

Do More With Less

An Architecture of The Climate Emergency That is Enriching Yet Resourceful & Lean

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“The summer of 2023 was the warmest ever recorded in Greece, and it may represent the “normal” summer of the future”

“According to the Greek Foundation of Economic and Industrial Research, it is estimated that Greece’s GDP could suffer a cumulative loss of €700 billion by 2100, if no measures are taken to prevent and adapt to climate change

Charalampos Giannikopoulos, D-Carbon

Extracts from ‘Greece in the Era of resilience and climate change’
27th March 2024

“Climate change is a global problem needing global solutions - and that requires the very best minds to come together. We’ve been leading mainstream sustainability in the UK for over 30 years and are keen to spread that knowledge globally by collaborating with the best locally.

Julian Lipscombe, Bennetts Associates
Ready-Steady-Greece Webinar



View from the roof of our Syggrou project

Our Sustainability Objectives in Greece

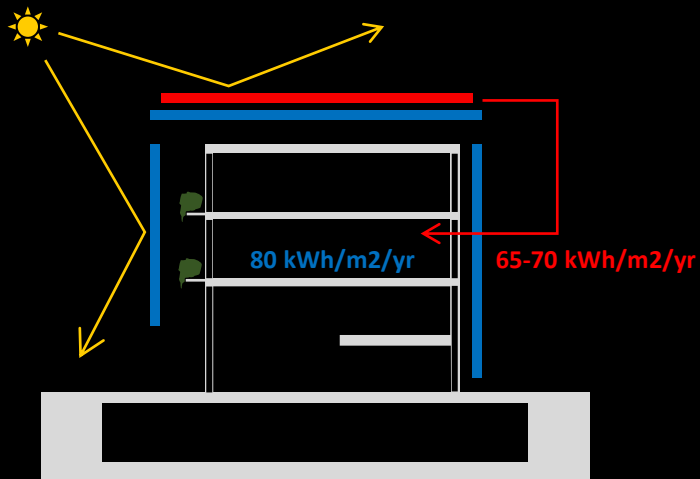
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- ‘Athenian’ spirit rooted in context, heritage, materiality and climate
- New standards for sustainability
 - passive design & max 40% glass
 - ‘3Ss’ & ‘parasol principle’
 - carbon-responsible materials
 - ventilation strategy innovations
- LEED Platinum
 - ‘Gold’ original target
 - collective effort
- Issues
 - shading design & sub-optimal VE
 - all-concrete structure
- Not perfect – but a good first step



Reflections on Syggrou

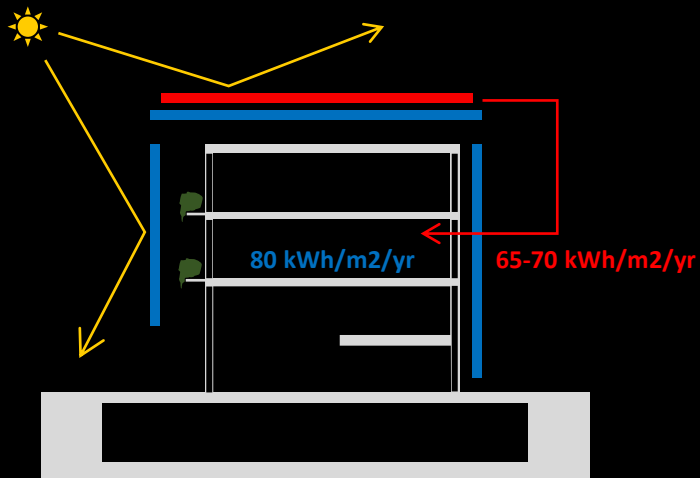
- Harnessing the Greek climate
- Exploring steps towards what a Net Zero Carbon Greek building might be
- Aspiration to be energy self-sufficient



Harnessing Your Climate

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- 'Parasol Principle' and 'Super-Roof'
- Exploring steps towards what a Net Zero Carbon Greek building might be
- Expressing layers to create a tapestry of Geometry, Shadows and Nature



Harnessing Your Climate

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- Anatolia College, Thessaloniki
- Reimagining of the College estate
- Strong existing College commitment to sustainability



Sustainability as Educational Tool

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- Sustainability made more evident in reimagined campus
- Educating the leaders of the future about sustainability with the campus as educational tool

Energy Strategy

- High resolution energy monitoring and smart controls
- High efficiency ventilation systems with heat recovery and demand control
- Virtual servers to reduce on-site energy demand
- Provision for future connection to district heat network
- All electric vehicles on site
- Free cooling systems minimise active cooling requirements
- PV farm close by to power up the masterplan
- Heat pump system with energy recovery
- Energy storage for demand side response to support future decarbonised UK grid

A key aim of the masterplan is to ensure a highly efficient energy strategy in line with the client aspiration and best practice. The strategies listed above illustrate the key measures to ensure an energy-efficient smart masterplan.

Sustainability Imperative & Inspiration

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Climate Resilience and Circular Economy

- Low embodied impact prioritise responsibly sourced, recycled and reused materials
- Design for life and consider the buildings end of life
- Integration of low flow fixtures and fittings and explore water recycling
- Integration of sustainable urban drainage
- Flexibility, adaptability and longevity of the space to adjust to future changes
- Sustainable food generation on site
- Reuse and repurposing of existing materials within public realm
- Minimise construction and operational waste

Climate resilience and future adaptation is a crucial part of the overall sustainability strategy for Anotolia College. Design for flexibility and longevity will strengthen the future development of the masterplan in line with sustainability principles such as circular economy, waste and water resilience.

Sustainability Imperative & Inspiration

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Social Value and Placemaking

- PEOPLE
- Community Engagement to reflect population diversity and provide voice to locals
- Place Making to create a quality place for the people and local community
- Safety and Security to ensure a safe environment for the staff and the local population
- Create equitable, carbon positive place that enhance the environment and enable communities to be safe and flourish
- Public Amenity areas with enhanced inclusion and accessibility principles
- Connection with Nature through a high-quality external space with enhanced greenery and microclimate
- Heritage and Culture to enhance the character of the local areas
- Support Local Economy to facilitate multiple uses in different times through the day and year

The strategies listed are to enhance the social value and placemaking impact of the masterplan for the student, staff and neighbouring community. The culture of the school is significantly linked with the community; the sustainability strategy aims to highlight this connection via the projects design.

Heritage and inclusion, connection with nature, safety and security are crucial items of the College's culture and design; the proposed masterplan focuses on optimising and enhancing them to ensure students will be living in an inclusive and safe environment with a strong sense of community.

Sustainability Imperative & Inspiration

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Health and Wellbeing

- Biophilia plan to incorporate nature into the design
- Design that supports post-covid flexible work patterns
- Prominent walkability within the masterplan
- Microclimate control to enhance comfort in outdoor areas
- Air and noise pollution reduction from the main road
- Shading devices to control heat gains and glare
- Car free masterplan reduce traffic with only supply vehicle on site

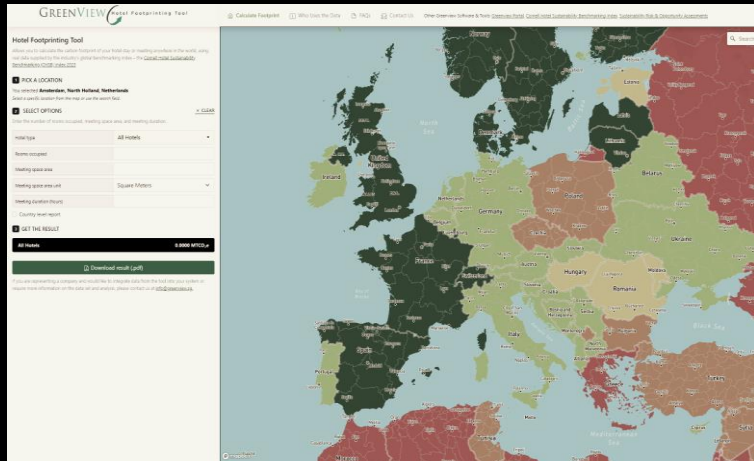
Wellness is at the heart of the proposal for the masterplan. The landscape and architecture of the proposal masterplan is in line with the principles identified above to ensure a healthy environment for students.

Sustainability Imperative & Inspiration

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Sustainability as Educational Tool

- Increasing customer pressure for environmentally responsible tourism
- Hotel sector accounts for 1% of global carbon emissions
- First major NZC hotel in UK



Eco-Hospitality Exemplar

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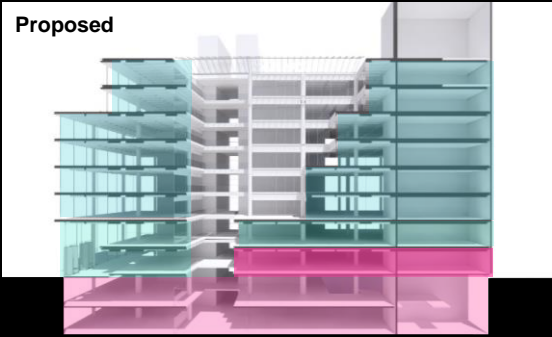
- Incremental measures to meet exacting Embodied and Operational carbon targets
- Exploring what an NZC hotel looks and feels like



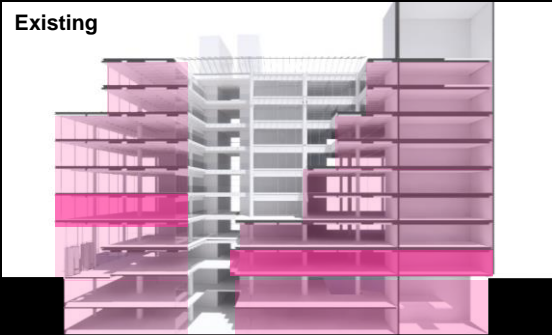
Eco-Hospitality Exemplar

- Character, fabric and energy transformation in live national news broadcast facility

Proposed



Existing



Retrofit & Rework

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Embodied Carbon

Benchmarking typical office buildings

There are few embodied carbon benchmarks for India. Edge Buildings provide indicative benchmarks for typical buildings based on a research study undertaken with the EU. It includes A1-A3 embodied carbon which accounts for the material manufacture only.

431 kgCO₂e/m² (Edge Benchmark)
*A1-A3: Excludes: Substructure, Frame, Stairs, Ceilings, Services

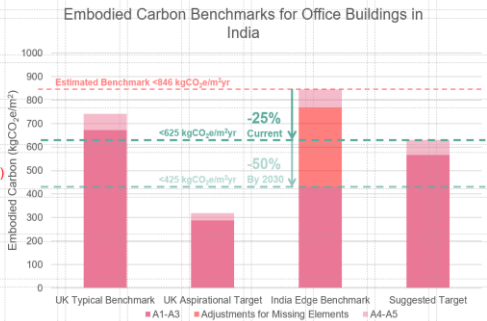
846 kgCO₂e/m² (Est. Full Benchmark)
*A1-A5 Estimated with adjustment for missing elements

600 kgCO₂e/m² Est. target current
Based on reducing to 425 kgCO₂e/m² by 2030



Data Source: BEE Energy Benchmarks https://www.beendia.gov.in/sites/default/files/Flyer_22nd%20Jan.pdf

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Operational Carbon

Benchmarking typical office buildings

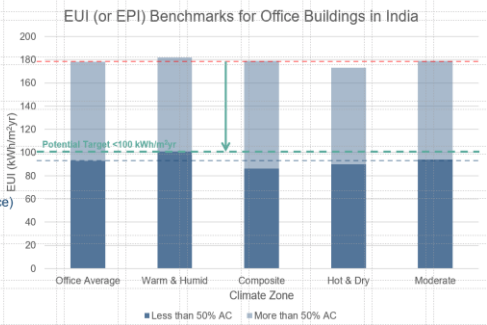
The Bureau of Energy Efficiency has collated a series of benchmarks by sector and climatic region for India. These are measures by the Energy Performance Indicator (EPI) metric which is equivalent to Energy Use Intensity (EUI):

$EPI = \frac{\text{annual energy consumption in kWh}}{\text{total building area (excluding unconditioned basements)}}$

180 kWh/m²yr average (AC Reliant)

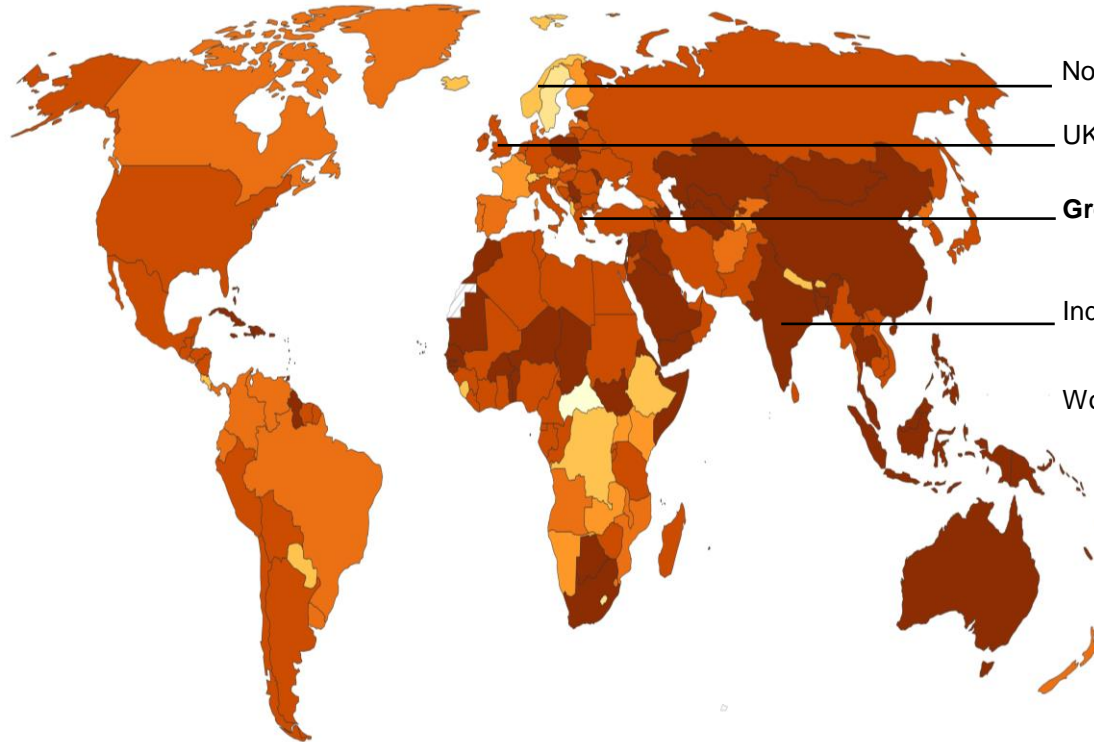
95 kWh/m²yr average (Low AC Reliance)

100 kWh/m²yr suggested target



Data Source: BEE Energy Benchmarks https://www.beendia.gov.in/sites/default/files/Flyer_22nd%20Jan.pdf

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Norway: 26 gCO₂e/kWh

UK: 270 gCO₂e/kWh

Greece: 344 gCO₂e/kWh

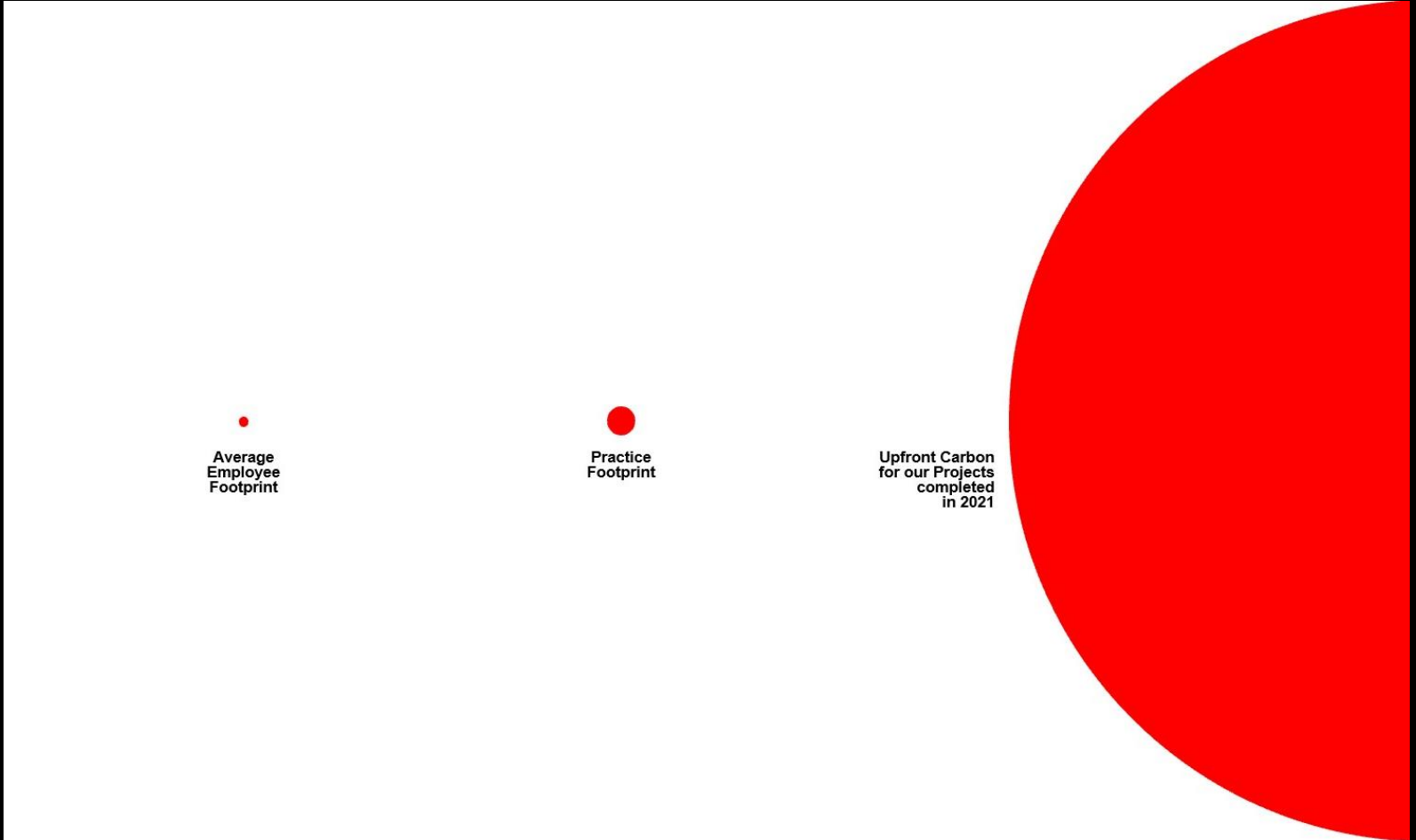
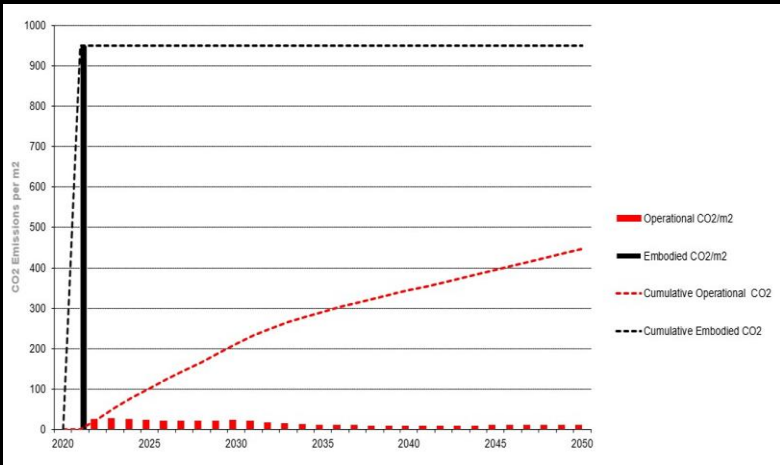
India: 637 gCO₂e/kWh

World Av: 433 gCO₂e/kWh

Global Carbon Intensity of Electricity 2021 (UoOxford)

Establishing Carbon Benchmarks

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What Next?

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