Increasing digital workplace sustainability:

Data-driven strategy to accelerate progress together

Atos

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Foreword

A new landmark for workplace sustainability

Until now, if you were to search the internet for 'laptop failure rates', you'd find a study concluding that one third of laptops break after three years. That research dates back to 2009 and was based on only 30,000 devices. Since then, little investigation has been done into digital workplace sustainability at scale.

That was our starting point for this study. We wanted to leverage the vast quantities of data available to Atos and our partners to challenge convention and pinpoint new opportunities for enterprises and their IT service providers.

Our Sustainable Workplace team analyzed data drawn from 28.5 million devices used by medium to large organizations. They translated their findings into an evidence-based approach to measurably increase sustainability while achieving cost savings.

We can now see how the financial, environmental and social value of every device can be increased while still delighting users. Some findings surprised even our experts. For instance, by doing nothing but adjust the standard refresh cycle from three to four years, enterprises can gain a 25% reduction in related emissions without compromising device performance or user experience. Positive employee engagement is crucial, with 75% saying they would be happy to keep a device for longer if they understand the environmental benefits of doing so. This can be a differentiator especially for businesses seeking to attract and retain younger generations of employees, who we know are looking for urgent action on sustainability.

Knowledge is power. We hope this report will help businesses to supercharge their sustainability journey to achieve their ambitions for people and the planet.

Leon Gilbert
Head of Digital Workplace
Atos

Why does digital workplace sustainability matter?

Accounting for up to 4% of global carbon emissions, IT plays a critical role in building climate resilience.[1] It's clear that by reinventing the device lifecycle, enterprises and their partners can make a significant contribution to cutting that figure.

Emissions

57%
of ICT's carbon footprint
is generated by devices and workplace[1]

79%
of a laptop's carbon footprint
is generated during manufacture[2]

Waste

62 million
tonnes of e-waste was produced in 2022[3]

Only
12.5%
of e-waste is recycled[4]

Resources

Every remanufactured laptop saves
1,200kg
of the earth's resources[5]

Employee engagement

51%
of 2,000 business students say they'd accept a lower salary to work for an environmentally & socially responsible organization[6]

Top employers
(measured by employee satisfaction) have
14%
higher ESG scores than their peers[7]

[1] *ICT Sector Electricity Consumption and Greenhouse Gas Emissions, Malmodin et al (2020)*

[2] *A Net Zero Roadmap for Sustainable IT, Gartner (2023)*

[3] *Global E-waste Monitor, UN 2024*

[4] *The World Counts, Electronic Waste Facts*

[5] *Circular Computing*

[6] *Rising Leaders on Social and Environmental Sustainability, Yale (2022)*

[7] *ESG as a workforce strategy, Marsh & McLennan, 2020*

About our research

OEMs are working hard to cut manufacturing-related emissions. Our focus is on how to reduce the embodied carbon of devices and carbon associated with device use.

We drew on a wealth of data to understand exactly what's happening along the ICT supply chain.

As a digital service and analytics provider, Atos monitors the electricity consumption of one million devices worldwide, giving us a vast window into how and when devices are used.

Our partner Nexthink is a specialist in digital experience management. Its digital experience and device performance analytics are based on telemetry from 27 million devices.

Tier 1 is the UK's number 1 social value IT asset disposition provider, helping large companies to responsibly dispose of and recycle their outdated equipment. It has data covering 0.5 million devices.

Circular Computing is an IT sustainability leader, responsible for bringing to market the world's first quality-marked high-performance remanufactured laptops.[8]

The 25 datapoints in this report have been generated by Atos and our partners, based on analysis of data related to IT devices used by large and medium organizations. Datasets include device agent data, user behavior analysis, digital experience metrics, aggregated help desk data, IT service management data and analytics, and asset disposal data.

28.5
million devices

25 key
data points

Atos   nexthink   tier 1   circular computing™

[8] Circular Computing remanufacturing process and laptops are certified with a BSI Kitemark, a UK product and service quality trademark

Research findings

Findings relate to:

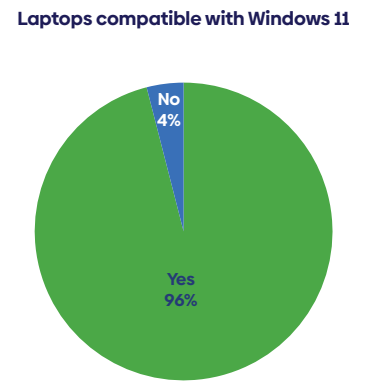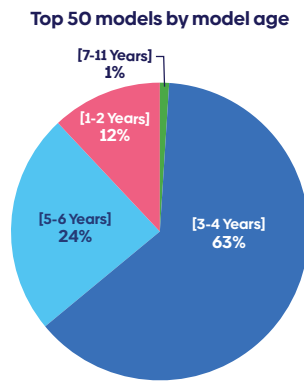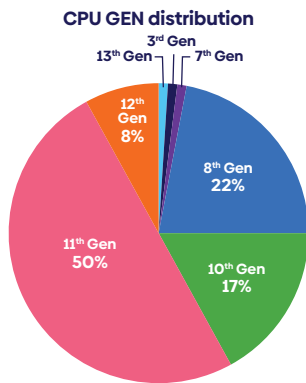• Embedded carbon

• Carbon associated with device use.

How do reliability, performance, efficiency and user experience change as devices age?

Our analysis reveals that across ICT estates, devices are upgraded and replaced in a way that is unsustainable.

Basis, methodology and findings

The following datapoints are generated by Nexthink device performance and digital experience analytics, together with analysis of ITSM data gathered within medium and large organizations.

• **Device reliability only becomes unsatisfactory from Year 5, when error rates increase by 100%**

• **Device performance needs boosting from Year 4, with a significant drop of 22% from Year 4 to Year 5**

• **Generation of CPU does not have a major impact on device performance**

• **Older devices are comparable to new in terms of energy efficiency**

• **Data did not reveal conclusive trends or patterns in external condition of devices**

• **96% of devices in large organizations are Windows 11 compatible**

CPU GEN distribution

3rd Gen
13th Gen — — 7th Gen
12th Gen 8%
8th Gen 22%
11th Gen 50%
10th Gen 17%

Top 50 models by model age

[7-11 Years] 1%
[1-2 Years] 12%
[5-6 Years] 24%
[3-4 Years] 63%

Laptops compatible with Windows 11

No 4%
Yes 96%

• **Digital Experience scores increase by 13% when RAM capacity increases**

• **75% of employees are prepared to keep their device for longer if they understand the environmental benefits of doing so**

Key takeaways for enterprises

Based on this data, we see major opportunities for enterprises to further prolong the life of devices across their IT estates.

By doing nothing, enterprises can extend the standard life of a device by 25%. That's because device performance only starts to decline from Year 4. This means that users can keep each device for at least four years – not the standard three-year refresh – without compromising on reliability, performance, efficiency or user experience.

When the performance of a device does decline, the solution could be as simple as upgrading the memory. While there is no correlation between generation of CPU and device performance, increasing RAM does increase the quality of user experience. There is no justification for replacing or upgrading a device on the basis of its CPU alone.

[9] *Power consumption measured over time by model*

Similarly, as enterprises prepare for Windows 11, there is no need to replace current devices on that basis alone without further investigation. The same is true of energy efficiency: there is no justification or requirement to replace devices on the basis of power consumption.

All this is good news from a cost and sustainability perspective. Motivation of users is clear, with over three quarters happy to keep their device for longer. This signposts major opportunities for organizations to engage employees in strategies that prolong each device life while still giving them a great experience.

External condition of the device includes broken keyboard, screen, USB port, Bluetooth and trackpad. There is currently no standard way today to gather such data. At Atos, we are currently evaluating methods that could be used to determine external condition.

"These findings have busted some myths and revealed that devices may well be over spec'd. By taking a truly data-driven approach we have identified the factors that impact good or bad performance. Current device stock is only around three to four years old, so there is vast potential now to keep the current models for longer, even with the arrival of Windows 11. It's easier to add RAM to an existing device than it is to replace a CPU, so that's great for IT budget holders as well as the environment. We know that sustainability is increasingly a factor for employees who want to see climate action. With small adjustments, we can drive big change. Consider the difference across a large IT estate - savings the equivalent of thousands of homes' electricity consumption."

Tiago Antao, Nexthink

What is the role of remanufactured devices in today's IT estates?

Based on data, we see major opportunities to expand the use of remanufactured devices as greener, cheaper and comparable in quality and performance to new devices.

Basis, methodology and findings

The following datapoints are generated by Nexthink device analytics, together with analysis of Circular Computing manufacturing data. Nexthink analytics can compare new device models with remanufactured devices with similar specifications in four domains: digital experience, performance, productivity and collaboration and business applications.

- **76% of large organizations' current laptop environment can be remanufactured**

- **Remanufactured devices achieve similar reliability as new devices[10]**

- **Performance of remanufactured devices is comparable to new**

Key takeaways for enterprises

Based on this data, we see huge scope to increase the number of remanufactured devices in IT estates – bringing cost as well as sustainability benefits to enterprises.

"This research is an opportunity to evolve away from old orthodoxy on how to avoid tech deficit. When IT leaders have real and comprehensive data, they can make informed decisions for a more sustainable alternative to business as usual. We know that every new device costs around 338kg CO2eq of carbon, even before it is switched on. Every time they choose a refurbished or remanufactured device, enterprises will avoid around 316kg CO2eq of carbon, as well as saving around 70% of the cost of buying new. These are big numbers that are entirely achievable and give organizations a quick win. It's about partnership and strong leadership to change the narrative while educating people about all the embodied carbon, energy, waste and water consumed for every new device."

**Conrad Mohr,
Circular Computing**

Data shows that for users, remanufactured devices are indistinguishable from new devices in terms of user experience and performance. Therefore, at Year 4 – when device performance, reliability and user experience start to degrade – enterprises should consider a refurbished or remanufactured device.

When they are no longer needed by organizations, 76% of the current device stock can be sent for remanufacturing, with associated reductions in Scope 3 emissions. Remanufactured devices will be returned to brand-new condition, reset to factory settings with reinstalled software and possibly more memory.

For the quarter (24%) of devices that can't be remanufactured, there are options to refurbish or recycle devices when they can no longer be used and replace them with remanufactured stock. In this way, this 24% can enter the circular economy.

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[10] *Circular Computing data for remanufactured shows a consistently low RMA rate of below 3%, comparable to new manufactured devices. Return Material Authorization (RMA) Rate is a manufacturing metric that measures the percentage of products shipped to customers that are returned due to defective parts or not otherwise fit for purpose. RMAs are a key indicator of quality.*

What's happening along the device lifecycle?

Our analysis reveals high levels of waste generated by devices that could instead be reused, repurposed and recycled.

Basis, methodology and findings

The following datapoints are based on analysis of Tier 1 data from 2019-2023, based on devices sent by enterprises for recycling and decommissioning.

- **From 2020, there was 4% increase in device redeployment year on year, with 8% in 2023**

- **Since 2023, screen related faults have increased by 28%**

- **10.1% of devices that are recycled could be repurposed instead**

- **Only 12.3% of devices that go through the decommissioning process are actually faulty**

- **A traditional laptop support model equates to as much as 3 months of electricity use per annum[11]**

"In the past, companies looked to device reuse as a revenue stream. Today, we're seeing a steady rise in organizations converting reuse into social and environmental value instead. We're asked increasingly to provide a report of what's happened to devices once they have left an organization in terms of both carbon and social impacts. That data is available – not just for an annual CSR report, but because employees and customers want to see urgent sustainability action. More can be done to raise awareness that any device can have an extended second or third life. The vast majority of assets have more to give before they reach landfill, whether through donation to bridge the digital divide, or to be broken down into parts through education and employment initiatives for under-represented people."

Jonathan Rose, Tier 1

Key takeaways for enterprises

These findings reveal waste in the ICT lifecycle, with potential for most devices to have a much longer first, second and third life.

Enterprises increasingly look to redeploy devices rather than recycling them, with growing awareness of the sustainability and cost advantages of doing so. Yet there is huge room for improvement, given that 88% sent for decommissioning could still function. There is large scope to reduce organizations' Scope 3 emissions based on the hierarchy of waste: refurbish, remanufacture, repurpose, before recycling and onto eventual decommissioning.

From when users receive a device (new, refurbished or remanufactured), they need ongoing advice and support on device care and optimal use; for example, regular cleaning, rebooting and software refresh to prolong device life without impacting their experience. The increase in screen faults may be due to the growing volumes of thinner devices and those with touchscreens – both of which are easier to damage. To protect screens, it's uneconomical to fix or replace screens, so screen protectors are a potential solution to prolong device life.

Enterprises can do more to ensure that devices are repurposed/resold/reused wherever possible. Ensuring BIOS are removed and that devices are removed from the corporate network will assure that devices are safely wiped and available for resale versus recycling.

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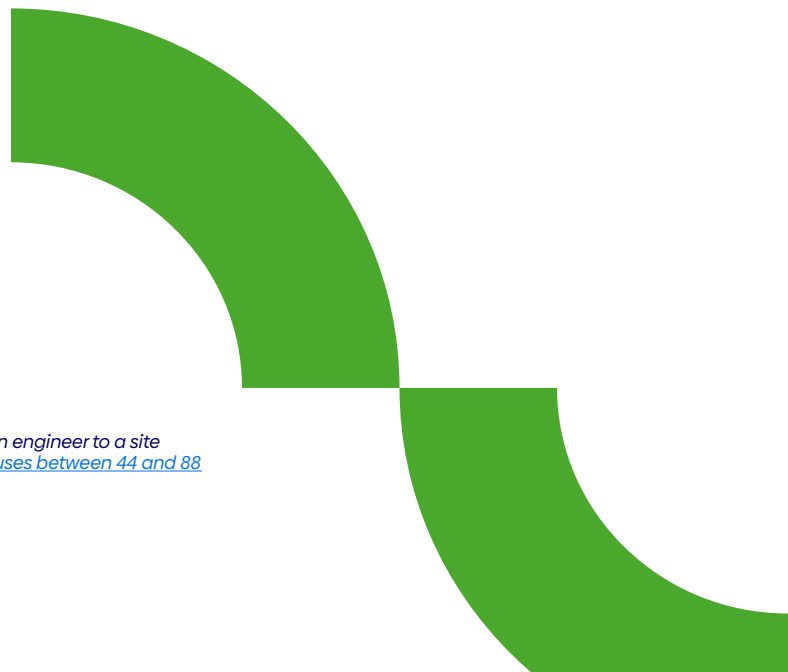
[11] *Based on a calculation of 150g CO2 / km and one 15km return visit by an engineer to a site (15km x 2) in a small car = 150 x 15 x 2 = 4.5kg of CO2. The average laptop uses between 44 and 88 kg of C02 / year, Ditchcarbon, 2022*

How efficiently are devices used in relation to energy consumption?

Basis, methodology and findings

The following datapoints are generated from live data gathered from 1 million devices in medium and large enterprises. They provide benchmarks for enterprises to investigate their own device usage, taking into account a range of organizational and user-specific sustainability, wellbeing, ergonomic requirements and accessibility factors.

• 48% of users use an external monitor

Nearly half of all employees are connected to an external screen in addition to their laptop, which can easily double the power consumption of a standard laptop. Depending on the size of the screen it can be up to three times higher. This is an issue from a sustainability perspective and something that organizations might want to address through an employee education and incentive campaign. However, employee experience and accessibility aspects must also be considered. In future, we will investigate patterns in the use of more than three monitors.

• Only 0.07% devices have abnormal consumption

Fewer than 0.1% of devices are showing an abnormally high power consumption, which equates to over 1kwh per day, on average over 30 days. This does not seem to be an issue.

• Nearly 2% of laptops have an inefficient power plan

Power plans seem to be properly balanced between sustainability (lower power consumption) and employee experience. For devices flagged with an inefficient (not balanced) power plan, employees can be requested via remote action to go to 'set power plan' and change their power plan settings to 'balanced'.

• 16% of devices run for over 23hrs a day

16% of devices run all day long and are never switched off. This is a surprisingly high number, evidencing room for improvement through employee awareness and education to switch off devices when they aren't needed.

• 28% of devices have less than 2hr interaction

• 6% of devices have no interaction

A significant proportion of devices in organizations seem to be running with little user interaction, some with zero interaction. It's worth investigation to identify the reasons for this. There are sustainability issues; and there may also be security implications. Employees should be encouraged to switch off their devices when they are not needed, or put them into sleep mode. They may find that their device is not needed at all and can be returned for reuse or repurposing. This will improve the organization's ESG performance.

• 9% of users use multiple active devices

With nearly a tenth of employees using more than one active device, there are opportunities to investigate the reasons for this. Users could be encouraged to return superfluous devices for reuse and repurposing. This will improve the organization's ESG performance.

• 24 Carbon intensity can vary as much as 2.3 times during the day
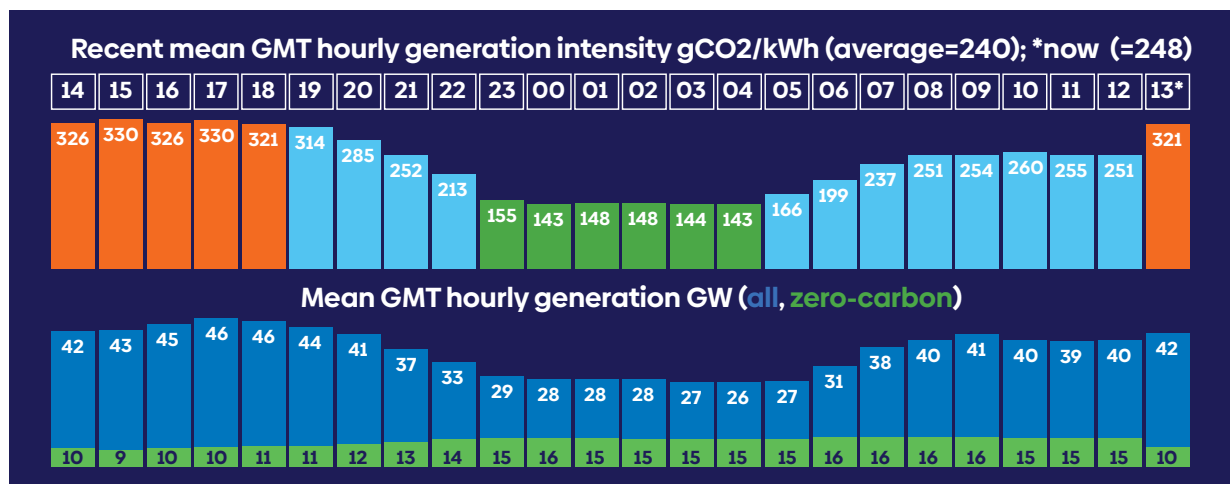
Source: On Variations in GB Grid Electricity CO2 Intensity: Samples - Earth Notes

Given the variations in carbon intensity, there could major benefit in educating users about when to be on the electrical network and when to be on the battery. For example, plugging in during the afternoons when the network is green, and switching to battery in the morning when carbon intensity is higher. There are also opportunities to introduce smart technology that adapts and automates optimal energy-efficient use of the grid.

• **Only 40% of environment-impacting settings can be reinforced with automated policies**

We analyzed over 50 device settings that impact electricity use. Of those, only 40% can be reinforced with automated policies. With 60% of device settings selected according to users' choice, education and awareness is needed to encourage green settings.

"At National Grid, our purpose is to ensure that energy is available when and where it's needed while building a greener future. A key area of opportunity – for energy providers and consumers – is the huge variation in the energy mix at different times of day. Today, very few of us would consider using our laptops to impact the demand variability of the grid. Yet nobody would think twice about charging their electric vehicle overnight when demand is lower and energy is greener. One reason is the huge difference between the two in terms of power consumption. We've calculated that a device uses approximately 0.17 kilowatt hours of energy a day. Yet, when added together across large IT estates, this becomes a more significant figure. If we can connect that kind of demand flexibility with ICT, we have a real opportunity to fundamentally change the greenhouse gas emissions of entire energy systems for entire countries. Measurement with transparency is key. Within our own organization, we are looking at using the data from this study to drive strategic changes in behavior. And we're investing in employee education, because you need to take people on this journey, helping them as conscious consumers."

**David Welling,
National Grid**

"Sustainability is an increasingly important part of today's business culture. Executive sponsorship is crucial; senior stakeholders set the agenda and values that inspire meaningful change. It's also important that IT and sustainability teams work together to set intention and bring employees with them. Making information available is key, with regular nudges and incentives that encourage and reinforce positive choices. Our experience is that when we explain and celebrate sustainability, things really do start to change. If you tell people 'it's good for the planet', this won't resonate. But if you tell them what their action means in terms of carbon emissions, it's more powerful. This also contributes to employee engagement and satisfaction with their working environment and purpose."

Nina Zellweger, Nexthink

Key takeaways for enterprises

With data providing benchmarks, user engagement will help us all to drive small changes that – together – will shift the dial on energy use and carbon reduction. Investigation is needed to identify enterprise-specific datapoints.

Employee choices around use of multiple devices, and length and timing of work sessions could be based on sound business and operational reasons. If not, there could be key opportunities to educate and change user behaviors.

Summary of conclusions and recommendations

> *"This study has highlighted high levels of waste endemic across the IT industry. However, it also identifies a series of actions we can all take to turn this around.*
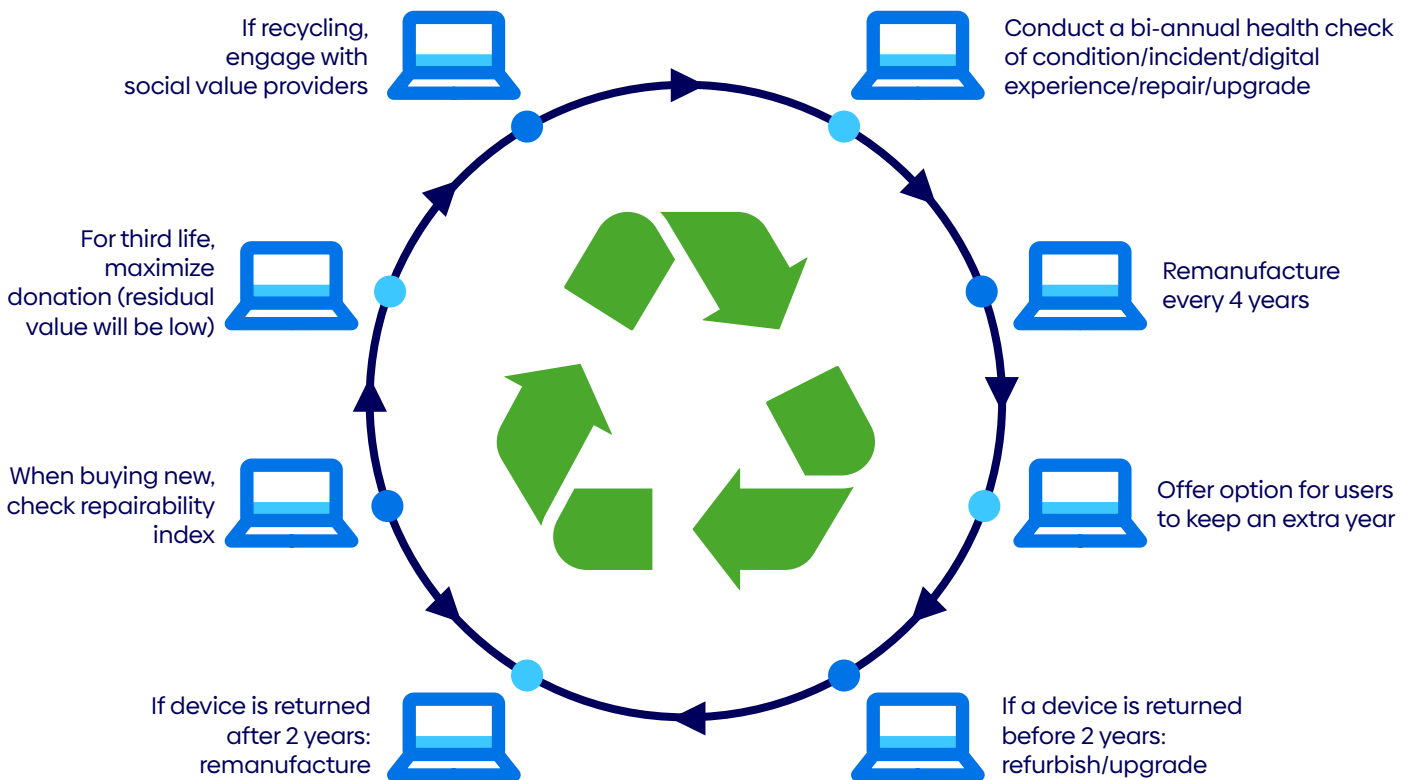>
> *We have benchmarks that enterprise leaders and key decision-makers can use for sustainability policy and practices – including information and incentives for employees to make sustainability part of everyday life. We have a new data-driven approach to deliver the right device, to the right user, for the right amount of time in the most sustainable way. Instead of a standard 3-5 year device lifespan and a fixed refresh cycle, there is evidence for moving to data-driven, condition-based device maintenance across an 8-10 year lifespan. New devices should be the rare exception. High-performance refurbished and remanufactured devices can be the norm. In addition, there are ways to give devices a valuable third life in partnership with sustainability experts and social enterprises. Here at Atos, we have new insights and areas that we'll keep monitoring and measuring in collaboration with our partners. Working together, we have a roadmap for dramatically increasing the number of sustainable devices held across the overall IT estate".*
>
> ***Sebastien Vibert, Head of Sustainable Workplace, Atos***

Conclusion 1: Device lifecycles can be doubled while still delighting users

Optimal device lifecycle: Reduce, reuse, recycle

If recycling, engage with social value providers

Conduct a bi-annual health check of condition/incident/digital experience/repair/upgrade

For third life, maximize donation (residual value will be low)

Remanufacture every 4 years

When buying new, check repairability index

Offer option for users to keep an extra year

If device is returned after 2 years: remanufacture

If a device is returned before 2 years: refurbish/upgrade

Conclusion 2: Employee engagement is essential to workplace sustainability

Statistics show that employees increasingly want to work for businesses that take action to protect the planet and communities. This shift is particularly clear among Gen Y and Gen Z employees, who want to work for organizations that deliver on their commitment to environmental and social responsibilities.

Sustainability can be integrated into daily life across all communication channels (and as part of device packaging, marketing and messaging) to inform, inspire, motivate and acknowledge progress for individuals and the enterprise as a whole.

Giving people concrete facts and stats about the environmental and social value of their individual device choices and usage is more powerful than general statements and intent. This gives employees opportunities to extend sustainability action from home into work.

Conclusion 3: Comprehensive and real-time data is essential to drive meaningful progress on sustainability

What we can measure, we can change. That's why leaders and decision-makers need ongoing access to data so that they can implement evidence-based and outcome-driven sustainability policy, programs and employee engagement.

It's vital that IT and sustainability teams, potentially also HR and Communications teams, work together to set implement programs and measure success.

Leveraging enterprise data, IT, Sustainability, Corporate Responsibility and HR departments can either take action, or encourage employees themselves to make the right adjustments or choices.

So, what next?

If you'd like to discuss any aspect of your digital workplace sustainability ambitions or challenges, our experts are here to help.

Sebastien Vibert
Business Owner Sustainable Workplace

Markus Schoen
Product Manager Sustainable Workplace

Contact us to learn more how Atos can help you to create a sustainable workplace.

Tech for good: better for you, society and the planet

About Atos

Atos is a global leader in digital transformation with c. 92,000 employees and annual revenue of c. € 10 billion. European number one in cybersecurity, cloud and high-performance computing, the Group provides tailored end-to-end solutions for all industries in 69 countries. A pioneer in decarbonization services and products, Atos is committed to a secure and decarbonized digital for its clients. Atos is a SE (Societas Europaea) and listed on Euronext Paris

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Let's start a discussion together

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