



# PROFESSIONAL COLD APPLIANCES: EMPOWERING PUBLIC AUTHORITIES

Work package WP3: Empowering market players at central level and support for policy design

*Task 3.1: Empowering public authorities*

*Deliverable D3.1: Empower public institutions*

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## Project Partners



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# INTRODUCTION

## About this project

ProCold is a European project in the framework of Horizon 2020, supporting the development and market penetration of energy efficient commercial refrigeration equipment. The project aims at stimulating both the supply and demand side market for environmentally friendly efficient technology by various market oriented services, including among others a web-based product database for efficient products, procurement guidelines and tools and a product competition. The project is implemented in 8 countries (DE, FR, CH, IT, CZ, PT, SE, AT).

The services and tools provided by the project are based on long-term experience with the specific technologies and market in the different countries. The position concerning the draft legislation documents for commercial display refrigeration summarised here therefore is based both on long-term experience in this field and on work from the initial stage of the ProCold project.

This document provides guidance about current and future European regulations supporting public authorities to design policy measures and to optimize public procurement.

## Product types

To facilitate the reading of this document, a quick overview on the key appliances covered by the ProCold project is provided below by showing pictures of relevant types. More details can be found in the report "D2.1: Professional Cold Product Category Definitions and Saving Potentials" (download on [www.topten.eu/pro-cold](http://www.topten.eu/pro-cold)).

### Beverage coolers and ice cream freezers



Beverage coolers and ice cream freezers are procured in large numbers by food and beverage industry and branded; loaned or leased to retailers, kiosks, take-aways, canteens, sport facilities etc.

## Refrigerated commercial display cabinets



Typical use of refrigerated commercial display cabinets is in supermarkets, retail, canteens, bakeries etc. They can be self-service cabinets (direct access for customers) or serve-over counters, vitrines etc. where employees will access the foodstuffs.

## Refrigerated vending machines



Refrigerated vending machines are only for refrigerated foodstuffs. They do not include vending machines for coffee and other hot beverages or microwave-equipped vending machines.

## Professional refrigerated storage cabinets



Professional refrigerated storage cabinets are intended for use in professional kitchens, they meet high demands regarding food hygiene (temperature monitoring, stainless steel surfaces).

### Plug-in blast cabinets



Plug-in blast cabinets are intended to rapidly cool hot foodstuffs to below 10 °C in the case of chilling and below –18 °C in the case of freezing.

### Minibars



Minibars are used primarily in 4- and 5-star hotels but also for camping and boating.

### Wine storage appliances



Basically, professional and household wine storage appliances are technically the same.

### Professional / commercial static-air cabinets



Professional static-air storage cabinets and commercial vertical static-air display cabinets are currently falling into a gap between the scopes of EU regulations for professional / commercial and household products.

## Overview of the EU Legislation for products covered by the ProCold project

Professional/commercial refrigerators and freezers are concerned by several different EU regulations.

### Labelling and Ecodesign

Number of EU regulation or product lot	Content	Situation (December 2015) and next step in policy process
Lot 12  Product categories: <ul style="list-style-type: none"> <li>• Beverage coolers</li> <li>• Small ice-cream freezers</li> <li>• Vending machines</li> <li>• Soft scoop ice-cream cabinets</li> </ul> Supermarket refrigerator and freezer cabinets (remote and plug-in)	Label and Ecodesign requirements for refrigerated commercial display cabinets.	Steering towards adoption  Interservice-Consultation, WTO notification, Expert Group Member States (Labelling) or Regulatory Committee (Ecodesign)
1060/2010	Label for household refrigerating appliances, including wine coolers, minibars and other similar products	Review on-going  Consultation Forum on 14 December 2015.
643/2009	Ecodesign requirements for household refrigerating appliances, including wine coolers, minibars and other similar products	
2015/1094	Label for professional refrigerated storage cabinets (only this product group)	Published in May 2015  No immediate next step  See ProCold's overview and comment for professional refrigerated storage cabinets and blast cabinets <sup>1</sup> under:
2015/1095	Ecodesign requirements for: <ul style="list-style-type: none"> <li>• professional refrigerated storage cabinets,</li> <li>• blast cabinets,</li> <li>• condensing units and</li> </ul>	<a href="http://www.topten.eu/english/pro-cold.html">http://www.topten.eu/english/pro-cold.html</a> - h26

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<sup>1</sup> Condensing units and process chillers are system components and therefore not covered by ProCold activities (focused exclusively on plug-in products).

	<ul style="list-style-type: none"> <li>process chillers</li> </ul>	and under: <a href="http://www.topten.eu/?page=professional-storage-refrigerators-2&amp;fromid=">http://www.topten.eu/?page=professional-storage-refrigerators-2&amp;fromid=</a>
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F-gas regulation (concerns refrigerants)

Number of EU regulation or product lot	Content	Situation (December 2015) and next step in policy process
517/2014	Phase-down of fluorinated greenhouse gases (f-gases) through market quotas and product requirements. Ban of refrigerants with high global warming potential (GWP): <ul style="list-style-type: none"> <li>For domestic refrigerators and freezers from 1 January 2015 GWP <math>\geq</math> 150;</li> <li>For plug-in commercial refrigerators and freezers from 1 January 2020 GWP <math>\geq</math> 2500 (e.g. ban of R404A); from 1 January 2022 GWP <math>\geq</math> 150 (e.g. ban of R134a).</li> </ul>	Revised version published in 2014  No immediate next step.

## RECOMMENDATION FOR LOT 12

Lot 12 covers label and Ecodesign requirements for refrigerated commercial display cabinets. The most recent draft Ecodesign and labelling regulations for Lot 12 from September 2015 are very positive and ProCold fully supports the approach and stringency of the measures proposed by the European Commission and JRC.

Two top classes empty

The scheme reserves the two top-efficiency classes (A and B) above the most efficient products currently available, to be able to cover and stimulate efficiency improvements in the next few years. If this was not the case, too many products would populate the top classes soon and the label would not be effective both in terms of guidance to be best products for buyers and stimulation of further innovation for efficiency. Since a very frequent revision of the label class limits should be avoided, the concept must effectively support the market at least for a period of five years.



### The segmentation allows comparison between different product types

The calculation of the EEI is straight-forward and the label allows to compare different cabinet types. If this was not the case, and for example semi-vertical or roll-in cabinets would have separate M and N values, then the differences in energy efficiency compared to other vertical cabinets would be hidden and could not be compared. (M and N values define gradient and axis intercept)

### Large improvements with Tier 2 in 2020

The proposed minimum energy efficiency requirements will trigger a significant market development by 2020 at Tier 2, by requiring open chilled cabinets to be top-efficient by today's standard and by requiring vertical open frozen cabinets to be closed. Judging from the newest graphs elaborated by JRC, the requirement of EEI < 80 at Tier 2 seems well balanced and fitted to the available data. It is moderate in the sense that Tier 2 would not ban open cabinets completely, but ensure that by 2020 all open cabinets will be top-efficient by today's standard. Also product types with higher energy consumption like open semi-vertical cabinets, open roll-in cabinets and open serve-over cabinets would not be banned from the market, as long as they are top-efficient.

#### 1. Comments on major issues:

- The energy label should not be segmented further than in the September 2015 draft regulations. This means no correction factors and no additional M and N values are added. The energy label should show that for example roll-in cabinets, semi-vertical cabinets and serve-over counters are less efficient compared to other vertical cabinets, as it is an energy label's duty to show the difference between cabinet types.
- Tier 2 should also set stricter requirements for closed cabinets in order to improve them too.
- Considering the graphs provided by JRC in September 2015, the suggested classes for the energy label seem well designed and balanced.
- If an additional segmentation between remote and plug-in cabinets should be introduced, ProCold supports the suggestion that plug-in and remote cabinets have the same M and N values for now, and only if the market development shows the need to adjust the M and N values<sup>2</sup>. However, the segmentation should never be used to hide differences in energy efficiency, say if plug-in cabinets were typically to use 10% more energy than remote cabinets, the energy label should show this difference.

#### 2. Comments on minor issues:

- Total display area in m<sup>2</sup> should be given with the same decimal places as in the testing standard (three decimal places instead of one).

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<sup>2</sup> The graphs provided by JRC in September 2015 show no need to segment plug-in and remote cabinets. However, plug-in cabinets are typically in a smaller size range and their total energy consumption (TEC) is measured in a different way compared to remote cabinets.

- A definition of “multi-use” cabinets should be included in the regulations (the measurement method already exists in the draft<sup>3</sup>).
- For some plug-in cabinets typically used outside of supermarkets (e.g. plug-in refrigerated glass displays in bakeries, see image below), it might be useful to know the net volume next to the total display area. ProCold suggests to check this in the review and if needed make the net volume a mandatory product information for certain plug-in cabinets.



- Minibars are not directly mentioned. Only wine coolers are explicitly excluded from the scope. Since both minibars and wine coolers should be covered by the regulations for household refrigerating appliances, ProCold suggests to make it clear and to explicitly exclude also minibars from the Lot 12 regulations.
- It has to be considered that the new testing standards for beverage coolers and ice cream freezers do not include door openings, and new energy-saving technology like energy management systems (15-45% savings) and night covers (savings unknown) will be allowed during the test. Thus declared energy consumption will be lower compared to previously published data.

### 3. Refrigerants:

Natural refrigerants with low global warming potential (GWP - see Table 1) are used in many types of plug-in refrigeration equipment today. The two most commonly used green refrigerants in plug-in refrigerated cabinets are R290 (propane) and R600a (iso-butane). These refrigerants can be used in any type of equipment (except for the largest, open appliances; they would have to be fitted with doors or use several cooling circuits in order to work with R290 or R600a, because the amount is limited to 150 grams per cooling circuit).

However standard refrigerants like R134a and R404a with a very high global warming potential are commonly used as well. The F-Gas regulation (f-gas regulation n° 517/2014) requires a stepwise phase-out of high GWP refrigerants in 2020 and 2022 (GWP > 2500 in 2020 (e.g. R404A); GWP > 150 in 2022 (e.g. R134a)).

The promotion of natural refrigerants in the label for commercial display refrigerators would support a smooth and fast transition of the market until 2022.

It would therefore be very important to indicate the type of refrigerant on the label, in order to highlight natural refrigerants on the label.

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<sup>3</sup> Draft Energy Label regulation Annex IX (b) ii) „If one or several compartment(s) is/are multi-temperature, it/they shall be tested at the lowest operating temperature at which it/they can be used.“

Table 1: GWP of refrigerants

Refrigerant	Global warming potential compared to CO <sub>2</sub> over a 100-year time	
R134a	1430	high-GWP
R404A	3990	
R290 (propane)	3	green, low-GWP
R600a (isobutane)	3	
R744 (CO <sub>2</sub> )	1	

## RECOMMENDATION FOR HOUSEHOLD REFRIGERATING APPLIANCES AND SIMILAR PRODUCTS

All wine coolers and minibars should be more explicitly included in the scope of household refrigerating appliances.

The on-going revision of the regulations covering household refrigerating appliances offers the opportunity to make sure that there are no gaps between the different policies.

The current regulations for household refrigerating appliances (1060/2010 and 643/2009) could apply to all wine coolers and minibars regardless if they are sold for household or commercial/professional use (except products connected to a network with remote control system for accounting<sup>4</sup>). In reality however, the declarations for commercial/professional wine coolers and minibars are too often missing or incomplete.

In the revised regulations for household refrigerating appliances it should therefore be explicitly and clearly written, that all wine coolers and minibars are included in the scope (with the one above mentioned exception), no matter if they are intended for commercial, professional or household use.



Minibar



Wine cooler

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<sup>4</sup> Exemptions are: "refrigerating appliances for tertiary sector application where the removal of refrigerated foodstuffs is electronically sensed and that information can be automatically transmitted through a network connection to a remote control system for accounting."

### Commercial/professional static-air cabinets fall into gap

Household refrigerating appliances are static-air cabinets. Static-air means without ventilator, without internal forced-air circulation. Most commercial/professional refrigerators and freezers are ventilated cabinets. There is a very small market share of static-air cabinets intended for non-household use. These are excluded from the regulations for commercial/professional cabinets:

- 2015/1094 and 2015/1095 exclude all static-air cabinets;
- The draft regulations for Lot 12 exclude only vertical static-air cabinets, because ice cream freezers (which are horizontal by definition) and some horizontal supermarket freezer cabinets are static-air.

Since the market share of static-air cabinets intended for non-household use is minimal, this gap could be ignored and should not stand in the way of quickly finishing the new Lot 12 regulations and the review of the household refrigerating appliances. On the other hand it is not satisfactory to leave it to manufacturers, suppliers and the market surveillance authorities to decide whether a product is intended for household use or not.

There are examples of static-air chest freezer sold for professional use, that would be in energy efficiency class G and costing 6000 Euros in electricity over 15 years of life time (650 litres net volume, 2000 kWh/year with electricity price of 0.2 Euros/kWh). Technically there is no difference to household chest freezers, but they cost five times as much in electricity costs.

ProCold suggests two options:

1. Include all static-air cabinets in the scope of the revised household refrigerating appliances regulations.
2. If there is a risk that this would unintentionally ban specialized types of static-air cabinets for non-household use, they could be exempted from minimum energy efficiency requirements, but should still be covered by product information requirements and energy labelling.

## GREEN PROCUREMENT

The Topten procurement criteria help public authorities and private large buyers to improve the implementation of environmental strategies and to easily find green products. In fact, professional buyers that place emphasis on energy efficient refrigerated cabinets meet environmental targets, save on electric costs and act in an exemplary way.

More information can be found in the procurement guidelines, the brochure "Energy efficiency reduces costs and environmental pollution" and on [www.topten.eu/pro-cold](http://www.topten.eu/pro-cold). The product lists on [www.topten.eu](http://www.topten.eu) regarding professional refrigerators are very useful.

Very powerful procurement criteria are to ask for:

- Topten products or use the Topten technical criteria in calls for tender
- Display cabinets with doors and lids
- Cabinets with climate-friendly refrigerants
- Beverage coolers equipped with energy management systems
- Ice cream freezers with integrated night covers

The ProCold CO<sub>2</sub> Calculator is an easy to use Excel tool calculating CO<sub>2</sub> savings as well as energy and cost savings of Topten models compared to other products ([download excel](http://www.topten.eu/uploads/File/ProCold_Calculator.xlsm), [http://www.topten.eu/uploads/File/ProCold\\_Calculator.xlsm](http://www.topten.eu/uploads/File/ProCold_Calculator.xlsm)).

## ADDITIONAL FACTS ABOUT PROCOLD

ProCold is a European project designed to support the market development for energy efficient commercial refrigeration equipment. The project is funded in the framework of the Horizon 2020 programme.

Project Coordination:

ADEME, French Agency for Environment and Energy Management

Project Partners:

Austria: Austrian Energy Agency, AEA

Czech Republic: The Energy Efficiency Center, SEVEn

France: Guide Topten

Germany: Oeko-Institut e.V.

Italy: Politecnico di Milano

Portugal: Quercus

Sweden: Swedish Society for Nature Conservation

Switzerland: Bush Energie GmbH

Project duration:

01.02.2015 – 31.01.2018

## REFERENCES

- [1] Draft energy label and Ecodesign regulation DG ENER Lot 12 refrigerated commercial display cabinets (September 2015); detailed graphs for different product types showing the label classes, Tier 1 and Tier 2.
- [2] Commission Delegated Regulation (EU) No 1060/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household refrigerating appliances
- [3] Commission Regulation (EC) No 643/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household refrigerating appliances
- [4] Interim report, Ecodesign & Labelling Review Household Refrigeration, June 2015, prepared by VHK and ARMINES for the European Commission, [www.ecodesign-fridges.eu](http://www.ecodesign-fridges.eu)
- [5] Commission delegated regulation (EU) 2015/1094 of 5 May 2015 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of professional refrigerated storage cabinets
- [6] Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers

- [7] Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006
- [8] ProCold website [www.topten.eu/pro-cold](http://www.topten.eu/pro-cold)
  - o Product lists 'Professional Refrigerators' with top-efficient commercial and professional products using green refrigerants
  - o Policy recommendations for commercial and professional refrigeration products
- [9] Procurement Guidelines (see on [www.topten.eu/pro-cold](http://www.topten.eu/pro-cold))
  - o Sustainable Storage Refrigerators and Freezers
  - o Sustainable Minibars and Wine Coolers