

Microsoft 365 Sustainability White Paper

How to achieve a sustainable IT workplace using Microsoft 365, sustainable devices, and Azure – focusing on the climate and people wellbeing in organizations.



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Version history

Version	Date	Changes	Contributors
1.0	March 19, 2023	Initial publication.	Andreas Stenhall
1.1	October 8, 2023	<p>New sections:</p> <ul style="list-style-type: none"> • Prevent mobile phone notifications on non-working hours and days by using "Quiet time". • Scheduling when messages are sent in Teams and Outlook. • Surface emissions estimator tool. • Carbon emission dashboard from Surface now in the Surface Management Portal in Intune. <p>+ overall changes and more. For complete list, see GitHub.</p>	Andreas Stenhall
1.2	March 27, 2024	<p>New chapter added:</p> <ul style="list-style-type: none"> • Accessibility: Software and Hardware. <p>New sections:</p> <ul style="list-style-type: none"> • Copilot(s) and AI. • Surface repairability improvements, such as repair videos plus buying spare parts yourself. • Make dynamic groups more efficient in Entra. 	Andreas Stenhall

		+ overall changes and more. For complete list, see GitHub .	
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Warranty and Disclaimer

This white paper is not an official Microsoft document and represents solely the author's personal aspects of sustainability in terms of Microsoft 365, Azure, and devices areas. Also, although the contents in this material have been assessed and verified, continuous changes in the products introduced by Microsoft might make some steps invalid from one day to another.

About Andreas Stenhall

Andreas is a Principal Modern Work Architect and Advisor at Coligo (www.coligo.se), specializing in the Windows deployment & management and identity & security, for businesses, enterprises, and governments., and has on more recent years started working with sustainability in IT as well. Andreas has worked with Windows deployment and security for more than 20 years.



When not providing hands-on consulting services, Andreas lectures, leads workshops, and teaches courses on the topics related to Windows client and device management as well as the Microsoft cloud and specifically security. He has spoken at various Microsoft conferences, including prominent BUILD conference and TechEd events both in the US and in Europe.

Andreas is deeply involved in the community and has been awarded the Microsoft Most Valuable Professional title of "Windows and Devices for IT" every year since 2009.

He has also run the Swedish-speaking community www.alltomwindows.se since 2003, as well as an English-language blog for IT professionals, named "The Experience Blog" (www.theexperienceblog.com) since 2007.

He is the author of two books, although by now way beyond the "best before date", Windows 8 in the Enterprise as well as Enterprise Client Management: Using Windows Server 2012 R2 and System Center 2012 R2.

More up to date than the books mentioned above are the courseware that Andreas has developed with focus on managing Windows using Intune and moving to a cloud-only world using Windows 11, Intune and Passwordless technologies. These courses¹ are delivered in Sweden via partner Cornerstone (www.cornerstone.se).

You can connect with Andreas on Twitter @AndreasStenhall and on LinkedIn at <http://www.linkedin.com/in/andreasstenhall>. Andreas can be reached at andreas.stenhall@coligo.se via email or Teams.

The sustainability work is published on <https://www.climatesmartit.com> and you can also follow @ClimateSmartIT on Twitter.

¹ [Microsoft Intune - Manage Windows 10 and 11 - Cornerstone](#) (courseware material is in English)

Preface

We live in a world which is changing rapidly, and this means increased stress in not only work life but also personal life. At the same time, we know that climate changes due to emissions are impacting many of our lives as well, with for instance extreme weather conditions occurring more frequently now than ever in modern times.

I have had a personal interest in striving towards making the most climate smart choices and am constantly working with trying to reduce work stress so that I can relax and enjoy the good things in life.

Close to my heart is climate change. I do not believe the solution to solve our climate and environmental challenges is to stop or ban things – let us start to shift, evolve, and choose more climate smart alternatives and force the development in the right direction instead.

The why

Two things worry me; The first is the high and rising carbon emissions causing rapid climate change and the second thing is that we are draining Earth's natural resources.

Political decisions are lagging, and effects are far from effective. Therefore, if enough people can be influenced and inspired by other means, we can make a change - together.

We need to make sure that we, here and now, start to change and evolve in a way that we as human beings for generations to come have a sustainable future.

The how

Every enterprise or business owner but of course every individual has a responsibility to help make a sustainable world. This means that we must minimize emissions and certify that our natural resources last, and that we must keep a healthy ecosystem with nature and animals.

Choosing more climate smart choices is something close to my heart and has been in my focus for the last years, after seeing how polluted the world is through traveling across the world. Something that is very close to my heart and a passion as well is my work, which is around the IT workplace and deploying and managing devices such as computers and mobile phones.

Over the years, doing more than just making the IT workplace work as good as possible is an urge that has grown stronger. At the same time, I love to travel!

So, to be able to achieve my mission of improving the climate and the globe, what I can and should do is to combine all my passions and what I do best into one; climate smart actions, traveling and IT.

The what

Now that you have come so far, let us become practical! In IT there are lots of things you can do to help your business become more sustainable. The days when double-sided printing was a great environmental thing to do are over, now we can make a change for real!

Choosing more climate smart options for our end users when it comes to computers or mobile phones, or for instance choosing the right data center can significantly reduce the climate impact that is correlated to everything we do in IT.

At the same time there are now plenty of tools available to aid in your everyday work, meaning you have the potential to save time and thereby hopefully relieve stress.

Executive summary

This white paper should be seen as an inspiration for your work in the IT department when it comes to sustainability, from a climate perspective as well as a people's perspective.

In the IT workplace there are more things to do for the climate than to enable double-sided printing to save paper. You can reduce your carbon emissions by at least half or even more just by enabling the right technology and choosing the right devices for your users. Did you know that one unit of a typical corporate laptop from the most common vendors today has the equivalent amount of carbon emissions as a 3-hour round-trip flight? Imagine the impact you can make by making smarter choices in this area.

Moving infrastructure and applications to cloud platforms where the datacenter is green has many benefits – and it will be very transparent to see the climate impact and calculate the gains compared to your own datacenter.

At the same time, there is a lot you can do to get sustainable employees that are less stressed and have the support of tools to reduce work stress. Also, being proactive in IT has never been more important and with the tools that are broadly available today, you have all the possibilities of being proactive and supportive of your workforce.

The contents of this white paper are based on Microsoft 365 and the technologies that are in there.

The last revision of this white paper was done on March 27, 2023.

Reducing climate impact

You can significantly reduce climate impact by choosing the right devices and using the right version of Windows, and at the same time use modern deployment tools to in a double sense “re-image” how you deploy your computers. Let’s look deeper into what the options you have at hand are.

Choosing the most climate smart devices

Knowing that computers used in organizations range from one hundred to about seven hundred kilograms of carbon emissions throughout their lifecycle is enough to realize that it has an enormous impact. The average I would say is around 300-350kg of carbon which means the same amount carbon emissions as a 3-hour roundtrip flight².

Microsoft has had really high ambitions for a long time, since 2012 actually, when it comes to reducing carbon impact, with the internal carbon taxes³. In the last year there is also a great example⁴ from Dell where they use recycled materials. Also, HP⁵ has a great example where ocean plastic is used in several devices.

Lowest amount of carbon in manufacturing

The part when a device is manufactured is what generates most carbon emissions. Thus, choosing a device with the lowest carbon emissions will have a true impact on the climate.

All major vendors publish the carbon footprint of devices, and this includes Microsoft, Hewlett-Packard, Dell, Lenovo, and Apple.

Look for *eco profiles* or *carbon footprint* in combination with the vendor of the devices to find this information. More vendors are more than likely to follow and start to publish carbon impact from their devices.

Vendor	Link
Apple	Environment Note: Scroll down to <i>Your product’s environmental report card</i> .
Dell	Product Carbon Footprints
Hewlett-Packard (HP)	Product Carbon Footprint
Lenovo	Eco Declarations – Product Carbon Footprints (PCF)
Microsoft	Eco profiles
Samsung	Sustainability Note: Scroll down to <i>Environmental impact of products</i> and note that Samsung provides rather limited information

Table 1.1 – Links to published documents on sustainability for each hardware model.

² [ICAO Carbon Emissions Calculator](#)

³ [How Microsoft is using an internal carbon fee to reach its carbon negative goal - Microsoft Industry Blogs](#)

⁴ [NEW LATITUDE 5000 SERIES ARE DELL’S MOST SUSTAINABLE LAPTOPS YET* | Dell Technologies](#)

⁵ [Learn About HP Computers Made With Ocean Bound Plastics | HP® Tech Takes](#)

Extending the lifetime of devices

Knowing that manufacturing of devices has the most impact, you can reduce climate impact significantly by extending the lifetime of devices, i.e., use devices longer than you do today. A common lifecycle is changing typical office devices every three years. By extending this, you can significantly reduce your carbon footprint.

Warranty and security updates for the hardware

Using devices longer than you do today does not come without impact and includes two important parameters to take into consideration; warranty lifetime as well as for how long you will receive security updates for the hardware.

Warranty lifetime

Any modern device will technically have a lifetime of way beyond three years and even beyond the official service and support lifetime. The parameter you can use in terms of sustainability is how spare parts and repairability can be managed by the vendor? More about that in the next section.

Vendor	Link	General summary
Microsoft	Surface Warranty, Protection Plans & Support – Microsoft Surface for Business	2 years warranty default – additional support up to 4 years.
Dell	Support Services & Warranty Dell US	3 years by default – additional options available.
Lenovo	Lenovo Warranty & Protection Lifecycle Support Lenovo US	3 years by default – additional options available.
Hewlett-Packard	N/A	3 years by default – additional options available.

Table 1-2 – Vendor support statements.

Security updates for the hardware, i.e., firmware updates

One important factor to take into consideration when you extend the lifetime of usage of your devices is security. We know that today it is not only important to patch Windows and other software, but it is becoming more and more critical to patch the software of the hardware itself (firmware) to make sure that there are no vulnerabilities in the hardware that can be used by attackers to gain access to your environment. The important thing here is to make sure that the devices are covered with firmware updates.

Vendor	Link	General summary
Microsoft	Surface driver and firmware lifecycle for Windows-based devices - Surface Microsoft Learn	As announced in September 2023, Microsoft provides 6 years of firmware updates. <i>Note: Before that Microsoft guaranteed 4 years or more.</i>
Hewlett-Packard	N/A	No information.
Dell	N/A	No information.
Lenovo	N/A	No information.

Table 1-3 – Hardware security (firmware) updates statement.

Using Thin Clients and Cloud PCs or Virtual Desktops

This old trick in the book can once again be a real option given that you want a financially good solution, as well as sustainable.

Thin clients are rather simple devices which means they are easier to manufacture and with lower complexity and lower number of electronic components it also means lower impact on carbon emissions. Combining thin computers and connecting them to virtual desktop such as Azure Virtual Desktop or full Windows clients in the cloud (Windows 365 or Cloud PC), via Microsoft datacenters can be a real winner. This is especially true as Microsoft provides zero emission and zero waste data centers.

Cloud PC (Windows 365)

A Cloud PC (which is also known as Windows 365) can run on many types of devices, emulating a performant physical device. For instance, we already know that Microsoft have worked with some vendors⁶ to provide a full experience on a phone, which can then be connected to a monitor, keyboard, and mouse for a great and seamless experience.

Repairability

Being able to repair and find spare parts for devices is much more climate smart than replacing the entire device.

Vendor	Link(s)	General summary
Microsoft	More spares now available for commercial customers - Microsoft Tech Community Watch the newly released Surface videos for device repair - Microsoft Community Hub Download Surface Service Guides from Official Microsoft Download Center	Spare parts available, as well as service guides and as of 2024 also videos to make it even easier to repair the Surface devices. Some spare part availability is limited to the United States. Replacing battery is unfortunately not possible.
Hewlett-Packard	N/A	No information.
Dell	N/A	No information.
Lenovo	N/A	No information.

Table 1-4 – Spare parts and repairability statements.

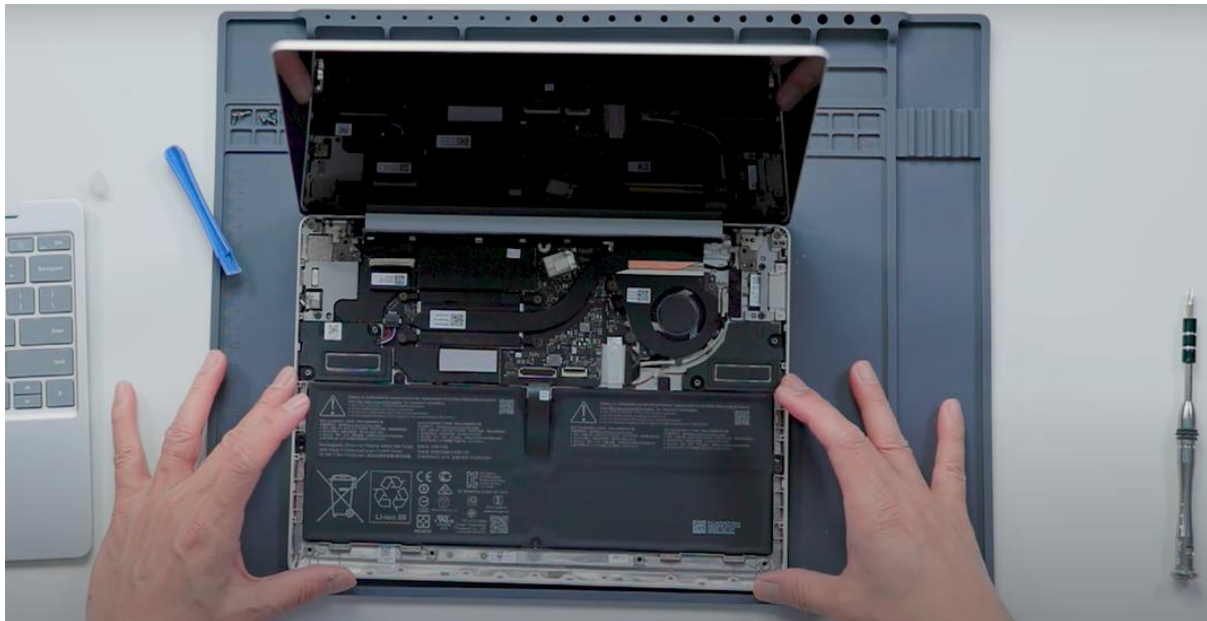
Spare parts and repair videos for Surface devices

Extending the life on your devices is great not only from a climate perspective but also from a financial perspective.

⁶ [Enhanced Windows 365 App Experience – Re-imagining mobile productivity | Windows Experience Blog](#)

Microsoft is collaborating with iFixit⁷ who offers spare parts for Surface devices, and guides how to repair your Surface devices.

In addition to this Microsoft has released several videos on YouTube that thoroughly walk a technician through the process of repairing and replacing components of the more recently released Surface devices. The videos are available at [Watch the newly released Surface videos for device repair - Microsoft Community Hub](#).



One example of a Surface repair video, showcasing how to replace certain parts of a Surface device.

Using refurbished hardware

Considering that manufacturing a new computer requires a significant number of natural resources as well as generating hundreds of kilograms of carbon emissions, it might be ideal to choose refurbished devices.

There are several companies taking on used hardware and fixing and cleaning them and re-selling, in various conditions.

It is maybe not the most obvious choice as you should strongly consider security updates for the hardware to exist for as long as you plan to use the computer.

It also requires a sort of “buy-in” from the user that they are getting a refurbished device rather than getting a brand-new device. I see that a new hire employee could easily wrinkle their nose on getting a refurbished device. On the other hand, I think that we are moving, and must move, more to circular thinking and this is a maturity question that will become easier to handle over time.

⁷ [Microsoft works with iFixit to provide replacement components for Surface | Microsoft Devices Blog \(windows.com\)](#)

End-Of-Life

Sooner or later your device will be end-of-life, and what do you do with it then? There are a few options.

For instance, in Sweden, the company Dustin offers a service called *Takeback*⁸. It serves as an easy way for your old IT products to be either re-sold or recycled in a responsible way.

Donating

One obvious option is to donate the used devices to organizations that will make sure the devices come to use in places where the users do not have the possibility to purchase devices of their own.

Re-selling

Re-selling the hardware to companies that can take care of the hardware and give it new life and new use for others as refurbished is another option.

Recycling

If devices are broken and beyond repair, the option to recycle it is obviously the option you have. Depending on where in the world you are, your options will vary. For instance, in Sweden there is something called "manufacturer responsibilities", which means that anyone who sells electrical equipment on the Swedish market are obliged to take care of the disposal of the devices and treat the material so that it can be recycled⁹.

Electronics recycling is becoming more important and more accessible, and I suggest you look at the options you have near you.

Peripherals

A typical workplace consists of a monitor, mice and keyboard and is often provided via a docking station. There are options for some peripherals that are better for the environment.

Type	Link	General summary
Mouse	Meet our New Mouse Made from Recycled Ocean Plastic Microsoft Accessories	

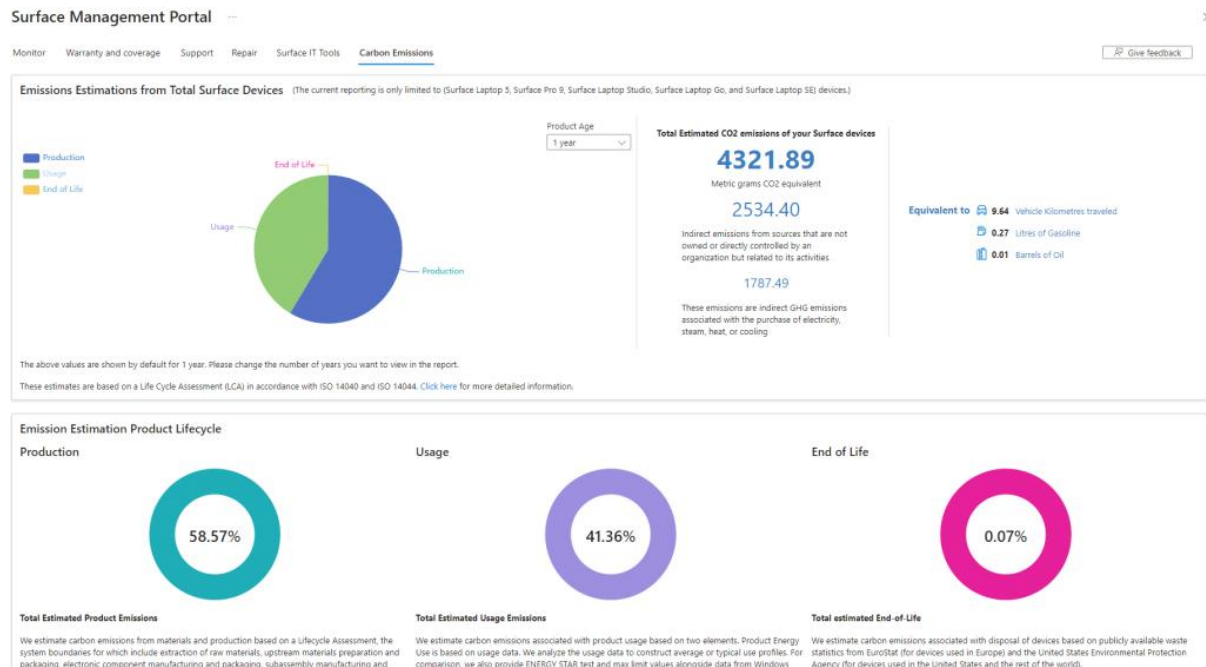
Table 1.5 – Climate smart peripherals.

⁸ [Klimatsmart återanvändning av IT-produkter | Dustin.se](#)

⁹ [Producentansvar för elutrustning \(naturvardsverket.se\)](#)

Carbon emission dashboard from Surface now in the Surface Management Portal in Intune

If you are using Surface devices managed with Intune, you will find the new Carbon Emissions tab in the Surface Management Portal¹⁰.



In the Carbon Emissions tab, you will find details on how much carbon emissions are generated by your Surface devices, from production to end of life.

Surface emissions estimator tool

If you want to do a precise estimation of carbon emissions either when you already have Surface devices, or as part of procuring Surface devices, you can use the tool Surface Emissions Estimator tool¹¹.

The tool lets you choose not only the models and the number of devices, but also where in the world the devices will be used as the amount of “green” electricity differs quite a lot depending where in the world you are located. The last parameter is how long you are planning to use the devices.

In the end you get a clear description and numbers on carbon emissions based on your choices.

¹⁰ https://intune.microsoft.com/#view/Microsoft_Azure_Surface/SurfaceManagement.ReactView

¹¹ <https://tco.exploresurface.com/sustainability>

Microsoft Surface Emissions Estimator

Total Estimated CO₂ Emissions of Your Selections

17.26

Metric Tons CO₂ (MTCO₂)

End of Life

0.03 MTCO₂

Product Use

0.03723 MTCO₂

Transport

0.2 MTCO₂

Packaging

0.09317 MTCO₂

Scope 2 ⓘ 0.03723

Scope 3 ⓘ 17.23

17.26

MTCO₂

Total Estimated
Emissions

Production

16.9 MTCO₂

Device Mix Portfolio

Product Selection 1

Surface Pro 9 SQ3 8GB DRA... ▼

100

Sweden ▼

Number of years (4) ▼

The Surface Emissions Estimator will let you estimate the carbon emissions based on model, where the devices are being used as well as for how long the device lifetime is expected.

Reduce transport of computers

Transportation of computers is often done twice; first when the device is shipped from the manufacturing factory to the corporate IT department, or a hardware partner. The computer is then historically deployed with the corporate IT image and applications, having the computer joined to an Active Directory domain. Once this re-imaging is completed, the computer is shipped to the user.

This is common for many organizations, and in some cases, I've seen, computers have been manufactured in Asia only to be shipped to Europe, having IT provision the computer and then IT has shipped it back to an Asian office. This is insanity!

Autopilot is the solution for computers

The concept of Microsoft's feature Autopilot is to ship the computer directly to the end-user, and while this saves time and money, it will also reduce emissions related to transport. Autopilot is a well-proven feature that has been around since 2017 but it has honestly not been ready for production in more recent years from around 2020. Nowadays, there are many organizations using Autopilot and more and more customers start using it each day.

Mobile devices

The same concept as Autopilot is for computers is also available for mobile phones and has been even before Autopilot was born. If you are not already buying phones connected to your organization now is the time to start doing that as well. All devices, regardless of whether they are mobile phones or computers, can and should be treated and managed in the same way and with the same tools. Microsoft Intune is a great platform for managing all of this in one single console.

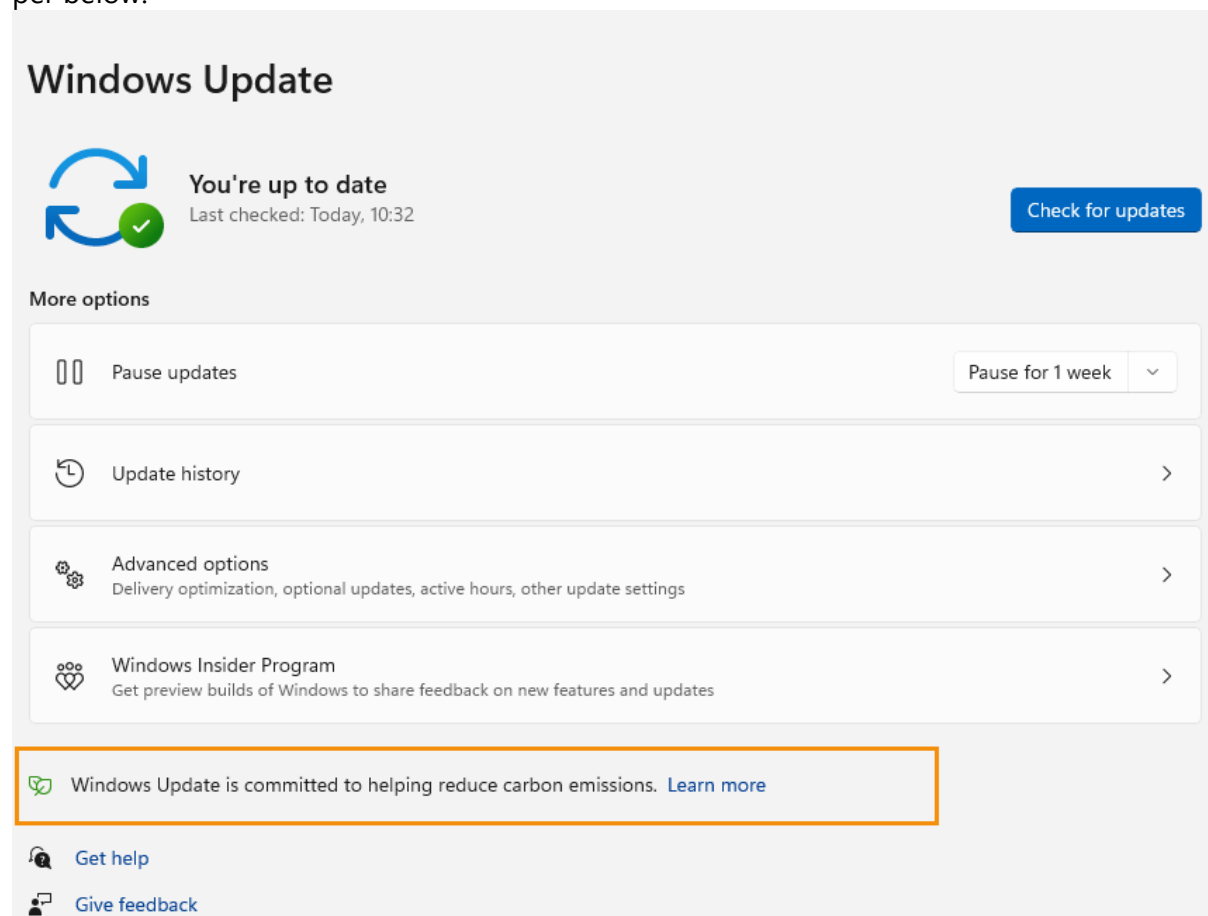
Windows 11

Microsoft are keen on reducing climate impact and by upgrading to Windows 11, and specifically Windows 11 22H2 or later, you get some obvious climate smart changes with that.

Windows Update will update your computer when renewable energy is used

Starting with Windows 11 22H2, you can choose when updates are installed via Windows Update, and this can be scheduled to take place when it would result in lower carbon emissions¹². This is achieved by monitoring the geographic location (roughly based on country in combination with electricity zone) of the computer and combining this with third party sources of how green the electricity is in each zone.

If this feature is available to you, you will see in Windows Update settings area the note as per below.



If you see the note as in the image above, then your Windows 11 device is adhering to and using smart ways to install updates that will reduce carbon emissions.

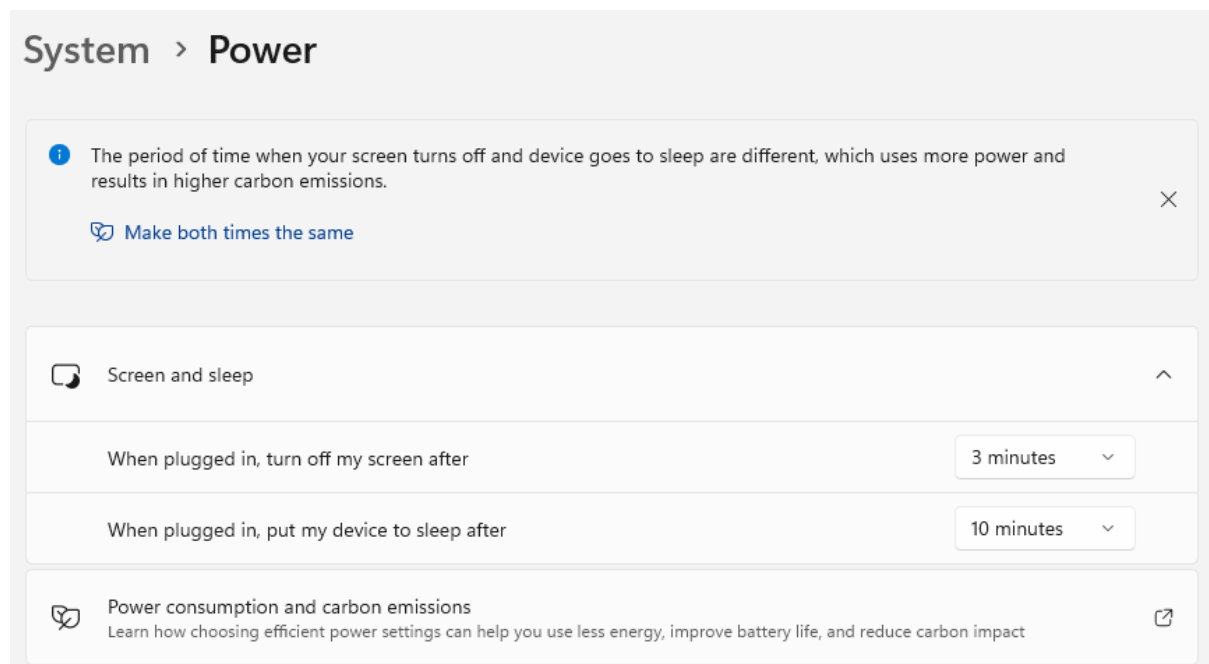
¹² [Announcing Windows 11 Insider Preview Build 22567 | Windows Insider Blog](#)

Display and sleep changes

Typically, the most energy consuming component in a computer setup is the display. In Windows 11 22H2 and later this is handled in two ways to reduce carbon emissions. Both relates to power settings.

The first being the adjusted power settings

The display will turn off after 5 or 10 minutes already, or according to Microsoft documentation even in as little as three minutes¹³. The computers will also go to sleep mode in the same amount of time, which also reduces energy and carbon emissions.

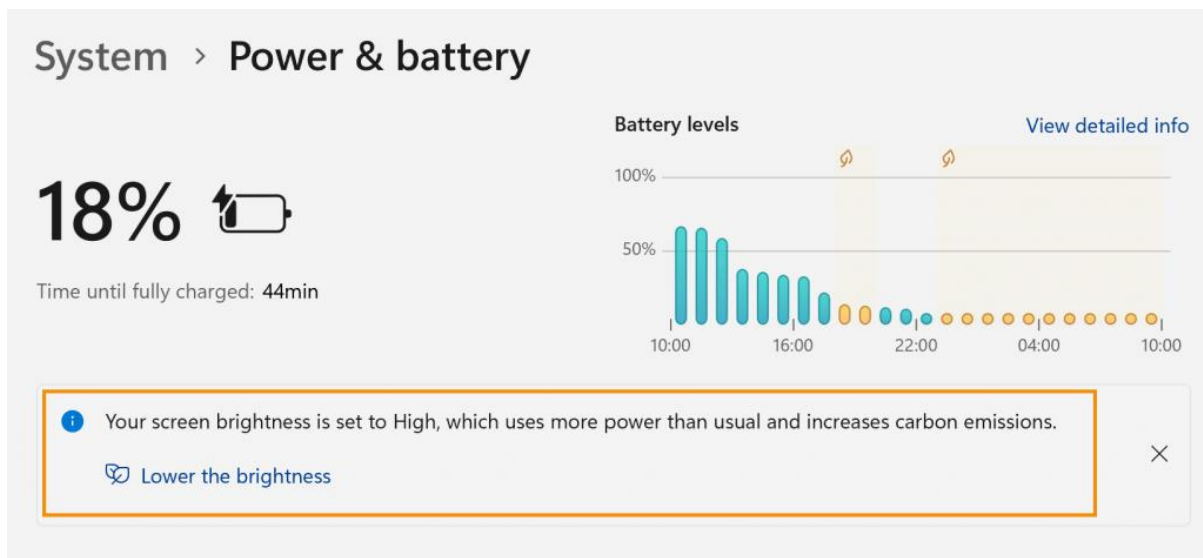


These new adjusted power settings apply for new installations of Windows 11 22H2 and later. If you upgrade from Windows 10 or another build of Windows 11, the settings you had will remain intact.

Recommendations for screen brightness

When the computer is on, and if you set the screen brightness to the highest possible, in the settings area you will see a warning that this setting will lead to more potential carbon emissions. Of course, this depends on if you have electricity coming from fossil fuels or renewable sources.

¹³ [Power efficient settings in Windows 11 \(microsoft.com\)](https://www.microsoft.com/en-us/windows/windows-11-power-efficient-settings)



Microsoft are building awareness on carbon emissions into Windows.

Energy recommendations

Starting with the March 2023 patches¹⁴ for Windows 11 22H2 (KB5022913) Microsoft introduce Energy recommendations in Windows. Depending on the type of computer you will see different options when you search in the Start menu for "Lower your carbon footprint by applying these recommendations", which is also found in Settings > System > Power and then Energy recommendations.

¹⁴ [Releasing Windows 11 Build 22621.1343 to the Release Preview Channel | Windows Insider Blog](#)

System > Power & battery > Energy recommendations



You're almost there—keep it up!

Apply energy saving recommendations to lower your carbon footprint

[Learn more](#)

Apply all

- ☒ Set the power mode for best energy efficiency >
- ☒ Set the screen brightness for best energy efficiency >
- ☐ Put my device to sleep after 3 minutes
When you apply this change, we'll also update the timeout setting for your screen
- ☐ Turn off my screen after 3 minutes
- ☐ Save power by optimizing screen contrast and brightness for the content shown
- ☒ Change brightness automatically when lighting around me changes >
- ☒ Turn off my screen saver >
- ☒ Stop USB devices when my screen is off to help save battery >

Energy recommendations in Windows 11 22H2 (since March 2023) is something that can be an energy saver.

How to upgrade to the latest Windows 11?

You can technically easily upgrade to Windows 11 – although it will require more effort if you are using Windows 10 for professional use in an organization. The first thing to do check is in Windows Update and do a search for updates. This will tell you if it is possible to upgrade or why not. As always, application compatibility needs to be verified and user testing for instance.

If you are in an organization upgrading to Windows 11 is easy if you are using Intune and/or Windows Update for Business or WSUS¹⁵. If you are using traditional solutions such as Configuration Manager or other third-party deployment tools, you can also deploy Windows 11 the same way you've been doing it for years.

It's great to see that Microsoft are designing Windows and building features into Windows that is great for the climate. It is also great to see that Microsoft creates awareness around the climate questions and carbon emissions by adding this to various parts of Windows. I expect this to be just the start and look forward to how this work will evolve in future updates of Windows 11.

¹⁵ [What's new for IT pros in Windows 11, version 22H2 | Windows IT Pro Blog \(microsoft.com\)](#)

Azure vs own Datacenter

Most organizations host their servers in their own datacenter, often placed close to the headquarters, with additional servers placed throughout the globe as branch offices if is not a national organization.

If you host your own datacenter, do you know how much and what variant of cooling you use to keep the datacenter cool? Do you know how much energy the datacenter requires?

Moving infrastructure to Azure can be good from a sustainability standpoint.

Migrate infrastructure to Azure

Microsoft in some regions provides zero emissions and zero waste datacenters, which is hard to compete with in your own on-premises datacenter.

As always, you need to create a business case but consider consolidating servers and potentially move infrastructure to Azure. There are examples of organizations that have moved entirely to Azure and closed their own datacenter.

Migrate applications to Azure AD

Better than just moving application servers to Azure is to evaluate if the applications can be replaced with Software as a Service (SaaS) options instead. This does not necessarily mean that you must migrate to another application or system, as most vendors of applications and business systems now shift more towards SaaS.

Depending on the maturity of the vendor, the SaaS version of the suite is often more limited in terms of features, and this is something that must be evaluated before making such a shift. The benefits of moving away from managing your own application servers are many, and only you can determine when that shift can potentially take place.

Make dynamic groups more efficient in Entra

Dynamic groups in Entra have had the possibility to use operators '**contains**' and '**notContains**'. As Microsoft has deemed those operators to be less performant, they should only be used when necessary. The first of those has been removed from the rule builder GUI but can still as of now be used by existing dynamic groups and via custom query.

A good replacement for the contains operator is **startsWith**. In fact, Microsoft recently changed for instance the basic Autopilot dynamic group to use **startsWith** instead of contains.

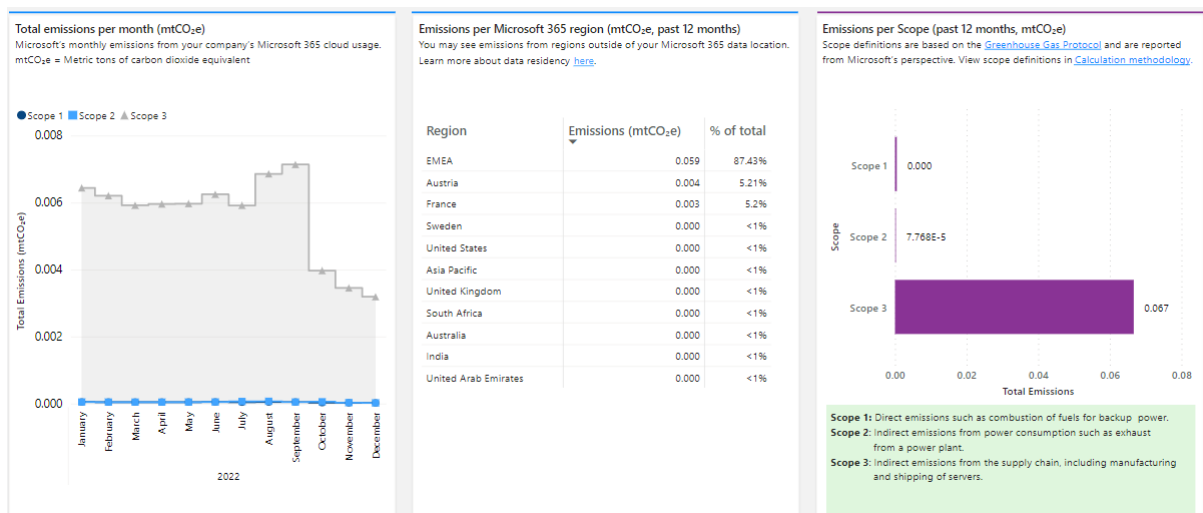
The reason I add this here is that the less CPU power is used, the less energy is needed to perform the evaluation, in the long run and on a broader scale reducing energy consumption which is always good.

Emissions impact dashboards that highlight your gain

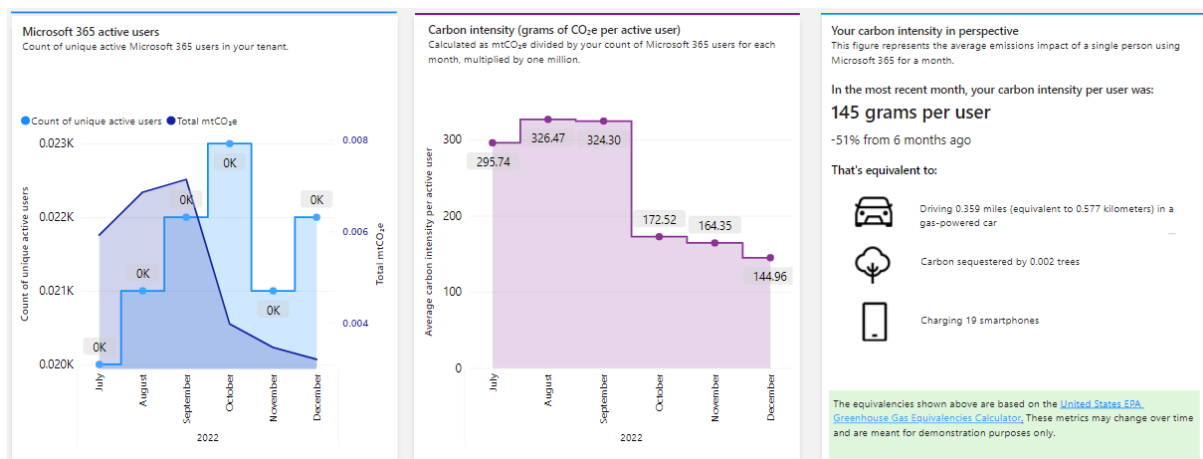
Microsoft provides two dashboards for highlighting and presenting emissions that come from usage of Microsoft 365 services as well as Azure services.

Microsoft 365 Emissions Dashboard

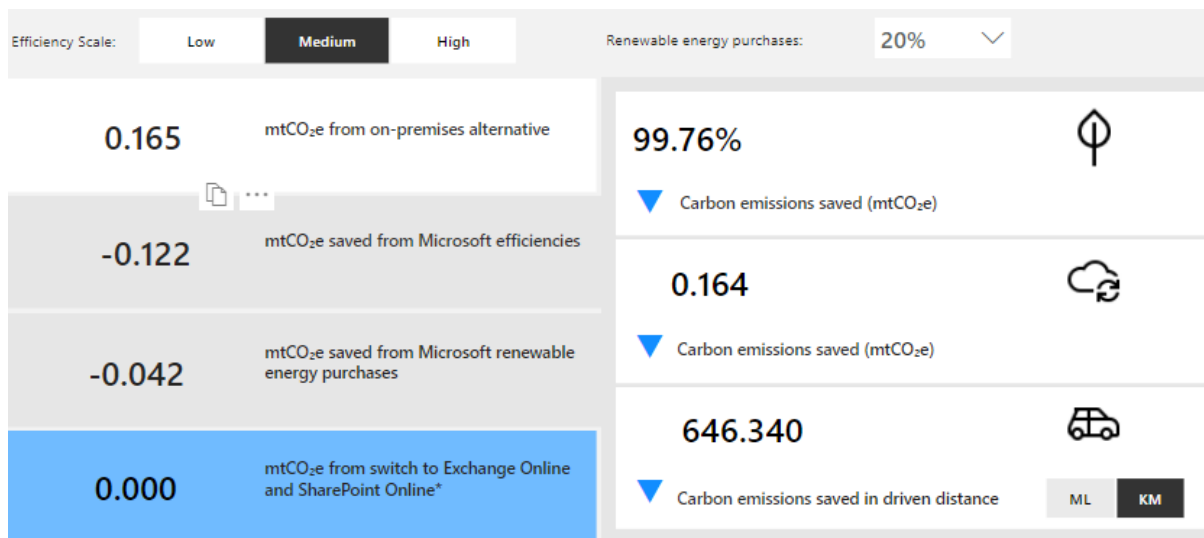
The Microsoft 365 emissions dashboard is great for showcasing your carbon impact for using Microsoft 365 cloud services. The numbers can be used directly for reporting to the organization carbon and climate figures. It is also useful for showcasing carbon impact in compared to hosting these services in your own datacenter, and you can easily match this to see what the gain is.



Monthly total carbon emissions as a result of Microsoft 365 services usage.



You will see how much carbon emissions you have per user, by using the Microsoft 365 services.

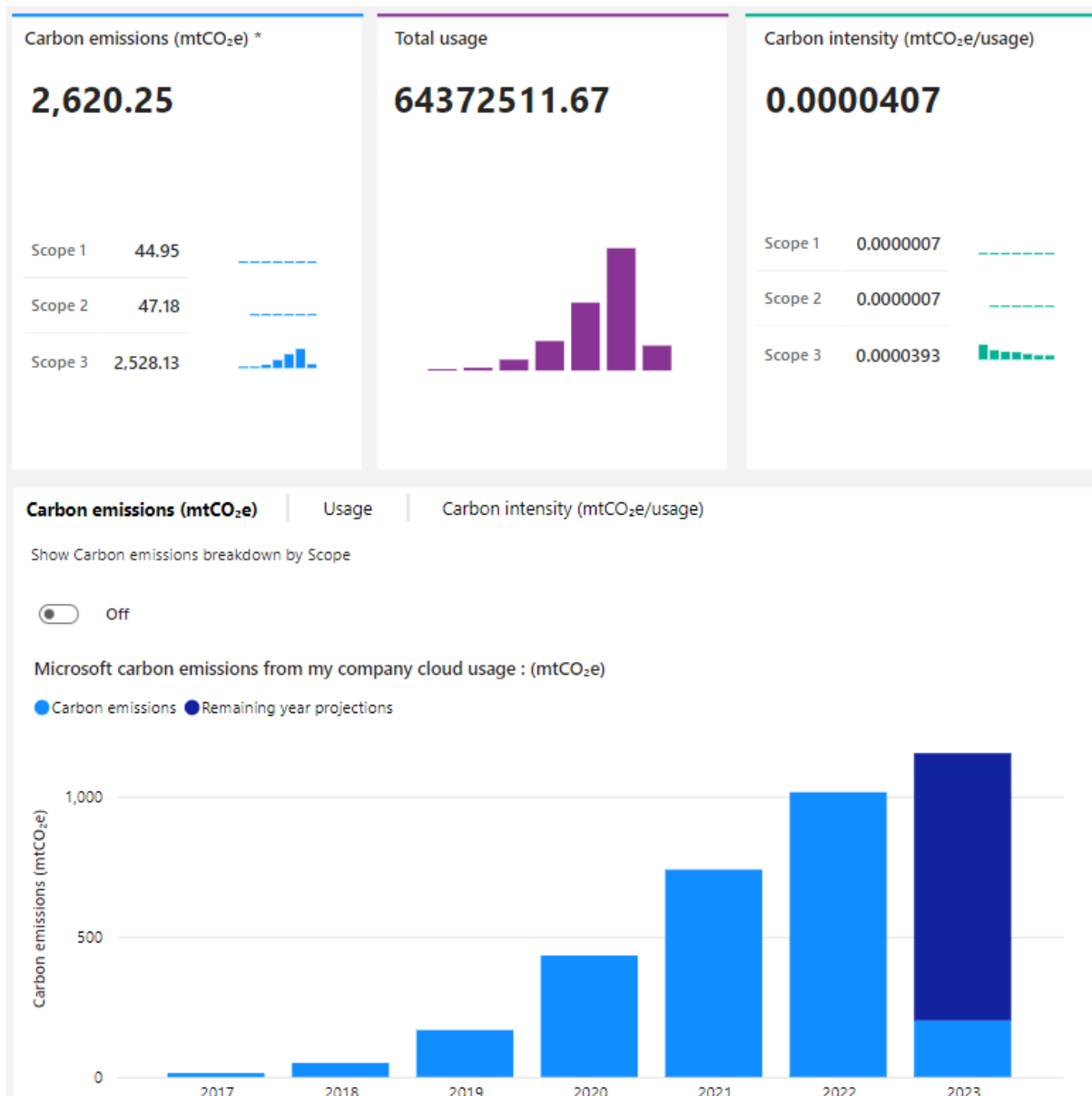


You will also see how much the gain is, in comparison to hosting these services in your own datacenter.

Getting started with the Microsoft 365 Emissions dashboard is quiet easy by following the guide at [Connect to the Emissions Impact Dashboard for Microsoft 365 - Power BI | Microsoft Learn](#). My recommendations for setting this up are creating an account with Report Reader role (according to least user privilege concept) and excluding this from MFA as this account will refresh data on a regular basis.

Azure Emissions Dashboard

The Azure emissions dashboard is great for showcasing your carbon impact for using Azure services.



Emissions over time is one example of what you can get from the Azure emissions dashboard, as well as Scope 1, 2 and 3 emissions.

By subscription name | By azure region | **By azure service**

Azure service	Carbon emissions (mtCO ₂ e)	Usage	Carbon intensity (mtCO ₂ e/usage)
Virtual Machines	775.79	20169900.00	0.0000385
Azure App Service	367.53	7836005.30	0.0000469
SQL Database	277.70	6521481.64	0.0000426
Storage	249.34	5993209.35	0.0000416
Log Analytics	168.73	4502890.51	0.0000375
Azure Cosmos DB	109.61	2407782.55	0.0000455
Azure Database for PostgreSQL	62.35	1959213.49	0.0000318
Azure Synapse Analytics	59.64	1679670.18	0.0000355
API Management	47.85	1218073.05	0.0000393
Total	2,620.25	64372511.67	0.0000407

Azure emissions sorted per service will highlight what Azure resources causes the most impact.

Setting up the Azure Emissions dashboard is a bit more complex than the Microsoft 365 Emission impact dashboard and can be setup by following this guide [Connect to the Emissions Impact Dashboard for Azure - Power BI | Microsoft Learn](#) from Microsoft.

Requirements for procurement

One the most efficient ways of driving sustainability in the right direction is to put requirements on your partners and start requesting more sustainable products (devices) as well as services. This can also mean that your partners are required to detail the sustainability aspects, not only from a climate perspective but also from a people perspective.

As I see it vendors that want to continue delivering products and services have already started to work with sustainability, but many vendors haven't and with you adding sustainability requirements in procurement and agreements, everyone will have to start working with sustainability or only sustainable vendors will be left.

Sustainable co-workers and people wellbeing

Time and stress do not go well together, especially as all our time is limited. Saving time and being proactive in IT will reduce stress in your workforce. That is the starting point here.

Copilot(s) and AI

If there is one thing that can really save time it is various AI technologies and services. In the Microsoft world I would like to highlight a few of the most prominent and time-saving ones.

The first one is Microsoft 365 Copilot which aids optimizing your entire workday by summarizing meetings, helping you create custom content and create presentations in seconds based on one or more documents.

A second and third copilot, yes, I put them in the same place, is one that is available in Windows and in the browser. It is Windows Copilot and Copilot respectively. In Windows you will find the Copilot in the taskbar, and you can always reach Copilot in the browser by browsing to <https://bing.com/copilot>.

A fourth copilot is for the group of end-users that is somehow developing code, and that is GitHub Copilot. It can help you with writing code, finding bugs, creating test cases or document and explain what the code does.

Microsoft 365 Apps

There are quite a few tools and things you can do in Microsoft 365 to widely reduce stress in your workforce and save time. In this section I will highlight some favorites of mine.

Shorten meetings to make them end earlier than 1 hour or half an hour

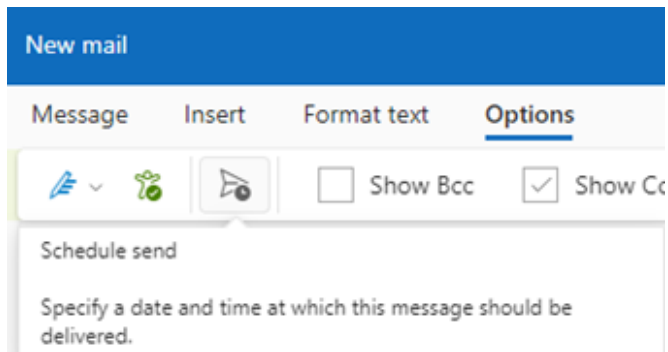
Are you familiar with back-to-back meetings where some people rush from one meeting to the other, constantly being late to the next meeting with the excuse "sorry I'm late, the previous meeting ran over"? Well, there is a fix!

If you short one-hour meetings down to 50 minutes, you leave room for a break which results in less stressed employees, that is for sure. At the same time, reducing half-an-hour meetings to 25 minutes is a good thing.

Having applied this myself for about two years now, I can say for certain that this setting will make a huge difference in reducing stress!

Central settings in Exchange Online

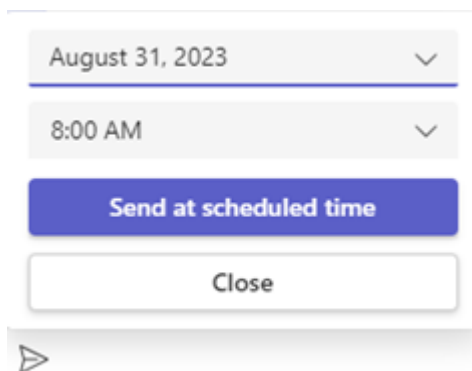
My strongest recommendation is to apply the settings on an organization-wide basis, using PowerShell as described in this article; [reduce your meeting time in Microsoft Outlook](#). That will eventually apply to your entire organization.



Use scheduled messages to send Teams chat messages only during business hours

Respecting work hours is something to strive for, and unless agreed, any chat messages in Teams should be sent so that the message is delivered during business hours.

This is easily achieved by right clicking the send button in a Teams chat and use the scheduling feature to send the message during business hours.



Quite time to prevent notifications on non-working hours and days

Notifications for work related messages when you are not on duty are often stressful and can contribute to a bad working environment. In an ideal world, you only get notifications when you are working, and when off duty you will not receive notifications from Teams or Outlook.

The great thing here is that there are technical solutions for making this reality, and the technical solution in this case is Microsoft Intune which provides the feature "Quiet time".

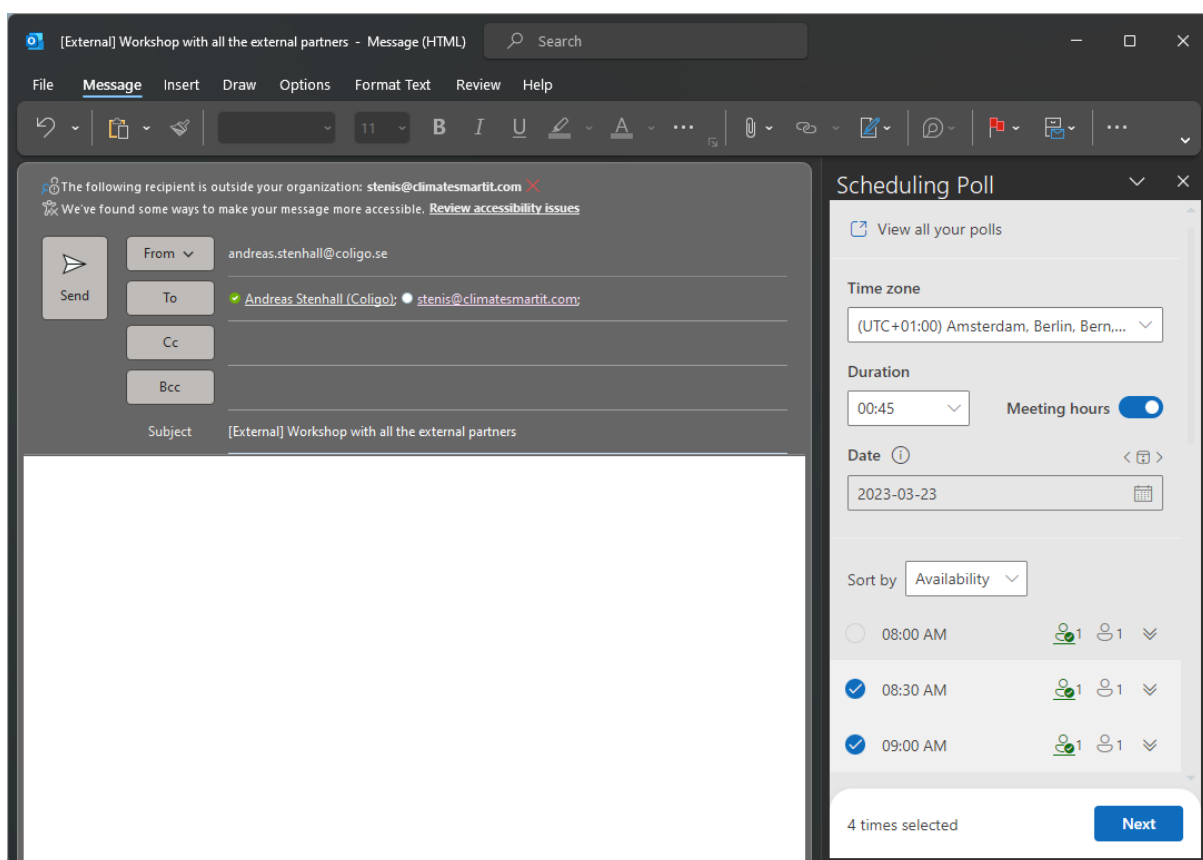
That means that if your workers mobile phones are managed by Intune, you can create "Quiet time" policies that will stop notifications for non-working hours, certain days of the week or a specific date range for instance.

For information on creating the policies and configuration to prevent notifications, see the article [Create quiet time policies in Microsoft Intune | Microsoft Learn](#)¹⁶.

Make it easier to schedule meetings and save time

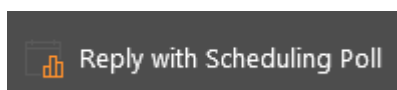
A problem when scheduling meetings with people outside of your organization is that you typically do not see their availability in their calendars. This often results in multiple turns of emails, chats, or phone calls to come to a meeting time that works for every participant.

There is help and to schedule such a meeting the most efficient way, use FindTime! Note that this has been a standalone add-in to Outlook for a few years but has recently as of Q1 2023 been integrated into Outlook with the name *Scheduling poll*.



Scheduling polls for your meetings with external parties is a real time-saver!

You have two options to initiate a poll; the first being selecting an email and then choosing Reply with Scheduling Poll button in the ribbon menu.



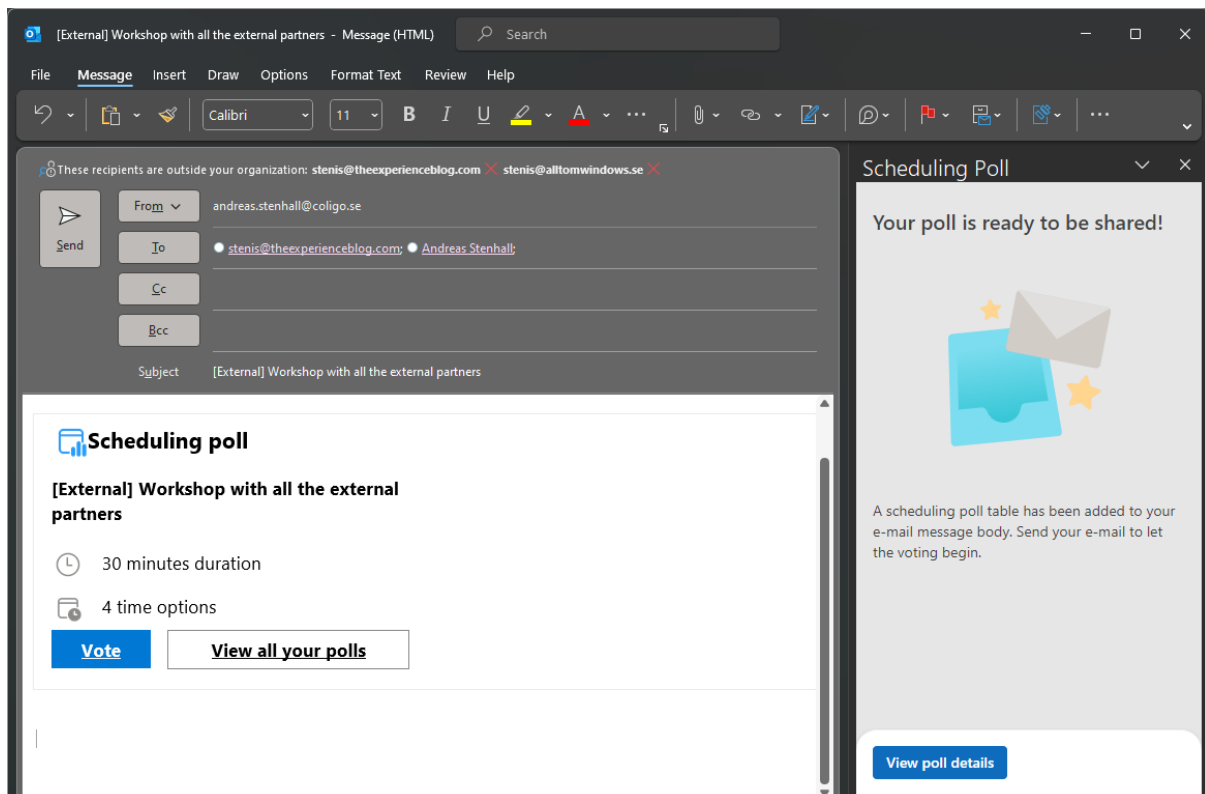
The second option is to start an email, add the participants and then the contents of the email. You then choose the New Scheduling Poll from the ribbon menu.

¹⁶ <https://learn.microsoft.com/en-us/mem/intune/apps/apps-quiet-time-policies>



After this you choose the times when you and others in your organization can have the meeting and when enough options to choose from are selected, you send the email. All selected meetings times are then entered into your calendar as tentative.

The recipients then get a link and can vote for the options that suit them, and when everyone has replied and a date is found, the calendar meeting is automatically scheduled and sent as a regular booking, all of which is done automatically.



When done, you send the email, and the recipients can start voting on the times that work for them.

The user then gets the email and can start voting.

[External] Workshop with all the external partners

🕒 30 minutes duration

📍 No location provided

📅 4 options provided

🌐 (UTC+01:00) Amsterdam, Berlin, Bern, R... ▼

🗳️ Scheduling poll

Choose times you prefer or are available

Tuesday, March 21, 2023

8:30 AM

Unknown

❤️ Prefer

No votes

✓ Yes

1 vote

✗ No

No votes

✓

9:00 AM

Unknown

❤️ Prefer

No votes

✓ Yes

1 vote

✗ No

No votes

✓

Wednesday, March 29, 2023

9:30 AM

Unknown

❤️ Prefer

No votes

✓ Yes

1 vote

✗ No

No votes

✓

10:00 AM

Unknown

❤️ Prefer

No votes

✓ Yes

1 vote

✗ No

No votes

✓

+ Propose another time

Vote

How others voted

Andreas Stenhall

The participant selects the times which work, and if any time is preferred as well.

Obviously, this means that the recipients must vote, because otherwise the meeting will not be scheduled. You can at any given time go to <https://findtime.microsoft.com> and sign in to view all polls, and from there you can also send reminders to recipients that have yet replied.

Bookable times

A rather new calendar event type is Bookable time (New event > Bookable time), currently only available in Outlook on the web (for Microsoft 365 Apps) at <https://outlook.office.com>.

This will be available for Microsoft 365 Apps for Enterprise as well during H1 2023 (which requires you to use a recent version of Microsoft 365 Apps for Enterprise). Note that Microsoft does not recommend sticking to the semi-annual channel release for Microsoft 365 Apps for enterprise as that will increase the time for new productivity features such as this to reach the end users.

The Bookable time calendar event type means you can let internal or external people schedule time with you, whenever it suits them and of course based on your availability.

For example, create a new Bookable time and choose a time period of say two weeks' time, where anyone with the link will be able to schedule, for example 1:1 meeting with you.

New bookable time - Calendar - andreas.stenhall@coligo.se

Create

1:1 Meeting

Slot duration 30 mins

Custom availability [Change availability](#)

Note: People can book time with you only during the hours you specify and when you don't have a conflict.

Privacy

Public
Everyone will be able to see this bookable time on your booking page.

Private
Only people with the link will be able to see this bookable time on your booking page.

Search for a room or location

Teams meeting

1:1 meeting - schedule when it works for you!

Tips

Introducing bookable time
Set your bookable time and let others know when you're available.
Share a link of your booking page that can be used by people both inside and outside your organization to schedule time with you based on mutual availability.

Your calendar remains private
Choose who can see your bookable time - anyone who has access to your booking page or only the people that you share a link with. In any case, the events on your calendar remain private to you.

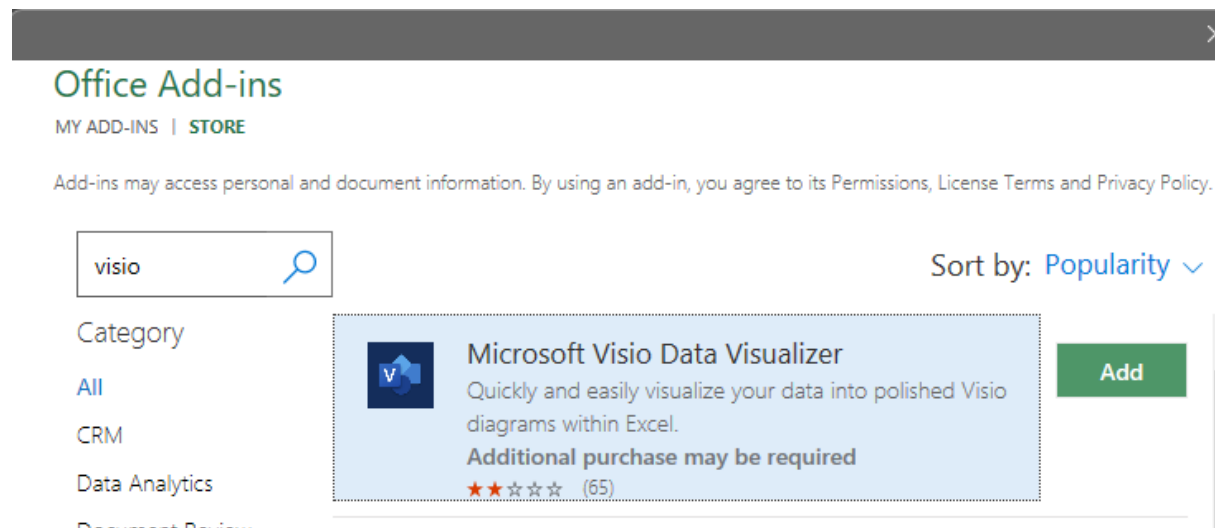
< 1 of 2 >

Letting co-workers or other people schedule bookings in your calendar is great and makes it easy for everyone.

Visio add-in for Excel

How many hours do you spend in Visio and creating the perfect links and moving objects around only to find that you will have to move quite a few objects and when you do, links and boxes are not aligned, and you have a lot of extra work to fix that!

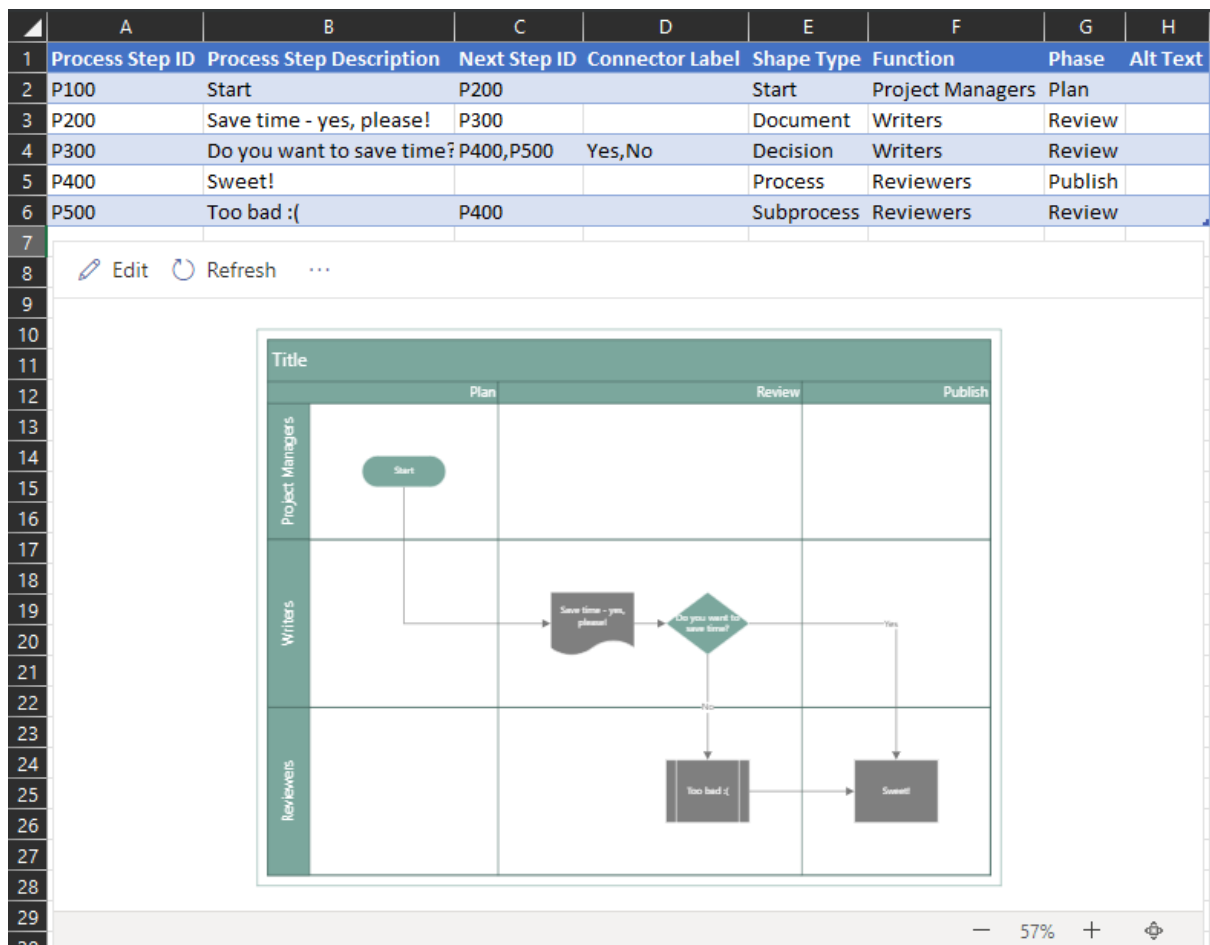
With the *Visio add-in for Excel*, you simply add line by line with dependencies and the Visio scheme is created automatically. This is a real time saver¹⁷.



The Microsoft Visio Data Visualizer add-in makes creating Visio schemes easier than ever!

Basically, you choose the Visio type of scheme that you want to create and off you go. You enter all the boxes, line by line, in a structured way and the Visio is generated automatically out of this. Had I known about this before, I would've saved hours and hours.

¹⁷ Thank you Per Öhman for this excellent tip!



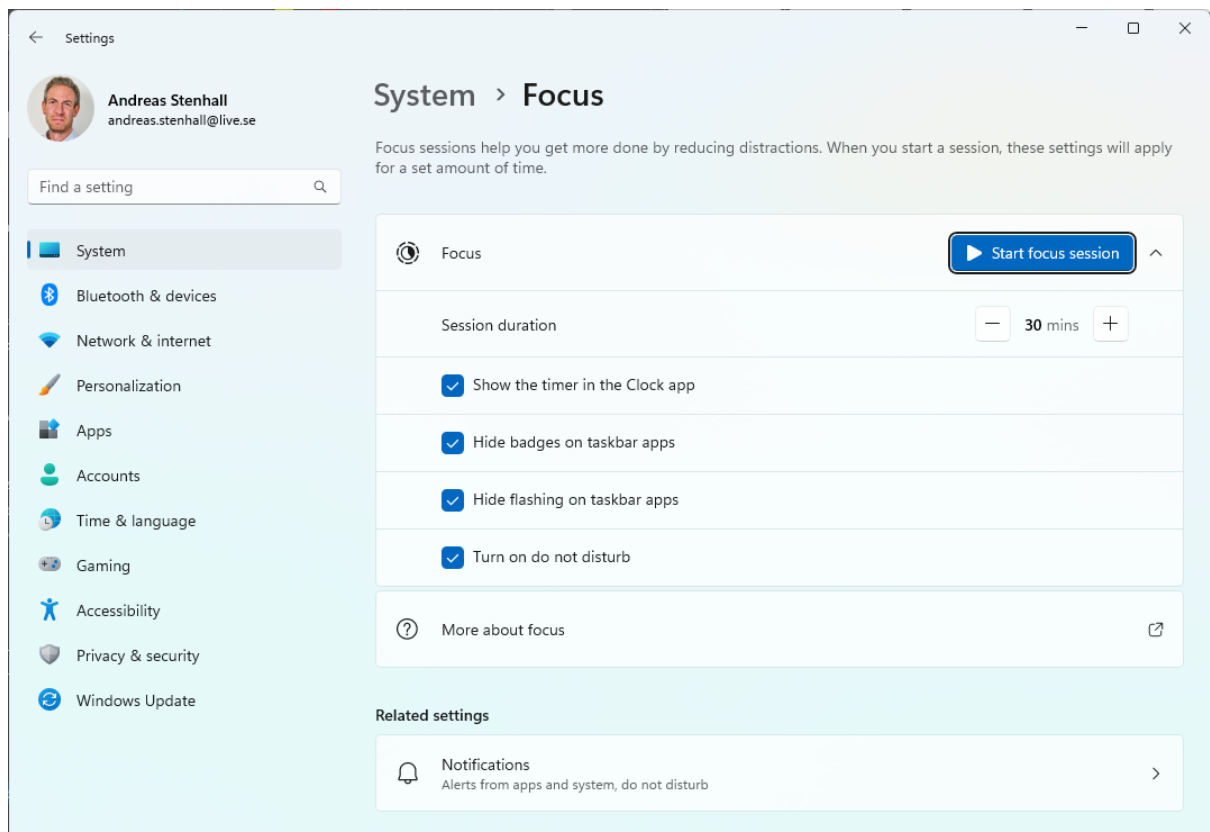
Structured data is the input needed for the add-in to create the automated Visio scheme.

Windows 11 – End-user features

Using the latest version of Windows 11 gives your users the best possible user experience when it comes to working without being disturbed and focusing on what needs to be achieved.

Focus on work with no annoying disturbances or distractions

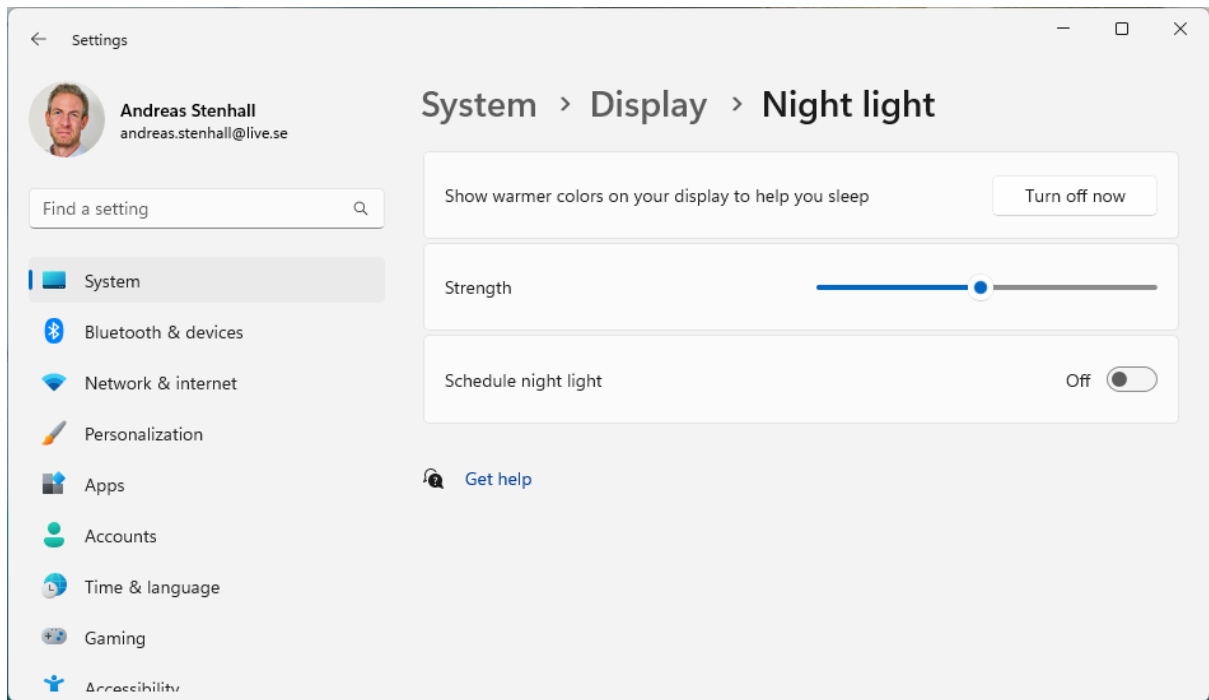
Windows 11 (22H2 and later) lets you enable Focus mode, which means that you for the time you specify can work undisturbed from all forms of notifications that otherwise will fly in and take focus away from the work you are doing.



Enable Focus mode to work without being disturbed or distracted.

Night light

Whenever working in the dark you can ease the strain on your eyes by enabling Night light.



Enabling Night light is typically good for your eyes.

Dictating instead of typing or using a mouse

Not only will this be a lot quicker, but it will also save your users' arms, hands, and fingers, relieving them from stress and letting them rest.

In Windows 11 22H2 you can press the Windows key + H and enable voice mode, where you can start talking and the voice assistance will write whatever you are saying. The only downside of this is that this awesome feature is not available for all languages!

Windows 11 – IT features

Now, we shift over to the IT side, and what the IT department can do to reduce stress and potentially also be proactive in this help.

Endpoint Analytics in Intune

I can only turn to myself to know that whenever my computer is not working as it should, it creates stress and frustration as I have work to carry out. A couple of examples can be that the computer is slow or that an application (or in worst case the computer) is crashing.

Endpoint Analytics is a part of Microsoft Intune. The value of Endpoint Analytics is that you can quickly identify problems with the computers that your end-users are experiencing. This is an excellent opportunity for you in IT to become true superheroes!

Using Endpoint Analytics, IT can proactively identify the bad user experience and act on it. This is the first time this kind of data is available for everyone to see and take action on.

Unfortunately, what I see in most customers and organizations is that IT is not ranked very high to say the least. Imagine if you can come to your end-users and say “hey, I notice that your computer is really slow, and we suggest this action to help you get a better work environment”. Or “we see that Excel is crashing a lot, can you give us some details in when this is happening so we can troubleshoot and fix the problem”?

With Endpoint Analytics you can virtually see or imagine the end-user’s frustration and problems in their daily work, and you have all the information you need to help them proactively.

Profile management will save time for end-users

The point with profile management is how to get back to a state which can make your users productive as soon as possible after a device reinstall or reset. This scenario of course also covers when you get a new device that replaces an older one.

Business impact

Most organizations have a policy that “we will troubleshoot a problem on a Windows device for X number of minutes, if we can’t solve it, let’s do a reinstall or reset”.

This might seem like a great policy that saves time for the service desk. But the numbers the management do not see is how much time have service desk have to spend on helping the user get back on track *after* the reinstall or reset? The same goes when user needs help transferring from one device to another as part of regular renewal of device. The potential time-saver here is enormous. If the user can get to a state that has everything the user needs available instantly, the user can become productive much quicker.

A consequence of having everything brought back quickly is that not only can the user be productive quicker, but the user will much more likely agree to a reinstall or reset when knowing the user can start working without hassle again. It might also mean that you can

reduce troubleshooting time from say 60 minutes down to 15 before you do a reinstall or reset. Overall, a real time-saver and money-saver!

Needs and goals

High-level goals:

- Getting back to a state where a user can start working as soon as possible after re-install or reset of the device, or even when switching device as part of hardware renewal.
- “Everything back as it was” (more details on this below). I.e., the time the user needs to spend on getting back to a state that just works as before needs to be minimized.

Expanded description of goals:

- All files and documents back as they were and accessible by user.
- All required applications back as they were. *(This is out of scope for this blog post as most organizations use ConfigMgr, Intune or a third-party software to deploy applications).*
- All relevant settings back:
 - Specific settings for line of business applications.
 - Outlook signatures and calendar settings etc.
 - Printers and printer settings.
 - Browser related settings, favorites, and history, including saved passwords.
 - Mapped SharePoint sites (Teams files) in File Explorer.
 - Settings for apps.

Solutions

Let’s have a look at what Microsoft technologies are available to solve the needs.

Personal files and documents

- **OneDrive for Business with Known Folder Move.**
If you have the possibility to use OneDrive for Business this is the best solution out there. Make sure to set the GPO or MDM setting to silently configure OneDrive to automatically have your OneDrive folder available after re-install or reset. Also set the policy setting “Enable Known Folder Move” to make sure that Desktop, Documents and Pictures folders are redirected to your OneDrive Folder. Reality check, do you know anyone who do NOT save stuff they need on the desktop? :)
- **Work Folders** (which I typically call the internal OneDrive).
Setting up [Work Folders](#) is easy, the role has existed in Windows Server since 2012 R2, thus requires a Windows File Server to setup and enable. Once you’ve setup Work Folders, use good old redirection of Documents and Desktop folders (and maybe Pictures as well) pointing to the local Work Folders directory just like it is done with Known Folder Move for OneDrive for Business.
- **Folder Redirection + offline files.**
Only two words: *Stay away!* (And migrate as soon as possible to OneDrive for Business or Work Folders if you are already using it). For some organizations I have worked with I have made it opt-in to use offline files, clearly stating the potential risks when opting in. *Offline files cause user problems and have a very high risk of user data loss.*

Common or shared files and documents

- **SharePoint Sites** (Teams files directories).
Many users prefer to work with SharePoint sites and Teams files by syncing them to work with the files in File Explorer. There is no official way of having these remapped automatically after a reinstall or reset of a Windows device.

Settings

- **User Experience Virtualization (UE-V).**
I have many times referred to [UE-V](#) as the *best thing since sliced bread*. It is a technology that was released about 10 years ago, with the intent to provide roaming of settings for Windows and applications (both Microsoft and any third party), using on-premises file shares. It also roams printers if you are not deploying those through other means.

Since Windows 10 version 1607 UE-V is integrated in the operating system. I've used UE-V quite a lot and this is a good technology to get many settings back after a reinstall. In one case I could do an F12 reinstall of a Windows 10 device before going to lunch and after lunch I logged in and started working instantly, with all settings back. Those were the days!

Over time as applications are moving to the app's world, UE-V has basically become less effective in its job. Also, after adding UE-V to Windows version 1607, UE-V has not gotten much love from Microsoft and as no development has been made for almost six years this is still something that most will benefit from, but sad to see that Microsoft do not care for this.

- **Enterprise State Roaming.**
About the same time that UE-V was integrated into Windows 10 we also saw the introduction of [Enterprise State Roaming](#). This is a technology that use the cloud (a private protected and untouchable area) in Azure to store profile settings that roams with the user. For instance, background image, Windows theme settings and some other stuff is being roamed when enabling this through Azure AD. Sad to say, this feature is facing the same destiny as UE-V, with no new features or changes for the last six years or so.

Actually with Windows 11 the number of settings that roam using Enterprise State Roaming have decreased, now only roaming passwords, some Windows settings, and language preferences.

- **FSLogix profiles.**
Microsoft bought FSLogix and with that obtained their profile technology. This is a container-based profile solution used primarily in remote Windows solutions, such as Azure Virtual Desktop. Although the technology should be possible to use on physical machines as well, I haven't many details regarding this and haven't tried it out myself. One reason for this is that [FSLogix profiles](#) requires an Active Directory and is not yet (per January 2022) supported for Azure Active Directory, although this is announced in the future.
- **Edge profile sync.**
The new and lovely Edge has profile sync with roaming built-in which is very much appreciated. Sign in with your school or work account and off you go! You'll also find

some additional information on [Configure Microsoft Edge enterprise sync | Microsoft Docs](#).

- **Outlook settings roaming.**

Finally you can roam your email signature and a bunch of other settings to the cloud – without doing anything other than making sure this option is enabled. Take a look at [Outlook roaming options](#) to get more information about this one.

Note 1: Roaming profiles take care of both files and settings but like with folder redirection and offline files: Stay away from roaming profiles to make your life happier.

Note 2: As apps in Windows always store their configuration and user specific data in a standardized location. That is

C:\Users\%username%\AppData\Local\Packages\%AppName%\ which means Microsoft should be able to provide a supported way of roaming these settings.

What settings can you use?

Depending on how your Windows devices are managed you can use some or all these technologies. This is applicable for **Windows 10, Windows 11, Windows 365** as well as **Azure Virtual Desktop**. Note: All technologies below are not necessarily supported for all physical and virtual use cases.

	Active Directory Joined	Hybrid Azure AD Joined	Azure AD Joined
User Experience Virtualization (UE-V)	Yes, pointing to file share	Yes, pointing to file share	Yes, pointing to OneDrive for Business local folder*
Enterprise State Roaming	No	Yes	Yes
FSLogix profiles	Yes	Yes	No (not supported yet)
Edge profile sync	Yes	Yes	Yes
Outlook settings roaming	Yes	Yes	Yes

Table 2-1. Summary of what profile technologies are available for various Windows device join types.

* For configuration, this is a great start: [Manage User Experience Virtualization on the Modern Desktop | Aaron Parker \(stealthpuppy.com\)](#)

Support matrix

	Windows 10/11 – Physical	Windows 10/11 – VDI	Windows 365	Azure Virtual Desktop
User Experience Virtualization (UE-V)	Yes	Yes	*	*
Enterprise State Roaming	Yes	Yes	Yes	Not supported**
FSLogix profiles	Not supported	Yes	Not supported	Yes***

Edge profile sync	Yes	Yes	Yes	Yes
Outlook settings roaming	Yes	Yes	Yes	Yes

Table 2-2. Summary of what profile technologies are supported officially by Microsoft.

* Technically it will work, but likely not supported by Microsoft for Windows 365 nor Azure Virtual Desktop.

** Supported only for personal pools – not multi-session Windows 10 or 11, nor Windows Server.

*** For Azure Virtual Desktop, currently there is no support for Azure AD Joined devices.

Summary of profile management

With the existing Microsoft tools and technologies, you can reach a state where most of the stuff you want back actually is configured and brought back automatically. Getting the files and documents back is easy. Edge profile sync and Outlook settings roaming are a no-brainer and should be used by everyone.

UE-V and Enterprise State Roaming are not developed anymore but they still fill a purpose and can be very useful to save time, *starting today*, as they are very easy to get started with and has a very low implementation cost. FSLogix profiles are primarily intended for datacenter hosted solutions.

With those facts, there is a strong need for Microsoft to strengthen profile management to make it the true time-saver it can be. IT management would very much appreciate it I can assure. But the ones that would appreciate this the most are the end users!

Microsoft Viva

When talking about sustainable co-workers it is impossible not to mention the Microsoft Viva platform. This alone could be a white paper and I will only touch this on the surface. The Viva platform is created among other goals to improve the wellbeing of your co-workers.

If you are using the Microsoft 365 Apps platform you have probably seen the email that comes with a weekly summary which will help you identify trends and how you spend your work week, in terms of participation in meetings, email conversations and chats and calls.

This is just the tip of the iceberg and there is a lot more that viva provides.

Accessibility: Software and hardware

Microsoft has as far as I can remember, which is quite many years, been in the front line of making Windows client operating systems work very well for any user, regardless of potential limitations or difficulties. This combined with adaptive hardware devices that make controlling Windows even easier empowers any user to be as productive as possible.

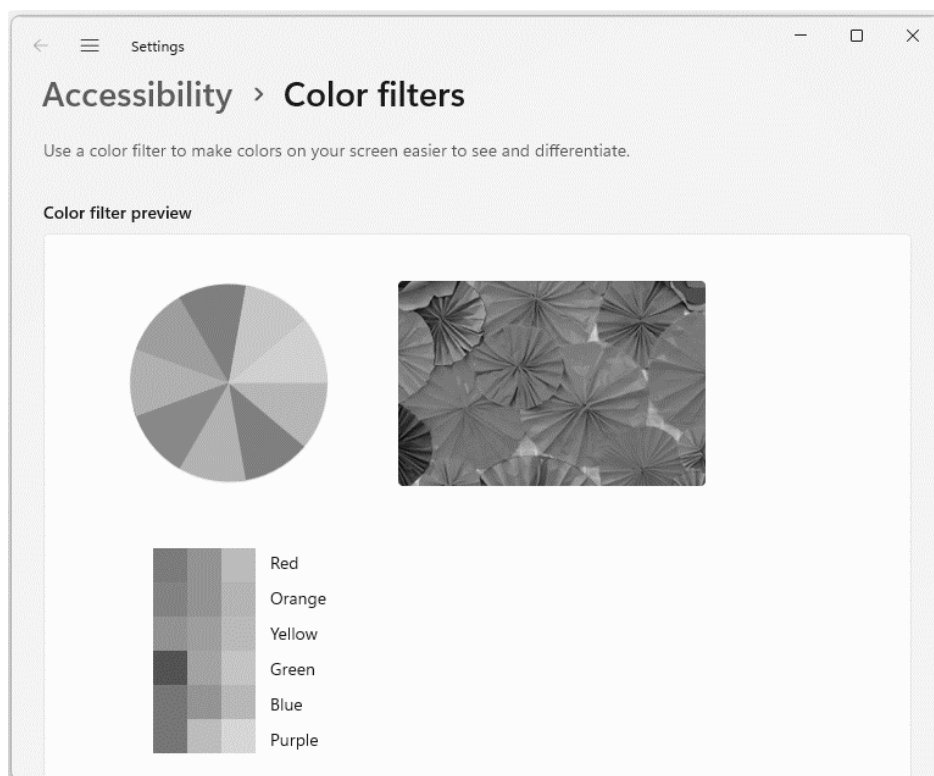
Software

With software any tools can be created to ease the use of relevant apps or applications. Windows 11 provides a great foundation in terms of accessibility, both with the operating system user interface as well as additional tools in the operating system

Windows 11

Microsoft has focused a lot on accessibility features in Windows over the years and by using the latest version of Windows 11 you will have the best accessibility tools and options at your disposal. The really great thing is that it is now easier than ever to start all the accessibility tools such as Narrator or Live Captions by using Windows Copilot to ask it to start the tools quickly.

A great summary of all accessibility tools is available at <https://www.microsoft.com/en-us/windows/accessibility-features>.



One example of an accessibility tool in Windows is Color filters, which means you can add high contrast or gray scale colors to the entire Windows user interface.

Eye control Windows

Windows 11 has built in support for eye tracking devices that let you as a user control Windows with your eyes instead of a traditional mouse or touchpad. Get started <https://support.microsoft.com/en-us/windows/get-started-with-eye-control-in-windows-1a170a20-1083-2452-8f42-17a7d4fe89a9> and also see what hardware devices are supported.

Hardware

Regardless of the operating system and software features, they cannot solve all difficulties. This is why it is important to have specially designed hardware that will provide the aid that software cannot.

Adaptive devices

In March 2024 Microsoft made all their adaptive devices available to commercial customers. This means that anyone can purchase devices that will aid any user not being able to use a traditional keyboard and mouse.

All adaptive devices are published in Microsoft Store at <https://www.microsoft.com/en-us/store/b/accessible-adaptive-devices-accessories>



Some examples of the adaptive devices that Microsoft offers.

Source: <https://blogs.windows.com/devices/2024/03/21/introducing-surface-pro-10-for-business-and-surface-laptop-6-for-business/>

Summary

To summarize this white paper, there are quite a lot of things you can do to both reduce climate impact and at the same time also provide the best available work environment for your end users. Keeping your co-workers less stressed is an important key to sustainability in your organization and reducing climate impact is also important.

With this white paper I hope you have gotten some inspiration on how to start working with at least some of the recommendations from this white paper.

If you have any questions, want to collaborate in these topics or have any comments, please reach out.

Together we can make a difference!