Eco-design: What is the role of design in building sustainable services?
Who am I?

➔UX/UI designer - freelance
➔In charge of the ecodesign program at Designers Ethiques
➔Co-author of the ecodesign guide
➔Member of the GreenIT group

Born and bred in Rennes ;-)  
Now living in Rouen
We’ll try to cover...

1. The basics of ecodesign
2. Some ecodesign best practices
3. ROX : expo “Celtique ?”
4. Conclusion and resources
Part 1

Introduction to ecodesign
What is the impact of digital technologies?

➔ The impact is **huge** and **growing very fast**.
➔ The impact is **not only on CO₂** but on **multiple indicators**: 

- **GHG**
  - Greenhouse Gas Emissions

- **Energy**
  - Primary energy used to produce the final energy

- **Resources**
  - Consumption of abiotic resources such as metals

- **Water**
  - Water consumption used in making electronic components

And more!

More info: [Environmental footprint of the digital world - Green IT](https://GreenIT.fr), 2019
What has the most environmental impact?

➔ The biggest impact is in making the devices.

The electronic equipment and devices have the most impact.

The manufacturing phase is the most important.

Source: Etude numérique et environnement - Arcep Ademe - Janvier 2022
Prospective scenarios establish that the only way to reduce emissions is to combine sobriety and ecodesign measures.

Source: Etude numérique et environnement 2020, 2030, 2050 Arcep Ademe - Mars 2023
We don’t build devices, so what can we do?
What about technological obsolescence?

Your phone seems to work very slowly?

An update can’t be installed?

There is no space left to install an app?

The smartphone replacement rate is around 21 months globally.

https://www.counterpointresearch.com/smartphone-users-replace-their-device-every-twenty-one-months/
The Jevons paradox and rebound effect

Introduction

Efficiency increase

Cost reduction

Increase of demand

Increase of the consumption

Jevons paradox - Wikipedia
What is ecodesign?

Ecodesign is about **integrating the environment**, from the **beginning of the design process** of a product or a service, and at **every step of its life-cycle**.

Replaced by [IEC 62430](#)
Introduction

What are the key principles of ecodesign?
1. Define the functional unit

What is it?

The main function of a product or service:
A unit of reference that corresponds to a user goal.

What is it for?

- Estimate the impact of a product or service.
- Compare products or services when we do a life-cycle assessment (LCA)

Examples of simple functional units:

- Buying a ticket for a concert.
- Looking for a phone number.
- Booking an appointment.
- Checking your bank account.
- Watching a video (during 10 min)

https://www.eco-conception.fr/static/fonction-unite-fonctionnelle-acy.html

Livre blanc écoconception - AGIT 2017
1. Define the functional unit

Example: buying a ticket for a concert

You can’t compare the landing pages, you have to compare the user journey.
2. Estimate the impact of all the equipment

... all the equipment and devices needed for the digital service:

- Electronic equipment and devices
- Network
- Data centers
3. On all the steps of the life-cycle:

of the service...

Illustration: www.eco-conception.fr
3. On all the steps of the life-cycle:

and of the equipment and devices

Illustration: [Ademe - Face cachée du numérique](https://designersethiques.com)
4. According to several environmental indicators

... to avoid impact transfers

- Resource use
- Climate change (GHG emissions)
- Water consumption
- Waste production
- Ecotoxicity
- Etc.

More info: Digital technologies in Europe: an environmental life cycle approach
5. In a continual improvement process

- Identify the **most significant levers for improvement**
- Choose the ecodesign level
- Document the process

### Several levels of ecodesign

**Improving what already exists**

- Redoing the service entirely
  - Rethink the whole system

More info:
- *The 4 levels of ecodesign*
Part 2

Best practices
Where do we start?
1. Challenge the need for “digital”

- Does the service need to be digital?
- Are there other ways to fulfill this need?
- Are there risks to exclude people who don’t have access or can’t use a digital service?

Conférence Pas Sage en Seine
https://passageenseine.fr/
Thank you Richard Hanna for the example
2. What is essential?

- What are the real needs to achieve the goal?
- Are there other ways to do it?
- What is the quality or quantity required? Is high quality really necessary?

More info: 1. Define the must haves and eliminate the non-essential - The intro guide to digital eco-design
3. What are the possible impacts of my service?

- What happens when 100 million people use your product?
- **Who or what disappears** if your product is successful?
- If the **environment** was your client, **how would your product change**?
- What would **using** your product "too much" look like?
- When you picture your user base, **who is excluded**?

Source: https://tarotcardsoftech.artefactgroup.com/
4. Assess and estimate

Estimate the impact of the user journey based on the functional unit

- What are the main issues?
- Where are the most important levers of improvement?
- What are the priority?

More info: 2. Assess and measure - The intro guide to digital eco-design
4. Assess and estimate

Estimate the impact of the user journey based on the functional unit

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- Where are the most important levers of improvement?
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More info: 2. Assess and measure - The intro guide to digital eco-design
5. Think “mobile first”

Pros:
- No problem when displayed on mobile
- Keep the information to what is essential

Example: prototype for the Ecodesign guide website
6. Simplify the user journey

Provide a **smooth user experience** to reduce friction and time

- What is the number of steps to achieve the user goal?
- What are the main painpoints and how to fix them?

Plus d’infos :  [Simplifier le parcours et Ecoconception / Les 115 bonnes pratiques - 3ème édition - Bonne pratique n°3](#)
6. Optimize images

Reduce page weight by optimizing images

- Is the image necessary? Does it bring value?
- What size is necessary? What quality?
- Is the image inclusive?

Images account for a big part in the weight of web pages archives http
7. Limit the use of plugins and widgets

✅ **Do**

Replace social media widgets with:
- an image and a link
- just links
- or is it needed on every page?

Replace the Google map with:
- an image and a link (to Open Street Map)
- an address and a link
- or just the address if nobody is going to come to your office ;-)
8. Ban infinite scrolling

Choose the right number of elements to display.

Infinite scrolling is meant to increase the time spent on a website.

Exemple: Unsplash uses infinite scrolling whereas Low Tech Lab uses pagination.
9. Test with low bandwidth

Test your site on a low bandwidth (browser development tools).
10. Think offline mode

Think about an offline visualisation to be accessible even in zone that have no network coverage.

The Waorani people live in the middle of the Amazonian forest and use Mapeo to record resources of the forest.

The offline mode is essential for this type of work.

Info: Mapeo - Digital Democracy
Mapeo - Waorani case study
And the burning question on everybody’s lips...
What about the dark mode?

Consumes less energy on OLED screens

But:

- Only 9% energy saved if the brightness of the screen is at 50%.
- Has no impact on LCD or LED
- Can cause accessibility issues for some people.
- Need to provide both a light and dark version.

→ Probably not the first thing to tackle

Example providing an alternative between a light and dark background

On this topic:

Faut-il activer le mode nuit pour augmenter l'autonomie de ma batterie ? Le cas de l'application Twitter - Greenspector

What is the impact of Dark Mode on battery drain? – Mobile Enerlytics
Examples of eco-designed websites

https://sustainablewebdesign.org/

https://www.rebootcommunication.org/

https://www.exposition-celtique.bzh/

https://behaven.com/en

http://ruchebiocoop.com/

https://www.adaptaville.fr/

Other examples on Lowww directory et guide d'ecoconception designers éthiques - aller plus loin
Part 3

Return on experience:
“Celtique?” exhibition
Expo “Celtique ?”

Return on experience

More details on the process:

➔ La démarche d’écoconception - L’expo “Celtique ?”
➔ Eco-concevoir le site d’une exposition : nous avons relevé le défi ! - Green IT

https://www.exposition-celtique.bzh/
A bit of context

Goal: Create a **responsive website for an exhibition** of the Musée de Bretagne on the subject of Celtism.

Specifications:
- **Ecodesigned**
- **Accessible**
- **Cookie-free**
- **Open-source** as much as possible

The **website** is meant to **have its own life** beyond the “in person” exhibition to provide resources for different types of people (teachers, students, aficionados, etc).
A bit of a challenge

An exhibition means:

- photos (lots)
- illustrations
- videos
- podcasts
- documents
- interactive quiz
- some guidance to navigate between all those resources
Adapting for the web

Solutions:

➔ Simplified structure (removing nested levels)

➔ Progression indicator (1, 2, 3, 4)

➔ Navigation buttons (previous / next)
Return on experience

Photos

Solutions:

➔ **Selected** Images

➔ **Resized and compressed** image on the page

➔ Possibility to open in **higher resolution** for specific needs
Return on experience

Photos

Example of gain:

Original size: 13.9 MB (9600 x 5400)
Resized HD: 241 KB (1812 x 1024)
Resized and optimized for desktop: 47 KB (800 x 418)
Videos

Solutions:

➔ Videos resized and compressed

➔ Integration of videos using HTML5 player rather than integrated YouTube plugin

➔ Not all videos displayed by default (load more button)

Quiz

Solutions:

➔ **Reduce the number** of questions from 12 to 9

➔ **Give up** the idea of a progression bar

➔ **Provide an indication of the status** above the Submit button (You have have X questions left to answer before you can see your result)
Return on experience

Police

Solutions:

➔ Use of a system font: Arial
➔ Visual identity in the exhibition logo in svg
Overall result

- Pages with a score of A or B
- Overall user journey with low impact
Partie 4

Conclusion and resources
Conclusion and resources

Beware of greenwashing...

Questions to ask yourself:

➔ What is the real motivation?
➔ Is it for marketing purposes?
➔ What is the impact of the service or product being sold?
➔ Are there also steps taken towards accessibility, inclusion, and ethics?
➔ Is the ecodesign process documented?

Volkswagen - un bel exemple de greenwashing
Is it going to be expensive?

Just like for accessibility, it will not cost more if it’s done from the start!

It can improve the service on several levels:

Better user satisfaction:
- Better SEO
- Smoother user experience

Wider target audience:
- Better inclusion of people with limited access
- Better accessibility

Better company image and values

Savings:
- Hosting
- Equipment and devices
Reference guides (some in the process of being translated !)

The guide to ecodesign

Designers Éthiques

Écoconception web, les 115 bonnes pratiques (4ème edition) and Github

GreenIT

Référentiel d’écoconception WordPress

GreenIT

Guide de bonnes pratiques mobile

GreenIT
Ressources

Reference guides

Référentiel général d’écoconception de services numériques (RGESN) - DINUM

Handbook of Sustainable Design of Digital Services (GR491) - INR

Principes de sobriété éditoriale : 50 bonnes pratiques pour écoconcevoir vos contenus web. - Ferréole Lespinasse
The main goal of ecodesign is to...

prolong the life of devices to stop building new devices
MERCI !

Don’t hesitate to contact us:

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