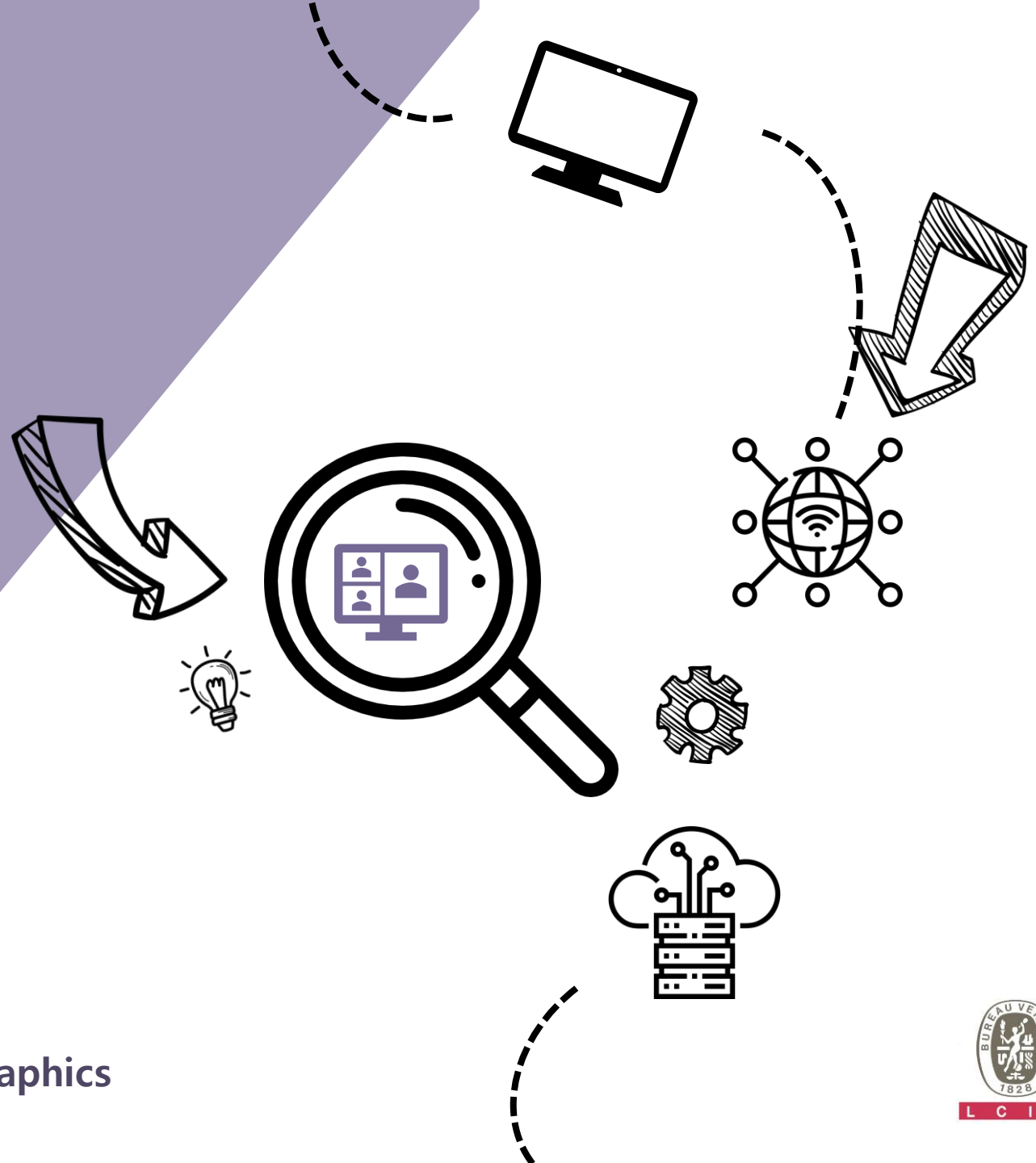
Carbon footprint of a webconference

Example of using the NégaOctet Database



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NegaOctet pilot case, using EIME V6

The result of 36 months of research, **NégaOctet** offers a method and tools to measure and reduce the environmental impact of digital services over their entire life cycle.

In 2021, the **EIME software** was selected among 12 pilot cases to implement the NégaOctet repository.

METHODOLOGIE	DATABASE	APPLICATION
Writing of the ADEME Digital Services PCR	1,500 datasets shared	12 pilot cases validated

Case study by
Amandine VINCENOT, LCA Consultant
Firmin DOMON, LCA Consultant

Baseline result

Usage scenario:

20 people connected with camera

On a smartphone

Use in France

1 hour conference

Via a mobile network

0.995 kg CO_2 eq.

Carbon footprint obtained with EIME software and the "digital services and equipment" indicator set

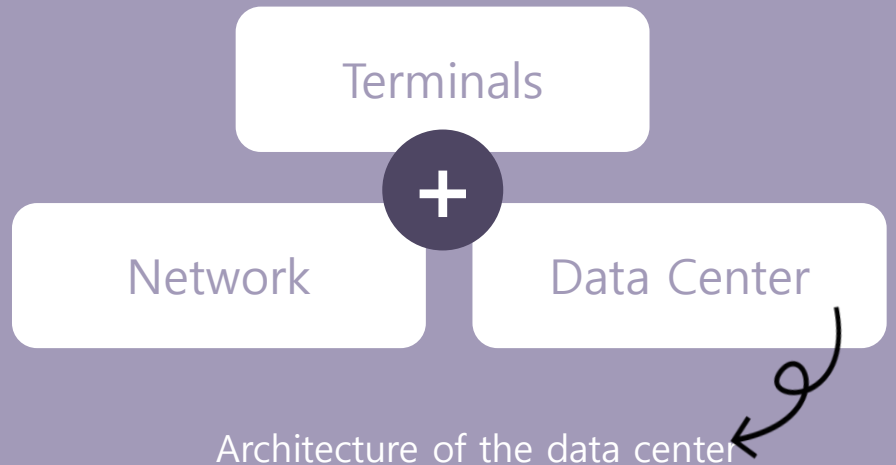
What does this represent ?

3.9 km by car

Source : datagir.ademe.fr

Scope of the study

The study takes into account the following elements:



Architecture of the data center
- Servers
- Firewall
- Consumption of non-IT equipment

Terminals

We take into account the user's equipment to connect to the web conference. The reference scenario includes a smartphone.

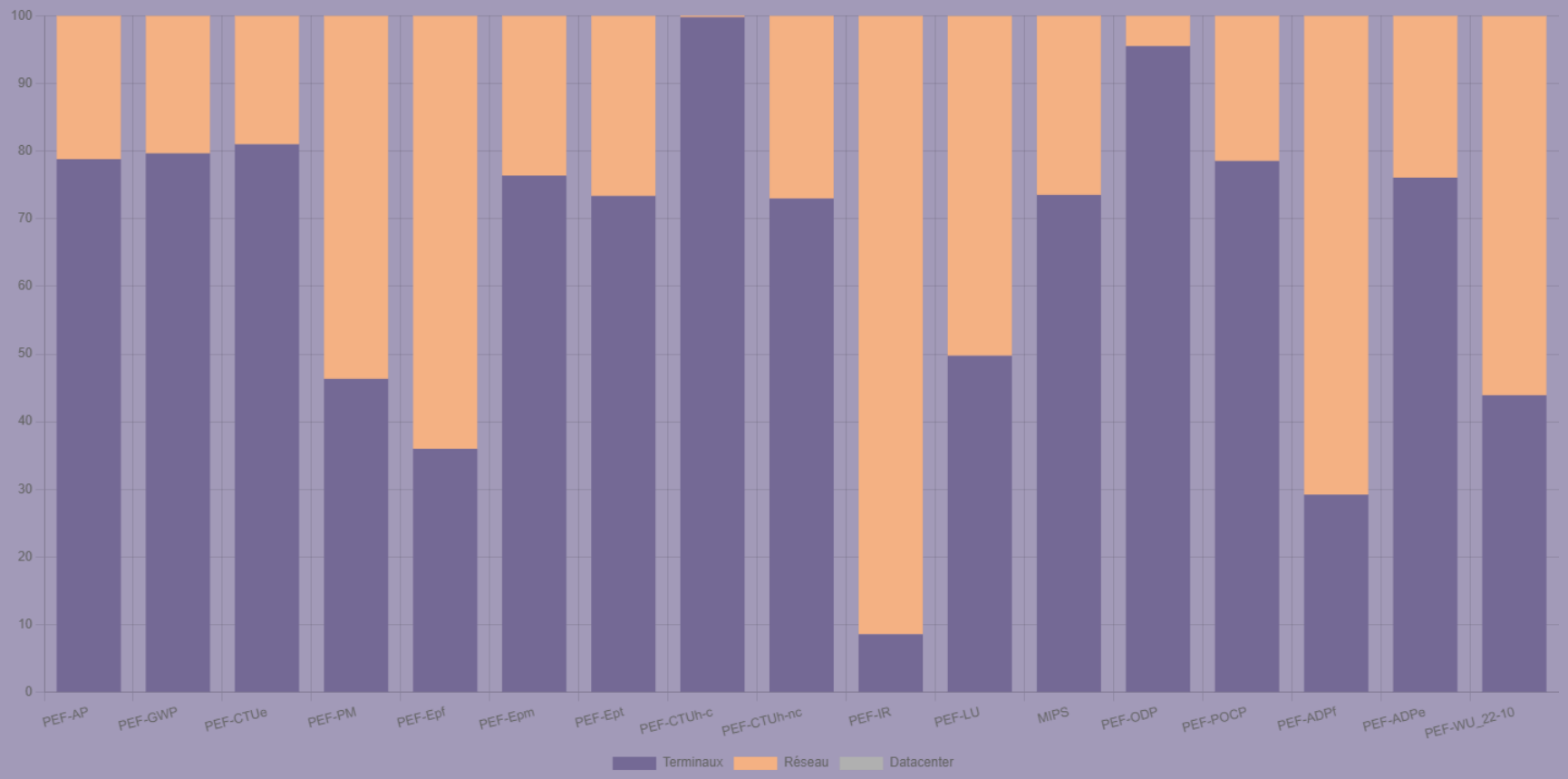
Network

Data exchanges between data centers and user terminals are considered. The impacts are representative of a mobile network and SD video quality transmission (0.7 GB/h).

Data Center

Based on NégaOctet data, the architecture of a datacenter was reconstructed: servers, firewalls and the consumption of non-IT equipment. Storage is not considered for this conference.

Analysis of results – multi-indicator impacts

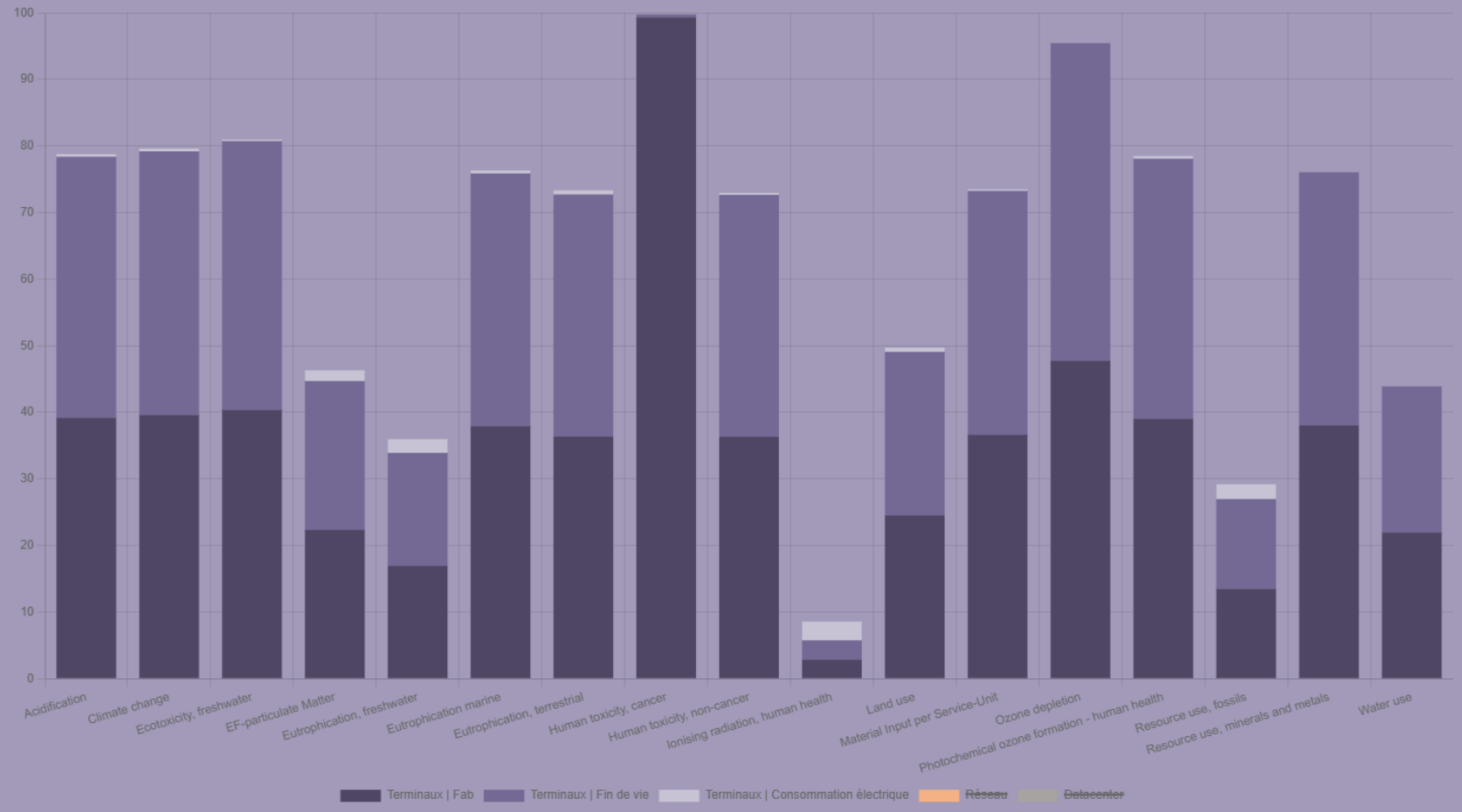


Contribution

Major contribution of terminals and the network on all indicators.

Terminals contribute from 6% to 91% while the network contributes from 9% to 94% on all indicators.

Analysis of results: Smartphones – multi-indicator impacts

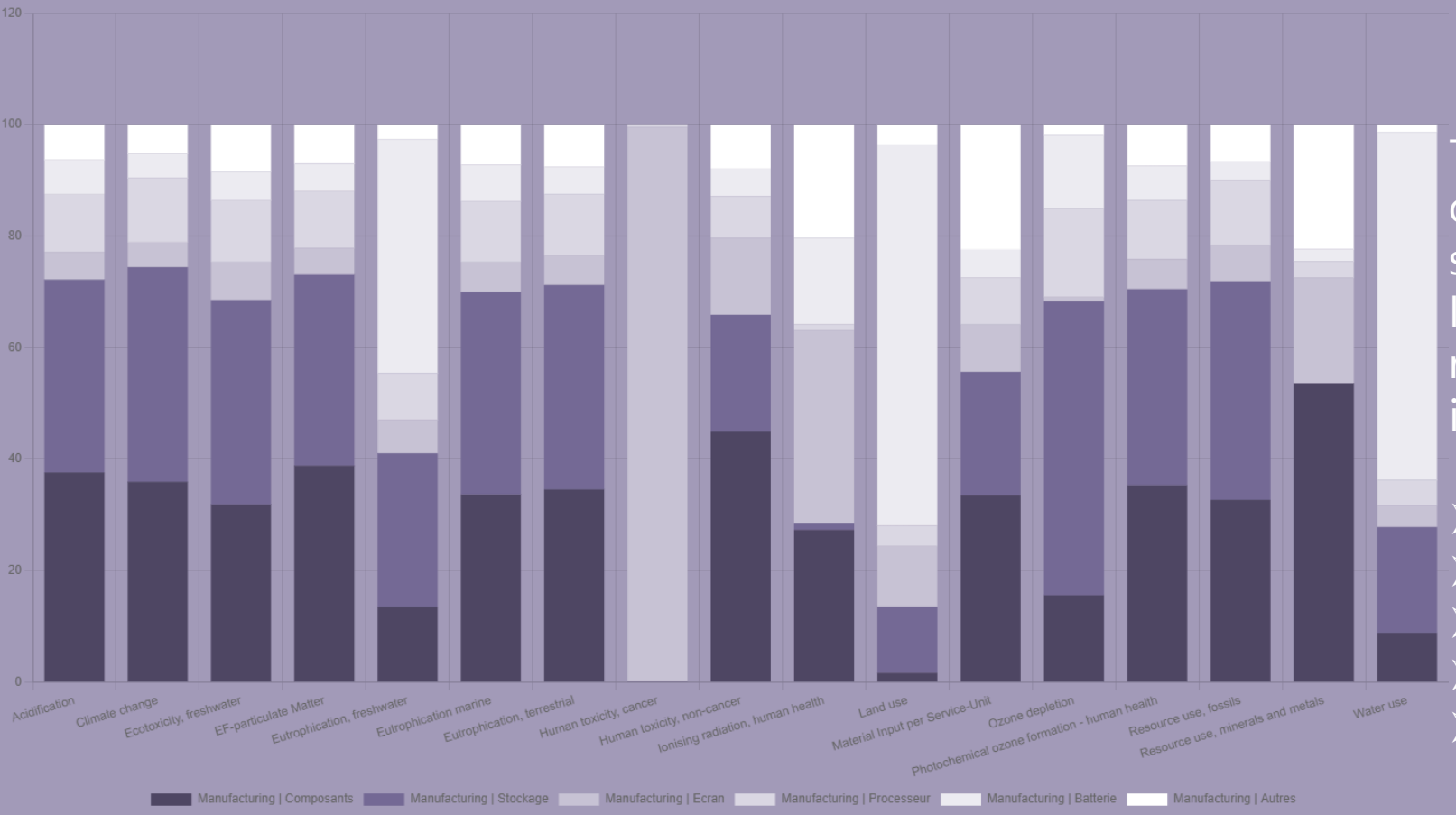


Contribution

The manufacture of smartphones is the most impactful step, representing up to 91% of impacts (ozone depletion).

End of life is the second most important factor, impacting up to 25% (Land Use)

Analyse des résultats : Le détail avec NégaOctet



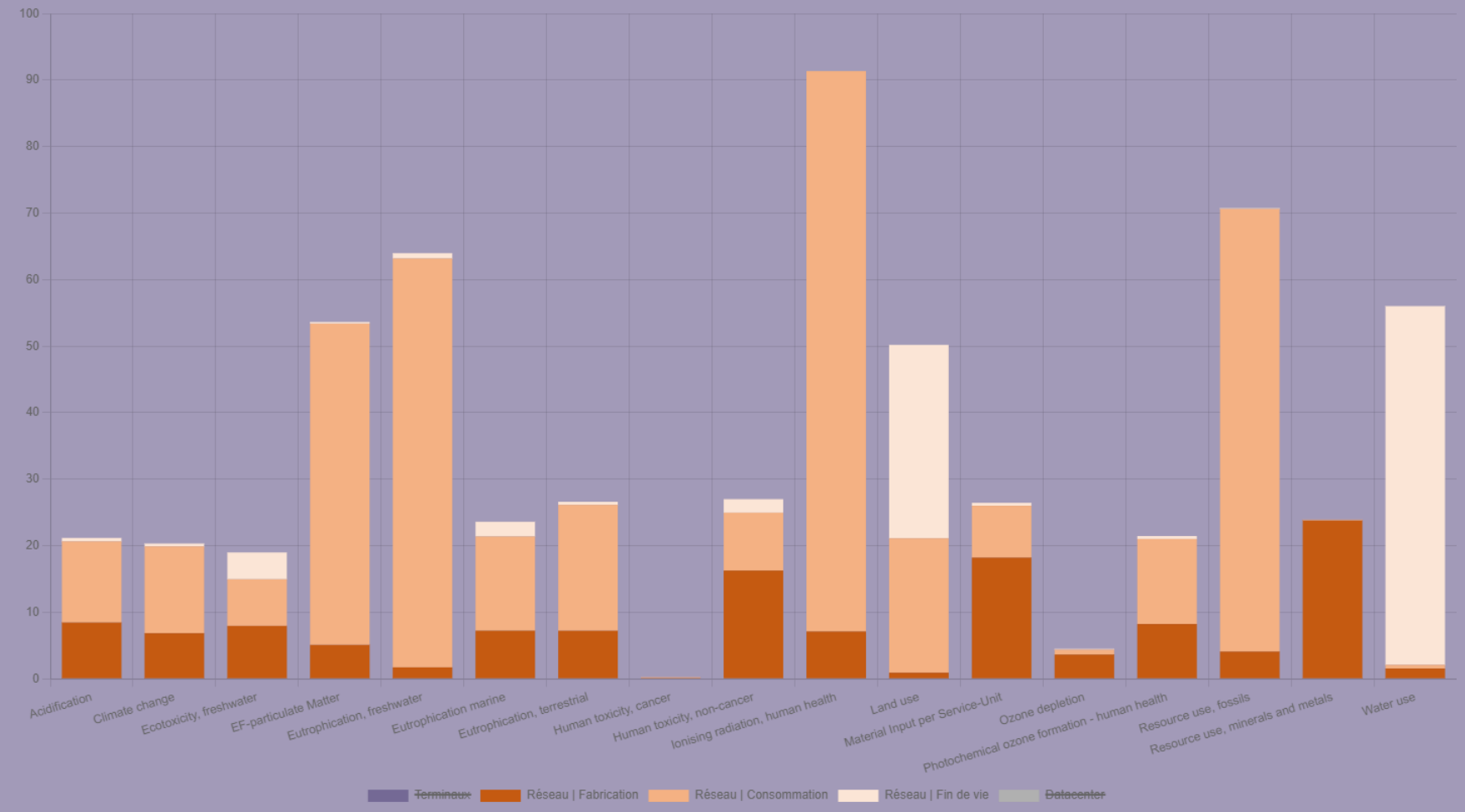
Contribution

The importance of smartphone components depends on the indicator studied.

In general, the 5 components representing 80% of the impacts on each indicators are :

- Connecting components
- Storage
- The screen
- The processor
- The battery

Analysis of results: The network – multi-indicator impacts

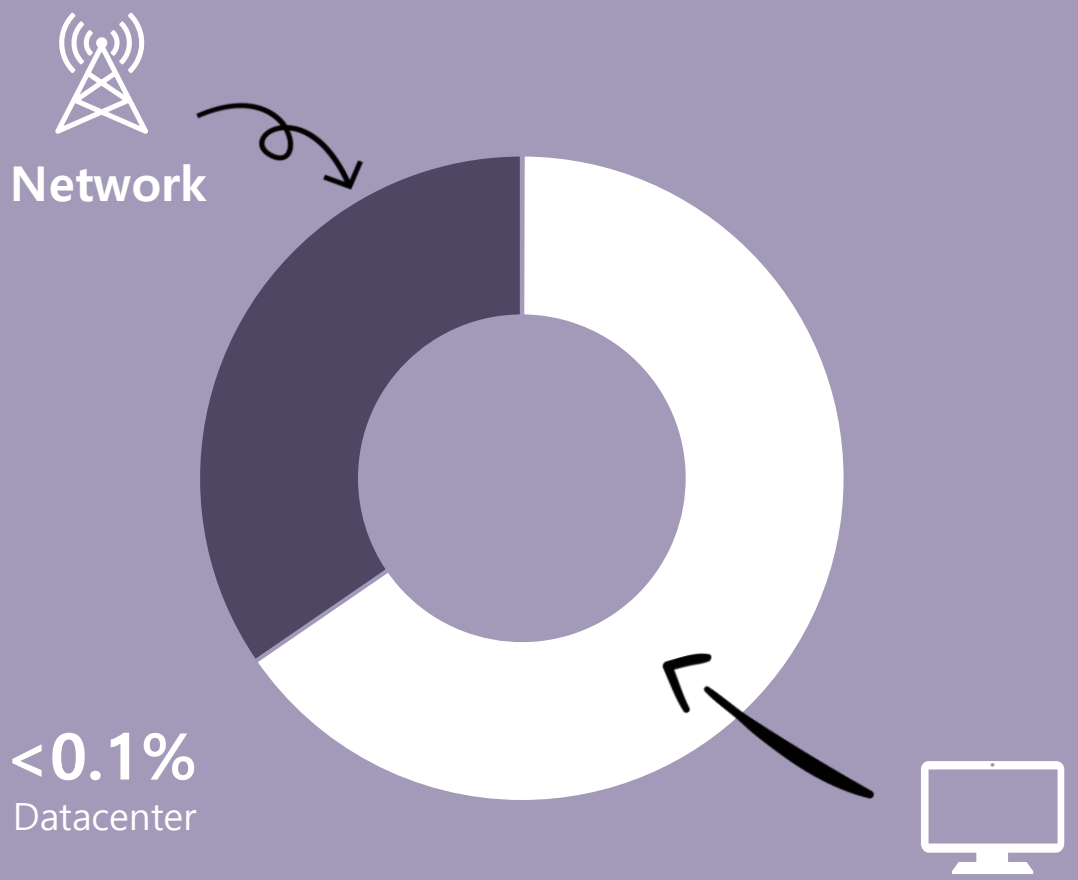


Contribution

Except for 2 indicators, energy consumption is the main contributor to network impacts – up to 83%.

End of life has an impact on water and soil use indicators while manufacturing has a significant impact on 3 indicators: use of mineral resources, MIPS and non-carcinogenic human toxicity.

Analysis of results – carbon footprint

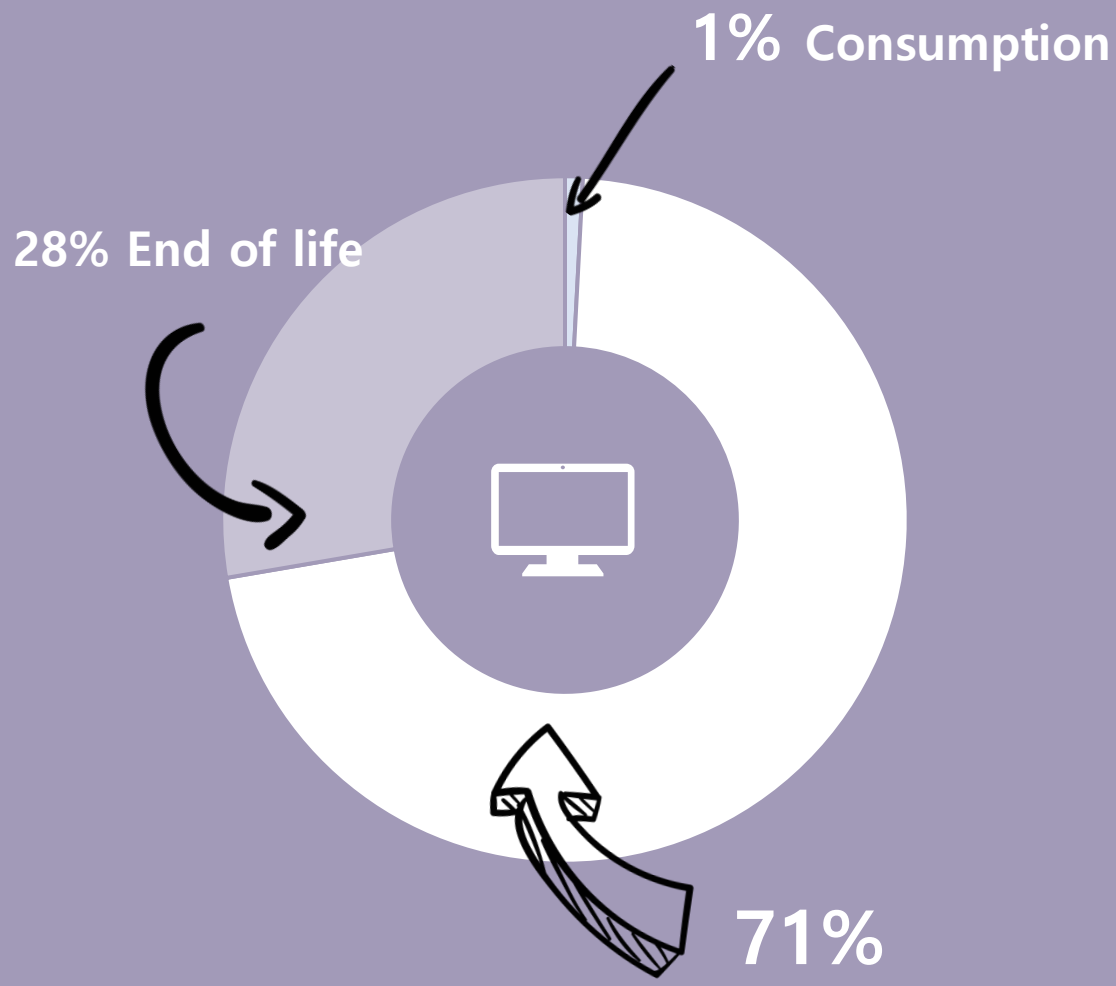


65%. This is the contribution of **terminals** to the carbon footprint of web conferencing. This makes it the first source of impact.

Networks account for 35% of impacts.

Data transfer via data centers accounts for less than 0.1% of impacts (storage impacts have not been accounted for in this case).

Where do the impacts of smartphones come from?



The different life stages of smartphones:

Manufacturing

Manufacture and assembly of the different elements present in a smartphone. The impact of manufacturing has been reduced to 1 hour of use for the conference.

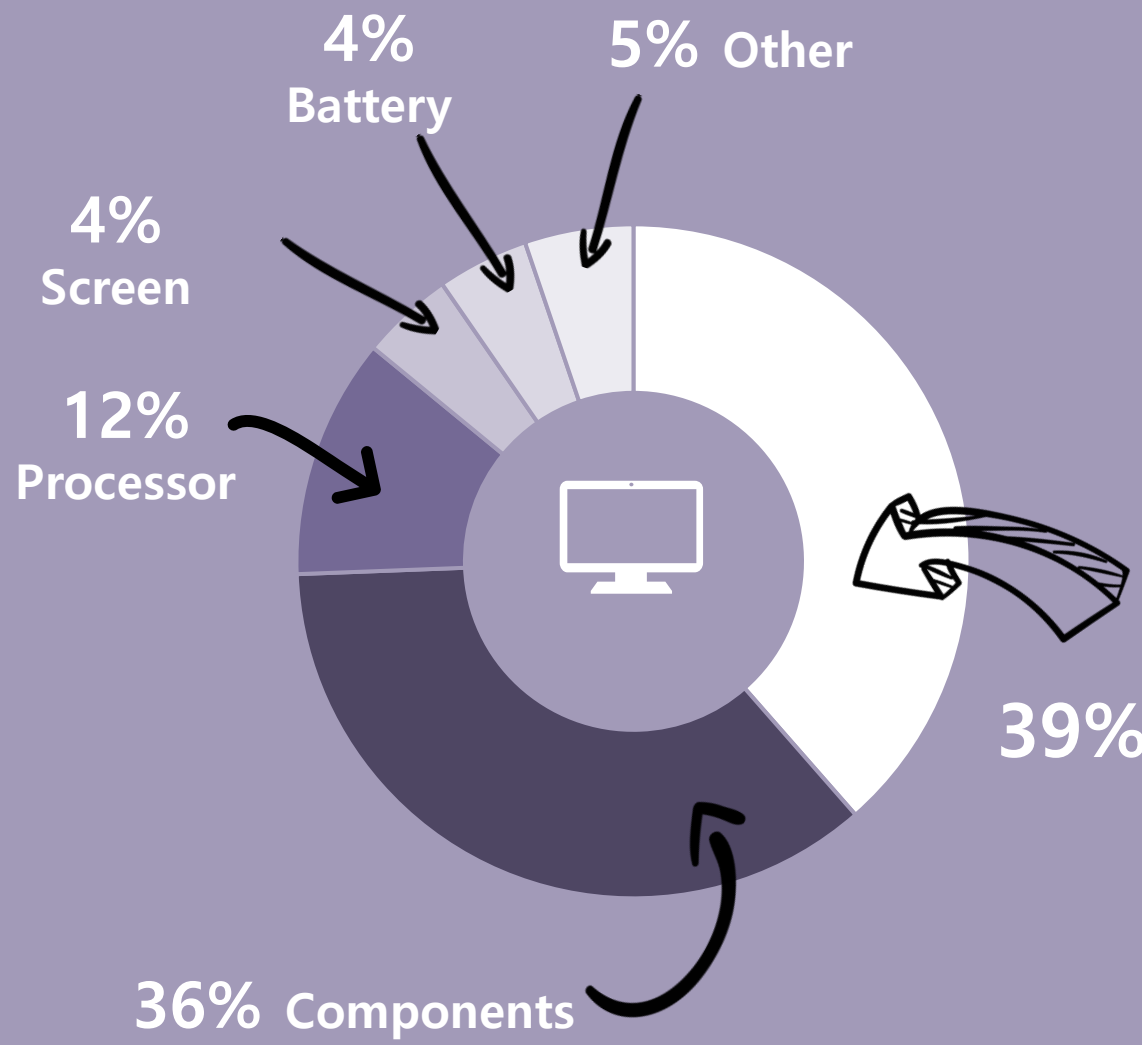
Consumption

Energy consumption required to be in videoconference with the webcam on for 1 hour.

End of life

Taking into account the collection, dismantling, sorting, special treatment of certain components and end of life (landfilling, incineration and recycling). The impact of the end of life has been reduced to 1 hour of use for the conference.

More details on manufacturing with NégaOctet data:



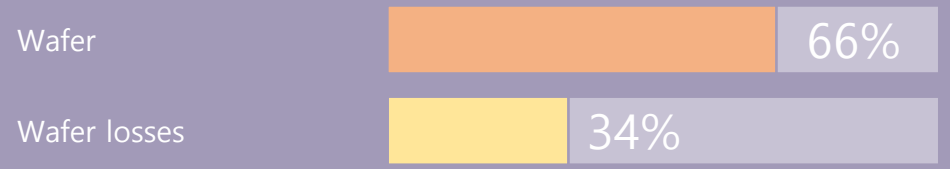
Manufacturing has two main contributors:

Components

Represents the different components present on the electronic board: integrated circuits, resistors, capacitors, transistors, etc ...

Storage

Includes RAM (6GB) and SSD (128GB). Each type of storage is composed of a surface of wafer 40 masks (chip). RAM has 53.2 mm² of wafer and 27mm² of losses. RAM impacts are detailed below:



Contact

LCIE Bureau Veritas
170 rue de Chatagnon
ZI Centr'Alp
38430 Moirans

codde@bureauveritas.com