carbon 'spend' due to long payback times	Retrofit **might not be targeted** to happen in the right and time	**Aligned but secondary** so potentially missed or VE-d
Retrofit-led	Decarb cost is a **small uplift** on already-essential projects	**'Spend' is highly efficient** compared to building new	Retrofit priorities are **central to the program** throughout	**Integral to the purpose** and success criteria of each project
Operational co-benefits	Reduced energy and maintenance costs	Greater insulation from future legislation	Condition issues directly addressed	Targeted co-benefits to target operations

Can you afford to decarbonise your buildings and campus?

Can you afford **not** to improve the condition of your buildings to enhance student experience and wellbeing? So you might as well decarbonise at the same time.

Separating supply and demand



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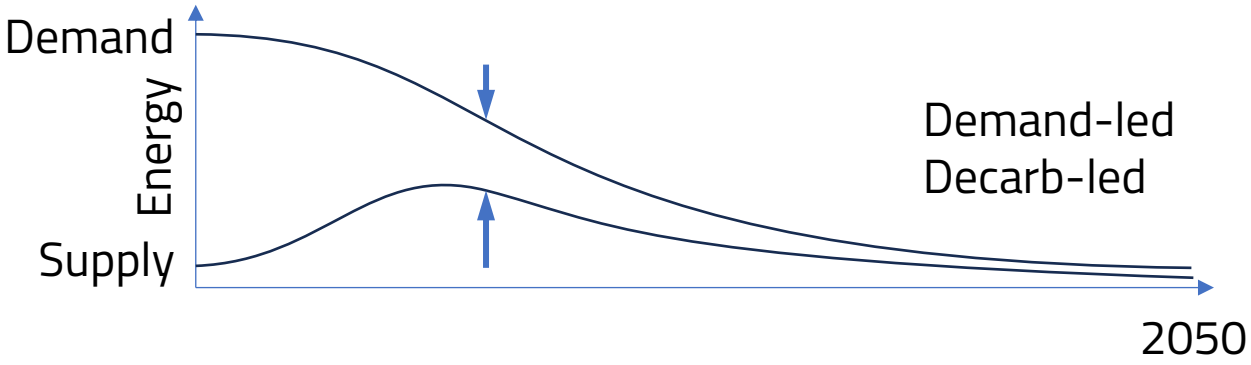
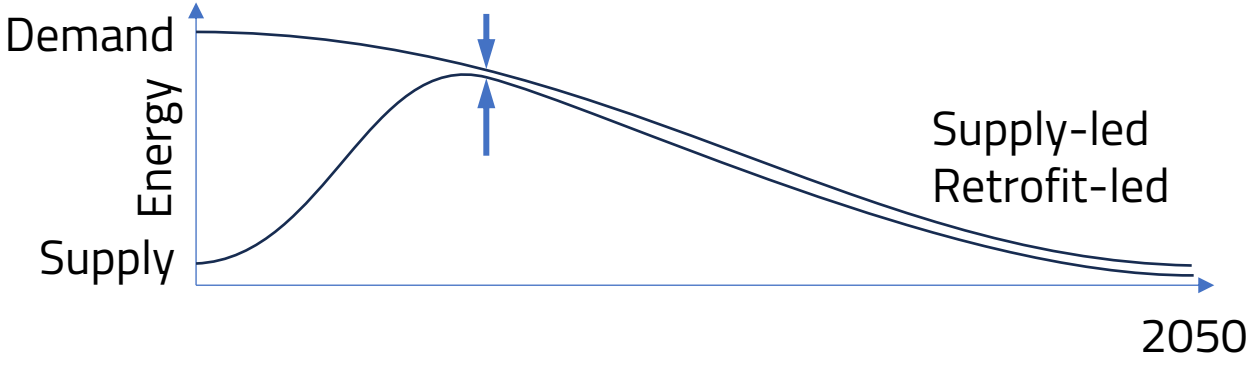


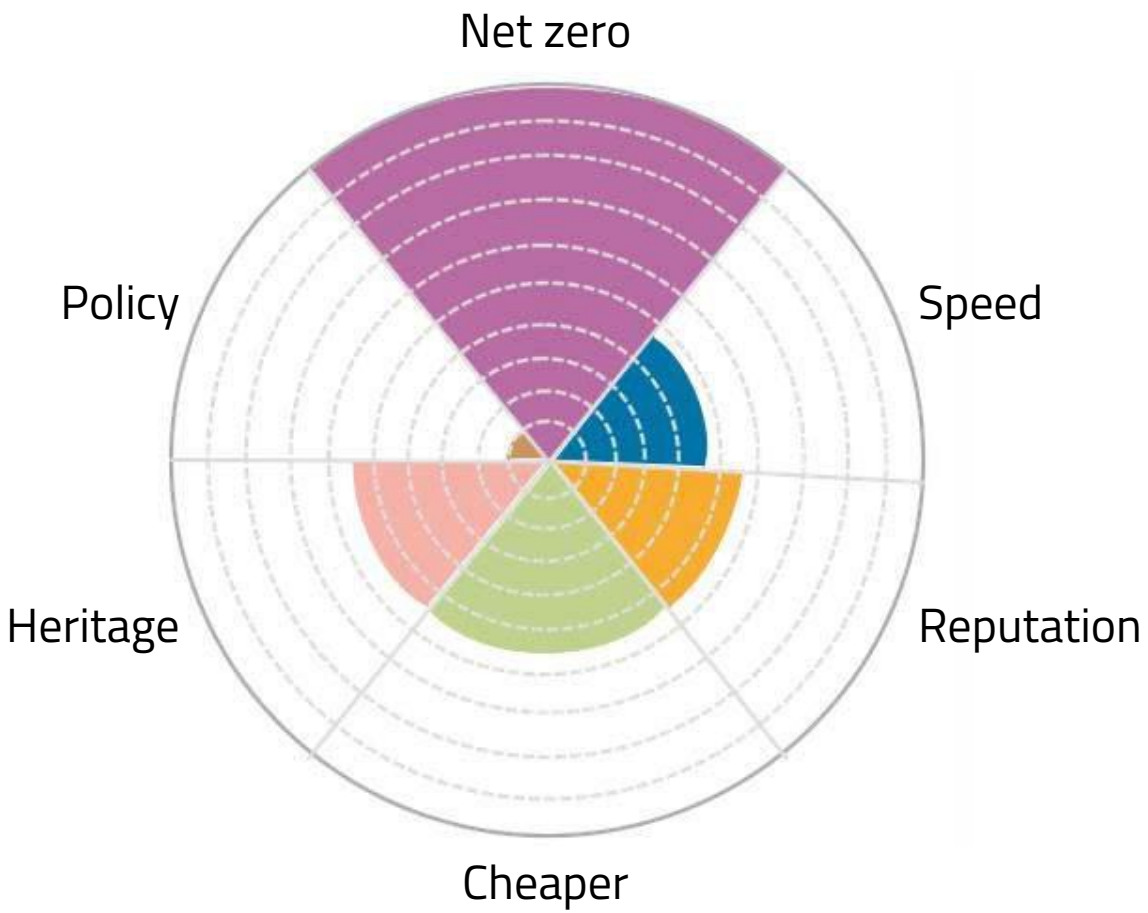


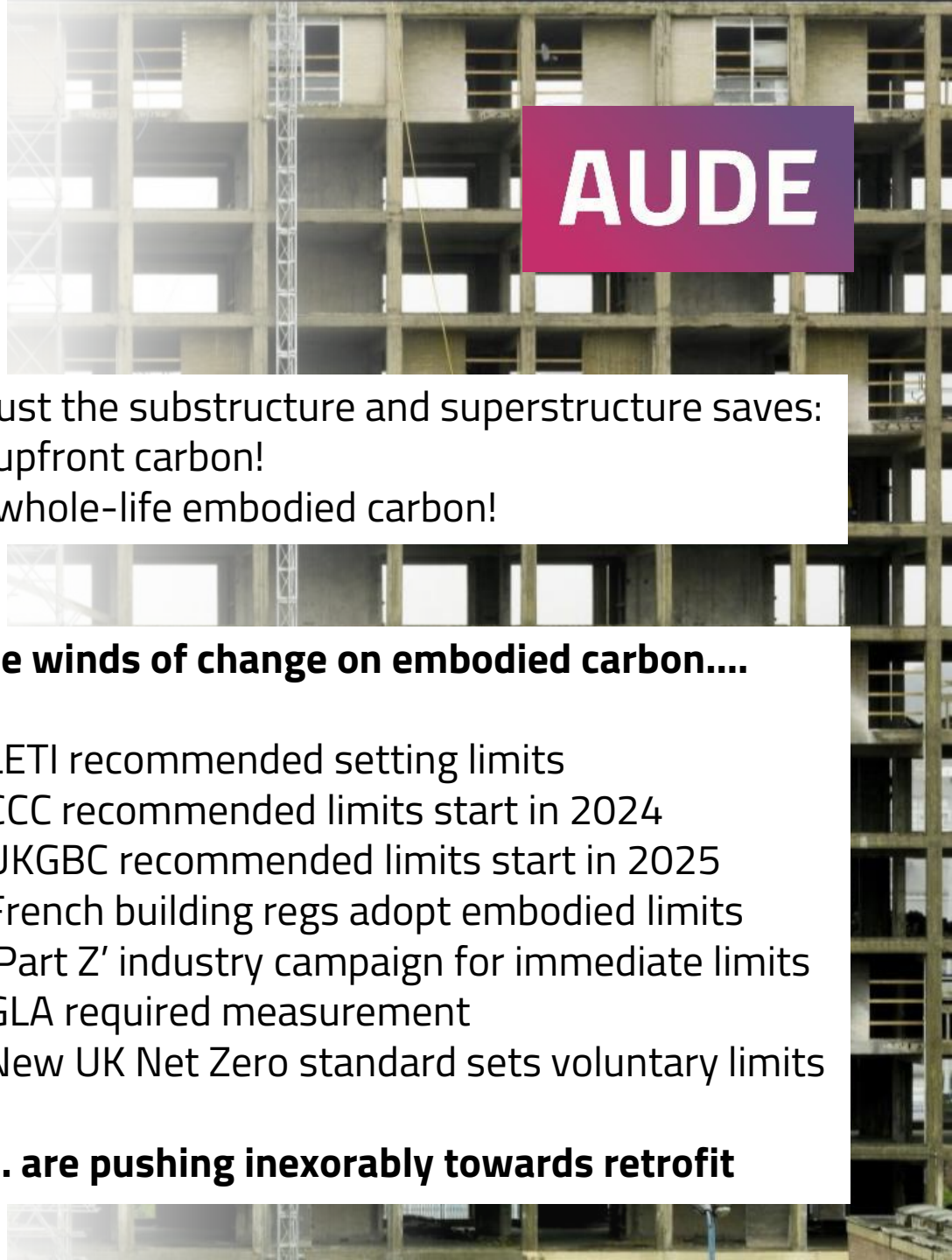
Demand-led – Decarb-led		Supply-led – retrofit-led
Decarb-led actions CapEx restricted	Demand	Interventions are **retrofit-led** and gradual
CapEx **restricted** due to demand measures	Supply	**Prioritised** and independent of demand
Often **self-funded**	Funding	Often **3rd party** supply agreements
Slower net decrease	Emissions	**Faster** net decrease
Risks decision-paralysis	**Palatability**	**Easy to see the way forward**
£250m over 25 years	Perceived costs*	£17m over 25 years

* Perceived costs are from real example of different options on recent Decarb Plan. Supply-led costs exclude gradual retrofit costs (as they're essential for operations) and energy supply solutions (funded by 3rd party)

The opportunities in retrofit
(and it's coming anyway!)

Current benefits





Keeping just the substructure and superstructure saves:

- **63%** of upfront carbon!
- **49%** of whole-life embodied carbon!

The winds of change on embodied carbon....

2017: LETI recommended setting limits
2019: CCC recommended limits start in 2024
2021: UKGBC recommended limits start in 2025
2021: French building regs adopt embodied limits
2022: 'Part Z' industry campaign for immediate limits
2022: GLA required measurement
2024: New UK Net Zero standard sets voluntary limits

.... are pushing inexorably towards retrofit

Timing your retrofit

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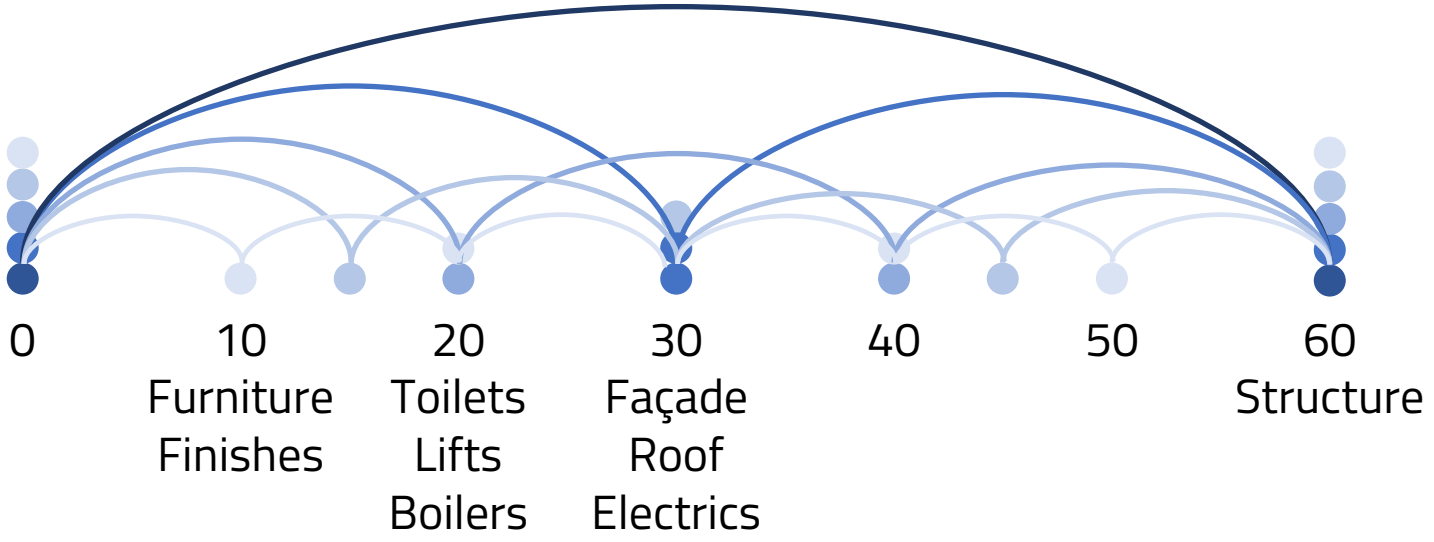
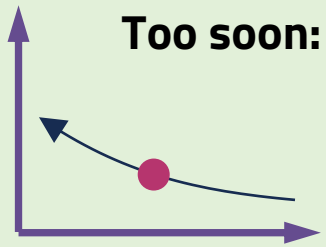
Theory:
"Optimise based on lifecycles"



Reality:
"It needs to be when we need it"

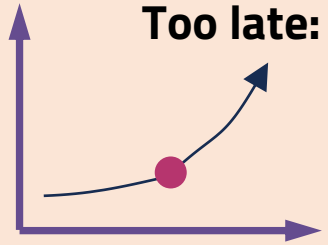


Too soon: Downsides seen are **very gradual**

'Wasted' embodied carbon

e.g.

Greater annual investment



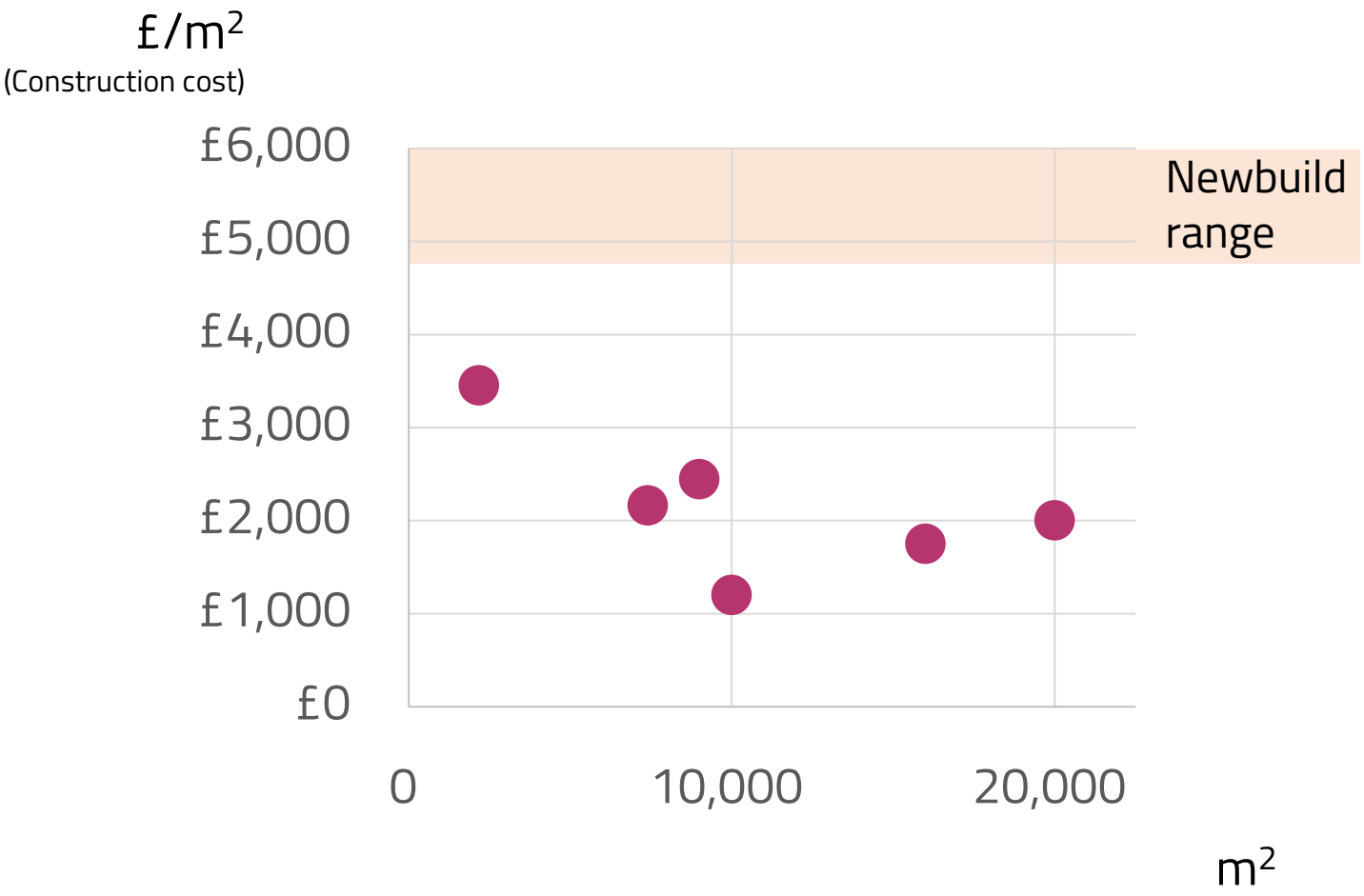
Too late: Downsides grow **exponentially** &/or with **tipping-points**

Higher maintenance costs

e.g.

More complex retrofit

Retrofit is cheaper than new-build



All examples involved:

- architectural,
- facades,
- structural and
- building services interventions

* Data points on the graph are drawn from the area and construction cost of case studies within the AUDE Legacy Buildings Guide. New build range based on University of Liverpool recent experience.

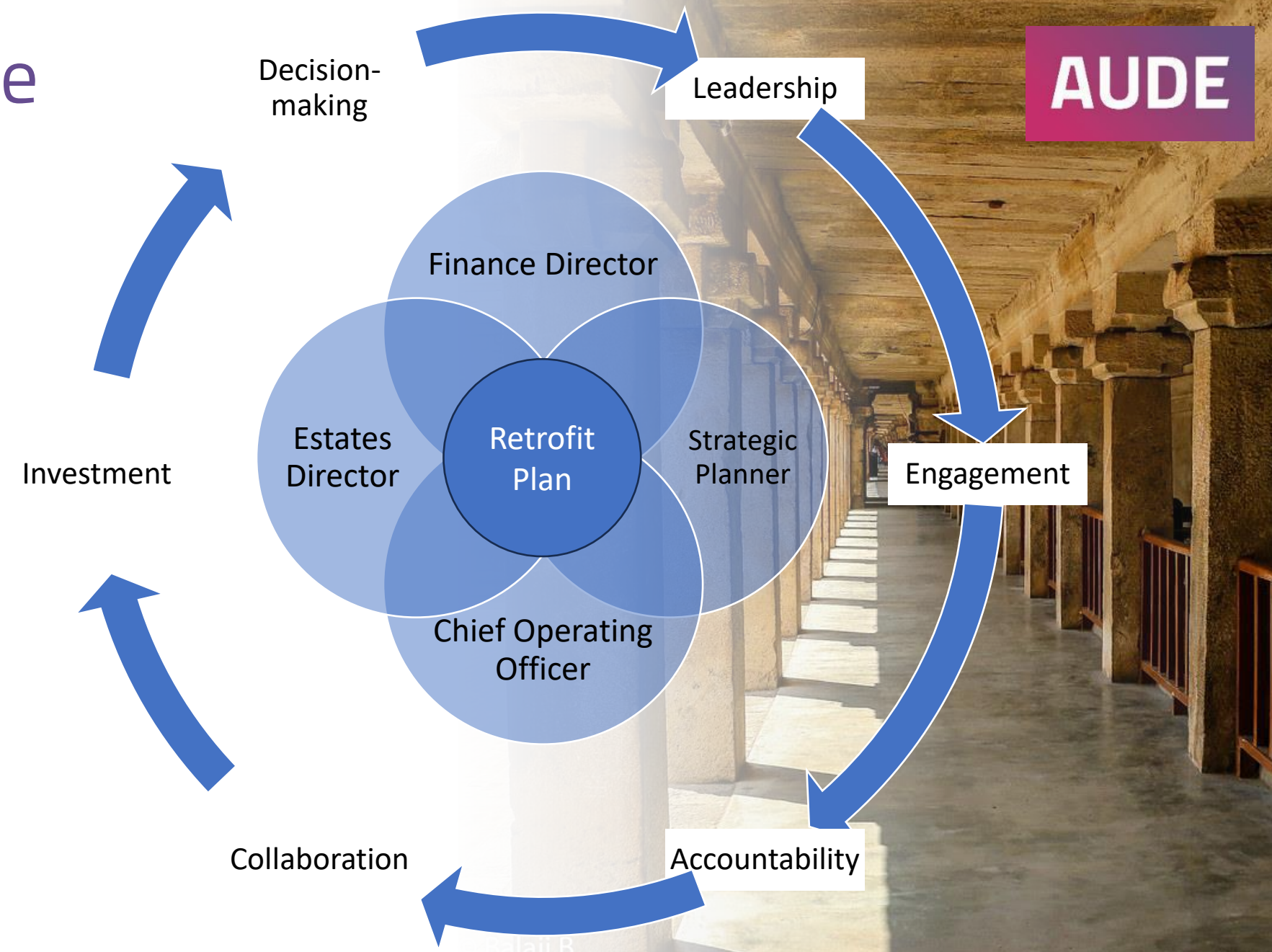
Governance

A '**One University**' mentality

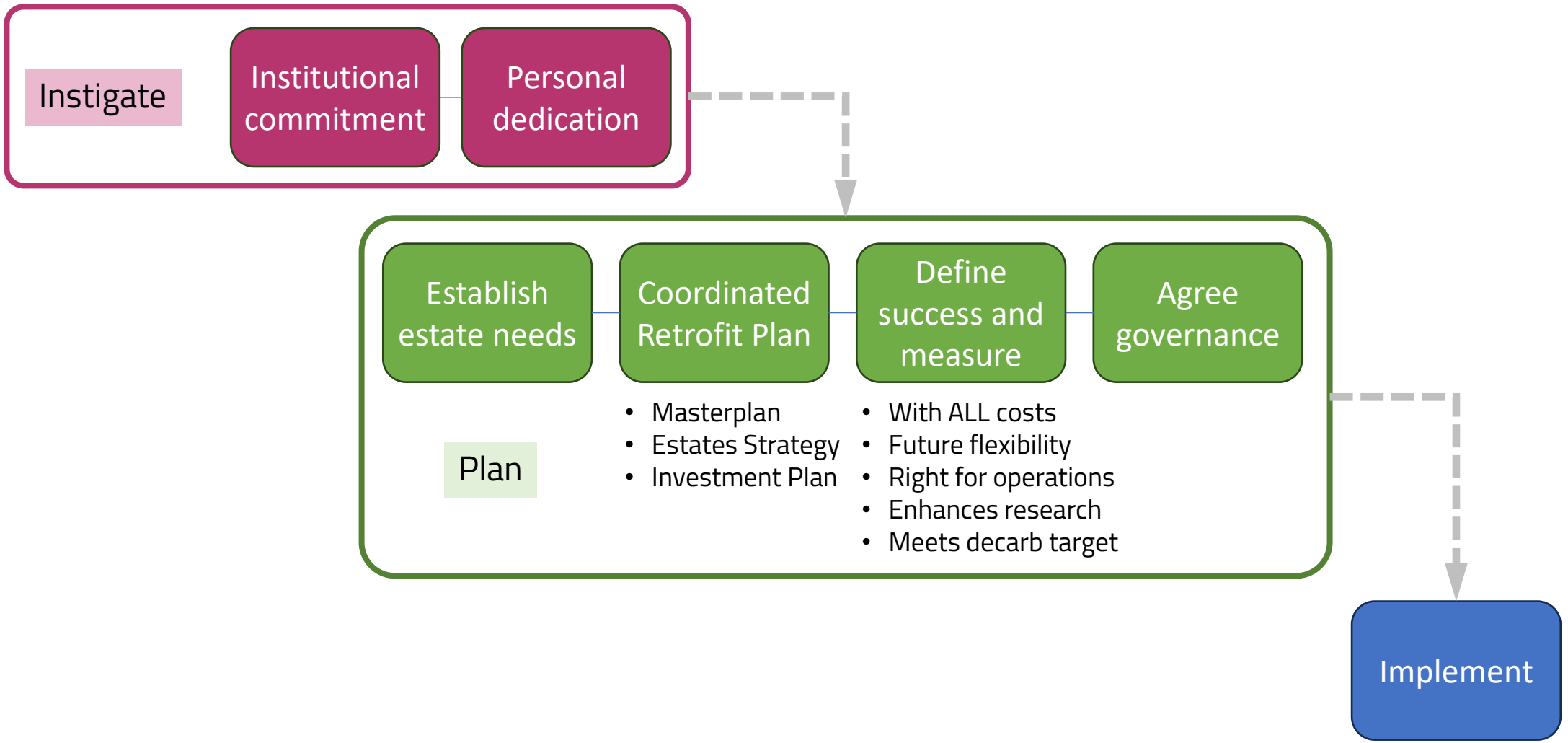
Connection across
- Planning
- Construction
- Operations
- Maintenance

For seamless benefits

Otherwise reducing one increases the others.



A route-map for the future



Retrofit or decarbonisation?

Retrofit your legacy;
decarbonise your future

Call to action:

- Pursue institution-wide buy-in to ‘One University’ approach
- Establish governance structure
- Investigate decarb-led vs retrofit-led
- Create coordinated plan

And finally…

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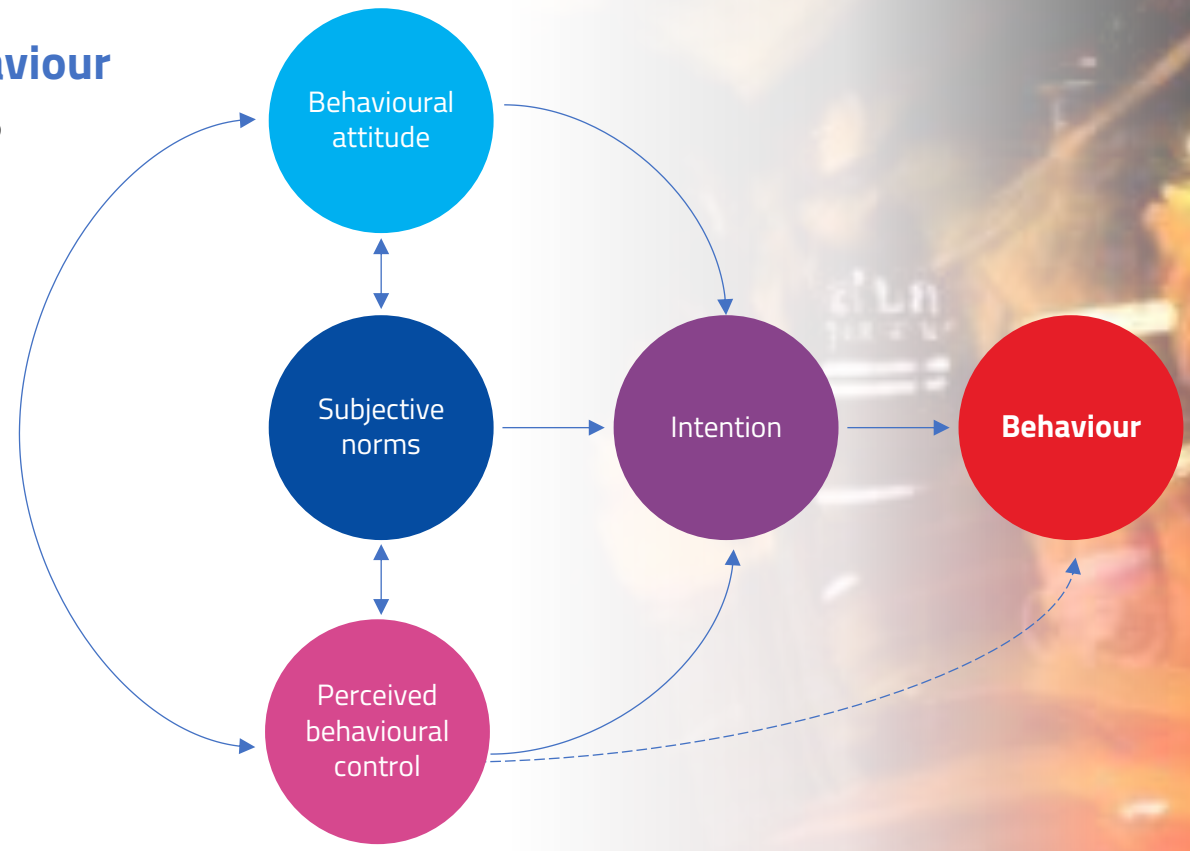
Steering Groups, Cross-Discipline Teams etc.
are all just collections of individual, illogical, fallible humans.
So…

Theory of planned behaviour

Do your teams want to?

Are they expected to?

Are they able to?



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