

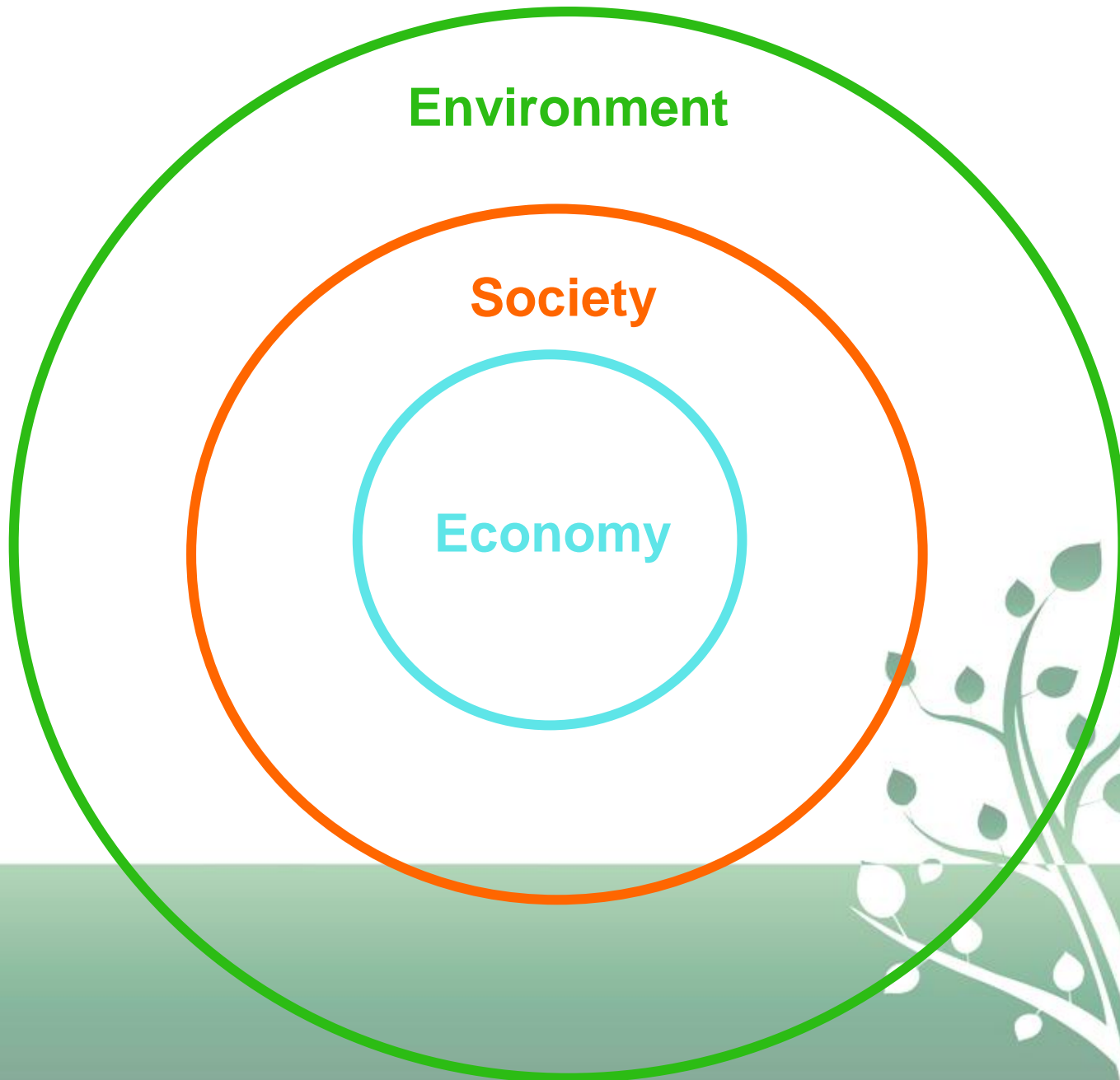
# **The Green Deal**

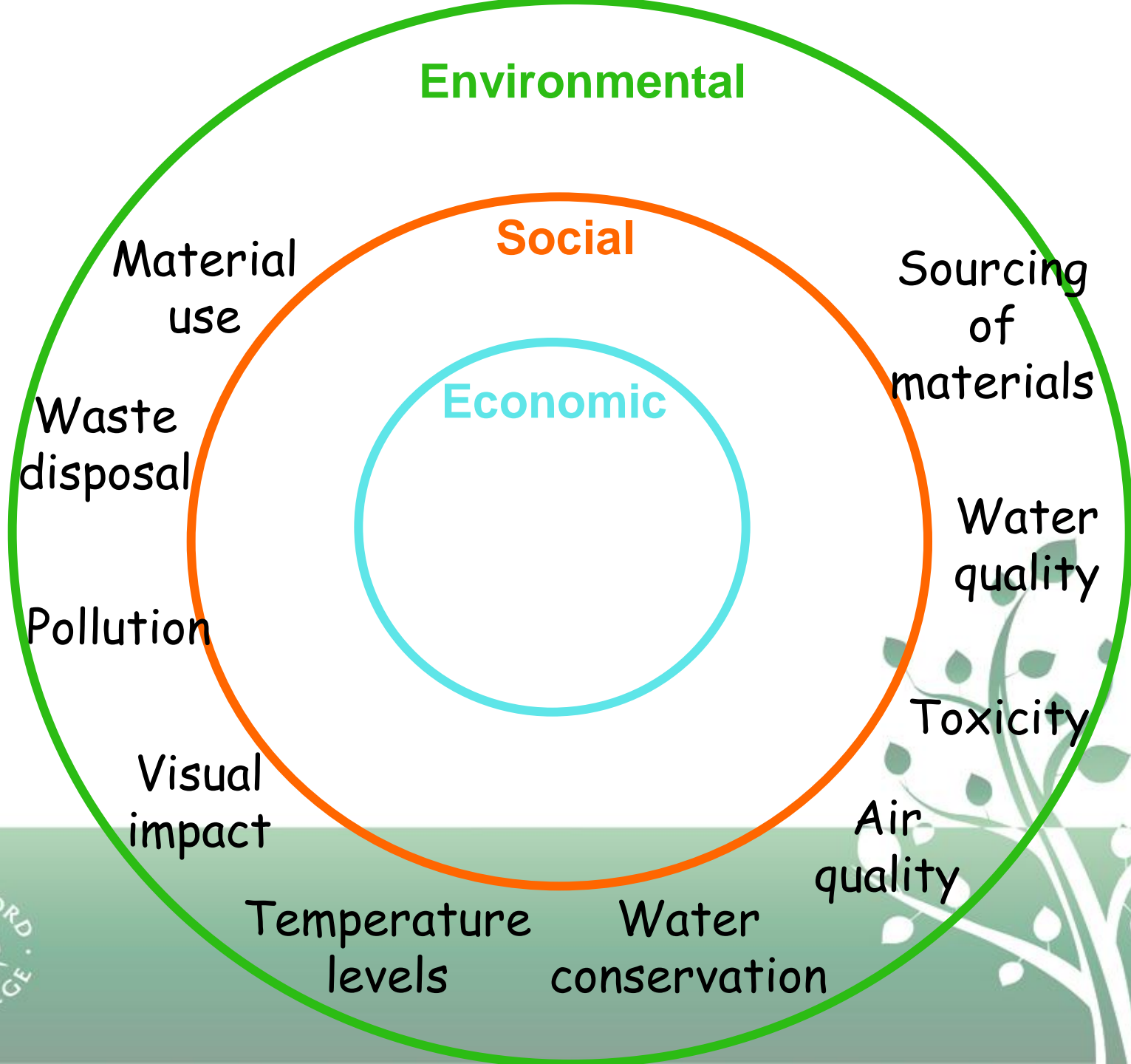
## **Low Carbon Retro-fit of Buildings**

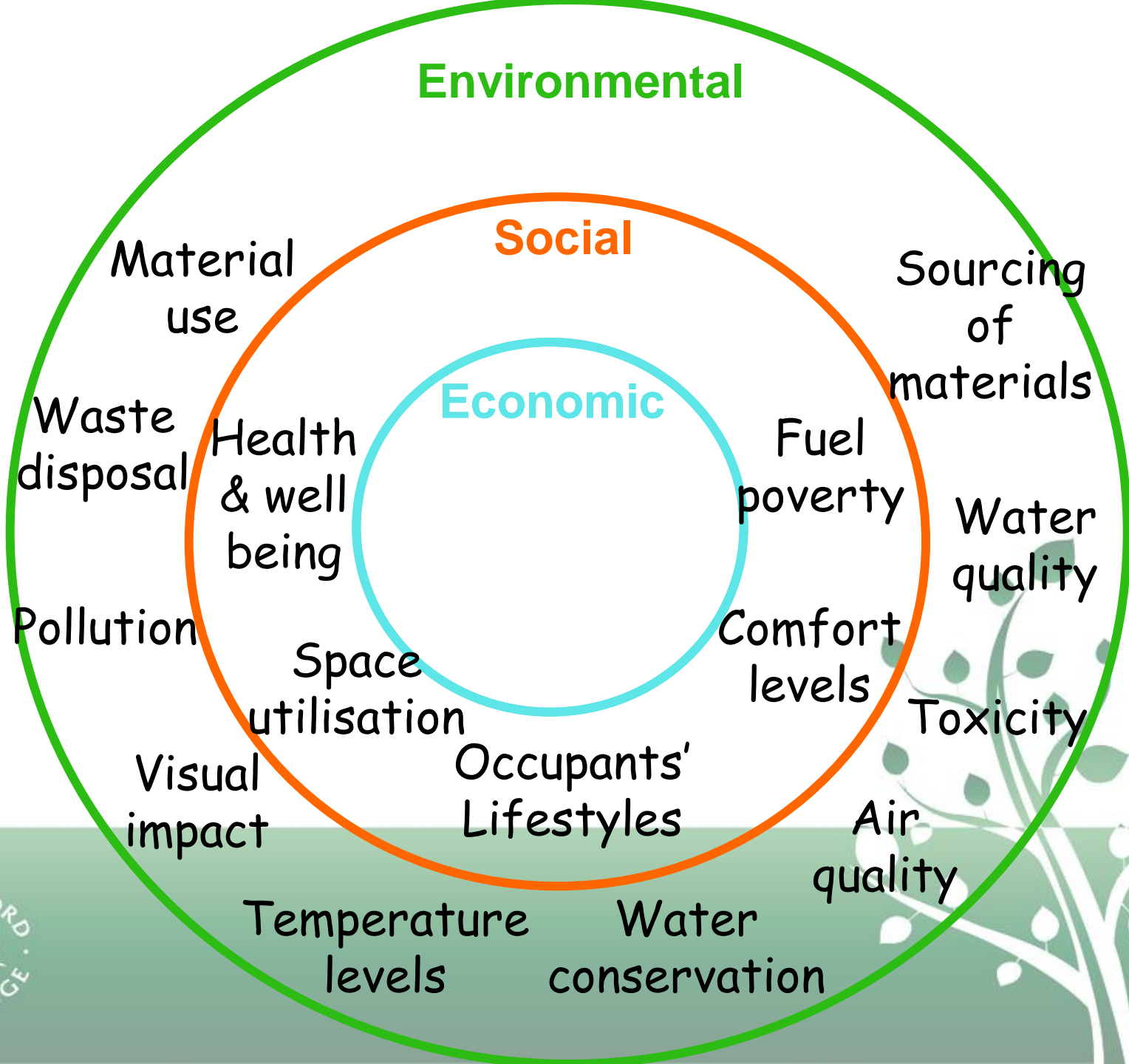


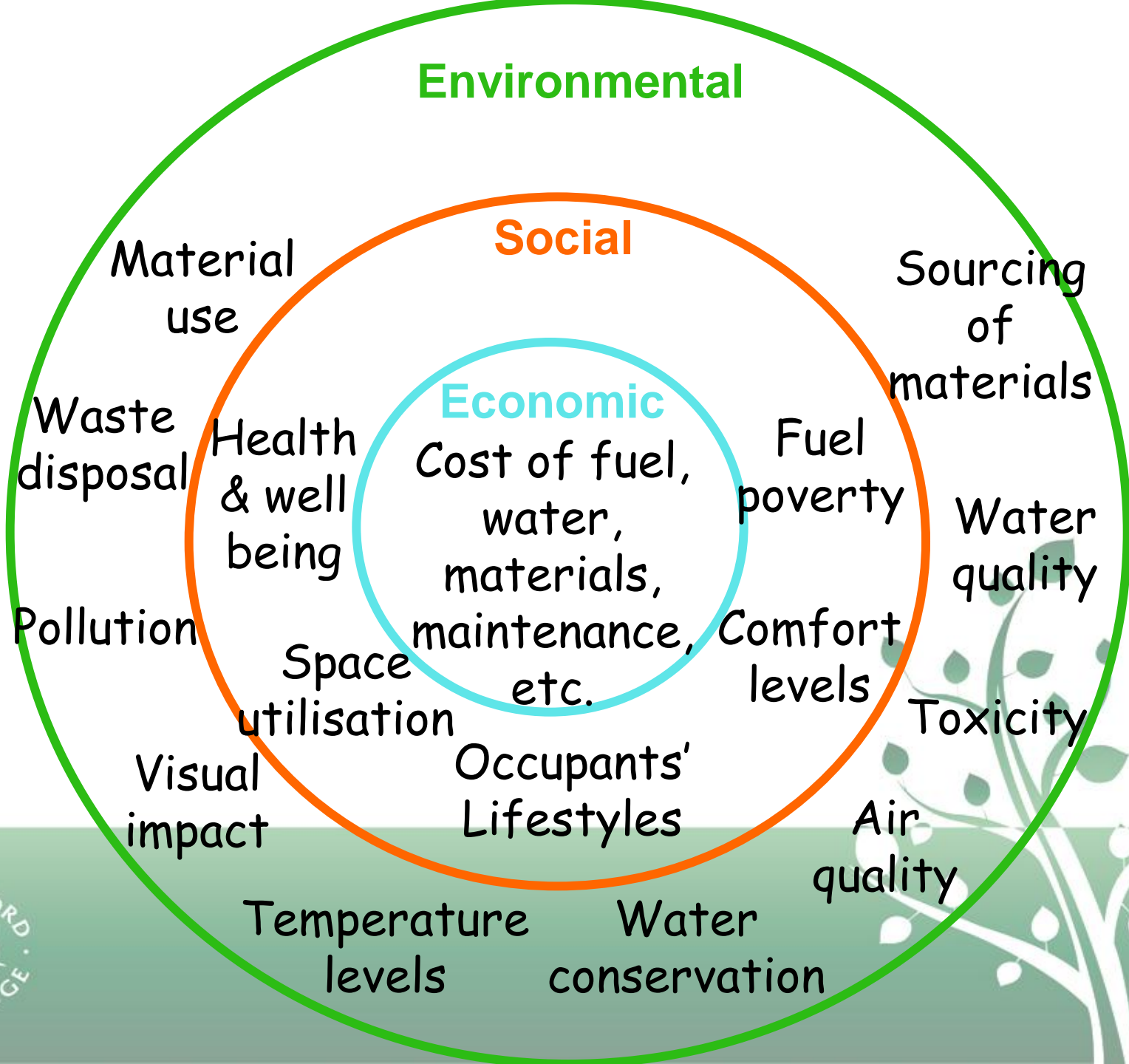
# Presentation Overview

- Impact of the environmental performance of buildings on the social and economic well-being of their occupants
- An overview of the UK buildings
- Energy efficiency measures
- Retro-fit technology examples from Bedford College's Brundtland Building
- Benefits and issues relating to the listed technologies











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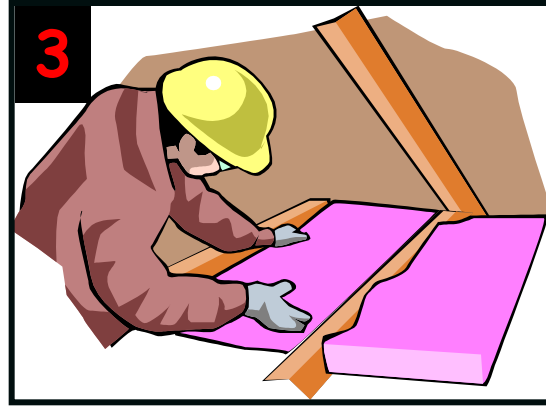
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# Energy Efficiency Measures

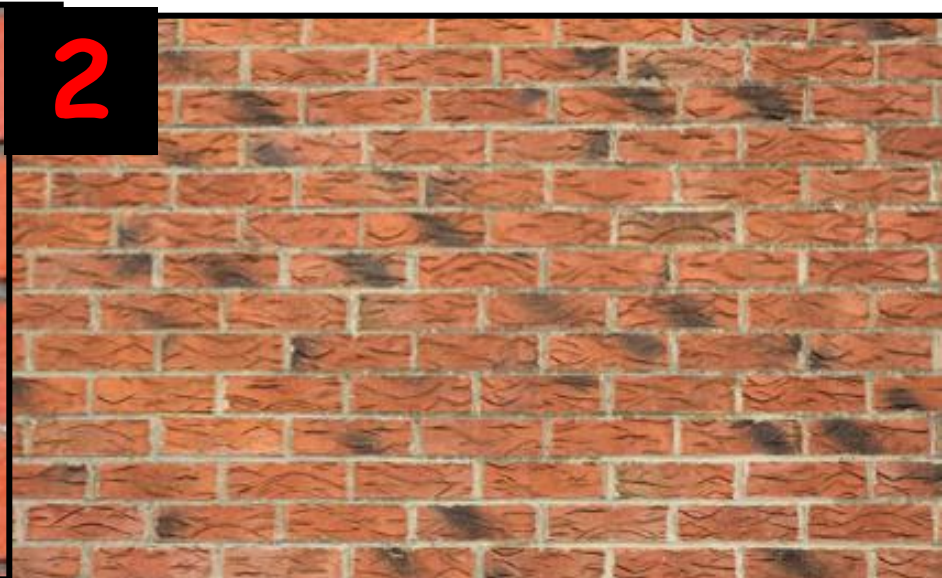




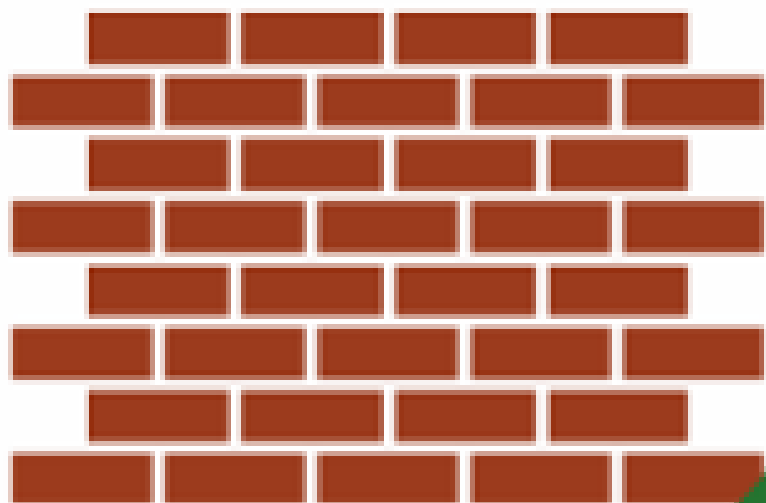
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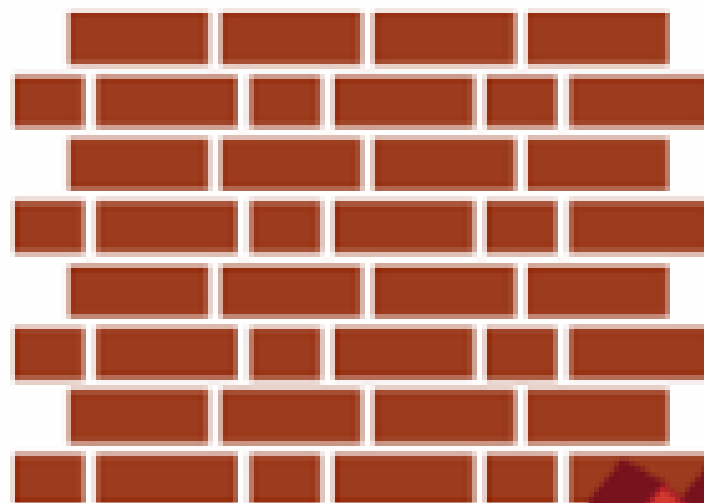
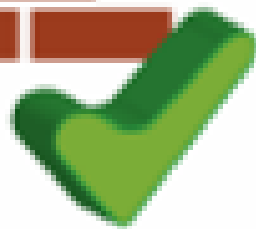
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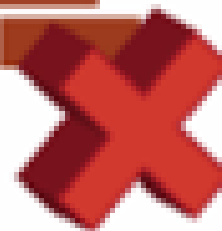
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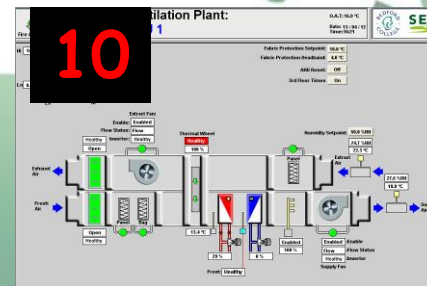
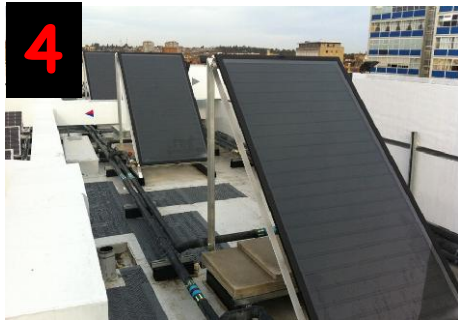
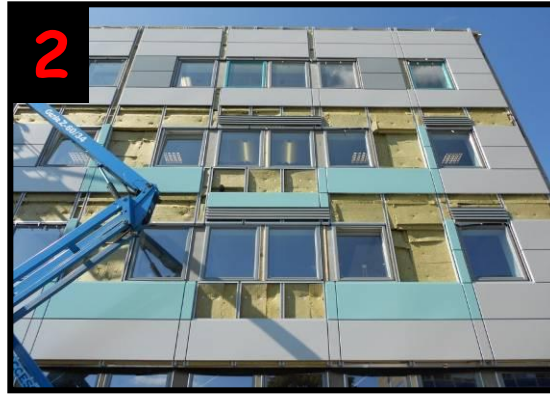
Cavity Wall



Solid Wall



# A Selection of Low carbon Retro-fit Technologies Installed in Bedford College's Brundtland Building



Technology	Payback Time	Key Benefits	Areas for Concern
Aluminium Rain-screen cladding and double glazing	n/a		
Rainwater Harvesting	266 yrs		
Wind Turbine	16 years		
PV Panels	8 years		
Solar Thermal Panels	18 years		
Building Management System	24 years		
Energy Efficient T5 Lighting	19 years		
Intelligent Lighting Controls	9 years		



<b>Technology</b>	<b>Key Benefits</b>	<b>Areas for Concern</b>
Aluminium Rain-screen cladding & double glazing	Energy savings & improved thermal comfort	Insulation traps heat Will not pay back
Rainwater Harvesting	Reduction in water use	Will not pay-back
Quiet Revolution QR5 Wind Turbine	Vertical axis turbine is suitable for urban location	Will only work on windy days
Solar Photovoltaic (PV) Panels	Energy savings and FIT income	End of life waste disposal concerns
Solar Thermal Hot Water Panels	Energy savings and RHI income	Only 3 solar thermal panels for a large building.
Building Management System	Provides real-time performance data for installed technologies	Many technical issues with the system taking a while to resolve
Energy Efficient T5 Lighting	Energy savings	LED is a more energy efficient option (but more costly)
Intelligent Lighting Controls	Lights turn off automatically	Lights turn on when someone walks in, even if not needed



# Thank You



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