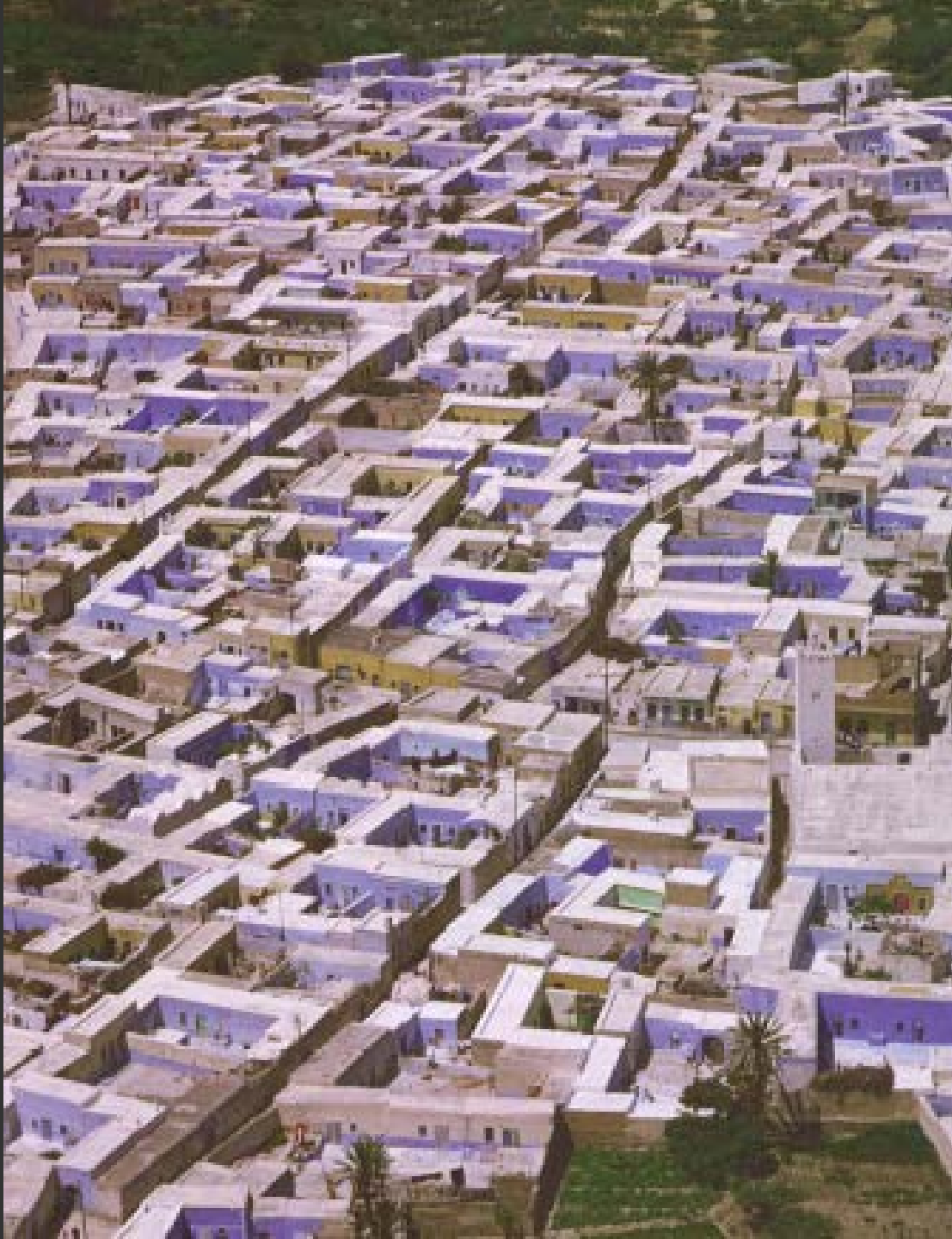


Home for 2030
Technology and Environment 1
M4X01974

**THE BIG IDEAS and
How we live now?**

The City

- Only when they started to sow their own crops did the need for permanent shelters arise. Inevitably, people found it advantageous to work together to harness water sources and till the land- and so we have the start of society and the start of a city.

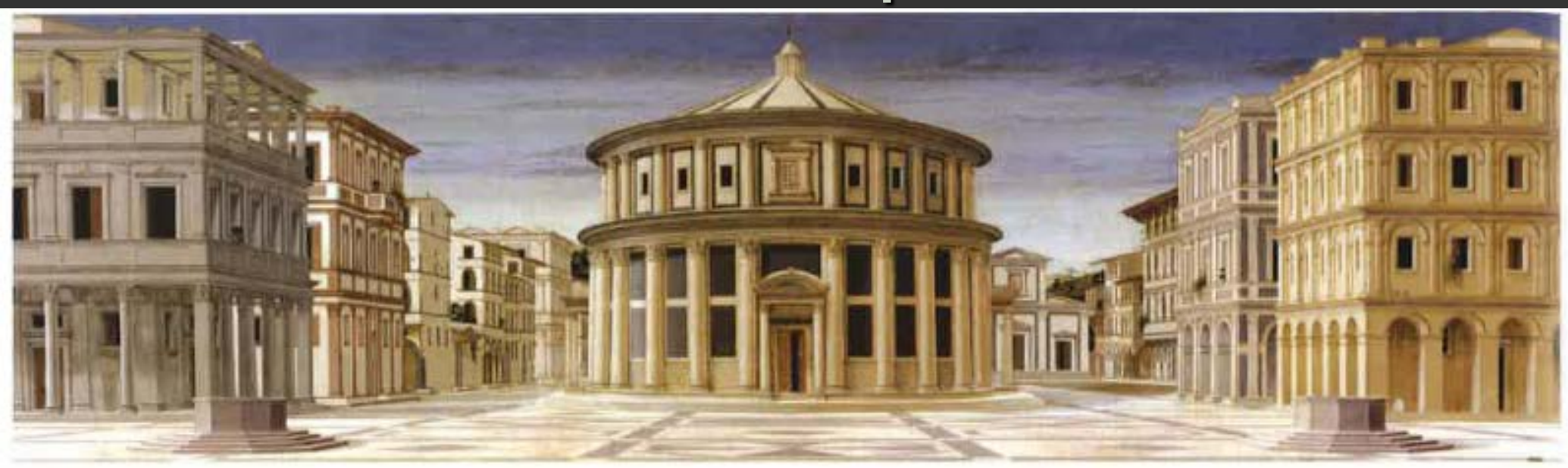


The City

- So intimate is the connection between man's building of the first cities and his development of a civilized way of life that the very word 'civilization' comes from the Latin word *civis*, which means citizen, or dweller in a city.
- Kenneth Clark points out that a sense of permanence is the prerequisite of civilization, and what could more explicitly indicate that a man meant to give up his wandering ways and settle down than his building a city?
- Men, said Aristotle, come together in cities in order to live; they remain there to live the good life.

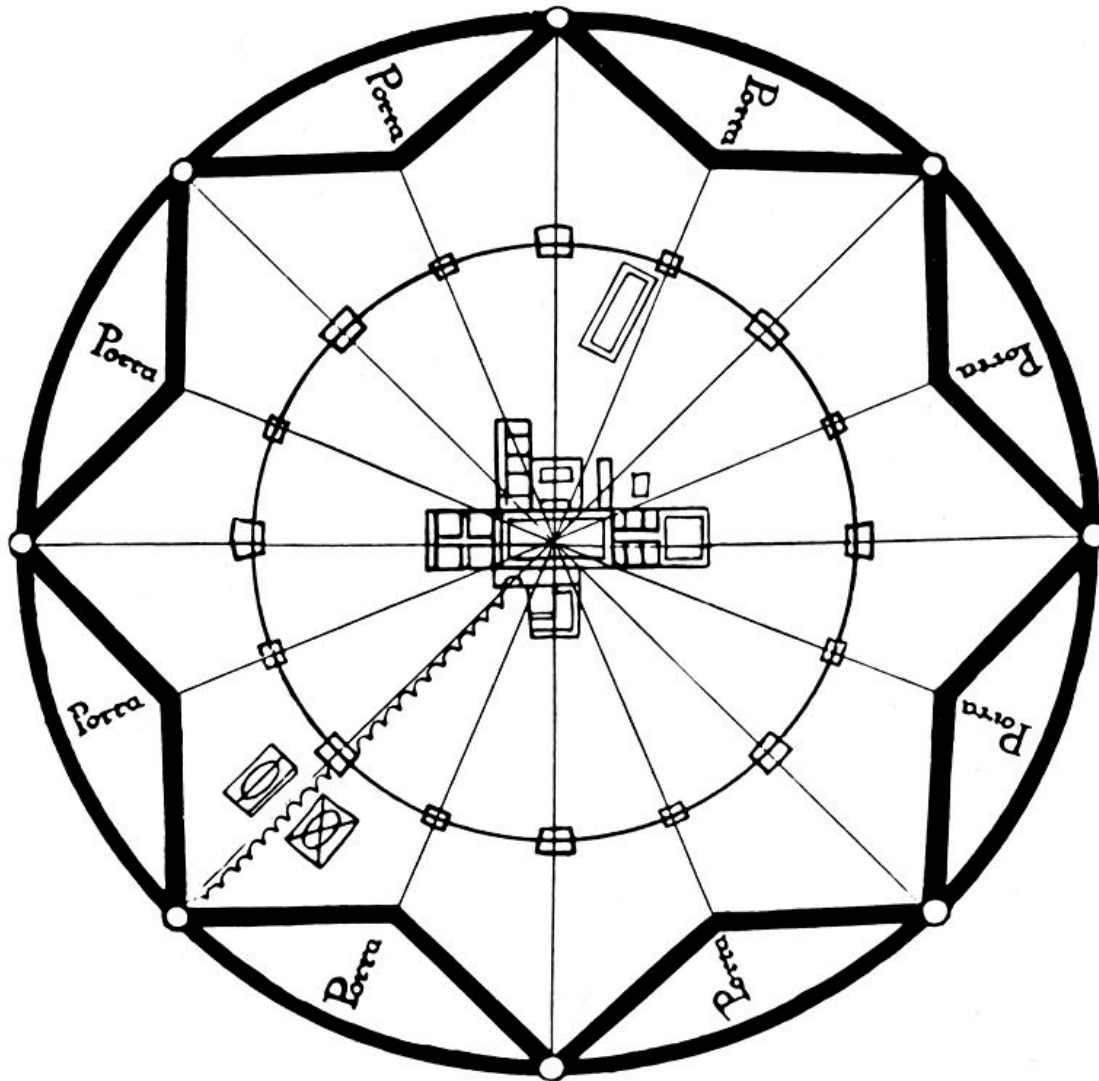
Aerial view of Kalaa Sghrira Tunisia, showing the typical dense pattern of narrow streets and courtyard housing

The ideal place



Traditionally attributed to Piero Della Francesca this view of an Ideal City(c.1470) is now thought to be by Leon Battista Alberti, projecting a view of the harmonious Classical Buildings described in his De Re Aedificatoria,

The ideal place

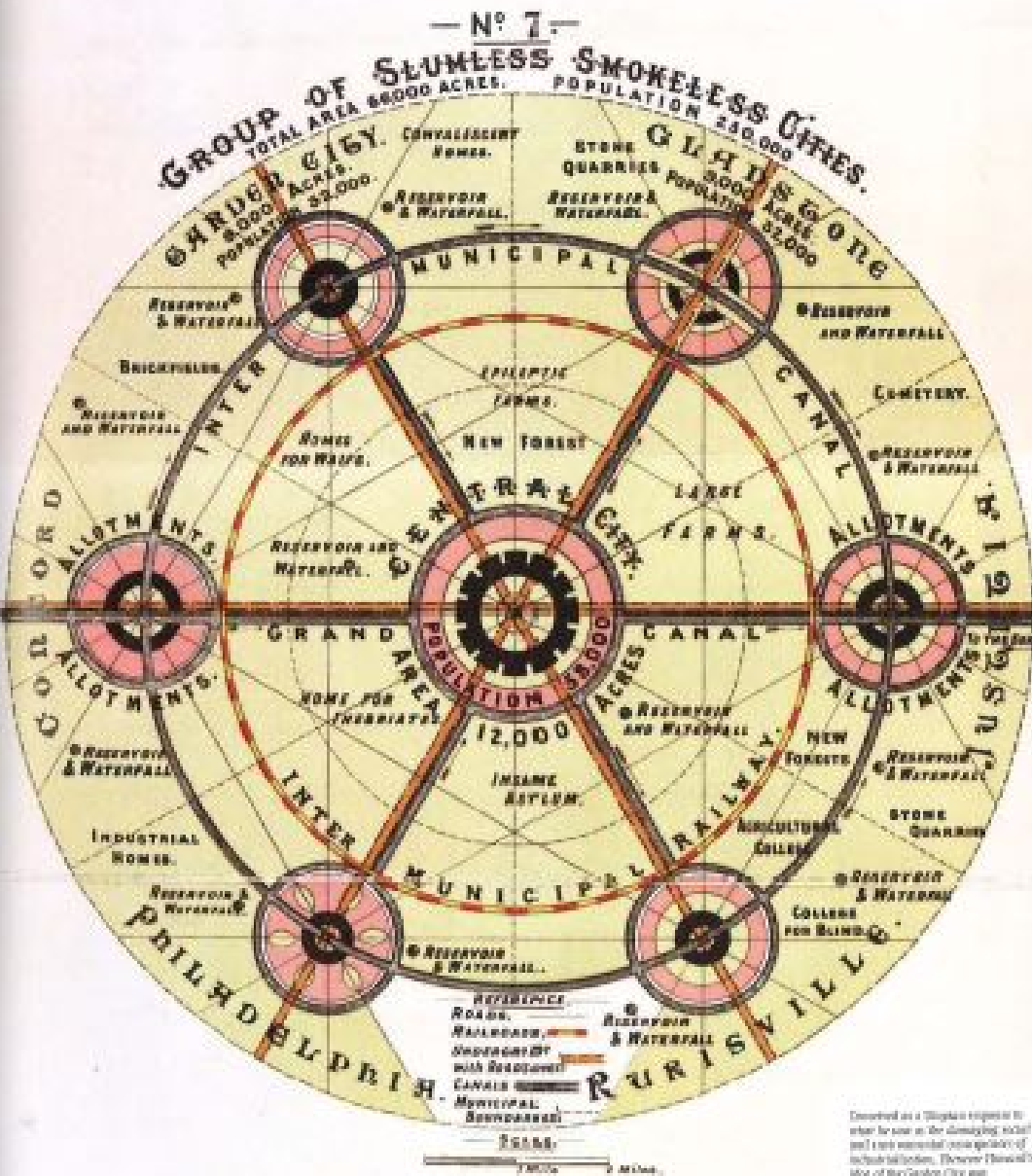


Sforzinda is a visionary ideal city named after Francesco Sforza, then Duke of Milan. It was designed by Renaissance architect Antonio di Pietro Averlino (c. 1400 - c. 1469), also known as "Averulino" or Filarete.



The City – Renaissance Florence

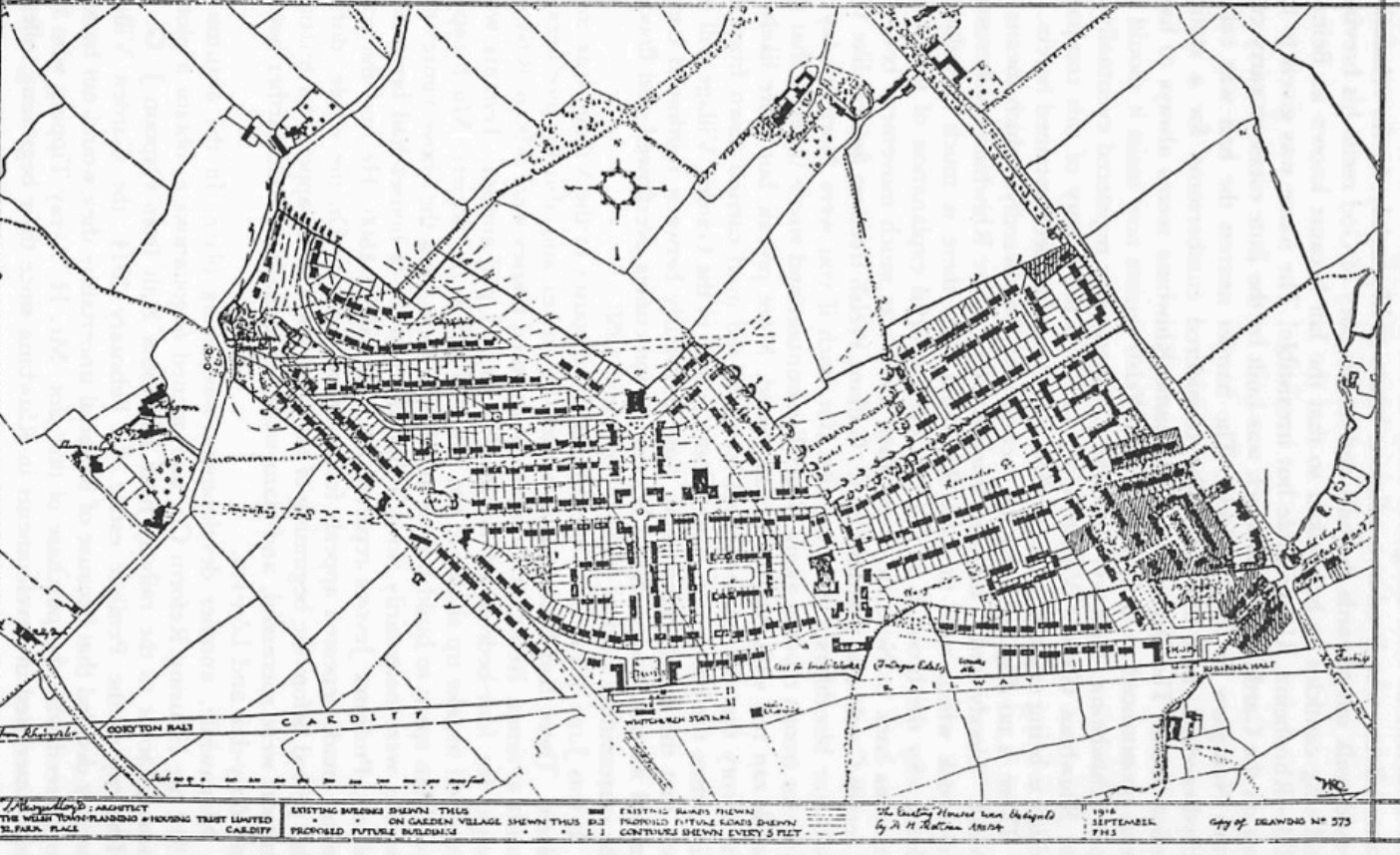
The Ideal Place - Utopia



Formed by combining the Greek words for 'not' and 'place', *Utopia*, was the title of a book written in 1516 by scholar and statesman Sir Thomas More (1478-1535). Modelled on Plato's *Republic*, it described a fictional island where an apparently perfect society flourished. In this sense the word 'Utopia' has come to describe visions of the 'ideal' city.

Conceived as a Utopian response to what he saw as the damaging social and environmental consequences of industrialisation, Ebenezer Howard's idea of the Garden City was published in 1898 and captured in this diagram where symmetry recalls earlier 'ideal' city plans.

RHIWBINA GARDEN VILLAGE Near CARDIFF • PLAN SHEWING PROPOSED LAY-OUT SCHEME



A Bird's Eye View, looking from the west side of the Circle, across the main avenue, and over the square "Y Green," which is shown plotted in detail in the plan on page 13.

Rhiwbina's Garden Village movement began in the 1890s in response to the industrial revolution's side-effects of slums and poor living conditions. Its rhetoric championed better living conditions for the working class as well as the middle class and by the turn of the century, several Garden Villages existed in Britain. Its principle of co-operative ownership appealed to many and in 1911, a group of Cardiffians met to consider the idea of their own Garden Village.

Rhiwbina Garden Village



The Modern City Singapore

COMMUNITY ARCHITECTURE



Architecture by everyone

The term 'community architecture' was coined by the journalist Charles Knevitt in 1975 to describe an English housing movement that involved the participation of users in the design of buildings.

It later came to embrace disparate trends that grew out of the political activism of the 1960s and growing concern about the impact of large scale urban renewal- of which Jane Jacob's book *The Death and Life of Great American Cities* offered a searing critique.



Designing accessibly for all

UNIVERSAL DESIGN

- Designing to meet the needs of disabled people became a growing concern during the second half of the twentieth century, and by the 1990s had begun to be focused internationally around the idea of universal design.
- This also embraced the concerns of the ageing 'baby boomer' generation, and was influenced by the social model of disability that emerged in the UK in the 1980s, but had its roots in earlier and wider movements for civil and human rights.



SUSTAINABILITY

● ***Environmental architecture***

- Making new buildings more energy efficient has led to the growth of passive **design**, but the early focus on running costs is now giving way to a more holistic concern for 'cradle to grave' assessments that address a building's entire lifecycle or 'ecological footprint'.

Completed in 2002, the Beddington Zero Energy Development (now known universally as BedZED) is one of the most widely visited low-energy, sustainable housing developments in the UK. Situated in Hackbridge, south London, it was designed by Bill Dunster Architects



SUSTAINABILITY

● ***Environmental architecture***

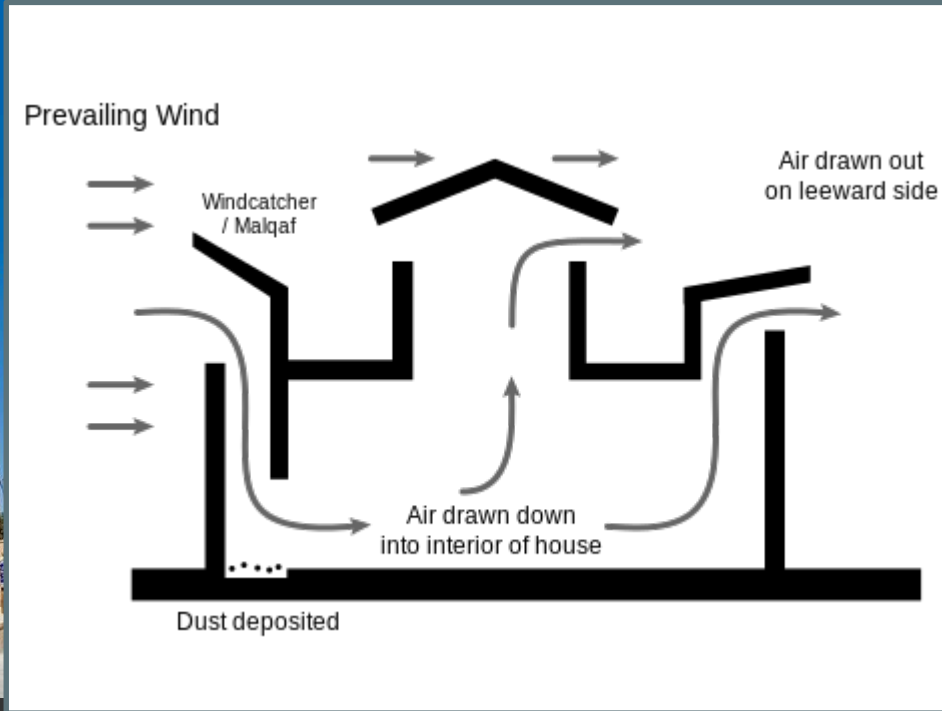
- Global concern about the capacity of the planet to sustain a rapidly rising population without drastic environmental degradation came into sharp focus in 1987 with the publication of 'Our Common Future', the report of the World Commission on Environment and Development (now generally referred to as the Brundtland Commission).
- Its suggestion that 'sustainable development' was the key to ongoing prosperity launched the idea of 'sustainability' into the global consciousness.
- The consumption of natural resources grew exponentially in the last century, and with this came a growing scientific awareness of the interdependence of life, which led to the emergence of ecology as a separate discipline.

SUSTAINABILITY



'The fundamental principles of passive design have been practised in vernacular buildings throughout history.'

Towards zero-energy architecture



Architects
Rolf Disch, Housing
Freiburg Germany

PASSIVE DESIGN

- Passive design describes an approach to achieving the required environmental conditions with the least possible use of 'active', energy-consuming systems.
- In particular, it aims to reduce dependence on artificial lighting, mechanical ventilation and air conditioning.
- Although computer software is now used to model a building's performance, based on a sophisticated mathematical understanding of climate, heat transfer and fluid dynamics, the fundamental principles have been practised in vernacular buildings throughout history.

How do you see the future
for the way you or we live?



Greta Thunberg

The climate activist who needs no introduction, Thunberg was recently nominated for a Nobel peace prize for putting the climate emergency on the political agenda and inspiring the global student strikes. She sailed across the Atlantic twice to attend climate summits and recently turned down a prestigious environmental reward (and £40,000),

claiming the "climate movement does not need any more awards". Expect to hear a lot more from her in 2020.

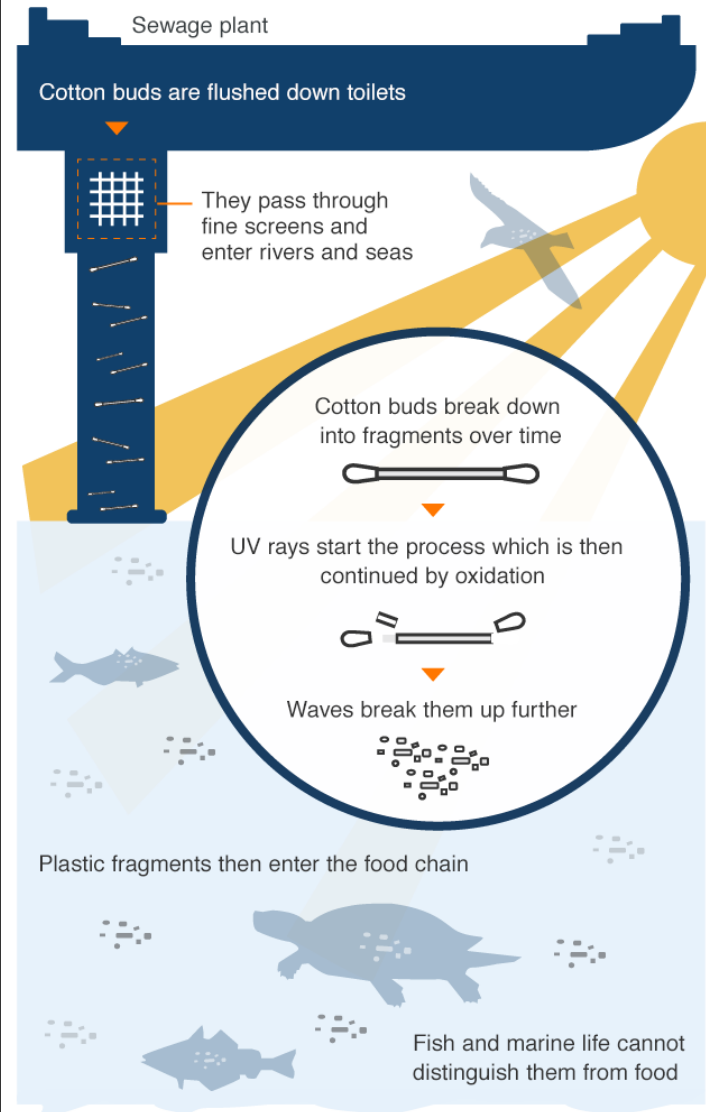
- *Nominated by Evelyn Laurie, Frances O'Donnell and Oliver Seligmen*

**Climate
action**



MASS CONSUMPTION POLLUTION?

What can happen to your cotton buds

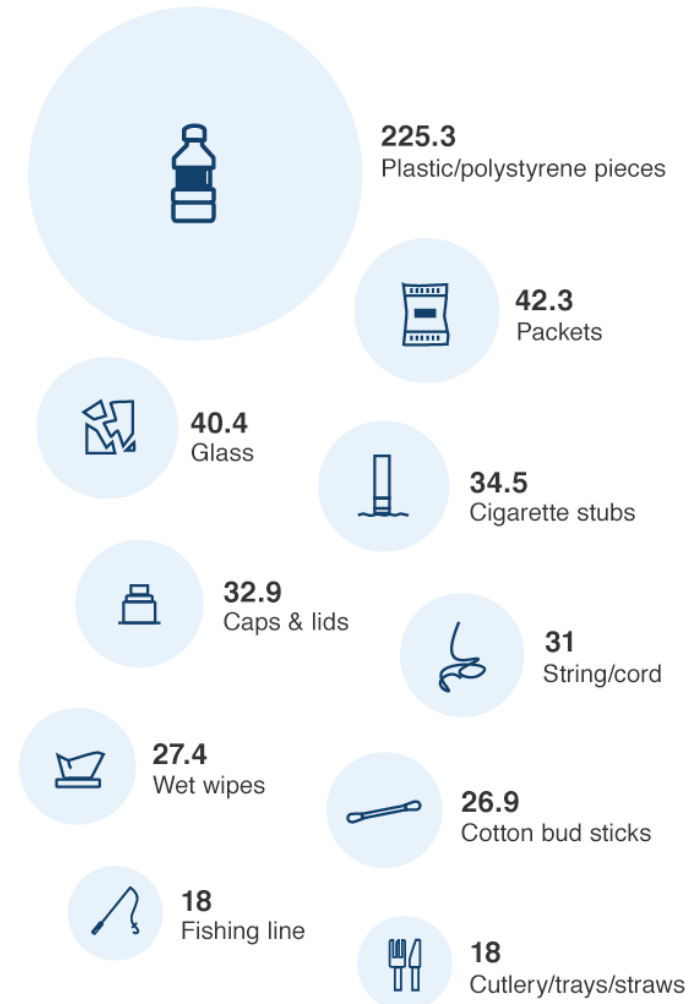


Source: The Cotton Bud Project

BBC

What kind of waste appears on UK beaches?

Items found per 100m



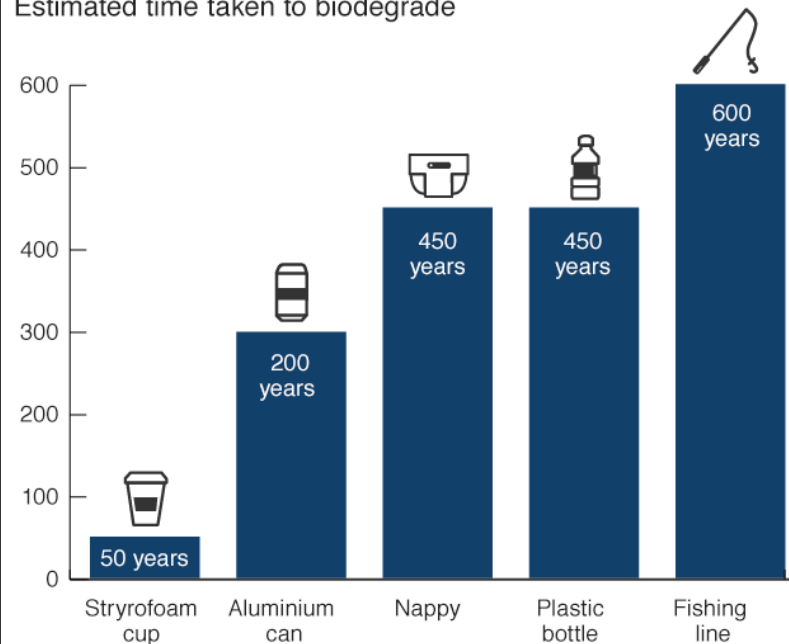
Source: Based on a Marine Conservation Society survey of 339 beaches across the UK

BBC

MASS CONSUMPTION POLLUTION?

How long til they're gone?

Estimated time taken to biodegrade

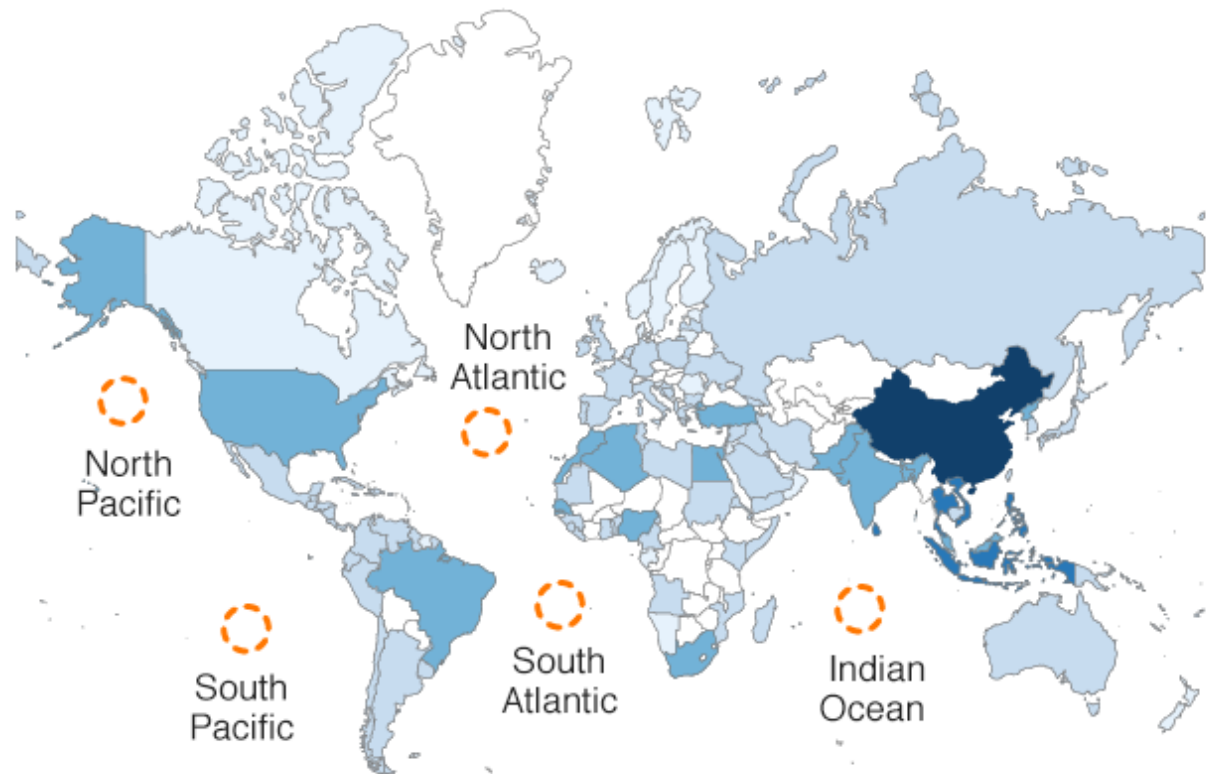


Exact time will vary by product type and environmental conditions

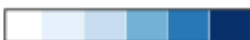
Source: NOAA / Woods Hole Sea Grant

BBC

Ocean plastic



Mismanaged plastic waste, tonnes

0  > 5 million

 Gyres - Whirlpools of water which trap huge collections of waste in their currents

Source: Jambeck et al, Science Feb 2015, UNEP, NCEAS

BBC

MASS CONSUMPTION POLLUTION?

Drinks bottles

A rising tide of plastic



Source: Euromonitor

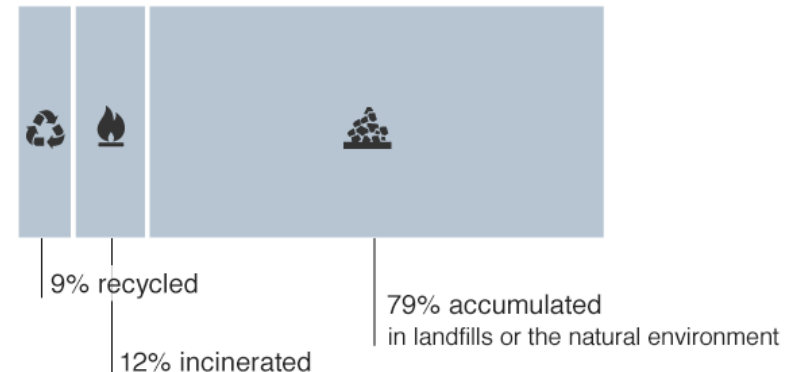


How much plastic is there?

An estimated **8.3bn tonnes** of virgin plastic has been produced to date



As of 2015, approximately **6.3bn tonnes** of plastic waste had been generated



If current production and waste management trends continue, roughly **12bn tonnes** of plastic waste will be in landfills or the natural environment by 2050.

Source: Science Magazine





Out of the blue; the Ocean Cleanup Foundation collecting rubbish

THREE PROJECTS CLEANING UP OCEAN PLASTIC

Life below
water



57 City to Sea

Like so many good ideas, City to Sea was conceived down the pub. Five years later, its founder, Natalie Fee, leads a team of 20 environmentalists, who campaign against single-use plastics. Based in Bristol, the community interest company successfully lobbied major retailers to stop selling plastic cotton buds. Now it is campaigning for women to “rethink their periods” and choose sustainable alternatives to the estimated 4.3bn menstrual products that are thrown away annually.

• As seen in *Positive News* magazine
Oct-Dec 2019

58 Ocean Cleanup Foundation

On a 2013 diving holiday in Greece, Dutch inventor Boyan Slat – then a teenager – was horrified to see more plastic in the sea than fish. He went on to found the Ocean Cleanup Foundation with the audacious remit of ridding the ocean of plastic. He developed an autonomous system to filter plastic from the sea and successfully deployed a prototype in 2019, followed later in the year by a system to stop plastic entering the sea via rivers.

59 eXXpedition

In October an all-female sailing crew left Plymouth to investigate the causes and solutions to plastic pollution at sea. The two-year, around-the-world eXXpedition mission will be broken down into 30 legs and welcome aboard a total of 300 women, all of whom work in science, technology, engineering and mathematics. It is hoped those taking part will use the experience they gain to drive positive change in their respective fields.

**“AN ALL-FEMALE
SAILING
CREW IS ON
A MISSION
TO FIND
SOLUTIONS
TO PLASTIC
POLLUTION”**

FASHION AND TECHNOLOGY

[illegible]

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our loved ones
of mind
mas

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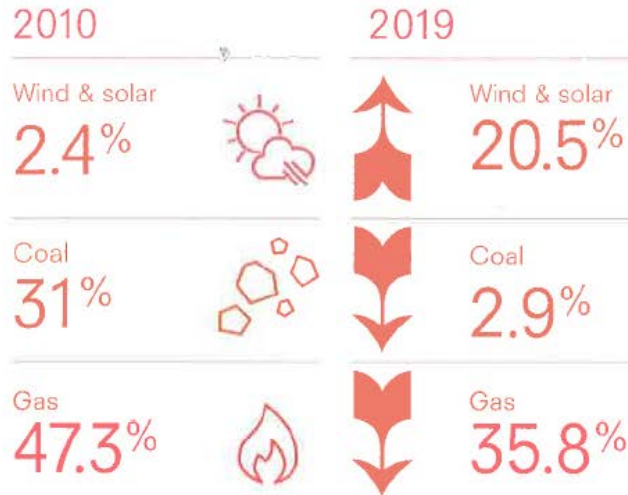
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Powering forward: how energy in the UK has transformed in a decade

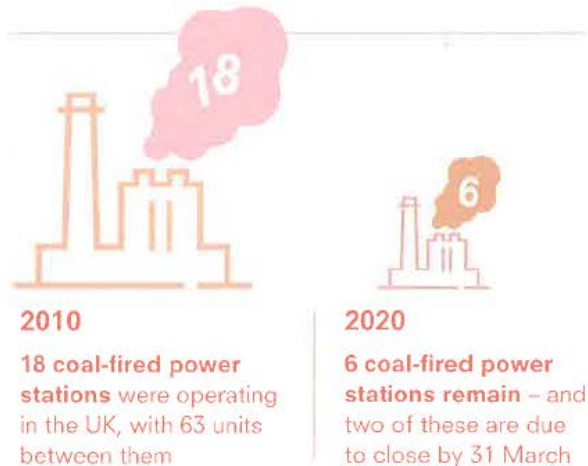
In 2019, the UK hit a major energy milestone: between July and September, renewable power sources produced more electricity than fossil fuels did for the first time. As we begin a new decade, we reflect on the progress made in the last one

UK'S ELECTRICITY SOURCES



COAL

Coal use has significantly shrunk in the last decade



WIND

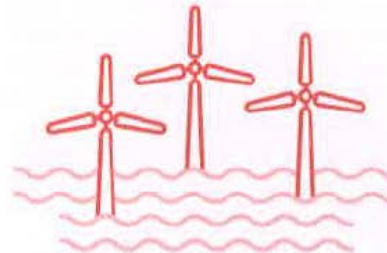
Meanwhile, wind power has accelerated. The UK is home to the world's largest offshore wind farm – Hornsea One – which alone produces enough energy to power an estimated 1m homes

On 1 January 2010 the UK had:

- 7 offshore wind farms
- 232 onshore wind projects
- Total operational wind capacity of 3,811MW

On 21 November 2019, the UK had:

- 37 offshore wind farms
- 2,197 onshore wind projects
- Total operational wind capacity of 22,000MW



The Energy Equation



Solar could balance the grid at night

► The myth that solar farms are useless in darkness has been debunked after a trial found they can help balance the grid at night.

Lightsource BP, which led the project, revealed that solar inverters can provide reactive power – the ability to maintain voltage levels on electricity transmission systems – by reducing or increasing voltage levels even at night.

National Grid claimed using solar in this way

could boost capacity on the network without costly infrastructure upgrades. Lightsource BP estimated such a move would save UK energy customers £400m by 2050.

“We have proven that solar plants can play a larger role across the electricity network – even at night,” said Kareen Boutonnat, Lightsource BP chief operating officer. “Our team continue to develop and support this project.”

European Investment Bank to stop funding fossil fuel projects

► The European Investment Bank has pledged to phase out its multibillion-euro funding of fossil fuel projects over the next two years. After 2021, the EU’s lending arm will no longer bankroll coal, oil or gas

projects, and will instead make lending decisions that are in line with the Paris climate agreement, as part of plans to become carbon neutral by 2050. The news was welcomed by environmental campaigners, however critics have highlighted loopholes in the legislation.

F1 pledges to wipe out carbon footprint

► Car racing franchise Formula One will be carbon neutral by 2030, according to a plan launched in November. Emissions from race cars only accounted for 0.7 per cent of the franchise’s total emissions in 2018, while

45 per cent came from transport between events. According to the plan, Formula One will switch to low or zero-carbon travel and implement ‘credible’ offsetting and sequestration programmes. Its estimated emissions for 2019 were 256,551 tonnes.

The Energy Equation



Full steam ahead on UK geothermal energy projects

Progress towards geothermal power sources in the UK have received a boost, thanks to £16.8m in funding for a 4.5km well to be dug at the Eden Project in Cornwall. The news came a few weeks after a 5.1km well – the largest in the UK – was completed at United Downs, also in Cornwall.

Initial tests at the United Downs facility show that it is capable of producing the country's first geothermal power. Once operational, the plant could supply as much as 3MW of electricity.

Meanwhile, the new funding from Cornwall Council, the European Union and institutional investors will allow drilling of the well at the Eden Project to get underway in the summer.

Eden Project founder Sir Tim Smit described geothermal energy as “the missing piece of the jigsaw” for consistent renewable energy. “We want to work with others all over the world – sharing knowledge and encouraging the change as fast as is humanly possible,” he said.

IMPROVING AFFORDABLE HOUSING

Reduced
inequalities



Sustainable cities
and communities



26

Goldsmith Street

This street in the UK city of Norwich is a good news story for multiple reasons. Via 100 homes, the development offers traditional though increasingly hard to come by council housing – properties owned by Norwich city council and leased on secure tenancies and fixed rents. On top of that, all the houses have been built to Passivhaus standards of energy efficiency – and design that won architects Mikhail Riches and Cathy Hawley the prestigious RIBA Stirling prize for 2019.



Goldsmith Street,
the prize-winning
council homes in
Norwich

27

YorSpace

Combining a Community Land Trust with a Mutual Home Ownership model, YorSpace demonstrates it is possible to create homes that are sustainable and genuinely affordable. The 19 properties at its flagship Lowfield Green project in York, due to be completed later in 2020, cost around a third less than average market rates in the area. Among its proudest success so far, say founders, is the way the project has engaged local people.

28

Energiesprong

Energiesprong, a Dutch non-profit, is trialling a way of transforming old council houses into carbon-neutral homes in Nottingham, with a view to rolling it out elsewhere. The company helps housing authorities secure funding for upgrades, such as fitting solar panels. It also works with regulators to tune policy so authorities can receive some of the money that tenants save due to the upgrades. The resultant cash helps fund more retrofits.

<https://www.youtube.com/watch?v=9zkGBYmSTS8>

<https://www.youtube.com/watch?v=s--1w1PQeF8>

Social Housing



Scotland is one of the countries prioritising wellbeing in economic policy

29 Wellbeing Economy Governments

What if the success of a country was measured by the happiness of its citizens, as opposed to its GDP? That's the aim of the Wellbeing Economy Governments, which currently comprises Scotland, New Zealand and Iceland. They argue that the goal of economic policy should be the nation's collective wellbeing rather than its collective wealth. New Zealand's government published a Wellbeing Budget in 2019 – believed to be the world's first – which allocated hefty funding packages for mental health care and measures to combat domestic violence and child poverty. Iceland's prime minister Katrin Jakobsdottir has also confirmed that her government is developing a wellbeing budget.

Reduced inequalities



Well being

56 London Borough of Waltham Forest

Some 13.7 miles of segregated cycle lanes, 700 trees planted and cycle training for 15,000 residents; the Enjoy Waltham Forest project has created a 'mini-Holland' during the past five years, bagging it the 2019 Ashden Award for clean air in towns and cities. Various events are planned to encourage more people to get on their bikes. "What's happening here is a model for the rest of the UK's urban areas," said Paul Gasson from Waltham Forest Cycling Campaign.



Good health and wellbeing



Sustainable cities and communities