

*Reference no: sp-31*

## **YEARLY APPLIANCE ENERGY COSTS INDICATION - A STEP TOWARDS ENERGY EFFICIENCY TARGETS**

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### **Executive Summary:**

The EU energy label currently provides the consumer with information on the energy efficiency, energy consumption and several other energy-related aspects. However, the energy label lacks the information on an aspect that many consumers find very important i.e. the product's (yearly) running costs. As is well known, a product that is initially somewhat more expensive can in fact work out to be cheaper in the long run due to the running costs being less expensive.

The main objective of the YAECI project is to provide customers with information at the point of sale on the yearly running cost of products with an energy label, in order to stimulate the uptake of affordable efficient products.

The calculation for the running costs of the YAECI project is based on the following data for each participating country:

1. (average) cost per kWh based on the national electricity prices
2. data on the product's electricity consumption as included on the energy label.
3. Optionally – water costs, based on data on the label and national average water price.

Retailers, which are participating to the YAECI project, are publishing the data on the products yearly running costs, at the points of sale to inform their customers so they can choose energy efficient products.

Keywords: energy efficiency, energy label

### **Introduction**

The main objective of the Yearly Appliance Energy Costs Indication (YAECI) project is to provide customers with information at the point of sale on the yearly running cost of products with an energy label, in order to stimulate the uptake of affordable efficient products.

The project is organised by partners in 11 EU countries and has started with the reparatory phase in March 2012 and aims to attract retailers to display the running costs. The YAECI project was initiated as a follow-up to the successful programme “Energie Weter”, organised in the Netherlands in hundreds of shops. In individual countries different product groups are covered, white appliances covered by the new energy label and displaying the annual energy consumption being dominant.

### **Products covered by the YAECI project**

For the selection of products, the YAECI project team considered [2] all appliances which are covered by the Directive on energy labelling. The Directive 92/75/EEC and the

corresponding implementing Directives cover the following products (hereafter “old label products”):

- Refrigerators, freezers and their combinations;
- Washing machines, dryers and their combinations;
- Dishwashers;
- Ovens;
- Electrical lamps;
- Tumble dryers;
- Air-conditioning appliances.

The Directive 2010/30/EU which amends the Directive 92/75/EEC was adopted in May 2010. On the date of writing, Delegated Regulations were adopted for the following products (hereafter “new label products”):

- Refrigerators, freezers, their combinations and wine storage appliances;
- Washing machines, dryers and their combinations;
- Dishwashers;
- Televisions;
- Tumble Dryers;
- Electrical lamps and luminaires;
- Air-conditioning appliances.

Overall, the number of old label products sold in shops is decreasing and thus becoming less significant for their coverage by future YAECI action. For this reason only the new label products are covered by the YAECI energy indicator. Nevertheless, a methodology which associates the old and new energy labels has been developed for assisting the retailers, in case they prefer to display the energy indicators in all of their products.

The combined washer dryer is the only exception in which an old label product is included since no new energy label has yet been developed for this product category. Ovens and light bulbs and tubes, which are covered by the EU Directives on energy labels, are not included in the selection for the reasons provided below.

Products which are not covered by the EU Directive on energy labelling are not covered by the YAECI project because this would impose difficulties in establishing commonly accepted methodology and in collecting the necessary data from the manufacturers. This difficulty was experienced in the Dutch initiative EnergieWeter which attempted to include a wider range of products (e.g. laptops and computer monitors).

Some aspects related to specific product categories which were considered during the selection process are explained below.

#### *Refrigerators, freezers and their combination, washing machines and dishwashers*

The potential impact of displaying an energy indicator on wine refrigerators, which are covered by the new Directive on energy labelling, is expected to be insignificant in all countries due to their relatively low sales (both in terms of units and power capacity). For this reason, wine refrigerators have been excluded from the scope of products covered in this project.

#### *Tumble dryers and combined washer dryers*

Tumble dryers and combined washer dryers have been excluded from the YAECI selection in countries with warmer climates. In addition, according to available market data, in some New Member States (including CZ, RO and SI), the market penetration of this type of products is generally much lower compared to the western European countries (e.g. FR and NL). However, the market trends show that the market penetration is increasing rapidly and therefore their inclusion was considered in CZ, CR, RO and SI as well.

The new Delegated Regulation on tumble dryers was published recently and it will become mandatory for all tumble dryers, which are placed on the market after May 2013. For this

reason, only new label tumble dryers are included the database which will be developed by the project team to provide data on running costs to the retailers. Nevertheless, a methodology which associates the new and old label for tumble dryers has been developed as well to assist the retailers until no more old label products will be sold.

#### *Ovens*

The use of electric ovens is generally higher compared to gas ovens but their share of overall household electricity consumption, is relatively low. In the EU, the market penetration of electric ovens will continue to rise but this will not have any significant impact on the electricity consumption, since the current share of electric ovens is already very high.

Nevertheless, ovens have been excluded for the scope of product covered in this study due to the likelihood of similar difficulties that were experienced in the EnergieWeter initiative. The main difficulties relate to the estimation of the usage patterns which seem to differ considerably not only between different countries but also between households within the same country.

#### *Air-conditioners*

The use of air-conditioners in the residential sector is increasing in all EU countries, regardless of the local weather conditions. However, in the short-term the impact of this product will remain rather insignificant in countries with cold climates, because the main driver of the air-conditioners market is the cooling demand (regardless of the fact that some air-conditioners can be used for heating as well).

The new and old energy labels for air-conditioners cannot be correlated because they are based on different classifications and standards. For this reason, no methodology has been developed for old label air-conditioners.

#### *Electrical lamps and luminaires*

Usually, the retailers who trade white goods and televisions also sell light bulbs. Nevertheless, this product category has considerably different characteristics compared to other products covered by the EU legislation on energy labelling, limiting the impact of their potential inclusion. Most significantly, due to the small size of light bulbs and their packaging, the energy indicator might not be noticed by the consumers.

### **Product selection**

Table 1 shows the selection of products which is mainly based on the market penetration and trends of different products in each country. Due to their large market penetration, the refrigerators and freezers, the washing machines, the dishwashers and the televisions are covered by all countries.

The inclusion of washer dryers, tumble dryers and air-conditioners is excluded in some countries due to their low market uptake. For the reasons explained in the previous section, ovens and light bulbs have been excluded from the scope of analysis performed in this study.

The table also shows which labels are taken into account in the development of the YAECI database of running costs. The combined washer dryers is the only old label product which is included in the database since the new label for this product has not been published yet.

**Table 1: Final YAECEI product selection**

Product	AT	CZ	CR	DE	ES	FR	MT	NL	PT	RO	SI	Old label	New label
Refrigerators	√	√	√	√	√	√	√	√	√	√	√		√
Washing machines	√	√	√	√	√	√	√	√	√	√	√		√
Dishwashers	√	√	√	√	√	√	√	√	√	√	√		√
Televisions	√	√	√	√	√	√	√	√	√	√	√		√
Combined washer dryers	√	√	√			√		√			√	√	
Tumble dryers	√	√	√	√		√		√			√	√	√
Air-conditioners			√		√	√	√		√	√	√		√

### Calculation of the Energy Indicator

The term “energy indicator” refers to the running cost which will be displayed in shops either within the price tag of the products or separately. The aim of the energy indicator is to provide to the consumers an estimate of the running cost of products. This information is not included in the EU energy labels.

The information which is currently displayed in the EU energy labels can assist the consumers to estimate their potential energy savings from more efficient products but not in monetary terms. This poses a risk that the information which is provided in the EU energy label (i.e. energy class and energy consumption) may not encourage consumers to purchase the most performing products.

For the development of YAECEI energy indicator, the project team assessed different options covering the following 4 aspects:

- definition of the time frame of the indicator;
- selection of a common or a diverse approach between the participating countries;
- definition of potential presentation standards for energy indicator;
- adding supplementary information.

The selection of the approach for each of these aspects is described below.

#### *The time frame of the indicator*

The running cost of products can be calculated on an annual basis or for longer periods (e.g. 5 or 10 years). The project team assessed the option of displaying the running cost of products over their lifetime. In this option, the average lifetime for each product category would be based on a common source of information. Potential sources considered, include the base cases from the Ecodesign preparatory studies which were carried out in the context of the Ecodesign Directive. These base cases serve as a reliable source since they have been developed in consultation with the manufacturers. However, this option was abandoned due to the possibly significant differences between the actual lifetimes of products and the

possible opposition by retailers and manufacturers on using one average value for all products.

For this reason, the project team selected the option of displaying the annual running cost which will be mandatory for all participating retailers and all products. This approach has already been applied in a real situation (under the EnergieWeter initiative in the Netherlands) which gives it additional credibility. Nevertheless, the retailers will be encouraged to display the running cost for longer periods without associating those periods with the lifetime of the respective products. The annual cost savings might appear insignificant and therefore the provision of the running costs for a longer period will further encourage the consumers to purchase energy efficient products.

#### *Context and appearance*

The context of the energy indicator will be based on EnergieWeter approach. Similar to the Dutch initiative, the YAECI energy indicator will follow the following principles:

- the energy indicator will be presented in the form of the statement “Energy cost per year is € X” (written in national languages and currency);
- in shops, the energy indicator must be set on the price tag (preferable on the last line) and for online sales the indicator will be presented in the product specification;
- the use of the YAECI logo is encouraged but not mandatory;
- the YAECI logo can be displayed on the price tags of the products and on separate tags.

This approach is preferred because of its acceptance by the retailers and also as its effectiveness has already been tested and applied in real life situations under the EnergieWeter initiative.

#### *Use of supplementary information*

The project team examined the possibility of including additional aspects of the running cost which could be used as supplementary information of the energy indicator. For this reason, the significance of the share of water consumption to the total running cost was analysed. The inclusion of water consumption was considered as it is one of the key elements included in the EU energy label and is largely related with the environmental impact of products. The products that would be affected by the inclusion of water consumption are the washing machines, dishwashers and washer dryers. At least for the washing machines and washer dryers (especially the water-cooled units) the cost of water represents a significant share of total cost. Although the weight of water consumption is not as significant in dishwashers, it would still be reasonable to include the cost of water, to ensure consistency on the overall approach.

Overall, the benefits of including the cost of water consumption are the following:

- water represents a significant share of the total running cost for some products (e.g. in washing machines the share ranges 28%-54%);
- the water cost is included in other similar initiatives;
- the water consumption is included in the EU energy label.

Following are the main disadvantages of including water consumption:

- potential difficulties might arise in defining a representative average cost for the water consumption (e.g. differences between municipalities/ regions and at different levels of consumption);
- the inclusion of water might cause difficulties for the evaluation of the YAECI action since this will be largely based on the share of products per energy class.

Therefore, although the water consumption represents a significant share in the total running cost of certain product categories, it also poses several challenges which relate mainly to the definition of a representative average water price. For this reason, the running cost of water

consumption is not mandatory in the YAECI action but it will be supported by YAECI if this is requested by the retailers.

*Approach on the energy indicator*

Based on the analysis of different options for the definition of the energy indicator the mandatory principles that should be followed by all retailers are the following:

- the annual running cost must be displayed in all shops and products;
- the annual running cost will be presented in the form of the statement “Energy cost per year is € X”.

Non-mandatory, but desirable principles are the following:

- the energy running cost for a different number of years (e.g. 5 and/or 10 years) may also be displayed as supplementary information;
- retailers may display the YAECI logo in the tags which will include the energy indicator.

Another optional element is the following:

- retailers may include the running cost for water consumption calculated based on the methodology provided by YAECI.

**Methodology for the calculation of the running costs**

The methodology[2] for the calculation of the annual running costs for products selected in YAECI project have been developed. For all product groups which are displayed with the old and new EU energy label, two different formulas have been developed (except for air-conditioners).

The development of the YAECI database takes into account only the methodologies referring to the new energy label (except for combined washer dryers for which only the old energy label exists). The methodologies for these products will be embedded in the YAECI database. All other methodologies have been developed to assist the retailers to make their own estimates, in case they wish to also display the running costs of products using the old energy label.

*Definition of data per country*

The calculation of the running cost is based on data which is mostly provided by the EU energy label, but certain parameters are defined by the project team. Specifically, the following data needs to be defined:

- energy prices per country;
- water prices per country (optional);
- usage patterns of single and double-duct air-conditioners (applicable in CR, ES, FR, MT, PT, RO and SI).

The data for each of these categories and their sources are described in the sections below.

*Energy prices per country*

Table 2 shows the household energy prices in all countries represented in YAECI. These prices come from Eurostat and they refer to the first semester of 2012 and will be updated at the beginning of the YAECI action. These prices include all taxes and they are charged in direct current (DC) bands for annual consumptions between 2,500 and 5,000 kWh;



**Table 2: Energy prices per country** (average of the first semester of 2012)

Country	Energy price €/KWh
AT	0.1975
CR	0.1208 (0.9109 kn)
CZ	0.1497 (3.7700 CZK)
DE	0.2595
ES	0.1822
FR	0.1412
MT	0.1700
NL	0.1858
PT	0.1993
RO	0.1050 (0.4612 lei)
SI	0.1542

The project team also examined the possibility of obtaining data from national sources (e.g. statistical offices, energy agencies) and for this purpose information was collected as well from such sources.

Although national authorities and statistical offices often provide more up-to-date data, Eurostat was selected as the most appropriate source, due to the differences that exist between countries in the definition of characteristics which relate to the electricity prices (e.g. corresponding bands and inclusion of taxes). In this context, the use of data from Eurostat can ensure consistency throughout the whole duration of YAECI.

#### *Water prices*

The inclusion of the cost of water consumption as a supplementary information to the energy indicator is optional. The inclusion will be based on the height of water prices at the national, regional or local levels and on the preferences of the participating retailers. Table 3 shows the average water prices per m<sup>3</sup> in 7 countries covered by YAECI. These prices are either provided by national statistical sources (CZ and FR) or they have been estimated based on average prices from various suppliers. In addition, these estimates entail the following three aspects:

- the prices correspond to an annual consumption of approximately 120 m<sup>3</sup>/year;
- they reflect costs of both water supply and sewage;
- any extreme cases (i.e. particularly high or low prices in certain regions) have been excluded.

**Table 3: Water price per m<sup>3</sup>**

Country	Water price €/m <sup>3</sup>	Source
CR	1.52 (11.33 kn)	Estimate
CZ	2.92 (73.44 CZK)	CZSO
FR	1.73	INSEE
MT	3.20	Estimate
PT	1.28	Estimate
RO	1.29 (5.86 lei)	Estimate
SI	0.66	Estimate

### **Involving retailers and endorsement**

Retailers are the key actors in this action. They have to provide the information on the yearly energy costs at the point of sale and in advertisements. They benefit from clearly demonstrating their environmental commitment and by attracting consumers to more efficient products that may be (somewhat) more expensive but can generally also provide a higher margin.

The participation of retailers is an essential part of the action. Each project participant (in 10 countries) is expected to ensure in writing the participation of at least 1 national retailer chain with at least 7 participating retailers and 8 individual retailers or 2 national retailers with at least 7 participating retailers or at least 15 individual retailers.

The list of retailers actually cooperating with the YAECI programme at the moment of writing this paper is already beyond expectation. Besides the 1400 retailer participating in EnergieWeter in the Netherlands several hundreds of shops in the other participating YAECI countries have committed themselves to the project. Amongst them big retailer chains and web shops which will be visible at the YAECI website [www.appliance-energy-costs.eu](http://www.appliance-energy-costs.eu).

Retailers are understood to benefit by joining the scheme, since they will have an extra selling tool to attract the attention of the consumer and have stronger arguments to sell (sometimes) more expensive products.

### **Evaluating results**

Evaluating the impact of the project activities is one of the keys to understand if projects such as YAECI have the potential to further improve the position of energy efficient appliances on the market.

A specific project activity provides both an evaluation of the market effect of the action and how the action was received by retailers and consumers. The evaluation of the action has 3 components:

- a quantitative evaluation at the end of the action answering the question whether the market share of more efficient appliances has increased for retailers that participated in the action,
- a qualitative evaluation of the action regarding consumers,
- a qualitative evaluation of the action regarding retailers.

The qualitative evaluations regarding consumers and retailers are foreseen half way the action. In this way the results of the qualitative evaluations can be used to guide and, if necessary, further improve the approach of the action in between (mid term evaluation) whereas the quantitative evaluation aims at assessing the maximum result possible.

### **Promoting the project activities**

Promoting the yearly appliance costs to consumers is one of the key conditions of the success of the programme. Within the programme, each national partner is expected to organize a range of activities, most of them in direct cooperation with the participating retailers. Examples of the promotion activities include:

- Project website, with national language sections for 11 participating countries
- Brochures for shop assistants and consumers
- Leaflets and/or posters for consumers
- Press conference (including press release) and seminars
- Articles in general media

Activities already undertaken within the project are regularly published on the project website: <http://www.appliance-energy-costs.eu/eu/news/>



## References

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*The YAECI Project has been supported by the Intelligent Energy Europe programme. The sole responsibility for the content of this website lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EACI nor the European Commission are responsible for any use that may be made of the information contained therein.*