

2050: Appliances of the Future -

The Road to Net Zero

September 2022



Organised by:

AMDEA
The Association of Manufacturers
of Domestic Appliances



Office for Product
Safety & Standards

2050: Appliances of the Future - The Road to Net Zero

September 2022



On behalf of the organisers, I'd like to extend a big thank you to all who spoke at, supported the delivery of and attended our conference.

This one-day event was

delivered by AMDEA (The Association of Manufacturers of Domestic Appliances), City, University of London and the Office for Product Safety and Standards (OPSS).

This was our second cross-industry, jointly-partnered event and follows on from the 2050: Fridge of the Future conference that ran in September 2021. Last year's event identified some of the key challenges and requirements that we, together, must address to deliver a more sustainable future for appliances. This year's conference focused on the challenges and pathways that will help shape and deliver a net-zero industry and carbon neutral homes through technological advancement, increased appliance efficiency and a more circular appliance economy.

Via a diverse and highly experienced mix of speakers we covered an informative, challenging and thought-provoking

agenda. The event focused on the net zero transition pathway, actions required for manufacturers, regulators and stakeholders and the role we can all play in efficient appliance use. We debated actions required to deliver the circular economy challenges and the opportunity for new business models.

Never has the need for a sustainable world been more important than today. No one is under any illusion that the challenges to be overcome are great but overcome them we must if we are to meet the environmental and sustainable goals that will deliver a net zero future for us all.

This event is just one step on the pathway to a more sustainable future. We are committed to ensuring that the challenges and desired outcomes laid down at the event are progressed. AMDEA, along with our partners and stakeholders, will be inviting all of you to support and participate in these discussions over the coming months.

Thank you for your continued participation and support.

Paul Hide: CEO, AMDEA

Three key themes were explored across three Sessions:

1. The Net Zero Transition Pathway: What actions are appliance manufacturers taking to reduce the 'cradle to grave' impact of appliance production, delivery, use, repair and recycling. Are there key hurdles to cross (regulation/geopolitical/resources/technology) to get to net zero? And if so, what are they?

2. Owner Behaviours and New Business Models:

What role does the user/householder have to play in achieving the net zero home? How do we encourage consumers to "Do it Right" in terms of purchase, use, repair/servicing, and recycling?

What barriers are there to changing consumer behaviour? What incentives might increase the uptake of different behaviours and usage patterns?

Appliance use is growing, both in mature markets (the UK) and globally. Maximising the most efficient use of power generation requires a smarter approach to energy consumption, but how do we align these demands to a continued reduction? Will the increasing uptake of connected appliances address/reduce areas of risk?

3. The Circular Economy Challenge: Extended life, multiple life, Right to Repair and the supply

Welcome and Introduction

PROFESSOR RAJKUMAR ROY
City, University of London's Executive Dean of School of Science and Technology



The first speaker of the day was City, University of London's Executive Dean of School of Science and Technology, Professor Rajkumar Roy, who introduced the conference, set the scene and told delegates that many universities, including City, were carrying out essential research into the energy of the future.

He said: "The theme of the day is sustainable appliances – this is at the heart of what AMDEA is trying to promote in the industry sector, and we, as a university, are researching. City is very much into sustainable technology, engineering and appliances. The OPSS perspective comes from standards and regulations to support that development."

'Sustainable appliances are at the heart of what AMDEA is trying to promote in the industry'

Professor Rajkumar Roy, City, University of London's Executive Dean of School of Science and Technology

Professor Roy added: "We have prepared our students for a future with sustainability – City University London is focused on business, industry and practice, so this type of event is very important for City to understand this audience's requirements better and interact with you about the future."

chain. How do we address the competing demands of consumer desires to purchase new appliances versus the increasing call to encourage extended life through increased servicing and repair?

As well as presentations from keynote speakers and panels of experts, audience members engaged in Q&A sessions, discussing key themes, including sustainability, energy saving, consumer behaviour and net zero targets.

He highlighted four trends that support sustainable appliances:

1. Energy Efficiency – consumer behaviour needs to improve. Water consumption is also important, said Professor Roy – we need to look at how we use less water.

2. Microplastics – Professor Roy highlighted how appliance technology is developing, such as washing machines from Beko that can filter/separate microplastics from waste water.

3. Recycling, Reuse and Repair – Professor Roy said we need to get maximum value from an appliance's life cycle by using the Right to Repair and that we must support repair going forward. "We're not there yet – I'd like to see it in the future, and we must work together to achieve it. Maintenance costs must be reduced, and the life of an appliance increased", he said.

4. Ethics – in terms of designing a product and using it, but also in business, such as the corporate social responsibility of the supply chain.

Professor Roy referred to The Social Value Act 2012, which requires the public sector to ensure that the money it spends on services creates the greatest economic, social, and environmental value for local communities.

He also stressed that we need to reduce food waste through the use of appliances and make products more accessible for wider communities.

"We are used to creating economic wealth, but, along with it, how can we co-create social value with our customers?" asked Professor Roy.

"I hope this conference encourages a discussion towards this journey."

He said the objective of the event was to understand what the future looks like and how consumer behaviour is going to shape it.

Opening Address

PROFESSOR PAUL MONKS
BEIS (The Department for Business, Energy and Industrial Strategy), Chief Scientific Adviser



The conference's opening address came from Professor Paul Monks, BEIS (The Department for Business, Energy and Industrial Strategy), Chief Scientific Adviser, who delivered his speech via video.

He said that one of the challenges on the road to net zero was how to make appliances of the future more energy-efficient but also ensure they were ready to recycle, refurbish and reuse, without producing any extra costs. "The win-win would be to have green devices that reduce cost," he said.

'We must put consumer behaviour alongside technological mitigation measures – that's critical'

Professor Paul Monks, BEIS (The Department for Business, Energy and Industrial Strategy), Chief Scientific Adviser

Professor Monks said net zero wasn't just "technocratic" – he stressed how it was pervasive and runs through all sectors of society, including buildings and transport.

He said we need to ensure that consumers want to use appliances and certain technologies because they're better for the environment, and that we must educate people on how best to use appliances and repair them: "We must put behaviour alongside technological mitigation measures – that's critical."

One of the challenges that BEIS is looking at is the use of materials, said Professor Monks.

Summing up, he said we must look at how we adapt consumer behaviour, think about the new challenges that are out there, and get a "double wheel" running – the ability to reuse and recycle appliances, but also use greener power sources alongside that.

Keynote Address – Setting the Scene

TERESA ARBUCKLE
Managing Director, Beko Plc, UK and Ireland



Teresa Arbuckle, AMDEA Chair and Managing Director, Beko Plc, UK and Ireland, focused her keynote speech on how home appliance brand Beko and its parent company, Arçelik, are tackling issues such as sustainability.

She said: "There are opportunities for networking and collaborating. It's not about being in silos. Government, business, manufacturers, and retailers – all of us – need to work with consumers to try make a difference in the world that we live in."

Recycling

On recycling, she said it will become more 'on-trend' for people to get electrical products repaired, but that it was important to point out that using an old appliance can be much more expensive for the consumer and less eco-friendly than using a new one.

She added: "If we change the way we use our appliances and go for energy-efficient products, it will make a difference."

'Appliances account for 13-15% of carbon emissions in consumers' homes'

Teresa Arbuckle, Managing Director, Beko Plc, UK and Ireland

Teresa explained how the main bulk of emissions in the life cycle of a major domestic appliance occur in the use phase – when the product is in someone's home, while the second biggest is in the extraction and transportation of raw materials.

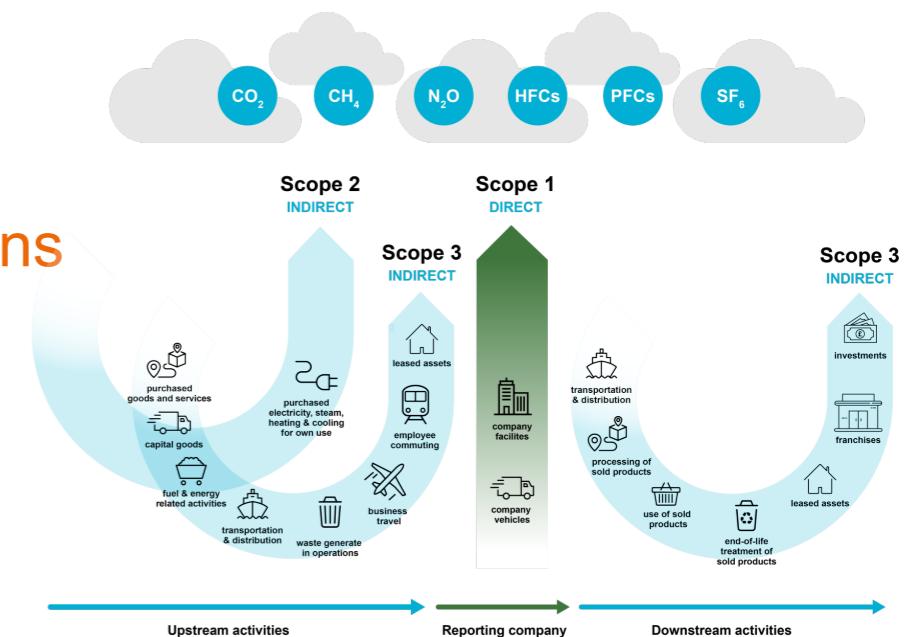
In light of this, Beko has introduced 'RecycledTub' washing machines and washer dryers, which use recycled plastic bottles in their tubs.

The brand has also launched the world's first washing machine with a microfibre filter – which was on show in the networking area at the conference.

At this year's IFA trade show (Sept 2-6, Berlin) Beko unveiled its 'SaveWater' technology – available on



Greenhouse Gas Emissions



Carbon Emissions Full Life Cycle Analysis – Major Domestic Appliances

Life Cycle Assessment Phases – Global Warming Potential (GWP) Results

Product	Raw Material Extraction and Transportation	Manufacturing	Product Transportation	Use Phase	End of Life
Washing Machine	12%	0.21%	0.17%	87%	0.9%
Refrigerator	19%	0.07%	0.18%	80%	0.9%
Dishwasher	7%	0.07%	0.13%	92%	0.7%
Oven	21%	0.44%	0.25%	77%	1.3%
Tumble Dryer	13%	0.10%	0.08%	86%	0.7%

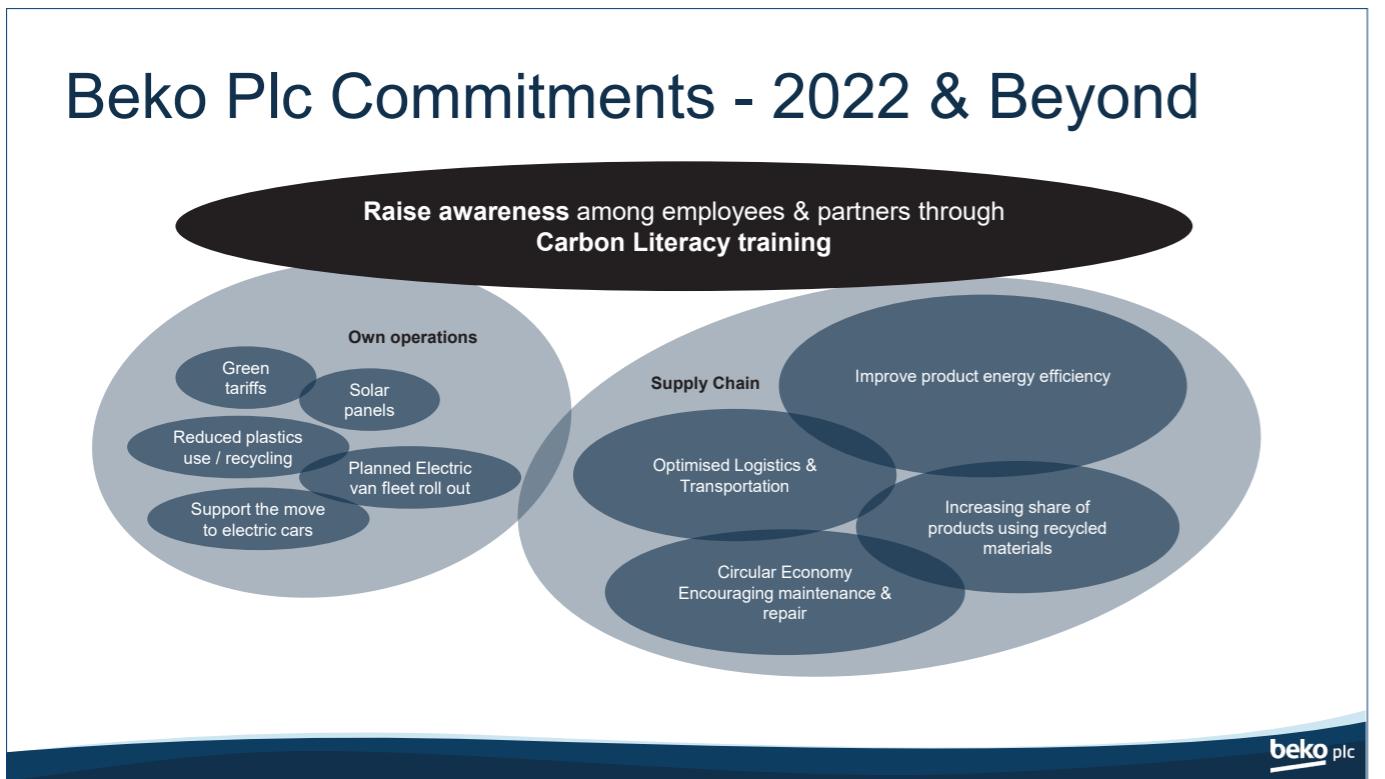


Using recycled materials in production can lead to a dramatic reduction in emissions, compared to virgin materials



SESSION ONE : The Net Zero Transition Pathway

Beko Plc Commitments - 2022 & Beyond



appliances that consume water, like dishwashers and washing machines.

In the case of a dishwasher, the water from the last cycle is saved and used for the first cycle of the next load, reducing the amount of water used.

Beko also has solar panel refrigeration in Africa, uses recycled fishing nets to manufacture parts for its ovens, and is introducing recycling packaging for its small domestic appliances – using recycled materials for the packaging on major appliances is harder, said Teresa, due to logistics, but the company is looking at how to address this.

She highlighted how heat-pump tumble dryers are much more efficient to use than condenser models and urged the industry to educate consumers on the benefits of using heat-pump dryers.

Arçelik – Company Background

- 12 brands
- 81 subsidiaries in 52 countries
- 30 production facilities around the world
- 29 R & D centres
- 45,000 employees

During the past 10 years, Arçelik has carried out a lot of work to address sustainability, including reducing the amount of water its appliances use, and ensuring its factories use green energy.

In 2021, Arçelik was awarded the Terra Carta Seal,



which recognises global companies that are driving innovation and demonstrating their commitment to genuinely sustainable markets.

Closer to home, in the UK, Beko is part of the Carbon Literacy Project, a scheme which educates businesses on sustainability. Sixty Beko employees have been on the programme and are now carbon-literate.

Carbon emissions

Reducing carbon emissions requires a collaborative approach", said Teresa.

She explained how Beko is working with retailers to reduce the number of products that are returned and called for manufacturers to do things differently when it comes to educating consumers on the usage of products and repair and recycling, adding: "We have the same ambition as the UK Government – we would like to be at net zero by 2050."

Keynote Address –

PAOLO FALCIONI
Director General, APPLiA Europe



In his keynote speech on the transition to net zero, Paolo Falcioni, Director-General of APPLiA, focused on the relationship between legislation and appliances.

He said that legislation should set the target and allow the industry to find the best possible way to hit it – it shouldn't be too restrictive.

The EU is responsible for 8-9% of global CO2 emissions – residential buildings account for 10-15% of that, said Paolo. Overall, residential buildings are responsible for 1% of the overall CO2 emissions in the world.

Sustainability means being able to reduce the impact on the environment, but while growing both the European and the world GDP – in 1990, Europe decreased its CO2 emissions by 24% while growing the GDP by 60%.

"It is possible to do both things together," said Paolo.

He pointed to the success of the Ecodesign policy in Europe on helping the EU reach the 20% energy efficiency target for 2020.

Ecodesign

"Appliances of the future will be sustainable", he said, adding that Ecodesign and water usage are key.

'It is impossible to use recycled plastic unless there is a good supply – that is one of the challenges that we have'

Paolo Falcioni, Director General, APPLiA Europe

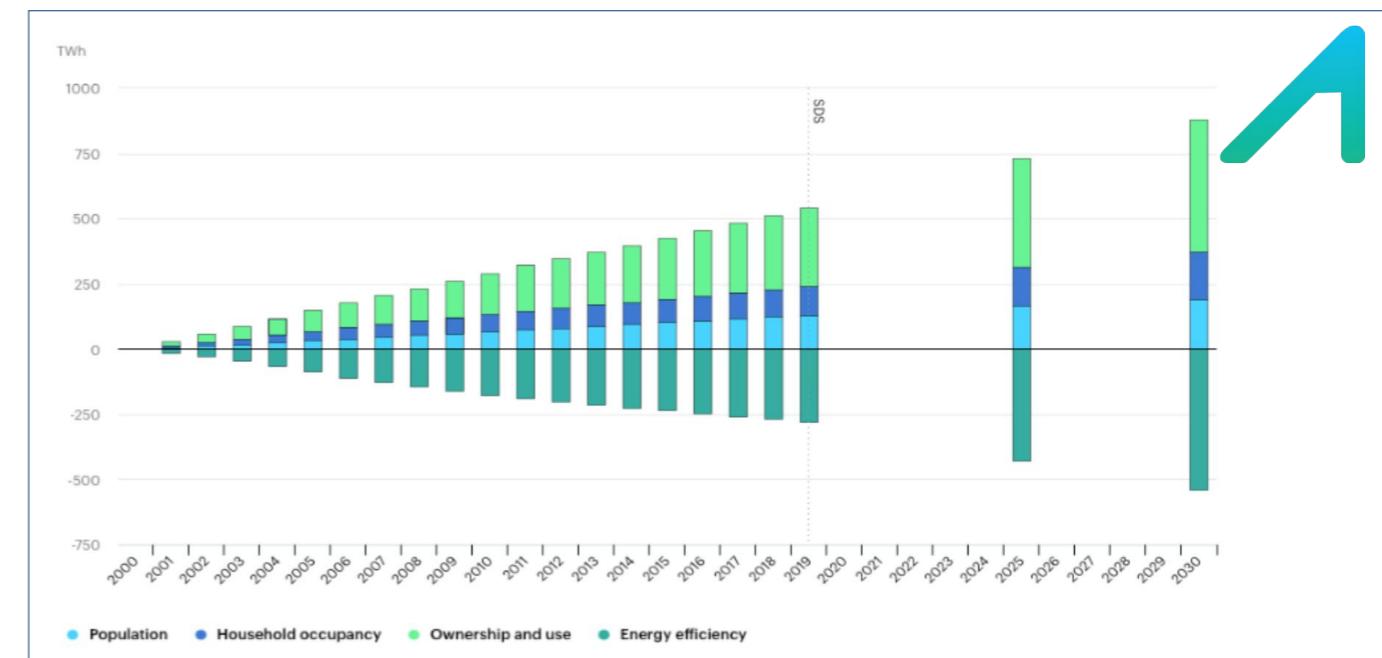
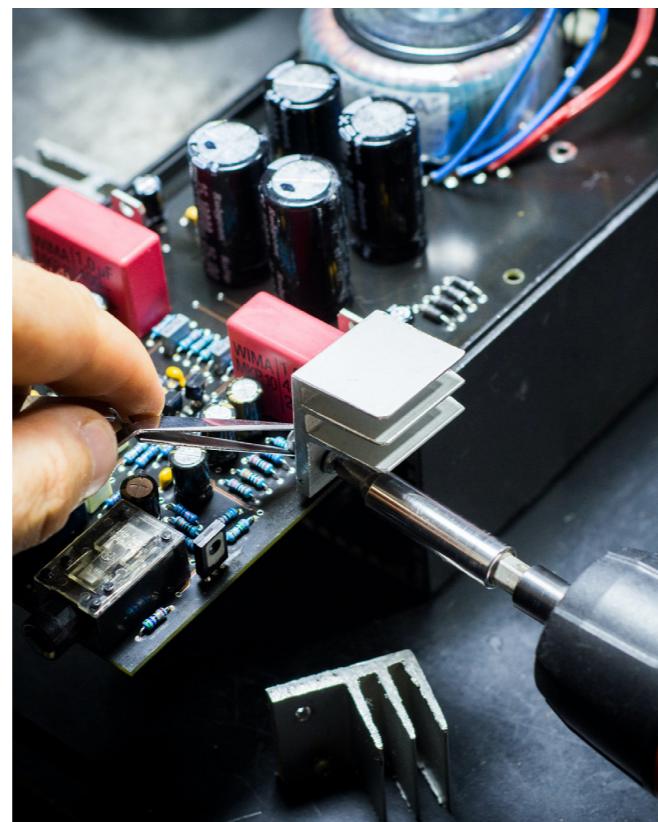
Residential buildings are responsible for 1% of the overall CO2 emissions in the world.

"We have to offer better products with benefits," said Paulo, explaining how when he'd visited the IFA technology trade show in Berlin, he'd seen products that were made with up to 65% of recycled plastics.

He also highlighted how the quality, the cost, the volume and supply of recycled plastics for the manufacturing of appliances has to improve.

Repair

Repair is also key, said Paolo – as long as it is done correctly. "The Right to Repair is there, but we need a network of repairers. When a product is repaired but it does not work well, the consumer will go after the brand, not the repairer – we have to make a better link between the repair network and the liability of the brand."



The EU is responsible for 8-9% of global CO2 emissions – residential buildings account for 10-15% of that.

He concluded by saying that innovation is the "fuel" that powers the industry, and that legislation should allow us to explore all the possibilities we need to tackle the situation we face.

Engineering

Abdulnaser Sayma kicked off the session by highlighting the role manufacturers can play in helping engineers to design and make appliances that are more sustainable, and he asked what research can be done to influence the design of appliances.

He also raised the subject of the use of appliances as part of a connected system – a network to minimise energy use.

Refurbished appliances

Paula Chin said she wasn't an expert in appliances – her specialist subject is packaging – but she recounted a recent story about her 16-year-old washing machine, which had broken down in August of this year.

The Net Zero Transition Pathway

Panel Discussion and Audience Q&A

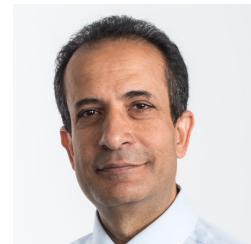
The Net Zero Transition Pathway panel session was chaired by Graham Russell, Chief Executive of the OPSS.

The theme of the discussion was centred on what actions are appliance manufacturers taking to reduce the 'cradle to grave' impact of appliance production, delivery, use, repair and recycling.

Are there key hurdles to cross (regulation, geopolitical, resources and technology) to get to net zero. And, if so, what are they?



GRAHAM RUSSELL
CEO, OPSS,
Session Chair



ABDULNASER SAYMA
Professor of Energy
Engineering, City,
University of London



TERESA ARBUCKLE
Managing Director,
Beko Plc, UK and
Ireland



PAULA CHIN
Senior Policy Adviser,
World Wildlife Fund



PAOLO FALCIONI
Director General,
APPLia Europe

She said that her initial response was to go straight to a retailer and buy a new appliance, but, instead, she decided to look at buying a refurbished machine online – she explained how she tried to get the old machine repaired but was told that it would be too expensive to have it fixed, so she might as well just buy a new one.

What message does this send out, asked Paula.

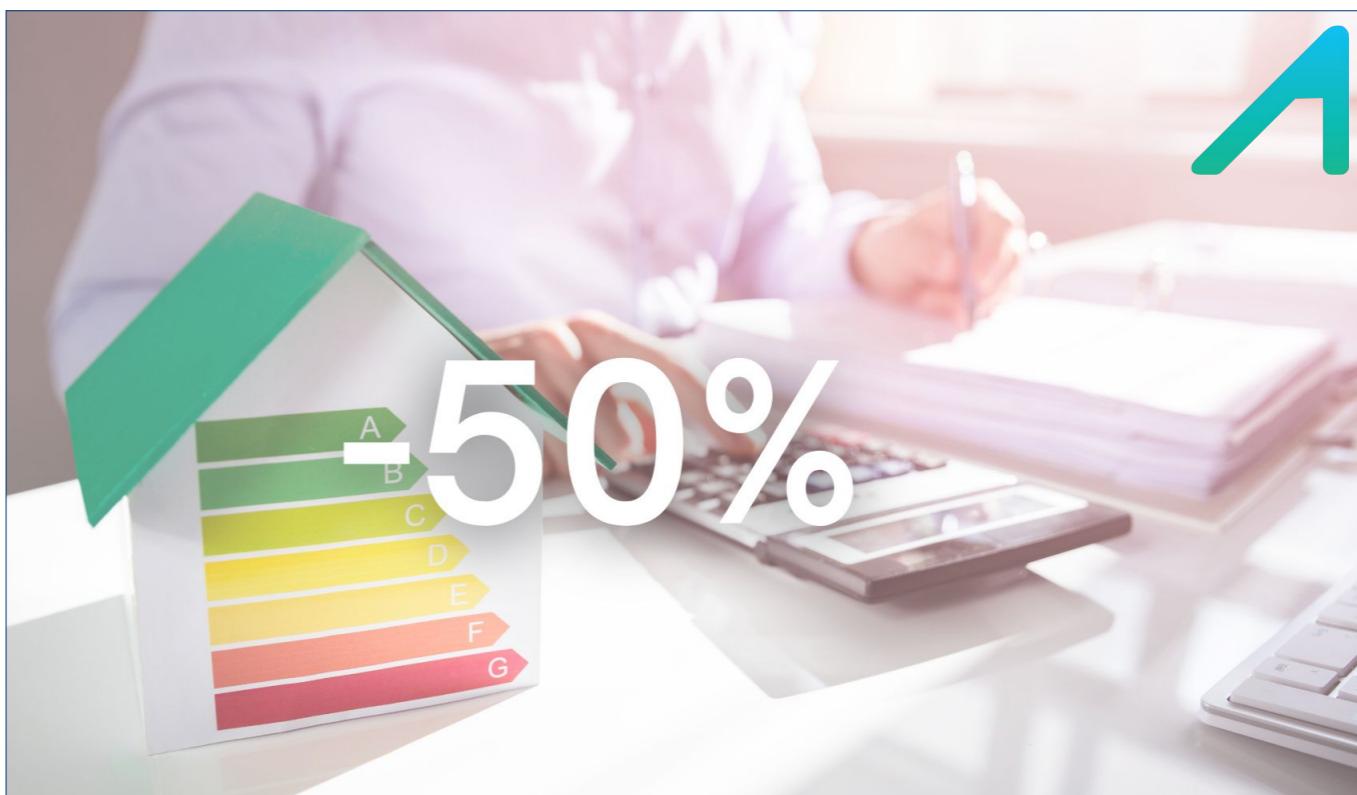
After trawling the internet for half a day, she bought a refurbished machine online from another retailer and paid £20 to have the old one taken away and recycled.

She said that there was an opportunity to raise awareness that refurbished appliances are available for consumers to buy and an opportunity to look at all aspects of the value chain – from raw materials to logistics, retail and consumer education.

"Ultimately, we have to make sure the consumer has the best experience, regardless of what they buy – whether it's a new or refurbished appliance", said Paula.

Graham said we want people to renew their appliances, but also make refurbished machines more available.

He asked how we can change the dynamic around: "It's great to have new, obsolescence is built in, and things don't last forever."



Tipping point

Teresa said how there is a consumer mindset – not just in appliances, but across the board – about buying something new. However, she added that it would become more on-trend for people to hold on to products and get them repaired, so they last longer.

"No one is saying everyone should go out and buy one – that's the wrong approach – but it's hard."

'There is a tipping point – a product of a certain age is going to be a lot more expensive to run than one with a higher energy efficiency rating that came in last year'

Teresa Arbuckle, MD, Beko Plc UK and Ireland

She referred to when Beko took part in a radio show on energy saving and was asked by the presenter why manufacturers can't just publish details of how long their appliances will last.

"The problem is, that's really difficult – if someone is using their washing machine every day, three times a day, I can assure you that the product's not going to last as long as if you use it once a week," she said.

Abdulnaser commented that we need to assure consumers that it's better value for them to get a cheaper refurbished product, than use an old product, which is less energy efficient and could cost them more money to run.

He added that, at the end of day, although some consumers want to be environmentally friendly, most of them are driven by cost.

Legislation

Paolo said that when a product is sold, Ecodesign legislation sets the minimum efficiency level and this has to be respected when appliances are reconditioned.

He added that due to the current energy crisis, it is better for consumers to spend a bit more on a product in the first place because they will recoup that in a couple of years.

He said we have to give the consumer a choice, so they understand what is best for them when they're making a purchasing decision.

Questions from the Floor

Q1: Manufacturers spend a lot of time and money developing new products.

What is going on at an international level that might help the standardisation for the evaluation of appliances, so can we avoid the conflict of what's going on in the EU and the UK with energy labelling, and in the US, where we have Energy Star, which is a franchise?

What work is going on to help the consumer and the manufacturer to use one test methodology to evaluate a product?



A1: Paolo responded by saying the IEC (International Electrotechnical Commission) is looking at global standards in appliances, and that, for example, there are European or US variations that take into account the specific requirements of each market – he cited how the way Japanese consumers wash their clothes is different from those in the US.

"The standards are there – they are international, but the way in which policy makers are making them available to consumers through the Energy Label or Energy Star, or a different type of energy labelling in Japan, is beyond our control," he said.

Q2: On Right to Repair, which is critically important, what about compliance with the manufacturer's original product if someone else takes on ownership of it and makes changes to it?

What skillsets are required and what about the spare parts used? How can we make sure that's all aligned?

A2: Paolo said there was a European shortage of technicians, so to combat this problem, APPLiA has published an educational book on how to repair home appliances, which is available online.

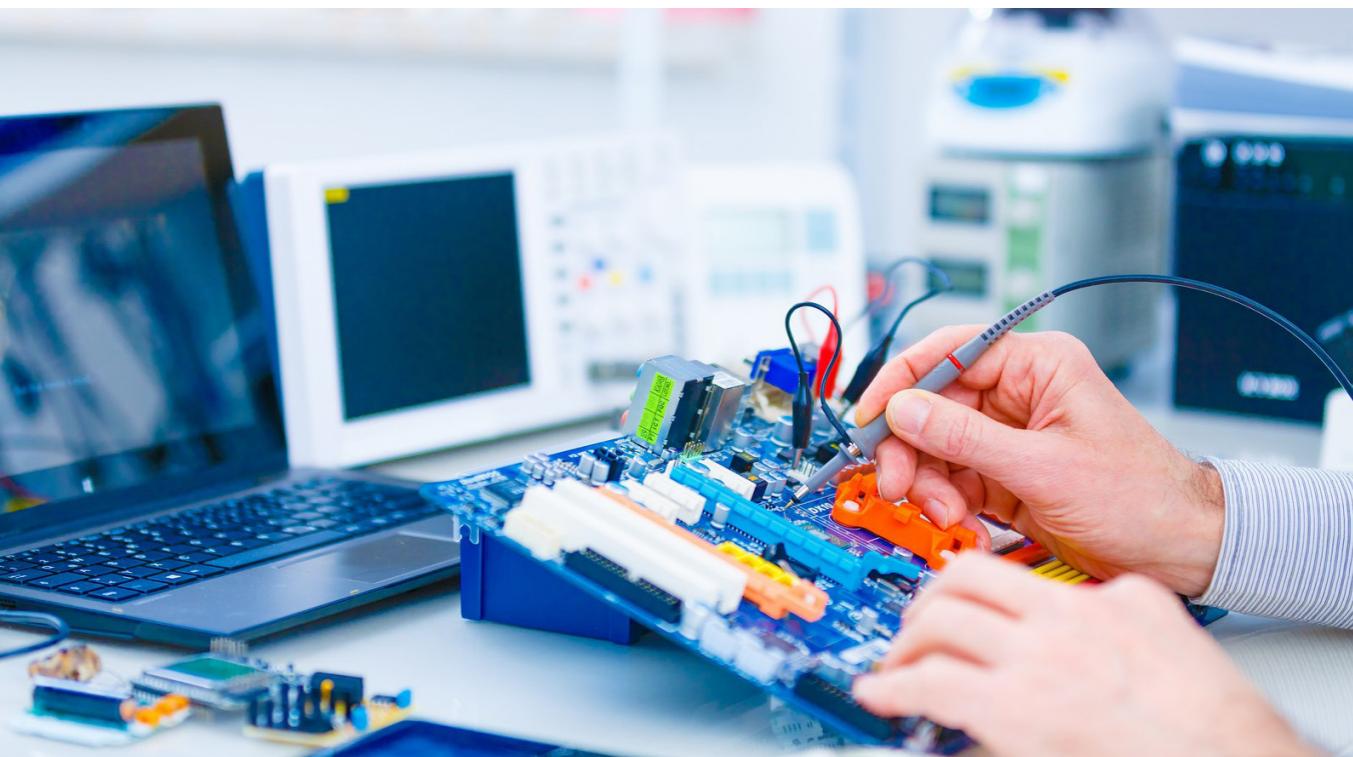
Teresa highlighted how in Ireland, Beko and other manufacturers are working with the WGA (White Goods Association) on an apprentice programme and that it is looking to do something similar in the UK, as the current level of technicians and engineers just isn't enough.

Paula said that engineering and technical repairs needed to be more closely aligned – so when a product is developed and designed, engineers need to take into account how it can be repaired by a technician in someone's home.

Science

City University's Professor Rajkumar Roy made a point, rather than ask a question.

He said: "As an industry, we need all sort of skills – technicians who can repair on-site or in workshops, and engineers who will design the system in the first place, so it can be repaired, but we should also focus on predictive maintenance."



'Collaboration is the way forward'

City University's Professor Rajkumar Roy

He added: "We can bring science into it, to try and understand how machines degrade over time and create advanced techniques to properly predict this – that can be done."

Q3: Does the panel think that there is a danger of monopolism if the IoT (Internet of Things) is held by any one company when it comes to technology and repairs?

A3: Teresa commented how Beko has a network of repair agents across the UK, as well as its own engineers.

IoT (Internet of Things)

On IoT, she said that Beko had carried out a connected kitchen trial that monitored energy usage and found that consumers focused more on the gadgets involved, like an iPad, rather than the appliances.

She added that if one company which isn't an appliance brand, for example, came up with the IoT, that wouldn't be welcomed – it needs to be a similar approach to the internet, so you can connect any appliance from any brand to the IoT.

Graham said he was looking forward to the day when his fridge knows what it needs to have in it, and his cooker will turn itself on and cook the menu.

"It's not too far away," said Teresa.



Q4: How many appliances are there in the UK and how long would it take to change them out?

A4: AMDEA CEO Paul Hide commented on this – he said: "We think there are more than 156 million large domestic appliances in UK homes."

Teresa added: "It would take a very long time, but it's similar to electric cars – that's also going to take a number of years."

She added that it wasn't about using legislation to push appliances on consumers.

Recycled plastics

Paula said the IoT shouldn't distract us from what's possible right now – repairability, accessibility and recycling.

SESSION TWO : Owner Behaviours and New Business Models



On waste and raw materials, she said: "There is growing competition for recycled plastics – if it's required for fridges, will that take away the recycled plastics that are needed for food packaging?"

"Waste is a failure of our linear system – how can we ensure that through Defra's waste prevention programme we have symbiosis and that we recognise what the best use of that recycled material is?"

Q5: The more we move into recycling and reuse, the harder it will be to retain safety messaging for consumers. How do we ensure that we're not taking this away from people?

A5: Teresa said: "We know that consumers don't read the manual, but we can't blame them for it – that's not fair. We are working on a project to make it as easy as possible for people to use technology – we are using QR codes for all our product manuals, so you can swipe them with your mobile phone and get the data."

If it's a second-hand product, she said, the consumer will then understand the changes that have been made to it.

Consumer confidence

Paula added that when she was doing her research into buying a replacement washing machine, there were some local shops that sold refurbished appliances, but that she didn't have a high level of confidence in them.

She said that to inspire confidence in consumers, "one man band" shops on the high street need to make people aware that they are fully certified



and up to date with the standards, regulations and certification required.

'We are working on making it as easy as possible for people to use technology – we are using QR codes for all our product manuals'

Teresa Arbuckle, MD, Beko Plc UK and Ireland

Conclusion

At the end of the session, Teresa said thanks to the audience and that she hoped to see some action following on from the conference.

She urged delegates not to wait until this time next year to talk about some of the issues involved, as the future of the planet depends on it.



Keynote Address

FIONA DEAR
Co-Director, The Re-Start Project



Addressing the topic of consumer behaviour in her keynote speech, Fiona Dear, Co-Director of The Restart Project, shared statistics that showed how e-waste (electronic) is the fastest growing waste stream.

In 2019, the UK was the second biggest producer of e-waste, behind Norway, she said.

Globally, there are over 50 million tons of e-waste produced a year, which is greater than the weight of the Great Wall of China.

Behaviour

Fiona highlighted how the majority of people support the idea of repairing products but said the consumer behaviour doesn't reflect that.

According to a European Parliament poll in 2022, 77% of EU citizens would rather repair their device than replace it.

A 2022 study by ReLondon found that 75% of Londoners believe we need to repair more to help tackle the climate emergency.

'In 2019, the UK was the second biggest producer of e-waste, behind Norway'

Fiona Dear, Co-Director, The Re-Start Project

According to a European Parliament poll in 2022, 77% of EU citizens would rather repair their device than replace it.

Research by Material Focus in 2021 highlighted that 43% of householders in the UK still put electrical and electronic waste in their general waste but some people are doing the right thing - 27% take it to their local recycling centre. 4% repair it and 10% sell it or give it away.

Fiona identified some of the biggest barriers to repairing products as cost and also how appliances are made.

'We've just got out of the habit of repairing - it's not such a part of our culture anymore'

Fiona Dear, Co-Director, The Re-Start Project

"We have the Right to Repair but parts aren't available for all products, and, increasingly, software is an emerging concern," she said.

Fiona also said that consumers are used to seeing adverts for new products and extended warranties, which means that repairing their old appliances isn't a priority.

"We've just got out of the habit of repairing - it's not such part of our culture anymore," she said.

Options

Fiona suggested that to encourage consumers to keep products in use for longer, we need to change what options are available to them and get the message across at the point of sale in retail, by providing more information, or by advertising refurbished products.

There needs to be better options for buying refurbished appliances or leasing products - Fiona said we need to shift the balance so that it almost



E-WASTE

Still the fastest growing waste stream in the world



becomes harder to buy a new appliance because there are so many other options.

She cited an example - retailer Selfridges has announced a new target to ensure that 45% of its transactions across stores and online come from circular products, practices and services by 2030.

"We're just at the start - it's going to become mainstream, but the question is, 'how soon?'" said Fiona, explaining how, in France, there is now a Repairability Index for certain products.

She called for the UK Government to level the playing field by expanding the Right to Repair and lowering costs, such as VAT.

Finally, Fiona talked about product design and wondered whether we could move to more modular designs in appliances, which make products safer and easier to repair, as well as more energy efficient.

"The scale of the challenge is huge, but it's so important," she said, adding that perhaps there should be a goal that by 2050 we shouldn't be taking anything from the earth to make new products - that would really shift how people are thinking.

Topics up for discussion in this section included:

- What role does the user/householder have to play in achieving the net-zero home. How do we encourage consumers to "Do it Right" in terms of purchase, use, repair/servicing and recycling?

The Countries Producing the Most E-Waste

The countries which produced the most e-waste per capita in 2019



Source: Global E-Waste Monitor 2020



statista

• What barriers are there to changing consumer behaviour? What incentives might increase the uptake of different behaviours and usage patterns?

• Appliance use is growing, both in mature markets (the UK) and globally. Maximising the most efficient use of power generation requires a smarter approach to energy consumption, but how do we align these demands to a continued reduction? Will the increasing uptake of connected appliances address/reduce areas of risk?

Martyn asked for some initial thoughts from the panel.

Simone said she had spent most of her career in the electrical appliance industry and has a good overall view of what goes on across the whole supply chain.

She mentioned collaboration and said there's already been lots of great work done, such as energy labelling, but there was a lot more to do: "We need to get consumers thinking about the entire journey."

One issue, she said, is wasted journeys - when a product is out for delivery, but the customer isn't at home when the vehicle turns up.

Simone also suggested that we need to look at the level of returns and the reasons why products are being sent back - this has an impact on the carbon footprint.



Cost of living crisis

Brands and retailers need to work together to get their messages across, said Simone.

Jane said that appliances are a very significant area for Citizens Advice and that consumers' needs at the moment couldn't be more important, due to the cost of living crisis.

'People's number one concern isn't energy efficiency - it's actually being able to pay for their energy'

Jane Parsons, consumer expert, Citizens Advice

Owner Behaviour and New Business Models Panel Discussion and Audience Q&A



■ **MARTYN ALLEN**
Technical Director,
Electrical Safety
First, Chair



■ **SOPHIA DAVID**
Head of Sustainable
Behaviours, BEIS



■ **FIONA DEAR**
Co-Director,
The Re-Start Project



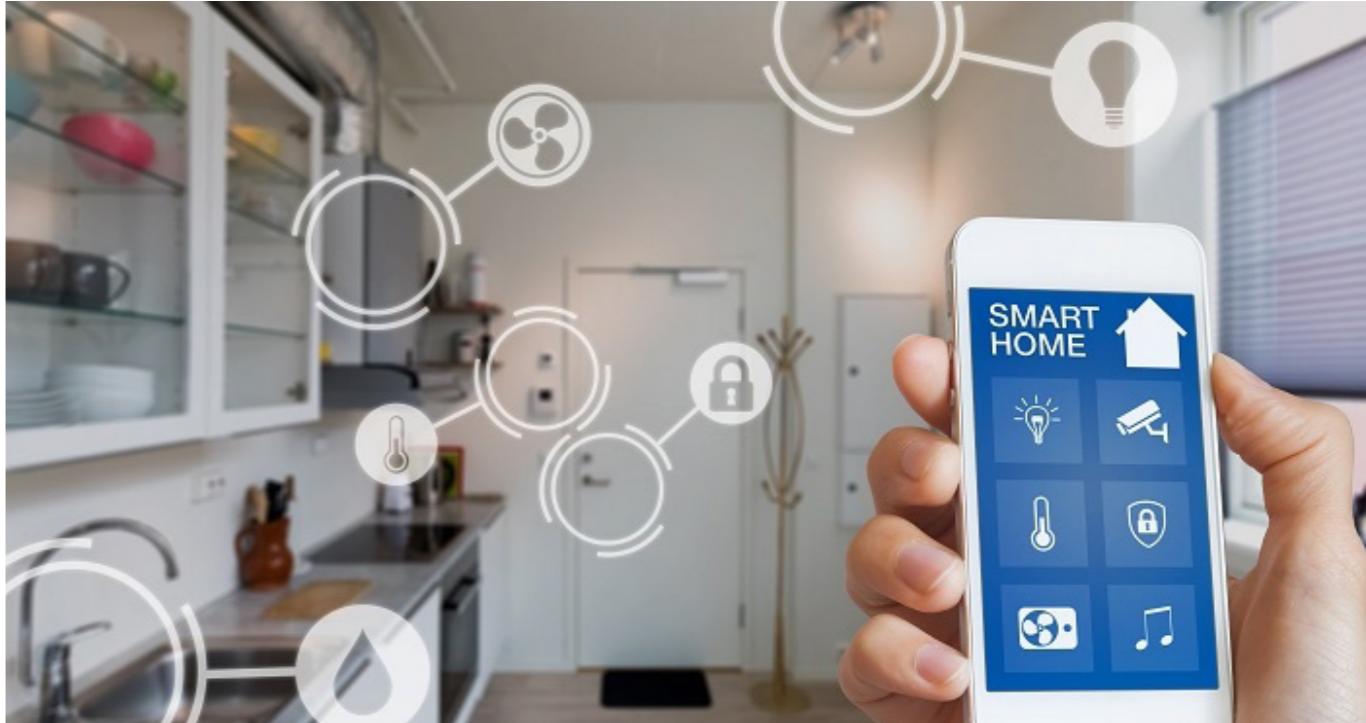
■ **SIMONE FISHER**
Executive Director,
Product Care Group



■ **JANE PARSONS**
Consumer Expert,
Citizens Advice

"Getting consumers involved is the only way that smart home technology is going to work and move on - you need their engagement. We all need to work together to achieve net zero, but the cost of using energy has rocketed - we need to discuss that."

She added: "We're getting record-breaking call volumes every day on energy - people are making some incredibly difficult choices. Their number one concern isn't energy efficiency - it's actually being



Selfridges has announced a new target to ensure that 45% of its transactions across stores and online come from circular products, practices and services by 2030.

able to pay for their energy and, clearly, it's going to get worse.

Citizens Advice offers a Cost of Living Briefing that's available to the public online.

Jane said that affordability barriers need to be broken down in technology, so that some people don't get left behind - people who are in rented accommodation can't always make choices about their appliances.

On consumer education, she said there needs to be a limit on how much weight you can put on it - it's a huge challenge and people are overloaded with information.

"We need to make sure we're not putting too much emphasis on consumers having to work it out for themselves - it has to be intuitive."

"We're very supportive of the Right to Repair but we must make sure there are no 'walled gardens' built by companies - everybody must have access."

She added that interoperability is key for the smart home - we must avoid proprietary systems.

"As more homes become smart, people will be inheriting technology from previous homeowners - we don't want people to be locked into certain networks," said Jane.

"People need to be able to switch their smart technology in the way that they can switch their energy suppliers."

Sophia commented on consumer behaviour and how the Government is trying to get more people to adopt new practices and make changes - 44% of emission reductions involves people making a change in their behaviour and lifestyle, such as travel and the products they buy for the home, she said.

Questions from the Floor

Q1: As you're all consumers and appliance owners in your own right, what changes have you already made in your own homes, in light of what we've been discussing?

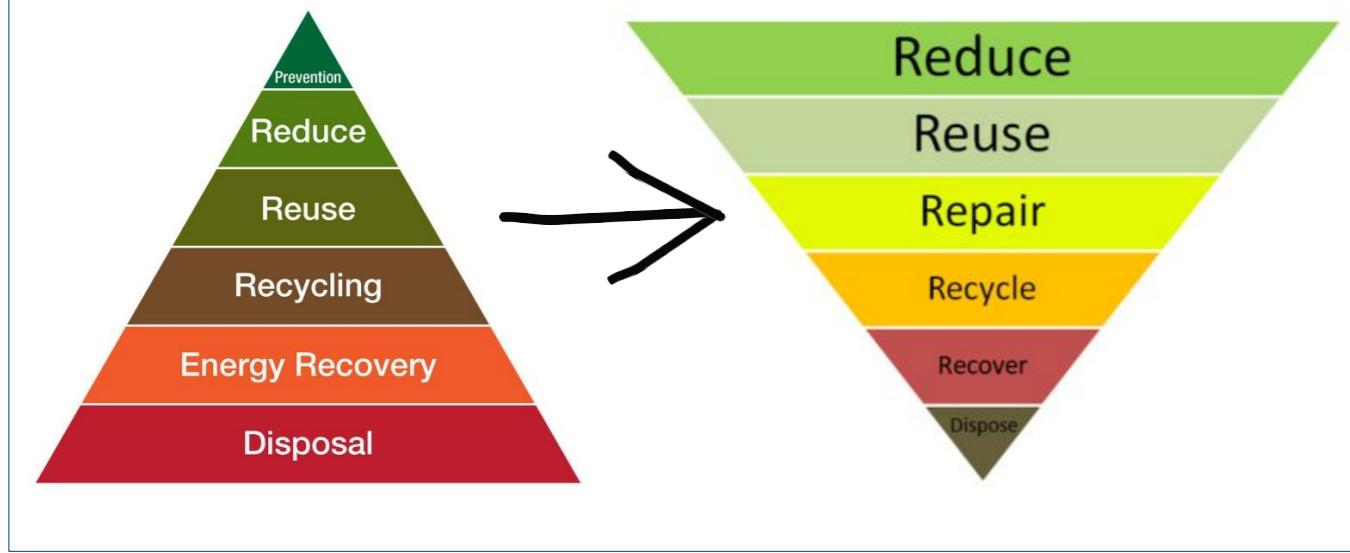
A1: Simone said: "We're all promising ourselves that we'll do more and be better. I was having a conversation at lunch about recycling and how the consistency around it differs from borough to borough, council to council."

"We heard earlier about some of the challenges around recycling small appliances - it's not surprising to know that people put them in the general waste."

"I don't think we'd have that situation if there was a consistency across the UK."

"For me, personally, I'm not a hoarder - the temptation is always 'Let's get rid of it'. I'm definitely thinking more about that and separating things out, but I don't think we make it easy for consumers. There's a lot of fly tipping going on where I live, and it seems to be getting worse."

What this means



Q2: One of the things that potentially drives people towards purchasing new products, rather than second-hand or refurbished ones, is the availability of good finance deals. Does the panel feel that there's a role for finance providers to play, as well as manufacturers, to push people towards refurbished products?

A2: Fiona replied: "That's a really good point - I hadn't thought about it."

Simone said that refurbished products are available but perhaps not as easy to find, as they are not often sold through mainstream retailers.

Q3: When it comes to behavioural insights, do some customers behave differently to others? Should we have different messages for different user types?

A3: Sophia said it was difficult to make generalisations, Simone added that in the consumer electricals space, marketing messages were generally geared towards men, and that some retailers have recognised that it's as often that

women are making the purchasing decisions so the messaging needs to be more balanced.

'We need to work on making it easier for people to recycle electricals. It's still too hard for too many people to do the right thing.'

Scott Butler, Executive Director, Material Focus

Scott added: "In terms of the messaging you would use, yes, you would tweak it, but I just want to emphasise that while we're interested in the myriad of complexities and nuances, the general public may only just want a very straightforward message about what's the right thing to do. Our emphasis is on making it as simple as possible."

He said that the debate around whether waste should be repaired or reused after it's been collected and disposed of in the right way, is something that can happen systematically in the industry.

"We also need to recognise the younger generation, who tend to live more transitory - they might go to university in one borough, then move to another one, and rent a flat, where recycling materials is notoriously difficult."

Scott also said that councils, local authorities, producers and retailers need to work on making it easier for people to recycle electricals: "It's still too hard for too many people to do the right thing."



Simone said we all have a responsibility to encourage consumers to maintain and look after their appliances.

Instruction booklets

"Lots of products are returned because they haven't been used correctly by consumers", she explained, and added that some manufacturers need to get better at making instruction booklets more visible and accessible, as consumers don't tend to read them.

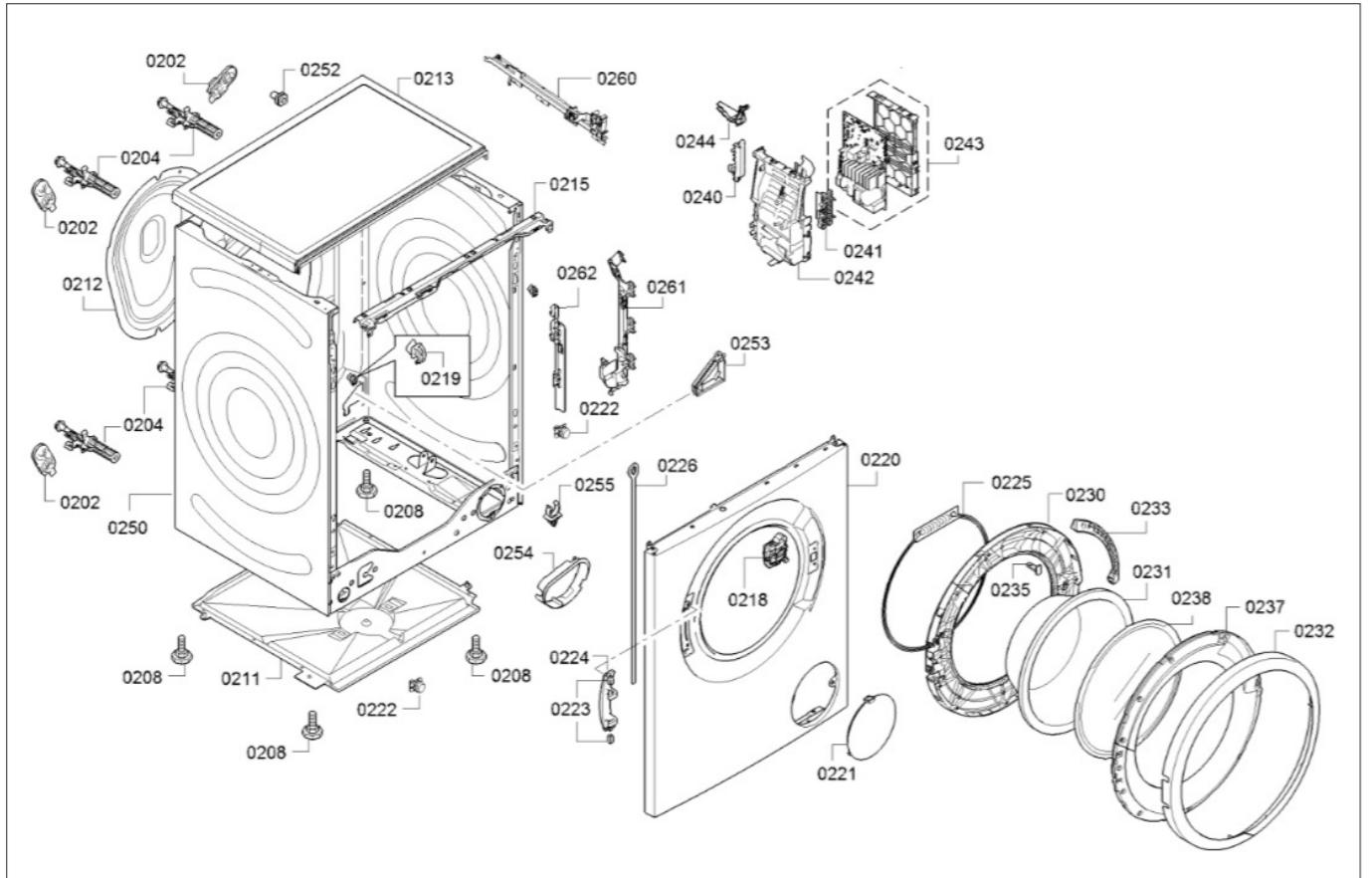
On self-repair, which the Re-Start Project gets involved with, Fiona said that schemes like repair cafes are very aware of safety issues - particularly when electricals are involved.

Q5: It seems that we haven't quite touched on the two most basic consumer behaviours - we buy what's available and what we can afford. There needs to be a real focus on getting the supply side up to the right standard.

A5: It's not just the products - we need to make sure the repair, the maintenance and the recycling services are available in bulk. What does the panel think about that?

Simone said we should look at areas other than repairs, including people who carry deliveries and staff who man consumer helplines: "We need them to be upskilled."

SESSION THREE : The Circular Economy Challenge



Simone added that it was important to get those staff thinking more about the options for keeping products in people's homes, rather than replacing them.

Spare parts

Martyn mentioned the availability of spare parts and manufacturers having to keep them for 10 years. He said: "We know there are many alternative parts available from online marketplaces that aren't of great quality, so when the repair work is done by people who aren't as competent as we'd like them to be, it's a perfect storm of safety risk."

Q6: If you're a smaller specialist electrical retailer, rather than a large one with lots of staff and resources, how can you change consumers' behaviour when they're buying goods?

A6: Fiona said that there could be a good opportunity for small retailers to partner with local repair shops and

make customers aware of that at the point of sale.

Retailers

Typically, said Simone, in her experience, smaller retailers are often better at dealing with customers than larger ones: "You get a good service and if something goes wrong, you pick up the phone..."

Martyn said that a lot of small independent retailers know they're customers' names because they've shopped there for years.



Keynote Address

MARK MIODOWNIK
Professor of Materials and Society,
UCL



Keynote speaker, Mark Miodownik, Professor of Materials and Society, UCL, tackled the challenge of a circular economy.

He said that collaboration was key to deal with the issues involved.

Setting the scene, Mark reflected on the concept of a linear economy, which is based on built-in obsolescence – citizens get a product and then buy another one when it goes wrong, or when the owner wants to replace it with a new one.



Recycling is great, but it's the "least good option" said Mark – repair and maintenance are the biggest wins.

He added that when people think about 2050 and the future for them and their children, they will want appliances that won't make the world a worse place.

"It really is absolutely urgent – we can't play around with letting the market make a decision on it. The market will turn to citizens and externalise the waste – that's what markets do. You need some regulations and a level playing field for people to get circular, and you need to emphasise repair and maintenance," he said.

"If we're going to do one collaborative thing today, we should agree on these things and get it into legislation – we've got no time to lose."

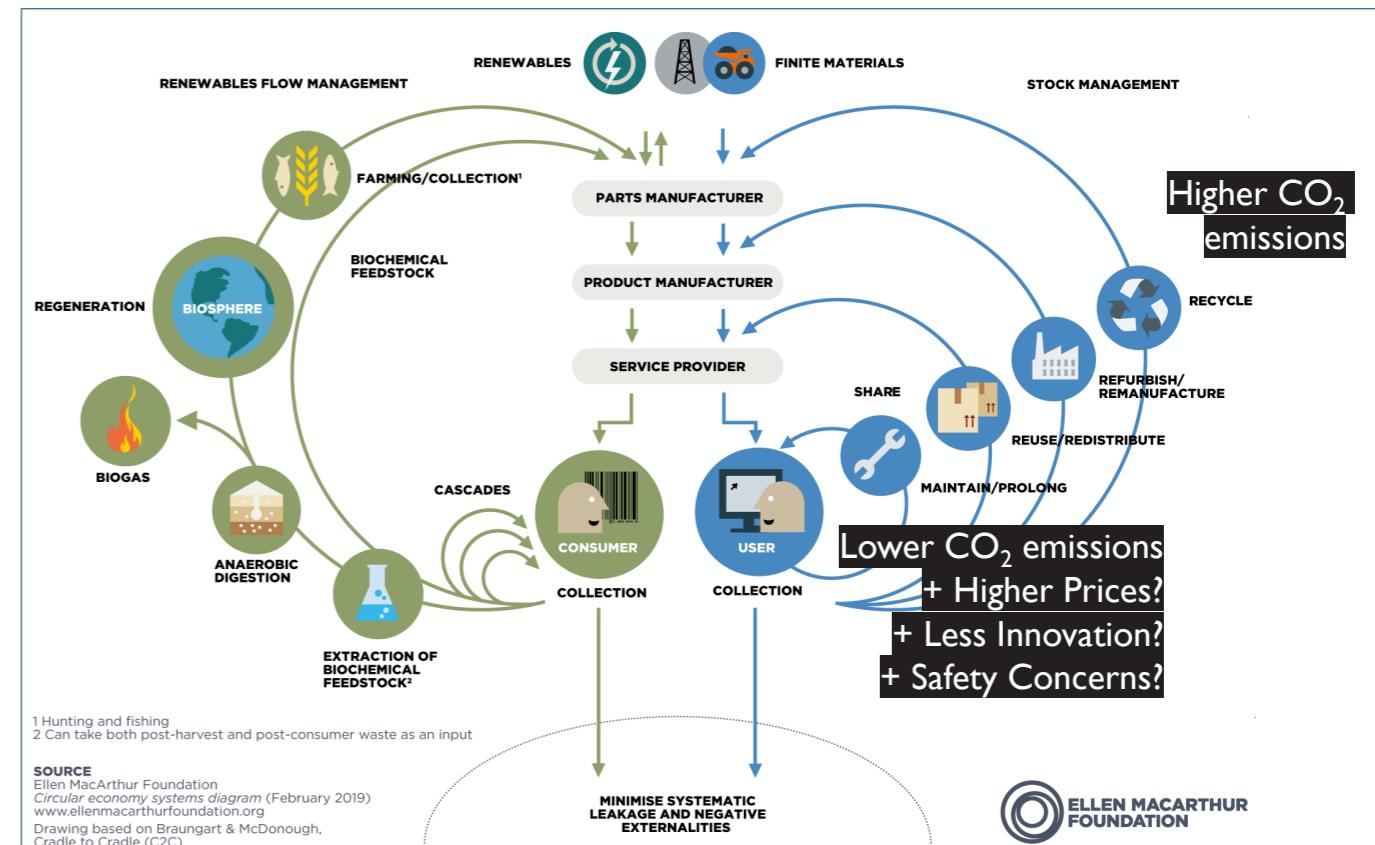
Commenting on the Right to Repair, Mark said that some manufacturers are concerned that it will lead to less innovation – he cited the example of Apple initially being against the idea of a universal phone charger, but that these views are changing.



Safety

Safety is also a legitimate concern when it comes to the Right to Repair, said Mark.

Looking at repair options, he said that both the car and photocopying industries had successfully



adopted a 'service model', where you call someone out to fix a product that has gone wrong.

A lot of people in Government think this is the future – that all appliances will be based on a service model if we are to achieve our net-zero goals, said Mark.

He suggested that citizens need more information at the point of sale on the expected life of an appliance and its repairability.

Mark called for the industry to create a "digital passport" – so when citizens who are looking at buying a refurbished product have data on who repaired it and when, so they can make an informed decision.

Sustainability information is marketable he said, adding: "It can't be cheaper to buy new than repair."

He said, for example, that if a citizen who is living in a hard-water area buys a washing machine, the manufacturer should contact the owner and let them know how to look after their product properly, to reduce the risk of failure.

VAT Incentives

Mark also recommended reducing the 20% VAT cost of repairing products, and said, that ultimately, we want the products with the lowest carbon emissions to be the cheapest.

We need a community where people can walk out



of out their house and go and talk to someone who can sort out a broken product for them, rather than having to do it themselves by watching a YouTube video, said Mark.

"That's the kind of society I want for my kids – it's got more circularity, more support for the vulnerable, more jobs, lower CO2 emissions and new, profitable business models."

Subjects on the agenda for this session included:

- Extended life, multiple life, Right to Repair and the supply chain.

- How do we address the competing demands of consumer desires to purchase new appliances versus the increasing call to encourage extended life through increased servicing and repair?

Wendy introduced the panel and asked them to share their thoughts on Mark's keynote speech.

Eva said that we all know what the problems are, and that there is a huge industry opportunity around circularity.



Durable

Eva said products need to be designed to be durable and have software that can be easily updated.

There also opportunities with service-and-subscription-based business models, and traceability on refurbished product, she explained, adding that she was pleased by what Mark had presented.

"We know what we need to do, and we need to take action," she said, adding: "We need to think about what business models will be around for our kids."

James said that his "takeaway" from Mark's speech was that there wasn't just one solution, but that we need to recognise what the most appropriate adjustments are for different products and different sectors: "We need to look at the whole economy and the way we consume and produce."

'If, in five years, we're still being told it's cheaper to buy a new product [than get it repaired], something has gone wrong'

James Butterworth, Senior Policy Officer, Defra

He added that we need to work out where the opportunities are for products to be designed so they can be repaired at home, rather than taken away, or for greater availability of spare parts that enable professional repairers to do more.

John said his reflections were around two main

The Circular Economy Challenge

Panel Discussion and Audience Q&A



■ **WENDY MIDDLETON**
Deputy Director,
BEIS, Chair



■ **JOHN ERYKOYUNCU**
Head of the
Centre for Digital
Engineering,
Cranfield University



■ **EVA BERMELL**
Supply Chain
Manager,
Fisher & Paykel



■ **JAMES BUTTERWORTH**
Senior Policy Officer,
Defra



■ **MARK MIODOWNIK**
Professor of
Materials and
Society, UCL

areas – consumer awareness and future technology.

"How many of us really think about the lifecycle cost of having an appliance and how do we compare different appliances? This type of information isn't available?"

He added: "If we have to pay more upfront, I think that will maybe change our attitude."

A product's carbon footprint is a necessity, he said: "We need to move towards making that information available."



Digital

Looking at 2050, lots of new digital technologies will be emerging and we'll be able to predict the performances of appliances much better, reducing the risks for service providers.

"There will be much more sharing of information, which will create lots of new business models."

Wendy explained how Mark had set out some of the potential barriers to creating a circular economy – cost, innovation and safety – and how we tackle them.

She highlighted his idea of a "digital passport" and asked the panel for their views on how manufacturers engage with consumers.

Eva said: "There is a huge revenue opportunity for manufacturers to have a subscription model – we need to explore those options a lot more."

John commented that, as an academic, he had found the idea of a digital passport eye-opening and mentioned that there needs to be a closer relationship between the consumer and the manufacturer when it comes to product ownership.

James said that the idea of a digital product passport has come up a lot in discussions and that the EU is looking at proposals and applications, but the challenge for policy makers is to how to make the concept operational and with the right information available.

Questions from the Floor

Q1: Do you think there's a change required in how we educate people on the issues involved?

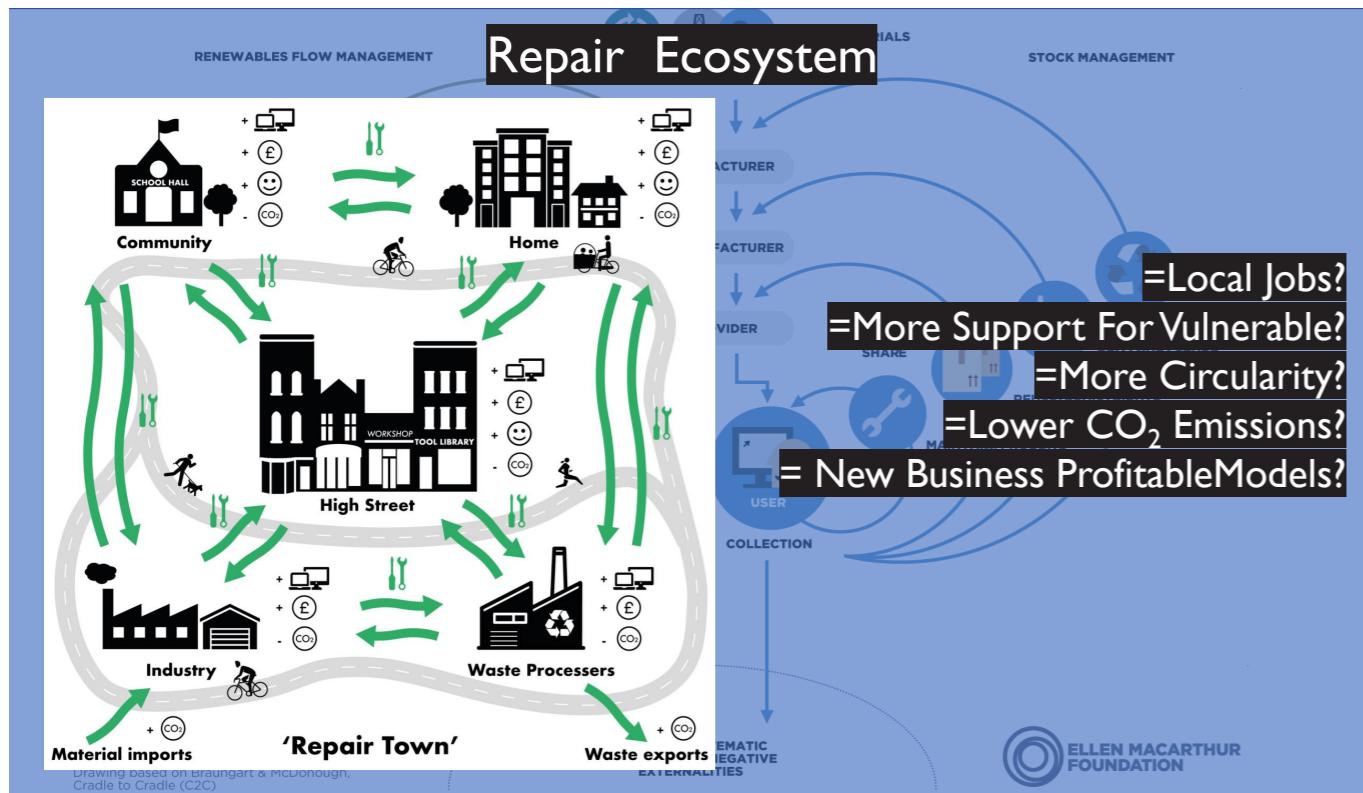
A1: John said: "Corporate social responsibility is key: We need to raise consumer awareness in terms of what companies are doing – that will be a driver. If people are aware, their behaviour will change, eventually."

"We have to promote that we, as consumers, value information."

Mark replied: "I really think we should stop using the word 'consumers' – words matter. We should change it to 'citizens', 'recyclers' or 'maintainers', or 'community'."

Q2: One of the ways we could address some of these issues is standardisation – reducing the number of models and parts that we create. That has a strong contradiction with our lifestyle – we want more personalised products. How do we handle personalisation versus standardisation?

A2: Mark said: "We should be drawing a circle around the community, rather than personalisation –



a bespoke solution is for the community. That's how to get community action and democracy at its best – people will drive that situation."

Eva said personalisation and standardisation can co-exist, thanks to modular designs.

Q3: With the cost comparisons of a new appliance versus a repair – consumers are less likely to take the repair option – is durability a better option?

A3: Mark said: "It's people's risk appetite. If they go to a repair person, they spend a certain amount of money, and the life of their product is only extended by a year, is that cost-effective?"

He added that it was hard for people to make a decision without data – they need to know the expected lifetime of a product.

If it's expected to last 10 years, but it goes wrong after eight years, the person will make a more informed decision – no one typically knows how long a product will last, said Mark.

Eva said the IoT will be able to provide useful information on how consumers use their appliances and what kind of products and issues they're having.

John said that in terms of repair, the skills side is key: "Can people actually do the repair, and, if they can't, how do we increase the skill level and provide guidance?"

Supply chain

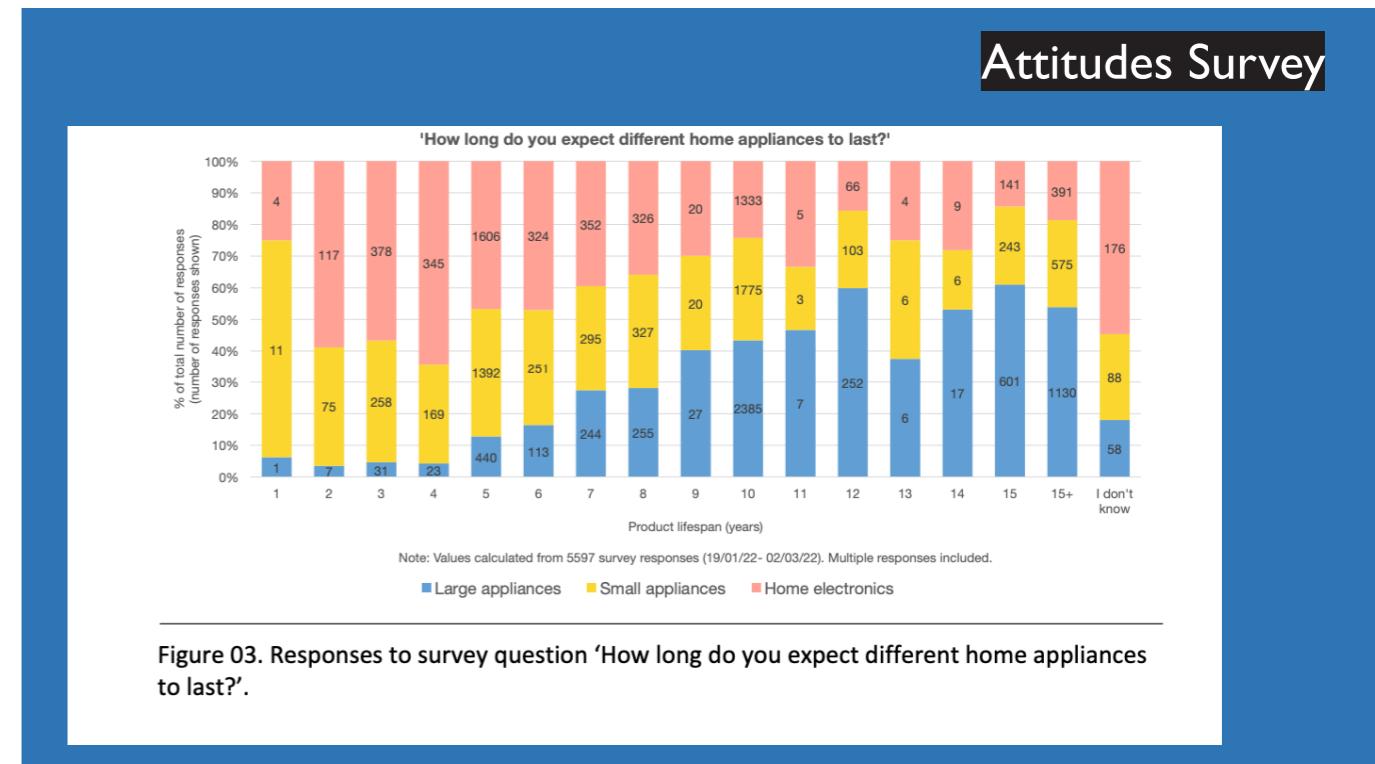
"We can solve the challenge we face together – not just the people in this room, but the people that we represent and who we connect with in our wider network," he said. Wendy asked how the supply chain would need to change to meet the different habits and demands of consumers.

Eva commented that it would be better for the environment if people could buy something made locally rather than have it shipped in a container from China – there needs to be more options available.

John said the challenges for the supply chain could become more difficult, as there will be a lot more users to deal with directly.

He added: "Moving forward, how do we collect and manage information from the different stakeholders across the whole supply network? Once we've cracked that, the opportunity is huge – we'll reduce costs, the carbon footprint and dissatisfied customers."

Q4: Businesses will change when they're required to. If you want manufacturers to change the culture and make parts last longer – and if the Government legislated for five-year guarantees – that would force the supply chain to change, which would then lead into a non-disposable cycle. Is it down to the Government to put some legislation in place to extend the guarantee periods on appliances?



A4: Mark said manufacturers want a level playing field in order to make money. He commented that the Government and brands could both help to provide more information on the expected lifetime of products to help consumers at the point of sale.

Q5: I totally get that we need to repair stuff, but a large demographic of people who are on the breadline will always have disposable white goods and, unfortunately, we have a younger demographic who haven't got the means or ability to think about buying more expensive and durable products, when cheaper ones are available. How do we combat that?

A5: Mark responded by saying that's why the idea of a community really matters – we need to see reusable, affordable products and repair centres on the high street.

John talked about the idea of a shared economy – people in a community using appliances together, similar to car sharing.

Q6: In the OPSS strategy document, it refers to "consumers" in some places and "citizens" in others. There is an issue with trying to get it right – the world has moved on and we almost need a new word for 'consumer'.

A6: We've got to get both education and the products right – we need the products to lead, because people will buy them if they're there. How do we balance all these things?



Mark said the next decade is critical and that the people in this room are crucial to achieving net zero, but that small steps aren't going to work: "We can do it, but we need to do something radical and come up with it together."

John said "less is good" – we need to reduce the number of things we want or buy, and that we need to collaborate and engage as a community more.

Concluding Remarks

Graham Russell, Chief Executive, OPSS

The final word went to Graham Russell, chief executive of OPSS, who, in his summing up, said collaboration is key, but there are also conflicts – or 'creative tensions' – to consider – the answers aren't just a small step away.

'Is there a danger that we're creating more complicated products that are harder to reuse, recycle and repair?'

Graham Russell, CEO, OPSS



Key takeaways and actions for follow up:

- Collaboration is key – we need to work together across all aspects of the sector and the supply chain
- We need to educate consumers on the issues involved, but we mustn't overburden them with too much information and responsibility – we need to help them to make informed decisions
- Consumers need more information on the expected lifetime of products
- Sustainable and energy-efficient products are key, but so are durable, repairable and refurbished appliances – they need to be more accessible and affordable to the general public
- There needs to be more affordability and availability of recycled plastics
- We need to make recycling electricals easier for people to do
- We must reduce the amount of food waste
- We need to explore more green power sources
- We should ideally not have a situation where it's cheaper to buy a new product than to get the old one repaired.
- Legislation has a big role to play
- We need to take a community-based approach, sharing ideas and supporting each other in our local area
- New business models must be explored – we need to look more closely at how consumers buy and use their appliances
- There is an opportunity for a "digital product passport", so consumers have data on when and how an appliance was repaired or refurbished?
- Corporate social responsibility is key
- We must act now – the future of the planet depends on it

Next Steps

AMDEA, OPSS, CUL and our supporting partners are busy working on a programme of discussions, events and future actions to ensure that all interested stakeholders can have a say in how we shape a future that delivers the net zero home by 2050.

Opportunities to participate in future events will be shared with you, we welcome your engagement.

And finally, we are already starting the planning process for our 2023 conference. We'll let you know more in the new year.

Participating Organisations

A365	IStructE
AEA	Jayel Projects
Agricultural Engineers Association	KCL
AMDEA	Kenwood
APPLiA	Lewis Mathys Emmerson
Arçelik	London Fire Brigade
B&Q	LSEG
BEIS	Material Focus
Beko	Microwave Technologies Association
Bosch Siemens Home Appliances	Miele
British Standards Institute	National Consumer Federation
C2Compliance	NCF
Circular Economy Hub, University of Exeter	Norcros
Citizens Advice	Product Care Group
City, University of London	REPIC
Cooley	Samsung
CTSI	Sharp manufacturing
Currys	Siemens DISW
Defra	Smeg UK
Domestic & General	Strix
EEESafe & LocalitEEE	techUK
Electrical Safety First	The Re-Start Project
Electrolux	Towards Vision
EUH Consultancy	UK Office for Product Safety and Standards
Euromonitor International	UKAS
Fisher and Paykel	United Kingdom Accreditation Service
Haier Hoover Candy	University College London
Hansheng	Vax
Hertfordshire Trading Standards	Weightmans
ICF	Which?
Infostash	World Wildlife Fund
Intelligent Appliances	
Ipcress Media	