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Panasonic Feedback on: Energy Savings Scheme – Air Conditioner Activity Definitions

1. Over Sizing concern

All stakeholders involved in the supply & installation of Air conditioners have a fundamental objective to correctly size the unit, regardless of incentives on offer. This includes both under sizing and oversizing.

End User – Performance and energy efficiency

Installer/Builders – Performance as per expectations and no customer call back to resolve performance concerns, wasted expense

Manufacturer – Performance concerns lead to warranty callouts, when there is actually nothing wrong with the product, wasted expense

Recommendation: To avoid any concerns around ESS incentives driving poor sizing decisions, all air conditioning incentives should be designed to ensure that the following decision process can take place by the person designing the air conditioning system (Installer or Mechanical Engineer) for every sale:

- a. What is the capacity of unit required for the space to be conditioned
- b. What is the best type of system to suit this building and need
- c. Within the products that satisfy both a and b, are there products that are more energy efficient, that can qualify for incentives

If this holistic view is ignored and incentives are not correctly structured to cater to all types and capacities of systems, this is what leads to poor sizing and application decisions being made. This means that the scheme should be designed around having eligibility levels structured in a way that there is 'eligible product' to suit all capacities and system variants.

A single, or too few threshold categories for eligibility of all products and all capacities is not the correct way, and encourages poor product decisions to be made. Air conditioning systems have diminishing levels of energy efficiency for larger systems. To set a single efficiency threshold for all capacities, can mean that every single 2.5kw wall hung single split system on the market is eligible – even the terribly inefficient ones, yet the absolute best and most efficient 7kw wall hung single split system is not eligible. In this case, through poor design of the program, you are encouraging unwanted energy efficiency outcomes such as: multiple units installed instead of a single unit, under sizing leading to the product operating at an inefficient section (too high) of its output capacity range for long periods of time etc.

The best guideline for correct sizing of equipment is the "AIRAH Air Conditioning Best Practice Residential Guideline for NSW" and this can be referenced as the standard to follow for both Residential and Commercial applications

If there must be some form of evidence gathering to demonstrate compliance with this best practice guide, the best solution would be for a heat load calculation to accompany each submission, to demonstrate sizing has been correctly calculated to arrive at the cooling/heating capacity selected.

2. Product eligibility threshold criteria

Recommendation is to use TCSPF and HSPF as the threshold criteria to determine whether a product is eligible for incentives or not. AEER and ACOP should not be used.

Why? AEER and ACOP are measured at the units 100% output power. This is not a condition that is frequently experienced in real world usage, and therefore is a poor

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judgement of energy efficiency comparisons or threshold levels. In real world usage, the system is operating the majority of the time at a part load output. TCSPF and HSPF evaluate the product at these part load efficiencies that deliver real and realised energy efficiency.

When designing an air conditioning unit, the components including compressor selection, fan sizing, coil sizing etc are all selected to achieve optimal efficiency at a certain capacity or capacity range. The new TCSPF and HSPF now correctly provide incentive for manufacturers to design their units to be the most efficient in the real world (part loads), as opposed to an AEER specification looking great in a brochure, however real world efficiency being very different.

It is impossible to design a system to be optimised for part load efficiency, as well as optimised for 100% load efficiency. Due to the new TCSPF and HSPF measurement methods, all manufacturers are now designing their systems to be most efficient at part loads, which is fantastic as this will lead to realised energy savings by end users in the real world application. Because the units are designed to be optimised for part load efficiency (where TCSPF and HSPF are measured), full load efficiency decreases (which shouldn't really matter to anyone much anymore).

This means that the new 2021 models coming to market, that are designed to more energy efficient than their predecessors, have inferior AEER and ACOP specifications. If a scheme uses AEER and ACOP, not only is it misguided in achieving the primary objective of improving energy efficiency, there will be a decreasing amount of eligible product available to satisfy the threshold as each manufacturer releases their new models designed around TSCPF/HSPF criteria.

For any existing models (Introduced Before April 2020) without TCSPF/HSPF data registered, a manufacturer can voluntarily update their registration to include this data, so there should be no negative to using this threshold for all products.

Please see suggested table attached of recommended performance thresholds.

3. How to make administration of eligible products clear and simple

Given the above recommendation of using TCSPF and HSPF as the threshold criteria, this leads to the concern around making it easy for participants to determine what is and isn't an eligible product.

If the criteria for eligibility is published in a table, the judgement for eligibility should be the Gems database. To make it even simpler, the table headings should reference the exact column heading name as per the Gems database to avoid any confusion eg "*Residential HSPF_mixed*".

When it comes time to administer rebate schemes etc under the ESS, the facilitator can also publish an 'eligible products list' using this criteria, to make it very easy to understand for the general public etc.

4. Climate Zone to use for threshold levels

We understand that there is a balance to be reached between the scheme being perfectly correct, and also relatively straightforward to understand and administer. For this reason, we recommend for simplicity, that the MIXED zone be used for all of NSW. Whilst on a geographical area basis, the COLD and HOT zones make up a significant portion of the state, when population spread is taken into account, the mixed zone would cover 90%+ of the population.

For calculation of incentives, the actual zone should be used.

5. Gems database

The Gems database should be treated with caution when using it to make judgement on qty of products eligible for various different threshold criteria. This is because:

- a. There is a huge proportion of product that is still 'active', that in reality is an old or superseded product that is no longer available. Manufacturers are in no rush to change products to inactive, as there is always a small amount of stock filtering through the market in various resale channels (Retailers etc) for many years after the product is discontinued.
- b. There are many products that are suitable for industrial / commercial applications, that will never be sold into a residential setting. These products need to be excluded from any filtering for residential programs.
- c. There are some models registered that have never been brought into the country, and or, 'hero models' that are prohibitively expensive and sell very few units in real terms. Threshold criteria should be set to divide the mass market low efficiency product from the mass market high efficiency product.

6. Demand response

Recommendation: Demand response capability for DRM1, DRM2 and DRM3 functionality should be included to align the program with current or future DRM initiatives.

The judgement criteria should be based on Gems registration, and all 4 of the following must = TRUE. 'Demand Response 1', "Demand Response 5", "Demand Response 6", "Demand Response 7"

The reason 'Demand Response 1' alone should be the qualification criteria, and not "Demand Response 1" or "Demand Response 4" is that "Demand response 4" relies on the installer taking the time to install the demand response module inside the unit at the time of install. There is no guarantee this will be done. For example, if there was a time gap of 2 years, between implementing this ESS, and then a DRM initiative being launched, when it came time to connect up all the air conditioners, you would find many cases of units with no manufacturer DRM module to connect to.

By using 'Demand Response 1', whereby the terminals are built into the product from the factory, this guarantees that when a DRM program is launched, all the sites will have DRM capable machines ready to be connected to the signal receiver or similar device that the energy company dictates.

The Gems database should be the single source of truth for DRM eligibility. If an manufacturers information is incorrect in the Gems database, they should fix it.

7. Commercial Activity definition

Recommendation. *Allowing the Commercial Activity to be used when installing centralised units, or in the common areas of Class 2 Buildings.*

There are a lot of larger 'commercial' VRF type products installed in buildings that do not fall under the typical residential building classes.

8. Are more of the higher performance products sold, or more of the lower performance products?

Our estimation from our knowledge of our own sales, plus of the market more broadly is that approx. 70% of units sold are the lower performance products. This comes down to the price sensitivity of purchasers for the initial capital outlay. Whilst the cost for a product that is much more efficient may be only 15% more, the purchaser often chooses the cheaper product.

There is also a lack of understanding among consumers when purchasing air conditioning product, and therefore the model selection in many cases is left up to the installer. For fear of being beaten on price by another installer, most installers quote the cheaper model, as there is risk associated with quoting the more efficient and more expensive model. The installer generally has no interest or benefit to sell the more efficient product, as they are not going to be paying the running costs, and they need to invest a greater amount of time 'selling' and explaining to the end user why they should purchase the more efficient product.



Another section of the market that is a large volume purchaser and decision maker for air conditioning is builders (Both freestanding house, medium density, and high density). The direction for these decision makers is to buy the cheapest model possible, as they have no concern for the energy efficiency that the eventual home owner /tenant will need to pay for. The builder will not be paying the power bill.

To determine the baseline efficiency for each product class, we suggest using the 'worst' TCSPF/HSPF for each category.