

April 2020

REUTERS EVENTS™

Ethical
CORPORATION
MAGAZINE

THE HEAT IS ON

The race to cool our sweltering cities

**THE CITIES RISING
TO THE RESILIENCY
CHALLENGE**

**WHO IS MINDING
THE GREEN
BUILDINGS GAP?**

**THE MAN TRYING
TO BRING ENERGY
EFFICIENCY IN FROM
THE COLD**

THE WORLD-RENOWNED RESPONSIBLE BUSINESS AWARDS

The leading celebration of
responsible business excellence

8 Northumberland Avenue, London, UK

15

Award
categories

20

Top industry
judges

100,000+

Global
reach

350+

Awards
Attendees

ENTRIES
OPEN



MID
MARCH
2020

NOMINATIONS
CLOSE



JUNE
12
2020

SHORTLIST
ANNOUNCED



JULY
10
2020

AWARDS
CEREMONY



OCTOBER
8
2020

**BY NOMINATING, BEING SHORTLISTED AND PERHAPS EVEN
WINNING AN AWARD, YOU WILL:**

GAIN RECOGNITION FROM YOUR PEERS

and experts as a global leader in the industry

GET THE ACKNOWLEDGEMENT YOU DESERVE

for your company's commitment to excellence
in the responsible business space

BOOST YOUR REPUTATION

for spearheading innovation and best practice with
the largest sustainability community in the world

WWW.ETHICALCORP.COM/AWARDS



WELCOME TO THE APRIL 2020 ISSUE

Is white the new green? It's a question we are asking this month in the magazine as we focus on climate resiliency in cities, and the drive to increase access to low-carbon cooling technologies in an over-heating world.

As Diana Rojas reports, the technique of painting buildings with white reflective paint is being used in cities across the world as a passive, low-cost technology to reduce interior temperatures by several degrees. It is one of the technologies being promoted by the Cool Coalition, a global network headed up the UN Environment that is leading a push this year to make access to low-carbon cooling a priority in the fight against climate change.

Until now, the climate impact of heating has garnered more attention than cooling as the industrialised countries in the global north are

the bigger emitters. But in the global south – where temperatures are getting hotter and the population growing and moving to urban heat islands, and more people are able to afford room air conditioning – emissions from cooling are set to nearly double by 2050, posing risks for delivering on the Paris Agreement and the Sustainable Development Goals alike.

With far less than 1% of development aid going to help countries implement cooling strategies, cities in the global south are having to innovate. In another article Rojas profiles how the city of Ahmedabad, in India, has implemented a pioneering heat action plan.

She also profiles some of the US cities that are leading the way on climate resilience: Washington, DC; Park City, Utah; and the Ohio cities of Cincinnati, Cleveland and Columbus.

Meanwhile, Belo Horizonte in Brazil and Hermosillo, Mexico, are featured as some of the greenest Latin American cities.

The focus then shifts to the UK, where local authorities that are home to 85% of the UK population have declared a climate emergency, >



7-9 FASHION ST, LONDON E1 6PX UK

Editor:
Terry Slavin
Sub-editor:
Karen Luckhurst
Contributors:
Diana Rojas
Mike Scott
Catherine Early

Editorial:
terry.slavin@ethicalcorp.com

Website:
ethicalcorp.com

Event and content opportunities
Sponsorship Team
sponsorship@ethicalcorp.com
+44 207 375 7245

Advertising and sales:
Matt Buckingham
matt.buckingham@ethicalcorp.com
+44 207 375 7245

Design:
Mauve
info@mauvestudios.com
www.mauvestudios.com



Demand reduction is not even in the same ballpark as renewable energy, and is improving at a derisory 1-2% a year

the highest proportion in the world. Mike Scott reports on how cities like Greater Manchester, Oxford, Bristol and Leicester are rising to the dual challenges of mitigating their own impact and adapting to climate hazards like flooding and heatwaves.

Our second briefing this month focuses on another neglected area in the climate agenda, and one where cities also have huge power to act: energy efficiency.

The International Energy Agency (IEA) estimates that improvements in energy efficiency can deliver more than 40% of the greenhouse gas emissions reductions needed to meet global climate goals, yet demand reduction is not even in the same ballpark as renewable energy, improving at a derisory 1-2% a year.

Mike Scott reports on how companies like H&M, Johnson Controls and Mahindra Heavy Engines are working to double their energy productivity within 25 years as members of EP100, a scheme run by the Climate Group and the US-based Alliance to Save Energy.

Catherine Early talks to experts, including from the UK's Committee on Climate Change, about how the UK's commitment to reach net-zero by 2040 could be undermined by its failure to adequately address energy efficiency in buildings, while Mike Scott takes a look at an award-winning scheme called Energiesprong that takes a whole-house approach to retrofitting.

And I interview Benoit Lebot, former head of the International Partnership for Energy Efficiency Cooperation, which has been disbanded since December, about his frustrated efforts to elevate demand reduction on the global climate agenda.



BRENDAN MCDERMID/REUTERS

Of course, the Covid-19 crisis has erupted since this issue was commissioned, hitting a pause button on the global agenda for action on climate change and the SDGs, including the postponement of COP26 climate negotiations until next year.

Instead of our planned briefing on the rise of climate and social activism, we are devoting our May issue to looking at how Covid-19 will reshape sustainability, with a mix of independent reporting from our expert journalists and commentary from some of the leading thinkers in our community.

I hope you enjoy the latest issue, and keep well. ■



Terry Slavin

terry.slavin@ethicalcorp.com
[@tslavinm](https://twitter.com/tslavinm)

INSIGHTS AND ANALYSIS IN 2020 TO INFORM A DECADE OF ACTION

JANUARY

Calls to action

Thought leaders and the investment community, including John Elkington, Paul Druckman, Windy Lubber, Lise Kingo, Sally Liden and Soony Verghese, give their marching orders for business in the coming decade of action on climate change and the SDGs

FEBRUARY / MARCH

Deforestation Risk

In a two-part assessment of deforestation risk in supply chains we will do deep dives into palm oil and forest and timber products in February and at soy and beef in March

APRIL

Smart and resilient cities and energy efficiency

How cities are adapting to climate change through the use of nature-based solutions, and cooling technologies. Our second briefing will focus on the global drive to double energy efficiency

MAY

How Covid-19 is reshaping sustainability

Commentary and reportage on how companies are rising to the Covid-19 challenge, and the impact of the pandemic on ESG investment, biodiversity, the energy transition and workforces

JUNE

Accelerating the circular economy

Full issue focus on circular economy, featuring new developments on plastic, including involvement of investors and rise of social plastic. We also delve into e-waste

JULY / AUGUST

Sustainable marketing and communications

For our combined summer issue we look at sustainable communications and marketing, the impact on consumers and how companies are simplifying the purpose message

SEPTEMBER

Sustainable seafood and healthy oceans

Ocean-based solutions, from offshore wind and tidal power to sustainable seafood and cleaner shipping, could provide 21% of the solutions to climate change. This briefing will explore the new front in the climate battle

OCTOBER

Are science-based targets up to scratch?

A critical look at SBT, including calls for human rights to be included, and the fashion industry's sectoral approach to SBTs. Our second briefing will look at moves to standardise ESG reporting

NOVEMBER

Water risk and biodiversity

We look at growing water risk as a result of climate change. Our second briefing will be on the business-led initiatives to protect biodiversity through more sustainable land use

DECEMBER

The transformation of energy

Technology-focused issue on the energy transition, particularly looking at energy storage technologies and hydrogen, electrification. Also, the rise of geothermal energy

VIEW THE FULL CALENDAR HERE!

If you are interested in sponsored content or display advertising opportunities in the magazine then please get in touch with sponsorship@ethicalcorp.com



Contents

CLIMATE-RESILIENT CITIES

- 7 THE TICKING TIME BOMB**
Of rising demand for cooling
- 13 COOLING FOR ALL**
Ahmedabad plans for more heatwaves
- 15 WE ARE STILL IN**
Climate resilience in the US
- 20 MAKING THE A GRADE**
Latin America's greenest cities
- 22 COMETH THE HOUR**
The UK's climate emergency cities



7
**WHY ACCESS
TO COOLING IS
CRITICAL TO
MEETING SDGs**



32

**HOW BRITAIN'S LEAKY
HOMES ARE PUTTING BRAKE
TO NET-ZERO AMBITIONS**

ENERGY EFFICIENCY

- 26 FROM BOILER ROOM**
To the boardroom
- 32 WHO IS MINDING**
The green homes gap?
- 38 GREAT LEAP FORWARD**
In retrofitting homes
- 39 IN FROM THE COLD**
Interview with Benoit Lebot
- 43 WHAT'S ON THE WEB**

Can we defuse the **'TICKING TIME BOMB'** of soaring demand for cooling?



With energy use for air conditioning set to nearly double by 2050, [Diana Rojas](#) reports on how a global network headed up by UN Environment is working to make access to low-carbon cooling a priority in the fight against climate change

 [VIEW ONLINE](#)



W

ith 2019 a year of superlatives in climate – the hottest months ever, the most intense heatwave ever in Europe, the hottest and driest year ever in Australia – the need to expand global access to efficient and climate-friendly cooling has risen up the agenda ahead of the postponed COP26 climate conference in Glasgow.

New on the scene is the Cool Coalition, a global network launched last April by UN Environment, the Climate & Clean Air Coalition, the Kigali Cooling Efficiency Program (K-CEP), and Sustainable Energy for All (SEforALL), that aims to expand global access to efficient and climate-friendly cooling, while also reducing greenhouse gas emissions from air conditioning and refrigerants.

Some 80 partners from all sectors have pledged more funding, from developing national cooling plans, to cutting emissions in cooling products and diminishing the need for cooling in cities.

“Part of the problem is awareness. Many people don’t know how damaging the simple cooling feeling of an air conditioner can be,” said Dan Hamza-Goodacre, executive director of K-CEP, a philanthropic initiative of 17 foundations and individuals that have pledged \$51m to boost energy-efficient cooling in developing countries. “Most people don’t know how much energy is used to keep a fish cold before they finally put it on their plate at home. It is the job of the Cool Coalition, to raise this awareness and make the invisible more visible.”

The Montreal Protocol, which came into force in 1989, was an international treaty that phased out hydrochlorofluorocarbons (HCFCs), which are responsible for ozone depletion. But while



A street thermometer in Este, Italy, during the European heatwave of 2019.

VERESHCHAGIN DMITRY/SHUTTERSTOCK



THILO SCHMUELGEM/REUTERS

The Cooling Coalition has pledged funding to help diminish the need for cooling products.

replacement with hydrofluorocarbons (HFCs) helped heal the ozone layer, HFCs have a global-warming potential thousands of times that of carbon dioxide.

Two decades later, in January 2019, the Kigali Amendment came into force committing countries to an 80% reduction in HFC production by 2047.

Several countries pledged to integrate cooling in their nationally determined contributions (NDCs) – climate mitigation plans required by the Paris Agreement. At the G7 meeting in France last autumn, some 26 more countries, led by France, signed onto the [Biarritz Pledge for Fast Action on Efficient Cooling](#), committing to adopt comprehensive national cooling plans, improve the energy efficiency of air conditioners, and phase out HFCs. They also pledged to mobilise finance for these activities.

According to the International Energy Agency, addressing HFCs alone can deliver 0.4C of avoided warming, and coupling the HFC phase-down >

“

People don’t know how much energy is used to keep a fish cold before they put it on their plate. It is our job to raise awareness



In the global south, temperatures are rising and the population is growing and moving to urban heat islands

effort with improvements in energy efficiency could double the climate benefits, while saving some \$2.9tn globally by 2050 through lower power usage.

Until now, the climate impact of heating has garnered more attention than cooling as the industrialised countries in the global north are the bigger emitters. But in the global south – where temperatures are getting hotter, the population growing and moving to urban heat islands, and more people are able to afford room air conditioning – emissions from cooling are “a ticking time bomb that we can see on the horizon,” said Brown.

Soaring demand for cooling globally is leading to a dangerous loop: energy use from cooling and refrigeration is expected to rise 90% by 2050 (from 2017 levels), which would result in additional greenhouse gas (GHG) emissions equivalent to a third of all current emissions, according to a 2018 University of Birmingham study.

The numbers are staggering. Just the number of air conditioners in use is expected to rise from 1.2 billion today to 4.5 billion by 2050, according to the Cool Coalition. In India alone, room air conditioning ownership is expected to reach 200 million by 2030, from only two million in 2006, says a SEforALL and K-CEP study.

Hamza-Goodacre said most of the limited

development funds for climate are going to renewable energy, but the cooling efficiency investment momentum is growing. “In the development finance world... they are waking up to the opportunity [that] cooling efficiency and profitability can go hand in hand,” they said.

In addition to the G7 signatories to the Biarritz Pledge, various multilateral development banks have pledged to increase funding for cooling, with the World Bank Group and the Green Climate Fund integrating clean and efficient cooling across their lending/investment portfolios, and the Children’s Investment Fund Foundation (CIFF) pledging an additional \$20 million to K-CEP.

The donation from the CIFF brings K-CEP’s funding to more than \$60m, and in January the group launched its \$12m NDC support facility, which will provide funding and guidance to organisations to support governments that want to integrate cooling solutions into their second-round NDCs at COP26 in Glasgow, which has been postponed to some time next year due to Covid-19. K-CEP, founded in 2017, is a philanthropic programme to help increase the energy efficiency of cooling in developing countries in central/south America, Africa, the Middle East and Asia (minus Iran), and an aim to replace HFCs with newer, climate-safe coolants. >



In India, room air conditioning ownership is expected to reach 200 million by 2030.

Last autumn, the UN Environment Programme unveiled new, voluntary guidance standards for more eco-friendly air conditioning and refrigeration appliances, with lower global-warming potential. The aim is to assist governments in developing/emerging economies to set energy labels and minimum performance standards, and to bolster those in many countries where they are outdated or unenforced. In the absence of standards and enforcement, the report says, countries are vulnerable to becoming “dumping grounds for products that cannot be sold elsewhere”.

Brown said K-CEP is supporting regional harmonisation of standards that would help countries work together and send stronger signals to exporting/manufacturing countries.”

Meanwhile, several companies are vying for the Global Cooling Prize, a high-profile private-sector contest that seeks to spur innovation toward super-efficient, less GHG-emitting room air conditioners.

According to a study by the Rocky Mountain

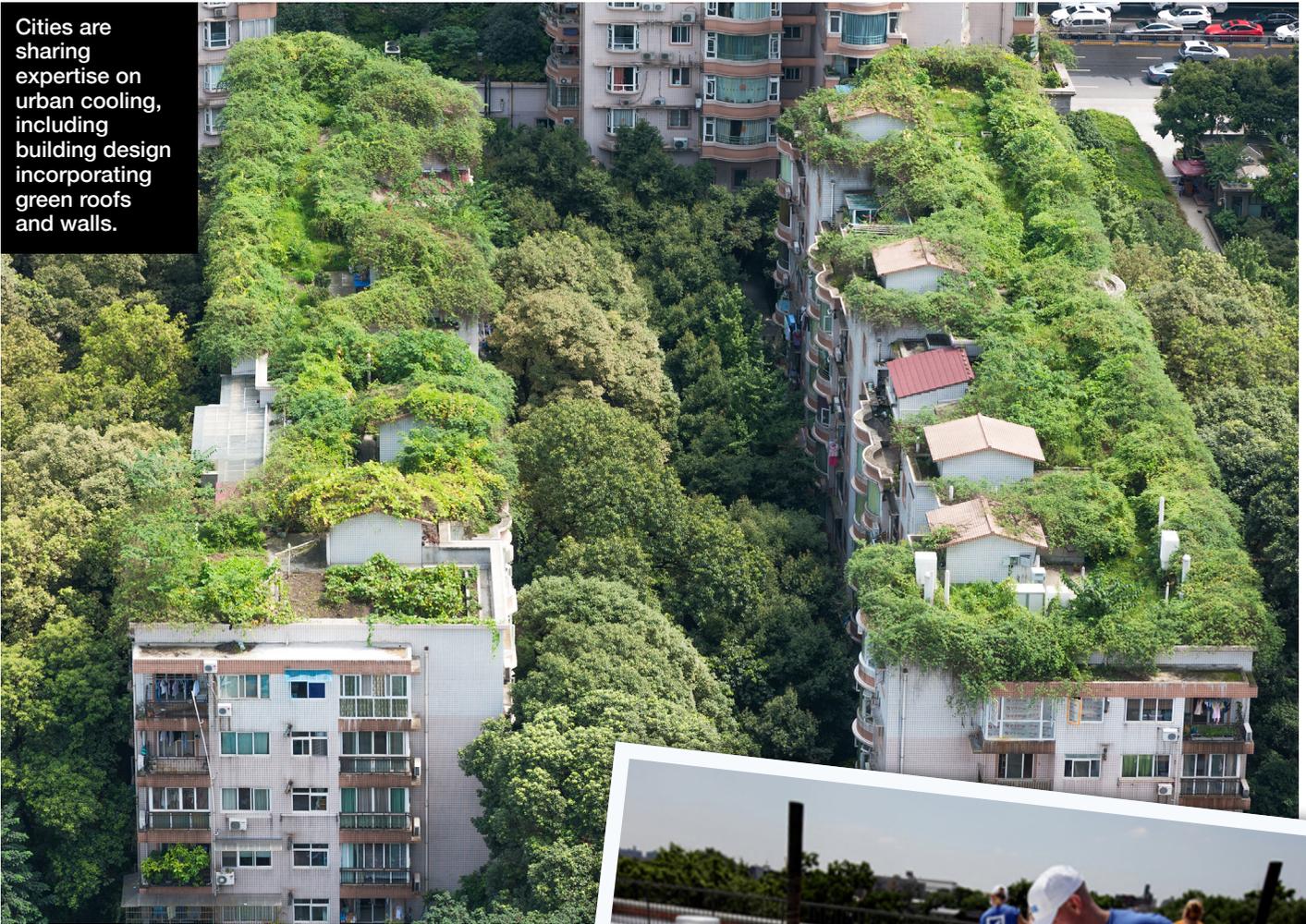


In the absence of enforcement, countries are vulnerable to becoming dumping grounds for products that cannot be sold elsewhere

Institute (RMI), one of the prize’s sponsors, technology available today could support residential air conditioning solutions that have a five times lower climate impact and are four to five times more energy efficient, but the “market is not moving fast enough on its own”.

The eight finalists have been awarded \$200,000 each to develop and ship their prototypes to India for testing this summer, with the winner, who will receive \$1m in prize money, to be announced in November 2020. >

Cities are sharing expertise on urban cooling, including building design incorporating green roofs and walls.



LP2 STUDIO/SHUTTERSTOCK

One barrier to uptake of more climate-friendly air conditioners is that until they are mass-produced they will be more expensive to buy than standard air conditioning, although they will be lower cost to run. Iain Campbell, senior fellow at RMI, said innovation in financing and policy would also be necessary to bring down the upfront costs.

“The prize process was structured to shine light on this very specific space and identify what could be possible and then test the solutions to demonstrate what is possible,” he said.

“The results from the testing stage will inform market stakeholders, especially legislators and policymakers, as to what levels of efficiency can be achieved within appropriate cost constraints and how some of the future low global warming potential (GWP) refrigerants and refrigerant alternatives actually perform.”

The Cool Coalition also seeks to shift cooling to renewables, district cooling approaches, and solar powered cold chains, among other ideas.

Paris, for example, has pledged to expand its district cooling system, the most extensive in the



New York City's Cool Roofs programme has coated more than 9 million square feet of roofs with white paint.

world, from mostly hospitals, hotels, museums and department stores to also include small companies and residential buildings, with the aim of covering 100% of the city in 20 years (from 43% today). District cooling is a closed system that uses chilled water (from the Seine, in Paris's case) to cool all connected buildings. France's Engie, the utility that runs the Paris network, pledged to invest some €2bn by 2024 in district cooling systems worldwide.

Besides focusing on less polluting or carbon-intensive ways to crank up the air conditioning, >



Cities can individually and as a collective make a great difference in reducing the impacts of climate change

the Cool Coalition is encouraging passive cooling ideas, especially in cities where concrete, asphalt and a lack of vegetation can exacerbate the heat. C40 joined the Cool Coalition as a knowledge partner, committing that its more than 90 member cities would share expertise on how to integrate urban cooling into their climate action plans and building design, including adding more green public spaces on undeveloped land, green roofs and walls.

In Medellín, Colombia, winner of an Ashden sustainable energy award last year, verges along roads and waterways have been turned into green corridors, providing shade for cyclists and pedestrians and improving air quality along busy roads. The city's botanical gardens train people from disadvantaged backgrounds to become gardeners and planting technicians, and they've been put to work transforming abandoned land that had become dumps and isolated anti-social areas into lush gardens. As a result, temperatures have fallen by two or three degrees Celsius in many places, with more significant reductions expected in the future.

Athens has been lowering cooling needs of public buildings by up to 60% since it began planting green roofs on them in the early 2000s, and in 2016, San Francisco became the first American city to make green roofs compulsory on some buildings.

In other cities, white is the new green: Since 2009, New York City has coated more than 9 million square feet of tar roofs (and counting) with white paint through its Cool Roofs programme, and Los Angeles is applying light grey paint to its streets. This is because light colour surfaces reflect, rather than absorb, the heat of the sun, lessening the need for mechanical cooling inside.



MEDELLIN GLOBAL CENTER FOR ADAPTATION

Ashden award winner Medellín, in Colombia, has turned verges into green corridors.

A 2014 study by Arizona State University found that cool roofs could reduce temperatures by up to 1.5 degrees C in California, or 1.8 degrees in Washington, DC, with white roofs being even more effective than “green” roofs for cooling.

Regina Vetter, C40 Cool Cities network manager, said there are a range of tools available for cities to exchange their knowledge, best practice and challenges in adapting to heat and lower urban temperatures.

“Cities can individually and as a collective make a great difference in reducing the impacts of climate change in their communities.” ■



Diana Rojas is a freelance writer based in Washington, DC, and a regular contributor to Ethical Corporation, focusing on environmental policy and sustainability issues. Diana is fluent in Spanish and Portuguese.



Ahmedabad residents fill water jugs during a heatwave in the city.



AMIT DAVE/REUTERS

How cities like Ahmedabad are helping to tackle deprivation of access to cooling

Despite the attention being given to corporate and governmental efforts to making future cooling more efficient and eco-friendly, a startling fact often gets overlooked: while the 30 hottest cities are in developing countries, far less than one per cent of development aid goes to help countries implement cooling strategies.

The result: more than one billion people lack access to cooling (and in many cases, the electricity to power it), with an ever-increasing threat of heat-related deaths in urban slums. It also means that the rural poor and farmers lack access to cold chains to keep food safe and nutritious, and health systems have difficulty keeping vaccines and other medicines viable. And, not inconsequentially, more than two billion others in the growing middle classes can only afford high carbon, less-efficient cooling equipment, which will lead to a spike in global climate change, according to a 2018 report by Sustainable Energy for All (SEforAll).

Globally, if air conditioning were to be made available to all who need it, and not just those who >

 [VIEW ONLINE](#)

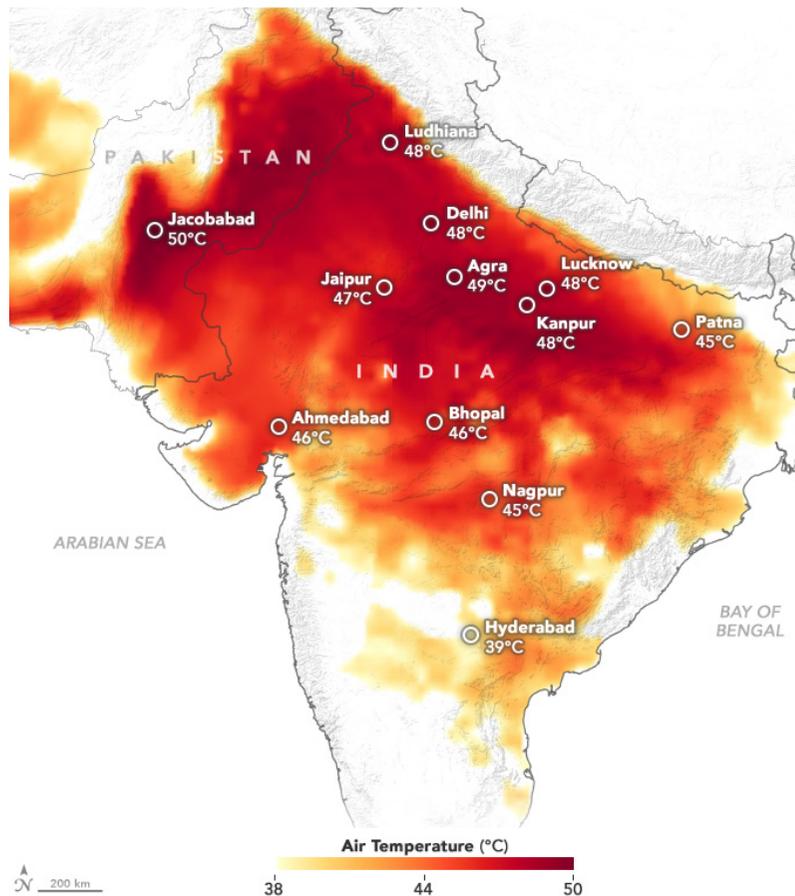
can currently afford it, the number of units would need to rise from 3.6 million today to 14 billion by 2050, according to a UN report.

“The shame of it is that we see resource-limited families stretch to procure an air conditioner so that they can finally sleep well at night, but then realise that they cannot afford to operate this life-enhancing appliance as it consumes so much electricity, proving to be a burden on their pockets,” said Iain Campbell, senior fellow at the Rocky Mountain Institute (RMI), which is sponsoring the Global Cooling Prize. (See also [Can we defuse the ticking time bomb of soaring demand for cooling?](#))

With 30% of the global population already facing dangerously high temperatures more than 20 days a year, heatwaves are causing some 12,000 deaths annually, and that fatality rate is expected to rise to 255,000 by 2050, according to the SEforAll report. In 2015 in India and Pakistan alone, some 4,500 people died during a heatwave that saw temperatures rise to an unfathomable 49C.

The Kigali Cooling Efficiency Program (K-CEP) notes that access to cooling is needed to achieve a number of the UN Sustainable Development Goals, such as ending hunger, disease and poverty. Studies have shown that worker productivity declines as the heat rises above the 20-30 degree threshold, and that heat in the classroom is tied to educational performance in children. And with the changing climate, diseases that previously were only common in tropical zones will spread, making the need for cooling to preserve vaccines more urgent.

Yet despite the bleak reports, ideas abound to help cool humans while not further heating up the globe. These range from off-grid solar systems to support fans and cold-chain refrigeration, to instituting more low-cost passive cooling – cool and/or green



While the 30 hottest cities are in developing countries, less than 1% of aid goes towards cooling strategies. NRDC.ORG

roofs, building design and retrofit to allow for better cross-air flow – as well as financing instruments to help with the purchase of energy-efficient cooling equipment.

After 1,300 people in Ahmedabad, in western India, died in a heatwave in 2010, the city of 6.4 million people decided to act to try to minimise future loss of life. Working with the Indian Institute of Public Health, the US-based Natural Resources Defense Council, other groups and NGOs, municipal leaders brought in South Asia’s first heat action plan.

An early warning system is in place to alert those most at risk when temperatures above 45C are imminent, including grassroots workers dispatched to areas where the most vulnerable people are living. During times of red alerts, school timings are changed, water is distributed to all bus depots, power cuts are banned, and hospitals are mobilised to treat heat-related illnesses. The city has also brought in cool roofs across the city, claiming that this brings down inside temperatures by 5-7C.

The initiative has been so effective that 30 cities in 11 other Indian states have since adopted similar plans. ■



We see families stretch to procure an air conditioner, but then realise they cannot afford to operate it as it consumes so much electricity



Diana Rojas



From regenerative urban farming to net-zero buildings

Diana Rojas profiles some of the US cities that are leading the way on climate action

 [VIEW ONLINE](#)





JIM YOUNG/REUTERS

With two-thirds of the global population expected to live in cities by 2050, and 70 million more people migrating from the countryside to urban habitats every year, cities are growing in importance as climate actors, according to climate action disclosure platform CDP.

The extent to which cities are rising to this challenge, even where national government may be failing to grasp the nettle, is seen nowhere more clearly than in the United States.

Despite persistent federal rollbacks of environmental and clean energy regulations since 2016, the biggest number of cities worldwide on CDP's climate change A-list for cities this year were in the US.

It's the second year that CDP has scored cities on their performance on climate change, and of 850 cities that reported, 105 were given the highest ranking for their transparency and action on climate change. Among them were 34 US cities, a substantial slice of the 200 that report to CDP.

"To the effect that the US cities are saying 'we are still in', they're setting clear goals and working with the businesses within their cities to support the cities' goals," said Katie Walsh, CDP head of cities,

states and regions in North America. She noted that winning cities, on average, took double the number of actions related to adaptation and five times the mitigation action compared with other cities.

In North America, there have been 371 city-based overall climate projects worth some \$32.9bn, said Walsh, adding that there is high investor appetite for projects, with green bonds over-subscribed.

To qualify for the A-list, municipalities need to disclose publicly, have a city-wide emissions inventory (and not just of municipal fleets and buildings), set an emissions reduction target and have a climate action plan.

In this presidential election year, a snapshot of A-list American cities shows that they are in both "red" and "blue" states, shorthand for states whose voters historically back Democratic (blue) or Republican (red) presidential candidates. "I think what we're finding is that cities are taking action and they're not waiting for the federal government," said Walsh.

She added that their task has recently been made much harder because they are having to manage the spread of the coronavirus. "Mayors along the Mississippi river are already grappling with how to plan for what will likely be yet-again historic floods, alongside the financial and human health costs of coronavirus, and all our US cities that face high summer temperatures will soon have to consider how to plan for cooling centres for elderly, vulnerable populations with massive stay-at-home orders in place." >

Mayors along the Mississippi river are braced for more floods.



Washington, DC, is the world's first LEED Platinum City and a CDP A-lister.

She said climate change is a threat multiplier for the spread of infectious diseases such as the coronavirus. “US cities must keep the wheels in motion to continue to drive action on the environment and climate change. The best time for action is long before the crisis hits.”

Here we profile some of the US cities who are leading the charge:

WASHINGTON, DC

Home to a federal administration openly hostile to environmental and climate mitigation measures, the city has 633,000 residents and a progressive municipal government that, in sharp contrast to its federal counterpart, is racking up accolades. Along with being on CDP's A-list it is a Tree City of the World, first LEED Platinum City of the World, and the first US city to establish a Green Bank, to name a few. Its goal is to make the capital city 100% renewable by 2032 and carbon-neutral by 2050.

Since its first Sustainable DC plan in 2008, the city has reduced its emissions by 29%, mainly because the local energy distributor switched from coal to natural gas. “Now it gets hard,” said Tommy Wells, director of the DC Department of Energy & Environment.

With buildings responsible for 76% of all greenhouse gas (GHG) emissions, the sector is a priority. A new building code requires net-zero for buildings over 50,000 square feet, but will be



US cities must keep the wheels in motion to drive action on climate change. The best time for action is long before the crisis hits

widened to include those of more than 10,000 square feet and then 5,000 square feet by 2050.

Finance will come through the \$100 million DC Green Bank, which will harness public money to attract private investment for green energy and mitigation. Meanwhile, the DC Sustainable Energy Utility is retrofitting buildings for energy efficiency (funded through a surcharge on energy and gas bills), while the DC Property Assessed Clean Energy Program (PACE) offers long-interest loans to finance energy-efficient building and upgrades, payable by an incremental increase in the property's taxes.

Wells said that the city has set a goal for how much electricity the power distributor must purchase from solar panels installed throughout the city. If there's not enough, then it must offer an alternative compliance payment, which will be used to fund more solar power in the city.

Washington, DC also aims to achieve 40% tree coverage by 2032 to cool down the city and >

mitigate the climate change threat of flooding, and has partnered with the non-profit Casey Trees.

DC was one of the first cities in the country to institute a five-cent tax on single-use plastic and paper bags in 2010, and uses the \$2.5m raised each year to fund its RiverSmart programme, which provides financial assistance and rebates to homeowners who plant rain gardens or replace impermeable surfaces with permeable alternatives, or who plant shade trees.

“No one has ever run for office saying they want to repeal the bag tax,” Wells said. “But there are a lot of cities that are constrained by state leaders who don’t believe humans are causing climate change.”

PARK CITY, UTAH

Enter Park City, a “blue” enclave in a deep “red” western state whose official state rock is coal. Most famous for its skiing and the Sundance Film Festival, Park City also has the most ambitious climate plan in North America: net-zero and 100% renewable energy by 2022 for city operations, and 2030 community-wide.

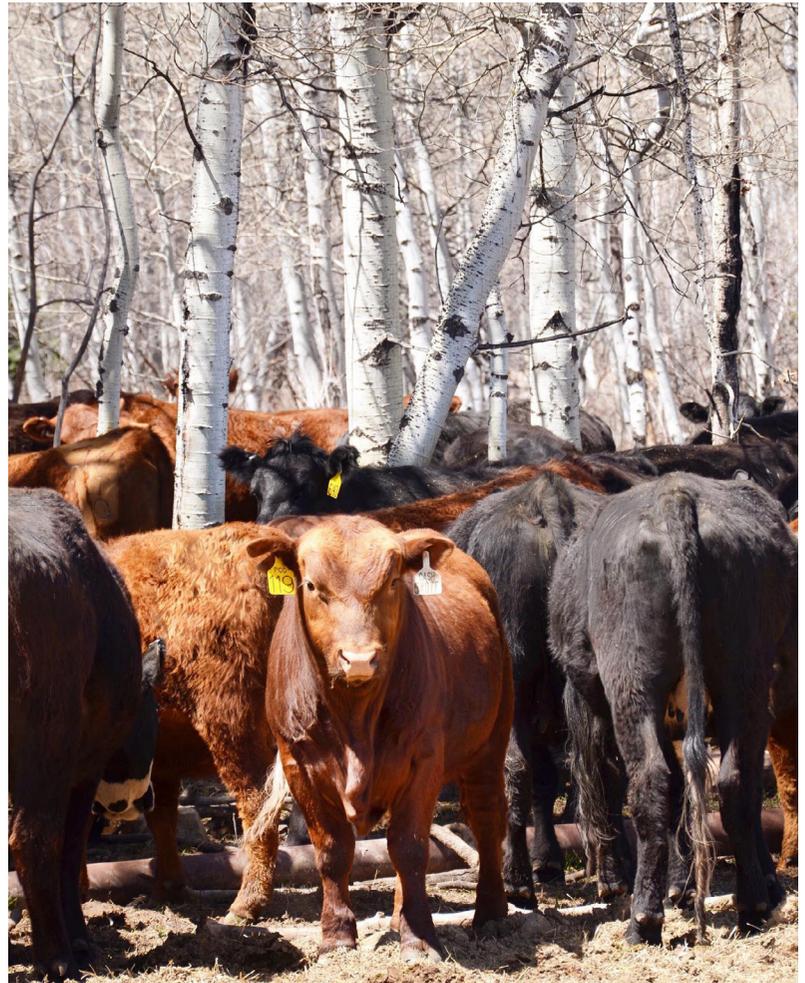
Before it could commit to such aggressive goals, Park City spent three years convincing the overwhelmingly Republican state legislature to loosen centralised control of the energy code to allow individual communities to opt for renewable energy. The Community Renewable Energy Act finally passed in 2019 (individual customers can opt out).

“I can’t vilify folks here. Sure, coal has major impacts, but I have nothing against the coal communities out there. These are good, hard-working people who see the end of times coming for coal,” said Luke Cartin, environmental sustainability manager of the Park City Municipal Corporation. Indeed, the Utah power utility is switching from 60% coal to 60% renewable by 2030 because solar and wind is cheaper than coal, he said.

Park City’s building code requires net-zero power on all new and renovated buildings that use city funds; its bus fleet is electric, while rooftop solar is expanding.

But for all the emissions the city cannot eliminate, it is turning to regenerative agriculture for carbon sequestration.

In 2018, the city introduced cattle on the 10,000 acres surrounding it, herding them strategically to force them to eat the noxious weeds and thatch that forms when grass mats don’t properly decompose. The disturbance caused by their hooves and introduction of cow manure accelerates



BILL WHITE FARMS

In 2018, Park City introduced cattle as a form of regenerative agriculture.

decomposition, allowing more microbiota to sequester more carbon, and better retain water. It also encourages native species to grow instead of weeds.

Park City paid for fences, an irrigation ditch and seed planting (clover, radishes and beets). A local farmer and restaurateur, Bill White, owns the cows. The cows work for the city; White uses the meat and dairy products in his nine restaurants and donates to food banks. A third partner, a nature conservancy, keeps tabs on the conservation easement.

Rangeland, a term used to describe extensive areas from desert to wetland in the western half of the United States, is the largest land use in the United States, and Cartin said measures like this engage large landowners, making them stakeholders in decarbonisation. And the idea brings carbon offsetting to a local level: entities that need to offset carbon emissions could pay into a fund that helps a rancher 30 miles away and supports the regional local economy. That financial mechanism could, in turn, encourage a rancher to make tweaks that they will be compensated for, which will benefit carbon sequestration on all the land. >



“The marketing side is huge. This is something people can see, touch and feel ... this is a beautiful, verdant pasture,” he said. “If our largest land use is ranching, then let’s engage these folks.”

With a year-round population of 8,200, Park City maintains infrastructure for some 80,000 because of the film festival and ski resorts. Given its small size, a carbon-neutral Park City wouldn’t be too impactful to the overall climate crisis, but Cartin said it can be a “the lab for so many cities”.

“We are small, but we can figure this out faster than anyone else because no one else is,” he said. “How can we expand this impact? We can be these proofs of concepts.”

CINCINNATI, CLEVELAND AND COLUMBUS, OHIO

Traditionally the country’s bellwether state in presidential elections, Ohio saw a trio of cities win A-list certification by CDP.

All are independently working on a specific set of climate goals, and although none has historically been regarded as a sustainability standout, by exchanging best practice they are “speeding things up”, Walsh of CDP said.

Oliver Kroner, sustainability coordinator in Cincinnati’s Office of Environment & Sustainability, said that since the three cities share regulatory and

Cincinnati is installing solar panels on public venues such as its zoo and on schools.

political context, they’ve made their solutions open source and exchange ideas and lessons learned.

“When it comes to addressing climate change, it isn’t a competition, we are all in this together,” said Kroner. “Cities are working to learn from each other about what is working and where we have roadblocks.”

Cincinnati, in the southwest near the Kentucky border, plans to reduce emissions 80% by 2050, and make all of its operations and fleets carbon-neutral by 2035 by building the country’s largest city-owned 100MW solar farm, which will also feed renewable energy to homes. There is also a Green Cincinnati Plan, which aims to expand the current 39% tree canopy to communities with a skimpier cover, and to reduce acreage of mowed grass and replace it with bushes and trees.

Importantly, the city is dedicating attention (and money) to educating its populace on its climate action plan. Examples include putting solar panels on schools, getting a 10% increase in residents able to list three things they are doing to improve sustainability, and even marketing 80 strategies to reduce emissions 80% by 2050. The goal is to get the community to “consider the environmental impacts of their lifestyles and choices”, Kroner says, adding: “Many sustainability efforts are fundamentally about behaviour change.” ■



In 2018, Hermosillo mandated green infrastructure design guidelines for all its public spaces.



AEROIMAGEN/SHUTTERSTOCK

Hermosillo and Belo Horizonte make A grade as two of Latin America's greenest cities

 [VIEW ONLINE](#)

Mexico leads the way among Latin American countries in urban planning for climate risk, home to four out of nine cities that made CDP's climate A-list.

In the dry desert state of Sonora, in the far north of Mexico, the capital city of Hermosillo won the CDP A-list accolade (along with Mexico City, Mérida, Ayuntamiento de Celaya, and León de los Aldama)

Last year, the city of 850,000 saw temperatures rise to 48C in June. Hermosillo is feted as one of the most liveable cities in Mexico, but strong cross-border trade with the US to the north has made it an attractive destination for internal migrants fleeing drought, unemployment, downturn in crops, and other misfortunes. With its gross domestic product (GDP) forecast to rise steeply to 2030 (133% according to the Economist Intelligence Unit) – it is struggling to accommodate rapid growth with dangerously decreasing water availability. Groundwater supplies 75% of its residents' total needs, and there are predictions of less precipitation and even hotter days in the future.

Elevation to the A-list is recognition of >



ANTONIA SALAVERRY/SHUTTERSTOCK

Hermosillo's efforts to manage its water resources. In 2018, Hermosillo became the first Mexican city to mandate green infrastructure design guidelines for all its public spaces, gardens, parks, alleys, rain canals and verges. The rules dictate everything from how much of a parking lot must be made up with permeable pavers (20%) to specifications for rain gardens and hydroponic green walls, to mandating that 3-5% of all new building area be permeable surface (with 50-75% of that area planted).

The city is also turning to new planting to preserve water reserves through its "Transform a Boulevard" partnership with 122 businesses. The companies have planted and cleaned some 24km, not only beautifying and adding shade, but using the green space to manage the scarce rain and to sequester carbon.

In addition, part of the city's plan includes treating 100% of the wastewater produced by its residents, rendering it safe for public consumption.

In a statement to CDP, Hermosillo Mayor Célida López Cárdenas said city leaders are motivated daily by meeting people and residents who, are interested in "green culture".

"Hermosillo is transforming into a hub of innovation and change, committed to delivering a safe and sustainable environment for its inhabitants," she said.

In Brazil, two cities made the A-list: Rio de Janeiro and Belo Horizonte. As the capital of the state of Minas Gerais, Belo Horizonte is renowned for its quality of life. The city of 2.5 million people boasts a bus rapid transit system, a robust Adopt a Green Space programme, bike lanes and a goal to reduce its

Belo Horizonte in Brazil boasts a bus rapid transit system, bike lanes and 800,000 square metres of solar collection.

already low greenhouse gas (GHG) emissions 20% by 2030. (Hydroelectric power in Brazil supplies nearly three-quarters of its electricity generation).

But Belo Horizonte takes clean energy up a notch: it now has some 800,000 square metres of solar collectors and a system for heating water by solar energy in 3,000 buildings, more than 10 times the national average per capita. It also generates electricity by capturing methane at an old city landfill, using the biogas fuel that it produces to generate enough energy to supply 20,000 houses that consume less than 100 kilowatt hours (kWh) per month.

The city, which endured a month of record-breaking, and deadly, rain in January, has taken steps to become more resilient in the face of climate change, with a building code that sets minimum permeable surface requirements, and other efforts to build "linear parks" to help restore the course of water throughout the city.

Net-zero is elusive because Belo Horizonte is interconnected with a national grid, and there are federal limitations on increased solar, said Dany Souza Amaral, executive secretary of the Belo Horizonte Municipal Committee on Climate Change and Eco-efficiency. But being nominated to the A-list recognises the work the city has put in to mitigate climate change since 2006, and incentivises it to forge ahead, he said.

"An A grade ... challenges us to be more daring and build public policies that deal with, and also anticipate problems related to climate emergencies," said Souza Amaral. ■



Diana Rojas

UK cities double down on climate action



CRAIG BROUGH/REUTERS

With 85% of its population living in cities that have declared a climate emergency, Britain is leading the way in grassroots action.

Mike Scott reports

 [VIEW ONLINE](#)

Some 55% of the world's people live in cities today, and they are responsible for 70% of global emissions. By 2050, two-thirds of the population will be urban-dwellers.

“This makes them hugely important in the fight against climate change,” says Kyra Appleby, global director for cities, states and regions at CDP.

At the same time, 85% of cities that responded to CDP's climate questionnaire said that they are already being affected by climate-change hazards. The biggest issue for UK cities is flash and surface flooding, which affects cities that house a quarter of the UK population, with river flooding and heatwaves also cited by many. >



SION HANUNU/SHUTTERSTOCK

It is no surprise, therefore, that they are starting to take the issue much more seriously. While in the 2019 survey some 43 cities – 7% of respondents – achieved the highest A-ranking for their efforts to respond to climate change, this year that proportion has doubled to 14%.

“There’s a big increase in the number of cities recognising that this is important and introducing ambitious plans to tackle it,” Appleby says. “In the UK, 250 local authorities have declared a climate emergency on the back of increased concern from citizens and businesses.”

Local authorities that have declared a climate emergency are home to 85% of the UK population, [the highest proportion in the world](#), according to the Climate Emergency Declaration campaign, which says New Zealand comes second, with 74% of its population in municipalities that have declared a climate emergency.

The key issues cities are tackling are buildings, energy use, transport and waste, she adds, and the best-prepared cities have set targets to cut emissions through the use of renewable energy, clean transport and energy efficiency.

Buildings are responsible for 40% of emissions and so they are one of the biggest targets to go after, says Jonathan Maxwell, CEO of SDCL, an investment firm focused on energy efficiency. “The

way energy gets to these buildings is incredibly inefficient. About 62% is wasted before it gets to the buildings and another 20-30% is wasted inside the buildings. It’s a fantastic opportunity to reduce waste and produce better solutions.

“There’s a lot we can do with technologies that are available today and they will improve further over the next 10-15 years. There’s a significant business opportunity to help companies save money and cut their emissions.”

Maxwell highlights technologies such as natural gas co-generation and HVAC (heating, ventilation and cooling), along with some more specific opportunities. “Only 25% of lights in the NHS are efficient, for example,” he points out.

Cities in the UK have more power to act than in the past, says Cara Jenkinson, cities manager at sustainable energy charity Ashden, which runs an awards scheme focused on decarbonising the energy system. “As a result of devolution, they have more powers to take holistic action on climate change.”

Not all mayors are interested in tackling climate change, she adds, but they may be interested in dealing with issues such as poor housing or fuel poverty, so Ashden has produced a “co-benefits toolkit” that demonstrates how action on climate change can deliver other local benefits, including improved health, increased >

Bristol is focusing on retrofitting properties to make them more energy-efficient.



We need to reduce the amount of stuff we buy and make sure the materials in that stuff is plugged into the circular economy



MADRUGADA VERDE/SHUTTERSTOCK

equity and social cohesion, economic opportunities and increased resilience.

Jenkinson highlights the efforts of Oxford and Bristol, which are focused on retrofitting properties to make them more energy-efficient, while CDP's Appleby cites Leicester's work with the Environment Agency to reduce the risks of river flooding and with the local De Montfort University to create a digital social platform to show residents how they can make their homes more resilient.

One of the regions that is most advanced in its planning is Greater Manchester, which has announced plans to be carbon-neutral by 2038, 12 years ahead of the government's 2050 target. The region's strategy is informed by two principles, says Jonny Sadler, programme director at the Manchester Climate Change Agency: it will be guided by the science, as outlined by the Tyndall Centre for Climate Change Research, which is in part based at the University of Manchester, and "it has to be a collective, city-wide effort".

Manchester's response differs from that of most cities because the agency is independent from the local authorities: it was spun out as an independent not-for-profit in 2015 and involves local businesses and organisations as well as the city and regional authorities. "We help the city set the right targets in line with the science and then we help to put them through the local political process," Sadler says. "In 2018, we were one of the first cities in the world to set a target in line with the Paris Agreement."

As a result, the city is on track to meet its target of cutting emissions by 41% since 2010 and it has new targets: to halve its emissions by 2025 and to be net-zero by 2038. It will do this "by only

building zero-carbon buildings and decarbonising the energy supply, including a massive amount of renewables generation in the city and decarbonising the transport system," Sadler says. "We also need to reduce the amount of stuff we buy and make sure the materials in that stuff is plugged into the circular economy so it gets reused."

With flooding one of the biggest risks for the city, Manchester is also focusing on green and blue infrastructure and nature-based solutions that can help both with carbon sequestration and adaptation to climate change. These include incorporating features such as swale into housing developments, which can reduce the flow of water into the drainage network to control flooding.

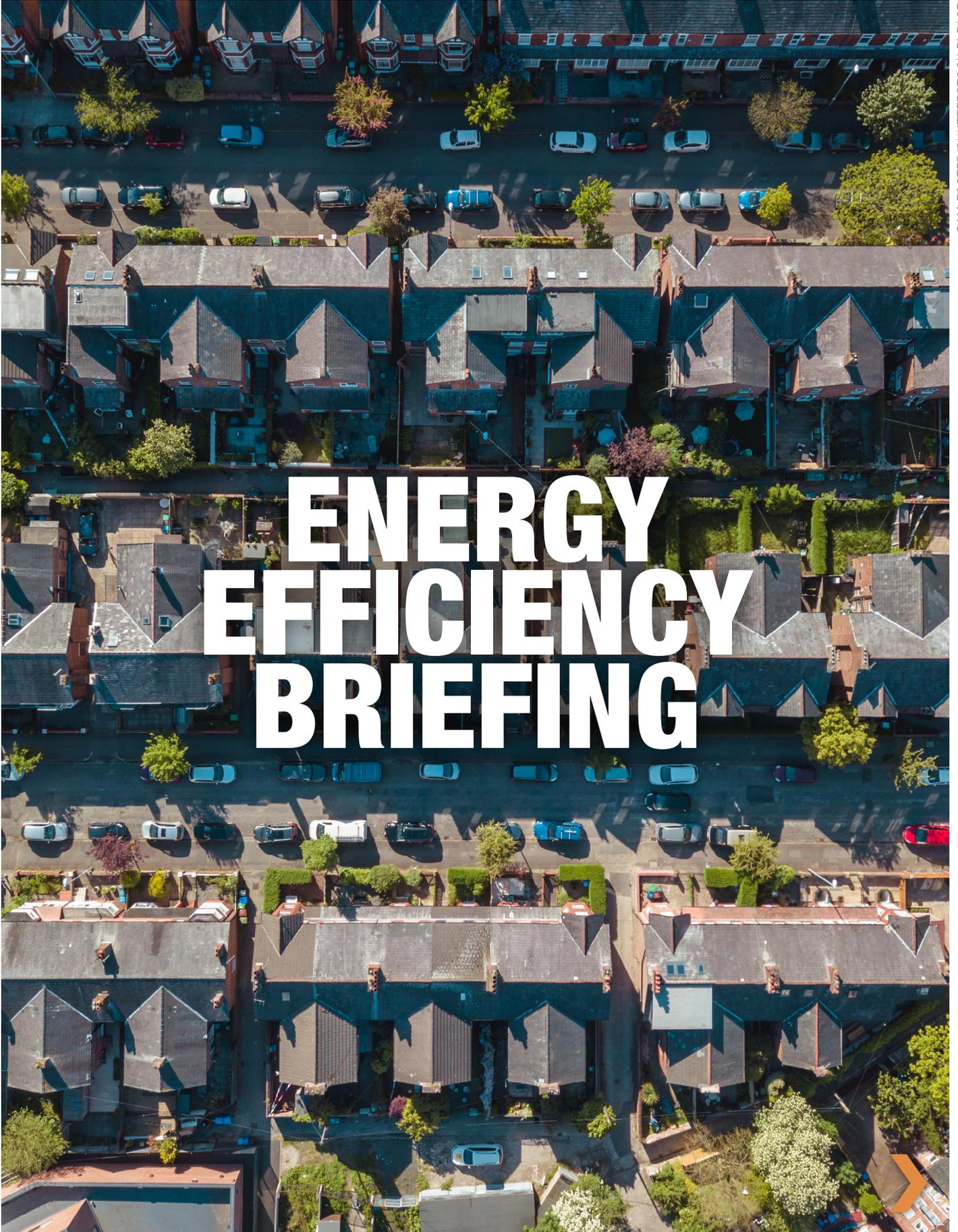
"We will see more and more cities setting really ambitious targets over the next 10 years and working more closely with the business community," Appleby says. "This has to be the decade of delivery." ■

Greater Manchester has announced plans to be carbon-neutral by 2038.



Mike Scott is a former Financial Times journalist who is now a freelance writer specialising in business and sustainability. He has written for The Guardian, the Daily Telegraph, The Times, Forbes, Fortune and Bloomberg.





SAM FOSTER/SHUTTERSTOCK PLEASE



From the boiler room to the boardroom

Mike Scott reports on the companies that are aiming to double energy productivity as part of their response to climate change

 [VIEW ONLINE](#)



| | | | | | |
|--------|-------|--------|-------|------|-----|
| 1605.0 | -67.0 | アンリツ | 1804 | +58 | トヨ |
| 1849 | +6 | ソニー | | | 日野 |
| 2033 | -41 | TDK | 7640 | -170 | 三菱 |
| 1184.0 | -4.0 | アルプスアル | 1034 | -32 | アイ |
| 1886 | +2 | 横河電 | 1141 | -22 | マツ |
| 2006 | -6 | アドバンテ | 3935 | -5 | ホン |
| 12095 | +420 | キーエンス | 29590 | -345 | スス |
| 591 | -11 | デンソー | 3152 | -53 | SUB |
| 173 | -4 | カシオ | 1362 | +9 | ヤマハ |
| 688 | -28 | ファナック | 13885 | -155 | シマ |

ISSEI KATO/REUTERS

Efficiency is often the ugly duckling of the clean energy sector, but it is also one of the areas with the biggest potential to cut emissions and tackle climate change.

One of the problems has been how to sell the concept to company managements even though the justification for efficiency measures is extremely strong. “Energy efficiency is less pretty and shiny than wind turbines or solar panels, to be sure, but there is such a good business case,” says Clay Nesler, vice-president for global sustainability and regulatory affairs at Johnson Controls.

“If you double your energy productivity (EP), you’re using half as much energy to produce the same economic output; those savings go straight to the bottom line, and they are very significant.”

One initiative that is trying to change the

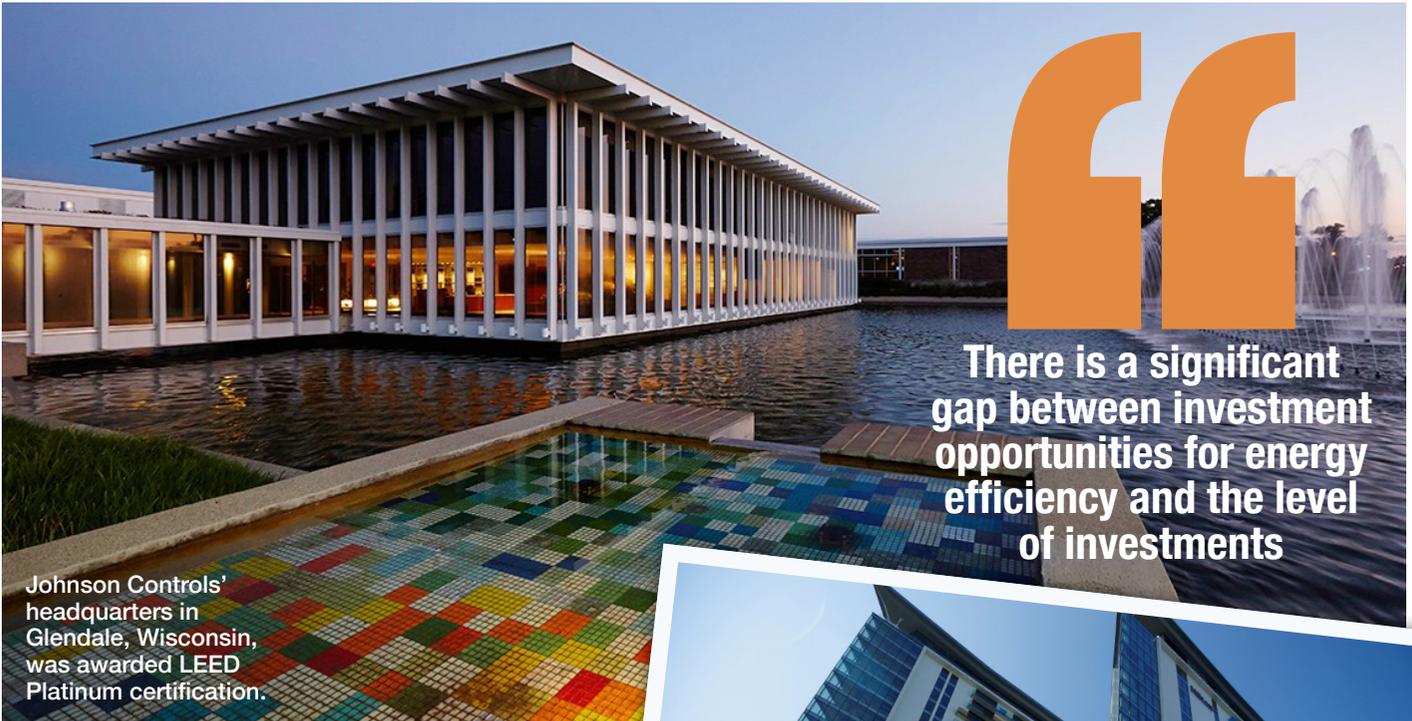
perception of energy productivity is EP100, a scheme run by the Climate Group and the US-based Alliance to Save Energy. The initiative, launched in 2016, brings together “energy-smart companies committed to improving their energy productivity and doing more with less,” the Climate Group says.

“It is a global leadership platform where companies can demonstrate leadership in being energy-smart,” says Jenny Chu, head of energy productivity initiatives and corporate partnerships at the group. “We really want to bring energy use out of the boiler room and into the boardroom. We want to be able to tell a story of decoupling growth from energy consumption.”

The International Energy Agency (IEA) estimates that improvements in energy efficiency can deliver more than 40% of the greenhouse gas emissions reductions needed to meet global climate goals. In addition to enabling a faster shift to renewables, energy efficiency improvements add enormous value to global gross domestic product (GDP) and boost companies’ bottom lines, Chu says.

The energy market is facing huge disruption >

The impact of the coronavirus on the global economy could boost investment in cost-saving measures like energy efficiency.



Johnson Controls' headquarters in Glendale, Wisconsin, was awarded LEED Platinum certification.

JOHNSONCONTROLS.COM

There is a significant gap between investment opportunities for energy efficiency and the level of investments

because of the effect of the coronavirus on the global economy, but this may boost the attractiveness of efficiency measures as the world starts to recover, says Chu. “Energy efficiency generates cost savings and that will be more important as we try to stabilise the world economy,” she points out. “It is less capital-intensive than other energy investments and it pays back more quickly. My feeling is that will make the business case stronger as we emerge from the crisis.”

Efficiency will be a key component of UK efforts to meet its target to become a net-zero economy by 2050. The UK government says more efficient use could cut consumption by 40 terrawatt hours (TWh) in commercial and industrial buildings, and a further 10TWh in industrial processes. There is also considerable potential in domestic properties, which are responsible for 13% of the UK's carbon emissions, rising to 22% if electricity use is taken into account.

However, there are a number of market barriers to achieving these savings, including limitations in measurement and verification, problems in accessing multiple revenue streams from energy savings, high transaction and implementation costs, and the difficulty of changing the way people behave.

The UK's Department for Business, Energy and Industrial Strategy (BEIS) is seeking views on how to reduce the market barriers to energy efficiency after the Environmental Audit Committee warned



DAVID MDZINARISHVILI/REUTERS

Hilton has committed to improving its revenue per megawatt hour by 40% across all its hotels.

that the UK “stands no chance” of hitting its goals on emissions reduction and the 2050 net-zero goal without urgent action on energy efficiency.

BARRIERS TO FINANCING

The United Nations Economic Commission for Europe says “there is a significant gap between investment opportunities for energy efficiency and the level of investments in energy efficiency in most countries”. One reason for this is that the financial environment is not very favourable for investments in energy efficiency. “Self-financing remains the most widely used type of financing of energy efficiency,” the Commission says. “Financial institutions view financing of energy efficiency projects as significantly riskier compared to other types of business projects.”

This is despite the fact that energy efficiency provides a positive return on investment, Nesler >

says. “We have to convince people to compare investment in energy efficiency with investment in other parts of the business.”

There are three ways to become an EP100 member:

1 Double energy productivity

A company commits to doubling its economic output from every unit of energy it consumes globally within 25 years, with a baseline year of 2005 at the earliest. The company chooses a relevant energy productivity metric (e.g. revenue/gigajoules (GJ) of energy) to track and report. All 5,400 hotels operated by Hilton, for example, are committed to improve their revenue/MWh (megawatt hours) by 40%.

2 Implement an energy management system

A company commits to implementing an energy management system in each of its facilities within 10 years and commits to an energy productivity target.

3 Net-zero carbon buildings

In a commitment led by the World Green Building Council, a company commits to owning, occupying and developing buildings that operate at net-zero carbon emissions by 2030. A net-zero carbon building reduces energy demand, is highly energy efficient and is fully powered by renewable electricity.

“We know it can be done,” Chu says. “India’s Mahindra Heavy Engines has already hit its target to double energy productivity, 21 years ahead of its 2041 target, becoming the first Indian company to do so.”



We know it can be done. India’s Mahindra Heavy Engines has already hit its target to double energy productivity, 21 years ahead of its 2041 target



KIM KYUNG-HOON/REUTERS

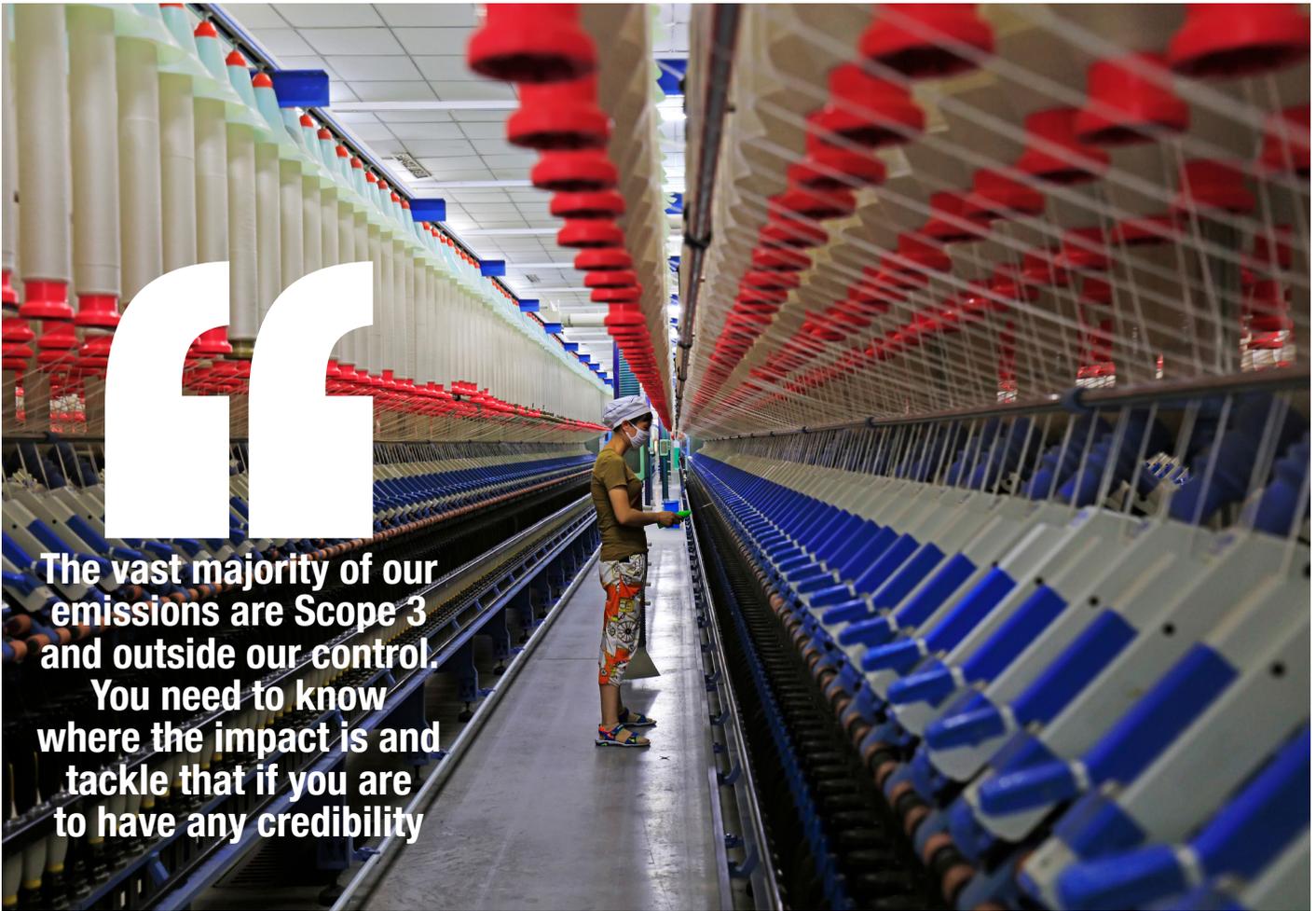
If energy productivity is doubled, half the energy is used to produce the same economic output.

The company met the target using a mix of technology upgrades, behavioural changes, and process modifications, including: energy-efficient lighting that cut power consumption from lighting by 30%, smart metering for real-time monitoring of energy consumption, energy audits where major opportunities for savings were identified, including installations of variable frequency drive (VFD) motor controllers and timer-based machine operations.

The benefits the company identified included a more than doubling of capacity per shift and a reduction in engine test time from 20 minutes to 1.5 minutes per test cycle, cutting fuel consumption per test by 90%.

Vijay Kalra, CEO of Mahindra Vehicle Manufacturers, said: “Energy productivity improvement can bring about an array of direct and indirect impacts that collectively help in ensuring the sustainability quotient of a business. The EP100 journey has enabled Mahindra to reduce costs, drive innovation and support the environment.”

Another company that has embraced EP100 is Johnson Controls, which is unsurprising given that energy efficiency is one of its key businesses. “We were on track to double our energy productivity from 2002, which we accomplished in 2019, and so we committed to double it again from 2009 to 2030 for EP100,” says Nesler. “A lot of organisations are nervous about doing something like that if they have already made improvements such as lighting >



“The vast majority of our emissions are Scope 3 and outside our control. You need to know where the impact is and tackle that if you are to have any credibility”

retrofits and other low-cost measures. But even though we harvest the low-hanging fruit first, it grows back pretty quickly. So, in lighting, we moved from incandescent bulbs to fluorescent, then to LED lights, and now we’re looking at automated lighting controls and more sophisticated options.”

For H&M, the clothing retailer, membership is a way to help it work with its suppliers on the issue. “Just 0.3% of our emissions come from our own operations,” says Kim Hellström, strategy lead for corporate social responsibility at the company. “The vast majority of our emissions are Scope 3 and outside our control. You need to know where the impact is and tackle that if you are to have any credibility.”

The biggest source of emissions in the company’s supply chain is onsite heat generation, which is often done with coal-fuelled boilers, followed by electricity from the grid in countries such as Bangladesh and China, where the power system is heavily coal-based. In some countries, it is difficult or impossible to create a business case for renewable energy and energy efficiency that the supplier can gain from, Hellström says. In those countries, the

main thing it can do is to engage with policymakers to introduce incentives.

In other markets, H&M works to enable cheaper loans for suppliers to buy more efficient boilers. “We have to make a good business case,” he adds. “Big suppliers have a much better understanding of that because they have more resources to make it happen.”

Around 30% (or 671) of its suppliers’ factories were enrolled in energy efficiency programmes by the end of 2019 and the company aims to achieve 100% by 2025, which will save an expected 74,991 tonnes of CO₂e.

But Hellström stresses that the industry needs to act together. “Cooperating with competitors is absolutely key. Many different brands are produced in the same factories. We all face the same challenges. When we collaborate in this field, there is no discussion about competition. It’s only together that we can create real change.”

One of the big challenges for the future is the emissions produced from cooling – energy consumption from air conditioners is set to triple by 2050, says the IEA, while the refrigerants have >



a global warming potential many thousands of times higher than CO₂. (See also [Can we defuse the ‘ticking time bomb’ of soaring demand for cooling?](#))

In part, this is driven by legislation, such as the Kigali Amendment to the Montreal Protocol, which aims to phase out these highly damaging refrigerants.

The Climate Group, along with the Alliance to Save Energy, has launched a Global Cooling Challenge under which EP100 members commit to identifying ways of cooling their operations as efficiently as possible.

“Our next-generation chiller products are 30% more efficient and use 40% less refrigerant than conventional products – and that refrigerant has a very low global warming potential that is no more harmful than CO₂, unlike the current refrigerants it replaces,” Nesler says.

This is just one example of how energy efficiency is changing, he adds. “In future, efficiency will go from being fairly passive, component-based interventions to active, system-level processes. There is a change going on from changing lights, insulating walls and looking for leaks in compressors to taking advantage of automation, sub-metering and data analytics. We will not only

Emissions produced from cooling commercial premises are set to soar amid rising global temperatures.



We’re on the cusp of an efficiency revolution that is dynamic and takes advantage of digital technology

be able to save considerably more energy than in the past, we will turn buildings into interactive, flexible energy resources on the electrical grid.

“As the grid becomes cleaner over time, it will also become more intermittent. Buildings need to be able to shift loads over time, take advantage of distributed energy resources and energy storage and communicate with the grid. We’re on the cusp of an active efficiency revolution that is dynamic and takes advantage of digital technology.” ■



Who is minding the **EFFICIENCY GAP?**

Despite repeated warnings from the UK Committee on Climate Change that energy efficiency needs to be tackled immediately if the UK is to meet its carbon budgets, progress has been limited, writes *Catherine Early*

 [VIEW ONLINE](#)



The UK has 28 million homes that need retrofitting.



SAMI FOSTER/SHUTTERSTOCK

B

ack in 2017, energy efficiency campaigners had reasons to be cheerful. The government's new Clean Growth Strategy adopted their aspirations to significantly upgrade the efficiency of existing homes, establish green mortgages to incentivise enhancements, and raise energy standards for all new developments.

The strategy outlined an overall approach to linking emissions reductions in buildings, industry, power and transport while growing jobs and the economy. Energy efficiency was a key part of the plan.

The UK Green Building Council said the new strategy appeared to be a signal of a new ambition compared with preceding years, which had seen



WELCOMIA/SHUTTERSTOCK

the scrapping of policies such as the Green Deal to improve existing stock and the zero carbon homes target for new builds.

The strategy established a new target for the average energy performance certificate (EPC), which defines the energy standard of a home, of existing stock to be raised from D to C by 2035, >

Energy efficiency measures are vital to help the UK reach net-zero by 2050.



EDDIE KEOUGH/REUTERS

with an earlier goal for rented homes of 2030.

However, last summer, an inquiry by a group of MPs on the parliamentary Business, Energy and Industrial Strategy select committee concluded that the government was off track to meet the targets in the Clean Growth Strategy, and that it did not have a clear grasp of how much public money was needed to deliver them.

Energy use in the home accounts for 20% of the UK's carbon emissions, [according to the government](#), meaning that improving energy efficiency has huge potential in helping reach its target of net-zero emissions by 2050. It would also help the estimated 2.55 million people in the UK who live in fuel poverty.



Without stronger building standards, new homes will add to those that will need retrofiting

But the challenge is huge. The UK has 28 million homes that need retrofitting, many of which are at a very low standard, earning the country the reputation of having some of the least efficient homes in Europe. In addition, the government has a target to build 300,000 homes a year by the mid-2020s to house a growing population. Without stronger standards, the risk is that these new homes will add to the volume of houses that will eventually need retrofitting.

Since the select committee's report, some policy has come forward for new-build homes. Last October, the government launched a consultation for the Future Homes Standard, which all new homes built from 2025 will be required to meet. Homes built under the standard will emit 75-80% less carbon than those built today.

In order to start ramping up to this, the government wants to bring in some measures covering energy efficiency and ventilation later this year. It has proposed two options: a 20% reduction in carbon emissions, largely achieved through very high fabric standards such as glazing, walls, floors, and roof materials to limit heat loss; and a 31% reduction through the use of additional technologies such as solar PV panels and heat pumps.

The government has stated a preference for the second option. However, this is problematic for industry as the UK lacks manufacturing and installation skills for heat pumps, explained John >

The UK government has a target to build 300,000 new homes a year by the mid 2020s.



If you want to have world-leading levels of efficiency, you really need to give people more than six months to tool up for that

Slaughter, director of external affairs at the Home Builders Federation (HBF).

The trade body wants to see the government's first option bought in this year, and the second one two or three years' later. This would allow the supply chain and skills to grow, and avoid disruption, he says.

Both the UK Green Building Council (UKGBC) and government advisers the Committee on Climate Change have criticised the government for a lack of clarity on how the Future Homes Standard will be achieved. The government's intention to provide detail in 2024 is too late, they say.

"If you really want to have world-leading levels of efficiency, which is what they've said, you really need to give people more than six months to tool up for that," says Richard Twinn, senior policy adviser at the UKGBC.

Even when homes are designed to a higher standard, they do not necessarily meet them in practice. Buildings regulations are based on the design of a home, with no requirement for developers to prove these are achieved in reality. Heat loss has been found to be as much as double the value claimed by the design, according to the BEIS committee's report.

There are a growing number of technology solutions to fix the so-called "performance gap", but as yet the government has not indicated that it will enforce post-build monitoring, Twinn says. "We'd like to see a requirement to make sure the property is performing as it should do in terms of thermal efficiency," he suggests. If not, the developer should have to fix this, or pay a penalty, he adds.

Slaughter of HBF cites many reasons for the performance gap, including the failure of existing industry tools to reliably model the in-



KURTEEV GENNADIH/SHUTTERSTOCK



STUDIO HARMONY

Top: The UK's Future Homes Standard will apply to new homes built from 2025.

Below: Potential energy savings from heat pumps are problematic in the UK, which lacks manufacturing and installation skills.

use performance, and a lack of specification data for products and materials that relates to actual conditions rather than those in the factory.

"This requires a collaborative strategy between the government, industry, manufacturers, the professions and other stakeholders, and we would welcome a collective focus," Slaughter says.

RETROFITTING CHALLENGES

However tricky these problems are to solve, the issue of existing homes is even more daunting, Twinn says. Retrofitting the UK's entire housing stock by 2050 would need to be done at the rate of 1.6 homes every minute, he says. And that is if all possible improvements were done in one go, rather than the piecemeal approach currently adopted.

Policies to improve existing homes have been chopped and changed over the years, but the two >



WILLY BARTON/SHUTTERSTOCK

current drivers are the energy company obligation (ECO), targeting the homes of the low income and fuel poor, and the minimum energy efficiency standard (MEES) for the private rented sector.

MEES regulations were upgraded last year, and now require private rented properties in England and Wales to reach at least EPC band E, with tenancies for properties rated F and G illegal. But a cost cap of £3,500 means that landlords only undertake cheap measures, and band E might not even be reached, Twinn of UKGBC says. Proposals to tighten the standard to band C, as promised in the Clean Growth Strategy, are overdue.

ECO is an obligation on energy companies to cut the cost of home heating. Under its latest iteration, the government expects it to cost £640m a year, paid for by a levy on energy bills. This is half the spend originally proposed, and significantly below the £1.57m spent on previous schemes. This led to a large drop in installations in 2018-19, according to the BEIS committee report.

All these figures are a drop in the ocean compared with the actual investment needed, estimated at £5-7bn, according to Twinn. Again, the scheme mostly pays for cheap measures such as loft and cavity insulation. Condensing boilers are also popular, but though these save on cost and carbon in the short

term, to meet net-zero, gas boilers will have to be removed from homes by 2030, Twinn says.

Campaigners want a programme for widespread whole-house retrofits. This is where a home undergoes all possible energy efficiency upgrades in terms of insulation, low carbon technologies and building fabric in one go, similar to the Energiesprong idea that has taken off in the Netherlands (see also [A Dutch leap forward in climate-proofing existing homes](#)).

But though this is a more efficient approach it is extremely expensive. Moving your house from EPC band F to E or D could cost around £3,500, but a whole house retrofit would cost £70,000, making it a challenging idea to support politically, says Chaitanya Kumar, head of climate and energy at think tank the Green Alliance.

Some local authorities are planning to pilot the concept, including Cornwall Council, which will retrofit 83 homes starting later this year, and the Greater London Authority, which will be tackling 1,600 homes over three years.

But while these are good learning experiences for councils, they are not really sufficient to support the business case for widespread uptake, Kumar says. The Green Alliance wants the government to challenge industry to prove cost reductions >

Privately rented properties in England and Wales are required to reach at least EPC band E.

and build up a supply chain. Around £250m of government money could create a pipeline of 5,000 to 7,000 homes to pilot the approach, he says.

“We think that the timing is right to get some money for this. The logic is all there, and there are local authorities who want to do this,” he says.

Meanwhile, in the “able to pay” sector, there are currently no government or market signals to persuade people to invest in energy efficiency in their own homes. Campaigners have suggested adjusting council tax or stamp duty to reflect energy performance.

Last July, the government announced a £5m Green Home Finance Innovation Fund to pilot home finance products such as green mortgages, where mortgage providers support homeowners to make improvements up to EPC band C. But the fund was blasted as “woefully inadequate” by the BEIS committee.

Twinn sums up overall progress in energy efficiency as “bleak”. “There are a few green shoots but energy efficiency is not really happening at scale. We’re nowhere near the delivery rates that we need, and there’s no plan in place for how we get there.”

With policymakers in the UK, as in the rest of the world, currently focused on the Covid-19 crisis, there is now huge uncertainty over progress on other agendas, such as climate change.

Jenny Holland, public affairs and policy specialist at UKGBC said: “What is clear is that we cannot tackle one emergency and continue to ignore another. Policy to scale energy efficiency measures across the country cannot be on the backburner for any longer than is absolutely necessary. Installation



AFRICA STUDIO/SHUTTERSTOCK

Buildings regulations are based on the design of a home, with no requirement to prove energy savings are actually achieved.

rates, particularly in homes, have fallen off a cliff and this worrying trend needs urgently to be reversed.”

Kumar at the Green Alliance agrees: “The coronavirus crisis could well result in the UK economy facing a deep recession. In such a scenario, what is needed is a ‘green stimulus’ package from the government, where the clean growth sectors of the future, including energy efficiency retrofit industry, are supported to create jobs and improve productivity.” ■

“

We cannot tackle one emergency and ignore another. Policy to scale energy efficiency measures cannot be on the backburner for any longer than necessary



Catherine Early is a freelance journalist specialising in the environment and sustainability. She writes for Business Green, China Dialogue and the ENDS Report among others. She was a finalist in the Guardian’s International Development Journalism competition.



A DUTCH LEAP FORWARD IN CLIMATE-PROOFING EXISTING HOMES

One of the most important ways we can reduce emissions from towns and cities is by making existing homes more energy efficient. But retrofitting houses is much more difficult than building new ones to higher standards.

One organisation that is trying to address this issue is Energiesprong, which has developed a way of upgrading homes to the highest energy standards in only a few days. The approach was developed in the Netherlands (Energiesprong is Dutch for “energy leap”) and involves creating a net-zero home in one step, rather than implementing efficiency measures piecemeal.

This is typically achieved by installing a new thermally efficient facade on the house, creating an airtight and insulated shell around an existing property, enough solar panels to generate as much energy as the house uses, and an energy pod that can house batteries and a heat pump, allowing the house to provide energy services to the grid.

“The work is funded with a whole-life financing model, where the cost is covered by energy savings and reduced maintenance costs,” says Emily Braham, strategy and operations director. Much of the energy saving comes from the use of offsite manufacturing, which



makes it easier to cut costs and guarantee quality while scaling up production.

The group focuses on social housing because it enables it to scale up most rapidly. In the UK, Energiesprong has pilot projects in place in Nottingham (155 properties) and Maldon (five properties) in Surrey, and the retrofits are expected to raise property values by 25% and cut energy bills by up to 60% a year.

The first small-scale trial in Nottingham cost £75,000 per home. But the organisation believes this could be reduced significantly if installations are scaled up, as has happened in the Netherlands.

“In the Netherlands we have already seen what can be achieved when innovation and

economies of scale come into play; the Netherlands has now almost halved the cost of its Energiesprong retrofits,” says a report by Green Alliance.

In the UK, it adds: “Industry believes that a government commitment to supporting 5,000 retrofits would drive economies of scale, enabling market actors to finance further retrofits towards a £35,000 per retrofit cost goal. At this level, Energiesprong retrofits could be subsidy-free.”

Braham says costs need to come down for the supply side. “We’re working with the financial sector and government to ensure a favourable policy regime. We would like to see a fall in VAT for whole house retrofits, for example – and we also need long-term certainty of demand.” ■

Mike Scott

THE MAN STRUGGLING TO BRING ENERGY EFFICIENCY IN FROM THE COLD

Terry Slavin speaks to Benoit Lebot, former head of the International Partnership for Energy Efficiency Cooperation, about his frustrated efforts to elevate demand reduction on the global climate agenda



VIEW ONLINE



W

e've known for more than two decades that energy efficiency is the most important weapon in the battle against climate change, with the International Energy Agency (IEA) estimating that decreasing energy demand could deliver 40% of the Paris Agreement.

But with energy efficiency improving at a derisory 1-2% a year, why is it that the only agency that fostered global collaboration around the issue, the International Partnership for Energy Efficiency Cooperation (IPEEC), was disbanded in December?

It's a question that the IPEEC's former executive director, Benoit Lebot, has had a lot of time to ponder since he closed its offices, housed in the IEA secretariat in Paris, and let go its team of six staff ahead of Christmas.

"There's a disconnect from what we know [about the importance of energy efficiency] from the IPCC or the IEA and ongoing efforts to tap the known energy efficiency potential," Lebot told Ethical Corporation, adding that there is no UN agency that is systematically collecting data on energy efficiency.

The disbanding of the IPEEC, he said "is an illustration that energy efficiency failed to be adequately and consistently supported, as it should be, with specific institutions, human capacity and an international framework."

“

There's a disconnect between what we know about the importance of energy efficiency from the IPCC and IEA, and global action to address it



RASSTOCK/SHUTTERSTOCK

Energy efficiency is cost effective, but is only improving at 1-2% a year.

Now working as senior policy adviser in the French government's ministry for the energy transition, Lebot remains hopeful that the former IPEEC, which was set up with a 10-year mandate in 2009 and reports to the G20, will yet see new life as the Energy Efficiency Hub, an energy efficiency equivalent to the International Renewable Energy Agency.

This is something that has been under discussion internationally since 2016, when Germany pushed for it ahead of its G20 presidency. Importantly, the hub would have a seat at the climate negotiations table as an accredited party to the UN Framework Convention on Climate Change (UNFCCC), something from which IPEEC was always excluded.

Diplomatic wrangling, however, meant the hub wasn't in place in time to replace the IPEEC when it was due to be disbanded last year. Then the first meeting of a steering committee to establish the new agency, scheduled for last month, fell victim to Covid-19, so has been kicked into the long grass once again.

For Lebot, it caps four years of frustration over the global failure to promote emissions-saving technologies, despite the paradoxical fact that their cost-effectiveness means they are often referred to as low-hanging fruit.

Investment in energy efficiency is running at about \$240bn annually, according to the IEA, well behind renewable energy. But to meet the Paris Agreement, energy efficiency will have to increase by four or five-fold, while clean energy only needs to double, he says. >



CC7/SHUTTERSTOCK

And while renewable energy is on target, with the IEA expecting the fast-growing renewables market to increase another 50% in the next five years, energy efficiency improvements are not only derisively low, but going in the wrong direction: In 2018 primary energy intensity improved by just 1.2%, the third year of decline.

So what are the barriers? Lebot says it's not just the fact that doing more with less is regarded as boring. "Despite the fact that energy efficiency is a beautiful thing, it is complex, it's granular, it's fragmented."

Most critically, it suffers from a lack of baseline data, which is expensive to collect as it needs to be detailed and specific in order to inform policy, create tools and attract investment.

And in contrast to renewable energy, which is now cost-competitive with fossil fuels, energy efficiency relies not on market forces but on a constellation of factors, including available technology, the behaviour of billions of consumers and millions of companies, and governments working on their own or in concert to set building codes and agree international technical standards.

"To reach scale we need an enabling environment. Governments have to make energy efficiency a priority in every decision and develop

Establishing fuel efficiency standards for HGVs could go a long way to helping curb transport emissions.



Despite the fact that energy efficiency is a beautiful thing, it is complex, it's granular and it's fragmented, and it suffers from a lack of baseline data

tools like labelling, standards and building codes, so the market responds. If we don't bring visibility to energy efficiency, the market can't act. That's why it needs special attention."

Despite the IPEEC's operating budget of less than \$1m a year, it had a plethora of task groups working on all sectors of the global economy, from developing standards to govern the internet of things, to establishing fuel efficiency standards for heavy-duty vehicles, something he describes as a huge missing element in the battle to curb transport emissions. >



What seems to excite Lebot most, however, is the potential for Big Data to help cities and landlords manage the energy efficiency of buildings, which are alone responsible for 30% of global final energy demand, a percentage that is set to rise even further with growing urbanisation.

He points out that one reason that cities have been slow to invest in LED lighting, for example, is that many municipalities don't even employ an energy manager. "There is no one looking at the bills."

But digitisation will allow energy use to become visible to everyone, he says. "It will allow us to leapfrog from a situation where you at best had an intern collecting data on energy performance on an Excel spreadsheet, to a world where big data can collect online energy demand and then start accessing information, processing information and implementing energy efficiency."

His other great hope is that as renewable energy continues to ramp up and the production of energy becomes more decentralised, and closer to where it is consumed, more attention will be paid to demand reduction.

While cooling his heels in the French environment ministry, Lebot is encouraged that

Big Data will help cities and landlords manage energy efficiency at scale.

he was invited by the Saudi government, which is president of the G20, to address a recent G20 workshop on the circular economy in Riyadh.

And though Covid-19 has dealt a blow to the establishment of the Energy Efficiency Hub, he sees a silver lining.

"I strongly believe that Covid-19 is offering the world the opportunity to totally reshape the world economy," Lebot says. "We have to think local, and reinvent local circuits for food, energy and transport. We have to address climate change, because it's a greater threat to humanity than Covid, and energy efficiency has to be fully part of that. The world needs institutions like this hub." ■



Terry Slavin
is editor of Ethical Corporation



WHAT'S ON THE WEB

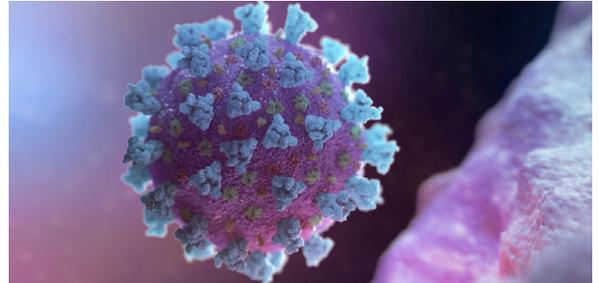
INTERVIEW

Paul Polman: 'Coronavirus is an acid test for stakeholder capitalism'



In an exclusive interview with Terry Slavin, the former Unilever CEO explains how the International Chambers of Commerce, which he chairs, is partnering with the World Health Organization in a bid to fight the pandemic

 [GO TO ARTICLE](#)



'This is a wake-up call. We must live within our planetary boundaries to avoid future pandemics'



Shaping a sustainable post-Covid-19 world: five lessons for business



Covid-19 roundup: Companies rally as pandemic takes escalating toll

PLUS

'FTSE companies urgently need to raise their game on CO₂ reporting'



[GO TO ARTICLE](#)

How lawyers are collaborating to help pave the way to net-zero



[GO TO ARTICLE](#)

Why 176 institutional investors are calling out brands for failure to respect human rights



[GO TO ARTICLE](#)