

EVOLUTION OF ENVIRONMENTAL LABELLING OF MOBILE PHONES

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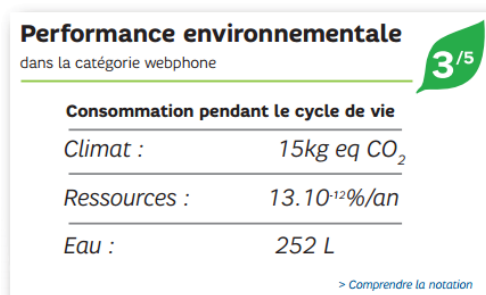


Figure 1 – Illustration of the SFR's environmental labelling in France (<http://www.sfr.fr>)

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Abstract

The mobile phone market is constantly evolving. Retailers and manufacturers offer a larger number of features to customers: a mobile network more and more efficient (2G, 3G then 4G), handsets with computer features, navigation, gaming, etc. This progress involves the use of more efficient and reduced electronic components: more powerful and more memory available in microprocessors.

One of today's most important issues is the emergence of environmental problems consciousness. In this context, various studies based on LCA have been recently conducted by the mobile phones retailers and manufacturers to understand to which extend their product could contribute to the environmental issues. Then, one of these studies goals is to provide information to consumers on the environmental impacts of mobile phones. These initiatives are supplemented by the French and European environmental labelling programs. Moreover, methodologies for LCA are also evolving. For example, the JRC, the European Union's scientific and technical research laboratory, advocated a series of recommendations in order to reduce uncertainty about the impact of LCA results [1].

This article deals with the environmental labelling scheme of mobile phones developed by SFR, a French telecommunications company. In the first time, this article summarizes the problems encountered on two main aspects: the need to update inventory data life cycle (ICV) faces the lack of availability of these data with the manufacturers and the need to develop the methodology to monitor the market and scientific advances. Secondly, the article will address various solutions that have been implemented in relation to these issues. Finally this article will detail the future challenges about methodological and standardisation issues (harmonization related to French or European environmental labelling or harmonization between different mobile operators).

1. SFR'S ENVIRONMENTAL LABELLING METHODOLOGY VERSION 1

In 2010, SFR with the technical support of CODDE Bureau Veritas, created the 1st version of its labelling methodology. This methodology is based on a simplified LCA, only using the data that will have significant contribution to the results and environmental impact variability.

Functional unit: To help customers compare mobile phones on the basis of similar features, we split them into three categories: classic (C.) (no Internet access), multimedia (M.) (2G Internet access), and webphone (W.) (3G Internet access). For the 3 categories, the functional unit of this methodology is: **“5.5 hours of calls (incoming and outgoing) per month for 2 years in France”**

System boundaries & Generic mobile phone evaluation model: In accordance with ISO 14040 and ISO 14044 standards [2], the total life cycle is taken into account and includes the production, distribution, use and end of life phases. The generic model takes into account 18 variables. These variables have been defined thanks to the study leads by the ADEME/AFNOR [3]. The LCAs are conducted using the EIME v4 software, the EIME v11.0 database (July 2009), and data collected by SFR from its suppliers for the configuration of the variables (18 questions).

Environmental indicators & Application of the methodology V1: Three indicators allow the distinction of handsets as much as possible:

- Global Warming Potential (GWP) expressed in kg eq. CO₂ (IPCC methodology, 2007).
- Raw Material Depletion (RMD) expressed in Y⁻¹ (US Geological Survey, 1998).
- Water Depletion (WD) expressed in litres.

The following figure shows the results of the methodology applied to a panel of 19 handsets representative of the market in 2010 (average of 6 C., average of 7 M. and average of 6 W.) according to the life cycle steps.

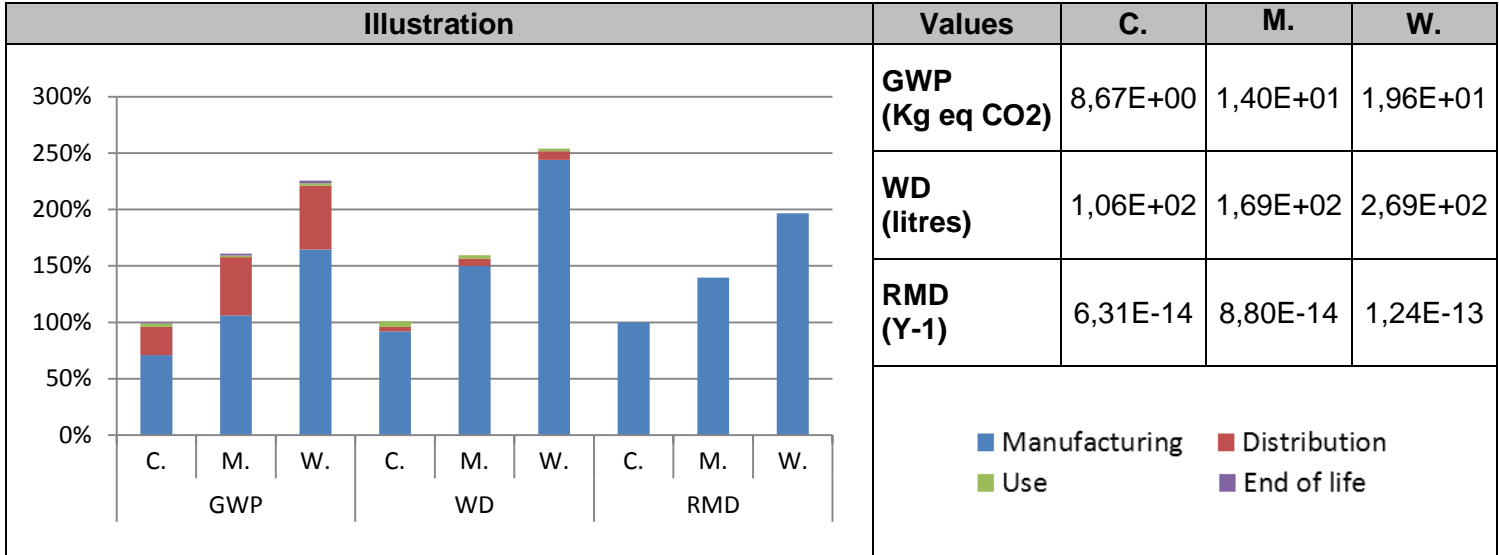


Table 1 – Results of the SFR’s environmental labelling V1 for the panel

2. SFR’S ENVIRONMENTAL LABELLING METHODOLOGY VERSION 2

In October 2011, SFR developed the 2nd version of its environmental labelling methodology with the technical support of CODDE Bureau Veritas. The goal of the 2nd version was to harmonize the SFR and ORANGE’s methodologies.

Generic mobile phone evaluation model: The method takes into account 50 variables. The major modifications are: distribution is more detailed, all the transports in aircraft are reported, the surface of silicon chips is a primary data, screens and PWB are splitted while only total surface was required, touchscreens can be assessed. The EIME v11.8 database (February 2011) is used.

Application of the methodology V2: Because of the evolution of the mobile phones market, we decided to split LCAs for mobile phones into two categories: classic (C.) (no 3G Internet access) and webphone (W.) (3G Internet access). The following figures shows the results of the SFR’s environmental labelling V2 applied to a panel of 23 handsets

representative of the market in 2011 (average of 7 C. and average of 16W.) according to the life cycle steps.

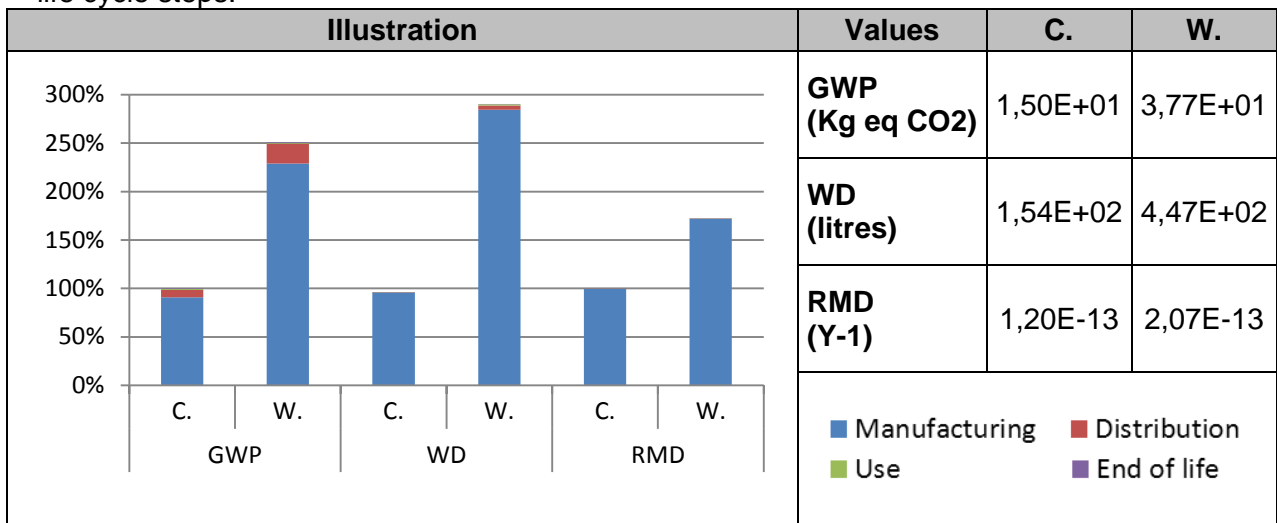


Table 2 – Results of the SFR’s environmental labelling V2 for the panel

22 webphones have been assessed in 2011 and 55 webphones in 2012. The distribution of these LCAs is presented in the following box plots.

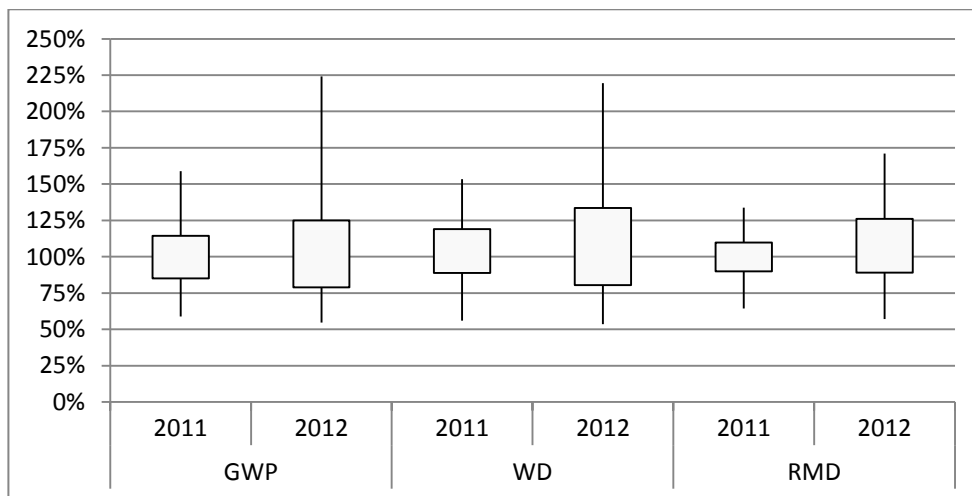


Figure 2 – Distribution of LCA results for webphones analysed in 2011 and in 2012 with the methodology V2 (Box plot)

Between 2011 and 2012, we notice that the distribution of impacts for webphones is becoming wider. This is due to the arrival of a new type of mobile: micro-tablets. The impacts of micro-tablets mainly depend on the size of the screen and the surfaces of silicon chips. These new devices bring into consideration the parameters chosen for the generic model.

3. COMPARISON OF THE 2 VERSIONS OF THE METHODOLOGY

In this paragraph, we compare the 2 methods from an assessment with a webphone [4] (cf. figure 3). The update of the method implied a significant increasing of the impacts on the

3 indicators. The production of LCD display panel is always the main contributor to the 3 indicators. Productions of integrated circuits and charger have greater impacts.

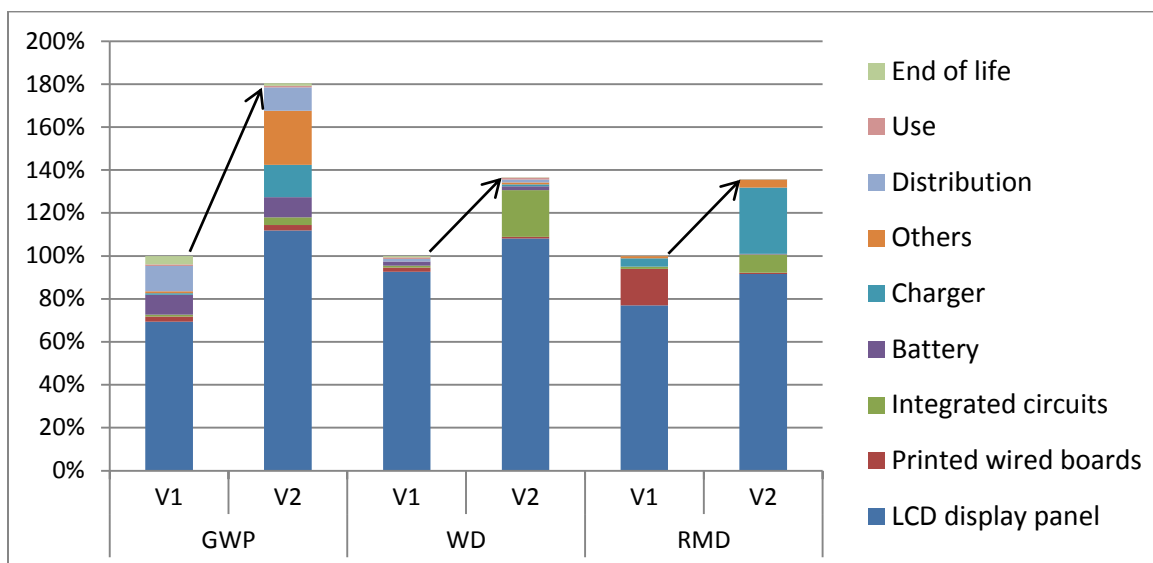


Figure 3 – Comparison of the method V1 and V2 for a webphone

4. CONCLUSION AND ISSUES

SFR's environmental labelling enables customers to compare the environmental performance of different mobile phones so they can make an informed decision in choosing a more sustainable phone. In addition of environmental impacts, SFR attributes a score between 1 and 5 to each mobile phone, resulting from the 3 environmental impact calculation. The completion of the variables taken into account in the generic model and the update of the LCA database are necessary to make the SFR's environmental labelling perennial. The update of the method in 2011 implied a significant increase of the impacts. The next main works of the SFR's environmental labelling are divided into 3 improvements:

- LCA database issues: improve the reliability of the Life Cycle Inventories (LCIs) on the LCD production which is the first contributor to the impacts; collect information from manufacturers of AMOLED and OLED display panels.
- Data collection issues: ensure that the data provided by the suppliers are reliable.
- Methodological and standardisation issues: SFR are studying the European environmental labelling [5] (choices in terms of LCA specific rules, database, and environmental indicators)

Currently this label has limited influence on consumer choice behaviour. In decision making, pricing and mobile phone features explain the tendency to select a mobile phone. Environmental taxes based on this label could help to change consumer behaviour.

REFERENCES

- [1] ILCD Handbook – International Reference Life Cycle Data System – First Edition 2010
- [2] Standards ISO 14040:2006 and ISO 14044:2006
- [3] Life Cycle Assessment of a mobile phone – ADEME, Avril 2008
- [4] Mobile phone designed in 2013 (spec: 70.7 cm² touchscreen, 16 Mo flash memories)
- [5] Product Environmental Footprint (PEF) Guide – First Edition

EVOLUTION DE LA METHODOLOGIE DE L’AFFICHAGE ENVIRONNEMENTAL DES TERMINAUX DE TELEPHONIE MOBILE DE SFR

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Abstract

Le secteur de la téléphonie mobile est un marché en constante évolution. L’offre évolue vers un plus grand nombre de technologies et fonctionnalités mises à disposition des clients : 3G puis 4G, webphones versus les téléphones classiques, etc. Ces modifications entraînent l’utilisation de composants électroniques de plus en plus performants : microprocesseurs plus puissants, plus de mémoire disponible, etc.

Dans un contexte global de montée en puissance des enjeux environnementaux, différents travaux ont été menés ces dernières années par les opérateurs de téléphonie mobile et les constructeurs afin de mettre à disposition de leurs clients des informations sur l’empreinte environnementale des téléphones portables, grâce notamment à une approche ACV (Analyse de Cycle de Vie). Cette volonté de transparence entre pleinement dans la logique des programmes d’affichage environnementaux français et européens qui se mettent en place actuellement.

De plus, les méthodologies relatives à l’ACV sont également en constante évolution. Ainsi, Le JRC (à développer plus préciser lequel), un organisme de la Commission Européenne, a publié une série de recommandations dans le but de limiter les incertitudes des résultats des ACV.

Développé en 2010, l’affichage environnemental de SFR permet aux consommateurs de connaître l’impact environnemental de leur selon 3 indicateurs: réchauffement climatique, épuisement des ressources naturelles et la consommation d’eau. Il a fait l’objet de plusieurs mises à jour permettant de mieux prendre en compte l’ensemble des transports en avion, des cartes électroniques, la distinction entre un écran LCD tactile et non tactile et la surface des puces en silicium. L’ensemble de ces modifications a entraîné une augmentation significative des résultats sur les 3 indicateurs analysés.

Par ailleurs, nous constatons qu’entre 2011 et 2012, la répartition des impacts des mobiles de catégories « Webphone » est de plus en plus large et prédominante. Ceci est dû à l’arrivée d’un nouveau type de mobile : les mobiles dits « micro-tablettes ». Ces nouveaux produits, dont les impacts dépendent essentiellement de la taille de l’écran et des surfaces des puces en silicium, remettent en considération les paramètres choisis pour le modèle générique.

L’axe d’amélioration prioritaire de la méthodologie de SFR consiste à poursuivre les efforts de fiabilisation des données provenant des bases de données des logiciels d’ACV. Les données à collecter en priorité auprès des constructeurs concernent la fabrication des écrans (LCD, AMOLED, OLED). D’autre part, en plus de l’harmonisation avec l’affichage environnemental français, SFR suit de près la nouvelle démarche lancée au niveau européen.