

Whitepaper

Prematurely retired - The impact of the end of Windows 10 support on the device stock in the EU27

Commissioned by:

Refurbed Marketplace GmbH

Authored by:

Paul Rudorf (paul.rudorf@fraunhofer.at)

Sascha Thöny

Fraunhofer Austria Research GmbH

Theresianumgasse 7

1040 Vienna, Austria

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1 Executive Summary

With the end of support for Windows 10 (regular support in October 2025; final end after the ESU transition period expires in October 2027 for private users and in 2028 for companies), affected devices permanently lose their supply of security updates, regardless of whether they continue to function perfectly from a technical standpoint [1]. This creates software-induced obsolescence, which encourages the premature replacement of technically functional hardware and thus runs counter to the goals of resource conservation and the circular economy.

A methodologically derived estimate shows that, of around **74 million Windows 10 devices in the EU27** (as at 1 January 2026), an estimated **41 million devices** will continue to run Windows 10 beyond the second cut-off date (October 2026/27). The primary reasons for not migrating to Windows 11 are technical incompatibility and deliberate rejection, as well as organisational inertia in the commercial sector. The environmental assessment, based on a simplified life-cycle model, highlights the potential for extending the useful life of devices. Extending the useful life by just one year could, for 41 million devices, prevent around 0.32 million tonnes of CO_2 emissions and approximately 1,172 tonnes of electronic waste. To put this into perspective: the proportion affected by obsolescence (41 million Windows 10 devices) corresponds to the annual CO_2 sequestration capacity of a forest area of over 500 km^2, which is equivalent to the area of Lake Constance.

From this, the whitepaper derives concrete recommendations: time-limited interim solutions for devices that cannot technically be upgraded, targeted migration campaigns in the commercial sector, prioritising refurbished rather than new devices when replacement is necessary, and policy options for extended security support. The underlying methodology, for both the quantity estimate and the environmental assessment, is disclosed transparently, including its assumptions and limitations.

2 Introduction and Problem Statement

Regular support for Windows 10 ended on 14 October 2025. Since then, Extended Security Updates (ESU) have been available free of charge to private customers running version 22H2 (prerequisite: a Microsoft account), but they will expire for good in October 2027 at the latest [1]. Commercial customers can extend until 2028, but this incurs a tiered fee of €60, €120 and €240 per device per year [2]. From that point on, all remaining Windows 10 devices will be permanently without manufacturer support, even if they continue to function perfectly from a technical standpoint.

This situation creates a form of obsolescence that differs from classical technical or economic obsolescence: the hardware itself remains functional but loses its safe usability once software maintenance ends. Users are thus faced with the decision of either replacing a technically intact device or continuing to work with an increasing security risk.

From a societal and environmental perspective, this so-called "forced" or "software-induced" obsolescence is of particular relevance. The premature replacement of technically functional devices triggered by the end of support contradicts the goals of resource conservation and the circular economy and generates avoidable environmental burdens such as CO_2 emissions and electronic waste.

This whitepaper therefore pursues two objectives: first, to quantify, in a methodologically transparent way, the installed base of devices in the EU27 affected by this end of support; second, to estimate the associated environmental impacts, in order to provide a sound basis for discussing options beyond complete device replacement.

3 Background: From End of Support to Obsolescence

3.1 Technical Significance of the End of Support

With the end of support, Microsoft no longer provides free security updates, bug fixes or technical support for Windows 10. Private users and companies can obtain a time-limited extension of security updates through the Extended Security Updates (ESU) programme, which is available free of charge in the private sector. This transition period ends in October 2027 at the latest. From that point on, newly discovered vulnerabilities in Windows 10 will no longer be fixed. Since Windows 10 devices already demonstrably pose a significantly higher security risk than Windows 11 devices today, this risk will increase further once updates cease for good.

3.2 Why Not All Devices Switch to Windows 11 (Cannot or Will Not)

Switching to Windows 11 requires certain hardware prerequisites (including TPM 2.0, Secure Boot and a supported processor generation). Even so, part of the existing Windows 10 installed base will not make the switch. The reasons can be divided into technical and non-technical causes.

Technical Reasons (Upgrade Not Possible)

Some devices simply do not meet the minimum requirements for Windows 11 and therefore cannot be upgraded through regular channels. The extent of this technical incompatibility differs markedly between usage segments:

- **Commercial sector:** According to an analysis by Lansweeper (as at July 2026), only around 2.8% of the remaining Windows 10 devices are technically unable to upgrade to Windows 11. Three reasons explain this low figure:
    - **Short replacement cycles:** Companies frequently replace their hardware through leasing or maintenance contracts with a fixed term, regardless of whether the device still works. A business laptop is replaced after just 3 years on average (hagel-it.de).
    - **Longer-lasting business hardware:** Devices such as the Lenovo ThinkPad, HP EliteBook or Dell Latitude work reliably for 4–5 years and therefore last longer than comparable consumer devices.
    - **TPM 2.0 often already present**: Many corporate devices had a TPM 2.0 chip installed even before Windows 11, because security features such as BitLocker required it.

  The commercial device fleet therefore consists predominantly of comparatively young, Windows 11-capable devices. The remaining 2.8% of devices that cannot be migrated are found mainly in industries with specialised end devices, such as healthcare/pharma, retail/consumer goods and manufacturing, where laboratory equipment, point-of-sale

systems, industrial controllers or certified specialist software make a fresh installation difficult or impossible.

- **Private sector:** Here the technical incompatibility rate, at an estimated 40–50%, is considerably higher, as private PCs are older on average and are less often renewed in short cycles.

Non-Technical Reasons (Upgrade Possible, but Not Wanted or Not Carried Out)

Even where a device meets the hardware requirements, a considerable share of them are not migrated for economic, organisational or personal reasons:

- **Deliberate rejection (mainly private sector):** Recent reports cite data protection concerns [3] and reservations about the stronger AI integration (Copilot) in Windows 11 [4].
- **Lack of urgency:** The free ESU extension until October 2027 removes the immediate pressure to act, an effect that was already observed in comparable form at the end of support for Windows 7.
- **Organisational inertia (mainly commercial sector):** Even devices that can be migrated without technical difficulty are sometimes switched over in companies only with a delay, for example because of procurement cycles, test phases for specialist applications or scarce IT resources, without any deliberate rejection.

This mix of technical incompatibility on the one hand and economically, organisationally or personally motivated staying put on the other leaves a considerable installed base of devices that are still used with Windows 10. This installed base forms the foundation for the quantity and environmental impact estimates presented in Chapter 5.

4 Methodology

4.1 Estimating the Affected Installed Base of Devices

The order of magnitude of the installed base affected by Windows 10 obsolescence is derived using a multi-stage funnel model that, starting from the total installed base of Windows devices in the EU27, narrows down step by step to the target group that is actually relevant:

1. **Total installed base** of Windows devices in the EU27 (basis: Ecodesign Impact Accounting (EIA) 2024 report [5], cross-checked against Gartner [6] and IDC market data [7] [8] [9])
2. **Windows 10 market share** within this installed base (Statcounter, as at July 2026 [10])
3. **Split by usage segment** private vs. commercial (derived from Eurostat usage rates [11])
4. **Technical upgrade capability** per segment (Lansweeper analysis [12])
5. **Realistic migration rate** at the second cut-off date, differentiated by segment (Windows 7 precedent, industry statements [13])

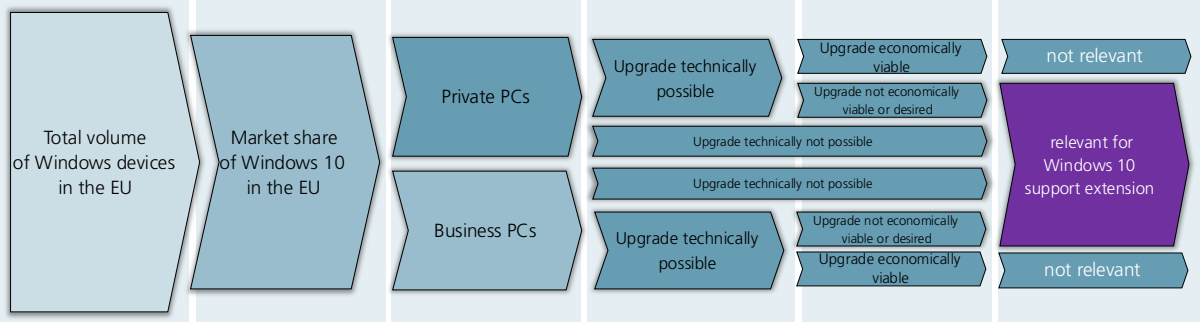


FIGURE 1: FUNNEL MODEL FOR DETERMINING THE WINDOWS 10 INSTALLED BASE

Each step is based on at least one publicly available source and, where possible, was cross-checked against a second independent source. For metrics without current primary data (e.g. the exact private/business split or the realistic migration rate), conservative assumptions were made. The result of this model (EU27 total and individual Member States) forms the quantity basis for the subsequent environmental assessment.

4.2 Model for Calculating the Environmental Impact

To assess the environmental relevance of premature device replacement, two methods are used. They are based on the same emission and weight assumptions but differ in how the results are presented : Method 1 shows the **annual saving per additional year of use**, Method 2 the cumulative saving **over a defined period X**.

For both methods, a use-phase energy demand that is constant across device generations is assumed. This simplification is based on the rebound effect described in the literature: efficiency gains of newer processors are largely offset by more intensive use and higher computing load, so that energy consumption per device barely changes across generations [14]. Exact compensation has not been demonstrated, but the assumption tends to be conservative.

Method 1: Amortisation Approach – Savings per Year of Use

The one-off emissions of a Windows 10 device, in this case around 6 years old (approx. 360 kg CO_2 EU-wide), are allocated proportionally to the period of use, by way of example for 6 and 7 years. The difference between the resulting annual values gives the CO_2 saving from one additional year of use. Analogously, the device weight of around 1.8 kg is allocated in order to determine the corresponding e-waste saving. The result is a compact annual key figure.

Method 2: Marginal Approach – Savings over a Period X

Here, the production emissions of the old device are regarded as sunk. Only the emissions newly triggered by a new purchase are relevant. The cumulative emission difference between a 6-year and a 7-year replacement cycle is compared over a period X. Every new purchase causes a production peak, so a longer period of use is always lower in emissions. The decisive factor is therefore the length of the replacement cycle. Anyone who replaces less often triggers correspondingly fewer production peaks over the period X, and the cumulative difference results purely additively from the number of avoided new purchases.

Further influencing factors not quantified here (type of replacement device, fate of the old device, development of the electricity mix, repair and end-of-life effects) are named in Chapter 8 (Limitations).

Classification: Chapter 5 is based on Method 1, as it can be calculated directly and is immediately understandable. Method 2 is taken up in Chapter 6 as a methodological outlook for more in-depth follow-up analyses.

5 Results

5.1 Scale of the Affected Installed Base of Devices

Based on the funnel model described in Chapter 4.1, the following installed base of devices results for the EU27 (as at 01.01.2026):

Metric	**Value (rounded)**
Total installed base of Windows devices, EU27 (01.01.2026, conservative [5])	389 million
Windows 10 installed base (market share 25.2% [10])	**74 million**
of which business PCs (approx. 40% [15])	30 million
of which private PCs (approx. 60% [16])	44 million
Theoretically relevant (all Win10 devices, EU27)	74 million
Realistically relevant (after 2026/27 migration, EU27)	**41 million**

In the commercial sector, only around 2.8% of Windows 10 devices cannot technically be upgraded. In the private sector, by contrast, approx. 55% cannot technically be upgraded, and even of the technically capable devices only 40–60% migrate. In total, around 41 million devices (realistic potential) therefore remain on Windows 10 beyond the second cut-off date, which corresponds to roughly 55% of the original Windows 10 installed base.

Broken down by population share, the following orders of magnitude result for the EU27 Member States:

TABLE 1: WINDOWS 10 DEVICE QUANTITIES AS AT 2026*

Country	Total Windows 10 devices [million]	Devices that will not upgrade to Windows 11 [million]
EU 27	74.14	41.07
Germany	10.54	5.84
Austria	1.24	0.69

*The detailed list at country level (EU27) can be found in the Appendix.

5.2 Environmental Impact

Based on Method 1 (Chapter 4.2), a CO_2 saving of around 7.8 kg per device per additional year of use results, along with a corresponding avoidance of e-waste. Extrapolated to the EU27 installed base of devices, the following orders of magnitude result for one additional year of use:

TABLE 2: ENVIRONMENTAL SAVINGS POTENTIAL EU27*

	Theoretical savings potential: all current Win10 devices can be used for one more year (74 million devices)	Realistic savings potential: only those devices that cannot technically be migrated or are not migrated for other reasons (41 million devices)
CO_2 saving	approx. 0.58 million t CO_2	approx. 0.32 million t CO_2
E-waste avoided	approx. 2,115 t	approx. 1,172 t

*The detailed list at country level (EU27) can be found in the Appendix.

6 Discussion, Recommendations and Conclusion

Interpretation of the Results

The analysis shows that, despite the extended ESU transition period until October 2026/27, the end of support for Windows 10 affects a considerable installed base of devices: around 41 million devices in the EU27 are expected to make use of the extension until 2027 and, in part, to continue to be operated beyond this second cut-off date without a switch to Windows 11. The underlying causes differ markedly between usage segments: in the commercial sector, organisational inertia in the case of devices that can in principle be migrated is the main factor; in the private sector, by contrast, it is a combination of technical incompatibility and deliberate rejection of the switch. The environmental assessment (Chapter 5.2) also makes clear that extending the use of these devices, rather than a blanket replacement forced by the end of support, holds a noticeable potential for saving CO_2 and conserving resources.

Recommendations

From these findings, graduated courses of action can be derived for different target groups:

- **For devices that cannot technically be upgraded (mainly private sector):** Interim solutions such as a secured Windows 10 boot medium (e.g. a USB stick with a hardened configuration) can extend safe use for a limited period without forcing immediate device replacement.
- **For technically upgradeable but unmigrated devices (mainly business sector):** Here, the obstacle is less a technical hurdle than organisational prioritisation. Targeted migration campaigns, clearly communicated internal deadlines and early testing of specialist applications for Windows 11 compatibility can raise the migration rate.
- **For the replacement case (where replacement is unavoidable):** Choosing a refurbished rather than a new device considerably reduces production-related emissions and should be anchored more firmly as the default option in procurement guidelines (private and commercial alike) [17].

- **For policymakers and manufacturers:** Security support that is extended or expanded beyond 2027 for devices without TPM 2.0/Secure Boot capability would directly address the obsolescence problem quantified here, without users having to choose between a security risk and premature device replacement.

Conclusion

In the EU27, the end of support for Windows 10 meets an installed base of devices that will continue to be operated to a relevant extent for years to come, with corresponding security and environmental implications. This estimate shows that even a single additional year of useful life, multiplied across this installed base, produces environmental effects of an order of magnitude that cannot be neglected. A premature replacement of technically functional devices triggered solely by the end of support is thus in clear tension with the goals of resource conservation and the circular economy.

Outlook

Two starting points in particular lend themselves to more in-depth follow-up analyses: first, the marginal approach (Method 2) outlined in Chapter 4.2, with cumulative accounting across several user types and time horizons, in order to substantiate recommendations in a more target-group-specific way; second, a refinement of the primary data basis for the private/business split and the technical upgrade capability in the private sector, for which no current, granular surveys are available at present.

7 Limitations and Assumptions

This estimate follows a transparent but approximate approach and should accordingly be read with the following limitations in mind:

Installed Base of Devices (Chapters 4.1 / 5.1)

- The EU27 total installed base is based on a linear interpolation between two reference years of the EIA report and a conservative safety discount; it is a cross-checked estimate, not an exact count.
- In the absence of current primary surveys, the private/business split (60/40) and the technical upgrade capability in the private sector (approx. 55% not upgradeable) rely on press and market data with a wider range than the comparatively well-documented business figures from Lansweeper.
- The realistic migration rate (40–60% private, 80–90% commercial) is an estimate by analogy based on the Windows 7 precedent and current industry assessments, not a robust forecast.
- The national distribution is based on population shares as an approximation, since a current Eurostat figure on household-level PC ownership is not available; regional

differences in purchasing power, level of IT equipment or economic structure are therefore not reflected.

Environmental Model (Chapters 4.2 / 5.2)

- The assumed average age of 6 years reflects the entire Windows 10 installed base, not specifically the devices that cannot technically be migrated. These are typically older. The critical age threshold for Windows 11 incompatibility begins at around eight to nine years, while only around one in ten people in Germany uses a PC that is older than five years [18]. The calculation nevertheless uses 6 years uniformly for both groups; a differentiated age assumption would refine the results further.
- The assumption of an energy demand that is constant across device generations is based on the generally documented rebound effect, but it is not a precisely demonstrated 1:1 compensation for Windows 10 devices in particular.
- Method 1 (amortisation) and Method 2 (marginal) deliberately address different questions. The results presented in Chapter 5 are based exclusively on Method 1.

Overall Assessment

In sum, the reported figures should be understood as a robust estimate with a range of approximately ±10%, not as an exact measurement. The combination of several independently cross-checked sources and the transparent disclosure of the assumptions made are nevertheless intended to ensure that the results are traceable and reliable.

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9 Appendix

Complete list of all EU27 countries:

9.1 Windows 10 Device Quantities

TABLE 3: WINDOWS 10 DEVICE QUANTITIES AS AT 2026

Country	Total Windows 10 devices [million]	Devices that will not upgrade to Windows 11 [million]
EU 27	74.14	41.07
Germany	10.54	5.84
Austria	1.24	0.69
Belgium	1.41	0.78
Bulgaria	1.81	1.00
Croatia	0.84	0.46
Cyprus	0.11	0.06
Czechia	2.09	1.16
Denmark	0.99	0.55
Estonia	0.32	0.18
Finland	1.01	0.56
France	11.00	6.10
Greece	1.58	0.87
Hungary	2.69	1.49
Ireland	0.48	0.27
Italy	9.87	5.47
Latvia	0.50	0.28
Lithuania	0.62	0.34
Luxembourg	0.07	0.04
Malta	0.07	0.04
Netherlands	2.44	1.35
Poland	6.37	3.53
Portugal	2.10	1.17
Romania	4.76	2.64
Slovakia	0.90	0.50
Slovenia	0.45	0.25
Spain	8.81	4.88
Sweden	1.47	0.82

9.2 Environmental Savings Potential (Theoretical)

All current Win10 devices can be used for one more year (74 million devices).

TABLE 4: 9.2 ENVIRONMENTAL SAVINGS POTENTIAL (THEORETICAL)

Country	tonnes CO_2	tonnes E-waste
EU 27	580,770	2,115
Germany	82,600	301
Austria	9,714	35
Belgium	11,072	40
Bulgaria	14,151	52
Croatia	6,575	24
Cyprus	857	3
Czechia	16,397	60
Denmark	7,740	28
Estonia	2,544	9
Finland	7,903	29
France	86,199	314
Greece	12,346	45
Hungary	21,105	77
Ireland	3,791	14
Italy	77,283	281
Latvia	3,939	14
Lithuania	4,862	18
Luxembourg	566	2
Malta	535	2
Netherlands	19,136	70
Poland	49,879	182
Portugal	16,487	60
Romania	37,270	136
Slovakia	7,027	26
Slovenia	3,548	13
Spain	69,025	251
Sweden	11,537	42

9.3 Environmental Savings Potential (Realistic)

Only those devices that cannot technically be migrated to Windows 11 or are not migrated for other reasons (41 million devices).

TABLE 5: 9.3 ENVIRONMENTAL SAVINGS POTENTIAL (REALISTIC)

Country	tonnes CO_2	tonnes E-waste
EU 27	321,724	1,172
Germany	45,757	167
Austria	5,381	20
Belgium	6,133	22

Bulgaria	7,839	29
Croatia	3,642	13
Cyprus	475	2
Czechia	9,083	33
Denmark	4,287	16
Estonia	1,409	5
Finland	4,378	16
France	47,751	174
Greece	6,839	25
Hungary	11,691	43
Ireland	2,100	8
Italy	42,811	156
Latvia	2,182	8
Lithuania	2,693	10
Luxembourg	313	1
Malta	296	1
Netherlands	10,601	39
Poland	27,631	101
Portugal	9,133	33
Romania	20,646	75
Slovakia	3,892	14
Slovenia	1,965	7
Spain	38,237	139
Sweden	6,391	23



Commissioned by:

Refurbed Marketplace GmbH

Authored by:

Paul Rudorf (paul.rudorf@fraunhofer.at)

Sascha Thöny

Fraunhofer Austria Research GmbH

Theresianumgasse 7

1040 Vienna, Austria

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