



# John Burns Primary School

Giving our Best, Achieving our Highest

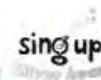
SUPPORTED BY  
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## A Climate Resilient School



Sustainable Travel  
Accredited and Recognised  
Sustainable level 2012





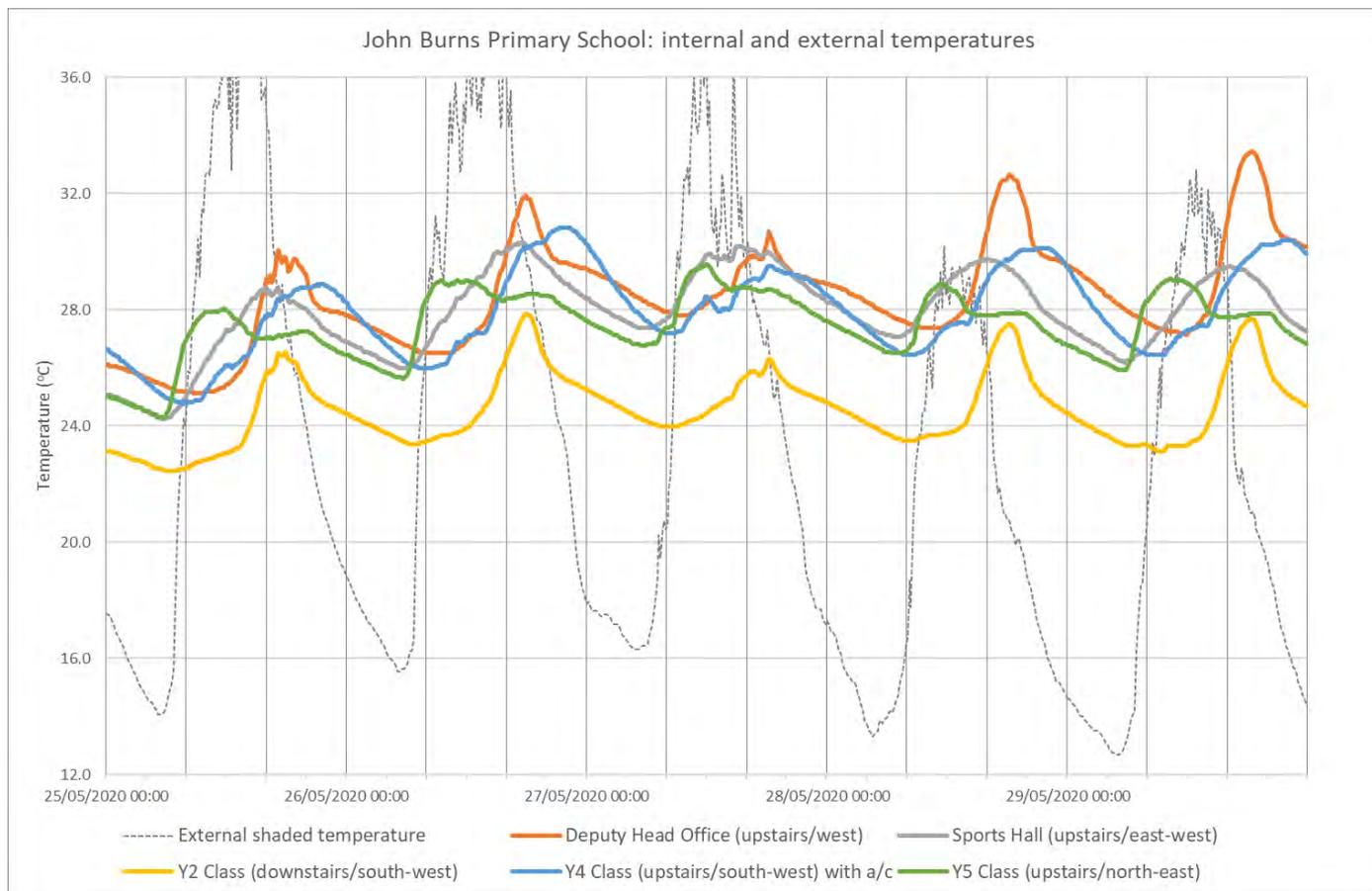
## Summer 2018: a six-week heatwave including during SATS week

- *Classroom teacher 1:*
  - *“The impact on the children is lethargy, sweating, continual thirst and low level feelings of sickness from the heat and stuffiness of the room.*
  - *“I have noticed an understandable dip in presentation, spelling and accuracy across the curriculum.”*
- *Classroom teacher 2:*
  - *“When I come into school in the morning, my classroom is already boiling, even though the windows, door and fan is already on by the time I get into school for 7am.*
  - *“The children are struggling to focus in class, with many feeling very unwell. We of course fill up the water jug regularly, however I know I am experiencing increased headaches and feelings of discomfort, so I can only imagine how the children are feeling. This makes it hard to encourage the children to work effectively.”*
- *Classroom teacher 3:*

Year 6 children are growing and developing. My classroom is smelly and hot by midday. It is not the conditions that I want to be subjected to each day, let alone a class of children, who are trying to learn in such an environment and whose well-being it is our responsibility to care for.



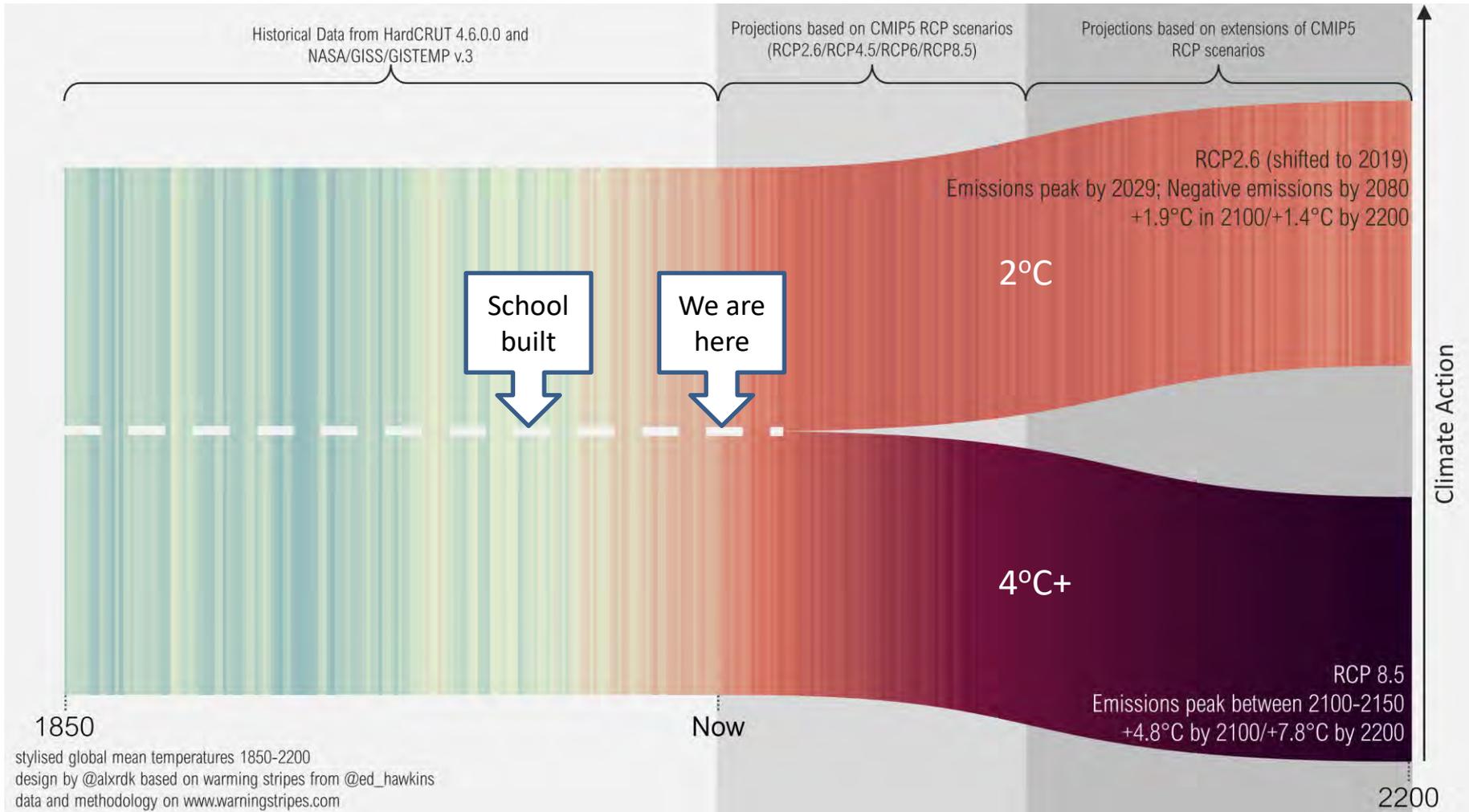
## May 2020: internal temperatures exceeded 30°C



- During a warm run of days like at the end of May 2020, upstairs rooms are never below 24°C, even overnight, and can reach >30°C during the afternoon. The Deputy Head's office can be >32°C, warmer than it is outside.



# The underlying problem is global heating





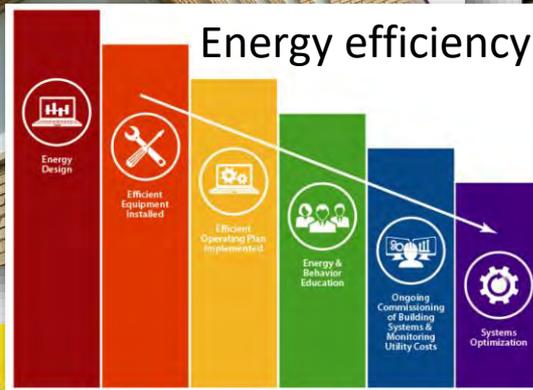


# We need a whole-school climate change retrofit

Brise soleil



Green roof



Solar PV



Shade sails



## Roof area: solar green roof with energy storage

Green roof adds thermal mass, absorbs heat and cools school from above (evapo-transpiration), and catches heavy rainfall to prevent flooding



PV panels shade roof, generate zero carbon energy, and help water the plants through collecting/dripping condensation

Green roof also helps PV panels keep cool and generate more energy

Battery storage means school can use more of its own electricity, and sell excess to grid when export tariff is highest

## Balconies, or outdoor classrooms?

We have ~60m<sup>2</sup> of balcony space



Dark, heavy slabs absorb and radiate heat into classrooms

Example: [Roof top garden, Vienna](#)



Pergola structure and climbing plants to provide shading, PV panels on top, bench seating, rainwater planters



# Sustainable drainage systems (SuDS) to manage rainwater

Example: [All Saints Primary School, Newmarket](#)



love every drop.  
anglianwater



## Energy audit results: biosolar roof, LED lighting, ceiling fans, window film

Project Name	Core or Alternative Project	Annual kWh saving	Annual Total £ saving <sup>1</sup>	Annual tCO <sub>2</sub> e saving	Capital Expenditure £	Simple Payback (years)
Boiler Replacement	Core	82,396	2,060	15.1	34,130	16.6
Implementation of POU Boilers	Core	76,891	1,922	14.1	32,241	16.8
Sedum Roof Deployment	Core	46,898	6,210	12.0	35,450	5.7
PV array	Core	19,585	2,374	5.0	31,512	13.3
LED Lighting	Alternative	15,602	2,184	4.0	8,684	4.0
Plantroom Pipework Insulation	Core	9,331	233	1.7	923	4.0
PVC Panel insulation	Core	4,092	102	0.8	1,851	18.1
Bris-Soleil	Core	2,962	415	0.8	10,800	26.0
Installation of Ceiling Destratification Fans	Core	1,646	230	0.4	1,530	6.6
Brick Cavity Insulation	Alternative	54	1	0.0	22	16.3
Living Wall Deployment	Alternative	7	1	0.0	500	NA
Low Emissivity films	Core	55	8	0.0	68	8.7
<b>Total ('Core' projects only)</b>		<b>243,856</b>	<b>13,554</b>	<b>49.9</b>	<b>148,504</b>	<b>11.0</b>

- Alongside the main biosolar roof proposal, LED lighting was installed in autumn 2020, and the school is pursuing a capital bid for roof insulation, low-e double glazing for windows/skylights, and better pipework insulation.
- Replacing the two existing gas-fired boilers, and installing separate 'point of use' hot water boilers for sinks was also recommended. But payback periods are 15+ years, and by the mid-2030s, the new boiler may need to be changed again to a heat pump or hydrogen system to achieve net zero.



## Current status

Studies funded by the Mayor of London established the **feasibility** of the project

- A **structural engineer's report** shows the roof area can take the weight of solar PV combined with a sedum green roof (up to 100kg/m<sup>2</sup>)
- A **whole-school energy audit** reinforces the benefits of a solar green roof together with other measures such as ceiling fans, improved glazing, new boilers, etc.

A **whole-school LED lighting retrofit** took place in autumn 2020

- Funded by Wandsworth Borough Council and John Burns Primary School

We have now secured a grant from the Department for Education to install the **solar green roof and solar pagoda outdoor classrooms**

- Aiming to install these in autumn 2021, subject to roofing repair and insulation work (see below)

Thames Water has also become a funding partner

- Thames conducted a **free water efficiency audit** in 2019. These save on average 9,500 litres per day (2,200l/day through water efficiency, 7,300l through leakage control).
- Thames has now also agreed to fund the **SuDS landscape design work** for the playground spaces

A final capital bid is being considered by Wandsworth Borough Council

- **To repair and properly insulate the roof**, and install energy efficient glazing and skylights, before the solar green roof can be installed.



## Project partners

### Funders

SUPPORTED BY  
MAYOR OF LONDON



Department  
for Education



### Technical advisors



### Delivery partners



others  
tbc



## Thank you for your interest in our project

To hear more, listen to the podcast:

- *Let's Talk WEM* S2:E1 available [online](#), Spotify etc
- Hosted by CIWEM President Niki Roach, with co-host Baroness Brown of Cambridge
- With Lesley McKay, Headteacher of Moor Allerton Hall Primary School in Leeds.

For more details about the project itself:

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