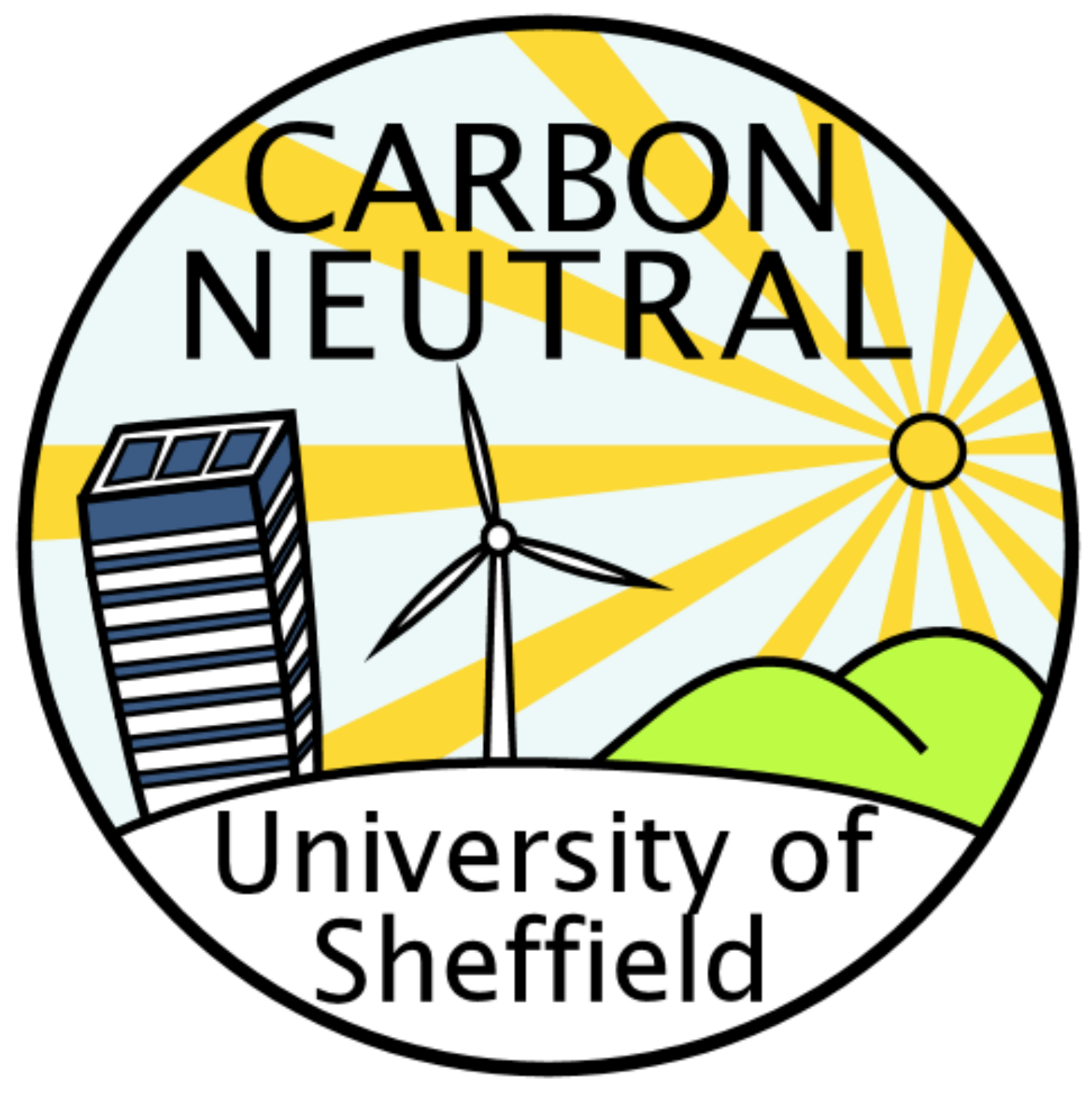


The Carbon Neutral University Network

A Local Solution to the Climate Crisis

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Connect the University community
Provide Sustainable solutions
Hold the University to account

Motivations

There is no longer any scientific doubt that man-made CO₂ emissions are driving global warming. The UK has the **highest** cumulative emissions per capita **in the world**¹.

"The EU needs an across the board reduction of over 80% by 2030 if it is to make its fair contribution to avoiding the 2°C characterisation of dangerous climate change."

Professor Kevin Anderson, Tyndall Centre for Climate Change, Manchester

University of Sheffield academics have a long history of involvement in climate science. We have nobel prize-winning contributors to the IPCC, as well as innovators in sustainability across many fields, e.g., Project Sunshine, WindNet, E-futures, and so on. We have the knowledge, expertise, and resources to take on the bold challenge of becoming a Carbon Neutral University. Our group has published a paper² (paper I) outlining our vision of achieving this by 2025

The current University energy strategy³ aims for a 43% reduction in 3 years, and an 83% reduction by 2050 (Figure 1), as dictated by HEFCE targets. Figure 2 shows carbon emissions scenarios by which global warming may be restricted to the internationally agreed 2°C target.

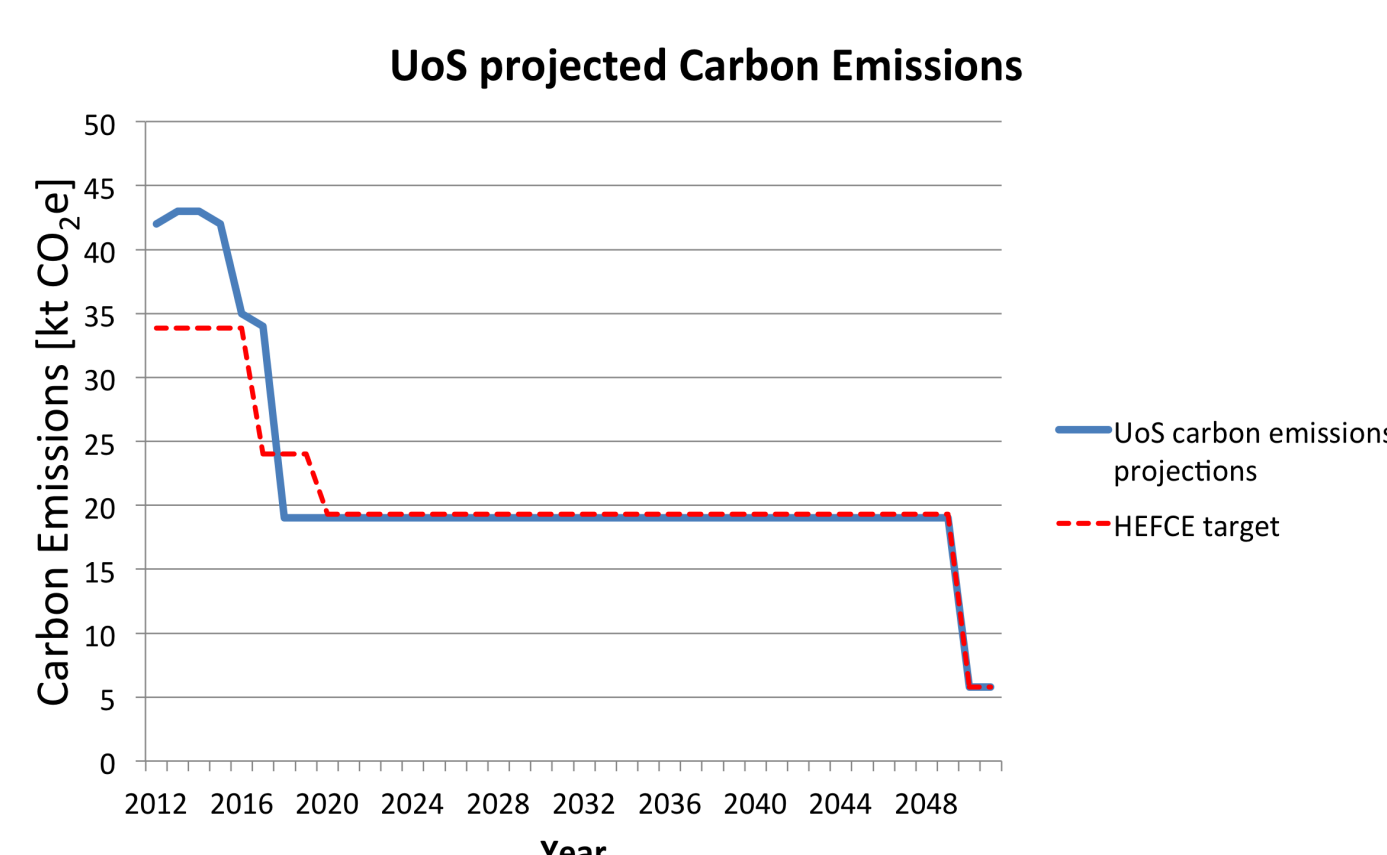


Figure 1. UoS carbon emissions targets

Global carbon emissions are still on the rise⁵. A peak around 2020 (red) is the only feasible remaining scenario, meaning our global society needs to be carbon neutral by approximately 2040. The University's current plan is **too little too late**.

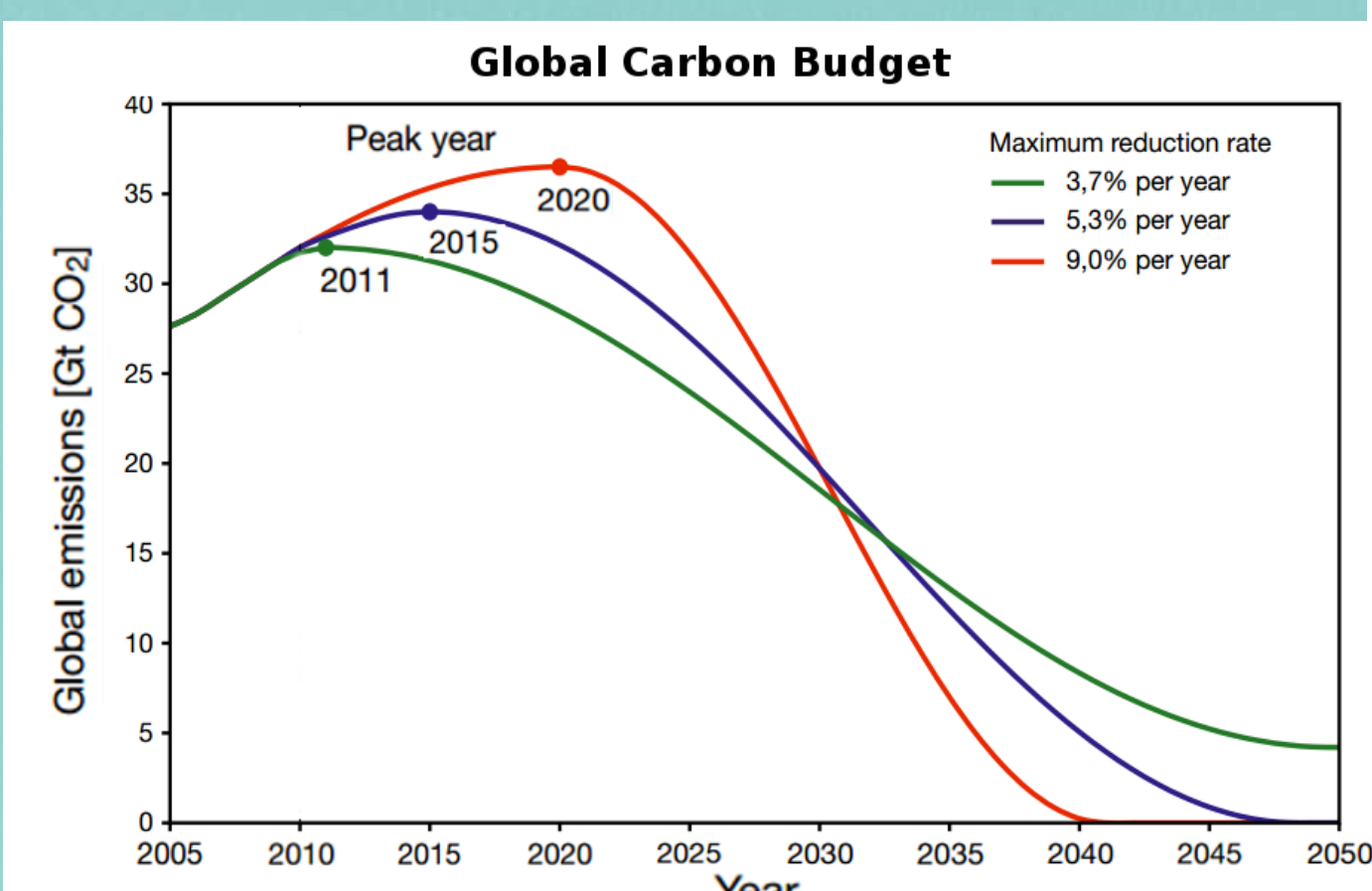


Figure 2. Global carbon emissions scenarios, giving 60% chance of <2°C global warming[4].

Recent campus expansions have offset any emission reductions achieved by the energy strategy, causing our emissions to **increase** by 30% since 2005 (Figure 3). A new approach is clearly needed.

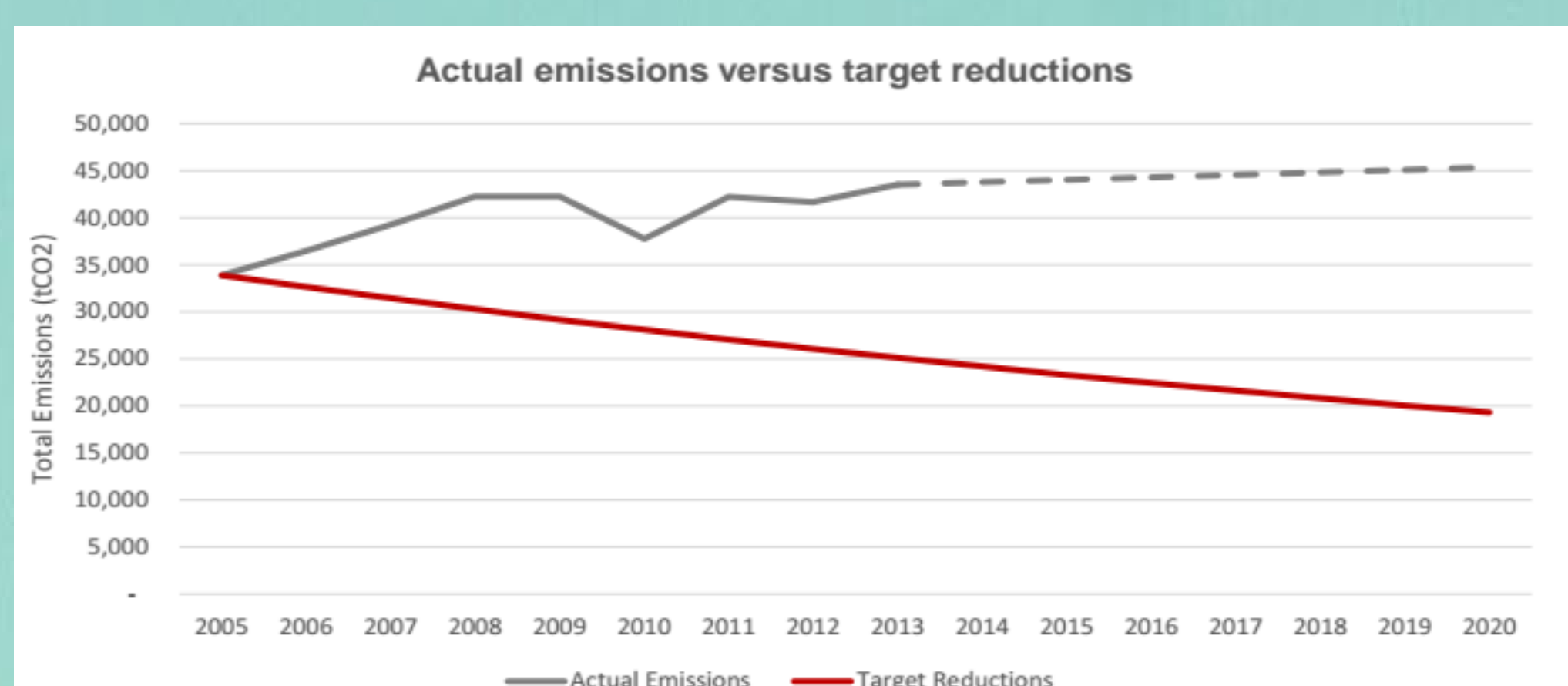


Figure 3. UoS Carbon emissions since 2005 (solid grey) and projection (dashed grey) versus target (red)[6].

Abstract

Anthropogenic carbon emissions are causing our climate to warm rapidly. The consequences are very worrying. This affects life today, and the impacts will intensify.

The UK has the highest cumulative carbon footprint per person. As a nation and a leading academic institute we have a moral obligation to lead the change to a carbon neutral society. We are also a community with the knowledge required to pioneer this transition, but to date we have failed to show leadership and deliver action.

We call on the University to adopt the bold target of cutting its emissions to zero by 2025. The Carbon Neutral University Network will connect all university stakeholders, provide sustainable solutions and ensure that the university becomes carbon neutral in line with the targets set by the scientific community. Clear reasoning and the time frame for a carbon neutral university target has been published on the website and is available for scrutiny. We encourage anyone interested to sign up to join the network.

Challenges - Opportunities

There are two themes to the challenge of becoming carbon neutral:

- i) technical
- ii) managerial/leadership.

Our challenge is to bring together the intellectual might of our community to build practical solutions which will cut our emissions. The adoption of a strong sustainability strategy would send a message of leadership and progress, boosting the University's image and inspiring change elsewhere.

In our second paper (paper II, in prep) we develop cases for more ambitious self-generation installations than the University has already considered. Reducing direct emissions will be the first step toward achieving the target proposed in paper I.

Self-generation

The biggest opportunity lies in wind power. A 35MW farm would completely offset the University electricity demand (20% capacity factor). We estimate such an installation would have a capital cost of £35m, and would become profitable after 12 years without feed in tariffs. Its construction will also create jobs, cohesion with local communities, and practical research opportunities. We have begun speaking to developers in order to build a business case.

Solar generation cannot meet the University's demands entirely, but just 10% of the available roof space could provide 7% of our electricity demand. This would create a 5MW system which would be eligible for a feed in tariff, and the payback time would be under 20 years.

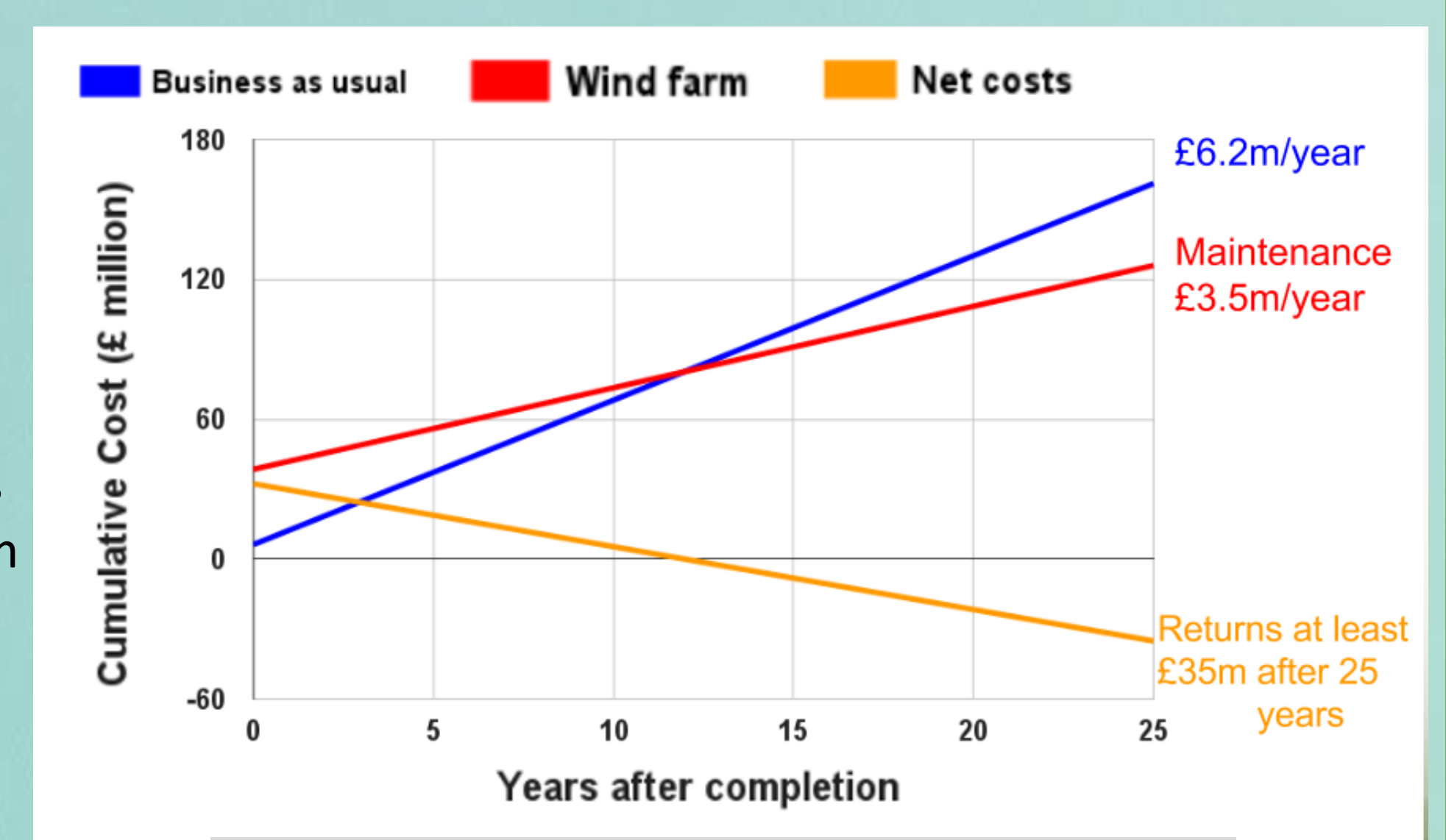


Figure 4. Cost projections for business as usual (blue), 35MW wind farm (red), and the difference (yellow)

Emissions from heating are roughly 50/50 from the district heating network and natural gas burning. Replacing the gas portion alone with biomass would provide a 54% carbon saving on the total heat consumed (excluding secondary emissions, e.g., fuel sourcing).

What now?

The Carbon Neutral Network was successfully launched on 21st May 2015, at an event attended by influential members of the University community; the Pro-VC for Science, the University energy manager, and Professors of climate change and engineering. The network is comprised of several working groups (Energy efficiency, self-generation, behaviour change, lobbying the University, knowledge exchange), overseen by a steering committee. We will always be looking to add enthusiasm and expertise to our network so **please consider getting involved!**



References

- 1) Hansen J., et al. 2013, PLoS ONE 8(12)
- 2) Paper I: <http://carbonneutralshf.weebly.com/papers.html>
- 3) UoS Energy Strategy http://www.sheffield.ac.uk/efm/engineeringmaintenance/energy_carbon-mgt
- 4) The Copenhagen Diagnosis, 2009, Updating the World on the Latest Climate Science. I. Allison, et al.
- 5) WMO Greenhouse gas bulletin, No 10, 2014.
- 6) TUoS 2020 Carbon Reduction Target: Progress Report

Interested in... ?



Wind power

Biomass and Heating

Buildings and Energy Efficiency

Solar power

Lobbying the University

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