VEOLIA

Imagine 2050

The innovations we will need in waste, water and energy to ensure a sustainable future.

Contents

Imagine 2050

Will there be enough **energy** to power our homes?

Will our children have access to clean drinking **water?**

Will our streets be clean and free of **waste?**

Inventing our Future

Estelle Brachlianoff, Veolia - Senior Executive Vice-President - UK & Ireland

Imagine living in a city in 2050. In a home with nanobots to sort your waste, a self-cleaning bathroom and where you can make your own plastic.

By 2050 it is estimated that 70% of the world's population will live in cities. It's a prospect that today we cannot even imagine. That's why we need to start the debate now.

To help you visualise what it might be like we have joined forces with the London School of Economics (LSE) to create our own 'tale of two cities' based on collaborative and individual approaches.

What we've tried to do is think ahead and imagine the future landscape of a sustainable city, then anchor those ideas to what we're already doing now. So we can show you why we believe inventing the future is our joint responsibility.

Considering the short term challenges we have in energy, materials and water security, economic and social prosperity, migration and global conflict management, every decision we take today will write the history of tomorrow and shape our society.

With that in mind, Veolia has bold plans to create a significant difference through our contribution to sustainable cities. Something we can all be proud of, now and in the future.

By definition a 'sustainable city' should be able to be maintained via low impact lifestyles without exhausting natural resources or causing ecological damage. So how can we make this possible?

We need to be bold. It's not just the social value we will gain from putting the circular economy into practice. It's the £23 billion p.a. which Defra estimates businesses in the UK could save by improving the way we use energy and water and by reducing waste.

What we cannot legislate for is how we change public perception. My dream is that all materials will have a second, third and fourth use by 2050, but we must be able to build facilities that can offer this reuse. As a nation we must be open to all opportunities that could help create resources for new products or energy sources.

That's a far cry from where we are now. In truth we seem to be going round in circles, without realising that the solution lies in a circular economy based on continuous reuse.

We must push the boundaries to ensure everyone realises they have their part to play and it can only be achieved by working together.

Using our expertise in the fields of water, energy and waste we can help preserve scarce natural resources and manufacture and produce green products and energy sources.

2050 might seem difficult to imagine right now. But unless we start thinking long-term, sustainable cities will just be a pipe dream for our children's children.

Foreword from Dr Stephen Burnley

Our present-day economy follows a linear pattern of resource use. We extract raw materials from the earth and process them to give us energy, water and goods. At the end of their useful lives we return resources to the earth - typically in the form of landfilled waste.

Dr Stephen Burnley
Senior Lecturer – The Open University

In recent decades we have realised that this situation cannot continue. The Earth contains only a certain amount of mineral resources. Once we have mined all the rare metals that we rely on for modern batteries and burned the last of the natural gas, those resources will have gone for ever.

Whilst manufacturing, using and disposing of goods, we also discharge substances to the air and to our rivers and the seas. Evidence is appearing that demonstrates the impact that our daily lives are having on the environment.

To achieve this will require a major change in thinking and acting from our politicians, from industry and, most importantly, from us. This is already happening to an extent. Through the efforts of companies like Veolia and local residents, many areas are already recycling more than half their domestic waste. In some areas, non-recyclable waste is also used to provide low-carbon power and heat for homes and businesses. Having said that, there is still a long way to go to bring about a sustainable economy.

"How we achieve the aim of a circular economy is a crucial question and can only be answered through debate involving citizens, governments and industry."

For example, the accumulation of carbon dioxide in the atmosphere is already disrupting the global climate – with potentially devastating results.

A major change in thinking and action is needed to create a circular economy. Learning from nature, all our wastes must become resources or raw materials for new processes. Energy generation and use must also become highly efficient and be based on infinitely renewable biological materials rather than on today's polluting and depleting fossil sources.

Veolia's report crystalises some of the methods we might be using by 2050 to bring about these essential changes to society. Some of the ways, like using nanobots to recycle waste, are some way off while others, such as smart taps that minimise water use in washrooms, are already with us.

How we achieve the aim of a circular economy is a crucial question and can only be answered through debate involving citizens, governments and industry. This report opens up this debate by encouraging us all to help invent the future. We now need to continue the process and establish what we have to start doing today to ensure a sustainable tomorrow.

How influential are our cities for the future?

Veolia asked the London School of Economics to explore UK Urban Lifestyle scenarios for 2050. These are their fascinating conclusions.

Increased fuel and food prices, declining levels of exploration of non-renewable resources and successful business models that achieve more with less have questioned our model of economic growth based on the exploitation of finite resources. Yet the transformation of the UK towards a circular economy remains slow, largely due to our politics and economy being locked into resource-intensive pathways that were dictated by previous technological and industrial revolutions.

However, increasing evidence suggests that this does not have to be the case and change can originate from our cities. We live in an age where rapid technology innovation has created a paradigm shift in the way we live, work and consume. With the majority of the world's population now urbanised, cities are at the centre of a resource revolution.

They are guiding citizens to lead sustainable lifestyles through high density living, sharing of goods and services and the reuse and remanufacturing of goods. More importantly, cities have the capacity to re-lock lifestyles into more sustainable and resource-efficient pathways by investing in innovative technologies that can accelerate this transition.

The report by the LSE provides a perspective on potential future lifestyle scenarios for UK cities in 2050, looking specifically at changes to energy, waste and water use patterns. It is based on an analysis of the wider academic literature on lifestyles and cities, and draws on existing scenarios and forecasting studies that provide insights into what the future of urban living may look like.

Cities will account for 80% of the increase in energy demand by 2030.

The lifestyle-city nexus

As the percentage of the people living in cities rises every year, resource scarcity and environmental degradation will be felt most acutely in urban centres. It will also exacerbate inequalities within cities - and between cities.

Cities may be at the heart of many of our most pressing environmental and resource depletion problems, but they also display unique characteristics that can provide solutions to these environmental and social challenges by accelerating the transition towards a more sustainable future.

For example, cities such as Amsterdam have approached the problem of resource efficiency in the waste sector by concentrating on the lifestyles of its citizens and its overall infrastructure. They have expanded the domestic recycling sector and invested in state-of-the-art waste management technologies to increase levels of waste incineration. The first relies primarily on lifestyle changes and the second on the use of technology to reduce environmental impact, leaving existing consumption patterns largely untouched.

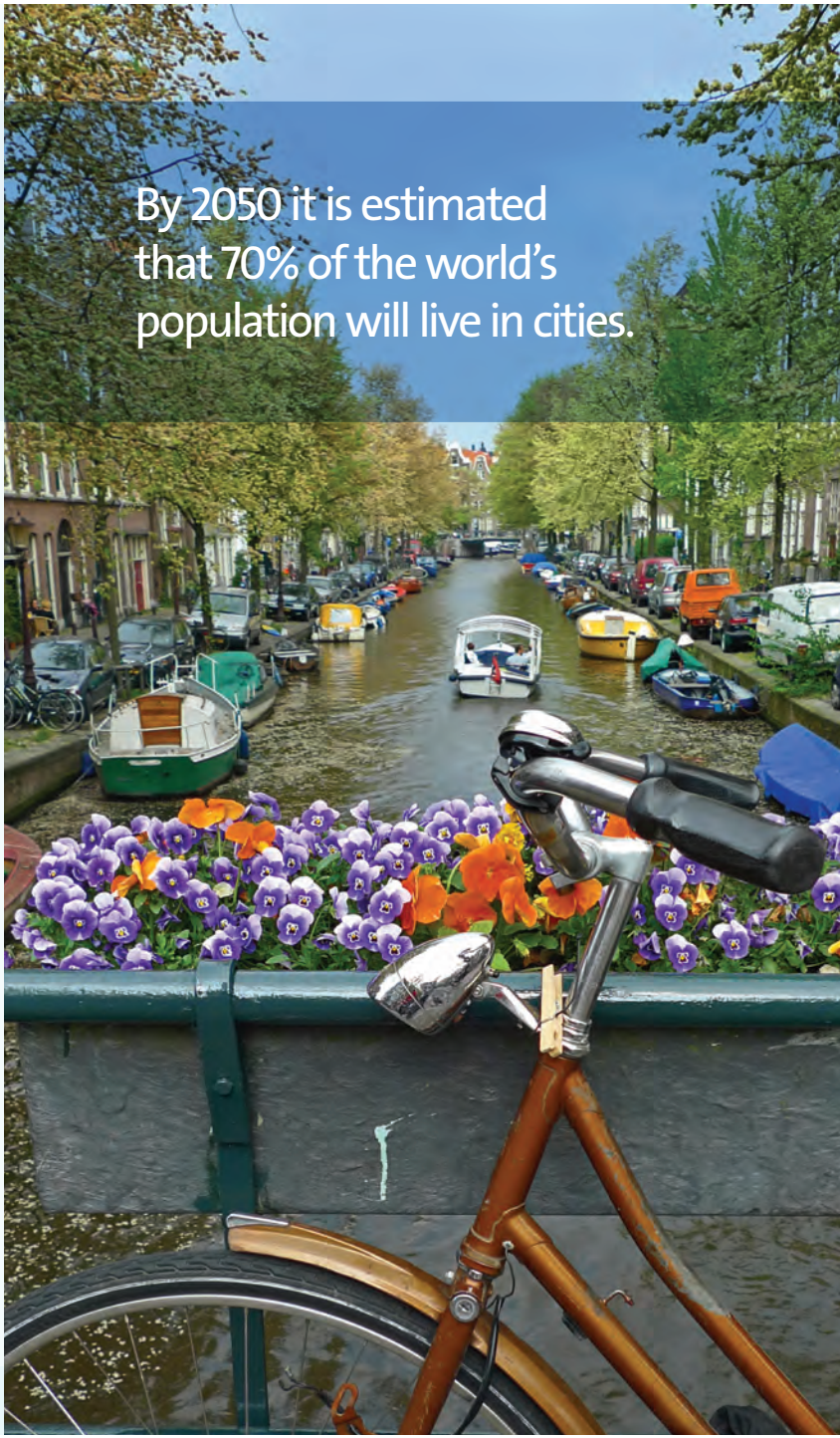
Amsterdam has taken a similar approach in the water sector, accelerating efficient water use through a lifestyle-led approach by using household water meters to lower consumption by

10-15%

A second initiative to prevent water leakage throughout the Amsterdam network had a greater impact on water use efficiency, but very little effect on behavioural patterns.

In the energy sector, Oslo was able to reduce its CO_2 emissions by setting up a district heating company, which supplied all new building developments. Consumers had to pay slightly higher prices for their energy, which originated from cleaner biofuels and hydroelectric sources. The policies were also coupled with simultaneous efforts in transport and the switch to oil heaters powered by biogas.

These examples show that although technology can be used in isolation to improve resource efficiency, the cities with the best success stories are also shaping behaviour through targeted policy. For many cities, resource consumption patterns have been transformed at the same time as the socio-technical system. This illustrates how essential it is to take a systems approach to lifestyle change. The focus should be shifted away from isolated issues such as domestic water or energy consumption, and moved towards rethinking how we can live, work, play and consume in more sustainable ways.



The impact of lifestyles

Urban sustainability is a multi-dimensional issue that cannot be addressed through technology and infrastructure alone. It also requires profound changes to the economic, political and social fabric of our cities and the decisions that shape our lifestyles.

Many of our consumption patterns and lifestyle choices are keeping us locked-in to unsustainable, resource-intensive behaviours that are difficult to break out of. One of the main problems is that our lifestyles are so closely related to existing institutions, value systems and trends in society. Without large-scale change on every level, it will be extremely difficult to change individual lifestyles.

However, simple changes to one lifestyle driver can have knock-on effects for many others, creating a virtuous circle of change that can steer us towards greater sustainability. One example is local council recycling schemes. By making recycling bins available to households, people find it easier to separate waste. Over time it creates new habits that shape a new set of social norms about the value of resources, which then spill over into other aspects of people's daily lives and consumption patterns.

The role of the city

Cities display unique characteristics that create a favourable environment for a sustainable transformation. They are designed to overcome distance and enable people to exchange goods, services and ideas in the most efficient way. So by their very nature, cities have the potential to encourage sustainable, low-impact lifestyles as the norm. This is accelerated by specific urban characteristics:

Density

Urban areas have higher population and infrastructure densities. The denser a city is, the easier it is to improve the efficiency of the 'urban metabolism' - the amount of resources needed per unit of economic output. The environmental footprint per capita tends to be smaller in cities as more efficient systems and denser living spaces lead to less energy, waste and water consumption.

Scale

The larger and denser a city, the more it benefits from economies of scale. This means that some services, such as district heating, decentralised energy generation, recycling collection and waste water treatment, are more cost effective to implement in larger cities as installation and maintenance costs are reduced.

Innovation

Cities are engines of innovation and economic growth. They can tap into their human capital and fast track innovative solutions to the most pressing sustainability challenges. Existing research institutions and infrastructure also mean cities are ideal test beds for new green technologies.

Collaboration

Dense urban areas enable us to move from individual ownership to a sharing model of consumption, a trend known as the collaborative economy. This is aided by the rise of the internet, enabling people to buy, trade, rent, or share goods and services with like-minded people nearby.

What will city life be like in 2050? In reality, we expect the future to lie somewhere between two extremes. In both examples, cities are drivers of change, one relying on technologies in a circular, collaborative and dense city context, the other in a linear, individualised and sprawling city context.

Scenario 1:
Collaborative practices in the compact city

In this scenario, the future of urban lifestyles is based on collaborative consumption. Collectivist values have led to new models of social, political and economic participation and an emphasis on shared ownership.

Mutualism and local self-reliance are the result of a concern for social equity and environmental sustainability. This is supported by strong local governance and resource prices that drive social and environmental change within the city.

There is a strong emphasis on system-level planning, optimising land use, buildings, services and infrastructures to reduce demand and improve resource efficiency.

Settlement patterns are quite dense, with a strong emphasis on preserving the ecological integrity of the urban periphery. Local businesses with cradle-to-cradle production methods are at the centre of economic activity within this post-consumerist city. Productivity and growth have been successfully decoupled from negative environmental impacts.

At the household level, the consumption of resources has been drastically reduced through new technologies and wide-reaching behavioural changes. This city is well on its way to being a closed-loop system.

Scenario 2:
Individualised materialism in dispersed space

In this second scenario, the future of urban lifestyles is highly materialistic and individualistic, within a hyper-mobile, globally connected and largely unregulated market economy. Short-term private consumption and ownership is prioritised over long-term communal thinking.

A preference for detached, single-family homes creates suburban sprawl and gated communities. This segregates an increasingly stratified society and private motorised transport still dominates transportation.

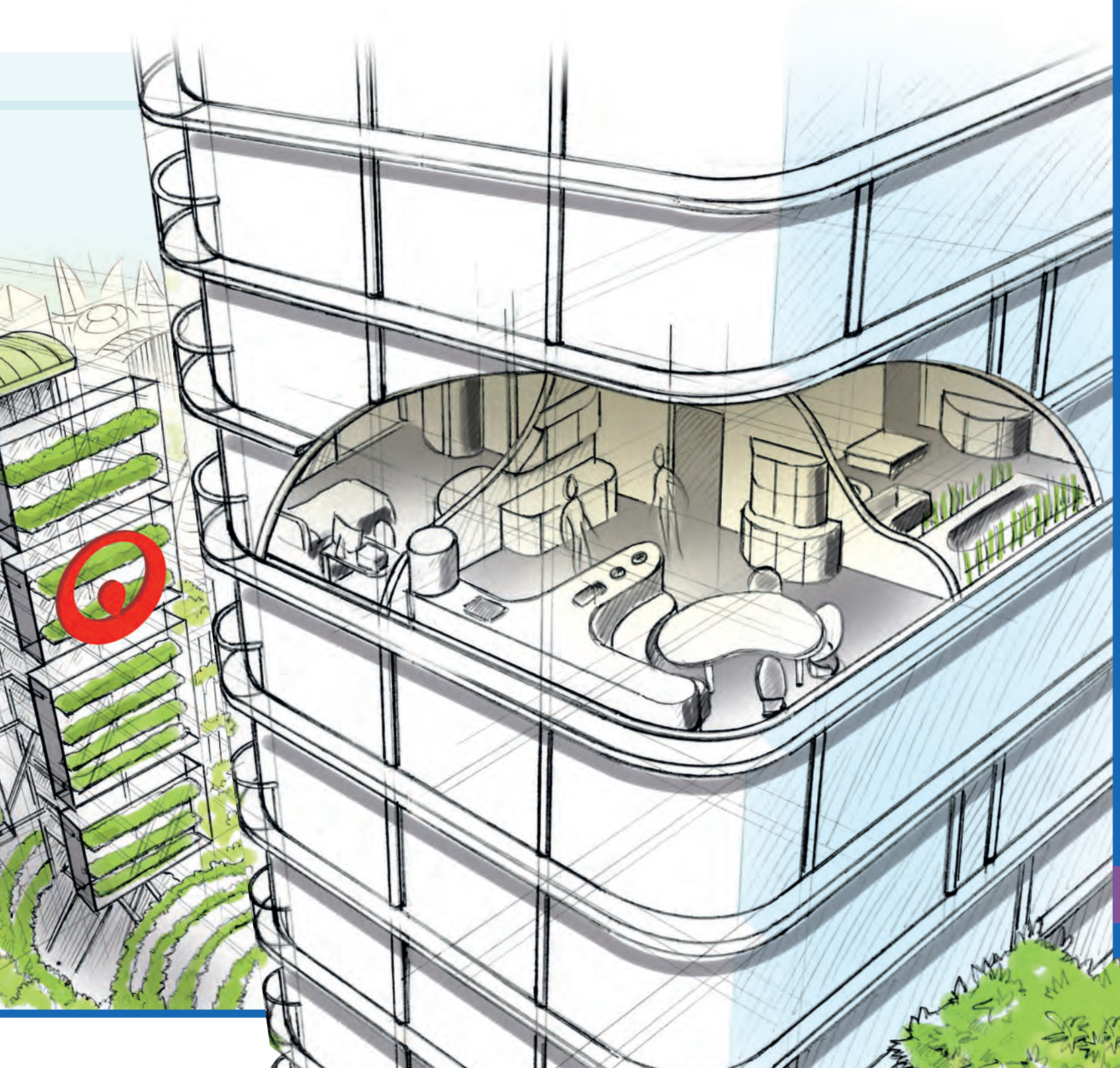
Resource efficiency at the household level has improved due to emerging technologies and intelligent control systems. However, the lack of a comprehensive policy, weak institutions and resource prices that do not take all externalities into account, mean that overall consumption of water, waste and energy remains fairly high.

Environmental degradation is primarily addressed through end-of-pipe solutions. Demand is managed through centrally controlled smart networks.

There are 1 million more urban dwellers in the world every week.

A final word

Although nobody can predict the future, creating forward-looking scenarios can act as powerful tools to create urban environments that encourage innovation, reduce environmental impact and improve quality of life. By illustrating the likely effects of remaining locked-in to our current technological, infrastructural and behavioural paths, they also provide a strong justification for taking decisive action on our most urban pressing sustainability issues today.



Imagine 2050

Let's imagine the home of 2050...

A home where innovation will serve householders to make everyday life easier and greener. Imagine a home where bins, refuse collection and traditional baths will be replaced by intelligent auto bio-degradable packaging, an underground vacuum network or ultrasonic bath. These may seem like very futuristic inventions coming from a science fiction novel, but Veolia is already developing some of the technologies presented in this report. So let's Imagine and enter into the home of YOUR future...

Richard Kirkman
Technical Director

Imagine 2050

Imagine a home free of bins that sorts its own waste

1 Infinicycle

The liquid and solid waste material will undergo a treatment to break the matter down into its chemical building blocks. Due to this process, it will be possible to recycle endlessly and recreate any type of material.

How?

Waste will be deposited down the drain to a treatment facility which will dissolve the waste into its chemical building blocks which can be sent for sorting/reprocessing.

2 Nanobot waste sorters

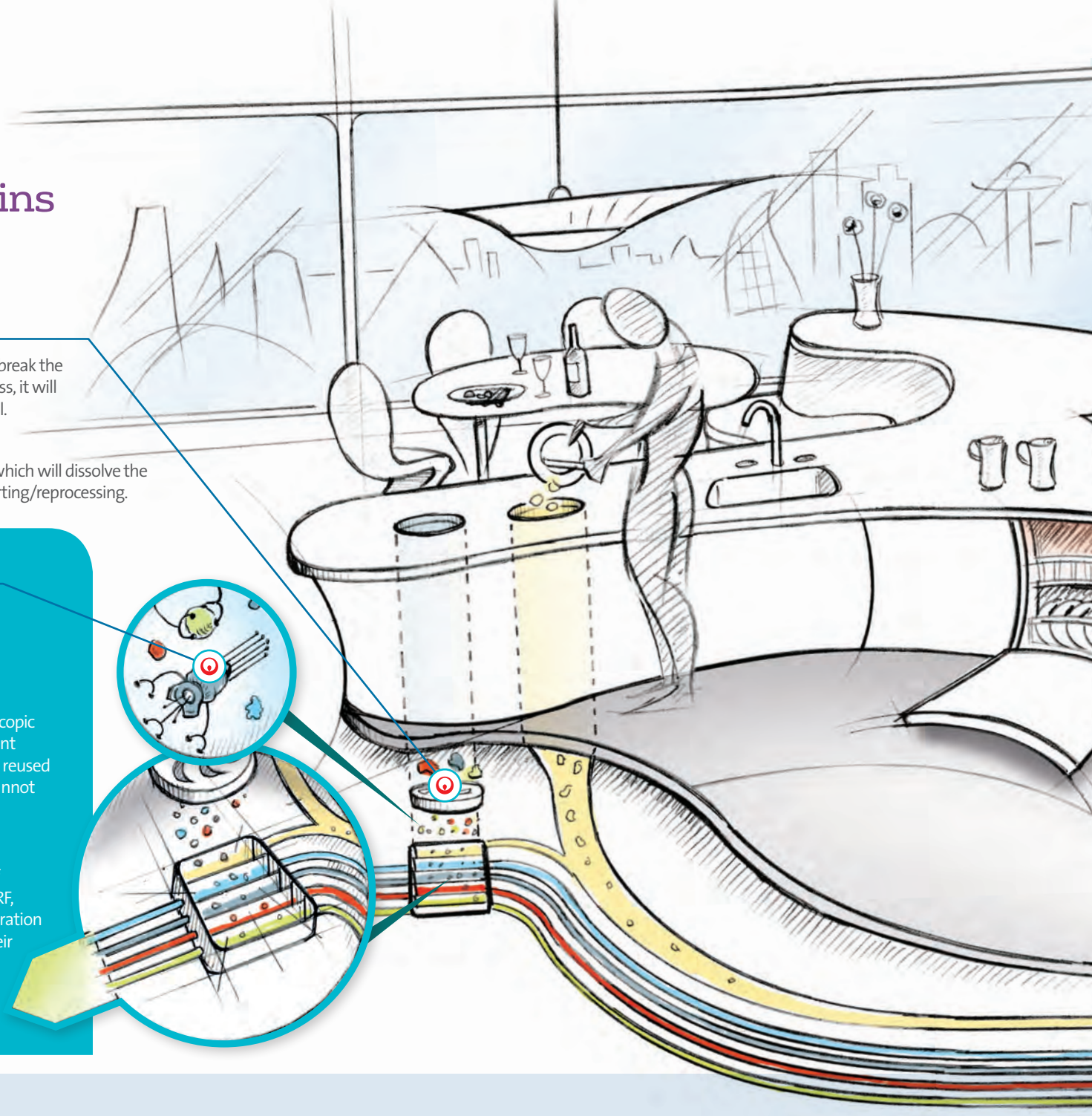
Products for recycling will be sorted by machines that separate mixtures of materials into categories based on their size, shape, colour and on their physical and chemical properties.

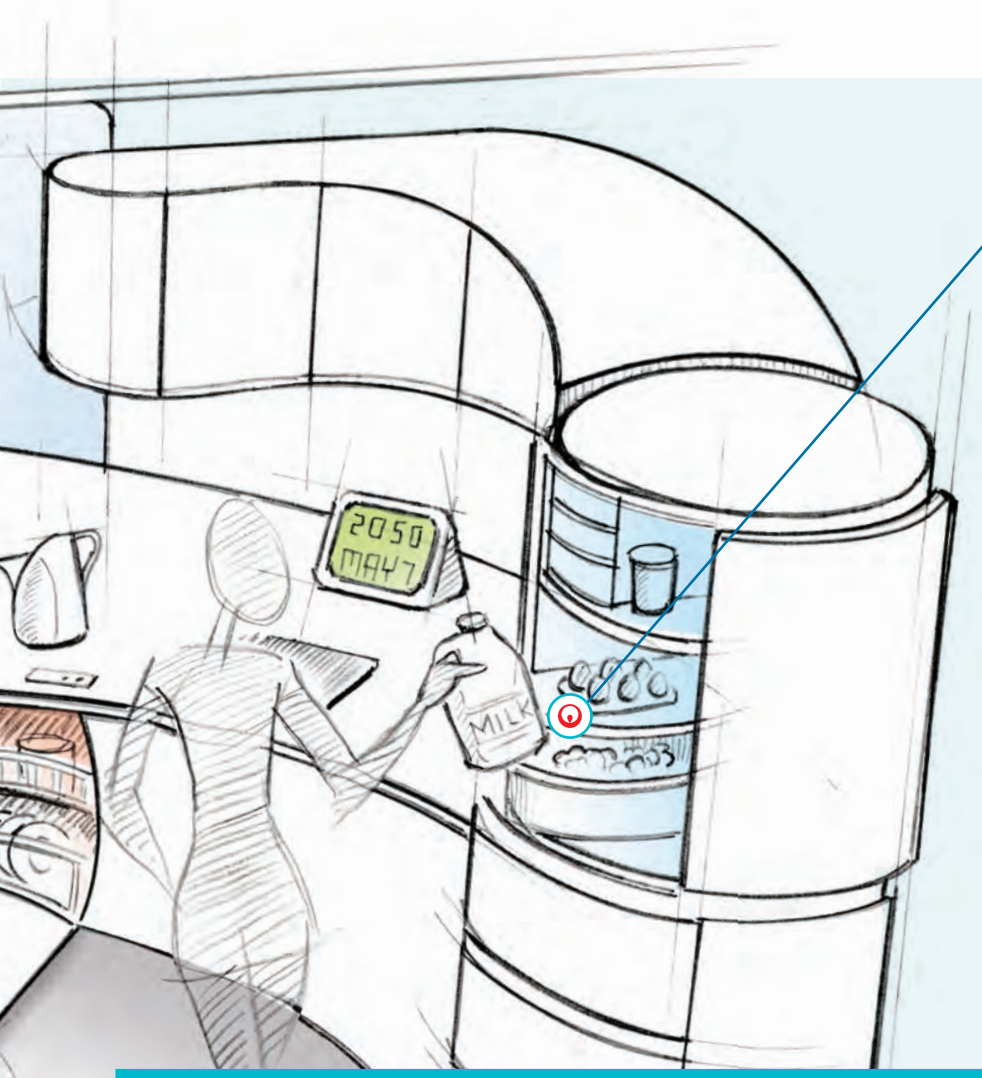
How?

In the future, mixtures of materials will be shredded into microscopic particles and nanoscopic robots will be used to recognise different types of material and collect them in a pure form so they can be reused by industry. This will help to reduce the amount of waste that cannot be used and has to be thrown away to almost zero.

It's happening now

Our Magpie Technology (Materials Acquisition and Gathering of Plastics by Intelligent Equipment) implemented at Padworth MRF, West Berkshire, uses near infra-red sensors and pneumatic separation technology to sort different types of plastic bottles based on their chemical composition. These sorted bottles can then be delivered directly to manufacturers allowing them to use large amounts of recycled plastic in new bottles.





3 Homes that generate power every day

Organic waste that is generated at home will be used to produce power for the district and help to reduce the carbon footprint from energy consumed at home.

How?

Municipal collection of waste via a vacuum from households and energy distribution transfers back to homes. This will develop local energy generation and reduce efficiency losses from the transfer of energy from large scale production.

It's happening now

SELCHP Energy Recovery Facility uses waste as fuel to generate electricity supplied to the National Grid and heat supplied to a local district heating network. The pipeline network is approximately 5km long in total and connects around 2,500 dwellings within the London Borough of Southwark to district heating. The SELCHP district heating scheme is offering energy at a slightly lower cost than gas, increased supply resilience and a low carbon solution to residents.

4 Intelligent packaging

Packaging will be active and able to control the environment inside the packaging providing optimum conditions. It will also self-degrade after the content expires.

How?

Intelligent packaging will contain substances that mop up any oxygen that leaks into the container. Coloured stickers on the outside of the packaging will change colour at a rate that is affected by the storage temperature. The sticker on a product kept in a cool fridge will show the safe to eat colour for longer than one kept in a warm room. Both these mean that food will last longer and less will need to be thrown away.

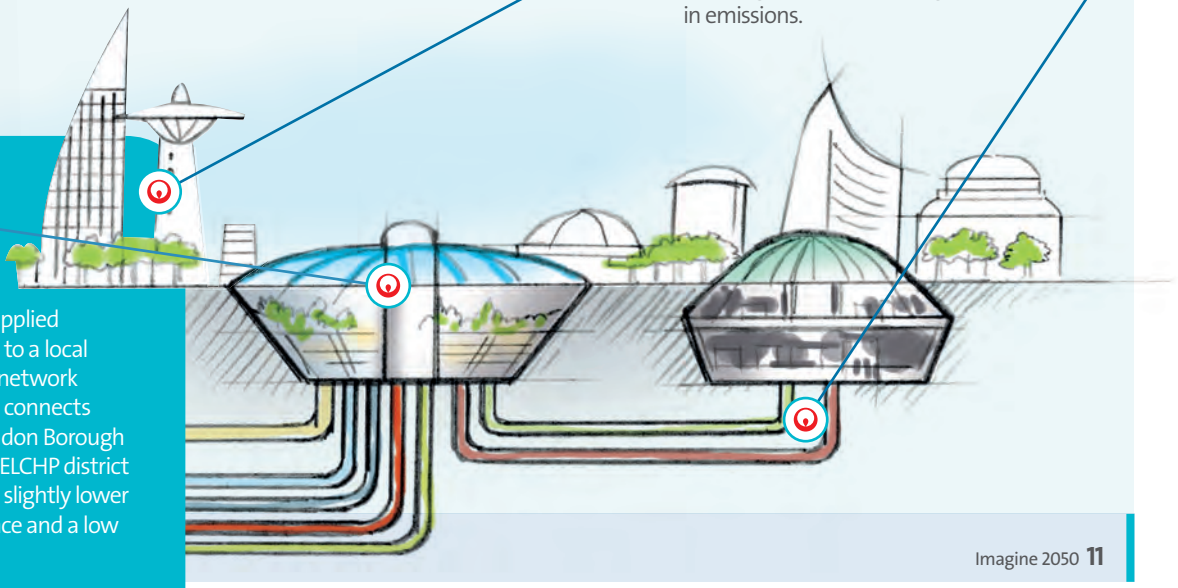
Packaging will contain additives that modify the behaviour of the plastic film making it oxo-biodegradable. Chemically, it will cause the long chemical chains to break down into harmless substances which are part of the earth's natural cycles. Packaging could be designed to start breaking down any time from a few weeks to two years depending on the use of the packaging.

Veolia is seeking to engage with the packaging industry to increase the momentum on circular packaging.

5 Underground collection network

All municipal waste will be collected via a pneumatic network transferring the waste flow to treatment facilities. This will reduce the presence of vehicles in the city and contribute to less greenhouse gas emissions, sound and visual nuisances which result from the collection of waste, and will be a 24/7 service. Multiple bins will be replaced by one pod integrated into walls allowing more space in rooms. The pods will then drive waste to the treatment facility.

Pneumatic collection consists of transferring household waste by an underground network, from fixed collection points to a unit that compresses material. This type of collection has several advantages: suppression of noise, visual and odour nuisances related to storage; and reduction of collection. Refuse vehicles in the city will be significantly reduced resulting in a corresponding fall in emissions.



Imagine 2050

Self cleaning bathrooms using the power of plants and bacteria

1 Power of plants to clean water

In 2050, every home will self-treat its domestic effluents by using the processing power of plants and bacteria. It will be a sustainable and natural solution, and 100% energy free.

How?

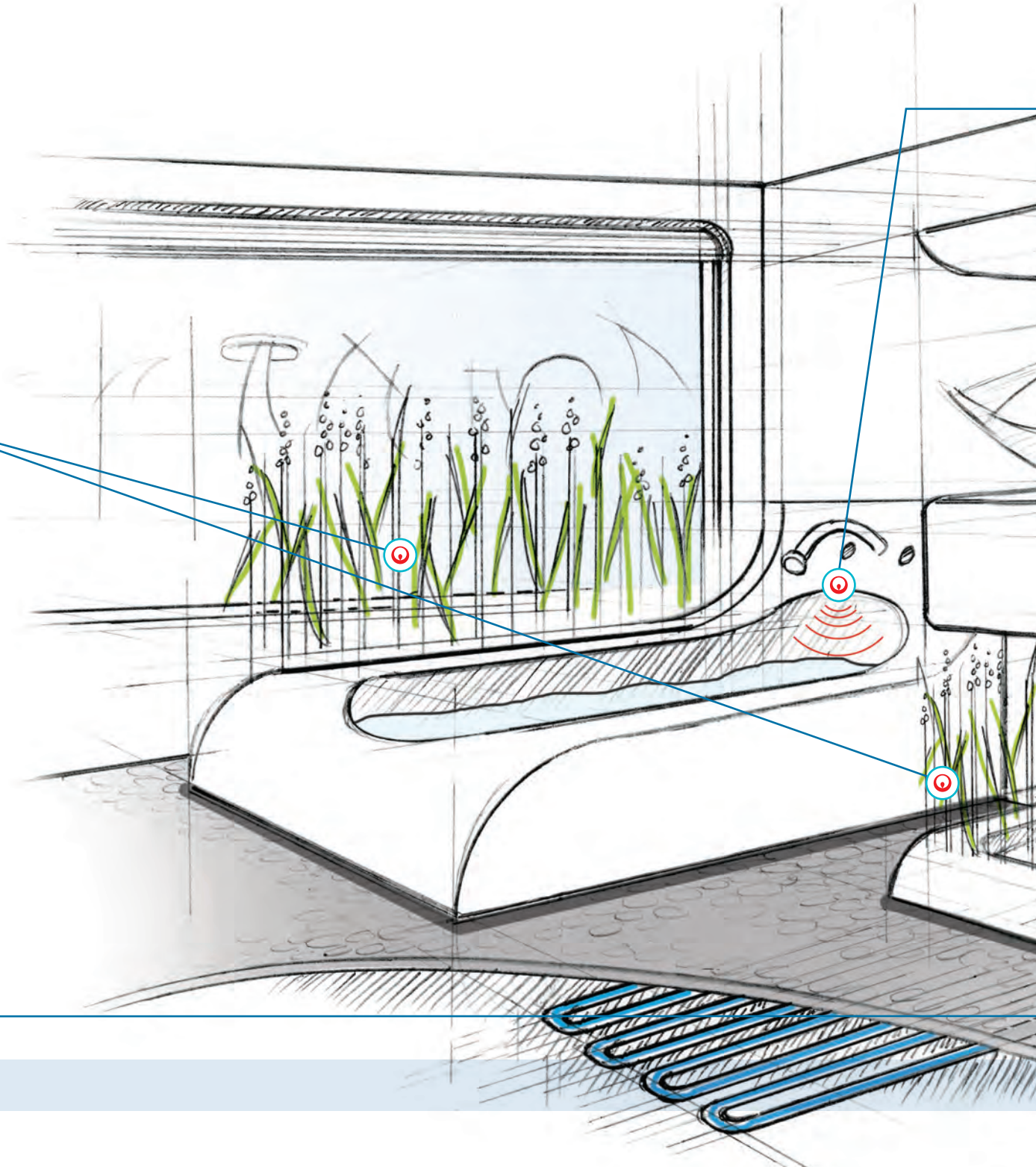
The principle is based on the purification capacities of plants and bacteria (aerobic and anaerobic) to transform organic material into mineral. The domestic effluents are driven to a vegetation basin with specific plant species. The water going through the soil and filtered through plants and bacteria will end up clean and ready to be used again.

2 Microbiotic energy

In the future bacteria will be a renewable energy resource working in a fuel cell device at the green energy centre.

How?

The system is based on microbial fuel cells using bacteria to produce and transfer electrons from organic matter to the electrodes and generate electricity. It's also an energy free way to treat sewage or leachate.



3 Ultrasonic appliances

Baths will be able to work by using a minimal quantity of water. Technologies needed for cleaning will be able to use ultrasonic vibrations to remove dirt.

How?

Waves of very high frequency (from 20 kHz to 170 kHz) generate a high quantity of microscopic bubbles in liquid. Waves are produced by a transducer making the liquid pressure vary from compression to decompression phases. This is called the cavitation's phenomenon. During the compression phase, the bubbles implode, causing turbulence on the material in the liquid, forcing out the dirt.

4 Senso-cleaners

All water taps will be equipped with senso-cleaners that will automatically scan your hands during washing and the water will stop once the sensor detects all dirt has been removed. This invention will enable significant savings in the quantity of water used.

How?

The high sensitivity optical senso-scanner will be able to detect any dust or particle that is dirt at a microscopic level.

5 Self cleaning surfaces

Any surface type (wall, floor, roof and window) will be able to auto-clean itself with a minimal amount of water and no detergent. It will also be able to capture rainwater and condensation to feed the water demand of the home.

How?

Lotus leaves are covered by a microrelief, consisting of epicuticular wax crystalloids. The crystalloids are embedded in the cuticle forming the interface between the plant and the environment. Due to chemical composition, the cuticle forms a water repellent surface, controlling the loss of water. The surface of the leaf also has a high degree of roughness, causing an important water repellence effect. It also avoids particles sticking to the surface because the contact area becomes too small. When raindrops fall onto the leaf, it removes all particles and dirt.

It's happening now

We have recently developed a new street sweepings Recovery Facility at Ling Hall, Warwickshire, which uses log washers, screens and magnets to extract recyclates, metal cans, leaves twigs and stones and also the precious metal, palladium. These metals are commonly used in catalytic converters and tiny amounts can be thrown out by car exhausts, which then settle on street surfaces. Traces of gold and silver might also be found in the sweepings, as tiny fragments can rub off clothes, shoes and jewellery.

Print on demand what you want, when you want, from your old milk bottle.

1 3D printing and intellectual property

The industrial revolution of the future will take place at home. 3D printers will be accessible to anyone and replace mass industries. Manufacturing will be specific to the need and will avoid mass production reducing the use of materials and energy. Diverse appliances will be available to print: medicines, electronics, everyday-life objects...

How?

Based on the intellectual property, 3D printers will be using applications that users buy in an online store. We will no longer buy products but innovative concepts of the engineers of the future. The plastic-based ink will be available in any store that could be supplied by Veolia.

It's happening now

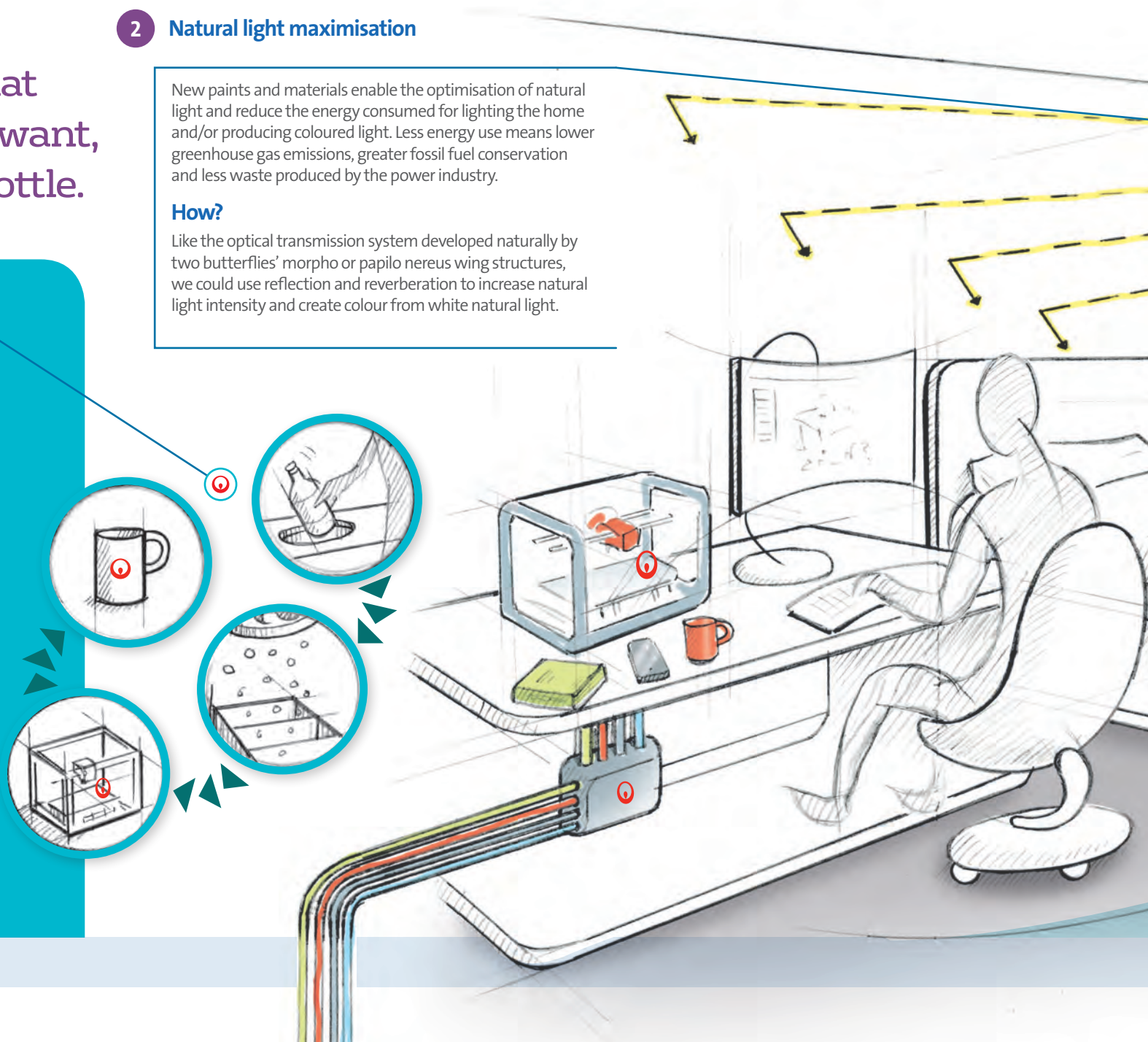
Our new Polymer Recovery Facility in Rainham sorts up to nine different plastics and colours using hi-tech equipment, helping us to recycle even more plastic that could be used to feed any 3D printer in 2050.

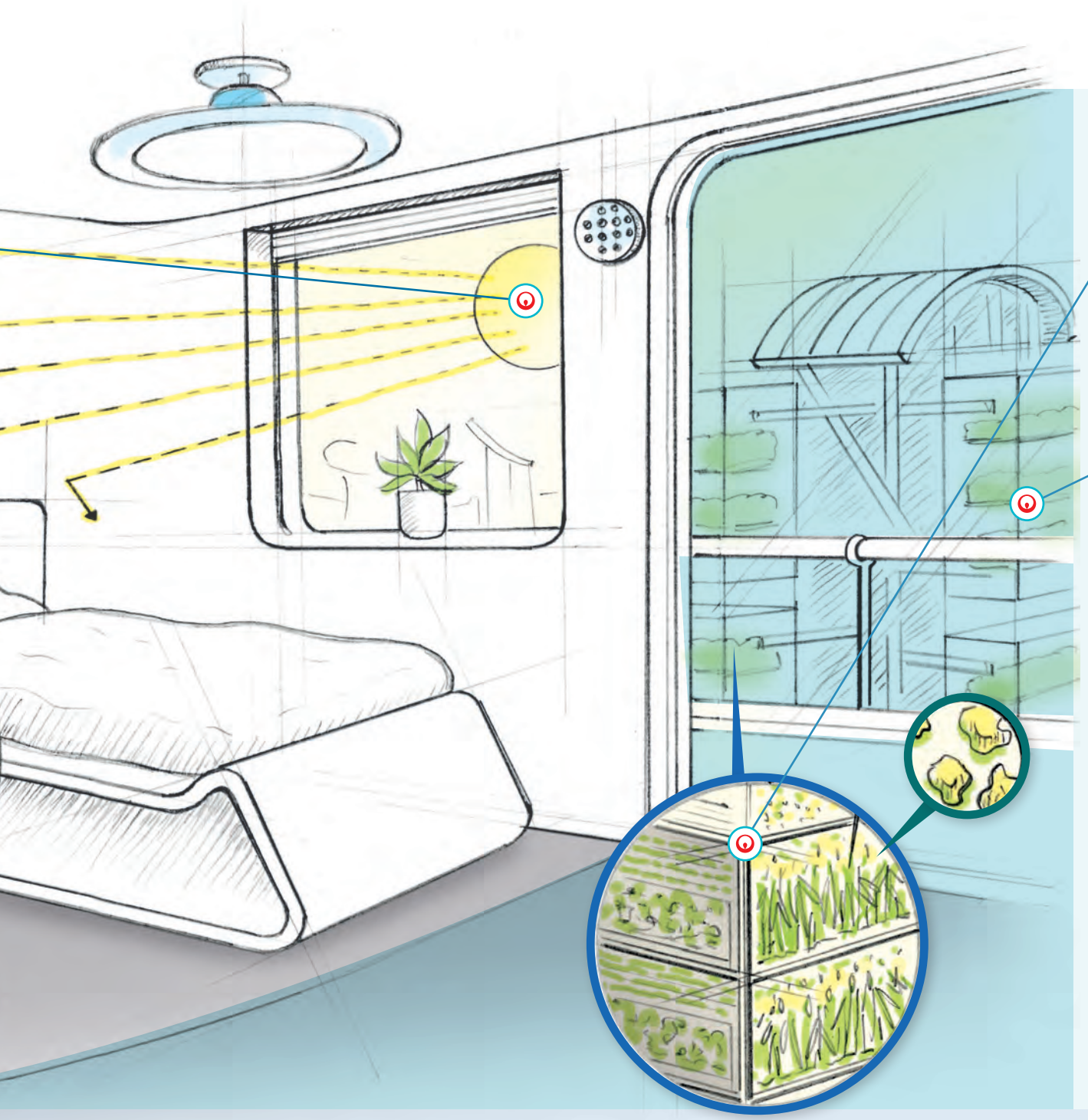
2 Natural light maximisation

New paints and materials enable the optimisation of natural light and reduce the energy consumed for lighting the home and/or producing coloured light. Less energy use means lower greenhouse gas emissions, greater fossil fuel conservation and less waste produced by the power industry.

How?

Like the optical transmission system developed naturally by two butterflies' morpho or papilo nereus wing structures, we could use reflection and reverberation to increase natural light intensity and create colour from white natural light.





3 CO_2 and algae: a biofuel couple

We'll be using CO_2 as a biofuel source.

How?

All the CO_2 emitted at home will be used to feed micro algae and produce biofuel. The biofuel in turn will be used to generate heat and power. The CO_2 produced from the heat and power generation will be once again used for biofuel production in a closed loop.

4 Growing our plastics

Material will be designed from 100% renewable sources to avoid resource depletion such as crude oil exploitation. Plastic won't be made from oil anymore but from plant components or made by bees. This will significantly reduce the carbon footprint of material production and move away from oil reliance.

How?

Plastic is generally produced from a derivative of crude oil. However, plant material can be used to make plastic components from combustion and an associated chemical reaction process.

Colletes bees are able to synthesise polyester plastic that they use in their hive to protect their larvae from external threats like heat, fungus, and bacteria. The natural polyester they make is very close to cling film in its physical characteristics.

It's happening now

Veolia Water Solutions & Technology has developed the innovative Cella™ technology that integrates biological treatment of industrial process waters, wastewaters and/or sludge to produce and recover a key ingredient for bio-plastics production. These bio-plastics have exciting applications as biobased and biodegradable raw materials for consumer products and services. This technology combines a responsibility of environmental protection with the added value of generating renewable resources.

This doesn't necessarily mean we will only use bioplastic and we need to choose carefully where to apply this renewable resource.

Richard Kirkman, Technical Director, explores how technology will shape the future of our urban lifestyles.

Whether technology enabled or driven by social change, what do you want our future to look like? It's a question many of us ask ourselves. And it's certainly one that we think about here at Veolia when we design our client services for the public and private sectors. After all, we are ultimately interested in developing smart, sustainable cities.

Undoubtedly, the behaviours we develop will play a key role. So it's important that we share our ideas about the future and canvass opinion amongst the key stakeholders and learn lessons from our neighbours.

Any tourist staying in a hotel in Scandinavia will see recycling bins in their room. The local fast food restaurant will have three bins for food, plastics and paper and if you don't use the recycling on-the-go bins correctly, people stop and stare at you until you fix it. In short, at least here, the social battle seems to have won.

This level of awareness and cultural acceptability has yet to percolate into the UK and other European countries. But we're certainly well on our way and the convergence of social, economic and environmental probity is taking a foothold.

There was a time when the majority looked at recycling with great scepticism, wondering whether these highly valuable resources might be secretly going to landfill, worrying about exports to China, or debating the health impacts of waste management.

However, views and behaviours seem to be changing amongst the general population and the media. Even under the new dynamic of austerity – and perhaps because of it.

Richard Kirkman
Technical Director

The future of technology

When it comes to technology, what will the future landscape look like? Well, let me start by asking what is wrong with bar codes?

Bar codes, now ubiquitous in society and synonymous with our beloved tin of baked beans, were invented in the 1950s, industrialised in the 1960s, and first used by Wrigleys back in 1974. Once treated with the same derision that has accompanied GPS, RFID and QR Codes, these new technologies have all become part of the wallpaper of our commercial world. In fact many futurologists now predict that super-intelligent computers will change the way we live over the next 30 years, and big data and the growth of computational power as well as a myriad of technological innovations support this prediction.

So, it is not because bar codes don't work anymore that we are using alternative means, it's just that we invented something else. And as we do still use bar codes, let's not throw the baby out with the bathwater (especially with the impending water shortages).

> "Our need for resource management doesn't end with zero waste, that's just the beginning."

Putting this all together, we believe the future will be a mix of traditional, albeit state-of-the-art, technology coupled with ground-breaking disruptive technologies.

Technology and the circular economy

We're already leading the way in creating a circular economy.

We're using the know-how we have today, combined with the seeds of innovation and pioneering technology to improve our future cities. We believe this will enhance and protect the natural world around us, leading to a better social environment for future generations.

We expect the home of the future to be underpinned by green building materials, protected water and material sources, low carbon energy supplies and a zero waste strategy. Not from cradle to grave - which implies a disposal point - but via a circular approach.

Packaging as we know it today literally has a limited shelf life. We expect advanced chemical processes, depolymerisation and molecular dissolution to create more complex packaging and intelligent materials that can be de-manufactured or re-engineered after each use.

Technology to sort materials is already growing exponentially, with infrared, spectroscopy, robotics automation and sensing technology leading the way. Processes long-used in automotive manufacturing are being adopted more readily each year. This will make recycling easier than not recycling because it takes people's choices out of the equation. We will auto-rate sustainability hard wiring it into our society.

Advanced biotechnology will thrive and new materials such as plastics made from sewage sludge will provide the future security of supply for consumer products. We expect a complete circular approach with no wastes generated. As in nature, each waste will be the feedstock for the next system.

Centralised traditional manufacturing will decline and be displaced by 3D printing, the 'replicators' from science fiction becoming a reality for the next generation.

We also expect to see waterless cleaning as standard in many fields, such as washing of clothing and home furnishings. Material and water resources will be reused many times and the closed cycle will become the norm.

The carbon era will have come and gone. For energy we will seek solar, wind and wave and biofuels amongst the new energy resources.

The revolution in sensing technology will bring about the Internet of Everything and along with it the ability to sense, measure, adjust and regulate everything we do. This may bring with it a social resistance linked to personal privacy. However, it will also drag us into a future where we have the means to improve everything around us, since data means information which enables knowledge, and with it comes wisdom.

Low impact lifestyles will be de rigueur. Social change, driven by our physical proximity, will bring about home working en masse, manufacturing at home, paperless e-papers, leasing and repairing not buying, changing the way we think and do.

This is a future that is so different to what we do today, it might scare people. But it's no different to looking back 500 years to life in the Middle Ages and wishing we were back there.

Our strategy is to invent this future together. To innovate and stretch technology into new fields, reinventing the normal into the exceptional with our customers - something that can be seen in the new facilities we're building today.

The future starts now.

The engineers, scientists and, importantly, clients, customers and stakeholders will all shape the future for us based on technical and behavioural needs.

Sustainability is at the heart of everything we do. We have the technology and expertise to recycle, recover and reuse precious resources for water, waste management and energy. So we're ideally placed to help create that smarter world.

Veolia's smarter future

Our current lifestyle and ways of thinking have a double impact on the environment – depleting our natural resources and creating pollution. What's needed is a smarter way of producing the goods and services that we all need.

Nature already has the perfect answer. In natural ecosystems waste and by-products from one activity become a resource for another. By turning our waste into a resource we can reproduce that circular flow of materials and energy, creating an industrial and commercial ecology for sustainable development.

It's an idea that we've already embraced.

Sustainability is at the heart of everything we do. We have the technology and expertise to recycle, recover and reuse precious resources for water, waste management and energy. So we're ideally placed to help create that smarter world.

Our wealth of experience across the three different sectors of waste, water and energy also enables organisations to benefit from our group's business synergies. Our smart solutions work in harmony with each other to improve efficiency and reduce our impact on the environment. From producing biodiesel from collected waste to creating energy to feed heating networks. Clever ways to recycle waste and wastewater resources and recover embedded energy that would otherwise be lost. So we can all look forward to a smarter future.

To make this story into a reality we believe three things need to change. Firstly, attitudes – the public must begin to accept that treatment, and in the future, manufacturing plants may be on their doorsteps or at the end of their street. As we move into the circular economy these materials will no longer be seen as waste, but more as a valuable commodity. However, things will only change when attitudes towards them improve.

Secondly, planning must be streamlined. Government must recognise that building green infrastructure is key and must be pushed forward and not held back by bureaucracy. If we work closer with communities to engage them and provide the benefits of jobs, investment back into the local economy, as well as reducing carbon dioxide emissions, the full potential will be realised to create a sustainable city.

Finally, businesses must engage in the circular economy. As they create new products on to the market, it must be recognised that virgin materials should be dramatically reduced if not eradicated. They must work with manufacturers of green products to provide the public with only sustainable options and best practice. We have the materials, let's mine them for the resource.

Resourcing the world

Veolia is the only company in the UK that can provide a whole spectrum of environmental services. To find out more about our energy, water and waste services and how they can work in harmony together with your organisation, please contact us:

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