Periodic Project Impact Report
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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.topten.it	Lithuania, LNCF top-10.lt	Luxembourg, Oeko-Zenter www.oekotopten.lu
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Spain, WWF www.topten.wwf.es	Sweden, SSNC www.toptensverige.se	Switzerland, Bush Energie www.topten.ch	UK, EST www.toptenuk.org

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 second of two monitoring reports on the quantitative environmental and economic impacts of the project. The second report refers also to the results of the surveys and the first report in order to give a complete picture. 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 a 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 Visitor 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 second 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	topten.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 form 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.

Table 3-1 and 3-2 summarise the purchase behaviour 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*lifetime]
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.

Source: 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.

The absolute end energy savings per appliance has not changed since D6.3 (May 2017) as not only the average products on the market have improved in efficiency but the most energy efficient products as well.

Table 3-3 and Table 3-4 present the hypothesis used to calculate the projects' impacts that are presented in Chapter 3.2.

For the calculation of the **primary energy demand** resulting from electricity consumption, a primary energy factor of 2.5 was applied. The decision to apply this primary energy factor is based 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." For fossil fuel a primary energy factor of 1.1 was used[2].

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 (month 1-18 of the project) resp. Ecoinvent V3.5 (month 19-42 of the project). 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 (month 1-18 of the project), Ecoinvent V3.5 (month 19-42 of the project), GWP 100 (IPCC 2013[3])

Country	Month 1-18 [kg CO_2e/kWh]	Month 19-42 [kg CO_2e/kWh]	Difference, absolute [kg CO_2e/kWh]	Difference, relative Percentage
EU	**0.50894**	**0.44289**	**-0.06605**	**-13.0%**
AT	0.38736	0.32631	-0.06105	-15.8%
BE	0.28201	0.27265	-0.00936	-3.3%
CH	0.10806	0.10539	-0.00267	-2.5%
CZ	0.81941	0.78298	-0.03643	-4.4%
DE	0.653	0.61129	-0.04171	-6.4%
ES	0.47822	0.35256	-0.12566	-26.3%
FR	0.12071	0.058213	-0.062497	-51.8%
IT	0.52319	0.41054	-0.11265	-21.5%
LT	0.84645	0.66406	-0.18239	-21.5%
LU	0.60202	0.5604	-0.04162	-6.9%
NO	0.037972	0.032937	-0.005035	-13.3%
PL	1.0895	1.0708	-0.0187	-1.7%
PT	0.56414	0.39298	-0.17116	-30.3%
RO	0.69904	0.4834	-0.21564	-30.8%
SE	0.061347	0.054662	-0.006685	-10.9%
UK	0.66073	0.55904	-0.10169	-15.4%

Source: Ecoinvent V3.3, Ecoinvent V3.5

For cars it was assumed that, the GHG reduction is 0.25 kg CO_2e/kWh*a of end energy savings due to the purchase of a Topten car.

[2] Source: Roger Hitchin, R.; Thomsen K.E.; Wittchen, K.B.. Primary Energy Factors and Members States Energy Regulations. Primary factors and the EPBD. N.d.

[3] 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

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

Table 3-4 Electricity prices per kilowatt hour for EU average and differentiated by country.

Country	Month 1-18 [Euro/kWh]	Month 19-42 [Euro/kWh]	Difference, absolute [Euro/kWh]	Difference, relative Percent
EU	**0.2054**	**0.2048**	**-0.0006**	**-0.3%**
AT	0.201	0.1978	-0.0032	-1.6%
BE	0.2745	0.2877	0.0132	4.8%
CH*	0.2054	0.2048	-0.0006	-0.3%
CZ	0.1421	0.1488	0.0067	4.7%
DE	0.2977	0.3048	0.0071	2.4%
ES	0.2284	0.2284	0	0.0%
FR	0.1711	0.1756	0.0045	2.6%
IT	0.234	0.234	0	0.0%
LT	0.1171	0.1107	-0.0064	-5.5%
LU	0.1698	0.1618	-0.008	-4.7%
NO	0.1631	0.1605	-0.0026	-1.6%
PL	0.1352	0.1451	0.0099	7.3%
PT	0.2364	0.223	-0.0134	-5.7%
RO	0.1233	0.1289	0.0056	4.5%
SE	0.1962	0.1993	0.0031	1.6%
UK	0.1831	0.1856	0.0025	1.4%

Source: Eurostat, 2016, 2nd half of the year (month 1-18 of the project); Eurostat, 2017, 2nd half of the year (month 19-42 of the project).
*for CH data for EU average were taken.

The determination of the aggregated project impacts for energy savings, GHG emissions' reduction and economic savings presented in Chapter 3.2 bases on the data described above in combination with the number of website users of the different Topten websites and additional indicators.

3.1.1. Topten websites' users

It has to be assumed that not all users of the different Topten websites will show a similar purchase behaviour 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 behaviour 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 behaviour. 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 or only look at one page. While not all visitors that stay longer on the websites and click on several sub-pages will purchase a product, most people have already the intention to purchase a new product before they visit the website; as a conservative estimate, we add a factor of 0.2 that reflects the percentage of visitors that decide in favour of an energy efficient appliance due to their visit on one of the Topten websites.

Starting from the unique website visitor statistics, the 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 of GHG follow conservative hypothesis in order not to overestimate the impacts.

Table 3-5 Overview of the website statistics of the Topten websites in the month 1-18 and 19-42 of the project

	Month 1-18		Month 19-42		Month 1-42	
Country	**Total of website visitors**	**Total of "enthusiastic" website visitors (factor 1:10)**	**Total of website visitors**	**Total of "enthusiastic" website visitors (factor 1:10)**	**Total of website visitors**	**Total of "enthusiastic" website visitors (factor 1:10)**
EU	73.168	7.317	90.786	9.079	**163.954**	**16.395**
AT	975.692	97.569	1.608.048	160.805	**2.583.740**	**258.374**
BE	29.633	2.963	26.839	2.684	**56.472**	**5.647**
CH	567.001	56.700	511.117	51.112	**1.078.118**	**107.812**
CZ	27.322	2.732	59.789	5.979	**87.111**	**8.711**
DE	218.328	21.833	202.758	20.276	**421.086**	**42.109**
ES	39.453	3.945	21.441	2.144	**60.894**	**6.089**
FR	205.717	20.572	95.192	9.519	**300.909**	**30.091**
IT	108.699	10.870	55.544	5.554	**164.243**	**16.424**
LT	10.484	1.048	9.634	963	**20.118**	**2.012**
LU	10.567	1.057	13.771	1.377	**24.338**	**2.434**
NO	8.192	819	10.021	1.002	**18.213**	**1.821**
PL	6.670	667	11.461	1.146	**18.131**	**1.813**
PT	46.121	4.612	56.216	5.622	**102.337**	**10.234**
RO	50.366	5.037	39.734	3.973	**90.100**	**9.010**
SE	32.461	3.246	37.709	3.771	**70.170**	**7.017**
UK	71.049	7.105	46.331	4.633	**117.380**	**11.738**
Total	**2.480.923**	**248.092**	**2.896.391**	**289.639**	**5.377.314**	**537.731**

Source: ToptenAct website-visitor-report

3.1.2. Additional indicators

The approach so far covers only the assumed purchasing behaviour 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, going further than raising consumer awareness (e.g. purchase behaviour and usage of products): these impacts will be described and roughly quantified in the following three points.

Because TOPTEN Act goes further than previous Euro-Topten projects in facilitating informed consumer purchases (ACTION), for example by directly referring consumers to the pages of retailers selling Topten products, an additional impact can be expected. A conservative increase of 10% impact with respect to previous projects is used in chapter 3.2 to account for this. In addition, an active collaboration with retailers allowed that, in many cases, they systematically increase the

percentage of Topten models in their product range offered to consumers. Some retailers – like the two biggest retailers in Switzerland[4][5] – even included in their yearly objectives the goal to reach a certain quota of Topten products in their yearly sales numbers (supported through suitable communication and pricing). This impacts also consumers who are not normally concerned with energy efficiency in their purchase decisions. Another (very conservative) increase of 20% impact was added for this.

Manufacturers are put in direct competition with each other due to Topten placing their products and energy efficiency values in an ranked list. This stimulates increased investments in developing new, better and if possible cost-effective technologies that in turn spread through the market, pushing it forward in general. Topten has also conducted product competitions, challenging manufacturers to develop new technologies in a bid for the title of “best on the market”. Topten has established contacts with over 370 manufacturers, covering more than 90% of the European market. For the far-reaching effect of this intensification of the manufacturer competition another increase of 30% was added to the impact calculations.

Influencing individual professional procurers, whether from the public or private sector, may have a greater impact than a large media campaign directed at individual consumers. As a result, Topten has also written a collection of twelve procurement guidelines for professional buyers that cover 6 domains such as transport, lighting, office equipment, household and professional refrigerators. These guidelines contain details on saving potentials, simple criteria that can be inserted directly into tendering documents as well as some background facts for each product category. Topten has actively communicated the guidelines to large buyers and has achieved notable successes. Some examples: retailers that already have a cooperation with Topten use the procurement guidelines for their own purchases. The European Energy Award mentions Topten either as a source of information or as an obligation in their guidelines for their public buildings and real estate holdings to obtain the label (in Switzerland “Energy-Cities” must use the Topten criteria in their procurement and the city of Zurich alone owns 10,000 apartments that it rents equipped with Topten appliances). Large buyers like insurance companies use the Topten criteria not only for their office buildings and canteens but also for their real estate holdings. Various rebate programmes are also offered by ministries and foundations to buyers of Topten listed energy efficient applications (examples from Austria, Luxembourg, Germany, Switzerland). The effect of all these procurement programmes is almost impossible to quantify but adds at least another 30% of impact – very likely even more.

Together these three factors add an increase of 90% impact to the calculations above.

[4] Mission statement on coop website: https://www.coop.ch/content/act/de/taten-statt-worte/tat-nr--198.html

[5] Mission statement on Migros website: https://generation-m.migros.ch/de/versprechen/sparsame-elektrogeraete.html

3.2. Results

Based on the visitors' survey data and assumptions shown in chapter 3.1 the overall quantitative impacts of the project were calculated. The results are differentiated by project phase (month 1-18; month 19-42) but are additionally also presented as total. They are shown in the following tables.

Table 3-6 Overview of the savings per year due to the users of the Topten websites and their purchasing behaviour (month 1-18, 19-42 ad 1-42 of the project)

Parameter	Unit	Month 1-18	Month 19-42	Total month 1-42
End energy reduction	GWh/a	79.38	92.68	**172.06**
Electricity reduction	GWh/a	39.97	46.67	**86.64**
Electricity cost reduction	Million Euro/a	8.31	9.58	**17.89**
Reduction primary energy demand	GWh/a	143.28	167.27	**310.56**
Reduction GHG emissions	t CO_2e/a	24,155	26,549	**50,703**

Source: Own calculation

Parameters of Table 3-6 have been calculated as follows:

- end energy reduction includes electricity reduction as well as energy reduction in the form of saved fossil fuels from more efficient cars.
- reductions GHG emissions & primary energy demand are calculated based on the end energy reduction and the factors from chapter 3.1 including reduced electricity as well as fossil fuels.

For the whole Topten Act project duration, the purchase behaviour of the users of Topten websites resulted in savings of 172.06 GWh end energy, including 86.64 GWh electricity per year. At the same time users reduced their electricity costs by 17,9 million euro per year. The project contributes with a reduction of GHG emissions of 50,703 tons of CO_2e per year to the European targets (see Table 3-6).

These calculations do not yet take into account the savings over the lifetime of the products which are shown in the subsequent table.

Table 3-7 Average savings due to one year of operation of Topten Act over the lifetime of the purchased products

	Unit	Savings
End energy reduction	GWh/lifetime	**590.27**
Electricity reduction	GWh/lifetime	**300.06**
Electricity cost reduction all enth, Users	Million Euro/lifetime	**61.71**
Reduction primary energy demand	GWh/lifetime	**1,072.31**
Reduction CO2e	t CO_2e/lifetime	**173,429**

Source: Own calculation

As shown in the next table, for the entire project duration and over the product life time the savings add up to 2065.93 GWh end energy including 1050.21 GWh electricity and electricity cost savings of 216 million euro. The GHG emission reduction adds up to 607,000 tons CO_2 e.

Table 3-8: Overview of the savings over the lifetime of the purchased products due to the Topten websites (month 1-18, 19-42 and 1-42 of the project)

Parameter	Unit	Month 1-18	Month 19-42	Total month 1-42
End energy reduction	GWh/lifetime	961.92	1,104.01	**2,065.93**
Electricity reduction	GWh/lifetime	488.99	561.22	**1,050.21**
Electricity cost reduction	Million Euro/lifetime	101.71	114.27	**215.98**
Reduction primary energy demand	GWh/lifetime	1,742.70	2,010.39	**3,753.09**
Reduction GHG emissions	t CO_2e/lifetime	293,181	313,820	**607,000**

Source: own calculation

4. The results put in perspective

The 1,050.21 GWh electricity due to the project over the lifetime of the purchased products correspond to the EU28 final yearly electricity consumption per capita in 2015 of 194,843 inhabitants[6]. This corresponds roughly to cities like Kassel (Germany), Reims (France) or Pamplona (Spain).. With the 215,98 million euro cost savings over the lifetime of the products due to the project, each euro invested by EU for the project (requested grand) resulted in 120,40 euros of savings.

[6] In 2015 the final electricity consumption per capita in EU28 was 5,390 kWh. Source: https://ec.europa.eu/energy/en/data-analysis/energy-statistical-pocketbook

Altogether the project savings have exceeded the estimates at the start of the project: with 1.5 million website users/year (slightly lower than projected) and additional stakeholder contact, cumulated **annual** savings triggered by the project are 590.72 GWh end energy, 1,072.31 GWh primary energy and 173,429 tons of CO_2 that could be saved per year of operation of the project (over the lifetime of the products). ToptenAct still generated primary energy savings of 564 GWh/a over the lifetime of the products if the factor of 1.9 introduced in chapter 3.1.2 is taken out.

Lifetime savings triggered during the **project duration** of 3.5 years amount to 2,065.93 GWh end energy reduction and 3,753.09 GWh primary energy reduction. The savings in tons of CO_2 become progressively lower due to the improvement of the electricity supply with a higher percentage of renewable energy sources (e.g. on EU average 0.509 kg CO2e/kWh (month 1-18) resp. 0.443 kg CO2e/kWh (month 19-42)).

Although not included in the Topten Act project, several teams use their Topten knowledge to regularly produce policy recommendations for EU Ecodesign and Energy Label regulations,for stakeholders at the national and European levels. These recommendations are not included in the calculations of the project impact but they were used to optimize new regulations or revisions in several instances. As a soft measure, this is close to impossible to quantify for Topten. An external study, conducted 2015 by the renowned office of evaluation specialist INFRAS on behalf of the WWF[7] has shown that the impacts of the Topten policy recommendations and support exceed by far the other types of impacts (cf. Table 4-1). The Topten consortium agrees with this assessment and will continue their efforts in this area.

Table 4-1 **INFRAS 2015: Impacts in terms of end electricity savings and CO2-emossion reduction according to activity in 2014. Cumulative savings indicate the sum of annual savings between 2006 and 2014.**

Table 1: Impacts 2014 in terms of end electricity savings and CO_2-emission reduction				
Activity **Region**	**Activities intended to raise consumer awareness** Chapter 3.2.1	**Collaboration with large buyers** Chapter 3.2.3	**Collaboration with retailers & producers** Chapter 3.2.4	**Policy advocacy** Chapter 3.2.2
Europe	**cumulative savings** 6.7 TWh 3.4 Mio. t CO_2 **annual savings** 1000 GWh/a	case study based quantification	case study based quantification	**cumulative savings** 7.5-10.7 TWh 3.7-5.3 Mio. t CO_2 **annual savings** 2.9-4.2 TWh/a

[7] INFRAS. Topten Global Impact Assessment. Final report. On behalf of WWF Switzerland. Zurich, 14 August 2015. Link: http://www.topten.info/uploads/File/IA-Report_Topten_global_final.pdf