

WP4 – National Activities – Dissemination and Exploitation

D4.7 – Software Update (Central Topten Software)

August 31th, 2018





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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The Topten Act project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°649647. This document reflects only the author's view. EASME is not responsible for any use that may be made of the information it contains.

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Introduction

Topten ACT aims at transforming the European market of energy-using products towards higher energy efficiency.

Topten ACT identifies the top energy-efficient products in 16 European countries, and makes this information available to consumers and large buyers on tailored national websites. The most energy efficient models in different product categories (such as household appliances, lighting, office equipment, consumer electronics, cars) are presented with comprehensive product information based on official labels and standardized declarations. Topten works with manufacturers and thus increases both market offer and consumer demand of high energy efficiency products. Topten is strictly neutral and independent from manufacturers and retailers, its selection criteria are always published online.

Within the market transformation toolbox, Topten is considered as a "soft measure", a measure that definitely impacts the market on crucial aspects: it is a market shifter, a facilitator, an education tool, a decision-making aid.

Central to the function and communication of Topten is the Topten software. Topten needs a strong and flexible website to display best products and attract consumers, manufacturers and retailers as well as policy stakeholders. Each of the 16 national websites displays the best products of the national market in addition to national information on energy efficiency. Topten.eu is a central website that shows the best products on the European market and provides a **reliable source of information for policy makers and researchers** about the current BAT products.

The initial software for the Topten website was created and implemented in 2006. Due to rapid development of new software technologies, this version was not compatible with current requirements anymore and had to be replaced in order to remain viable. The main criteria for the development of a new software and modern website were: **a stable and mature enough for the usage and maintaining in time**, improved design, basic responsive design, filters for individualised lists, a feature to add daily shop links in automatic exchange with online shop websites, SEO features and API interface.

The hard work for the Topten website has been recognised by European Commission: Topten has last year been selected as a finalist for the [EU Sustainable Energy Award 2017](#), which recognises outstanding innovation in energy efficiency and renewable technology. Each finalist has been portrayed with a **short 60-second film**. See how the Europe-wide Topten network contributes to the energy revolution on www.topten.ch/video.

The Topten software 2.0 is also making its way across the ocean: Argentina and Brazil will be up and running this summer 2018 with the all new web solution – enabling further 250 million persons a quick and reliable access to green products.

1. Structure of the new software

The Topten software is all about **product lists of best-in-class products** which are energy-efficient, resource-efficient and eco-friendly. These product lists need to be stored, maintained and nicely displayed. The Topten software therefore is based on two core components: a **database** and a **content management system**.

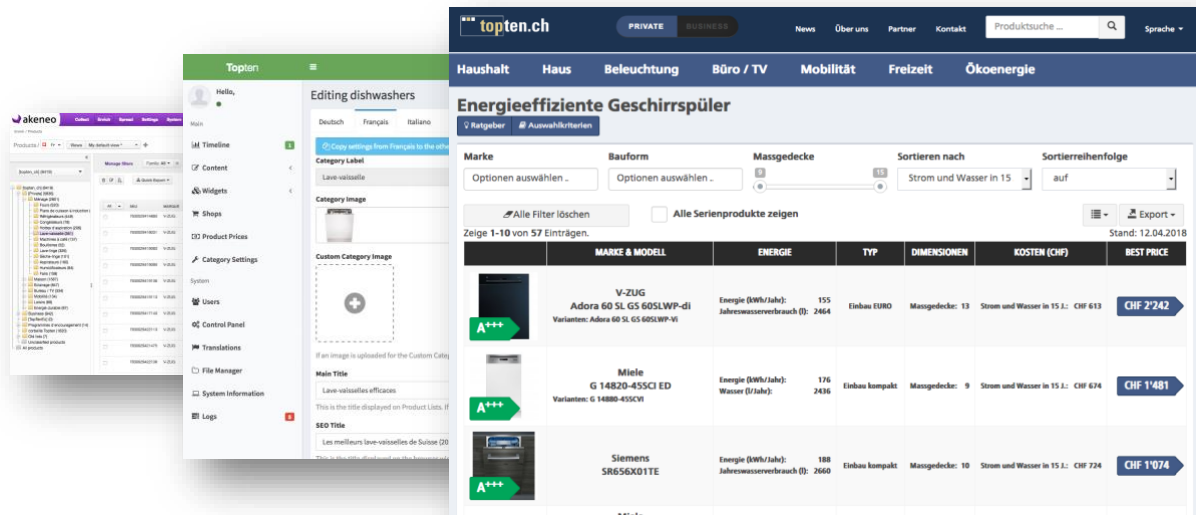


Figure 1: Product data from the product information system (left) is pulled from the content management system (middle) and displayed to the Topten website (right)

The heart of the software is a so-called **product information management system (PIM)** which stores the products and enables product editors to edit products in the database. We use the very common and versatile solution called Akeneo. The other main part of the software is the **content management systems (CMS)** which processes the product lists for the frontend and manages the written content (news, advisers and procurement guides etc.). The CMS is based on the Yii framework. These tools are not only developer-friendly, flexible and scalable but have a very user-friendly backend which make the daily work for content and product editors easy. Both systems (PIM and CMS) are connected and synchronised (see Figure 1). An automatic data transfer is daily set to keep product information always up to date.

Besides these product lists the Topten software manages and displays **product guides, selection criteria, articles, documents, listings of financial rebate programs, competitions and a blog**. This additional content is managed by the CMS system and different layout schemes, rules and settings have been programmed for each content format.

2. List of features

The list below is an overview of the software features. The most important ones will be explained and highlighted below along with three chapters on user experience (3), database and CMS improvements (4.1 / 4.2), and the exchange with partner sites and online retailers (4.3).

- Content management: articles, categories, static pages, carousels etc.
- Translations editor (file based or database editable)
- Language selector (with or without URL suffix)
- User management (role-based)
- Application settings management
- Shop link matching with external shops
- Best price function
- Branding of product lists (for cooperation with other labels, i.e. TCO)
- RESTful API (token protected)
- Responsive design capabilities (using latest Bootstrap versions)
- Data tables with export feature, expandable rows and detail page, filters and sorting
- Control panel for quickly triggering automated services (data synch, cache flush etc.)
- File Manager
- Optimised loading times (lazy load, image optimisations & pagination etc.)
- OAuth authorisation
- Database agnostic (It can use SQL and NoSQL databases simultaneously without any major codebase modifications)
- Caching agnostic (It can use any caching system without changing the codebase)
- Docker and Vagrant support
- Test suite
- Many UI features: range picker, multi select, search autocompletion, tooltips, modals, flash alerts etc.
- External link tracking with Google API (incl. automated reports)
- Full product search
- Breadcrumbs navigation
- Contact form with answer management system
- Secure connections thanks to https

3. User experience: making the choice for energy-efficient products easy

The new Topten software is optimised for user friendliness. Since 2016 the Swiss Topten database added around 1'500 new products and has grown to more than 6'600 best-in-class products in more than 50 categories. With this broad product range it is crucial for the user that the information for energy-efficient products are quickly and easy accessible. User experience has improved with the new Topten software due to better user guidance, displaying the right content at the right place and adding more shop links functionalities. The software has an up-to-date frontend which highly **resembles common online shop interfaces** and lets users quickly engage in finding the best product for their needs (see Figure 2).

Energieeffiziente Waschmaschinen

Zeige 1-10 von 80 Einträgen.

	ENERGIE	DIMENSIONEN	KOSTEN (CHF)	BEST PRICE
<p>Samsung WW80K5400WW/WS Varianten: WW80K5400UW/WS, WW80K6400QW/WS, WW80M6450PW/WS, WW80M6420PW/WS</p>	<p>Energie (kWh/Jahr): 116 Wasser (l/Jahr): 8100</p>	<p>Füllmenge (kg): 8</p>	<p>Strom und Wasser in 15 J.: CHF 834</p>	<p>CHF 697.95</p>
<p>Electrolux WASL2E300</p>	<p>Energie (kWh/Jahr): 76 Wasser (l/Jahr): 10499</p>	<p>Füllmenge (kg): 9</p>	<p>Strom und Wasser in 15 J.: CHF 858</p>	<p>CHF 1'299</p>

Erhältlich bei	Auf Lager?	Lieferung inbegriffen?	Preis	Shoplink
nettoshop.ch	ja	ja	CHF 1'298.90	zum Shop
Kaufsignal.ch	ja	ja	CHF 1'399.00	zum Shop
Fust	ja	ja	CHF 1'529.00	zum Shop

Beladung: Frontlader
Max. Schleuderdrehzahl: 1600
Tiefe (mm): 64

Einsatzort: Einfamilienhaus
Höhe (mm): 90
Türanschlag: links

Warmwasseranschluss: nein
Breite (mm): 71

Figure 2: The new Topten product lists with filters, sorting functionalities, integrated shop links and best prices

3.1. User guidance

The user experience in regard to guiding the user to the most relevant content has been the centre of our software update. The frontend has an **all new homepage** displaying an overview and direct access to the most relevant contents. The homepage catches the attention of the user with an **image carrousel** which displays the latest news. Just below the user finds the **most clicked product categories** (automatically calculated on the figures of the last month). Furthermore, the user has a **quick access to all product guides and financial rebate programmes** for energy-efficient appliances. The start page also displays a **nice overview of the latest documents and reports**. The start page therefore highlights latest news, most relevant products and an entry point to background information on energy efficiency.

Finally, the start page and the website overall are clearly structured with a **private and a business section** with a separate product navigation but also specialised content. The private section contains all household, electronic and lighting devices for consumers. Some countries even cover cars, e-bikes, e-motos, leisure activities and an overview of suppliers of green electricity. Whereas the business section

contains commercial appliances, financial rebate programmes for companies and procurement guides.

The product lists are very easily accessible from every site through a **dropdown image navigation**. The navigation contains all main product categories. The product navigation has especially been optimised for mobile devices. It now nicely guides the user to the right product lists thanks to a common hamburger icon and **basic pattern for mobile navigation** (see Figure 3). Finally, every single products page got a **breadcrumb navigation** which helps users to quickly see in which category they are and gives them the possibility to quickly navigate back to the full list.

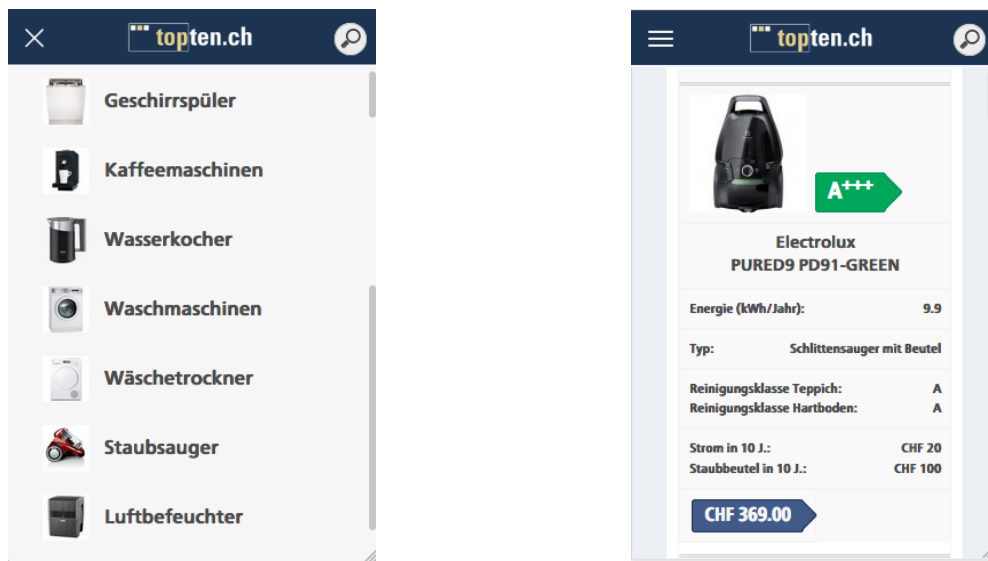


Figure 3: Mobile navigation and mobile view of the Topten Software

The product lists themselves have a **default sorting order** which displays the best products according to the most important feature such as energy efficiency class, efficiency index, electricity costs or efficacy values such as Lumen per Watts. The lists provide **different filters** with multi-select and range bars functionalities (see Figure 4). Each product list contains context buttons to the respective **product guides**, **selection criteria** and – if provided – logos with links to partners or to **financial rebate programmes**.



Figure 4: Product lists with enhanced functionalities in the case for the notebook list based on TCO criteria

3.2. Shop links: automatic, daily best prices

The Topten software with its updated shop link functionality helps users not only to save money thanks to energy-efficient products but also thanks to automatic, daily shop links which are provided from a wide range of online retailers. Each product list automatically gets updated daily and matches the Topten products with the **daily prices of the online retailers** which Topten is in cooperation with. The daily best price for each product is highlighted.

Each product is not only enriched with the best price but also with the deep links to the respective online retailers and further information such as availability etc. **Shop links** are visually appealing with nice logos, easy accessible information and buttons. Thanks to the shop link and best price functionality the Topten software is not only a product overview and guidance tool but also comes with a powerful and very useful price comparison tool. It is a two-in one solution and can **simplify a green purchase** massively.

3.3. Automatic and Rich Information: Displaying the Right Content at the Right Place

For a good user experience the new software also has various features which display the right content at the right place.

The software which is used within different European countries and language region ships with a **browser language detection** feature and automatically redirects the user to the according language thanks to its internationalisation and localisation tool (i18n).

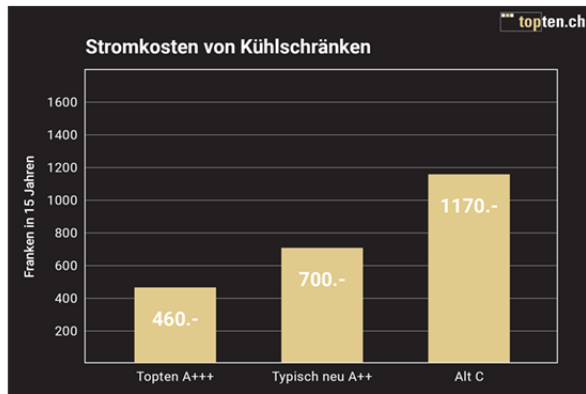
Product guides, selection criteria sites and static pages have the possibility to display **teaser boxes** showing the top five products of the corresponding product list (see Figure 5). These teaser boxes help to keep the users on the web site and bring them to the right product list. The teaser boxes are populated automatically and are always up-to date.

Ratgeber Kühlschränke

Home > Ratgeber > Ratgeber Kühlschränke

Rund 4 Millionen Kühlgeräte stehen in Schweizer Küchen. Zusammen verbrauchen sie jährlich rund 1'200 Millionen Kilowattstunden - Strom für insgesamt 240 Millionen Franken. Auch im Haushalt machen sich die Stromkosten des Kühlschranks bemerkbar: während seiner rund 15-jährigen Nutzungszeit summieren sich diese auf 880 Franken (A+ Gerät). Seit 2013 dürfen nur noch Kühlgeräte verkauft werden, die mindestens die Klasse A++ erreichen.

Sparen mit einem Topten-Kühlschrank



- A+++ Kühlgeräte verbrauchen rund 30% weniger Strom als A++ Geräte. Ein typisches Topten-Kühlschrank der Effizienzklasse A+++ spart während seiner 15-jährigen Nutzungsdauer rund 240 Franken Stromkosten gegenüber einem ähnlich grossen, typischen Neugerät mit der Effizienzklasse A++.
- Gegenüber einem alten Gerät der Klasse C spart ein Topten-Kühlschrank über 700 Franken.
- [Hier](#) gibt es mehr Informationen zur Energieetikette von Kühlschränken.

Vorgestellte Produkte

- Electrolux IK2581BNR**
Effizienzklasse: A+++
Energie (kWh/Jahr): 120
Effizienz-Index (%): 17.5
- Liebherr ICP 3334**
Energie (kWh/Jahr): 125
Effizienzklasse: A+++
Effizienz-Index (%): 17.5
- Electrolux IK2581BNR**
Energie (kWh/Jahr): 120
Effizienzklasse: A+++
Effizienz-Index (%): 17.5
- Liebherr CBNP 4858**
Energie (kWh/Jahr): 149
Effizienzklasse: A+++
Effizienz-Index (%): 17.6
- Liebherr CBNPes 5758**
Effizienzklasse: A+++
Energie (kWh/Jahr): 157
Effizienz-Index (%): 17.6

Figure 5: Product guide on fridges with an automatic right teaser box of the best five products

The new product lists have been enhanced with additional helpful information for the users. If an energy label is provided for a product category, then the according **energy class is displayed** directly over the product image. Each product list also lists the **number of products** within the product list which is automatically updated if a user adds filter settings. Furthermore, the lists show the **latest update date**. Each product list comes with a versatile **export function** of the displayed product lists (Excel, PDF etc.) making an in-depth **product comparison** easier.

Since the new software has undergone heavy changes and has an entirely new structure a thorough redirect map from the old URLs to the new URLs was needed. The software has a migration script which not only migrated the old content to the new site but also semi-automatically then set the **redirect map** for all these new URLs. The redirect map is hosted on a Gitlab folder which can be very easy accessed by the local webmaster and content editors to set new redirects or URL aliases.

4. A strong backbone: matching database and CMS

The software is based on two fundamental components – a product information management system (PIM) to manage the product information and a content management system (CMS) for written content, layout and display of product lists. The PIM is basically a database which comes with many tools for updating and

managing content with an online graphical user interface. The data is read by the CMS system and displayed then to the user. The PIM and the CMS have been mutually set up and developed resulting in a **stable, flexible and fast software stack**.

4.1. Akeneo: More than just a database

Managing more than 6'500 best-in-class products in more than 50 categories just for the case of Switzerland makes it clear how important it is to have a database which can be **easily maintained** by a content team and not only by one database specialist. Akeneo with its **graphical user interface** makes **daily updating** of a product database with an almost unlimited number of attributes feasible (see Figure 6).

The screenshot shows the Akeneo PIM interface. On the left is a sidebar menu with a tree structure of categories like 'Haar', 'Küche', 'Wäsche', etc. The main area displays a table of products with columns for SKU, FAMILY, STATUS, CREATED AT, UPDATED AT, EAN, EFFIZIENZKLASSE, ENERGIE (KWH/JAHR), MARKE, and MODELL. The table lists several refrigerators (Kühlschränke) with their respective attributes. Above the table are various filters and controls like 'Manage filters', 'Quick Export', and 'View per page'.

SKU	FAMILY	STATUS	CREATED AT	UPDATED AT	EAN	EFFIZIENZKLASSE	ENERGIE (KWH/JAHR)	MARKE	MODELL
7610849681716	Kühlschränke	Enabled	Mar 8, 2016	Nov 17, 2017	7610849681716	A+++	120.0000	Oecoplan	Oecoplan 140+63 A+++
7630029408261	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029408261	A+++	136.0000	V-ZUG	Optima 2 eco
7630029405185	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029405185	A+++	139.0000	V-ZUG	Futura eco
7630029405208	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029405208	A+++	151.0000	V-ZUG	Classic eco
7630029401835	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029401835	A+++	151.0000	V-ZUG	Prestige P eco
7630029414316	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029414316	A+++	157.0000	V-ZUG	Noblesse eco
7630029418291	Kühlschränke	Enabled	Feb 22, 2017	Nov 14, 2017	7630029418291	A+++	146.0000	V-ZUG	Magnum eco
7630029414330	Kühlschränke	Enabled	Mar 8, 2017	Nov 14, 2017	7630029414330	A+++	154.0000	V-ZUG	Cooltronic eco
7630029405161	Kühlschränke	Enabled	Oct 21, 2016	Nov 14, 2017	7630029405161	A+++	139.0000	V-ZUG	De Luxe eco
4048164700578	Kühlschränke	Enabled	Jun 9, 2017	Jun 9, 2017	4048164700578	A+++	121.0000	Comfee	KGK 170 A+++

Figure 6: A properly set up product information system is the core of Topten product lists

Importing and updating data can be done via Excel sheets, a sequential attribute wizard or manually via a tidy online user interface. Akeneo comes with an **import engine** which has been customised with scripted import jobs to facilitate **bulk imports**. The import engine also comes with a completeness tool which **verifies the data consistence** before writing the data to the data base. These import jobs make especially the **bulk upload for images** and **associations of product series and variants** reasonable. Since many products come in countless different variations (colours, sizes etc.) managing associations of main and product variants is a crucial feature for keeping product lists clean.

Organising products and displaying most important product attributes is made easy by the **attribute management system** of Akeneo. Product attributes are not only simple values but thanks to Akeneo attributes can be grouped in different views, groups and families. Furthermore, attributes can be set as filters or sort attributes. Even if Akeneo gives the possibility to bulk edit these attribute settings or simply edit single changes via its graphical attribute management system, the first setup of these helpful features needs time for the product editors.

The **attribute view settings** determine on which level the product attributes are shown. We have three levels of views:

- Collapsed view: Show only the most important product attributes
- Extended view: Show additional product attributes which the user might need
- Detail view: Show all the product attributes

The attribute management system makes the organising of products easy thanks to group and family assignments. **Attribute families** define which attributes belong to a product category and **attribute groups** define which attributes belong to a group which is recurring through different categories. For example, the attribute group energy contains attributes such as energy efficiency class or yearly energy consumption. Attribute groups create a clear structure in the visibility. Families give the option of only using the attributes really relevant for each product group; the attribute “screen_size” for example is relevant for TVs and monitors but not LEDs or vacuum cleaners.

Akeneo ships with a **native translation feature** which keeps track of all attributes in different languages. By defining **attribute codes** and **attribute language labels** beforehand, multi-language product lists can be quickly edited via the attribute codes which corresponds to the language labels.

Akeneo not only has an import engine but also an **export engine** which allows for customised scripts in order to create automatic export for different purposes such as a raw data base lists for the CMS or full product exports for product editors.

Finally, Akeneo has a **history feature** which keeps tracks of all database changes. The log files are presented in the online tool and product editors can quickly see how, what and when changes to the products have been made.

4.2. Yii 2.0: A flexible and scalable content management system

The second core component of the Topten software stack is a CMS which is based on the **Yii 2.0 framework** (see Figure 7). It is not only a typical CMS system where content editors can publish and edit online content, it is also the interface between the product information management system (PIM) on Akeneo and the frontend. The Topten CMS is tied to the PIM. The PIM **automatically exports the product database** on a regular basis and the CMS publishes the content to the web site.

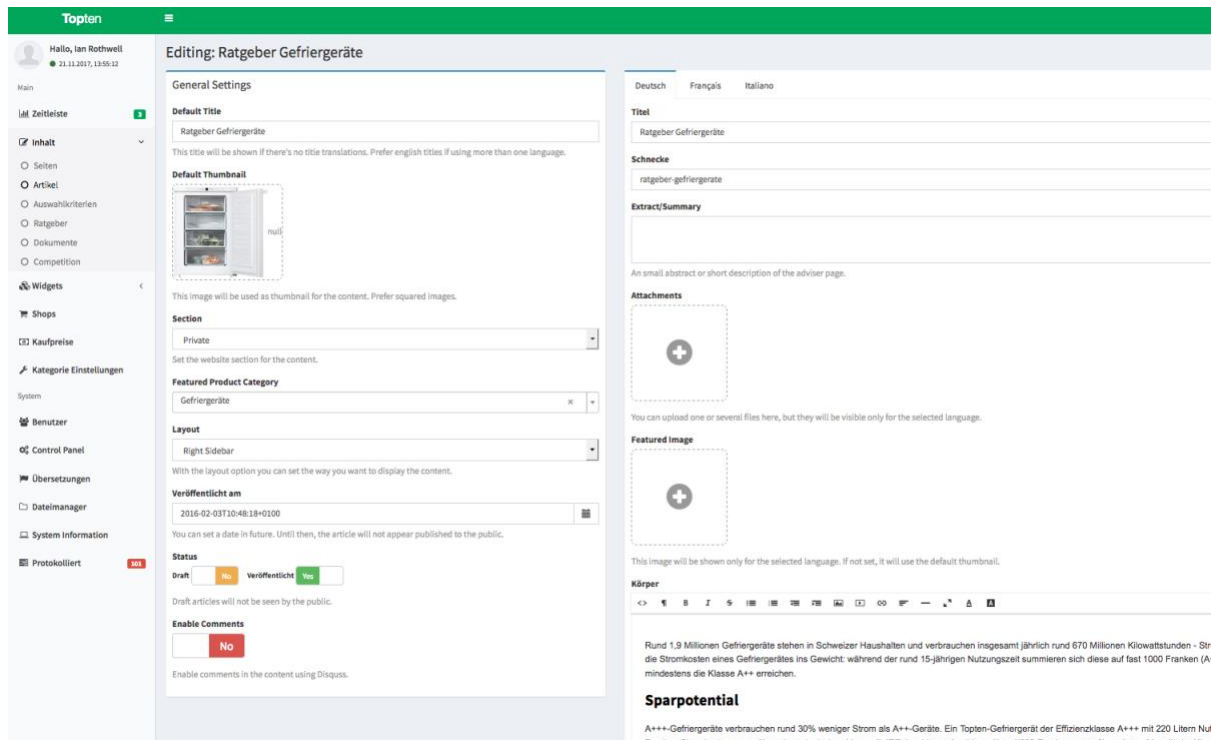


Figure 7: The backend of the Tipten software

The main content for the Tipten software are the lists of the best-in-class products. The most important product settings are directly transferred to the frontend; however, the Tipten software has **additional settings for the product lists in the CMS backend**. For each product list the product editor can set the default sorting order, add buttons for links to the according **product guides and selection criteria**, place **banners for partner campaigns** and set the most important **SEO tags** (title, description und keywords). All the settings can be set independently for each desired language.

Besides the product lists the Tipten websites also have product guides, selection criteria, documents and competitions. For each of these different page types, predefined **templates, rules and settings** are programmed in the CMS backend. There is a **typical backend content editor** (text or HTML view) and a **general settings tab** (layout, section, URL alias, extract, preview image etc.) for these sites. These different templates, the editor and the general tab settings make the daily work for content editors very convenient.

In the admin section of the CMS we have developed a **control panel** with the most important and common tasks in order to trigger **automated services for synchronisation** or quick-fix processes. Different automated jobs can be started with one click by every editor to trigger manual synchronisation jobs for updating the product lists from the database or for re-matching online shop links and prices with our products. With a **cache flush button**, the entire pre-processed temporary stored data is deleted and with a **panic mode button** a static information site can be launched in case of server crash down. A server crash down by a software error is anyhow hardly possible since each site and synchronisation job is modular which

means that only that single content frame would crash through an error, all the other sites will be still running.

The admin section of the backend has a **graphical time line** which displays the started and finished synchronisation jobs (data import and shop link matching). Additionally, the system provides **status information** how many shop links are matched (see Figure 8) and which terms have been translated to what language. These features help content and product editors to quickly spot uncommon issues.

Shop Prices

Accueil > Shop Prices

Affichage de 1-20 sur 5 807 éléments.

Export

Shop	EAN	Price	Delivery Included	Stock	Type	Updated At	Visible	
netto	0010942215424	CHF 99.90	Ja	Ja	Automatic	vor 14 Stunden	Nein	
netto	0010942215455	CHF 77.95	Ja	Ja	Automatic	vor 14 Stunden	Ja	
microspot	0010942215509	CHF 100.30	Ja	Ja	Automatic	vor 14 Stunden	Ja	
netto	0010942215509	CHF 99.90	Ja	Ja	Automatic	vor 14 Stunden	Ja	
microspot	0010942217367	CHF 88.40	Ja	Ja	Automatic	vor 14 Stunden	Ja	
netto	0010942217398	CHF 109.90	Ja	Ja	Automatic	vor 14 Stunden	Ja	
Fust	0010942218876	CHF 140.00	Ja	Ja	Automatic	vor 14 Stunden	Ja	

Figure 8: Status information on number of matched products with online shops in the content management system

4.3. Synchronising with online shops and partner sites

The Topten product lists have two key features which make them even more of an extensive public service: **synchronisation with online shops** and an **API connection** with partner sites.

The Topten software stack has a shop link engine which matches the Topten selected products via **EAN codes** with the shop links and prices of online retailers. The shop links are either fetched from provided protected online shop lists (in CSV or Excel format) or via manual maintained Excel lists. The shop link engine then gets the **deep links** to the shop and the **daily prices** which are automatically attached to the Topten products. The software checks for the best price for each product within the online shops and within the product variants – if a white fridge is cheaper than its black variant, then the price for the white fridge is displayed. The best price is then presented prominently next to the product, the other prices and links can be extended by the user. All the matched shop links are furthermore tagged for the Google Analytics API which **reports all the clicks on the shop links** and can then

be tracked in the Google Analytics dashboard. This functionality is not an on-board service by Google Analytics since the API setting and the tagging needs to be done via the Topten software. Topten Switzerland has for example already around 20 online shops integrated with more than 6'000 shop links matching.

Finally, the Topten software has an **API endpoint** with a token protection. This means the entire Topten product database including product advice and images can be fetched by partner sites or apps. The endpoint has various parameters and API calls can be done very specific for different product lists, sorting, number of outputs etc. The API is **fully documented on GetPostman** and has **live testing environment** for the partners (see Figure 9). Topten has had various requests by other websites and services who would like to improve their service by using Topten data in their app or web services, for example for calculating energy savings of companies by switching to more efficient products. The Topten API is for these automated tasks an ideal solution.

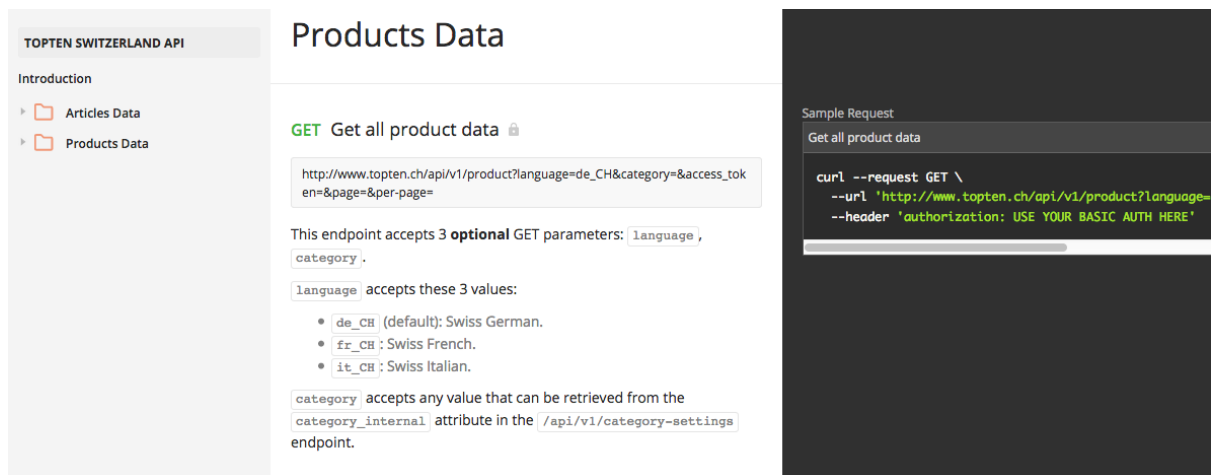


Figure 9: Screenshot of the full documentation of the Topten API on GetPostman

5. Improvements for everyone: roll-outs to other European countries

It is the goal of Topten **to further the “one voice” approach** with this new software, meaning that the basic structure and access will be kept the same for all new Topten websites to increase the recognition value. The code is for this reason stored and adjustable centrally; most versions are installed on two central servers to facilitate updates.

That does not mean, however, that all national websites must be exactly the same. While the software is central, it is also modular, meaning features and extra functionalities can be chosen and adapted to national preferences and different layout templates implemented. Examples of this are the specialized layout of the French front-page based on national user-experience surveys and the promotion of national rebate programmes for highly energy efficient appliances in Switzerland and Austria.

The development and implementation of a software generally follows the following method:

1. The main objectives of the software are identified.
2. The best solutions for the objectives are identified and implemented as central code.
3. The central code is implemented in a first roll-out to test for bugs and weaknesses and make improvements and adaptations as needed. Changes are included in the central code.
4. A second roll-out is implemented to replicate the first one and test for compatibility of the code with different requirements. Changes and new features are made available in the central code.
5. The rest of the roll-outs are implemented in batches of 2–3 roll-outs. This way content input by national content managers and customisations by the software developer can be ideally coordinated.

The central code was developed using the repository Github and Gitlab. Github hosts the code for the central software including Akeneo, Yii and the synchronisation engines, whereas Gitlab supports planning, input and discussions for software features. For each roll-out a separate branch is created containing the basic version where country specific customisations can be implemented without influencing or damaging the central software and the other countries; if a transfer of features is desired, it can be easily done between branches. This means that the **codebase is modular and interchangeable and all developed features (now and in the future) are available for all Topten countries**.

5.1. Roll-out process and first eight live versions

For the Topten software, the supervision and guidance of the development were carried out by Topten Switzerland. As such, the first roll-out to test and improve was also implemented for topten.ch. Features like automatic shop links and API interfaces can only be **successfully tested and improved with real life data**. As such, optimisations for these features were developed after the Go-Live of topten.ch along with features to support Search Engine Optimisation (SEO) (see Figure 10).

TopTen Hello, malke.hepp 17 Sep 2018, 07:33:38

Editing integrated_dishwashers Home > Category Settings > integrated_dishwashers > Edit Category

English (UK)

Category Label
Integrated dishwashers

Category Image

Custom Category Image

If an image is uploaded for the Custom Category Image, it will replace the "product lists" category image on the frontend.

Main Title
Integrated dishwashers
This is the title displayed on Product Lists. If empty defaults to Category Label.

SEO Title
Integrated dishwashers
This is the title displayed on the browser window. If empty defaults to Category Label.

SEO Description
Listings of energy-efficient dishwashers
Description text displayed to search engines.

SEO Keywords
dishwasher, energy saving, energy efficient, integrated

Figure 10: Newly developed feature to specify SEO tags for each product list

The roll-out process itself contains three stages until the Go-Live and two stages after the Go-Live:

1. Installation of basic stage version by software developer
 2. Content input to PMI and CMS by country content manager and decision about customisation wishes
 3. Implementation of customisations to stage version by software developer
- GO-LIVE**
4. Advanced steps: SEO settings, automatic shop links, re-directs, etc.
 5. Long term development of special features by software developer or national webmaster

Customisation wishes include a decision about the colour scheme, the logo, footer and header, order and content of blocks and links on the front-page, order of menu items and small features like mouse-over pop-ups, twitter-feed, extra "read more" buttons. If countries have many customisation wishes or require the development of larger features, the process will take longer as features need to be defined,

developed, implemented, tested and finalised. As this delays the other roll-outs, special wishes were put to a lower priority during the roll-out process.

Content input for the PIM includes the creation of a category structure in Akeneo, the definition of families and relevant attributes (and their attribute groups, options and parameters), the translation of all attributes, families and categories from code to label and the order of the attributes, attribute groups and attribute options; then the upload of products, images and of linking series and variant products.

Content input for the CMS includes the creation of basic pages, NEWS articles, selection criteria and recommendations (for each list), flyers; category settings for each list like title, SEO content, links to selection criteria, recommendations and partners, image and initial sorting; translations for all front-page buttons and functions; shop links; re-directs and sitemap (from old website to new website).

5.2. Where we are: status of the roll-outs

Eight Topten countries are currently live with their new website, two more are working on content input in various stages.

Topten Italy and France were the next country teams after Switzerland to receive stage versions with all adaptations being pushed to their repository branch. While Topten Italy and France were working on content input and customisations, we started the **roll-out for Topten UK**. Their contract for the old website was set to run out on 04.10.2017 and a Go-Live with the new software before that date made it unnecessary to renew or prolong the old contract. With a momentous focused effort by all parties, the **new website for Topten UK was live within two weeks on the 04.10.2017** (see Figure 11) – including customisations and all content input; by now shop links have also been added for most products. A big contributor to the fast migration from the old to the new software were experiences and existing materials from the topten.ch roll-out:

- Akeneo structure: large parts could be used with few adaptations to the structure
- Experiences with text and html migrations
- Products: some product categories could be used with minimal changes (business lists, European market with fewer differences between national markets than for private products)
- Images: already in correct format and ready for bulk upload
- Copy/ paste of re-direct file with adaptation to old toptenuk.org links
- Shop links: implementation of final and fully working version, no testing necessary
- SEO: already implemented and ready for content input for each category

Similar “short-cuts” could and can also be used for later roll-outs. For Italy and France, translations could be transferred from topten.ch for Akeneo translations as well as the l18n template translations for the Yii front end, making the migration process easier on the whole.

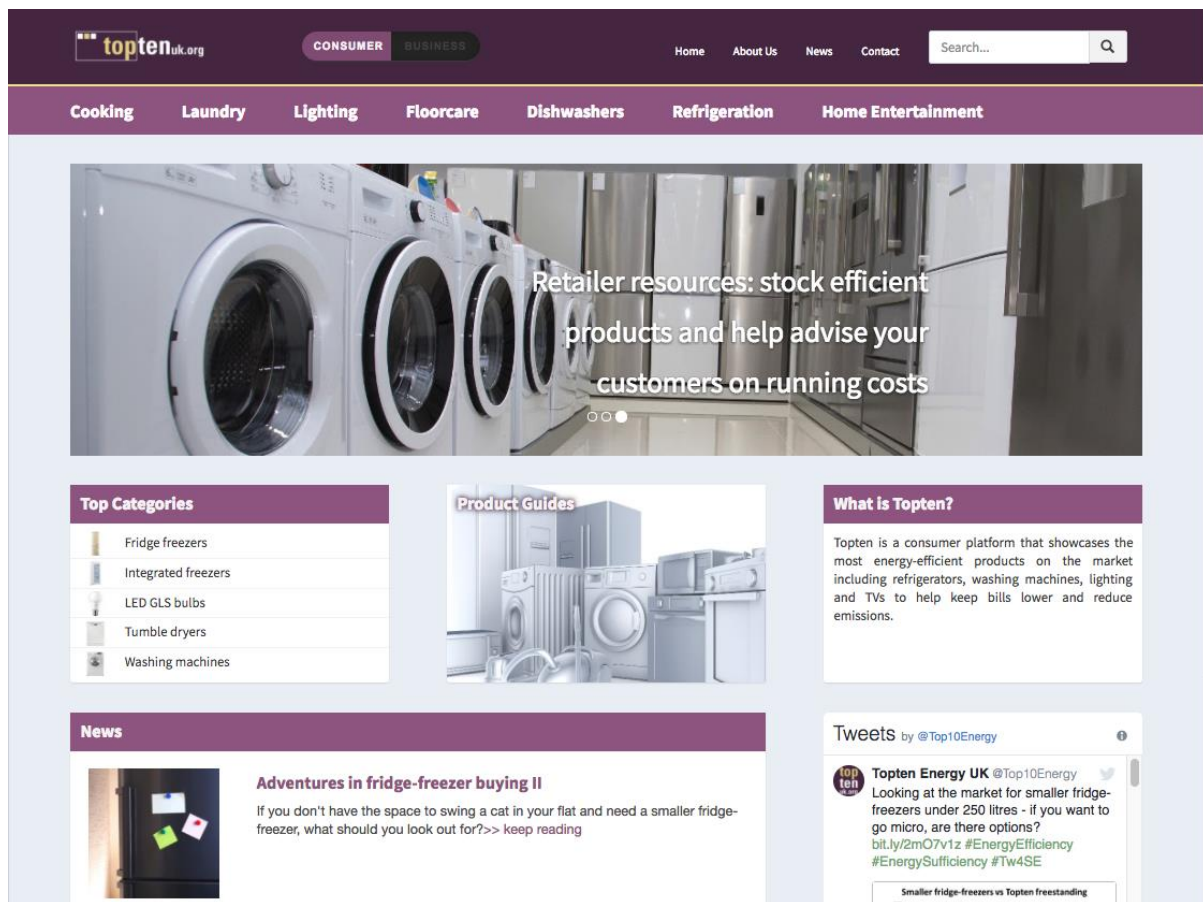


Figure 11: Topten UK (toptenuk.org) went Live on 04.10.2017

Topten Italy was the next country to go live on 24.11.2017 (see Figure 12). During this process, Topten Italy furthered the “one voice” approach by taking the opportunity to migrate to a new URL www.topten.it while keeping the old www.eurotopten.it as secondary URL. They also adapted their logo to the central Topten logo design and implemented it on the new software.

The screenshot shows the 'Frigoriferi' (Refrigerators) section of the topten.it website. It features a navigation bar with categories like 'Conservare', 'Lavare', 'Cucinare', etc. Below the navigation, there are filters for 'Classe efficienza energetica' (Energy efficiency class) and 'Tipo di frigorifero' (Refrigerator type). A slider for 'Capacità del frigorifero (l)' (Refrigerator capacity) is set between 104 and 390. The 'Ordina per' (Sort by) dropdown is set to 'Indice di efficienza energetica' (Energy efficiency index), and the 'Ordinamento' (Ordering) is set to 'Crescente' (Ascending). The main content area displays a table of refrigerator products with columns for 'MARCA E MODELLO', 'ENERGIA', 'TIPO', 'DATI TECNICI', 'COSTO DI GESTIONE', and 'PREZZO INDICATIVO'. Two products are visible: an LG GBB60NSZHE and a Liebherr CBNPes 4858. Below the table, there is a section for 'idealo' with a 'Disponibile da' (Available from) dropdown set to 'Idealo', an 'In stock?' status of 'Sì', and a 'Prezzo' (Price) of 1.921,00 €. A 'Link' button labeled 'Al rivenditore' (To the retailer) is also present. Technical specifications for the selected product are listed at the bottom, including energy class (A+++), temperature range (16-43 °C), depth (67 cm), energy efficiency index (15.9), height (201 cm), capacity (146 l), and frost-free status (No Frost: yes).

Figure 12: Topten Italy (topten.it) went Live on 24.11.2017 and implemented automatic shop links in 2018

Since then Topten Italy has established an agreement with Idealo, a large comparison website in Italy which redirects towards numerous retailers, for a data exchange that enables the daily exchange of automatic shop links. The products are matched automatically and tagged with the daily best price and a link to buy the products without a separate Google search. Google Analytics were activated to track the clicks, prices and number of daily shop links. Topten Italy is in the process of establishing the same shopl原因 exchange with Amazon Italy and ebay Italy.

Topten France went live with their new website www.guidetopten.fr on 13.04.2018 (see Figure 13) and are now in the process of implementing shop links. Due to cultural peculiarities, Topten France tasked their own webmaster with implementing some design changes that would make the page more attractive to French users. France therefore created a new template. The adaptations focused on the start page layout and the detail page of products. The adaptations were built-in within the Topten software stack and uses the same database and content management system. This full template customisations shows that the software can handle the requirements from the different countries.

The new detail page of France divides the attributes into cost aspects (purchase price, electricity and water cost over the product lifespan, total cost and savings if compared to a bad / regular model) and technical aspects (dimensions, functions,

consumption). The shop links will be displayed below the attributes and as usual include the name of the shops, daily price, links and availability (see Figure 14).



Figure 13: Topten France (guidetopten.fr) went live in April 2018

Philips 22PFS4022/12

CLASSE ENERGIE A+

Retourner à la liste des produits

Coût / prix moyen		Caractéristiques techniques	
Prix	180 €		
Économie par rapport à un modèle de classe B	56 €		
Coût en électricité sur 10 ans	59 €		
Coût total sur 10 ans	239 €		

OÙ TROUVER CE PRODUIT

DISPONIBLE CHEZ	EN STOCK ?	LIVRAISON INCLUSE	PRIX	VOIR LES OFFRES
Idealo	●	●	129,00 €	Aller au magasin

Figure 14: The product detail page of Topten France including costs, technical details and shop links

Topten Czech Republic went live with the new www.uspornespotrebice.cz on 17.07.2018 (see Figure 15). As a self roll-out, Topten Czech Republic commissioned a national developer to install the stage version according to documentation provided by the developer of the central software – with additional support provided when needed – and to implement all customizations. The website contains an additional business section targeting a professional audience and showing 18 lists for professional and commercial cooling as well as professional printers. Negotiations with a major Czech price-comparison website in order to establish shoplinks are ongoing.

Figure 15: The Business section of Topten Czech Republic provides tips on energy savings and product lists for companies

Topten Portugal went live with their new website www.topten.pt on 25.07.2018 (see Figure 16). The active contact to national companies and manufacturers is reflected in the specialized content in the Business section of the new website. Guided videos lead private consumers and companies through the website and highlight new functions such as filters for individual product lists and the page with guidelines for professional procurement (see Figure 17).

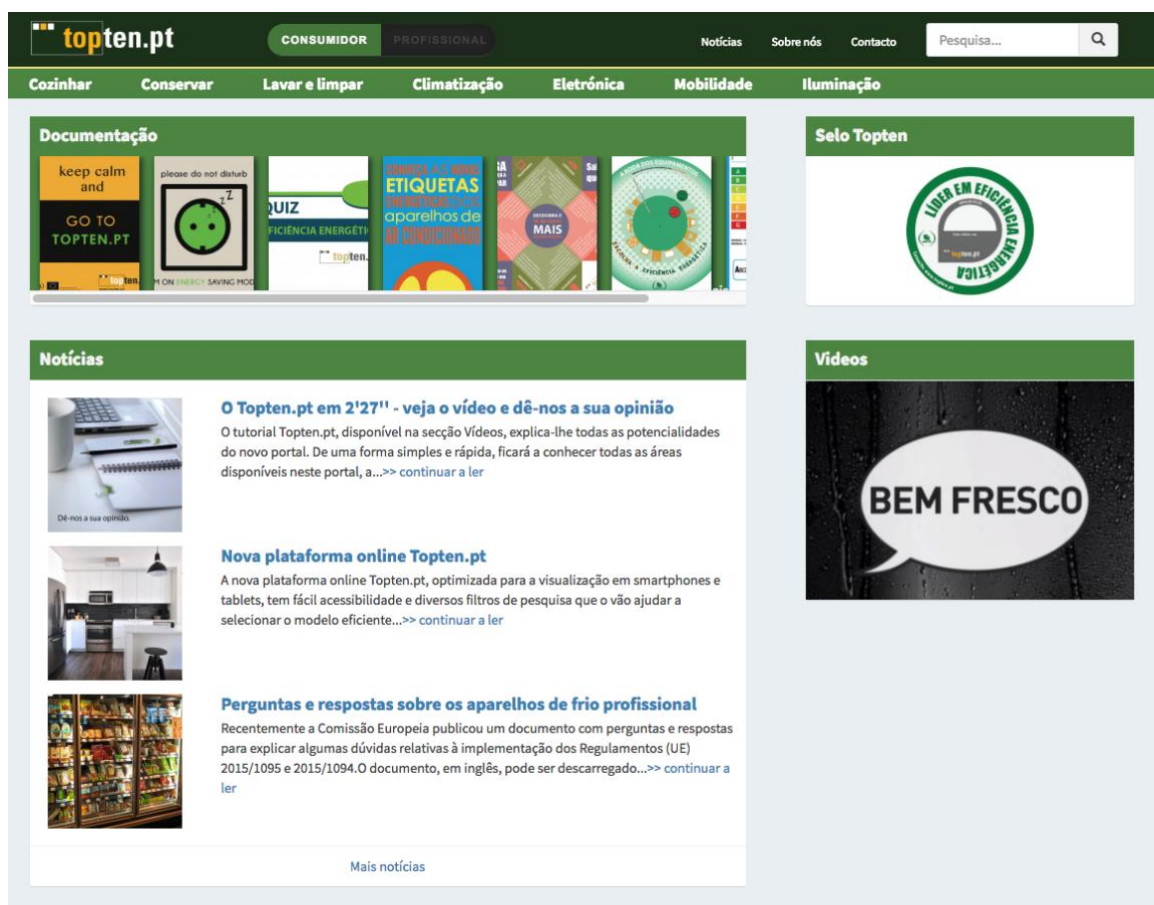


Figure 16: Tipten Portugal (topten.pt) provides consumers with latest news about energy efficient appliances and brochures about the best and comfortable usage

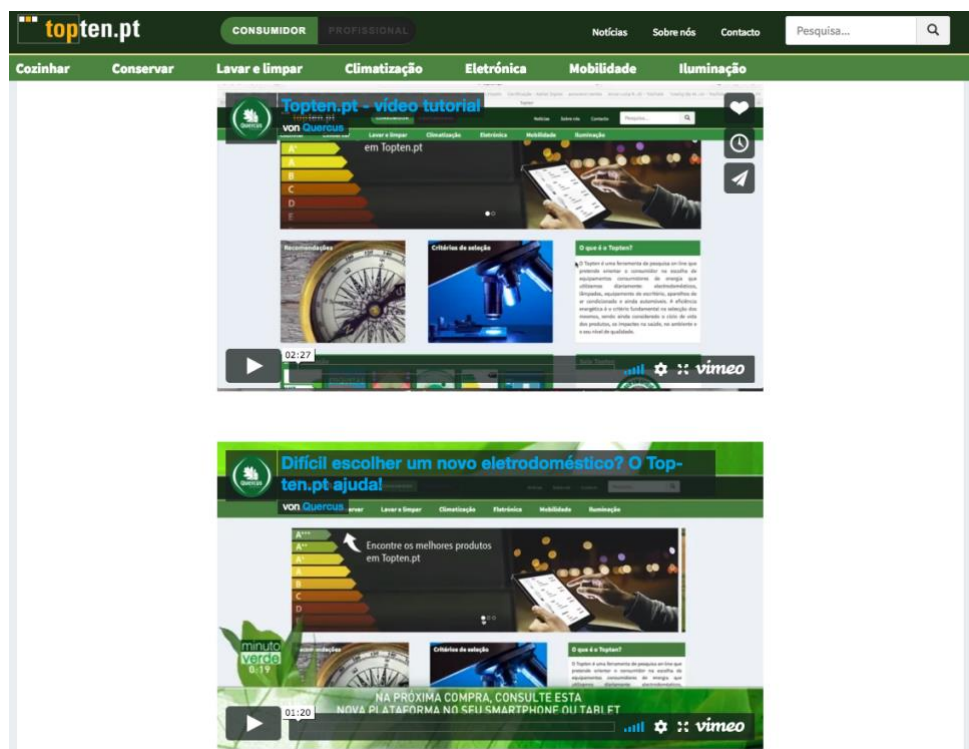


Figure 17: Videos guide visitors through the new topten.pt website and highlight functions

Topten Poland went live with their new website www.topten.info.pl on 31.08.2018 (see Figure 18). First shoplins have been added. In order to provide consumers with information about energy efficient building components, Topten Poland have established national partnerships with various portals and companies; the logo and link to each partner can be featured on respective lists through a simple backend function in Yii.

The screenshot shows the 'Okna' (Windows) section of the website. It includes a navigation bar with categories like 'Urz. biurowe', 'Silniki i pompy', 'Oświetlenie', 'Transport', 'RTV i AGD', and 'Komponenty budynkowe'. Below the navigation bar, there are filters for 'Klasa energetyczna na chłodzenie', 'Klasa energetyczna na ogrzewanie', 'Klasa odporności na obciążenie wiatrem', 'Wodoszczelność', 'Sortuj według', and 'Porządek sortowania'. A table of products is displayed, showing details for three models: STOLBUD CUBE 92, RODEX Rodline HFL thermo PLUS, and RYBAK Aluprof MB-104 SI. The table columns include 'PRODUCENT, MODEL', 'PARAMETRY ENERGETYCZNE', 'PARAMETRY TECHNICZNE', and 'KOSZT'.

PRODUCENT, MODEL	PARAMETRY ENERGETYCZNE	PARAMETRY TECHNICZNE	KOSZT
STOLBUD CUBE 92	Współczynnik przenikania ciepła (W/m ² *K): 0.58 Klasa energetyczna na chłodzenie: B Klasa energetyczna na ogrzewanie: A	Typ okna: Pionowe, drewniane Klasa odporności na obciążenie wiatrem: C3 Wodoszczelność: 9A Izolacyjność akustyczna (dB): 36	Średni koszt stolarki (zł/m ²): 1 604 zł
RODEX Rodline HFL thermo PLUS	Współczynnik przenikania ciepła (W/m ² *K): 0.67 Klasa energetyczna na chłodzenie: C Klasa energetyczna na ogrzewanie: A	Typ okna: Pionowe, PCV Klasa odporności na obciążenie wiatrem: C2 Wodoszczelność: 8A Izolacyjność akustyczna (dB): 47	Średni koszt stolarki (zł/m ²): 772 zł
RYBAK Aluprof MB-104 SI	Współczynnik przenikania ciepła (W/m ² *K): 0.68 Klasa energetyczna na chłodzenie: C Klasa energetyczna na ogrzewanie: B	Typ okna: Pionowe, aluminiowe Klasa odporności na obciążenie wiatrem: C5 Wodoszczelność: Exxx Izolacyjność akustyczna (dB): 30	Średni koszt stolarki (zł/m ²): 1 570 zł

Figure 18: Lists for building components on Topten Poland (topten.info.pl) use logos to showcase partnerships

Topten Belgium also went live on 31.08.2018 (see Figure 19). As Dutch and French are both official languages in Belgium, the website was set up to display all information in both languages; while visitors can actively choose the language setting, the software automatically identifies each user's preferences according to their browser settings and defaults to that language. During the roll-out process, Topten Belgium furthered the "one voice" approach by taking the opportunity to adapt their logo to the central Topten logo design and implemented it on the new software.



Figure 19: With a new logo Topten Belgium (topten.be) furthers the "one-voice" approach of Topten

Status for each country

- a. **CH:** online (topten.ch) since 12.09.2017
- b. **UK:** online (toptenuk.org/) since 04.10.2017
- c. **IT:** online with new URL (topten.it) and old URL as secondary URL (eurotopten.it) since 24.11.2017
- d. **FR:** online (guidetopten.fr) with adapted template since 13.04.2018; final customisations were done on national level due to many new special features
- e. **CZ:** online (uspornespotrebice.cz) since 17.07.18, done as self roll-out with business section
- f. **PT:** online (topten.pt) since 25.07.18 with a well thought through front page for the business section in addition to the private section
- g. **PL:** online (topten.info.pl) since 31.08.18; starting shoplinks
- h. **BE:** online (topten.be) since 31.08.18 with new logo
- i. **LUX:** stage version since 22.11.17; customization wishes finished including embedded google map with POI; content input ongoing in Akeneo (two languages)
- j. **LT:** stage version since 18.06.18 with new URL and new logo; customizations complete; content input ongoing (4 lists complete)
- k. **AT:** call for proposals for adaptation to AT specifications is running; will start with stage version installation by central web developer in autumn 2018
- l. **EU:** more changes necessary due to different function. Will be done in 2018

Note: Topten Brazil, Argentina and Chile will also adapt the new software. The roll-outs for Topten Brazil is ready for go-live, a launch event with partners is scheduled for November 2018. Argentina went live on 03.07.2018. Topten Chile is looking for a good time in their schedule to adapt the new software.

5.3. How-to: support with content transfer and management

Topten Switzerland offers support with the content transfer and management. In order to minimise redundancies, the following resources are and will be provided:

- **Instructions manual** in Google documents with all relevant tasks for the transfer along with a description of the tasks, the responsible content manager, links to more detailed instructions for each task and relevant annotations.
- **Q&A sheet** in Google documents for the most commonly asked questions and answers for each content area to supplement the instruction resources. Separate sheets are available for questions about Excel preparation, Akeneo, Yii, Gitlab and customisations.
NEW: a new sheet has been added with a list of “special optional features” developed during the first roll-outs that not all countries might want to implement but that are ready and available on request.
- **Webcasts** along with summarising tables of the most pertinent instruction details. The webcasts take the roll of small scale tutorials by each being no longer that 3–5 minutes and covering individual aspects (explanation of features, instruction for transfer steps) of the data transfer and management in Akeneo and the CMS; as such they are recordings of the task being done (visual) and verbally explained (audio).
- A comprehensive **vocabulary manual** containing all relevant and new terms and vocabulary of the software in order to prevent vocabulary based misunderstandings or communication problems.
- **Support hotline** by phone and email. Checking content files for formatting mistakes if initial uploads result in error messages due to small details; accompanying initial structure and product uploads; being available for questions about procedure, error notes and further issues.
- A collection of **example files** for the data management with Akeneo, e.g. Excel files for attribute upload, attribute option upload, product upload, picture upload, variant and series association, 301 re-direct file, family codes
- Instructions for **advanced steps**: Instruction or links to online instructions in Gitlab on the correct implementation of shop links (automatic and manual), 301 re-direct files (for SEO), APIs to partner interfaces as well as a description to an image resizer by Ian Rothwell and a short list of known small bugs in Yii with current work arounds that will be fixed when more time is available after the roll-outs
- **1h webinar** by central software developer for self roll-outs and further developments by national webmasters, available on <https://www.youtube.com/watch?v=GZvgtMSvjHU>

As many changes have been implemented before and after the Swiss Go-Live (starting with replacing Drupal with Yii), some webcasts and manuals were out of

date. Most of them have already been re-done. An introduction manual for the use of the Gitlab repository to post development issues has been created.

A comprehensive documentation of the code – for the use of webmasters for national roll-outs of further developments – has been (re-)written by the central software developer to include all recent changes.

6. Potential and further development

The new Topten software is a huge project. It not only provides users with the most energy- and resource-efficient products, it also supports users with product guides and background information and provides shop links with best prices and deep links to online retailers in order to facilitate a green purchase and bring consumers to take action.

Due to this wide range of services of the Topten software upcoming work mainly includes **maintaining the entire product database and content**. Future projects incorporate **more countries** and more product categories – especially **business appliances** have untapped potentials. Topten is starting to build up more and more lists with top commercial products which incorporate still massive energy saving potentials. Also, the updating of our extensive product guides is an ongoing work which needs to keep pace with the rapid technology advance.

The new Topten website has already the basic functionalities included and provides a software stack which is ready for **additional implementations**. New features will include:

- a compare function of products
- comment and rating functionalities for product guides
- improved layout of the product lists
 - displaying units
 - more filters with an expandable filter view
 - smart filters
- more customisation options for content and product editors
 - more CSS templates for content editors
 - start page with editable widgets
 - customisable menu navigation
- improved mobile view for tablets

Last but not least, the Topten software runs on two open source frameworks (Akeneo and Yii). **Keeping pace with their updates** and maintaining their mutual connections is an ongoing task. While the Topten software stack was developed especially the product information management system Akeneo got major updates which will help to eliminate bugs and improve performance further.