
Policy Recommendations on Commercial Refrigerated Display Cabinets

Summary

The European Commission intends to introduce Ecodesign requirements and energy labelling for commercial refrigerated display cabinets before the end of the year. The final vote is planned to take place before the end of 2018. We welcome the inclusion of these regulations in the 2018 package. Together, it is expected that these regulations will deliver a substantial saving potential of 58 TWh annually by 2030.

Topten has, for 10 years, covered commercial refrigerated display cabinets and worked with manufacturers, suppliers and buyers to monitor the development of best available technology (BAT). The most recent monitoring overview of BAT products from September 2018 is shown below ([“Screenshots and links \(September 2018\)”](#)). We also tested and compared a beverage cooler with household refrigerator under different testing standards. The results suggest that considerable technological development is possible for beverage coolers that would half the energy consumption (“Topten laboratory tests reveal high saving potential”). Recognising that a swift adoption of the regulations is of the highest priority, we recommend to make small adjustments now, and include other important issues in article 7 “Review”. They can then be addressed during the first review of the regulations (5 years after coming into force). We make the following recommendations:

- **Important aspects to preserve in the regulations**
 - Tiers of minimum energy performance requirements ([1a](#), [1c](#))
 - Inclusion into the scope of serve-over counters, roll-in and semi-vertical cabinets ([2a](#))
 - Transparent energy efficiency index (EEI) formula, minimal segmentation of product categories ([3a](#))
- **(Small) aspects to adopt now**

- Not only one but two empty top classes (B and A) reserved for future innovation ([1b](#), [1c](#))
- Inclusion into the scope of vertical static-air cabinets for sale/display ([2b](#))
- Label shown for any form of distance selling, advertisements and technical promotional material, and explicitly also at trade fairs, not only when there is price-related or energy-related information ([4](#)/[4a](#))
- **Aspects to include in article 7 “Review”**
 - Reassessment of reference values for the calculation of the SAEC for all covered product types ([3b](#))
 - Revision of whether the total display area (TDA) parameter used to calculate the EEI unintentionally leads to bigger glass areas ([3c](#))

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Overview of BAT products lists on www.topten.eu

Topten regularly surveys the market for highly energy efficient products and displays the resulting database of BAT products online on www.topten.eu. Screenshots of the lists currently on www.topten.eu are shown below along with the corresponding links (Screenshots and links (September 2018)). All listed models are plug-in type and use natural refrigerants (R600a, R290 or CO₂). Their energy consumption is declared according to harmonized European standards (in most cases EN ISO 23953; EN 16901 for ice-cream freezers and EN 16902 for beverage coolers). Note that energy consumption values declared in catalogues cannot be compared because manufacturers measure and declare according to their own protocols (not published, not harmonized).

Table 1 Overview of BAT products listed on www.topten.eu, September 2018

Category	EEI < 15	EEI < 30	EEI < 50	EEI < 75	Total
Beverage coolers	3	15			18
Ice cream freezers	0	0	5		5
Horizontal display freezers	0	9	19		28
Vertical display freezers					
- Medium* (0.33m ² ≤ TDA < 2m ²)	0	2	-----	-----	2
- Large* (TDA ≥ 2m ²)	0	1	0	2	3
Vertical chilled display cabinets	0	3	9		12
Vending machines	0	0	0	1	1
Total	3	30	35	1	69

* no display area on side walls

Screenshots and links (September 2018)

Beverage coolers

Brand	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	Whitstart	
Model	PKV 214	Smart-COOL SLECC (PK290)	CO40	COOL-400L HD C (PK290)	COOL-400 C (PK290)	COOL-400L SD C (PK290)	CO41	PKV 3610	PKV 403	M190	M190	PKV 190 (solid door)	PKV 4113	PK290	PKV 4113, PKV 4113 (AT,DE)	PKV 3613	PKV 3613	PKV 4113, PKV 4113 (AT,DE)	PKV 3613, PKV 3613	PKV 4113, PKV 4113 (AT,DE)	PKV 2613, PKV 2613 (DE)
Other models								PKV 3645, PKV 3610, PKV 3610 (AT,DE)	PKV 403	M190		PKV 1910 (solid door)	PKV 4113, PKV 4113 (AT,DE)						PKV 3613, PKV 3613	PKV 4113, PKV 4113 (AT,DE)	PKV 2613, PKV 2613 (DE)
Electricity costs (€ in 5 years)	200	309	131	1034	780	1110	219	539	718	877	902	387	771	734	1642	707	925	573	925	573	573
Net volume (liters)	218	400.4	40	393.4	391.7	392.3	40	239	327	348	261	110	260	261	665	237	353	178	237	353	178
Storage temperature (°C)	+4, +12	+1, -9	+2, +10	+1, -9	+1, -9	+1, -9	+2, +8	+1, -15	+2, +10	+2, +10	+2, +10	+1, -15	+1, -15	+1, -15	+1, -15	+2, +18	+1, -15	+2, +18	+1, -15	+2, +18	+1, -15
Temperature class	K4	K4	K4	K4	K4	K4	K4	K1	K4	K4	K4	K4	K1	K4	K4	K1	K4	K4	K1	K4	K4
Draft energy index	0.1	14.0	14.2	16.2	17.3	19.8	21.3	22.9	22.4	27.0	27.8	28.0	28.4	28.0	28.1	28.7	28.7	28.7	28.7	28.7	28.8
Energy efficiency class	DSE	B18	B2	B6	B7	B8	B9	B10	B10	B10	B10	B10	B10	B10	B10	B10	B10	B10	B10	B10	B10
Refrigerant	R600a	R290	R600a	R290	R290	R290	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a	R600a
Cooling	passive	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air
Countries available	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU

<http://www.topten.eu/?page=beverage-coolers-1>


Ice cream freezers



Brand	AHT	AHT Liebherr	AHT	AHT Liebherr	Liebherr
Model	Rio H125S R600a	Nuobis CC 300	Rio H125G R600a	Nuobis VT 300	GTEP 3302
Other models	Rio H150S R600a, Rio H150G R600a, Rio H150S R600a	Nuobis CC 150, Nuobis CC 200, Nuobis CC 400	Rio H150G R600a	Nuobis VT 400	
Electricity costs (£ in 8 years)	759	760	994	994	942
Net volume (liters)	302	296	291	288	261
Storage temperature (°C)	-14...-23	-14...-23	-14...-23	-14...-23	-10...-24
Draft energy index	38.0	36.2	47.0	47.3	48.2
Energy (kWh/year)	474.5	475	621	621	589
Refrigerant	R600a	R600a	R600a	R600a	R600a
Coating	Static	Static	Static	Static	Static
Countries available	EU	EU	EU	EU	AT, CH, CZ, DE, FR, IT, PL, SE

<http://www.topten.eu/?page=ice-cream-freezers>

Horizontal display freezers



Brand	Liebherr	Carver	Liebherr	Liebherr	Liebherr	Liebherr	Liebherr	Stuart	Liebherr	Liebherr	Amalica	Amalica	Amalica	Stuart	AHT	Stuart	AHT
Model	ST 1072	Mulker 1330 G	ST 1172	ST 672	ST 672	ST 672	ST 672	ST 1122	ST 1322	Dupla 2.2 DR	Super 2.3 DR	Super 2 DR	Super 2 DR	Super 2 DR	Super 2 DR	Super 2 DR	Super 2 DR
Other models	507s 1172		507s 1172	507s 672	507s 672	507s 672	507s 672	507s 1122, STE 1122	507s 1322	Dupla 2.2 R	Super 2.3 R	Super 2 R	Super 2 R	Super 2 R	Super 2 R	Super 2 R	Super 2 R
Electricity costs (£ in 8 years)	2712	1028	2011	2044	2027	2068	2098	1982	3117	3668	3044	4202	3504	3504	3766	3766	3766
Total display area (m2)	1.88	3.25	1.88	1.4	1.4	1.4	1.4	1.41	1.71	2.88	1.9	1.48	1.48	1.48	1.84	1.84	1.84
Net volume (liters)	740	242	818	601	684	487	530	484	540	889	1233	750	880	830	770	488	677
Storage temperature (°C)	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23	-18...-23
Climate class	L1 (1.15...-18°C)	3 (25°C, 60% RH)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)
Draft energy index	22.5	25.1	23.8	26.8	26.5	25.9	26.1	26.7	35.1	31.4	31.4	31.4	31.4	31.4	31.4	31.4	31.4
Energy (kWh/year)	1998	1206	1792	1781	1762	1749	1766	1784	1768	2395	2468	2468	2468	2468	2468	2468	2468
Refrigerant	Static	Forced-air	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static	Static
Countries available	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU

<http://www.topten.eu/?page=supermarket-freezers>


Vertical display freezers



Brand	Liebherr	AHT	AHT	Carver	Carver
Model	ST 1223	KINLEY 230XL (1) V3 AD LED	KINLEY 210XL (1) V3 AD LED	Virando CS 1780 LED	Virando CS 2380 LED
Electricity costs (£ in 8 years)	5198	7755	6867	14893	22778
Total display area (m2)	1.77	2.01	1.67	2.03	3.07
Net volume (liters)	756	756	630	895	995
Storage temperature (°C)	-18...-23	-18...-23	-18...-23	-12...-24	-12...-24
Climate class	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)	L1 (1.15...-18°C)
Draft energy index	21.0	28.3	29.1	53.9	58.1
Energy (kWh/year)	2749	4847	4732	9308	14235
Refrigerant	R290	R290	R290	R290	R290
Coating	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air
Countries available	EU	EU	EU	EU	EU

<http://www.topten.eu/?page=vertical-display-freezers>

Vertical chilled display cabinets



Brand	Ducat	Ducat	Carver	Foel	Foel	Carver	Foel	Foel	Foel	Carver	Foel	Foel
Model	HM 6-100	HM 6-125	Optimer 0948.G R290	Optimer 0948.G R290	Optimer 1348.G R290	Optimer 1348.G R290	Optimer VBN Slim 071 Green sliding door	Optimer VBN Slim 071 Green sliding door	Optimer VBN Slim 100 Green Q hinged door	Optimer 1948.G R290	Optimer 1948.G R290	Optimer 1948.G R290
Other models	HM 5-100, HM 8-120	HM 5-125, HM 8-129	Optimer 0948.G R290	Optimer 0948.G R290	Optimer 1348.G R290	Optimer 1348.G R290	Optimer VBN Slim 071 Green sliding door	Optimer VBN Slim 100 Green Q hinged door	Optimer 1948.G R290	Optimer 1948.G R290	Optimer 1948.G R290	Optimer 1948.G R290
Electricity costs (£ in 8 years)	2554	3154	4848	3720	4608	7008	3648	3648	8459	4079	8910	4798
Total display area (m2)	1.18	1.32	2.42	1.87	1.97	3.09	1.12	1.12	2.5	1.39	4.02	1.38
Climate class	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)	M2 (1...-7°C)	M1 (1...-5°C)	M1 (1...-5°C)	M1 (1...-5°C)
Draft energy index	22.9	23.5	26.7	31.8	32.1	32.8	34.1	34.7	36.0	37.0	37.5	39.5
Energy (kWh/year)	1859	1971	2030	2325	2380	4360	2404	4037	2862	6169	2941	4588
Refrigerant	R290	R290	R290	R290	R290	R290	R290	R290	R290	R290	R290	R290
Coating	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air	Forced-air
Countries available	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU

<http://www.topten.eu/?page=vertical-chilled-display-cabinets-with-doors>

Vending machines



Brand	Stuart
Model	GF VM (Flumator)
Electricity costs (£ in 8 years)	2605
Net volume (liters)	651
Storage temperature (°C)	
Climate class	N
Energy Efficiency Index	66.1
Energy (kWh/year)	1128
Refrigerant	R744
Coating	Forced air
Dimensions WxDxH (mm)	590 x 580 x 1830
Countries available	AT, BE, CH, CZ, DE, FR, IT, LIE, LU, NL, PL, UK

<http://www.topten.eu/?page=glass-fronted-refrigerated-vending-machines-2>

Topten laboratory tests reveal high saving potential

The preparatory study has shown that use-phase consumption can be significantly reduced by applying cost-effective non-proprietary technologies. However, the saving potential is hard to quantify due to the application of different test norms to different product types.

Topten has tested two commercial (BAT) and one household refrigerator according to three different test standards to ascertain if the test norm only affects the total energy consumption or also the relative energy efficiency of the products. The following three norms were used:

- EN 16902 (for beverage coolers)
- EN 62552 (for household refrigerators)
- EN ISO 23953 (for commercial refrigerated cabinets)

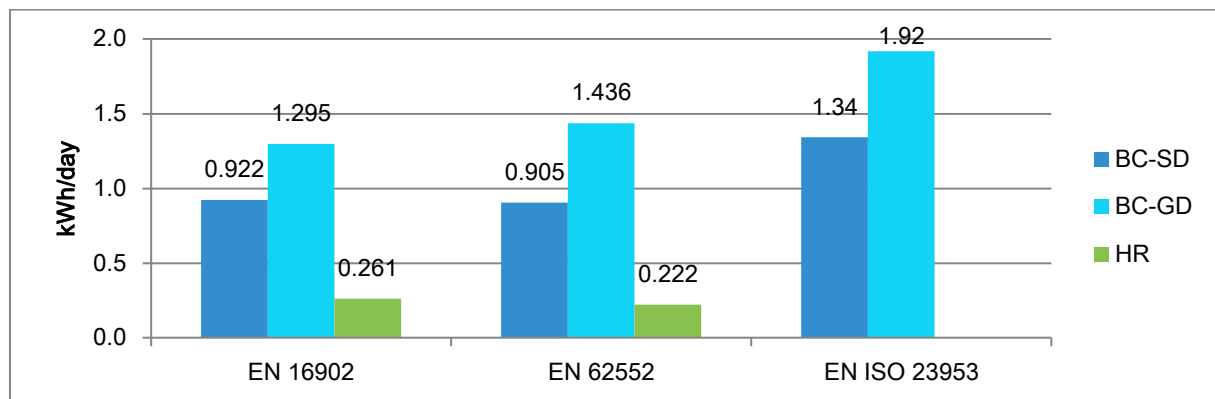


Figure 1: The real efficiency potential is independent from the test norm (BC-SD: commercial beverage cooler with solid door, BC-GD: commercial beverage cooler with glass door, HR: household refrigerator)

Result: the relative energy efficiency between the appliances remains constant independently of the test norm

- **Solid door bev. cooler** consumes **3.5 times** as much energy as household refrigerator
- **Glass door bev. cooler** consumes **5 times** as much energy as household refrigerator
- **Solid door cooler versus a glass door** equivalent cooler show an improvement in energy consumption of **more than 40%**

Note: both tested beverage coolers were BAT models with EEI < 30.

Another factor in the energy efficiency disparity – other than test standards - is the difference in performance requirements for beverage coolers, which must be able to draw down the temperature of loaded cans and for this purpose employ forced-air technology. Talks with various manufacturers indicate that forced-air technology raises the energy consumption by an approximate factor of two. Even with this increase, there still are major unexploited efficiency potentials available.

1) Energy class thresholds and MEPS

1a EC -> Stringency of minimum requirements

----- preserve in the regulations -----

Topten strongly recommends that Ecodesign MEPS reflect the technological advancements of the last years and proposes appropriate MEPS for several categories in accordance with the new energy class thresholds. As the Energy Labelling Regulation Framework expects each regulation to last for 10 years and due to the expected technological advances, Topten recommends the implementation of four tiers as we believe that the ambition of the regulation should be maintained throughout this time frame.

An early first tier of Ecodesign requirements is important to introduce mandatory product information and ban the worst performing products from the market. The next tier should be set with 2-3 years for manufacturers to adapt after adoption of the regulation, and this tier should trigger a significant market development. For commercial refrigerated display cabinets:

- All open freezers (horizontal and vertical) should be replaced with closed ones,
- Open refrigerators (horizontal and vertical) should be top-efficient by today's standard,
- Roll-in cabinets and serve-over cabinets should be top-efficient by today's standard, and roll-in cabinets should be mostly closed,
- Closed cabinets should improve as well, even if their energy performance is much better compared to open cabinets. The feasibility to introduce separate minimum requirements for closed cabinets should be considered.

The following tiers should uphold the ambition of the regulation of the regulation for the next years and consider the long-term efficiency potential of new technological innovations.

1b EL -> A and B empty for future innovation

----- adopt now -----

The Energy Labelling Regulation Framework foresees that classes A and B must be reserved for future technologies, if rapid technological developments are expected. The preparatory study for this Lot shows that the energy consumption of commercial refrigerated display cabinets can be significantly reduced by applying cost-effective non-proprietary technologies alone. It follows that the energy labelling regulation should reserve the top two classes (A and B) for future developments.

The policy developments have been stalled for 4 years. As such the energy efficiency class thresholds foreseen in the 2014 draft do not reflect the latest technological developments on the market and have to be revised before the vote in order to follow the Energy Labelling Regulation Framework.

Topten has made a market overview of the best available technology (BAT) products currently on the market (**Error! Reference source not found.**) and proposes new energy class thresholds accordingly. Anticipatory energy class thresholds will make sure that the label has a long-lasting impact on the market.

1c EC, EL -> Topten proposal for energy class thresholds and MEPS

----- **adopt now (energy class thresholds)** -----

Topten has made a market overview of the best available technology (BAT) products currently on the market and proposes new energy class thresholds and appropriate MEPS accordingly. For each product category, Topten

1. compares the 2014 proposed energy classes with BATs currently listed on Topten to show how populated the top classes already are and proposes new energy class thresholds that take into account current BAT products on the market. The classification proposed by Topten will allow for future technical improvements while still leaving room to older, less efficient models
2. sees how BATs perform against proposed MEPS and proposes new MEPS that remove the least efficient products from the market while making sure that a sufficient number of products remain on the market

Beverage coolers

The 2014 draft classification would mean that at least 18 beverage coolers (14 of them typical vertical 1-door beverage coolers) would already be class A at the time of the vote for the regulation, even more by the time of adoption and coming into effect of the regulation.

Therefore, Topten proposes the following energy class thresholds for beverage coolers:

Energy class	2014 draft thresholds	BATs (Sept. 2018)	Topten proposal
A	< 30	18	< 5
B	$30 \leq \text{EEI} < 50$		$5 \leq \text{EEI} < 10$
C	$50 \leq \text{EEI} < 80$		$10 \leq \text{EEI} < 25$
D	$80 \leq \text{EEI} < 110$		$25 \leq \text{EEI} < 50$
E	$110 \leq \text{EEI} < 130$		$50 \leq \text{EEI} < 80$
F	$120 \leq \text{EEI} < 140$		$80 \leq \text{EEI} < 110$
G	$\text{EEI} \geq 140$		$\text{EEI} \geq 110$

As there are already many highly efficient beverage coolers on the market and the technical development is still ongoing, Topten proposes the following MEPS for beverage coolers:

Tiers	Date	Topten MEPS
Tier 1	01.01.2020	$\text{EEI} < 110$
Tier 2	01.07.2021	$\text{EEI} < 80$
Tier 3	01.01.2023	$\text{EEI} < 50$
Tier 4	01.07.2024	$\text{EEI} < 25$

Ice-cream freezers

The 2014 draft classification would mean that at least 2 ice-cream freezers would already be class A and at least 3 ice-cream freezers would already be class B at the time of the vote for the regulation, even more by the time of adoption and coming into effect of the regulation.

NOTE: each of those models is available in various sizes.

Therefore, Topten proposes instead the following energy class thresholds for ice-cream freezers:

Energy class	2014 draft thresholds	BATs (Sept. 2018)	Topten proposal
A	< 40	2	< 20
B	$40 \leq \text{EEI} < 70$	3	$20 \leq \text{EEI} < 30$
C	$70 \leq \text{EEI} < 90$		$30 \leq \text{EEI} < 50$
D	$90 \leq \text{EEI} < 110$		$50 \leq \text{EEI} < 80$
E	$110 \leq \text{EEI} < 130$		$80 \leq \text{EEI} < 110$
F	$120 \leq \text{EEI} < 140$		$110 \leq \text{EEI} < 130$
G	$\text{EEI} \geq 140$		$\text{EEI} \geq 130$

Due to the fact that no MEPS have previously been in place, rapid technological advances (also through non-proprietary technologies) are foreseeable. Topten proposes the following MEPS for ice-cream freezers:

Tiers	Date	Topten MEPS
Tier 1	01.01.2020	EEI < 130
Tier 2	01.07.2021	EEI < 110
Tier 3	01.01.2023	EEI < 80

Supermarket display cabinets

The 2014 draft classification would mean that at least 14 supermarket display cabinets would already be class A and at least 26 supermarket display cabinets would already be class B at the time of the vote for the regulation, even more by the time of adoption and coming into effect of the regulation. Together, at least 40 appliances would already be in energy classes that should be reserved for future innovations.

NOTE: most of those models are available in various sizes.

Therefore, Topten proposes instead the following energy class thresholds for supermarket display cabinets:

Energy class	2014 draft thresholds	BATs	Topten proposal
A	< 30	14	< 10
B	$30 \leq \text{EEI} < 50$	26	$10 \leq \text{EEI} < 20$
C	$50 \leq \text{EEI} < 80$		$20 \leq \text{EEI} < 30$
D	$80 \leq \text{EEI} < 110$		$30 \leq \text{EEI} < 50$
E	$110 \leq \text{EEI} < 120$		$50 \leq \text{EEI} < 80$
F	$120 \leq \text{EEI} < 130$		$80 \leq \text{EEI} < 110$
G	$\text{EEI} \geq 130$		$\text{EEI} \geq 110$

This classification would serve for the different types of supermarket display cabinets (vertical, semi-vertical, combined, horizontal, freezers, refrigerators).

MEPS for this category must consider the inherently different energy efficiencies of the different types of supermarket display cabinets (e.g. vertical vs. horizontal). Serve-over counters, roll-in cabinets and semi-vertical cabinets inherently need more energy than other

cabinet types in this category. As such, Topten proposes the following MEPS for supermarket display cabinets:

Tiers	Date	Supermarket Cabinets	Serve-over counters, roll-in cabinets, semi-verticals
Tier 1	01.01.2020	EEI < 110	EEI < 130
Tier 2	01.07.2021	EEI < 80	EEI < 110
Tier 3	01.01.2023		
Tier 4	01.07.2024	EEI < 50	EEI < 80

Vending machines

The 2014 draft classification would mean that at least 1 vending machine would already be class B at the time of the vote for the regulation, even more by the time of adoption and coming into effect of the regulation.

Not much development has taken place in the last years. The introduction of Ecodesign and Energy Label should trigger technological advancements. Topten proposes the following energy class thresholds for refrigerated vending machines:

Energy class	2014 draft thresholds	BATs	Topten proposal
A	< 55	0	< 45
B	55 ≤ EEI < 75	1	45 ≤ EEI < 60
C	75 ≤ EEI < 95		60 ≤ EEI < 80
D	95 ≤ EEI < 115		80 ≤ EEI < 110
E	115 ≤ EEI < 135		110 ≤ EEI < 130
F	135 ≤ EEI < 145		130 ≤ EEI < 140
G	EEI ≥ 145		EEI ≥ 140

For vending machines, Topten proposes the following MEPS:

Tiers	Date	Topten MEPS
Tier 1	01.01.2020	EEI < 140
Tier 2	01.07.2021	EEI < 130
Tier 3	01.01.2023	EEI < 110

2) Gaps in the scope

The scopes of the three lots dealing with refrigerators and freezers must be carefully defined, so that no gaps occur. The three lots are:

- ENER Lot 12 commercial refrigerated display cabinets,
- ENTR Lot 1 professional storage refrigeration products,
- ENER Lot 13 household refrigerating appliances.

2a Gap 1: EC, EL -> Serve-over counters, roll-in and semi-vertical cabinets included in scope

----- preserve in the regulations -----

Special categories like commercial refrigerated roll-in cabinets, semi-vertical cabinets and serve-over counters are clearly part of Lot 12 and as such are covered by the regulation draft from 2014. However, there have been voices calling to exclude them from the scope of the regulation with one of the main reasons being that differences in the energy efficiency inherent to the product type might cause the proposed MEPS of the 2014 draft to ban all products of these categories from the market. Topten supports the decision of the Commission that these categories remain part of the scope because of their significant sales numbers and saving potentials. Differences in energy efficiency inherent to the product type can be taken into account by less tight MEPS or energy classes.

2b Gap 2: EC -> Vertical static-air cabinets for sale/display

----- adopt now -----

EU regulations for Lot 1 (professional storage refrigeration products) were adopted in May 2015. Because all static-air storage cabinets were excluded from its scope, it created a gap and uncertainty in product information: the suppliers and dealers can decide whether a product is intended for household or professional purposes and therefore should or should not be labelled.

An additional gap will arise for Lot 12 (refrigerated commercial display cabinets) where the draft EU regulations foresee to exclude all vertical static cabinets.

In the current review of the EU regulations for household refrigerating appliances (Lot 13) all “refrigerated appliances with a direct sales function” are explicitly excluded, meaning vertical static display cabinets will fall into a gap between scopes. **Therefore we recommend introducing product information requirements for vertical static products in the coming Lot 12 regulations.** This will make sure that product data is available and products can be compared. Manufacturers would have five different testing standards to choose from, and

could decide freely for each model, if it is a household, a professional or a commercial product (EN ISO 23953, EN 16901, EN 16902, EN 16825 incl. light-duty cabinets, EN 62552).

Insertion in EC Art.7 -> The review shall in particular assess:

- Any significant changes in the market shares of various types of appliance, in particular vertical static-air cabinets;
- The appropriateness of introducing a harmonized method for determining the standard annual energy consumption for vertical static-air cabinets;

2c Gap 3: EC, EL -> storage cabinets with glass doors

----- **adopt now** -----

The 2014 draft excludes from the scope all products:

“coming under scope of Commission regulation 2015/1095 & 2015/1094 with regard to professional refrigerated storage cabinets” (Art. 1.2(l))

as well as:

“cabinets that are primarily intended for the refrigeration and storage of items, and not for the additional functions of display and sales of items” (Art. 1.2(e)).

Topten proposes to eliminate Art. 1.2(e) in both the Ecodesign and the Energy Label regulation.

As the regulation for professional refrigerated storage cabinets excludes from its scope all *“serve-over counters and other similar forms of cabinets primarily intended for display and sale of foodstuffs in addition to refrigeration and storage”* the second exclusion of storage cabinets from the regulation for Lot 12 by intent is redundant and in addition may create a gap for cabinets that manufacturers declare as “equally intended for the refrigeration and storage of items as for the display and sales of items”. Examples of such products are storage cabinets with glass doors. Without the additional exclusion of “cabinets that are primarily intended for the refrigeration and storage of items”, manufacturers will have to decide whether such products fall under the regulation for Lot 1; if they decide that it does not, it will automatically fall under the new regulation for Lot 12. With the additional exemption, manufacturers might argue that the cabinets are not “primarily” for the display and sale but also not “primarily” for the refrigeration and storage of items – leaving a gap that would leave it at the discretion of each manufacturer whether the product should or should not be labelled.

3) Adjustments to EEI formula

3a EL -> Transparent energy efficiency index (EEI) formula, minimal segmentation

----- preserve in the regulations -----

The energy efficiency index (EEI) should be kept transparent as currently proposed in Annex VIII of the draft; this means no correction factors and only a minimal segmentation in the EEI calculation. Finding an optimal calculation for the energy efficiency index (EEI) is challenging. On the one hand, the calculation should consider different cabinet types and designs; on the other hand, transparency is lost with every correction factor and differentiation that is introduced. The EEI can then not be compared any more across the different cabinet types/designs.

For this reason, Topten is in favour of an EEI calculation without any correction factors and only a minimal segmentation of product categories (chilled vs. frozen, vertical vs. horizontal). If a specific cabinet type needs to be treated separately, it is better to introduce separate minimum requirements and label classes instead of creating a separate EEI calculation. This is the case when a specific cabinet type threatens to be banned from the market unintentionally, because it is inherently less efficient than other types. Another case could be that the label classes do not allow differentiating good and bad performing products within a specific type because the range is very different from other types.

Two examples for such cases are serve-over counters and roll-in cabinets. Here separate minimum requirements are needed (cf. "Energy class thresholds and MEPS").

3b EL Art. 7 -> The review shall reassess the reference values for the calculation of the SAEC

----- include in article 7 "Review" -----

The M and N values provided by the preparatory studies determine the energy efficiency of each product in relation to the average model on the market (energy efficiency index EEI; cf. Formula 1). As the last preparatory study for Lot 12 is from 2013, the M and N values in the current draft do not consider the technical advances of the market in the last 5 years. While for some categories, no significant technological advancements have taken place, some categories have benefitted significantly from technological advancements made for products in Lot 1 and Lot 13. As a result, their relative energy efficiency as compared to the average model on the market from 2013 is already so high, that it leaves little room for improvement in the future. One such case are beverage coolers where the best model on the market already reaches $EEI < 10$.

$$EEI = \frac{AEC}{SAEC} \times 100 = \frac{TEC \times 365}{(M + N \times Y) \times 365} \times 100$$

*with Y = TDA for supermarket cabinets and
Y = Vol for beverage coolers and ice – cream freezers*

Formula 1: Formula for the EEI shows the impact of the M and N values

In order to identify efficient products in each category in the future, a new study is essential. As a new study before the adaptation of this regulation would delay the implementation of the regulation, the study should take place after the implementation and provide information in the review of the regulation (a further delay in the initial adoption of the regulation would negate any advantages gained by identifying new M and N values immediately).




Insertion in EC Art.7 -> The review shall in particular assess:

- Any significant changes in the market shares of various types of appliance, in particular beverage coolers, ice-cream freezers, supermarket refrigerators and freezers, counter-refrigerators and freezers, roll-in cabinets and semi-vertical cabinets;
- The reference values for the calculation of the SAEC;

3c EL Art.7 -> The review shall revise whether the total display area (TDA) is the best parameter to calculate the EEI

----- include in article 7 "Review" -----

Cabinet designs with very large glass areas might have an unfair advantage and a misleadingly good EEI. By counting the glass area of the side walls, the EEI can be lowered by as much as 50% for small cabinets. This is demonstrated by the vertical supermarket cabinets in the Topten product lists:

			
Total display area	1.2 m ²	1.4 m ²	4.5 m ²
Display area only front	ca. 0.6 m ²	ca. 0.8 m ²	ca. 2.9 m ²
Difference in EEI when using only the front display area	-50%	-40%	-35%

The same problem will occur with supermarket chests with glass sides.



One solution is to consider only the area of the main glass side in the EEI calculation instead of the total display area (TDA): only the front for vertical cabinets and only the top for horizontal cabinets. Another solution for critical cabinet types is to consider the net volume in the EEI calculation instead of the glass area. Both parameters are currently not defined in the testing standard and would have to be added. This issue should be monitored during the five years after entry into force and if needed addressed in the review.

Insertion in EC Art.7 -> The review shall in particular assess:

- Whether the total display area (TDA) is the best parameter to calculate the EEI;
- The appropriateness of introducing a new parameter to calculate the EEI such as net volume or display area of the main glass front;

4) Make regulation effective for B2B market

In 2015, the Ecodesign and Energy Label regulation for professional refrigerated storage cabinets was adopted, which similarly to the proposed regulation for commercial refrigerated display cabinets, is intended to cover a Business-to-Business (B2B) market. The technological advances triggered by this regulation were already highly successful: first models reached energy class A+ less than one year after the entry into force of the respective Ecodesign and Energy Label regulations, despite EEI thresholds for energy classes having been tightened several times during the development of the that regulation. The labelling of products in forms of distance selling, however, falls short of expectations.

4a EL -> Adjust stipulations for the requirements of information to be provided by suppliers (Art. 3) and dealers (Art. 4) for any form of distance selling, advertisements and technical promotional material

----- **adopt now** -----

The current phrasing does not take into account the fundamental differences between B2C and B2B markets. The specifications in the Energy Label require the label to be presented next to price-related or energy-related information on advertising and promotional materials; this is not sufficient to guarantee that the energy efficiency class is shown online because

many manufacturers and dealers do not mention this information in the first place. Additionally, responsibilities of suppliers (EL Art.3) do not include presenting the energy label on their own platforms for distance selling although their websites serve as major platforms of decision making before the buyer is forwarded to connected dealers for the purchase itself. Manufacturer platforms are not by themselves typical points of sale as in many cases, products cannot be bought on their website; instead buyers are forwarded to their nearest dealer for the purchase of the products who then give each buyer an individual quote. That means that even without the price (and at times without any information on energy consumption) the manufacturer websites display their products with the intent to promote and sell – thus serving as a decision-making platform which in itself is a significant part of the sales process.

Art. 3 should include in the responsibilities of suppliers that:

- at the point of sale, each refrigerated commercial display cabinet shall bear the label in accordance with Article 3(1) on the outside of the front or top of the appliance, so that it is clearly visible;
- refrigerated commercial display cabinets promoted for sale, hire or hire-purchase, where the end-user cannot be expected to see the product displayed, shall be marketed with the information provided by the suppliers in accordance with Annex VI, except where the promotion is displayed on the internet, in which case the provisions of Annex VII shall apply;
- any advertisement relating to a specific refrigerated commercial display cabinet model includes a reference to the energy efficiency class of that model;

Expanding the labelling duties at the point of sale to suppliers ensures that labelling is also mandatory at trade fairs – while high sales volumes are generated especially during trade fairs, they are not always considered a traditional “point of sale”.

4b EL preface (5) -> The next Q&A commissioned for the standards (measurement methods) for commercial refrigerated display cabinets shall stipulate consistent instructions on testing of products' series

----- include in article 7 “Review” -----

For commercial refrigerated display cabinets, each model is typically available in up to several hundred configurations (small changes to one model that don't impact the technical components). As such, testing and declaration of energy data for each configuration is a controversial issue. While some of the configurations impact the

declaration of energy data, testing all configurations separately is likely to overstrain the laboratory capabilities of many manufacturers.

If not each model is tested separately, Topten recommends that the Commission provides for the creation of a guideline to stipulate a general rule for least-performing configuration testing or adjustment calculations where possible.

References

- [1] www.topten.eu/pro-cold
- Up-to-date product lists with top-efficient commercial refrigerated display cabinets using natural refrigerants
 - Policy recommendations
- [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
- [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