Methodology for the assessment of the gain provided by the «EcoFilter» Instagram filter

In order to check if the EcoFilter really brought the gain that was expected, Orange wanted to have an independent expert assessment carried out. This expertise was entrusted to the French company Greenspector, a sustainable digital specialist and the only one with the required measurement capabilities.

Principles of operation

The software and hardware tools developed by Greenspector make it possible to precisely measure the variation of resources consumption on smartphones while using an application or browsing a website. The software's influence on the smartphone is measured in terms of battery consumption, data, CPU and memory usage, etc.

These measurement campaigns are carried out on real devices, under network conditions (WiFi, GSM) adapted to the needs of each study. From these measurements, Greenspector evaluates the environmental impact in terms of greenhouse gases emissions, according to a model described below.
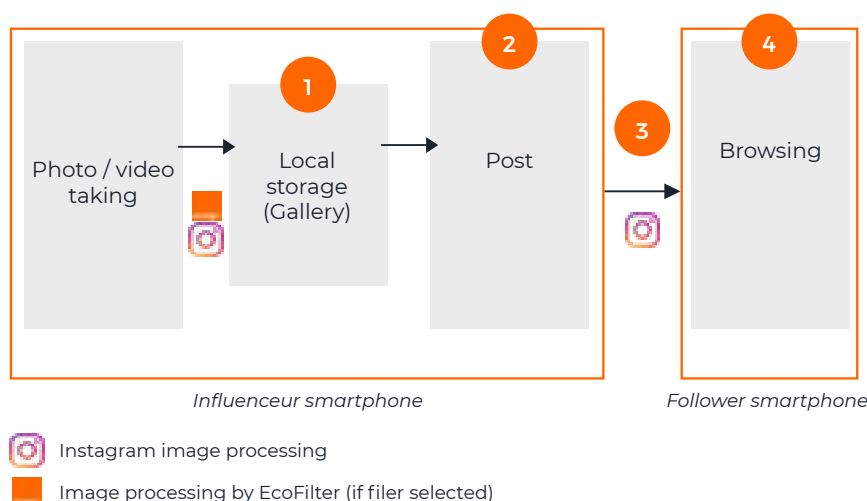
Measurement sequence for EcoFilter

Two series of measurement campaigns were carried out to study the impact of the EcoFilter filter: one by applying the filter when posting the photo and video stories in the Instagram mobile application; and a second similar campaign but without the use of any filter. The observation of the difference between the «with filter» measurements and the «without filter» measurements thus made it possible to establish the influence of the filter.

The campaigns with and without filter were carried out in parallel to ensure consistency between the elements measured. Especially regarding the shooting parameters which could have influenced the results (brightness, sound environment, etc.).

The scenario for the main measurement campaign was as follows:

- **Publication of a story of 10 photos from the Instagram application on a smartphone** (influencer action)

- **Viewing this story in the Instagram application on another smartphone** (follower action).

At each step, as well as during the intermediate processing steps, measurements were performed to verify the size of the media as well as the resource consumption of resources of the smartphones. These "end-to-end" measurements were carried out on devices from Samsung and Apple.

Influenceur smartphone   *Follower smartphone*

[instagram icon] Instagram image processing

[orange square] Image processing by EcoFilter (if filer selected)

In order to check the consistency of the data, several control points have been positioned :

1 : Before posting measurement of the raw size of the image
2 : Measurement of image size and energy on the influencer smartphone and application level when posting
3 : Measurement of the size of the data exchanged
4 : Measurement of the size of the data exchanged and of the energy at the level of the follower smartphone and at the level of the application during the consultation

Besides, additional measurements were carried out to verify the size of the media under various conditions on Android devices (several models from Samsung, Huawei, Sony, Xiaomi, Fairphone) and Apple devices.

Each published photo story consisted of 10 photos. 8 different types of pictures were used (daytime interior, exterior, portrait, etc.). Likewise, 3 different types of videos were used for the video stories.

Environmental impact assessment

The environmental impact of IT is far from trivial: pollution of water, soil, and the atmosphere during the upstream and downstream phases of the equipment life cycle, greenhouse gas emissions throughout the life cycle (3 to 4% of global emissions currently, and growing rapidly) …

A mobile application or a website contributes to these environmental impacts in different ways, from the seemingly innocuous gesture of the user on his smartphone to the datacenters of the service's provider through network equipment.

The impact model used by Greenspector for this study determines an impact in terms of greenhouse gas emissions (expressed as «CO_2 equivalent» noted eqCO_2). It includes the following phases:

- **On the user's smartphone**
    o Usage phase: the measured battery consumption is converted into energy consumption and then into CO_2 using emission factors determined by Greenspector ;

    o Manufacturing phase: battery consumption leads to natural obsolescence of the device's Li-Ion battery, which ultimately causes it to be replaced by the user. The impact model, therefore, includes a pro-rata of the impacts caused by the manufacturing phase of the smartphone. Learn more.

- **On the network**
    o Usage phase: the measured data volume is converted into energy consumption and then into CO_2, using the Greenspector emission factors from the Greenspector/Canal+ 2020 study ;

- **In the datacenter**
    o The measured data volume is converted directly into CO_2 using the emission factor proposed by The Shift Project in its 2018 Digital Sobriety Report.

As the Ecofilter filter can be used by influencers and followers without geographical limitation, all the emission factors used are based on a «world average» carbon content of electricity.

Measurement results

Greenspector's findings showed that:

- EcoFilter allows to reduce the size of the transferred media;
- EcoFilter helps reduce battery consumption on followers' smartphones;
- The application of EcoFilter to photo stories does not cause any measurable overconsumption of battery on the influencer side;
- Applying EcoFilter to video stories can cause a slight overconsumption of battery on the influencer side. However, this effect is largely offset by a higher reduction on the follower side. The overall impact of the filter remains positive even when the story is only seen by 1 follower.

As a result of these measures, the EcoFilter filter reduces the environmental impact caused by posting and viewing an Instagram story by 20% on average.

These results were obtained in February 2021. They may vary in the future depending on changes in the mechanisms implemented by Instagram on its mobile application and on its servers.

Conclusions

Greenspector recommends the use of the EcoFilter filter when posting an Instagram story, for its ability to reduce the environmental impact of this use.

Greenspector draws the users attention to two points:

- The general adoption of an attitude of sobriety in IT uses (before publishing a story, question its necessity);

- The EcoFilter brings gains on a particular subject; yet important results can be achieved by other actions such as extending the lifespan of smartphones.

About Greenspector

Greenspector is a sustainable digital pioneer. Its innovative technologies are made available to its customers with a SaaS software solutions and as expert consulting services.

The precise measurement of the consumption of resources of mobile applications and websites, in production or under development, allows the implementation of relevant progress actions. This yields results in the reduction of environmental and societal impacts, as well as the improvement of application performance and user experience.

At the heart of the company's IT, Greenspector solutions bring sobriety and performance to business applications, improving the battery life in the field. Smartphones and connected object fleets, better chosen and better managed, see their lifespan extended, thus reducing the costs of ownership as well as the environmental impacts.

Greenspector

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