

ENVIRONMENTAL IMPACTS OF DIGITAL TECHNOLOGIES

2.4 Eco-consumer: Recycling is not winning!

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Activity 05: Recycling is not enough!

We have seen that the production of all this equipment and its use is far from neutral. Let's now look at how to reduce these impacts. Part of the responsibility and the search for solutions lies with designers, manufacturers, politicians, the economy... Another part of the responsibility lies with each of us, as we will see in the following activities!

But beware of rebound effects that could lead us to believe that the only solution would come from energy or monetary gains!

Direct rebound effect


Rebound effects are effects that are induced by an increase in efficiency in a technology or process. This increase in efficiency may concern:

- energy (reduction in the amount of energy needed for the same function as before),
- time,
- space,
- money...

Finally, whatever efficiency gains are achieved, there are almost systematic rebound effects which consist in consuming either more of the same thing or more of something else thanks to the gains made. For example, we install more applications on our smartphone, we watch more videos, we run more calculations on the servers, etc. There are other types of rebound effect (indirect and systemic rebound effects), which we will see in the last part of this Mooc.

One way of reducing the direct environmental impact of digital technology is therefore not to systematically take advantage of the time and energy saved by the fabulous improvements in the efficiency of technologies to use them even more. These energy savings could instead be offered to the planet! The time saved could be offered to our brain to read, think, meditate, rest, discuss...

| Capsule slide | Related text |
|---|---|
| <p>Eco-consumer: Recycling is not enough!</p> <p>It's one thing to understand the concept of rebound effect, but it's another thing to see how it translates into our daily lives. No one will come to sell you rebound effects, even less to protect you. Rebound effects are observed throughout society. However, to understand more precisely how this is played on an individual scale and to talk about it around oneself can help to limit them.</p> <p>Step 1: Let's limit rebound effects!</p> <p>Step 2: What to do?</p> | <p>Eco-consumer: Recycling is not enough!</p> <p>It's one thing to understand the concept of rebound effect, but it's another thing to see how it translates into our daily lives. No one will come to sell you rebound effects, even less to protect you. Rebound effects are observed throughout society. However, to understand more precisely how this is played on an individual scale and to talk about it around oneself can help to limit them.</p> <p>Step 1: Let's limit rebound effects!</p> <p>Step 2: What to do?</p> |
| <p>Step 1</p> <p>Rebound Effect Scenario</p> <p>We suggest you to immerse yourself in a situation of promotional offer from your Internet service provider and we have imagined several possible reactions.</p> | <p>Step 1</p> <p>Rebound Effect Scenario</p> <p>We suggest you to immerse yourself in a situation of promotional offer from your Internet service provider and we have imagined several possible reactions.</p> |

| Capsule slide | Related text |
|--|--|
|  | <p>Switch to fiber for the same price! You have an ADSL package with a fairly low throughput of 20 Mbit/s.</p> <p>Your supplier offers you to switch to fiber at 1 Gbit/s for the same price. All your access and download are much faster. What are you doing?</p> <p>Several actions are proposed. For each one, feedback is given on whether this choice has negative rebound effects and why.</p> |

Option : “I download a lot more videos” OR “I watch more series on streaming platforms”

Feedback

This choice has negative impacts!

You may have had a good time, but without knowing it, the videos you watched or the time you spent on social networks required energy and materials that are invisible but very real.

The videos you download or stream are stored on servers. They must be transported from these storage spaces (United States, Norway...) to your screen. This requires energy, additional equipment and therefore polluting.

Option : “I don't change my internet activity, but I take advantage of the time saved to walk in the forest or garden or read”

Feedback

This is the most virtuous choice!

It reduces the rebound effects associated with these new performances.

| Capsule slide | Related text |
|--|---|
| <p>Option : “I take the opportunity to connect more devices simultaneously to a PDA (personal assistant): a control system of my shutters, my watch, my television, etc...)”</p> <p>Feedback This choice has negative impacts! First, these new capabilities can induce you to acquire new equipment (which will therefore have been manufactured). In addition, you don't hesitate to use more bandwidth (to fully use all your equipment), so you also use more energy on networks and data centers.</p> <p>Option : “I take the opportunity to chat with my friends on social networks”</p> <p>Feedback This choice has negative impacts! You may have had a good time, but without knowing it, the videos you watched, the time you spent on social networks required energy and materials that are invisible but very real.</p> | |
| <p>Let's limit rebound effects!</p> <p>Limiting rebound effects through a change in consumer behaviour is part of the solution to limit the negative impacts of digital. But we need a minimum of digital equipment.</p> <p>A set of best practices around the purchase and end-of-life management of smartphones, tablets, computers, screens, etc. helps to minimize the pollution and dispersion of metals related to the manufacture and recycling of these objects.</p> | <p>Let's limit rebound effects!</p> <p>Limiting rebound effects through a change in consumer behavior is part of the solution to limit the negative impacts of digital technologies. But we need a minimum of digital equipment.</p> <p>A set of best practices around the purchase and end-of-life management of smartphones, tablets, computers, screens, etc. helps to minimize the pollution and dispersion of metals related to the manufacture and recycling of these objects.</p> |
| <p>Step 2</p> | <p>Step 2. Update on your practices</p> <p>A growing number of citizens and organisations are aware of the situation. They are committed to changing their practices. What about you?</p> |

| Capsule slide | Related text |
|---|---|
| <p>Update on your practices</p> <p>A growing number of citizens and organisations are aware of the situation. They are committed to changing their practices. What about you?</p> <p>For each of the following actions tell us if:</p> <ul style="list-style-type: none">• this is already part of your habits• it's easy, you can commit to doing so• it's hard right now, but why not?• you think it is impossible, or that this proposal is not applicable in your case | <p>For each of the following actions tell us if:</p> <ul style="list-style-type: none">• this is already part of your habits• it's easy, you can commit to doing so• it's hard right now, but why not?• you think it is impossible, or that this proposal is not applicable in your case |

Étape 2. Que faire ?

Question 1 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|---|-----------------|--------------|-------------|------------|
| I turn off digital equipment when they're not in use | | | | |

Feedback : There is a tendency today not to turn off equipment so as not to waste time on the ignition (sometimes it is very long indeed).
However:

- A standby computer uses 20 % to 40 % of its power consumption.
- A computer that is turned off, but still connected, also continues to consume!
- All year round, 24h/24h, a single computer can cost up to 100€ of electricity per year!

Good idea? By configuring your equipment to go on extended standby, you could physically turn them off with a multi-socket equipped with an on/off button!

Source : [Les équipements électriques, ADEME, 2020](#) [Accessed on: 14/12/2021]

Question 2 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|--|-----------------|--------------|-------------|------------|
| I extend the use of IT equipment. | | | | |

Feedback : To limit the impact of digital, keeping our equipment longer is the first step to do and the most impacting! No need to change your phone every 2 years if it still works! If you have a problem, go see a repairer and if it really doesn't work anymore, make sure to recycle it through eco-organisms: [écosystem](#) for exemple , [e-dechet](#), [écologic](#).

Did you know?

Some organisms [Commown](#) offer to lease repairable and recyclable equipment and takes care of the maintenance and repair of your equipment.

Question 3 / 9



| | I already do it | Here we go ! | I'll try... | Impossible |
|---|-----------------|--------------|-------------|------------|
| I keep my equipment as long as possible and when I get rid of it, I make sure that it is treated in the best possible way! | | | | |

Feedback

What if you start by:

- **protecting your smartphone with a case and screen protector?**
- **checking that you don't have any old equipment in your drawers or in the cellar?**

In general, for electronic equipment and other consumer goods, consider the 5R rule:

- **Refuse** everything we don't really need,
- **Reuse** by finding a new life for an object when possible, buy your used equipment. Get repaired, think about [iFixit.fr](https://www.ifixit.com/)
- **Reduce** power consumption, consumption of storage space, etc.
- **Recycle** by taking your e-waste, depending on their size, into the dedicated waste disposal area or at your distributor who has a bin for small electronic items and finally
- **Repurpose** facilitating the recirculation of secondary materials (gold, silver, copper, etc.) for the manufacture of new objects

Question 4 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|---|-----------------|--------------|-------------|------------|
| I prefer to buy used equipment or repackaged, or I organize to pool equipment with my entourage. | | | | |

Feedback : Have you already identified places to buy this type of equipment?

Repackaged product means a product that has already been sold and used but has been returned to a seller. This product is restored by a professional in order to be returned to the market.

In law, a repackaged product is equivalent to a second-hand product. It therefore benefits from the legal guarantees of the sale: guarantee of hidden defects, compliance guarantee (24 months).

To ensure the durability of the material you purchase, choose the warranty period provided by the repacker as long as possible. It is a good indicator of its operating condition a priori.

Source : [Objets d'occasion, reconditionnés : quelles garanties pour l'acheteur ? Bercy Infos, le 28/01/2021](#) [Accessed on: 14/12/2021]

Question 5 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|--|-----------------|--------------|-------------|------------|
| I consider the purchase of new equipment according to my needs.. I avoid oversized, I prefer reuse and mutualisation. | | | | |

Feedback : You could start by reviewing the situation with number and type of equipment per person, duration of use of the equipment, how is the equipment management done at the end of use by the first user, what is currently mutualised?

Reviewing the situation makes possible to object to current practices and to propose actions which will probably lead to financial savings (in addition to eco-friendly...)

Did you know?

Avoiding the automatic renewal of computer hardware allows you to reduce the environmental impact of your computer fleet by up to 30 %!

Source : [En route vers la sobriété numérique. ADEME, 09/2022](#) [Accessed on: 27/01/2023]

Question 6 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|---|-----------------|--------------|-------------|------------|
| I get an incredible promotional offer for the latest smartphone. I wonder about my need to change equipment before I rush into the shop. | | | | |

Feedback :

Do you know that 88 % of French people change their mobile phone while it still works? Drop the Black Friday and the sales: it sounds attractive but it's the perfect trap to fall into the compulsive purchase panel, of bad quality things you didn't need. Don't get involved in overconsumption without your consent. Don't be taken for a ride: let him know!

Good idea: if I have dual use of mobile phones (professional and personal), I prefer dual SIM card phones.

Source : [Les impacts du smartphone, ADEME, France Nature Environnement, 2019](#) [Accessed on: 14/12/2021]

Question 7 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|--|-----------------|--------------|-------------|------------|
| If I have to buy new equipment, I pay attention to environmental labels and the reparability index. | | | | |

Feedback : If you need to buy new equipment, it is better to prefer repairable equipment, eco-labelled and especially adapted to your needs. Start by wondering what you really need. A giant screen in your studio, really? On the other hand, the more compact a material is, the harder it is to repair or maintain in time. Also check that the battery, hard drive and RAM can be changed. To guide you in your purchases, see the guide [TopTen](#), and its index of reparability on [iFixit](#).

Did you know?

Two eco-labels distinguish eco-designed equipment: **EPEAT** and **TCO**

Question 8 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|--|-----------------|--------------|-------------|------------|
| I minimize the daily use of my digital equipment (smartphones, computers...). I log out. I set up disconnected time ranges for my mental hygiene. | | | | |

Feedback: You could invite your friends or family to join you in your efforts!

We have applications and sites that capture our attention and solicit us in order to create habits. However, good practices can be adopted to protect against them.

Red is a trigger color that instantly attracts your attention so why not disable notifications and switch your smartphone in shade of grey.

A simple challenge to get started? keep your smartphone away from the room where you sleep. Your sleep will only be of better quality.

Do you know the site: <https://www.humanetech.com/take-control> ?

Question 9 / 9

| | I already do it | Here we go ! | I'll try... | Impossible |
|--|-----------------|--------------|-------------|------------|
| I contribute to the awareness to try to limit the exponential growth of digital pollution (direct and indirect). I'm talking to my entourage. | | | | |

Feedback :

This topic really concerns everyone today, young people, the least young, businesses, organizations and policies. It is not necessary to be a super expert to talk about this topic. When you finish this activity, you'll feel even more comfortable talking about digital pollution. You'll see, try, you'll be more listened to than you think!

Suggest to your entourage to follow the Mooc too!

| Capsule slide | Related text |
|--|---|
| <div style="background-color: #4a7c59; color: white; padding: 2px 5px; display: inline-block;">Conclusion</div> <p>Refuse, Reduce, Reuse, Repurpose, Recycle!</p> <p>Whether it is personal or professional in an organization, there are many levers to limit “digital pollution”. We have seen some here that limit the production of new equipment, its energy consumption and the risk of poor switches at the end of life.</p> <p>Generally speaking, and given the impact of production, if you have to remember only one thing, it is to limit the purchase of new equipment to a minimum!</p> | <p>Conclusion</p> <p>Refuse, Reduce, Reuse, Repurpose, Recycle!</p> <p>Whether it is personal or professional in an organization, there are many levers to limit “digital pollution”. We have seen some here that limit the production of new equipment, its energy consumption and the risk of poor switches at the end of life.</p> <p>Generally speaking, and given the impact of production, if you have to remember only one thing, it is to limit the purchase of new equipment to a minimum!</p> |

If you wish to go deeper into certain concepts

[The 5R of Digital technology](#) describes the sobriety strategies at all levels of action available to users of digital devices.

[The rebound effect](#) explains what the rebound effect is and why technical improvement is not the answer.

[What are the limits of the circular economy?](#) defines the circular economy and describes why this strategy has limitations.

[How to fight against programmed obsolescence?](#) defines planned obsolescence, explains why we need to produce more durable objects and how to extend the life of objects.


Conclusion

The immaterial world is not only material, but it also has a strong impact on our environment: consumption of water, energy, non-renewable resources such as metals, pollution and also social damage. Our digital consumption pattern is clearly not sustainable.

Moreover, the disruption in the supply of electronic chips is partly due to a drought in Taiwan which reduced access to water (and the manufacture of electronic chips requires a large quantity of water). On the other hand, the environmental damage caused by the artisanal processing of waste sent too quickly outside our borders is not acceptable. A form of sobriety and sustainability is needed today in the design of our goods as well as in their use. The belief in technological progress that would reduce energy consumption in conjunction with the miniaturisation of objects is unfortunately only an illusion.

Even if we can sometimes observe a unitary improvement. The rebound effect is not an illusion!

Credits :

| | |
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| <p>Pedagogical team :</p> <ul style="list-style-type: none">● Laurence Farhi, Tatiana Khomenko, Inria Learning Lab● Sophie de Quatrebarbes, S24B for Class'Code | <p>With the support of the Minister of National Education, Youth and Sport and UNIT.</p>  |
| <p>Graphismes :</p> <ul style="list-style-type: none">● Illustrations : Mikaël Cixous, 4 minutes 34● Photographies of Guillaume Clémencin : Nicolas Ledu | |
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