Periodic Project Impact Report
Deliverable D 6.3 (1 of 2)

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Topten ACT coordinator: ADEME

European portal www.topten.eu

Project partners and websites

Austria, AEA www.topprodukte.at	Belgium, BBL www.topten.be	Czech Republic, SEVEn www.uspornespotrebice.cz	France, Guide Topten www.guidetopten.fr
Germany, Oeko-Institut www.ecotopten.de	Italy, Eliante www.eurotopten.it	Lithuania, LNCF top-10.lt	Luxembourg, Oeko-Zenter www.oekotopten.lu
Norway, Naturvernforbund www.besteprodukter.no	Poland, FEWE www.topten.info.pl	Portugal, Quercus www.topten.pt	Romania, Icemenerg www.topten.info.ro
Spain, WWF www.topten.wwf.es	Sweden, SSNC www.toptensverige.se	Switzerland, Bush Energie www.topten.ch	UK, EST www.top10energyefficiency.org.uk/

Topten ACT aims at transforming the European market of energy-using products towards higher energy efficiency by addressing non-technical market barriers. Topten ACT works in order to:

1. Increase consumer purchases of top energy-efficient products in Europe: Topten ACT identifies the top energy-efficient products in 16 European countries, and pushes this information to consumers through tailored national websites and targeted communications activities. Topten websites are a free, accessible to all, 'public service' that helps consumers navigate the myriad of energy-using products offered to them in AT, BE, CZ, FR, DE, IT, LT, LU, NO, PL, PT, RO, ES, SE, CH and UK.

2. Increase the availability and visibility of top energy-efficient products on EU markets: Consumer demand for top energy-efficient products improves Topten ACT's ability to: 1) work with manufacturers to help them steer production lines towards more energy-efficient products; 2) support retailers to display and promote energy-efficient products in their shops.

3. Increase large buyers' knowledge of and demand for top energy-efficient products in Europe (both public and private entities): Large buyers have the ability to steer the market towards more energy-efficient products. Topten ACT approaches them with information on products of their interest (e.g. office equipment, vehicles) and offers direct advice in preparing calls for tenders that include energy efficiency criteria.

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1. Introduction

This report presents the first of two monitoring reports on the quantitative environmental and economic impacts of the project. The objective is to provide information on the savings achieved by the website-induced purchase of energy efficient appliances of the typical users of Topten ACT.

The overall objective of Topten ACT is to promote market transformation towards energy efficient products. To achieve this goal, Topten ACT operates several country specific websites in Europe, where the most energy efficient products for different categories and subcategories are listed. Topten ACT firstly aims to a direct influence on the purchasing decisions of individuals.

Second, the site forms the basis for further professional audiences, which use the websites and the criteria as a reference for own activities such as energy consulting, customer service, training, awareness raising and public relations. Through these activities further indirect effects are achieved, which are not necessarily noticed by the buyers themselves.

Internet-based information tools are always confronted with the problem that there is no direct face-to-face interaction with its users. Hence, it is sometimes difficult to get an feeling of the specific needs of the receiver of the information, the use of this information by the receiver and, in the end, the impact of the offered information on the decision making process of the receiver.

Therefore it is necessary to constantly monitor which user groups visit the website, to work with these user groups and consider their specific needs, to apply specific communication strategies and also try to evaluate which impact occur from the information.

2. Summary of part 1 and part 2 of the Survey

In order to get a better knowledge about the different user groups visiting the Topten ACT websites, Oeko Institute in cooperation with all partners performed an internet-based survey with two rounds. The questionnaire and results of the first round are documented in the Survey Report No.1. The questionnaire and results of the first round are documented in the Survey Report No.2.

Table 2-1: Involved websites of the visitor feed-back survey

Country	Website	Language(s)
Europe	topten.eu	English
Germany	ecotopten.de	German
Austria	topprodukte.at	German
Belgium	topten.be	Dutch French
Czech Republic	uspornespotrebice.cz	Czech
France	guidetopten.fr	French
Italy	eurotopten.it	Italian
Lithuania	top-10.lt	Lithuanian
Luxembourg	oekotopten.lu	German French
Norway	energismart.no	Norwegian
Poland	topten.info.pl	Polish
Portugal	topten.pt	Portuguese
Romania	topten.info.ro	Romanian
Spain	eurotopten.es	Spanish
Sweden	toptensverige.se	Swedish
Switzerland	topten.ch	German French Italian
UK	toptenuk.org	English

The following section gives an overview of the main results of part 1 of the survey. They are related to the characteristics of the visitors of Topten Act websites and the usage and assessment of the websites from the first round of the survey. The survey participants are characterised as follows:

- 499 (55%) are male users, 403 (45%) are female users
- the age of the users vary from 16 to 86 years with a mean of 47 years
- 820 (88%) participants are using the websites in a personal capacity, 81 (9%) in a professional capacity. Among the professional users, energy consultants are the predominantly group (32 participants or 42% of the professional users).
- 377 (43%) of the users visit the websites to inform a specific purchasing decision
- 392 (42%) were visiting the websites for the first time
- 291 (51%) of the repeated visitors use the websites frequently (more than 4 times a year), 281 (49%) use the websites up to three times a year

- 345 (34%) found out about the websites via a web search, 234 (23%) via personal recommendation
- 690 (74%) of the users are interested in the category “household appliances”, followed by 531 (57%) of the users who are interested in “consumer electronics” and 387 (42%) interested in “lighting”
- 687 (74%) assess the websites as easy or very easy to use
- The best rated properties of the websites are the easy navigation, the product comparison and selection criteria. The least rated properties are the news section and the range of product categories in the sense of product variety of the websites.
- 835 (90%) would recommend the website to a friend

The following section gives an overview of the main results of the second round, which was related to the different sources of information and the influence on the purchasing behaviour characteristics of the visitors of Topten ACT websites.

The main results are summarized below:

- 470 participants of the first round were asked to participate in the second round.
- 133 participants completed the online questionnaire.
- Altogether, the participants bought 203 Topten appliances, while household appliances and lighting devices are highly dominating.
- A majority of participants prefers quality and long-lasting products with low energy consumption or environmentally friendly operation whereas design or colour or a certain brand are less important.
- A high share of more than 56 % of participants buy their appliances in a retail store.
- 84 % of the participants find the information on the Topten-websites important for the purchase of a product.
- 81 % of participants orientate themselves on Topten's product lists or selection criteria.

3. Calculation of the quantitative environmental and cost impacts of the project

3.1. Methodology and proceeding

The number and types of the purchased products were determined on the basis of the two-rounds-survey done in the project (for details see chapter 2). The results of the second round of the survey showed how many users of the Topten websites bought which type of product in which quantity. These results will be put in relation to the overall number of users that participated in the survey. This way the number of the different types of products will be determined for one average participant in the survey, e.g. one participant bought on average 0,63 LED lamps.

The following table summarises the purchase behavior of the survey participants.

Table 3-1: Overview of the number of Topten products purchased by the 133 participants of the second round of the survey

Categories	Sum of Topten Products purchased by all survey participants	Number of purchased products per survey participant
Fridge / Fridge Freezer	10	0,075
Freezer	2	0,015
Dishwasher	9	0,068
Washing Machines	9	0,068
Vacuum Cleaner	13	0,098
Coffee Machine	6	0,045
Other Household Appliances[1]	15	0,113
Monitors - Flat Screen	5	0,038
Inkjet Printers	2	0,015
Inkjet Multifunctional	3	0,023
Laser Printers	1	0,008
Laser Multifunctional	1	0,008
Other office equipment[2]	1	0,008
TV	5	0,038
Other consumer electronics[3]	2	0,015
CFL	27	0,203
LED	84	0,632
other lighting[4]	1	0,008
Heating boiler	1	0,008
Circulation Pump	3	0,023
Air Conditioner	1	0,008
Car	2	0,015
Total	**203**	**1,526**

1: especially kitchenware, 2: notebook, 3: music system, 4: halogen.

Source: Öko-Institut: European visitor feed-back survey on Topten Act Websites - Online Survey (part 2)

In order to calculate the energy, GHG emissions and economic savings the following parameters were determined:

- The savings per product group and per participant of the second round of the survey (overall 133 participants).
- The GHG emission factors and the primary energy factor.
- The electricity costs.

The following table summarises the assumed savings per product group and per participant of the survey.

Table 3-2: Overview on the assumed savings per product group and participant of the survey for one year and for the lifetime of the specific product group

Categories	End energy savings per appliance [kWh/a]	Number of appliances purchased per participant	End energy reduction per participant [kWh/person*a]	Product lifetime [a]	End energy savings per participant [kWh/person*llifetime]
Fridge / Fridge Freezer	101	0,075	7,59	15	113,91
Freezer	101	0,015	1,52	15	22,78
Dishwasher	97	0,068	6,56	15	98,46
Washing Machines	24	0,068	1,62	15	24,36
Vacuum Cleaner	34	0,098	3,32	10	33,23
Coffee Machine	133	0,045	6,00	10	60,00
Other Household Appliances[1]	100	0,113	11,28	10	112,78
Monitors - Flat Screen	28	0,038	1,05	5	5,26
Inkjet Printers	30	0,015	0,45	5	2,26
Inkjet Multifunctional	50	0,023	1,13	5	5,64
Laser Printers	400	0,008	3,01	5	15,04
Laser Multifunctional	400	0,008	3,01	5	15,04
Other office equipment[2]]	200	0,008	1,50	5	7,52
TV	120	0,038	4,51	10	45,11
Other consumer electronics[3]	100	0,015	1,50	10	15,04
CFL	26	0,203	5,28	15	79,17
LED	26	0,632	16,42	15	246,32
other lighting[4]	26	0,008	0,20	15	2,93
Heating boiler	100	0,008	0,75	15	11,28
Circulation Pump	320	0,023	7,22	15	108,27
Air Conditioner	115	0,008	0,86	15	12,97
Car	5.560	0,015	83,61	12	1.003,3
Total		**1,526**	**84,80**		**2.040,68**

1: especially kitchenware, 2: notebook, 3: music system, 4: halogen.

Quelle: own calculation based on ADEME 2016[1], Topten.eu, ecotopten.de,

[1] Anette Michel, Sophie Attali, Eric Bush. Topten 2016. Energy efficiency of White Goods in Europe: monitoring the market with sales data – Final report. ADEME, 72 pages.

For the calculation of the **primary energy demand** resulting from electricity consumption the primary energy factor 2.5 was taken. The decision to take this primary energy factor bases on the Annex IV of the Directive 2012/27/EU that states: “For savings in kWh electricity Member States may apply a default coefficient of 2.5.”

The calculation of GHG emissions savings are based on the GHG emission factors for the electricity supply in Europe (in kilogram CO_2 equivalents) according to Ecoinvent V3.3. The table below shows the emission factors that were used for the calculation.

Table 3-3: GHG emissions factors of electricity supply for EU and differentiated by country. Source: Ecoinvent V3.3, GWP 100 (IPCC 2013[2])

Country	GHG emissions of electricity supply [kg CO_2e/kWh]
EU	**0,50894**
AT	0,38736
BE	0,28201
CH	0,10806
CZ	0,81941
DE	0,653
ES	0,47822
FR	0,12071
IT	0,52319
LT	0,84645
LU	0,60202
NO	0,037972
PL	1,0895
PT	0,56414
RO	0,69904
SE	0,061347
UK	0,66073

Source: Ecoinvent V3.3

Economic savings base on the reduced electricity consumption due to the purchase Topten products. In the table below the electricity prices used in the calculation are shown.

[2] Climate Change 2013 The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press 2013

Table 3-4: Electricity prices per kilowatt hour for EU average and differentiated by country. *for CH data for EU average were taken. Source: Eurostat, 2016, 2. half of the year

Country	Electricity price [Euro/kWh]
EU	**0,2054**
AT	0,2010
BE	0,2745
CH*	0,2054
CZ	0,1421
DE	0,2977
ES	0,2284
FR	0,1711
IT	0,2340
LT	0,1171
LU	0,1698
NO	0,1631
PL	0,1352
PT	0,2364
RO	0,1233
SE	0,1962
UK	0,1831

Source: Eurostat: 2016, 2. half of the year

The determination of the aggregated project impacts for energy, GHG emissions and economic savings bases on the data described above in combination with the number of website users of the different Topten websites.

It has to be assumed that not all users of the different Topten websites will show a similar purchase behavior as the participants of the survey. As not enough information is available on the socio-economic characteristics of the website users an exact extrapolation concerning the purchase behavior is not possible. Against this background a factor was introduced in order to determine what we call the “enthusiastic users” meaning those that behave like the participants of the 2. round of the survey concerning their purchase behavior. This factor refers to the bounce rate of the different topten websites that is around 50 percent in order to not consider users that stay only a few seconds. Additionally an overall factor of 0,2 was added that reflects the fact that even visitors that stay longer on the websites and click on several sub-pages will not all purchase a product.

Starting from the unique website visitor statistics an overall factor of 0,1 was applied, which led to the number of enthusiastic users shown in the following table.

Overall the assumption for the calculation of the savings and reductions were taken in a way to be on the save side and to not overestimate the impacts.

Table 3-5: Overview of the website statistics of the Topten websites in month 18

Country	Total of website visitors in month 18	Total of "enthusiastic" website visitors (factor 1:10)
EU	73.168	7.317
AT	991.926	99.193
BE	29.633	2.963
CH	567.001	56.700
CZ	27.322	2.732
DE	218.328	21.833
ES	39.453	3.945
FR	205.717	20.572
IT	108.699	10.870
LT	10.484	1.048
LU	10.567	1.057
NO	8.192	819
PL	6.670	667
PT	46.121	4.612
RO	50.366	5.037
SE	32.461	3.246
UK	71.049	7.105
Total	**2.423.989**	**242.399**

Source: ToptenAct website-visitor-report

3.2. Results

Basing on the results of the data and assumptions shown in chapter 7 the overall quantitative impacts of the project in month 18 (first half of the project) were calculated. They are shown in the following tables. Table 3-7 shows the savings per year whereas Table 3-8 shows the savings over the whole lifetime of the products.

It has to be added that the approach of this impact monitoring is restricted to the assumed purchasing behavior of users of Topten websites as described in the report: They buy more energy efficient products and contribute that way to savings of electricity, primary energy and the reduction of GHG emissions over the lifetime of these products. The project Topten ACT as a whole has a much broader impact on energy savings and GHG reduction: these impacts are described in INFRAS 2015[3] and include also activities intended to raise consumer awareness (e.g. purchase behavior and usage of products) but furthermore also the collaboration with large buyers, the collaboration with retailers & producers and policy advocacy.

Table 3-6: Overview of the savings in one year of operation of ToptenAct due to the purchase behaviour of users over the lifetime of the purchased products

	ToptenAct - Savings over lifetime	Unit
End energy reduction	331	GWh/lifetime
Electricity reduction	168	GWh/lifetime
Electricity cost reduction all enth. Users	34.462.250	Euro/lifetime
Reduction primary energy demand	588	GWh/lifetime
Reduction CO2e	104.338	t CO2e/lifetime

Source: own calculation

After 18 months of the project ToptenAct, the purchase behavior of the users of Topten websites, resulted in savings of 42,05 GWh endenergy including 21,18 GWh electricity per year. On the same time users reduced their costs by 4,4 million euro per year. The project contributes with a reduction of GHG emissions of 13.385 tons of CO_2e per year to the European targets.

[3] INFRAS. Topten Global Impact Assessment. Final report. On behalf of WWF Switzerland. Zurich, 14 August 2015. Link: assets.panda.org/.../topten_global_impact_assessment_wwf.pdf

Table 3-7: Overview of the savings per year of the users of Topten websites by their purchasing behaviour (month 18 of the project)

Parameter	Savings per year	Unit
End energy reduction	42,05	GWh/a
Electricity reduction	21,18	GWh/a
Electricity cost reduction	4.388.603	Euro/a
Reduction primary energy demand	73,82	GWh/a
Reduction GHG emissions	13.385	t CO2e/a

Quelle: own calculation

Over the product life time the savings add up to 496 GWh end energy including 252 GWh electricity and cost savings of 51,7 million euro. The GHG emission reduction adds up to 156.507 tons CO_2 e.

Table 3-8: Overview of the savings over the lifetime of the purchased products due to the Topten websites (month 18 of the project)

Parameter	Savings over lifetime of purchased products	Unit
End energy reduction	496	GWh/lifetime
Electricity reduction	252	GWh/lifetime
Electricity cost reduction	51.693.375	Euro/lifetime
Reduction primary energy demand	881	GWh/lifetime
Reduction GHG emissions	156.507	t CO2e/lifetime

Quelle: own calculation

For the whole 36 months of the project it can be expected that the overall impacts at least double.

4. The results put into context and outlook

The savings in electricity in month 18 of the project over the lifetime of the products correspond to 0,0084 % of the net electricity production in EU28 in 2015 according to Eurostat. The savings of electricity costs over the lifetime of the products can be expressed as a saving of about 10 Eurocent per inhabitant of EU28 (EU28 had about 510 million inhabitants on 1.1.2016 according to Eurostat).

In comparison with the results of the monitoring of the preceding project Euro-Topten Max (2012-2014[4]) the savings turn out to be lower even though the number of users was higher with 1,62 million users/year instead of 1,4 million users/year: 104.338 tons of CO_2e instead of 126.333 tons of CO_2e per year of operation of the project (over the lifetime of the products) and 331 GWh end energy instead of 340 GWh end energy.

On the first glance this is a surprising result. But it is in part due to the improvement of the electricity supply with a higher percentage of renewable energy sources (e.g. on EU average 0,46 kg CO_2e/kWh instead of 0,578 kg CO_2e/kWh electricity) and the energy efficiency standards of the appliances which results in lower electricity saving potentials. The latter reflect thereby the positive effect of the EU ecodesign measures. A second part is also due to the different purchasing behavior with a lower share of “big” products like fridges and freezers in the survey results of ToptenAct.

In the final impact report the results will be updated on the bases of the updated website statistics.

[4] Survey Report No. 2 European visitor feed-back survey on Euro-Topten Websites Deliverable D 5.4, WP 5. Prepared by Wuppertal Institute for Climate, Environment and Energy, Germany