**Industry update on refrigerated display and storage cabinets: Technical Working Group recommendations**

This consultation paper provides an update to stakeholders following industry feedback on the Consultation Regulation Impact Statement – Refrigerated display and storage cabinets (Consultation RIS) released on 15 July 2016. It includes:

* The policy proposals in the Consultation RIS that are supported by industry.
* The modified policy proposals to be included in the Decision Regulation Impact Statement (Decision RIS).
* Recommendations from the trans-Tasman Technical Working Group convened to consider implementation of the proposals, including minor technical alterations to the international Standards to be adopted.

**Consultation Regulation Impact Statement**

The Consultation RIS considered policy proposals to improve the average energy efficiency of refrigerated commercial cabinets, namely:

* Refrigerated display cabinets – commercial refrigerators, including those with transparent doors or lids and drinks chillers, all of which display food and/or beverages for sale in the retail sector.
* Refrigerated storage cabinets – a sub-category of commercial cabinets (also known as professional or service cabinets) that are often used behind the scenes in kitchens or by catering companies for the storage of foodstuffs.

The Consultation RIS considered five policy options, including three regulatory options directed at updating and revising the existing Standards to reflect the growing commercial cabinet market:

* **Option 1:** Business as Usual (BAU) **-** no changes to the existing requirements.
* **Option 2:** Adopting the ISO and EN test methods but setting local MEPS levels for Australia and New Zealand to improve the least efficient 10% of cabinets, in groups similar to those proposed by the EC MEPS process. Mandatory labelling is added.
* **Option 3:** Adopting the ISO and EN test methods but setting local MEPS levels for Australia and New Zealand to improve the least efficient 30% of cabinets, in groups similar to those proposed by the EC MEPS process. Mandatory labelling is added.
* **Option 4:** Adopting the ISO and EN test methods and EC MEPS levels (posed per group) from 2017. Mandatory labelling is added.
* **Option 5:** Non-regulatory intervention, in addition to Business as Usual.

Trans-Tasman consultation on the Consultation RIS took place in August 2016.[[1]](#footnote-1) Public sessions were held in five cities across Australia and NZ, with 90 companies represented and 20 written submissions received.

Overall the submissions supported policy option 4 which included the adoption of ISO and EN test methods and European Commission efficiency (MEPS) levels. There was strong support from industry for monitoring and enforcement of compliance, as well as online labelling.

Decision Regulation Impact Statement

Following feedback on the Consultation RIS, option 4 remains the recommended policy option but will be modified in the Decision RIS. The new option 4 retains the adoption of ISO and EN test methods (with minor technical variations) but proposes that Australasian MEPS be revised to align with EC efficiency index (EEI) levels. The new option 4 also proposes introducing voluntary online labelling rather than mandatory labelling as previously proposed.

EECA will continue to keep industry and stakeholders informed of progress with the Decision RIS process. The Decision RIS will contain the final policy recommendations and will incorporate any feedback.

This work is proceeding according to the expected timeframe for the proposed changes to Standards and regulations in Australia and New Zealand, and has a target implementation date of 1 December 2019.

**Background**

Refrigerated display and storage cabinets have been regulated for energy use in both Australia and New Zealand since 2003, using a 14 part Australian Standard AS 1731.2003 (AS 1731).

AS 1731 is no longer achieving its intended regulatory purpose and has not been updated to reflect changes in the trans-Tasman commercial refrigerated cabinet market or in technology advancements. It is complex, difficult to interpret and excludes a number of high volume cabinets common to today’s market. In addition, the current Minimum Energy Performance Standards (MEPS) and High Efficiency Performance Standards (HEPS) contained in AS 1731 are no longer setting appropriate targets for efficiency.

These regulatory problems are compounded by market and information failures. The nature of the supply chain in the refrigerated commercial cabinet market means that some buyers are not the end-users. This can cause difficulties for consumers wishing to access information about the energy efficiency of cabinets or to compare efficiency between models.

**Objective**

The objective of the proposed NZ/Australian Government regulatory action is to resolve issues with existing standards and regulations which prevent the supply and purchase of energy efficient cabinets in the trans-Tasman market.

The proposed regulatory action will resolve many of the issues that prevent consumers from making informed purchasing decisions. It will align energy efficiency specifications with those of Australia and New Zealand’s major trading partners. It will also keep Australian and NZ companies competitive by promoting international harmonisation through consistency in Standards and efficiency levels.

The Standards to be adopted under the proposed regulatory changes, and the relevant cabinet types, are outlined in **Table 1** below.

**Table 1: Summary of EN Standards and EC efficiency levels (including those parts which are not currently being considered for adoption in Australia and New Zealand).**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Standards** | **EC Efficiency Levels** | **Parts of standards or regulations that are not being considered by current proposals** |
| **ISO 23953 Refrigerated Display Cabinets** | Published | Draft | Covered |
| **EN 16825 Refrigerated storage cabinets and counters for professional use** | Published | Published | Covered |
| **EN 16902 Commercial beverage coolers** | Published | Draft | EN 16902 not currently being considered for adoption. Commercial beverage coolers to be covered by ISO 23953. |
| **EN 16901 Small ice-cream freezers** | Published | Draft | Covered |
| **EN 16838 Refrigerated display scooping cabinets for gelato (soft scoop)** | Published | Published | Covered |
| **Beverage vending machines, blast cabinets, condensing units and process chillers** | n.a. | n.a. | Not currently being considered for adoption. |

**Technical Working Group**

Following the August 2016 consultation process, the New Zealand government agency EECA (the Energy Efficiency and Conservation Authority) convened a trans-Tasman Technical Working Group (TWG) on behalf of E3, consisting of industry representation, regulators and independent experts, to consider potential technical alterations to the adopted Standards and to provide advice on implementation in relation to the modified policy option 4.

The TWG was tasked with providing technically robust advice on in-scope European (EU) Standards (see **Table 1** above), with as few exceptions/alterations as possible in order to improve and achieve international harmonisation. All recommendations from the TWG were evidence based and resulted from information and guidance provided by industry participants.

The TWG discussions were largely completed by June 2017.

The following is a high level description of the parts of the relevant Standards that were considered by the TWG, the recommendations made and provisional decisions reached. Further technical details are contained in the Technical Appendix to this paper, which can be accessed by using the following link to the Energy Rating website: **[link inserted]**

**Recommendation 1: Adoption of EU efficiency levels for refrigerated display cabinets**.

The proposed AU/NZ efficiency levels for Refrigerated Display Cabinets are based on minimum efficiencies aligned with previously published European levels (with adjustments to one cabinet category). These are shown in the appended summary table. The intention is to base the efficiency requirements on the EU Efficiency Regulations (See Option 4: Consultation RIS July 2016 Page 27).

Proposed efficiency levels follow the policy option 4 proposals apart from IRV-4 (Integral Refrigerated Vertical Cabinet with Glass doors) that follows a modified policy option 4 to take into account the change from a volume based metric back to a TDA based metric. The efficiency level based on an Energy Efficiency Index (EEI), together with the proposed date of introduction, are shown in the **table** below. Efficiency levels for the majority of refrigerated display cabinets will be covered by the test methods set out in ISO 23953:2015.

|  |  |
| --- | --- |
| Proposed EU energy efficiency level for refrigerated display cabinets | |
| Introduction | Specific refrigerated display cabinets |
| From 1 December 2019 | EEI < 130 |
|
|

**Recommendation 2: Adoption of EU efficiency levels for refrigerated storage cabinets.**

The TWG recommends the adoption of EU efficiency levels for Refrigerated Storage Cabinets. The proposed efficiency levels for Refrigerated Storage Cabinets are those currently applying in Europe which were implemented under Commission Regulation (EU) 2015/1095 on 5 May 2015 (see Consultation RIS July 2016 Page 27).

The efficiency levels based on an Energy Efficiency Index (EEI), and the proposed date of introduction, are shown in the table below.

|  |  |  |
| --- | --- | --- |
| Proposed EU energy efficiency level for refrigerated storage cabinets | | |
| Introduction | Refrigerated storage cabinets  Light and Normal Duty | Heavy duty cabinets |
| 1 December 2019 | EEI < 95 | EEI < 115 |
|
|

For regulatory purposes, Refrigerated Storage Cabinets are grouped into four categories based on physical characteristics:

* + Vertical Chilled
  + Vertical Frozen
  + Counter Chilled
  + Counter Frozen

These products are then further classified by a Duty Rating based on the ambient conditions in which the cabinets are intended to operate:

* Light duty
* Normal duty
* Heavy duty

The Standard detailing the test method for these cabinets is EN 16825:2016, *Refrigerated storage cabinets for professional use – Classification, requirements and test conditions.* Temperature performance and energy consumption are tested to determine energy efficiency in the form of an Energy Efficiency Index (EEI), with the EEI calculated using formulae prescribed by EU Regulations.

**Recommendation 3: Three defined registration channels**

The TWG identified three defined registration channels:

1. Single model registrations.
2. Family model registrations - in a ‘family’ registration the maximum energy consumption and minimum energy efficiency performance will be evidenced by a certified performance test conducted on the worst performing cabinet model. The worst performing model will be designated as the “parent” model in a family registration.
3. Deemed to Comply registrations – reserved for low volume bespoke/custom units that cannot be tested in a standard testing facility. This channel will have prescribed technical information required at the point of registration to enable a (ISO 23953 based) calculated efficiency level.

**Family of models – definition**

A family of models is a range of models of the same brand.[[2]](#footnote-2) Each family is based on a ‘parent’ model that has undergone a certified performance test and is registered on the energyrating.govt.au website. All other models in the family must have the same or better energy rating characteristics than the ‘parent’ model. The parent model’s certified performance test documentation is required to be uploaded at the point of registration, along with (physically identifiable) model number variations for all other models that are being registered as members of the same family. The TWG recommended that a maximum of 20 family member models be permitted in a family registration.

**Models that are part of a family**

To be included as a member of a family, it is proposed that all of the following conditions must be met:

1. At the point of registration the least efficient model is selected as the parent model and the registration individually identifies all other same or better efficiency models in the family; and,
2. Family member models must not exceed the allowable maximum energy consumption[[3]](#footnote-3) (TEC/TDA) in kWh/day/m2 or (TEC/VN) in kWh/day/m3 of the parent model; and,
3. Family member models must have an identical or warmer product temperature range (M-package temperature) than the parent model; and,
4. Family member models must be of an identical cabinet type and use the same method of access to products being displayed or stored as the parent model (either all open or all closed cabinets).

To assist in determining the model to be selected as the ‘parent’ of a family of self-contained cabinet models or remote cabinet models, criteria can be applied to identify the model that will produce the highest allowable maximum energy consumption and thus be the least energy efficient (refer **Technical Appendix** for criteria **[insert link]**).

Alternate components are permitted to be substituted in a cabinet that is part of a family registration provided the components have the same or better specification and performance. Compliance activity and check testing will be used to ensure registered performance is maintained.

**Deemed to comply registrations**

Deemed to comply is an alternative registration method for cabinets that are produced in low quantities (i.e. one-offs, bespoke/custom or built in) that cannot be tested in a standard testing facility.

A certified performance test to the recognised Standard is the most certain method for a risk free registration but the practicalities and relative costs are prohibitive with low volume cabinets, and generally outweigh the overall benefits. In this scenario, a simple method of analysing the energy characteristics of a design to demonstrate the energy efficiency of a cabinet, relative to the regulated minimum efficiency level, is considered to be a more viable approach.

ISO 23953.2:2015 (Annex D) sets out a method for establishing data requirements for Standard Ratings and evaluating alternative components for both remote and self-contained refrigerated display cabinets based on the AHRI 1200 Standard.[[4]](#footnote-4) This method is also incorporated into Annex B of EN 16838:2016 (Refrigerated display scooping cabinets for gelato).

These methods have conditions. For example, if an electrical component increases energy consumption then the cabinet efficiency must be revised based on actual measurements. If there has been an energy reduction, the calculation or measurement method can be used.

When submitting efficiency data for a commercial cabinet that has been calculated rather than physically tested, it is expected that a calculation adjustment factor of an additional 15% would be added to the claimed energy consumption to take into account real-world operation.

**Registration costs**

The TWG had broad representation from local manufacturers, importers and companies who have experience in both manufacturing and importing in the Australian and New Zealand markets. Extensive discussion and debate was directed at ensuring that registration costs would be fair and equitable under the new regulatory structure. Provision of wider registration channels through the ‘family of models’ and ‘deemed to comply’ pathways was accepted as providing industry with the means to comply with legal requirements at a fair and reasonable cost.

**Recommendation 4: Voluntary online labelling**

While a mandatory labelling system was not supported by industry, there was consensus by industry and regulators at TWG meetings that there was still a compelling case for labelling which should be online and voluntary (however, some manufacturers may still choose to apply physical labels to cabinets under a voluntary labelling scheme).

The cabinet efficiency characteristics shall be provided online, and in a standardised star rating format. The development of a star rating label (and the transition to the European Energy Efficiency Index) will require labelling algorithms to be developed by consultants (and published prior to implementation of the new MEPS scheme) in conjunction with New Zealand and Australian regulators.

**Recommendation 5: Adoption of ISO 23953 (Refrigerated Display Cabinets) with minor amendments**

The TWG noted that the light transmission factor and the change to the higher frequency of door openings for closed chillers are the main test differences between ISO 23953 and AS 1731.

It was agreed a key performance aspect is to ensure that a closed cabinet maintains the specified temperature when subject to door openings.

The TWG accepted the ISO inclusion of a sneeze guard. However, the ISO dimensional limit of not less than 1500mm may not be appropriate for all commercial cabinet types. Specific dimensions may be required in certain jurisdictions. The wording on sneeze guards as used in AS 1731 is preferred.

The TWG accepted ISO 23953 Annex A which effectively removes the light transmission factor.

**Recommendation 6: Adoption of ISO 23953.1 (Vocabulary) – concerning groups of cabinets as classified by type.**

The TWG accepted ISO 23953.1 which concerns groups of cabinets as classified by Type (see **table** below).



**Recommendation 7: Adoption of ISO 23953.2 (Refrigerated Display Cabinets – Classifications, Requirements and Test Conditions)**

The TWG recommends that ISO 23953.2 be adopted in relation to Refrigerated Display Cabinets, including minor amendments to clauses concerning controls, closed chiller loading heights and component substitution.[[5]](#footnote-5)

The TWG also accepted clause 5.3.2.7 and 5.3.2.8 (requirements for cabinet lighting controls). However, cabinets from Europe always contain a switch. To ensure the full interpretation of the ISO standard, and to encourage energy savings, it was recommended that AS 1731 wording be included to allow an automatic switch to be fitted.

The TWG accepted clause 5.3.2.3.2 (loading heights of closed cabinets), with a suggested variation to revert to the half-height loading of test packages using wording from AS 1731 (that provides clarity for the trans-Tasman market).

The TWG accepted ISO 23953 Annex D, which defines the various components that determine the energy consumption and performance of a refrigerated cabinet. This allows the ability to substitute components and calculate the difference using the technical standard methodology. The TWG suggested clarity be provided to ensure Annex D is clearly translated into regulation.

The TWG also accepted the Table 1 M-Package temperature classifications and the Table 3 Climate Classification of ISO 23953:2015, both of which incorporate additional classifications that were not present in AS 1731 (reproduced below).



**Recommendation 8: Adoption of EN 16825:2016 (Refrigerated Storage Cabinets and Counters for Professional Use)**

The TWG recommends adopting EN 16825:2016, with minor amendments to clauses concerning climate class testing, and including a specific additional clause regarding test room conditions for the water vapour test.

The TWG noted a light duty cabinet is tested at Climate Class 3, and the efficiency value is multiplied by an Adjustment Factor of 1.2 (stated in Annex IV 2 (b), Page L177/36) to normalise the efficiency rating at Climate Class 4.

The TWG also noted the clause that specifies heavy duty cabinets need to be tested at three different Climate Classes:

1. Climate Class 5 to validate that the cabinet could be operated at these conditions.
2. Climate Class 4 for efficiency ratings.
3. Climate Class 7 to measure water vapour condensation.

The TWG recommended inclusion of an option allowing for alternative Australian/NZ test filler packages as EN 16825 does not have provision for an alternative (as allowed for in ISO 23953).

**EN16825:2016 Addition – test room conditions for water vapour condensation test**

The TWG noted it is unclear from the wording of EN16825 whether or not the condensation test can result in a pass or fail energy efficiency requirement. There is no logical reason for undertaking the condensation test to Climate Class 7 (as stated in the Standard), as opposed to the Climate Class for which the Light, Normal and Heavy duty cabinets are intended (i.e. classes 3, 4 and 5 respectively). Adopting EN 16825 verbatim would require an additional 24 hours testing time and expense for no quantifiable benefit. Generally cabinets are tested at the climate condition that they are intended to operate at and have been designed for.

This ambiguity was evidenced by an independent MEPS test report to the FprEN16825:2016 test standard by a member of the TWG Committee. The report showed the test cabinet had condensation present during that test, but the result was not a fail.

The TWG agreed to include the condensation test, and also to progress the action point of contacting the EN Standard project team in Europe, passing on the concerns from the TWG and requesting the rationale to rectify the ambiguity and possible contradiction in terms. Local variations will then be considered (i.e. requiring undertaking the test at the intended Climate Class but with the option of a test for information only at Climate Class 6 for Light duty and Normal duty cabinets, and at Climate Class 7 for Heavy duty cabinets). However, this local adaptation cannot occur until agreement is reached and direction obtained from the European Standard Committee.

**Recommendation 9: Adoption of EN 16901:2016 (Ice-Cream Freezers – Classifications, Requirements and Test Conditions**)

The TWG accepted EN 16901 for small ice-cream freezers subject to a number of minor changes required to clarify definitions and a minor modification to a diagram.

**Recommendation 10: Exclusion of EN 16902 (Commercial Beverage Coolers – Classifications, Requirements and Test Conditions).**

The TWG considers that this Standard is not currently fit for purpose in the trans-Tasman setting. Instead,the TWG recommends that ISO 23953 be used to test beverage coolers.

The TWG discussed the adequacy of adopting EN 16092 Commercial Beverage Coolers (currently all refrigerated display cabinets, including beverage coolers, are regulated by AS 1731).

A separate EN standard for beverage coolers was developed and published due to the requirement of large European based beverage companies specifying canned or bottled carbonated beverages be chilled to a defined temperature at the point of sale. In these dedicated beverage coolers an electronic management device (EMD) was commonly used. An EMD permits the cabinet to reduce refrigeration cooling overnight (i.e. reducing power consumption during non-retail hours by raising the temperature of the displayed goods), before pulling the cabinet temperature back down to the prescribed temperature in time for retail opening hours. Naturally, this was pertinent to cabinets only containing canned or bottled carbonated beverages but was unsuitable for cabinets that could contain perishable beverages or foodstuffs (such as milk or fruit juice based products). A label was often used by beverage companies - ‘cabinet not for use with perishable products’ to leave discretion and risk to end users.

To adapt these beverage coolers to suit the perishable market, many manufacturers simply shipped them from factory in ‘perishable mode’ i.e. with the Energy Management Device (EMD) disabled. To enable supply to both markets most beverage coolers had to be tested to both EN 16902 and ISO 23953 (with the EMD enabled). In Australia and New Zealand the majority of these coolers are suitable as display cabinets for both perishable foodstuffs and non-perishable beverages.

From a technical perspective, EN 16902 is about pull down, not testing for energy efficiency. Test results supplied by TWG members showed cases tested under EN 16902, with the EMD enabled, portrayed an artificially low energy consumption measure (i.e. approx. 25% less) compared to actual, or when compared to a cabinet tested under ISO 23953 for refrigerated display cabinets. In addition, EN 16902 does not require a door opening test for closed cabinets to simulate actual use. The difference in energy consumption when comparing cabinets with and without doors was minimised during testing.

The TWG acknowledged that the test conditions in this Standard do not simulate the real world situations beverage cabinets would be subject too. Overall the TWG was concerned that introducing this Standard would add unnecessary registration/compliance complexity and may allow lower efficiency products into the market as it promotes a less onerous test.

From the Government regulators perspective, there is no obvious way to distinguish beverage coolers from refrigerated display cabinets based on their appearance. It is almost impossible to flag a refrigerated display cabinet as a beverage cooler because the EMD can be enabled or disabled before entering the market. It was also noted by regulators that ISO is currently considering an incorporation of EN 16902. It makes sense to assess adoption of the ISO version of this Standard when available.

TWG members therefore unanimously recommended that EN 16902 not be adopted and that ISO 23953 be used as the test Standard for beverage coolers.

**Recommendation 11: Adoption of EN 16838:2016 (Refrigerated Display Scooping Cabinets for Gelato – Classification, Requirements and Test Conditions).**

The TWG accepted EN 16901 for gelato scooping cabinets without any changes other than the possibility of applying this Standard to ice-cream scooping cabinets.

**Recommendation 12: Refrigerants are out of scope.**

**Feedback on recommendations**

Feedback on the provisional decisions and recommendations of the TWG is invited by **Friday, 8 September 2017** through the following channels:

* New Zealand submissions should be emailed to: [regs@eeca.govt.nz](mailto:regs@eeca.govt.nz)
* Australian submissions should be emailed to: [energyrating@industry.gov.au](mailto:energyrating@industry.gov.au)

*Note: Submissions will be published, as will the names of all stakeholders who have made submissions. If you do not want your submission to be published, please confirm in your covering email that you wish the submission to be treated as confidential.*

1. <http://prod-energyrating.energy.slicedtech.com.au/sites/new.energyrating/files/documents/E3%20Refrigerated%20cabinet%20RIS%2015%20July%202016.pdf> [↑](#footnote-ref-1)
2. For registration purposes, an identical energy rating specification cabinet can be given an alternative trading brand and model number provided that the manufacturer supplies a declaration stating the products are identical in energy rating performance and identical to the model in test report number XYZ. This declaration must be on the product manufacturer’s letter head, dated and signed in PDF electronic format and uploaded on the product registration website page along with the test documentation. [↑](#footnote-ref-2)
3. Minimum energy performance requirements in terms of the ‘maximum allowable energy consumption’ of a model expressed as the total energy consumption (TEC) per 24 hours of total display area (TDA) (Units: kWh/24h/m2) or net volume (Units kWh/24h/m3). An energy efficiency factor of a particular model can be determined by comparing the actual total energy consumption per unit display area or unit volume with the maximum allowable energy consumption as specified by regulation. [↑](#footnote-ref-3)
4. Air-Conditioning, Heating and Refrigeration Institute (US) – Performance Rating of Commercial Refrigerated Display Merchandisers and Storage cabinets [↑](#footnote-ref-4)
5. The classification of a refrigerated cabinet is defined by the storage temperature of the product (or M-package temperature class) which it can achieve and by the ambient conditions, or climate class, in which it is designed to operate at, and achieve the required storage temperature. Similarly the climate class classification defines ambient operating conditions that are used in establishing the test room conditions for refrigerated equipment, to determine the electrical energy consumption. [↑](#footnote-ref-5)