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# Digital solutions can reduce global emissions by up to 20%. Here's how

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Scaling certain digital technologies could help significantly reduce global emissions in sectors such as energy, materials and mobility.

Image: Unsplash/@riapuskas

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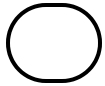


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- If brought to scale, digital technologies could reduce emissions by 20% by 2050 in the three highest-emitting sectors: energy, materials, and mobility.
- These industries can already reduce emissions by 4-10% by 2030 by accelerating the adoption of digital technologies.
- Data transparency, digital talent and partnership will be key ingredients to technology adoption at scale.

The impacts of climate change are growing more pressing by the day, but commitments for 2030 are projected to reduce emissions by only 7.5%. We need a **55% reduction by 2030** to keep the goals of the Paris Agreement on track. Filling this gap will require rewiring high-emitting sectors around efficiency, circularity, and sustainability. Digital technology can help accelerate this transformation.

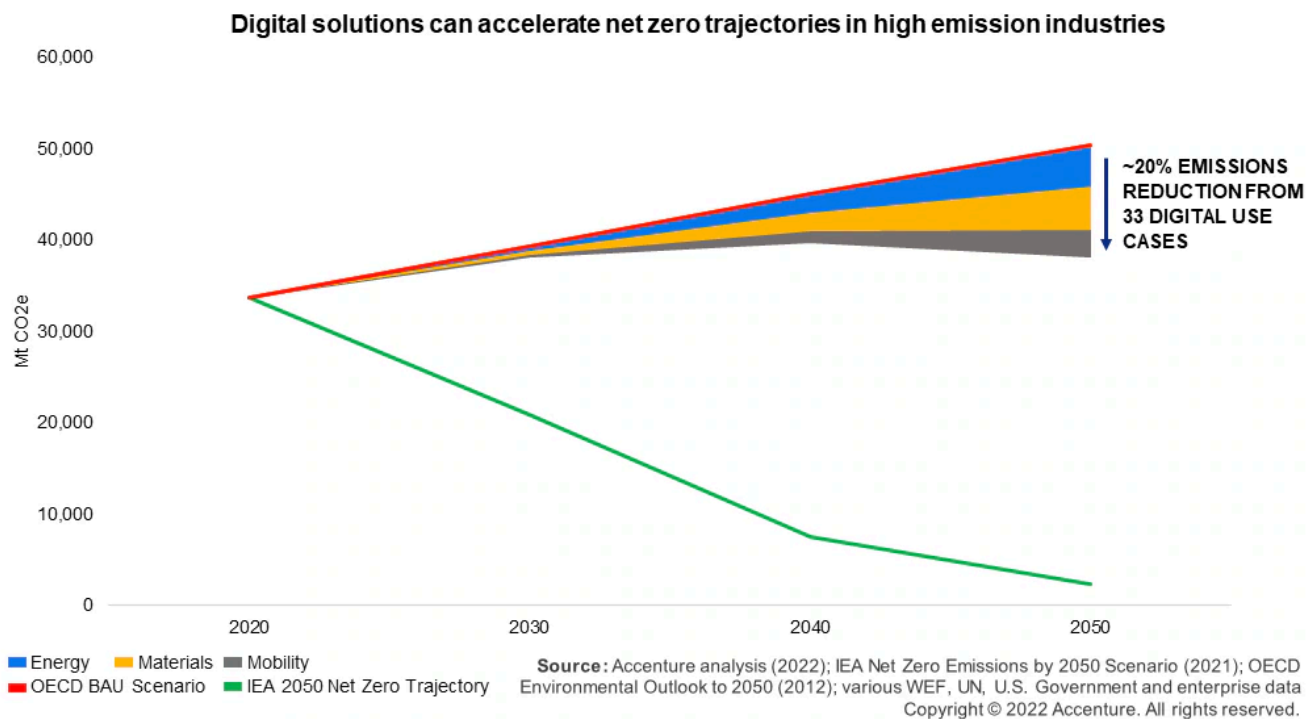
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- **This infographic shows CO2 emissions all around the world**
- **3 ways digital technology can be a sustainability game-changer**



**WFP warns world 'way off track' on pledges to cut emissions**

Analysis by Accenture, in collaboration with the World Economic Forum, shows that digital technologies, if scaled across industries, could deliver **up to 20%** of the 2050 reduction needed to hit the International Energy Agency **net-zero trajectories** in the energy, materials and mobility industries. These industries can already reduce emissions by 4-10% by quickly adopting digital technologies.

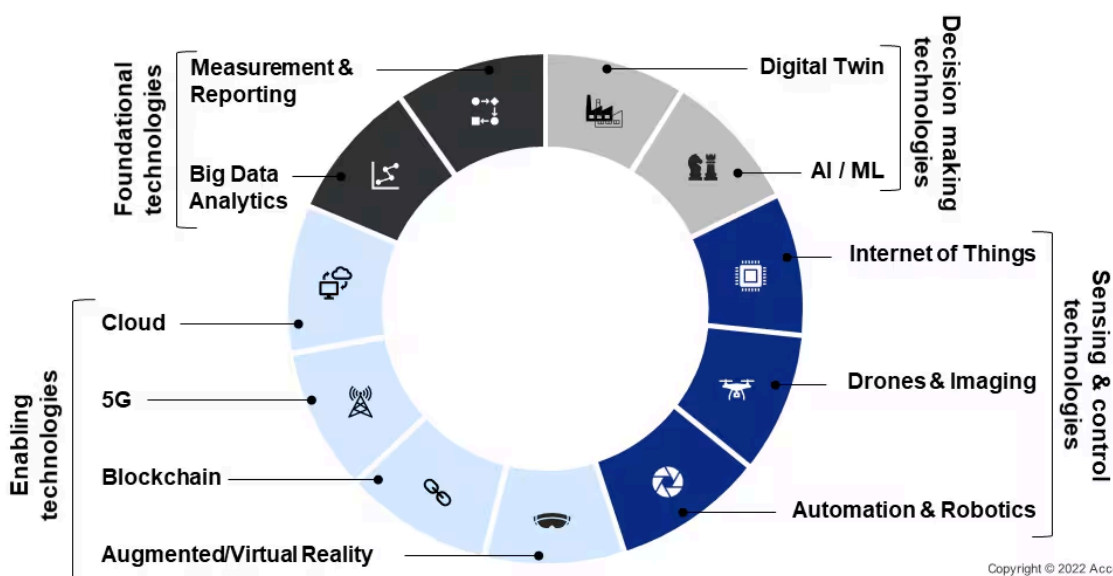


Digital technology could make a significant contribution when it comes to reaching net zero. Image: Accenture, IEA, OECD, WEF, UN, US government data

## Opportunities in energy, materials and mobility

Energy, materials, and mobility constitute the three highest-emitting sectors, contributing 34%, 21% and 19% of **total 2020 emissions** respectively. They also represent sectors where digital technologies hold the highest potential to reduce emissions. These include four clusters of high-impact digital technologies:

- enabling technologies that are core for any digital business today to realise benefits
- foundational technologies that exist within current operations.



The digital technologies that could drive decarbonisation in the energy, materials and mobility sectors. Image: Accenture

In the energy sector, our research shows digital use cases can deliver up to 8% of greenhouse gas (GHG) reductions by 2050. This would be achieved via enhancing efficiency in carbon-intensive processes and enhancing energy efficiency in buildings, as well as by deploying and managing renewable energy using artificial intelligence powered by cloud computing and highly networked facilities with 5G.










[IntenCity](#) is a good example of this – the Schneider Electric building is equipped with the internet of things (IoT) – enabled solutions, providing an end-to-end digital architecture that captures more than [60,000 data points](#) every 10 minutes. It is smart-grid ready and energy-autonomous, with 4,000 m2 of photovoltaic panels and two vertical wind turbines. IntenCity has its own building information modelling system, which is an exact reflection of the construction and energy model that is capable of reproducing the energy behaviour of the real building.

foundational technologies such as big data analytics and cloud/edge computing. In addition, use cases leveraging blockchain could enhance process efficiency and promote circularity.

In mobility, digital use cases could decrease up to 5% of GHG emissions by 2050, according to our research. This would mean leveraging sensing technologies like IoT, imaging and geo-location to gather real-time data to drive system decision-making. It would ultimately improve route optimisation and lower emissions in both rail and road transport.

For example, Mobility-as-a-Service (MaaS) platforms are increasingly becoming advanced mobility planning tools for consumers, encouraging a full range of lower-carbon options such as eBikes, scooters or transit. Uber has added [non-rideshare options](#) to its customer app and digital platform, which uses analytics to recommend transportation solutions for consumers. Other [studies](#) have found an estimated emission reduction of over 50% if MaaS could replace individual private car use.

There are priority, high-impact use cases that, if scaled, can deliver the most benefits in energy, materials and mobility sectors.

Energy		Improving refineries & pipelines through digital twin		Grid digital twin to improve power flow & quality		Connected building energy efficiency platforms
Materials		Mine energy efficiency using activity sensors		Circular metals & chemicals enabled by markers		Digital-enabled process electrification
Mobility		Sustainable aviation & shipping fuels		Traffic network & road digital twin		MaaS & smart charging platforms

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The 9 high-impact digital technology use cases that could benefit the energy, materials and mobility sectors  
Image: Accenture





The opportunity is clear: companies can deliver on their net-zero ambitions faster if they adopt digital use cases with a high potential to decarbonise industries. While many World Economic Forum partner companies are starting to deploy such [lighthouse examples](#), they can learn from each other and collaborate to rapidly transform their businesses, systems, workforces and partnerships at scale.

First, businesses must ensure their data is shared, autonomous, connected and enables transparency that supports a range of outcomes – from identifying and tracing source materials to optimising routes and enhancing efficiency. They must invest in new data architectures and integrate recognised frameworks into their internal reporting structures. This ensures that data is available, standardised, and shareable across value chains and with partners outside their traditional operating environment.

Second, businesses must prioritise digital inclusion and development of skills. They must ensure that their current and future workforce have access to new technologies and the skills required to scale digital technologies and transform business processes in high emission industries.

Third, businesses must foster collaboration among digital, sustainability and operations teams within their businesses, but also across value chains and industries. Partnerships between private companies, start-ups, technology providers, investors and public agencies will be critical to scaling investments, de-risking technologies and accelerating knowledge sharing.

It is important to ensure that the digital transformations that accelerate the clean energy transition are also inclusive and sustainable, so the benefits accrue to all. Moreover, we must mitigate the emission footprint of these digital technologies themselves, ensuring they have an overwhelmingly positive impact on our planet.

