Energy monitoring in the home. A consumer guide

Recently, RiDC led a thirty-day research project, measuring the energy consumption of assistive technology. This field work was followed by focus groups, allowing participants to reflect on their experiences. From this, we have compiled consumer guidance relating to the accessibility of energy monitoring devices.

We have highlighted:

- General information on finding, choosing and using an energy monitor in the home to measure energy consumption.
- Specific information on the accessibility of energy monitoring in the home, based on our thirty-day research project.

As part of our study, we helped panel members to use energy monitors to track their energy usage. Many of the panel members found tracking their energy usage helpful. RiDC gathered feedback on important factors to consider when choosing an energy monitor.

In this short guide, we share what we and the panel members learned. We hope this helps you decide if you'd like to track your energy usage and how to go about it.

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What is an energy monitor?

An energy monitor is a small device that tracks how much electricity an appliance uses.

Energy monitors are plugged into a powered mains socket. The appliance you want to track is then plugged into the monitor.

You can use energy monitors to track anything that plugs into the wall. Most energy monitors either have a screen on the monitor itself, or they connect to an app on your phone. Over time, the monitor will show how much electricity that appliance has used. This can help you calculate how much it costs to run a device.

About RiDC's study

RiDC led this study in partnership with the Energy Systems Catapult (Living Lab). It is funded by the Energy Savings Trust under the Energy redress Scheme Round 11.

We posted out energy monitors to a group of panel members. They used the monitors for 30 days and reported how much electricity their assistive technology used in that time.

This guide is focused on measuring energy in the home more generally. If you'd like to learn more about the findings from the study, you can read our full report here:

[link to full report]

Monitoring your energy usage: pros and cons

Overall, many panel members found the monitors **helpful.**

This is because the monitors help them to:

- **Understand exactly how much energy their assistive technology used.**

Some panel members were surprised how much or how little energy different pieces of assistive technology used.

Panel members said that learning exactly how much energy each item uses will help them make informed decisions when moving forward. Particularly when choosing or purchasing new pieces of equipment.

Some panel members found the energy monitors **unhelpful.**

This is because:

- **Finding out how much assistive technology costs to run can be overwhelming, particularly if you're unable to change how you use it.**

As we have emphasised in the report, assistive technology is vital for people. The emphasis must be on the energy efficiency and consumption of the assistive technology, rather than the use of this important equipment.

Choosing an energy monitor that's right for you

It was highlighted in our research, that whilst the use of the energy monitors was overall straightforward and beneficial, participants may not have looked into purchasing one if it wasn't for the research project. This was in part, due to a lack of information available about purchasing an energy monitor.

More importantly, where the information is available, it often offers very generalised advice which does not feel relevant to individual access needs. Below, we aim to direct you to the general information that is available whilst also adding more tailored advice, based on our focus groups.

Finding an energy monitor

There are many different types of monitors available. Some of the older monitors are simply plugs you put into a socket. They have an LED screen which shows the amount of energy consumed by an individual device or piece of equipment. Some have a feature of saving this data internally within the monitor. Newer models may include an app to control it remotely.

The following article by Which? provides a comparison of some of the different types of energy monitors available and the various features of each. It also includes some examples of places to purchase the monitors from, alongside different price ranges:

Are energy monitors the best way to measure your power usage? - Which?[1]

You can buy energy monitors from major retailers, such as Amazon and Argos. A search within these websites for 'energy monitor plug' will bring up various different makes and models. Please note some of the models will only be smart plugs without the energy monitoring function.

Which energy monitors did RiDC use during the study?

One of our panel members used the following energy monitor for our project:

Energy Monitor Plug, Electricity Usage Monitor with 7 Monitoring Modes, Large Backlight Display Power Monitor, Amp Volt Watt KWh Consumption Power Meter, Overload Warning for Home Appliances : Amazon.co.uk: DIY & Tools[2]

For our research project, the majority of our participants used a Kasa Smart Plug, model KP115, by TP- Link which included an app:

[1] Retrieved on 30th October 2023
[2] Retrieved on 30th October 2023

Kasa Mini Smart Plug by TP-Link, WiFi Outlet with Energy Monitoring, Works with Amazon Alexa(Echo and Echo Dot), Google Home and Samsung SmartThings, Wireless Smart Socket (KP115) : Amazon.co.uk: Lighting[3]

The app allows you to view the energy readings in real-time, as well as over a period of 7 days and 30 days.

Setting up your monitor

One of the most difficult parts of the process, according to our participants, was plugging in the monitor in the first place. This applied to both the Kasa energy monitor and the energy monitor without an app. This was particularly the case for those with a lot of assistive technology in the home, which often meant access to plug sockets was limited. It was also mentioned that the plug itself was quite clunky, meaning it took up more space than a normal plug which was problematic if trying to plug it in behind an adjustable bed for example. This did mean that participants were, at times, limited as to what they could measure.

Once the Kasa app was plugged in, there was an agreement that it was fine from then on because the plug could be left in and controlled remotely from a phone. In contrast, for the monitor without an app, it is necessary to either reach down to the monitor or unplug it completely to take the readings, making it less accessible, particularly for anyone with restricted mobility or poor dexterity.

The three key requirements to set up a Kasa energy monitor are:

1. Access to plug sockets
2. A Wi-Fi connection
3. A smart phone

The key requirements to setup the monitor without an app are:

1. Access to plug sockets
2. A pen to press the reset button during setup

App accessibility

Whilst many participants confirmed that it was easy to zoom into the text within the app by using their phone, participants felt there were a lack of accessibility settings within the app itself. There were also some difficulties with a screen reader not being compatible. This is something we have highlighted as an action within our report.

[3] Retrieved on 30th October 2023

One of our Researchers tested the app using the Apple read screen feature on their phone and confirmed text to speech worked on an iPad.

Remote control – Kasa app monitor only

An indirect benefit of the Kasa energy monitor, was the ability to control assistive technology remotely. However, this could of course apply to any household appliance such as turning a lamp on/off for example.

Being able to remotely control appliances either from a chair, bed or wheelchair was incredibly beneficial to many of our participants. One even highlighted that it reduced the need for carer support to some extent.

One participant confirmed The Kasa monitor worked well when connected to their Google Home making it accessible for many different individual needs. The instructions also confirm it is compatible with Alexa, as well as SmartThings.

Monitoring energy usage

Participants were pleased to see that they could monitor energy in real time. A participant who had used a different monitor previously said the Kasa app was particularly strong for this.

The app shows you the current power which goes up in real time based on your energy consumption.

You can then see the total consumption over the past 7 days and over a 30 day period.

There is also information to see the running times for each piece of equipment.

Participants would have liked to have been able to see direct cost information within the app rather than having to work out an average.

Some of the older energy monitors, without an app, do have the ability to input your own cost data into the monitor, based on information from your own energy bills. This is the case for the alternative device one of our participants used in our research project. However, this wasn't tested during our project.