Sustainable Procurement, Usage and Disposal of IT Devices

Basic principles
Information technology (IT) products are responsible for a significant proportion of the environmental pollution caused by universities. Assuming that all employees own at least one computer, more than 11,445 computers were in use at ETH Zurich in 2017. These are joined by the computers provided in libraries and computer rooms, not to mention printers, servers and other IT devices.

Many rare metals and toxic raw materials are used to produce IT devices [1]. Besides environmental pollution, nowadays production is often associated with negative social aspects, especially with regard to work conditions in the electronics industry and extraction of what are known as conflict minerals [2,3].

ETH Zurich strives to handle IT devices in an energy-saving, sustainable way. Many IT devices have a considerably higher energy consumption – and as a result a greater environmental impact – during production than during the usage phase (see Fig. 1). Therefore, longer usage is more important than lower energy consumption during the usage phase.

Procurement
Computers, monitors, tablets and smartphones
Re-using an old device as opposed to buying a new one is the best way to curb the environmental pollution [4]. Consequently, ask yourself the following questions before buying:
• Is a new device necessary or can the old one be upgraded?
• Do I need a more powerful device or is the present one sufficient for my purposes?
• Can a second-hand device from the organisational unit or a device from the equipment exchange centre [5] be used?
• Can a device be shared for part-time positions?

If a new purchase is necessary, a modular design and the device’s energy consumption are relevant. The modular design enables individual components, such as the battery or hard drive, to be upgraded more effectively and simplifies the recycling process. Labels can help you identify these criteria [6].

Choose a computer in the lowest possible performance class. The more powerful the processor and the battery, the greater the electricity consumption.

Compared to desktops, mini PCs should be favoured as they consume considerably less energy during the production and usage phase [4]. The greenhouse gas potential of a laptop is only smaller than that of a mini PC if the service life is longer (> four years; see Fig. 1).

Printers
Basic rule of thumb: print as little as possible on as few devices as possible and use the printer for as long as possible. Avoid work station printers and use printers for the entire floor instead. Confidential documents can also be dispensed from floor printers via pull-printing (send at work station, release at printer).

Scale the device correctly: perhaps a smaller black-and-white printer would suffice as there is also a large colour printer with advanced options available in-house for special cases.

Printers and multi-function devices should be certified with a sustainability label such as Blauer Engel, TCO or ENERGY STAR® [6].

Use the IT Services’ printing service [7], which includes the procurement and operation of the devices and meets the requirements for sustainable printing.

Servers and storage
• Instead of your own server, use the IT Services’ central infrastructure with virtual servers [7]. If, in exceptional cases, you still need your own server, leave the procurement to the IT Services. They will provide the systems you desire.

Servers belong in server rooms. These are designed for optimum energy consumption, optimum energy usage and cooling. In order to guarantee all this, the devices must be in keeping with the climate concept of the server rooms [9]. Energy-efficient and temperature-tolerant servers and...
other computer centre hardware with a standardised air flow result in lower energy consumption. These devices meet state-of-the-art specifications, such as 80 PLUS® Gold-Label or ENERGY STAR® Programme Requirements for Computer Servers and environmental specifications in accordance with the ETSI EN 300 019-1-3, class 3.1 standard.

- You are recommended to buy devices that include five-year maintenance contracts.
- Also use an adequate storage infrastructure for your requirements [7]. Compared to tape storage, rapid disk storage consumes up to 50 times more energy for rare accesses.

**Usage phase**

**Computers, monitors, tablets and smartphones**

The basic reference value for the service life of a computer at ETH Zurich is at least four years for laptops and at least five years for desktops. Moreover, you can reduce the energy consumption by correct handling:

- Switch off and disconnect when not in use
- Set up automatic power management with stand-by and sleep mode
- Make do without screen savers

**Printers**

- Print sparingly, on both sides and ideally place several pages on one printer side.
- Use recycled paper [8].
- Ideally read electronic documents on the screen instead of printing them out [8].
- Switch off the device overnight and during the weekend. Perhaps use a timer switch.
- Regular maintenance extends the printer’s service life.

**Re-use/disposal**

**Computers, monitors, tablets and smartphones**

Before you dispose of a functional device, see if anyone else in your organisational unit is interested. Perhaps you can hand it over to the equipment exchange centre [5] or private re-use by colleagues might be an option. You can also verify, if it can be donated to social institutions in Switzerland or the EU. Passing devices on to developing countries is not advised as the service life of old devices is often only brief and the regulations for an environmentally friendly and safe disposal or recycling in these countries are frequently lacking [10].

Before passing anything on, you must make sure that data protection has been guaranteed. The IT Services can help you in this respect [7].

Devices that no longer work or are no longer needed must be handed in to IT Support. This enables the product to be directed to recycling properly and valuable raw materials to be recovered.

**Printers**

Give devices that are no longer needed to the suppliers for possible re-use or appropriate disposal. As far as recycling is concerned, you should make sure the product is disposed of appropriately at the collection points in the building area. Old toner should be returned to the office material centres [11].

**References and comments**

5. www.geraeteboerse.ethz.ch
7. ID Servicekatalog → Drucker, Server, Speicher, Servicedesk
10. VOA (2011): Sub-standard electronics donated to Africa causing pile up of e-waste

**Imprint**

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