Creating Impact from Research: The Role of Communication Agencies

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Bulletin Academic

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Overview

Introduction to Bulletin Academic

The Prometheus Weather Files Project

The impact

Continuing the journey

Conclusions

Q and A

Bulletin Academic

Introduction to Bulletin Academic

Who we are and what we do

Who we are

- Academic communications agency
- Experience and understanding of academic environment and agendas
- USP: understanding complex information and disseminating to target audiences
- Skill set of ‘intelligent’ journalism, marketing, copywriting and graphic design
- Strong client base of universities, research centres and think tanks

Some of our clients

What do we bring to knowledge transfer?

We see ourselves ‘bridging the gap’ between academics and research users. We:

–Understand the research

–Identify target audiences

–Creatively disseminate

–Follow up

This approach can fit with the impact agenda but its about much more than that…

The reach of the media

Time to stamp out trade in misery – China Daily

Comment

Time to stamp out trade in misery

ACTION PLAN TO BE PUBLISHED SOON GIVES CHINA THE CHANCE TO DO MORE TO COMBAT HUMAN TRAFFICKING

Influencing policymakers

Research and policy briefings

Collaborating with industry

Business briefings and trade press

Communicating with funders and stakeholders

- Impact statements
- Newsletters
- Annual reports

Launching new ventures

NCCCS launch material

The PROMETHEUS weather files project

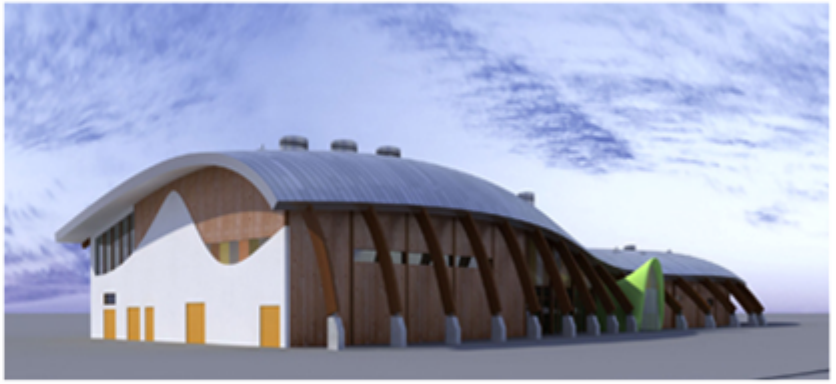
Built to stand the test of time

Using PROMETHEUS weather files to guard buildings against climate change

–University of Exeter's Centre for Energy and the Environment

–EPSRC 'Pathways to Impact' funding

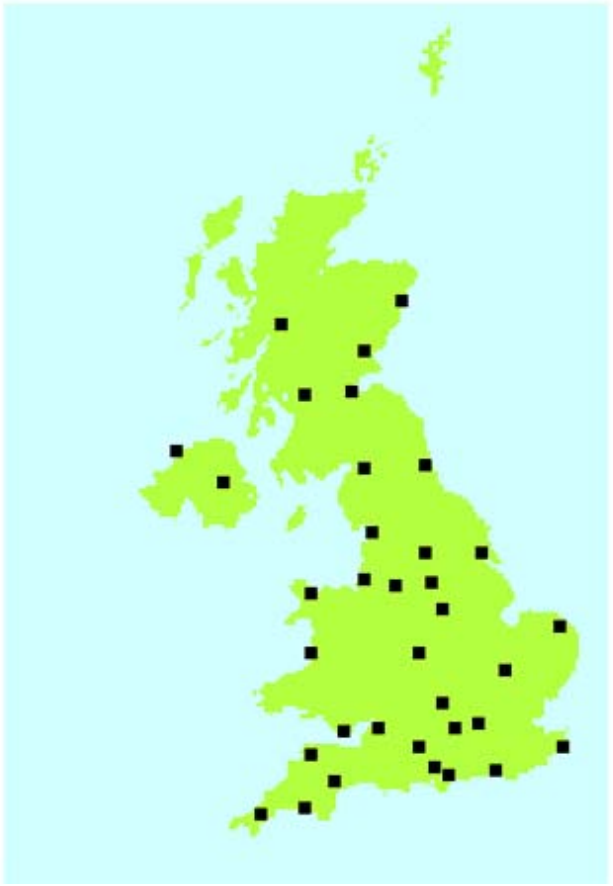
–Six-day project



Above: MyPlace Youth and Community Centre, London – Jacobs Engineering

PROMETHEUS project overview

- Files predict weather up to 2080 eg mean temperatures, wind speed
- Designers can use data to prevent overheating in buildings
- Test resilience of existing designs to climate change



Project brief – the knowledge broker role

- Raise profile of PROMETHEUS within the building industry
- Encourage architects and engineers to put data into practice
- Identify policy implications and engage relevant policymakers
- Demonstrate the research's impact on the wider world

What's the story?

Communicating the key messages to the right audiences

Why should policymakers care?

–Failure to protect buildings against overheating cost lives eg Paris heatwave

–Existing data for modelling buildings flawed

–Schools and hospitals could be unfit for purpose in 40 years

–Industry needs regulatory push to treat climate change adaptation seriously

What’s the story?

Communicating the key messages to the right audiences

Why should architects and engineers care?

–Opportunity to take the lead in sustainable design
–Data files are free to download
–Easy to test resilience of designs to climate change
–Already in practice eg UK’s first zero-carbon primary school

Devise dissemination strategy

- Write targeted briefings for policy and industry audiences
- Produce case study document to show PROMETHEUS works
- Set up links with policy advisors across government and industry bodies
- Write press briefing for media team
- Work with RKT team to attract industry to workshops

Workshop invitation/Research briefings

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Research Briefing

Built to Stand the Test of Time

Using PROMETHEUS weather files to adapt building designs to climate change

By Dr David Coley and Dr Matt Eames

Innovative research that predicts future weather up to 2080 could transform the capacity of the UK building industry and its regulators to adapt to climate change in the face of rising temperatures, which threaten to cause buildings to breach regulatory standards and endanger occupants.

Scientists at the University of Exeter's Centre for Energy and the Environment (CEE) have created probabilistic weather files for 35 locations across the UK that enable building professionals to design new buildings and formulate retrofit solutions to meet the challenges posed by changing local climates.

The files, which are free to download, are based on the latest UK Climate Projections (UKCP09), and are the product of the CEE's PROMETHEUS project – The Use of Probabilistic Climate Change Data to Future-proof Design Decisions in the Building Sector.

Their creation was inspired by the need to end the flawed practice of modelling buildings using historic weather data, which could render new schools, hospitals and care homes unfit for purpose in less than 40 years, academics say.

The current standard test reference year and design summer year are calculated only using data up to 2004 for 14 locations and fail to offer an accurate representation of even the current UK climate.

The European heat wave in 2003 served as a stark reminder that the overheating of buildings can have severe consequences for human health and productivity. About 35,000 deaths across Europe – mostly among the elderly – were attributed to heat stress in buildings. Although these extreme temperatures are currently estimated to be a 1-in-1,000 year event, they are expected to constitute an average summer by the 2040s, while in 2080 it could be anomalously cold, Met Office research shows.

As building projects will be affected by climate change in varying ways, the probabilistic PROMETHEUS files cover a range of common weather variables, such as mean temperatures and wind speed, and carbon emissions scenarios on hourly time steps for the years 2030, 2050 and 2080.

The files have guided the design of the UK's first zero-carbon school, Montgomery Primary School in Devon, and the refurbishment of a

Key findings

- The building industry and its regulators can use PROMETHEUS weather data up to 2080 to adapt new and existing building designs to climate change.
- Existing weather data for modelling buildings are flawed and could render new schools and hospitals unfit for purpose.
- PROMETHEUS has guided the design of a zero-carbon school and the refurbishment of existing council offices.
- Designers can use climate change amplification coefficients to measure the resilience of a specific building design to climate change.
- Policymakers need to foster the importance of adaptation to climate change within the building industry.

1960s office building for Cornwall Council. The files have also been used to test the resilience of the designs of, among others, Modbury Youth and Community Centre in London, Blackfriars train station and Leeds Arena.

CEE academics applied the PROMETHEUS data to a thermal model of a school and examined 252 building design and weather scenario combinations. Crucially, the academics discovered a direct, quantifiable link between rises in external temperatures due to climate change and increases in internal temperatures of buildings.

They were able to derive a set of climate change amplification coefficients that describe the expected response of any building design to any reasonable amount of climate change. The building industry and its regulators can use these coefficients to measure the resilience to climate change of a particular design, to set minimum performance standards within building regulations and codes and to cost design options rationally, researchers said.

However, CEE academics said that a cultural shift was needed within the building industry to give equal emphasis to adaptation and

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Built to Stand the Test of Time

Designing and adapting buildings to meet the challenges posed by climate change

Choice of three free lunchtime workshops for engineering and architectural firms

February 17th 2011, Council Chamber, Northcote House, University of Exeter
February 21st 2011, Council Room, Society of Chemical Industry, Belgrave Square, London
February 22nd 2011, Byford Room, Devonshire Hall, University of Leeds

Climate change is set to exert a significant impact on building design and energy use in the UK, exposing the building community to the danger that buildings will fail to comply with current regulations or be unfit for purpose.

The European heat wave in 2003 was a reminder that the overheating of buildings can have severe consequences for human health and productivity. About 35,000 deaths – mostly among the elderly – were attributed to heat stress in buildings.

Although these extreme temperatures are currently estimated to be a one-in-a-thousand years event, they are expected to constitute an average summer by the 2040s, while in 2080 it could be anomalously cold.

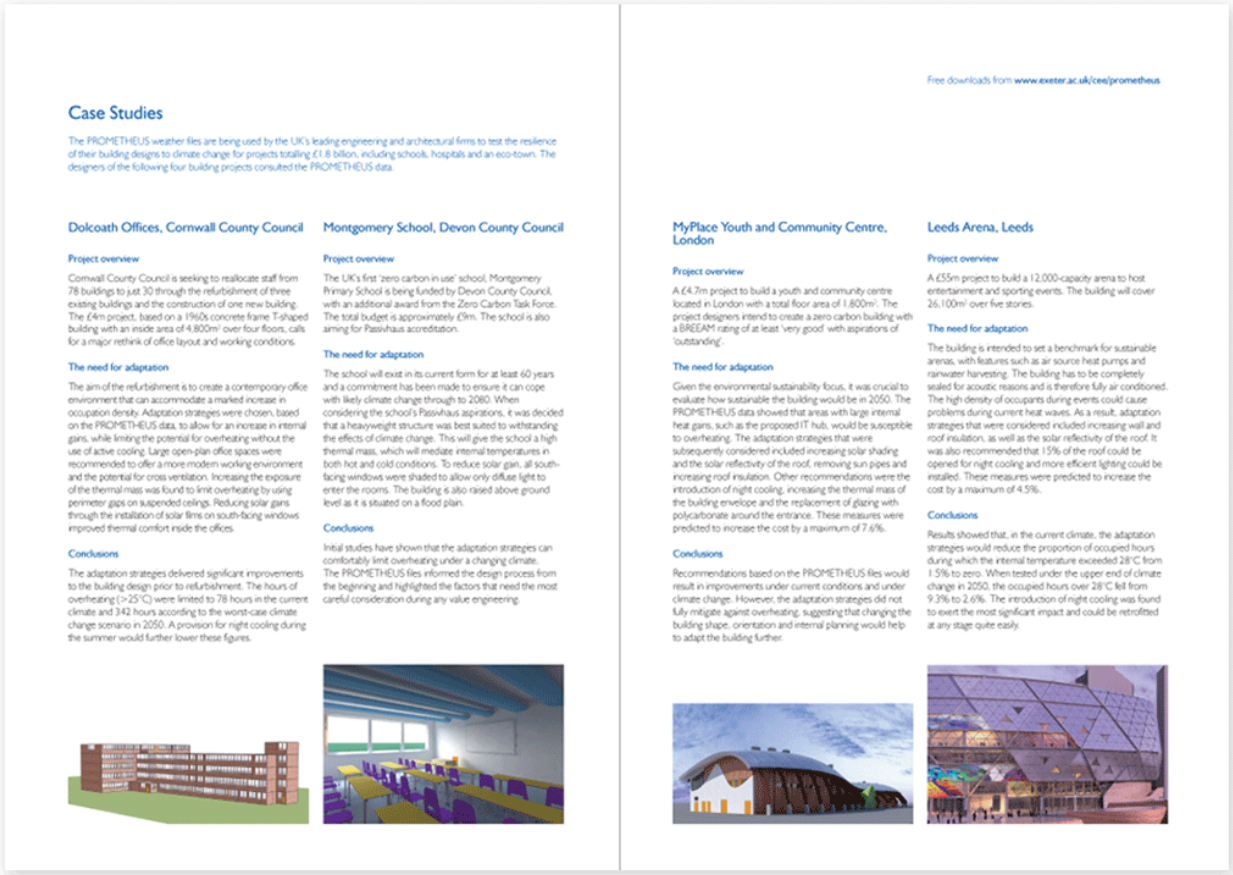
To ensure buildings can adapt to these predicted temperature changes, designers need to be able to model buildings using standardised, consistent sets of weather data. However, the current standard test reference year and design summer year are calculated only using data up to 2004 and fail to offer an accurate representation of even the current UK climate.

The PROMETHEUS project – The Use of Probabilistic Climate Change Data to Future-proof Design Decisions in the Building Sector – is the work of the University of Exeter's Centre for Energy and the Environment (CEE). It has devised a methodology for the creation of probabilistic weather files up to 2080 for multiple locations across the UK, based on climate change projections by the UK Climate Impacts Programme and the Met Office.

The file data, which are downloadable free of charge, comprise a range of future time slices, emissions scenarios and probabilities, and enable building professionals to design new buildings and formulate retrofit solutions according to specific local climates.

The workshops will outline the potential applications of the PROMETHEUS weather files, detail a case study from the building industry on how the files have been put into practice and include a working lunch where participants can discuss how their current projects would benefit from using the files.

Case study booklet



Case Studies

The PROMETHEUS weather files are being used by the UK's leading engineering and architectural firms to test the resilience of their building designs to climate change for projects totalling £1.8 billion, including schools, hospitals and an eco-town. The designers of the following four building projects consulted the PROMETHEUS data.

Dolcoath Offices, Cornwall County Council

Project overview

Cornwall County Council is seeking to reallocate staff from 78 buildings to just 30 through the refurbishment of three existing buildings and the construction of one new building. The £4m project, based on a 1960s concrete frame T-shaped building with an inside area of 4,800m² over four floors, calls for a major rethink of office layout and working conditions.

The need for adaptation

The aim of the refurbishment is to create a contemporary office environment that can accommodate a marked increase in occupation density. Adaptation strategies were chosen, based on the PROMETHEUS data, to allow for an increase in internal gains, while limiting the potential for overheating without the use of active cooling. Large open-plan office spaces were recommended to offer a more modern working environment and the potential for cross-ventilation. Increasing the exposure of the thermal mass was found to limit overheating by using perimeter gaps on suspended ceilings. Reducing solar gains through the installation of solar films on south-facing windows improved thermal comfort inside the offices.

Conclusions

The adaptation strategies delivered significant improvements to the building design prior to refurbishment. The hours of overheating (>25°C) were limited to 78 hours in the current climate and 342 hours according to the worst-case climate change scenario in 2050. A provision for night cooling during the summer would further lower these figures.

Montgomery School, Devon County Council

Project overview

The UK's first 'zero carbon in use' school, Montgomery Primary School is being funded by Devon County Council, with an additional award from the Zero Carbon Task Force. The total budget is approximately £9m. The school is also aiming for Passivhaus accreditation.

The need for adaptation

The school will exist in its current form for at least 60 years and a commitment has been made to ensure it can cope with likely climate change through to 2080. When considering the school's Passivhaus aspirations, it was decided that a heavyweight structure was best suited to withstanding the effects of climate change. This will give the school a high thermal mass, which will mediate internal temperatures in both hot and cold conditions. To reduce solar gain, all south-facing windows were shaded to allow only diffuse light to enter the rooms. The building is also raised above ground level as it is situated on a flood plain.

Conclusions

Initial studies have shown that the adaptation strategies can comfortably limit overheating under a changing climate. The PROMETHEUS files informed the design process from the beginning and highlighted the factors that need the most careful consideration during any value engineering.

Free downloads from **www.exeter.ac.uk/cee/prometheus**

MyPlace Youth and Community Centre, London

Project overview

A £4.7m project to build a youth and community centre located in London with a total floor area of 1,800m². The project designers intend to create a zero carbon building with a BREEAM rating of at least 'very good' with aspirations of 'outstanding'.

The need for adaptation

Given the environmental sustainability focus, it was crucial to evaluate how sustainable the building would be in 2050. The PROMETHEUS data showed that areas with large internal heat gains, such as the proposed IT hub, would be susceptible to overheating. The adaptation strategies that were subsequently considered included increasing solar shading and the solar reflectivity of the roof, removing sun pipes and increasing roof insulation. Other recommendations were the introduction of night cooling, increasing the thermal mass of the building envelope and the replacement of glazing with polycarbonate around the entrance. These measures were predicted to increase the cost by a maximum of 7.6%.

Conclusions

Recommendations based on the PROMETHEUS files would result in improvements under current conditions and under climate change. However, the adaptation strategies did not fully mitigate against overheating, suggesting that changing the building shape, orientation and internal planning would help to adapt the building further.

Leeds Arena, Leeds

Project overview

A £55m project to build a 12,000-capacity arena to host entertainment and sporting events. The building will cover 26,100m² over five stories.

The need for adaptation

The building is intended to set a benchmark for sustainable arenas, with features such as air source heat pumps and rainwater harvesting. The building has to be completely sealed for acoustic reasons and is therefore fully air conditioned. The high density of occupants during events could cause problems during current heat waves. As a result, adaptation strategies that were considered included increasing wall and roof insulation, as well as the solar reflectivity of the roof. It was also recommended that 15% of the roof could be opened for night cooling and more efficient lighting could be installed. These measures were predicted to increase the cost by a maximum of 4.5%.

Conclusions

Results showed that, in the current climate, the adaptation strategies would reduce the proportion of occupied hours during which the internal temperature exceeded 28°C from 1.5% to zero. When tested under the upper end of climate change in 2050, the occupied hours over 28°C fell from 9.3% to 2.6%. The introduction of night cooling was found to exert the most significant impact and could be retrofitted at any stage quite easily.

Creative approach

Linking PROMETHEUS to UK's first zero-carbon country estate

–Stay across the news agenda

–Be proactive

Above: Highclere Castle, *(uploaded to Flickr by Jonjames1986)*

Initial results

- Secured speaking slot for academic at industry event
  - Audience of policy advisers
  - Networking opportunity
- Discussions with industry body on publishing data
- Attracted leading firms to roundtable discussions
- Established links with DEFRA, DECC, TSB

The impact

- Referenced in official government response to Low Carbon Construction Action Plan
- Used in more than £3 billion of building projects
- University tightened intellectual property of PROMETHEUS data

Continuing the journey

After the funding stops…

- Build on policy paper momentum
- Seek media coverage to raise profile of climate change adaptation
- Track continued use of research by industry

Conclusions

Does the communications agency as knowledge broker work?

Conclusions

Does the communications agency as knowledge broker work?

- Need proactive and creative dissemination strategy from the start
- Academic institutions need integrated approach to impact
- Broad skill set and collaboration essential
- Time challenges
- Achieving impact is a journey – prepare for the long haul

Thank you for your time

Any questions?

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Creating impact from academic research