WithSecure™ Sustainability UX Study Report

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1 Introduction

At WithSecure, we are committed to continuing to reduce our environmental footprint. As a technology company, we acknowledge that technology, and more specifically, software, plays a significant role in energy consumption and, consequently, contributes to greenhouse gas emissions.

Software products can be used in various ways, incorporating different settings and usage patterns. The way in which a software product is used plays an important role in determining the number of operations and calculations it performs, consequently influencing the overall energy consumption. In other words, the settings that are applied to a software program can have a substantial impact on the energy consumption of the device running that software.

While optimizing code to eliminate redundant or inefficient procedures can lower the energy consumption to some degree, the remaining portion is still dependent on the usage patterns and customization settings. As an example, let’s examine media streaming services. A user's resolution preference is a tradeoff between the viewing experience and the number of operations required to transmit and display the content. In this way, user choices and settings directly contribute to the energy efficiency of the software and its impact on the device's power consumption.

We face a similar challenge with cybersecurity products, where specific settings are more resource-intensive than others. Moreover, each IT environment is inherently unique, with diverse requirements. This is why we provide users with an extensive array of settings, referred to as profiles. Thus, we enable them to fine-tune protection parameters to align with the specific needs of their environments.

Our Profile editor is a tool within the software product that allows users to configure security settings for subsequent application on protected devices. So far, the editor has not provided insight into the energy usage implications of these configurations. However, we believe that by visualizing the energy impact of certain settings in a profile that is applied to a protected end device, we empower security administrators to make more informed decisions when striking balance between security features and energy efficiency. In principle, our goal is to develop an “energy dashboard” within Elements that shows the cumulative impact of all the settings on the overall energy consumption of the protection features.

An illustration of what such a dashboard could look like is presented in the image below, in Figure 1.

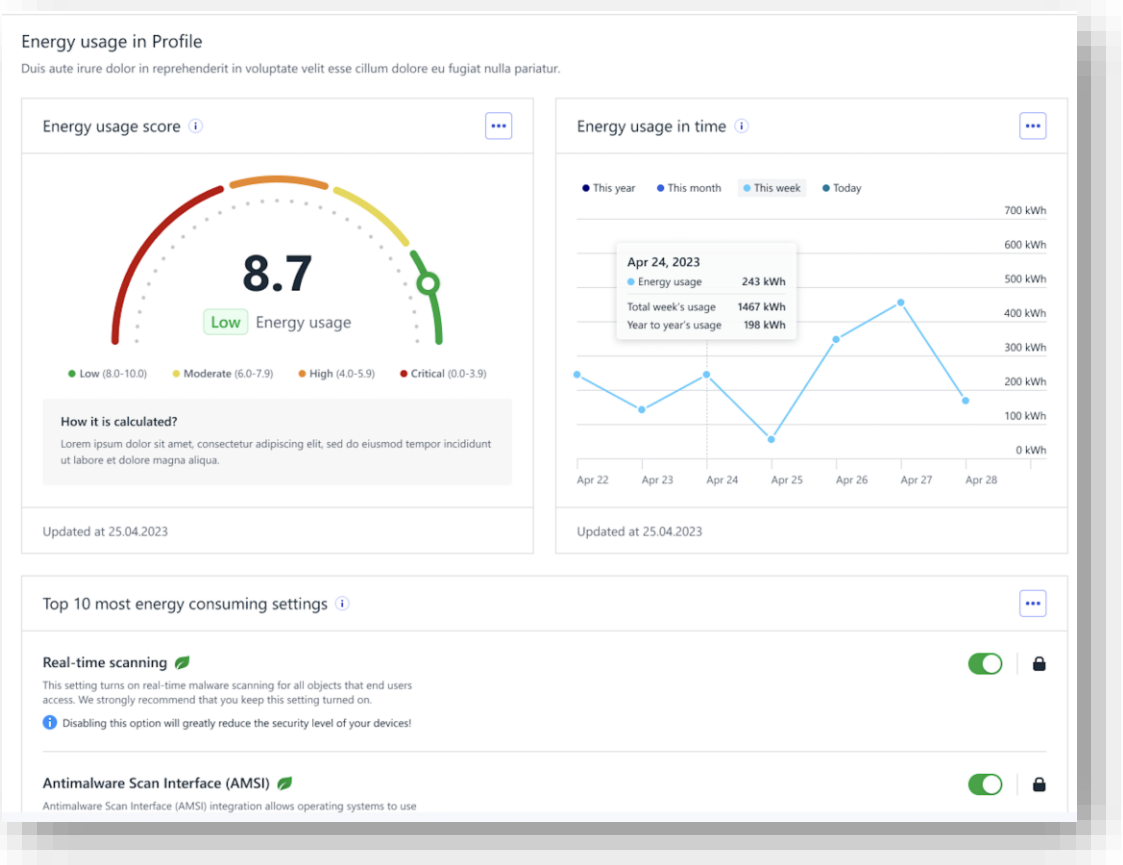

Figure 1: Illustrative Energy Dashboard.

We aim for the information on such a dashboard to have a meaningful impact, but we also recognize that users might be tempted to disable critical security settings to minimize the use of energy and adopt an eco-friendly approach. To better comprehend the likelihood of such behavior, we have decided to conduct research into customer behavior, analyzing the impact of environmental data on users' decision-making. WithSecure remains committed to providing the best security, but we will take sustainability into account while doing so.

To ensure the quality of our research, we have collaborated with scientists from the Poznań University of Economics and Business. This paper represents the initial phase of our ongoing research.

2 Research Methodology and Sampling

The research was conducted through an online survey comprising two sets of questions. The first set aimed to measure respondents' sensitivity to sustainability issues and their risk attitude concerning cybersecurity.

Subsequently, respondents were randomly shown one of the two versions of Elements Profile Editor: one with energy impact visualization (experimental groups) and another without energy impact indication (control group). All versions showed identical settings. Participants from all groups were presented with a hypothetical situation and asked to indicate how likely they would enable the feature in that scenario. We selected the survey option to evenly distribute variants to participants.

The final section of the study included questions about demographics, like region, company size, etc.

Survey invitations were primarily sent through email notifications to our partners and customers. It was important for us to ensure that the participants were individuals familiar with the product and actively using it.

The survey was conducted in October 2023.

3 Results

After filtering out incomplete responses, we received n=60 replies. Given the anticipated length of the survey, the modest participation rate was expected. We acknowledge that the survey presented a substantial commitment, and we express our gratitude to those who invested their time in responding to the questionnaire. We want to express our appreciation also to those who read this report, as we believe it provides potential value for other technology and cybersecurity vendors. While the sample size may not meet the criteria for statistical significance in academic terms, it serves our specific purposes and provides important guidance for WithSecure.

In our exploration of how visualizing energy usage influences user decisions, we began by assessing the sensitivity of users to environmental efforts within their companies and measuring their attitudes toward cyber risk. Each attitude was evaluated through sets of questions (six for cybersecurity and four for sustainability), with responses ranging from 'Strongly disagree' (coded as 1) to 'Strongly agree' (coded as 5). The results presented in Figure 2 represent composite values of these sets.

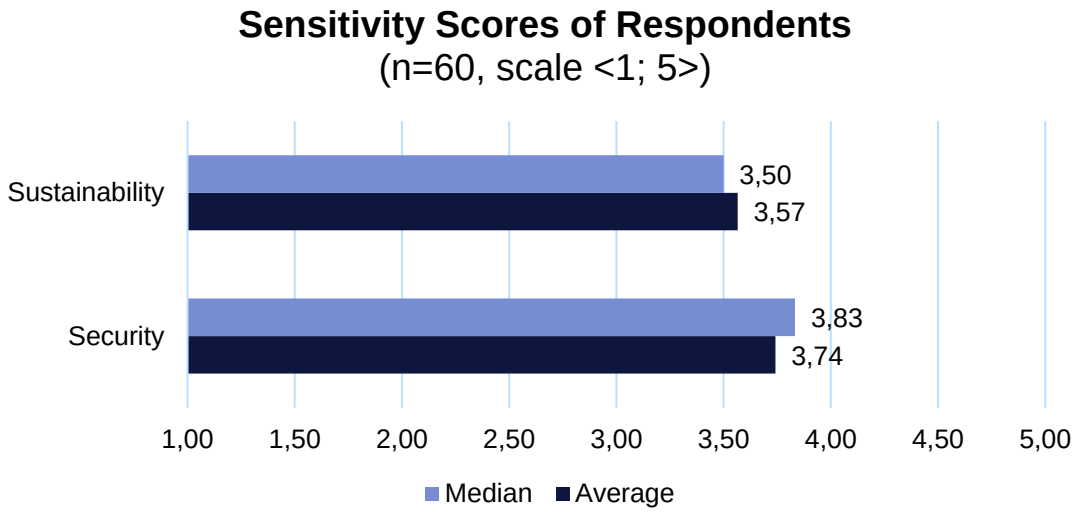

Figure 2: Sensitivity Scores of Respondents for Sustainability and Security.

As expected, our user base leans toward a conservative cyber risk attitude, with an average score of 3,74/5 (median 3,83; n=60). We interpret these results as a confirmation that our typical software product users are aware of the risks associated with incidents and breaches, and that they understand the importance of their role in both preventing and responding to such risks.

A high score on the sustainability awareness scale suggests that respondents recognize the importance of climate issues and acknowledge the need to act. The average score among respondents was 3,57 (median 3,50; n=60). We acknowledge the potential for skewness that results from the survey topic. It is plausible that individuals with a stronger interest in sustainability were more likely to participate in our survey.

The key part of our research involved a UX experiment, where respondents were presented with a hypothetical situation related to a specific setting in the Profile editor in our software product. They were asked to formulate their decision, while simultaneously considering two dimensions – security concerns and visualized energy sensitivity. Different respondent groups were exposed to three distinct versions of the user interface.

All the interfaces depicted the same setting, and the presented situation remained consistent: “Assuming you are configuring a profile to be assigned to all office users in the organization, knowing many of them tend to browse the internet for private matter from the same machine, would you enable this setting visible on the screenshot?”. The manipulated variable was the variant of the user interface, with the following options:

Default (no information about the energy usage impact) – serving as our control group (see Figure 3).

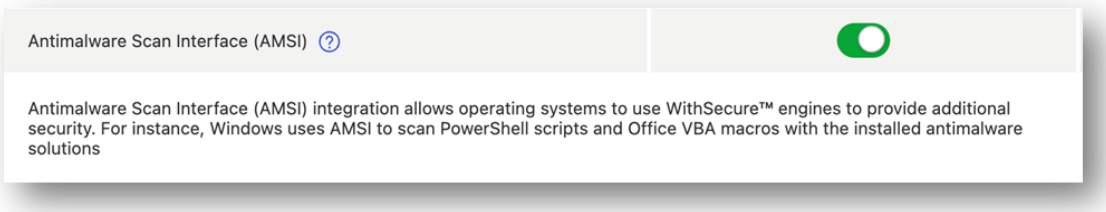

Figure 3: Default Control Group.

Two interface versions, both presenting the energy impact, were grouped for the analysis to make it more meaningful considering a small sample size. Those were Variant a) that is illustrated in Figure 4 and Variant b) that is illustrated in Figure 5. Variant a), considered in isolation, seemed to impact decisions more (users were less likely to enable it), but with just 12 responses it can’t be reliably considered alone.

Figure 4: Variant a).

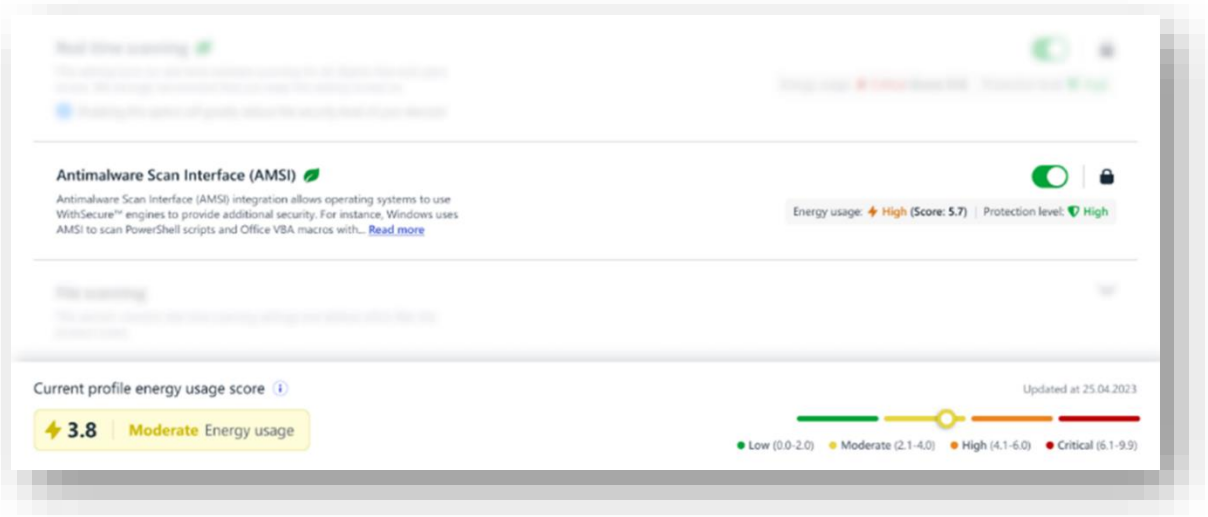

Figure 5: Variant b).

In each variant, we asked the respondents how likely they are to enable the setting in a given situation, with responses ranging from -2 (‘Definitely not‘), to 2 (‘Definitely yes‘). 0 meant ‘Might or might not’, -1 “Probably not” and 1 meaning “Probably yes”. Importantly, the feature used for the study was not security-critical and relatively unfamiliar. We believe that this choice enhanced the representativeness of the experiment eliminating a clear “right answer”. Respondents were randomly assigned the experimental question.

The results suggest that visualizing the energy consumption factor does influence users’ decisions, although the impact is not dramatic. We view this as a positive sign and an encouragement for our company to continue investing in sustainable software, for two key reasons. Firstly, had the results shown no effect of visualizing energy impact on the decisions, it would have rendered the implementation of such features into the product useless. Secondly, had the results demonstrated a dramatic shift in decisions, it would have validated our concerns that users might “overreact” to energy usage information, leading to drastic decisions that could compromise their cybersecurity posture.

What emerged from the results is a subtle influence, illustrated in Figure 6. The control group tended to lean more toward a “Definitely yes” response (coded as 2), while the groups exposed to energy impact leaned more toward a “Probably yes” response (coded as 1) for enabling the feature. The median value for the control group was “Definitely yes” (2), whereas for the energy label groups, the median was “Probably yes” (1). The average values were 1,25 and 0,89, respectively.

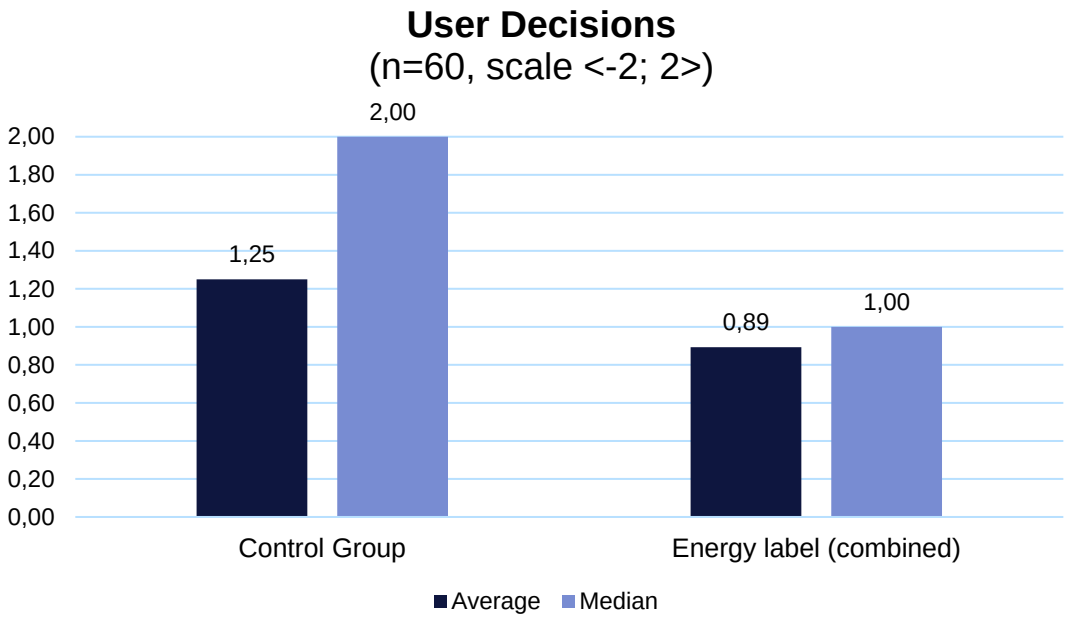

Figure 6: User decisions in control and energy label groups.

4 Conclusions

The research results clearly indicate that, in line with our expectations, WithSecure's software product users and their organizations prioritize sustainability (3,57 / 5) while at the same time they exhibit a heightened awareness of cybersecurity risks (3,83 / 5). The responses to experimental questions also exhibit an anticipated trend. It is evident that visualizing the energy impact of a setting influenced users to a degree, resulting in fewer respondents choosing to enable the setting when they were aware of its energy intensity. However, the impact was not drastic, which gives us confidence that our users, when shown the energy impact, will have a cautious approach in deciding whether to enable a specific option.

When implementing the new version of the Elements Profile Editor in our software products, we will make sure to warn users before disabling or changing the most security-sensitive settings, regardless of the energy impact. With this reminder, we aim to further reduce the risk of inadvertently lowering the protection level.