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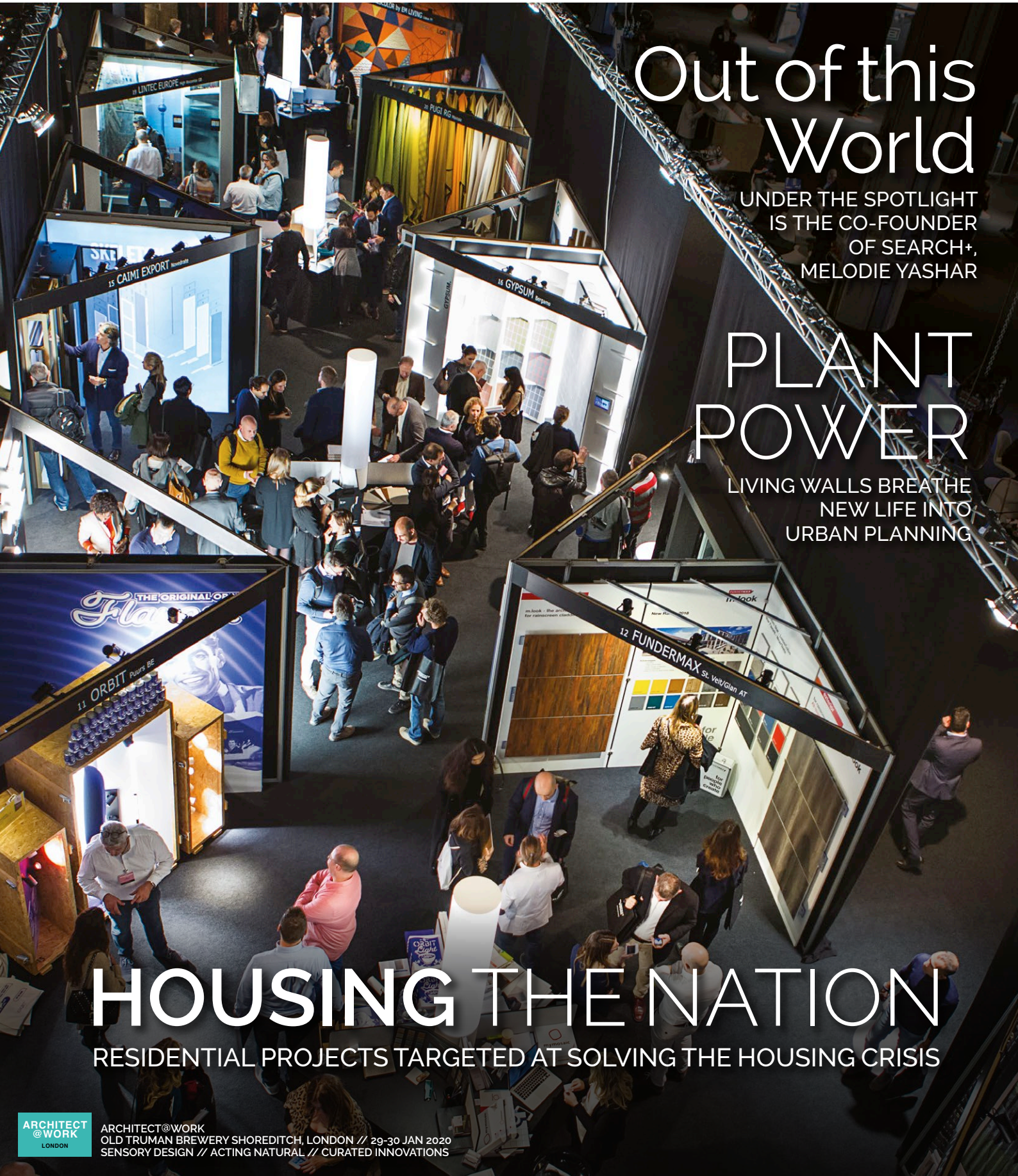


Out of this World

UNDER THE SPOTLIGHT IS THE CO-FOUNDER OF SEARCH+, MELODIE YASHAR

PLANT POWER

LIVING WALLS BREATHE NEW LIFE INTO URBAN PLANNING

HOUSING THE NATION

RESIDENTIAL PROJECTS TARGETED AT SOLVING THE HOUSING CRISIS

generation double-glazing windows which currently populate most traditional housing stock and replace them with better quality double warm edge glazing that reduces internal condensation with effective ventilation. Airtightness and high-quality insulation requires proper ventilation, which has to be incorporated to ensure that moisture on the inside of the building effectively flows out. This allows mechanical heat recovery to become viable even in the oldest properties.

Ultimately, when designing to retrofit and create carbon-efficient homes, longevity and sustainability are the most important considerations. The average lifespan of a house should be in the region of 60-100 years. Therefore it is important that the predicted rise in our future climate's temperature is addressed. Otherwise, any retrofit we do to reduce the heating load will increase the chance of over-heating and the need for active cooling in the future.

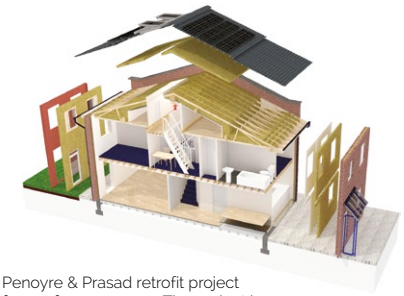
As the summer temperature is increasing year on year, it is important to find solutions to tackle overheating. Clues on how we can mitigate the need for active cooling in well-insulated housing can be found in other countries, in France for example, homes use features such as external shutters to reduce heat in the warmer months. However, introducing new elements will require a significant cultural shift to ensure the occupants know when and how to use them.

Only once we've reduced the thermal loads on our housing stock as much as possible, can we tackle the unused resource of roof space for clean, renewable energy systems in a cost-effective and meaningful manner.

Yet, costing is currently a challenge. With the development of thin insulation materials allows retrofitting of buildings is possible without the risk of changing the external appearance of our heritage buildings. Pricing will be brought down through large scale supply and production making these materials common rather than a niche in the marketplace.

There should be a cost incentive as part of any new green deal that the government proposes, for retrofitting buildings to increase their fabric performance, rather than the current penalty of paying VAT.

Therefore, in partnership with Penoyre & Prasad, we have pledged to offer net-zero carbon operational designs for all new projects from January 2020, at no additional cost to our clients. The time for action is long overdue, through this pledge we hope to encourage all stakeholders in the built environment to act against climate change, by first tackling our building's energy emissions.



Penoyre & Prasad retrofit project from a few years ago. The project is called Retrofit for Living. Penoyre & Prasad merged with Perkins and Will in November

ASIF DIN, SUSTAINABILITY DIRECTOR AT PERKINS AND WILL LONDON

Asif Din has been involved in environmental low energy buildings and supply chains for over 20 years, including PassivHaus and Zero Energy Developments. His projects include BedZED, Jubilee Wharf and the London pavilion at Shanghai Expo 2010 as director at ZEDfactory (formerly Bill Dunster Architects).
https://perkinswill.com

NATALIE BARTON
SARAH WIGGLESWORTH ARCHITECTS

De-carboning existing housing will require households to stop burning fossil fuels and timber to power and heat their home. If the UK's current energy demand could be met by renewable, carbon-free energy, then there would be no problem. However, the infrastructure is not yet in place to do so and will not be by 2050.

The robust solution is to reduce the energy demand of homes. This energy demand comprises the energy needed to heat (or cool) a home and that required for a home to run, such as powering appliances.

Architects can have a big impact on energy demand through improving the performance of the building envelope by increasing insulation and airtightness. We can also work with building services engineers to specify renewable energy generation technology and ensure that building services and appliances are running efficiently. Smart technologies can also help households control energy use.

Gas boilers and cookers will need to be replaced with electric alternatives such as heat pumps and conduction hobs. Some community renewable generation schemes will be needed. Household behavioural changes will be useful too, for example not having windows open while the heating is on.

Retrofitting houses will not be a one-size-fits-all approach. Strategies for individual homes or building types will be required and thorough analysis of a home's performance and its occupant's behaviours will be needed.

This was the first step of our R20 project, a retrofit of 9/10 Stock Orchard Street reducing the energy demand of the building, 20 years after its completion.

SWA and sustainability consultancy Enhabit undertook a comprehensive assessment of the building. This included using thermal imaging, carrying out airtightness tests, taking u-values of the building fabric, energy demand analysis using Passive House Planning Package software, and analysis of energy bill data. This research highlighted all the key elements of the building fabric and services to be improved, these included: Improving airtightness; reducing thermal bridging, increasing insulation and upgrading windows; improving ventilation by installing a new mechanical ventilation and heat recovery (MVHR) system, increasing solar control preventing spaces from overheating by improving external solar shading.

These retrofitting works took place while the building was occupied. For all existing housing, careful consideration will be needed regarding health and safety and people's wellbeing. Furthermore, households will need to learn how their retrofitted home works to use it successfully.

Scaling up retrofitting will be complex with many issues to be considered. The cost can be substantial, who will pay for it and how? New national and local government policies will be required to facilitate retrofitting UK-wide. For example, what role will the Building Regulations have to play in ensuring standards and who will monitor the work?

Planning departments will need to be involved and supported and a mutually satisfactory strategy will need to be agreed with conservation organisations.

While carbon-free products will need to be available, certified, and understood. Unfortunately, none of this will be easy and time is not on our side.

NATALIE BARTON, PROJECT ARCHITECT AT SARAH WIGGLESWORTH ARCHITECTS

Natalie is SWA's Diversity Champion, responsible for the overview and implementation of SWA's Equality, Diversity and Inclusion vision. She is invested in social mobility and justice, with an ambition to make SWA and the wider architectural profession more accessible.
www.swarch.co.uk