

#AI4Consumers
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Approved by Tomorrow:
How consumer centered AI can
power the green transition



euroconsumers



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The need to transition quickly to a more sustainable way of life is vital. Climate change, biodiversity loss and air pollution are driving more and more consumers to take action and make changes¹ and are demanding a serious response from companies and governments². Most of all, they want the recovery from Covid-19 to be a sustainable one.

Fast and responsible action is needed to deliver on the ambitious targets set out in the Sustainable Development Goals³, Paris Climate Agreement⁴ and the EU's Green Deal⁵. To regenerate our planet's life supporting systems and sustain equitable, healthy growth, we need a green transition to clean energy, maximum efficiency, zero waste and new ways of producing and consuming. For this to be successful, consumers must be on board and fully empowered to drive change by easily switching to sustainable choices and making their expectations clear to companies.

Digitalisation driven by data, AI and the IoT can provide tools to help make this clean, green and just transition. Consumers recognise this potential - in a recent survey carried out by Euroconsumers of consumers in Belgium, Italy, Spain and Portugal just over 42% felt AI would help to make the world more sustainable⁶.

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1. Personal action on climate change has increased in every country. 60% of respondents say they have personally taken action to fight climate change in the past six months – an increase of 11 points since 2017. Eurobarometer report 490 Climate Change, April 2019 https://ec.europa.eu/clima/sites/clima/files/support/docs/report_2019_en.pdf
 2. 73% of global consumers say they would definitely change their consumption habits to reduce their environmental impact, Nielsen, 2018 <https://www.nielsen.com/us/en/insights/report/2018/unpacking-the-sustainability-landscape/>
 3. 77% of UK grocery shoppers have, in the past 12 months, switched, avoided or boycotted buying certain products, or would consider doing so in the future, based on brands' environmental policies. <https://www.talkingretail.com/news/industry-news/consumers-boycotting-brands-environmental-policies-kantar-reveals-04-12-2019/>
 4. <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
 5. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
 6. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en 7.250 consumers from Belgium, Italy, Portugal and Spain were surveyed during November-December 2019 to find out consumers' feelings about AI and its potential uses, benefits or detriments.

The size of the challenge

Consumers are ready to make the transition to a cleaner, greener economy and think AI has potential to help. It is time to speed up and scale up the opportunities for AI to meet some of the challenges inherent in the sustainability transition such as:

Reaching climate neutrality	<p>Greenhouse Gases (GHGs) cause warming and climate change, they are released by burning of fossil fuel for energy and in production, farming, industrial processes, transport and consumer product use.</p>	<ul style="list-style-type: none"> • Cut GHG emissions • Decarbonise energy system • Transition to renewable energy • Energy efficiency • Electrification of transport • Ultra-efficient cities, transport and buildings • Smart infrastructure
Moving to a circular economy	<p>Waste generates about 5% of global emissions⁷. A circular economy designs waste out of the system entirely, maximizing the value of raw materials while minimizing environmental harm.</p>	<ul style="list-style-type: none"> • Sustainable consumption and production • Design out waste • Maximise value of raw materials • Design for repair and reuse • End planned obsolescence • Sharing assets and services
Regenerating biodiversity and ecosystems	<p>Food, fuel, climate regulation and the purification of air and water depends on healthy, biodiverse ecosystems. Loss of biodiversity means poor soil, deforestation and species loss.</p>	<ul style="list-style-type: none"> • Sustainable farming • Healthy food • Precision agriculture • Economic valuation of biodiversity • Carbon capture • Invest in restoration • Sustainable trade • Protect biodiversity rich areas
Cleaning up air and water pollution	<p>Water pollution damages aquatic ecosystems and home supplies. An estimated 7 million people die each year due to indoor and outdoor air pollution⁸.</p>	<ul style="list-style-type: none"> • Secure water supply • Water efficiency • Good sanitation • Drought planning • Air quality monitoring and warnings • Air filtering and capture • Clean fuels • Clean agriculture and manufacturing • Alternatives to damaging chemicals
Supporting essential services and livelihoods	<p>A just transition will deliver essential consumer commodities, social justice and human rights.</p>	<ul style="list-style-type: none"> • Safe, high-quality and long-lasting products • Affordable prices • Accessible services • Clear information and verifiable claims • End energy poverty • Strong consumer protection • Green finance

7. <https://www.worldbank.org/en/news/press-release/2018/09/20/global-waste-to-grow-by-70-percent-by-2050-unless-urgent-action-is-taken-world-bank-report>

8. https://www.who.int/health-topics/air-pollution#tab=tab_1

What is the potential for AI to power the consumer sustainability transition?

AI powering sustainability in key consumer sectors

AI manifests in diverse ways: it can sometimes be visible in physical things like robots or automated vehicles; it can sit behind new interfaces like voice or gesture recognition; or it might be powering data analysis and operations behind the scenes.



The success of AI in moving us towards sustainability will rely on the adoption of a wider technology infrastructure. In combination with increased IoT sophistication, the 5G rollout and complementary technologies like blockchain or enhanced battery storage it can start to address some serious sectoral sustainability challenges. AI is already being used to tackle air pollution through smart filters, adapting water usage in times of shortages, alerting to imminent climate events like floods or landslides, crunching masses of data to find the most energy and waste efficient manufacturing processes, or using smart grids to regulate energy consumption⁹.

9. See for example: http://www3.weforum.org/docs/Harnessing_Artificial_Intelligence_for_the_Earth_report_2018.pdf

There are also a growing number of ways in which AI is driving innovative and intelligent services and experiences direct to consumers. Here is a selection from different consumer sectors, showing the potential of AI driven tools and complementary technologies to power the sustainability transition:

Household energy and utilities:

Households consume 29% of global energy and contribute to 21% of global CO₂ emissions¹⁰. AI software is being incorporated into home IoT - most prominently in smart energy meters. AI equips them with capacity to learn more from the data they collect, incorporate it with external pricing data and identify the most efficient and cost-effective energy use for an individual home. This two-way communication between households and the grid also gives providers a deeper understanding of usage so it can make real time adjustments to manage peaks and improve efficiency. Through this demand/response side management, enabled by AI, smart contracts and blockchain, more intelligent allocation of energy is possible and customer service costs can be lowered.

New energy monitoring services are also using AI to monitor, analyse, and identify devices in the home that consume the greatest amount of energy, how much that energy costs, factor in solar production vs. power consumption, and then either recommend ways to save energy and money or switch to them automatically.

IoT sensor data analysed by AI can also greatly improve water and waste management systems make it easier to monitor water quality, manage usage and predict maintenance needs. At the household level, smart water meters can measure usage and offer tips on reduction, but when connected to the larger water system they can also map out community demand, detect leaks or contamination and help develop more efficient recycling of water back to households. If consumer risks to privacy and unclear pricing are dealt with then smart utility devices have potential to boost resource efficiency in homes.

Home appliances

AI can also be incorporated into individual appliances to spot issues that might cause problems, emissions or shorten lifespan. AI can run self-diagnostics to spot errors like a decrease in the cooling performance of a refrigerator, suggest a fix or automatically schedule a repair appointment. AI can also run regular maintenance to prolong product lifespan, and alert consumers about changes and how to remedy them - for example if a washing machine is using more water, tips can be sent on how to adjust settings to lower water use.

10. <https://sdgs.un.org/goals/goal7>

Food

The entire global food system is responsible for between 21 – 37 % of all GHG emissions, some of which is caused by food waste¹¹. Each year about a third of fresh food is thrown away by consumers who are unsure about the quality of their food¹². AI is enabling food retailers to apply dynamic pricing to discount prices of food in real time as they near their best before dates - this incentivises consumers to buy affordable, fresh food and reduces waste at the retailer and at home.

Grocery purchase data which builds up a picture of local and individual shopping habits and preferences can also be interrogated by machine learning to target notifications to low income consumers with less access to healthy food.

Smart labels on food, which link to key data on production and ingredients, can link to apps which provide consumers with key information on the environmental and social impact of the food.

Fashion and textiles

The fashion industry contributes to around 10% of global greenhouse gas emissions due to its long supply chains and energy intensive production.^{13 14} Blockchain is a helpful tool for consumer sectors with long supply networks like fashion as it provides an unchangeable and decentralised ledger, which can be used to record and then address environmental and social impacts down the line. When combined with the analytical capability of AI, it can make this information relevant to consumers and drive more sustainable choices to consumers.

AI also has a role in making newer peer-to-peer clothes rental or resale sites more appealing by using machine learning to recommend and suggest new options based on taste, location and budget. While such automated recommendation engines have long been in use in e-commerce and content curation, applying it to a service aimed at creating new circular consumption models will help meet sustainability goals more quickly.

Mobility

AI is critical to the roll out of autonomous and connected vehicles which make a huge contribution to reducing GHGs, air pollution and congestion. Individual's connected cars use AI to optimise fuel

11. Intergovernmental Panel on Climate Change (IPCC) Climate Change and Land, August 2019

https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf

12. U.N. Food and Agriculture Organization (FAO) <http://www.fao.org/save-food/resources/keyfindings/en/>

13. <https://unfccc.int/news/un-helps-fashion-industry-shift-to-low-carbon>

14. <https://www.unece.org/info/media/presscurrent-press-h/forestry-and-timber/2018/un-alliance-aims-to-put-fashion-on-path-to-sustainability/doc.html>

efficiency and when aggregated with other drivers' habits can create a rich picture of transport routes, timings and needs. Machine learning can also take data on electric vehicle charging to understand how to best match demand and supply.

At the moment, highly automated vehicles with driver takeover functions are emerging on our roads mostly for short haul urban journeys, this can help with shifting more people towards shared and on demand mobility services, and reduce the need for private vehicle ownership. Data from these journeys and other mobility patterns can eventually result in dynamic bus or public transport routing or autonomously scheduled ride shares. And, as part of the 'smart city', AI can enable anything from traffic lights to public lighting, monitoring of air quality and management of water consumption.



AI powering sustainability across the digital system:

Consumer facing digital technology is adept at processing data to personalising recommendations, ranking options, prompting behaviours and linking together people in networks. These AI-enabled activities prioritise what people see on their news feed, presents decisions on what to buy or watch, determines prices, places advertisements in real time. AI can also help to predict new patterns including travel, energy use or match together people on sharing platforms. If delivered on an opt-in basis with full transparency, there is powerful potential to ensure these algorithmically made decisions match consumer values and intentions to meet the green transition by embedding sustainability goals in their strategies, for example by:

- Virtual assistants offering up most sustainable option first
- Social media that promotes impartial information about climate change and demotes misinformation
- Incentivising low-carbon consumption in e-commerce platforms by informing consumers about the more sustainable option or even directing them towards that option
- Limiting or increasing cost of online advertising for high-emission products, and supporting clean, low carbon products with lower rates and high priority spaces.
- Creating user friendly carbon calculators that help consumers measure their impact and make positive changes¹⁵ or even starting to invest in personal AIs for everyone which can help them to meet their own environmental and social goals.
- Creating platforms that facilitate collective purchasing to help drive new markets for sustainable products and support mass switching to new clean, low carbon suppliers
- Supporting existing online consumer communities to work together (electric vehicle owners or home energy self-generators etc) to put pressure on supply chains and push for higher standards

Finally, the technology sector must do more to ensure its infrastructure does not contribute to climate change,¹⁶ by creating data centres run on clean energy and managed to maximum efficiency, and by designing low data, low energy use services for consumers and industry.¹⁷

15. 4 out of 10 people want to measure their footprint, <https://www.ericsson.com/en/press-releases/2018/12/ericsson-releases-its-10-hot-consumer-trends-for-2019>

16. <https://spectrum.ieee.org/computing/hardware/moores-law-might-be-slowing-down-but-not-energy-efficiency>

17. <https://www.itu.int/en/mediacentre/Pages/pr10-2020-global-ewaste-monitor.aspx>

Delivering trust by understanding consumers' perspective

None of the potential described above can become real unless we unlock the support, engagement and trust of consumers. With consumers on board, comfortable with sharing and linking up their data with others, happy to take up recommendations or hand over some choices to be automated, much can be achieved.

Unfortunately, in the case of AI we are starting from a place of relatively low trust, and so measures will need to be taken to quickly rebuild and maintain it. Euroconsumers' new survey gives some strong indications of where consumers' worries about AI are particularly high. Involving the consumer perspective, understanding what concerns them and what they'd like to achieve from the start can make sure that new AI services are trusted, valuable and meet sustainability goals.

Legislation and regulation have a crucial role in building trust. But we also want to challenge companies to recognise the critical part they have to play. This recognition of consumers' rights and need for trust should not be seen as a burden but as an entry point for inspiring new ways of reassuring trust, security and fairness and inspiring innovation from a different starting point. Below the main concerns are unpacked with suggestions for what companies can do to build back trust.¹⁸

Data and privacy protection

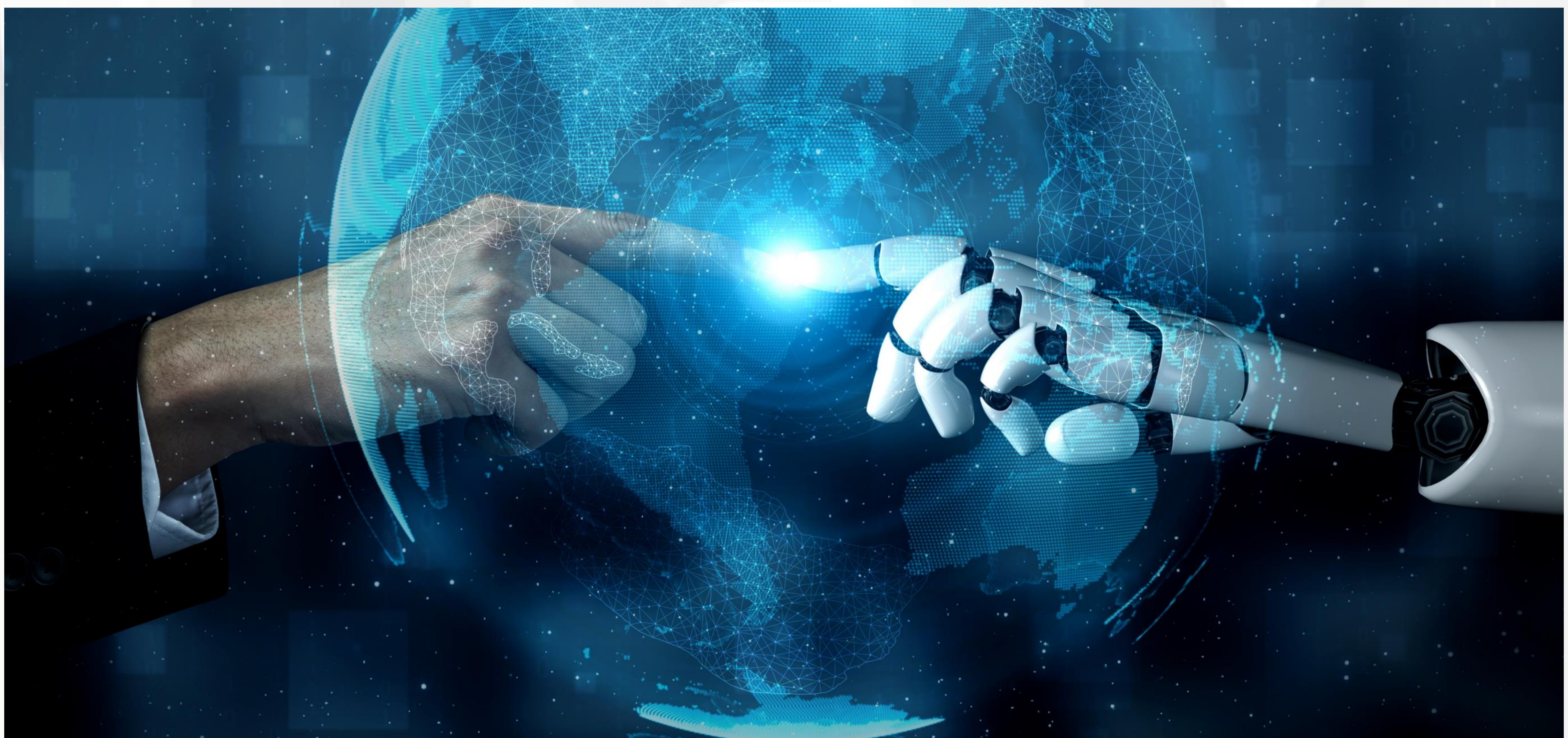
Data and privacy protection are key concerns for consumers with 60 % feeling AI will lead to more abuse of private/personal data. Yet AI needs more meaningful data to work - the better and more detailed the data, the larger its impact on sustainable behaviours becomes. As data use and sharing sensitive information about household behaviours, shopping habits and location is critical for making many of the services described above possible, addressing privacy and security worries is fundamental.

18. These recommendations focus primarily on what companies can do, further recommendations covering government and regulation can be found in BEUC'S Response to the European Commission's White Paper on Artificial Intelligence June 2020 <https://www.beuc.eu/publications/beucs-response-european-commissions-white-paper-artificial-intelligence/html>

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Companies can build trust back here by:

- *Demonstrating high levels of data security and protection, minimise the data they collect and demonstrate how it is being used to meet sustainability goals through AI*
- *Demonstrate new ways of sharing the value of data*
- *Making their data open and easily shareable so that companies can compete on fair terms to develop consumer-powered sustainability products, and authorities and planners can develop systemic sustainability solutions.*
- *Implement interoperability correctly to avoid lock-in and enable consumers to switch between different service providers easily*
- *Grant an exclusive right to the owners/users of sensor-equipped machines or devices to license the use of data collected to any party they wish*
- *Develop efficient and easy-to-handle tools and rules so that consumers and citizens can manage their data easily and securely*
- *Focus on delivering innovative and personalised services that better fit consumers' real needs and expectations, and by doing so enhance consumers' lives, uphold their fundamental rights and freedoms and those of society.*

Accountability

60 % of people agreed it was not clear who is accountable in cases where AI causes harm. Developing new and innovative services always carries a risk of unintended negative impacts, if consumers feel there is low accountability, they may not be keen to use them.

Companies can build trust back here by:

- *Being open and transparent about what happens if things go wrong and how consumers will be protected*
- *Making getting redress and getting things put right fast and simple, with access to a human contact to explain AI based decisions and outcomes*

- *Delivering empowering new models customer service which go beyond a ‘help desk’ function to be more of a consumer partnership to achieving goals*
- *Committing to advanced out-of-court dispute settlement mechanisms themselves based on AI technology, and guaranteeing semi-automatic compensation in the event of damage*

Work for consumers

Almost two thirds of people felt companies are already using AI to manipulate consumers’ decisions. To help services that make recommendations or automate decisions that benefit the environment are to succeed, there must be much more trust that these are done in people’s best interests to support their sustainability behaviours without manipulation.

Companies can build trust back here by:

- *Co-designing services with consumers to deliver AI that matches their needs and motivations to transform the planet*
- *Making significant, public commitments to sustainability central to their strategy and fully funded*
- *Demonstrate that they share motivations of consumers, and are about more than just grabbing attention and data*
- *Recruit and reward developers and innovators who create AI applications that can bring tangible benefits to end users, citizens and our society in general.*

Involve everyone

Emerging AI solutions could have enormous impacts on the ways we live, but solutions are being developed by a small group of people with a narrow perspective. Increasingly, there will need to be diversity in AI development and use to avoid discrimination and increases in inequality. The survey revealed around half of people (51%) have concerns that AI could lead to unfair discrimination against particular individuals or social categories, these concerns could lower the trust and engagement of particular communities who are already excluded from technological development and who often face poor consumer service and live in areas with lower environmental quality.

Companies can build trust back here by:

- *Driving out bias, discrimination and unfair differentiation from data analysis structures*

- *Demonstrating new services and products that can reduce discrimination and open up access*
- *Opening up data sets and outcomes of analysis tools for external inspection*
- *Co-creating solutions with consumers and consumer representatives, working on edge cases and underserved groups to understand specifics of their situation.*

Be open and transparent

82% of people surveyed felt they should have information about AI and its potential consequences, and the same amount thought they should know when they are dealing with an automated decision system. 77% also wanted the right to say 'no' to decisions being automated. This strongly suggests a lack of comfort and trust with automated decisions that greater transparency, redress and information could start to address.

Companies can build trust back here by:

- *Work with consumers to understand what actionable, useful information is and how to deliver it*
- *Being transparent about what data is used and how it is processed to make decisions*
- *Offering different options for decision making, including being able to decline an automated decision*
- *Be transparent about the business model and how company gets value from people's data*
- *Opening up risk assessments for public scrutiny*
- *Large global tech companies can recognise their wider role in the digital system and take more responsibility for the way in which the infrastructure such as advertising and information ranking can make transition to sustainability harder*

Conclusion

Companies developing consumer-facing AI services for the green transition have an excellent opportunity now to help people realise their sustainability goals and demonstrate they can deliver on trust at the same time. This task has become even more critical as we rebuild our economies following Covid-19, and rethink together how we can live in a more sustainable and healthy way. This rebuilding and rethinking will be best done through joining up forward-looking market players' capabilities with consumer organisations and consumers to share ideas and goals, and to find ways that the value of data can be better distributed to everyone. This will create a more balanced digital

ecosystem, that is better able to respond to the pressing challenges the world faces.

Those ready to show leadership here should make sure their organisation understands both the potential and risks of AI and have robust frameworks in place to make sure new technologies can deliver ambitious sustainability goals whilst respecting rights, guaranteeing privacy, consumer protection and strong governance.

This will create a basis on which consumers can start to feel more comfortable in sharing data, receiving advice and taking up the new services and ways of consuming needed to bring about the sustainability transition. With consumers at the centre of service design, more AI can work at its full potential and power an economy and society that will work for the future and be approved by tomorrow.

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