

## **Accelerating the Global Shift to Energy-Efficient and Climate-Friendly Appliances and Equipment**

# **Retailer Survey of High-Efficiency Room Air Conditioner Models in Singapore**

Prepared for

**UNITED FOR EFFICIENCY (U4E)**

By

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**October 2024**

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## Acronyms and Abbreviations

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AC	Air Conditioner
ACE	ASEAN Centre for Energy
AMS	ASEAN Member States
APAEC	ASEAN Plan of Action and Energy Cooperation
CCC	Clean Cooling Collaborative
CFHP	Climate Friendly Households Programme
COP	Coefficient of Performance
CO <sub>2</sub>	Carbon dioxide
CSPF	Cooling Seasonal Performance Factor
EE	Energy Efficiency
EER	Energy Efficiency Ratio
GHG	Greenhouse Gas
GWP	Global Warming Potential
HDB	Housing and Development Board
HFC	Hydrofluorocarbon
MELS	Mandatory Energy Labelling Scheme
MEPS	Minimum Energy Performance Standard
MSE	Ministry of Sustainability and the Environment of Singapore
NEA	National Environment Agency
PUB	Public Utilities Board
RAC	Room Air Conditioner
U4E	United for Efficiency
UNEP	United Nations Environment Programme
WCOP	Weighted Coefficient of Performance



# 1 INTRODUCTION

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## 1.1 Project Background

Since 2020, the United for Efficiency (U4E) has been working with the ASEAN Centre for Energy (ACE) and ASEAN Member States (AMS) to help establish the regional and national roadmaps for Air Conditioners (AC) and to work towards harmonized testing standards and energy efficiency levels. In 2023, the “ASEAN Cool Initiative”, funded by the Clean Cooling Collaborative (CCC), was introduced to accelerate the implementation of the ASEAN Regional Policy Roadmap for Energy Efficient Room Air Conditioners by providing technical assistance and capacity building on Minimum Energy Performance Standards (MEPS) and labels in the region.

The ASEAN Cool Initiative, led by U4E in collaboration with ACE, the International Institute for Energy Conservation (IIEC), and Lawrence Berkeley National Laboratory (LBNL), aims to accelerate the adoption of the ASEAN regional roadmap on air conditioners to enable countries to go straight to the more ambitious Regional Phase II levels (i.e., CSPF 6.09 Wh/Wh). It is important to note that the MEPS values for AC with cooling capacities below 3.52 kW specified by all AMS are already equivalent to or exceeded the Energy Efficiency Ratio (EER) of 2.9 W/W and ISO Cooling Seasonal Performance Factor (CSPF) of 3.08 Wh/Wh. AMS also have shown significant progress in implementing the previous regional policy roadmap for AC. Indonesia, Malaysia, Philippines, Thailand, and Vietnam have adopted ISO 5151 and ISO 16358 as national standards. Meanwhile, Cambodia, Lao PDR, and Myanmar use ISO 5151 and ISO 16358 as references in drafting MEPS regulations.

Under the U4E stewardship, IIEC is leading the detailed product and price comparison survey of high-efficiency Room Air Conditioners (RACs) across selected ASEAN countries. This survey aims to highlight differences in costs, performance, and availability of high-efficiency models. The findings will serve as a foundational reference for policy development, contributing to the broader goal of improving cooling efficiency across the region.

This project directly supports the overall objective of the ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II (2021-2025) to reduce energy intensity by 32% in 2025 compared to 2005 levels. It will deliver Action Plan 1.1 to develop and implement regional and national policy roadmap for MEPS under Outcome-based Strategies (OBS) 1 for Expand, Harmonise, and Promote Energy Efficiency Standards and Labelling on Energy-related Products.

## 1.2 Objectives and Retailer Survey Methodology

This retailer survey had a specific focus on Singapore and it aimed to review and determine the cooling capacities and efficiency values of off-the-shelf RAC models, focusing primarily on single-split systems. Single-split RACs were chosen for their predominance in most ASEAN countries. By concentrating on this widely used type, the survey sought to capture accurate pricing and market trends, ensuring the findings are relevant, comparable, and applicable to the broader regional market. The study highlights differences in cost, performance, and availability of high-efficiency models through a comprehensive product and price comparison.

The retailer survey followed a two-pronged approach, combining in-store and online data collection to assess the availability, pricing, and performance of high-efficiency air conditioner models in



Singapore. The in-store survey visited 10 medium-to-large retail chains, including Courts, Best Denki, Harvey Norman, Gain City, and Mega Discount Store. During the in-store survey, data on brand, model name, cooling capacity, energy efficiency rating (number of ticks), and price were recorded.



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 1-1: RAC Retail Stores in Singapore**

This in-store data was supplemented by online data collection from platforms like Lazada and Shopee Singapore. 223 models were collected and cross-checked with the National Environment Agency's database on energy efficiency ratings. The analysis focused on identifying the availability of highly efficient models, comparing prices and efficiency levels, and highlighting market trends in energy efficiency and pricing.

It should be noted that during the in-store surveys, no single-split RAC models were displayed at some retailers — 1 branch of Gain City and 2 branches of Mega Discount Store. Considering this, models sold online by these retail chains were collected and included in the analysis.

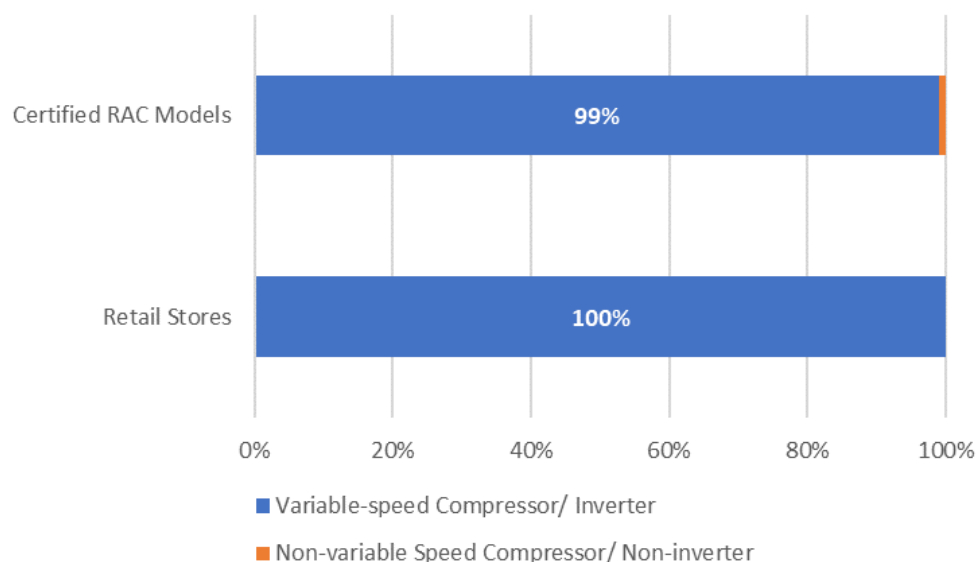
## 2 RETAILER SURVEY FINDINGS

The retailer survey assignment, conducted in September 2024, aimed to assess trends in the RAC market, focusing on single-split high-efficiency models. Findings on the availability, distribution of model efficiencies, and retail prices are discussed in the following sections.

### 2.1 Availability of RACs by Technology and Cooling Capacity

This section compares the 2024 single-split RAC model registry with RAC models available in retail chains to assess the alignment between registered models and actual consumer choices in the market. The current regulation on MEPS and energy labeling issued by the National Environment Agency (NEA) specifies that all single-split RACs with cooling capacities up to 17.6 kW shall be registered with NEA and the efficiency values in Coefficient of Performance or COP shall be declared. The scope of MEPS for regulated single-split RACs will be raised to 4-tick under the new MEPS regulation, which will take effect on April 1, 2025 (see Annex A and Annex B for details of MEPS regulation and tick rating for air conditioners).

The NEA registration database does not provide information on RACs' compressor technologies, however, this report uses information on part-load COP as the indication of the variable speed or inverter compressor technology for a specific RAC model. A review of the 133 certified models registered in 2024 shows that almost all registered models are equipped with variable-speed compressors, for which part-load COP information is provided. There is only one model in which part-load COP information is absent (see Figure 2-1). As for the retailers and online store surveys, 223 off-the-shelf and online models were compiled, and all were found to be *inverter* types with *R32 refrigerant*.

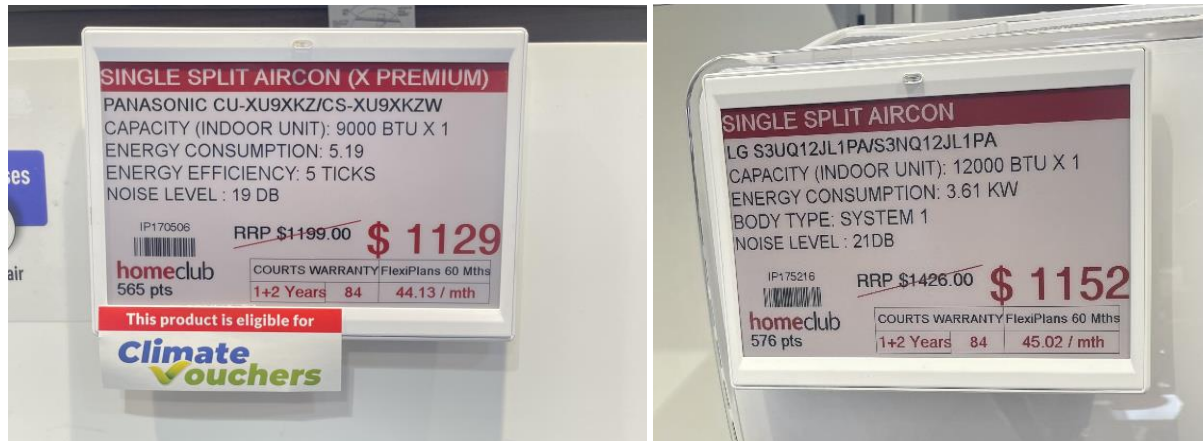


Source: Certified Models and IIEC Retailer Surveys in September 2024

**Figure 2-1: Share of RAC Models by Technology**



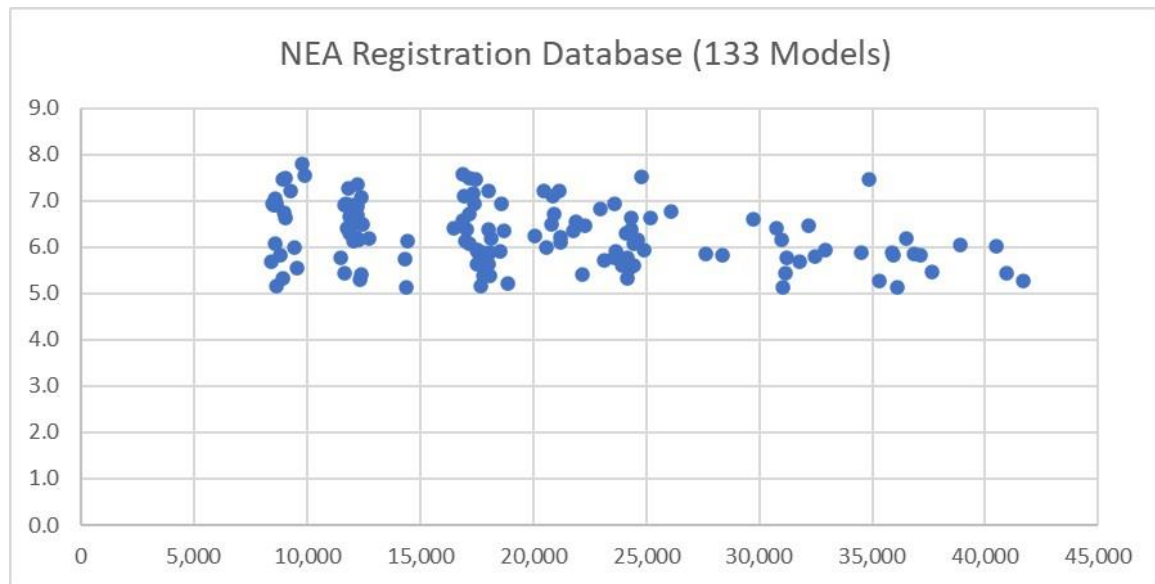
Although the MEPS and energy labeling regulation for RACs in Singapore specifies rated cooling capacities in kW, local retailers typically quote RACs' cooling capacities in British Thermal Units per hour (Btu/h), and often rounding figures up or down, like 9,000 or 12,000 Btu/h on price tags to simplify product information for consumers, as shown in Figure 2-2.



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024  
**Figure 2-2: Cooling Capacity Displayed on RAC Price Tags in Retail Stores**

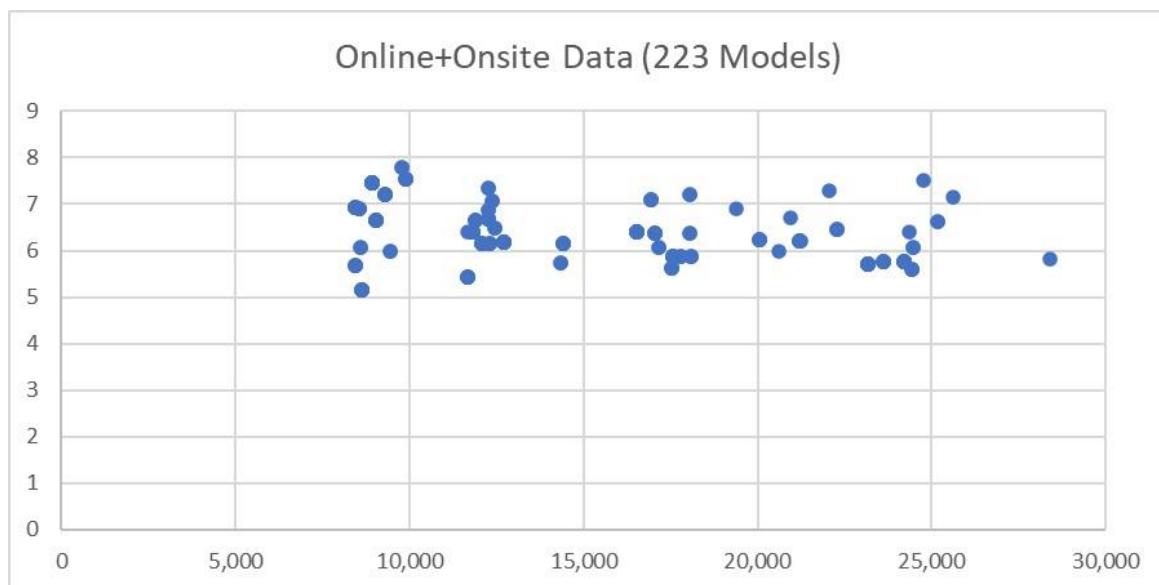
NEA does not categorize registered air conditioner models by cooling capacity ranges. Therefore, to determine common cooling capacities typically referenced by consumers and the local industry, this report categorizes cooling capacities based on actual models found in surveyed stores and NEA's registered database. The scattered plots of cooling capacities (in Btu/h) and efficiency values (in Cooling Seasonal Performance Factor or CSPF)<sup>1</sup> of single-split RAC models registered in the NEA registration database and those identified during the retailer surveys are shown in Figure 2-3 and Figure 2-4. The scattered plots reveal that the cooling capacities of most registered and off-the-shelf models are concentrated in the 8,000 to 25,000 Btu/h range, and RAC models with cooling capacities above 30,000 Btu/h are not found in the retailers visited.

<sup>1</sup> Weighted COP (WCOP) or WEER used in Singapore is converted into ISO CSPF using a regression-linear relationship  $CSPF = 1.192 \times WEER + 0.311$  with the ISO temperature bin hours (Park et al. 2020).



Source: NEA Registration Database, October 2024

**Figure 2-3: Distribution of Cooling Capacity and CSPF for NEA Registered Single-Split RAC Models**



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-4: Distribution of Cooling Capacity of Single-Split RAC Models from Surveyed Retail Stores**

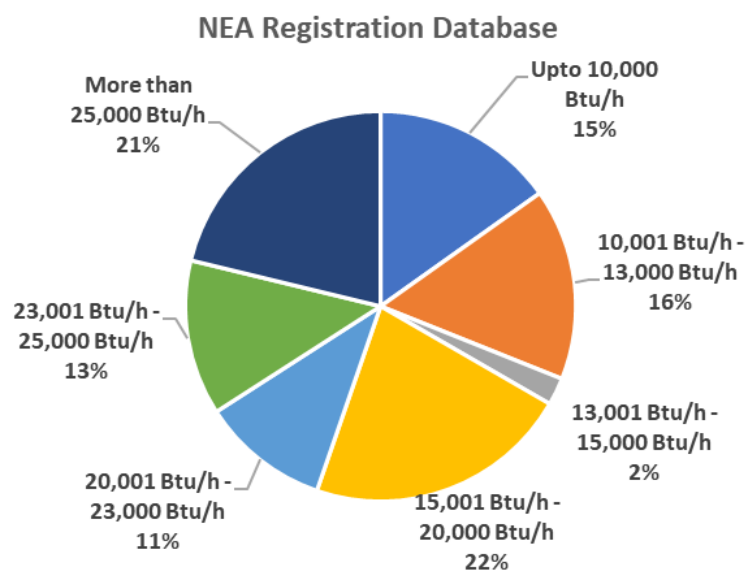
Based on the model clusters identified, this report divides the cooling capacities of single-split RAC registered and sold in Singapore into the following categories:

- 1) Up to 10,000 Btu/h (Up to 2.93 kW or about 1.0 HP)
- 2) More than 10,000 up to 13,000 Btu/h (More than 2.93 kW up to 3.80 kW or about 1.5 HP)
- 3) More than 13,000 up to 15,000 Btu/h (More than 3.80 kW up to 4.39 kW)
- 4) More than 15,000 up to 20,000 Btu/h (More than 4.39 kW up to 5.86 kW or about 2.0 HP)
- 5) More than 20,000 up to 23,000 Btu/h (More than 5.86 kW up to 6.74 kW or about 2.5 HP)
- 6) More than 23,000 up to 25,000 Btu/h (More than 6.74 kW up to 7.32 kW or about 3.0 HP)
- 7) More than 25,000 Btu/h (More than 7.32 kW)

The equivalencies of cooling capacities in horsepower (HP) are provided to enable comparison of RAC products in some ASEAN member states (AMS), such as Indonesia, Malaysia, and the Philippines, where an RAC cooling capacity is typically designated by its electrical power input in HP.

### 2.1.1 Popular Cooling Capacities

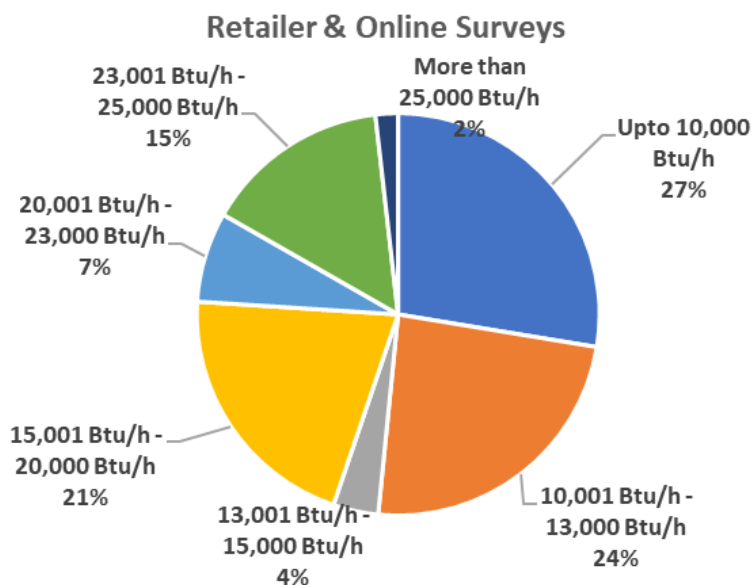
Distribution patterns of RAC cooling capacities in the NEA registration database and those available from retailers and online stores are shown in Figure 2-5 and Figure 2-6. In 2024, RAC models with cooling capacities from 15,001 Btu/h up to 20,000 Btu/h account for the largest share, about 22%, of all single-split RAC models in the NEA registration database. As illustrated in Figure 2-5, cooling capacities of registered RACs are quite well distributed across different categories of cooling capacities, except for those falling within the 13,001 Btu/h up to 15,000 Btu/h as they share only 2% of the total registered models.



Source: NEA Registration Database, October 2024

**Figure 2-5: Distribution of RAC Models in NEA's Registration Database by Cooling Capacity, September 2024**

However, the cooling capacity distribution in the NEA registration database does not align with what is found in retailers and online stores. Most RAC models available in retailers and online stores are below 13,000 Btu/h, comprising about 53% of the total RAC models displayed. It is worth noting that RAC models with capacities between 13,001 and 15,000 Btu/h (more than 3.80 kW up to 4.39 kW) and 20,001 to 23,000 Btu/h (5.86 kW up to 6.74 kW) represent only 4% and 7%, respectively, making them less visible to consumers visiting retailers and online stores. Larger RACs with cooling capacities between 15,001 and 20,000 Btu/h are the most common among higher-capacity models, accounting for 21% of the total RAC models displayed.

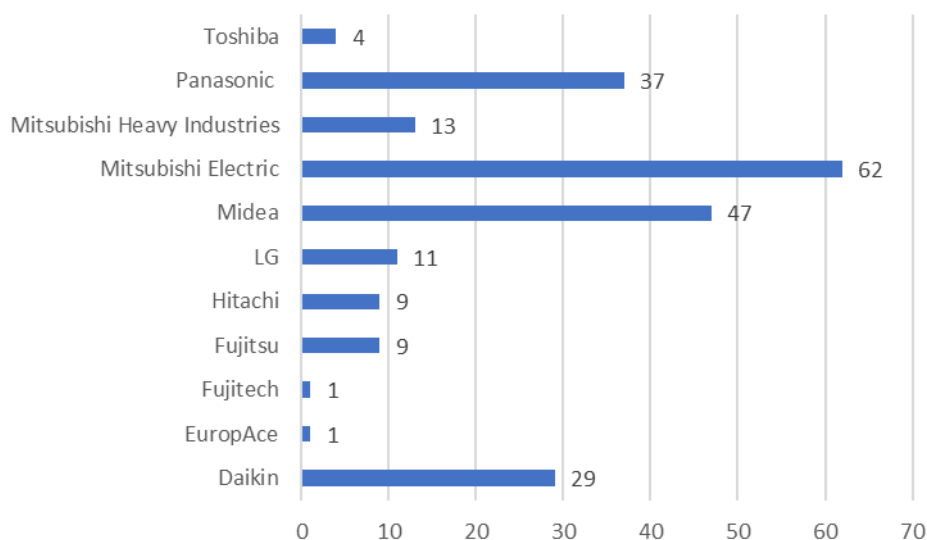


Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-6: Distribution of RAC Models in Retail and Online Stores by Cooling Capacity, September 2024**

### 2.1.1 Popular Brands and Models

In this report, “popular brands” and “popular models” refer to brands and models of RAC units frequently displayed in different retailers and online stores in Singapore. Based on the 223 RAC models compiled from retailers and online stores, Mitsubishi Electric is the most frequently displayed brand, followed by Midea and Panasonic. Daikin and Mitsubishi Heavy Industries are also commonly available off-the-shelf, while LG, Hitachi, Fujitsu, and Toshiba have a smaller shelf occupation but noticeable presence (see Figure 2-7).



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-7: Brands and Number of Single-Split RAC Models Available through Surveyed Retailers and Online Stores, September 2024**

In terms of the popular models, the most frequently displayed RACs in retailers and online stores include the following models as summarized in the table below.

**Table 2-1: Popular RAC Models in Retailers and Online Stores in Singapore, September 2024**

Brand	Cooling Capacity (kW)	Cooling Capacity (Btu/h)	CSPF (Wh/Wh)
Daikin	2.48	8,462	6.93
Panasonic	2.53	8,633	5.15
Mitsubishi Electric	2.62	8,940	7.47
Midea	2.65	9,042	6.64
Mitsubishi Electric	3.73	12,747	6.19
Mitsubishi Electric	4.84	16,515	6.41
Mitsubishi Electric	6.79	23,168	5.72

Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

## 2.2 Distribution of Model Efficiencies

Table 2-2 provides a breakdown of single-split RACs available in 2024 by cooling capacity category and their average energy efficiency. The energy efficiency, measured in CSPF, varies across different cooling capacities. Most RAC models in each category have an average CSPF higher than 6.09, except for those in the ranges of 13,001 - 15,000 Btu/h (3.80 kW to 4.39 kW) and 23,001 - 25,000 Btu/h (6.74 kW to 7.32 kW) which have the average CSPF of 6.03 and 5.82 respectively.

Small-capacity models, particularly those in the less than 10,000 Btu/h (less than 2.93 kW) range, exhibit the highest average CSPF at 6.75, followed by large-capacity models (cooling capacities more than 25,000 Btu/h or 7.32 kW) with an average CSPF of 6.56. Mid-range capacity models in the 15,001 up to 20,000 Btu/h (4.39 kW to 5.86 kW) range achieve an average CSPF of 6.25, while RAC models with 20,001 up to 23,000 Btu/h (5.86 kW to 6.74 kW) cooling capacity demonstrate an average CSPF of 6.34

**Table 2-2: Average CSPF (Wh/Wh) of Single-Split Inverter RAC Available in Singapore in 2024**

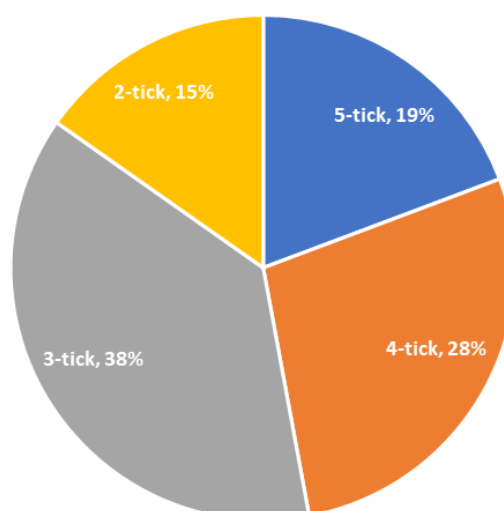
Cooling Capacity	Average CSPF (Wh/Wh)
Less than 10,000 Btu/h (Less than 2.93 kW)	6.75
10,001 - 13,000 Btu/h (2.93 kW - 3.80 kW)	6.32
13,001 - 15,000 Btu/h (3.80 kW - 4.39 kW)	6.03
15,001 - 20,000 Btu/h (4.39 kW - 5.86 kW)	6.25
20,001 - 23,000 Btu/h (5.86 kW - 6.74 kW)	6.34
23,001 - 25,000 Btu/h	5.82

Cooling Capacity	Average CSPF (Wh/Wh)
(6.74 kW - 7.32 kW)	
More than 25,000 Btu/h (More than 7.32 kW)	6.56

Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

Figure 2-8 presents the star rating distribution of single-split RAC models in retailers and online stores in Singapore. Models with a 3-tick rating are the most common, accounting for 38% of all models. This is followed by 4-tick models at 28%, and 5-tick models, representing 19%, indicating higher efficiency levels. Models with a 2-tick rating make up 15%.

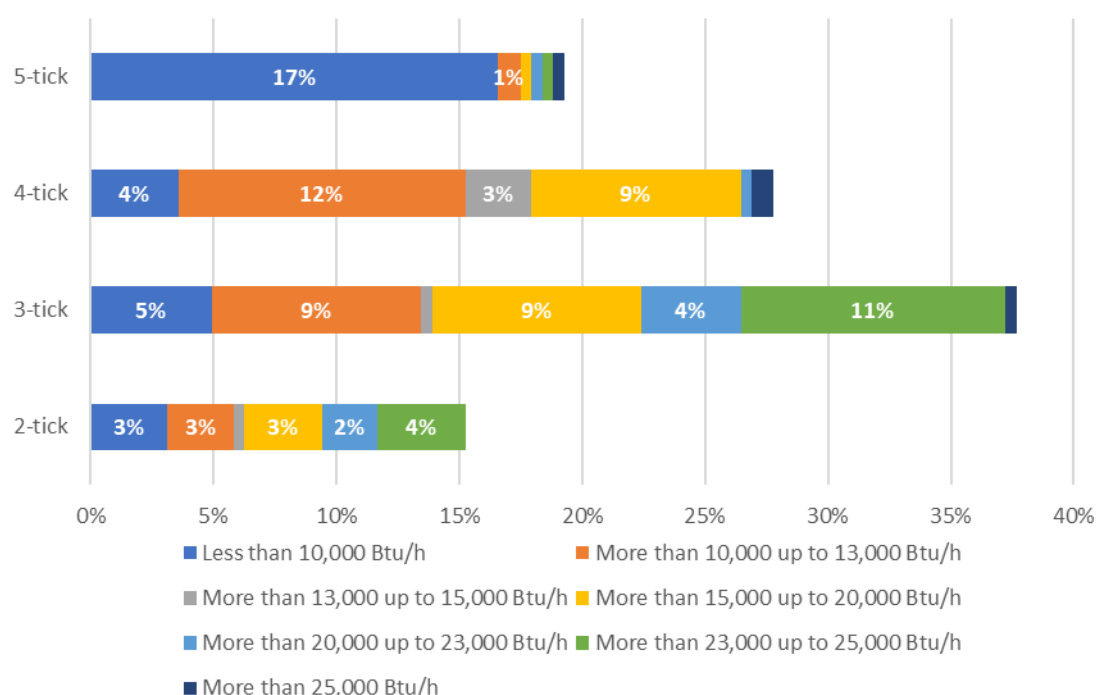


Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-8: Percentage of Star Rating of Single-Split RAC Models in Retail Stores in Singapore, 2024**

The star rating distribution of single-split RAC models also varies by cooling capacity as illustrated in Figure 2-9. In short, most 5-tick and 4-tick RAC models have cooling capacities below or equivalent to 20,000 Btu/h. Among 5-tick models, the largest share includes those with cooling capacities below 10,000 Btu/h (less than 2.93 kW), representing 17% of the total RAC models compiled from retailers and online stores. For 4-tick models, the 10,000 to 13,000 Btu/h range (2.93–3.80 kW) leads with a 12% share, followed closely by 9% in both the 15,000 to 20,000 Btu/h range (4.39–5.86 kW).

In the 3-tick category, the highest share is found in models above 25,000 Btu/h (more than 7.32 kW), which accounts for 11%, while 9% is seen in both the 10,000 to 13,000 Btu/h range (2.93–3.80 kW) and the 15,000 to 20,000 Btu/h range (4.39–5.86 kW). Among 2-tick models, the greatest share is in the 23,000 to 25,000 Btu/h range (6.74–7.32 kW), making up 4%, with smaller shares of 3% in both the below 10,000 Btu/h range (less than 2.93) and the 15,000 to 20,000 Btu/h range (4.39–5.86 kW).



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-9: Percentage of Star Rating of Single-Split RAC Models by Cooling Capacity in Retail Stores in Singapore, 2024**

## 2.3 Retail Prices

Typical RAC products available in retail stores in Singapore, along with their retail prices, are shown in Figure 2-10. Observations from the retailer surveys indicate that most retail stores and sellers are aware of the Climate Friendly Households Programme<sup>2</sup>, which offers SGD 300 worth of climate vouchers to all HDB (Housing and Development Board) households for the purchase of 5-tick RACs. The program advertisements were displayed in the stores, and retailers actively inquired if customers possessed these vouchers to reduce the purchase price. This awareness reflects the sellers' understanding of how the vouchers can incentivize sales and make high-efficiency air conditioning units more affordable for consumers.

<sup>2</sup> The Climate Friendly Households Programme (CFHP) was launched by the National Environment Agency (NEA) and the Public Utilities Board (PUB), Singapore's National Water Agency, in November 2020. The program aims to help 1-, 2-, and 3-room HDB (Housing and Development Board) households save on utility bills in the long run by offering vouchers for the purchase of energy-efficient refrigerators, LED lights, and water-efficient shower fittings. From 15 April 2024, all HDB households will receive \$300 worth of Climate Vouchers as part of the enhanced CFHP. The voucher includes - newly added items such as 5-tick air conditioners, direct current fans, washing machines, and water closets. The Climate Vouchers will be valid until 31 December 2027.



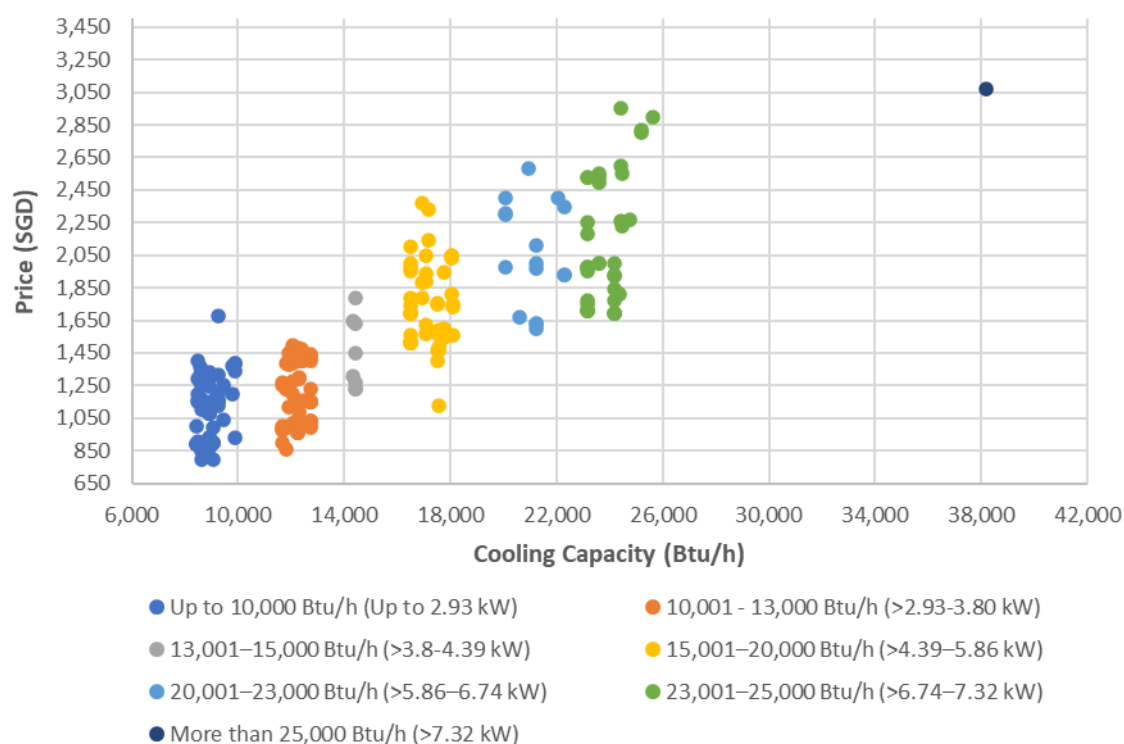


Source: IIEC's Singapore Retailer and Online Store Surveys in 2024  
**Figure 2-10: RAC Products Available in Retail Stores in Singapore**



### 2.3.1 Prices versus Cooling Capacities

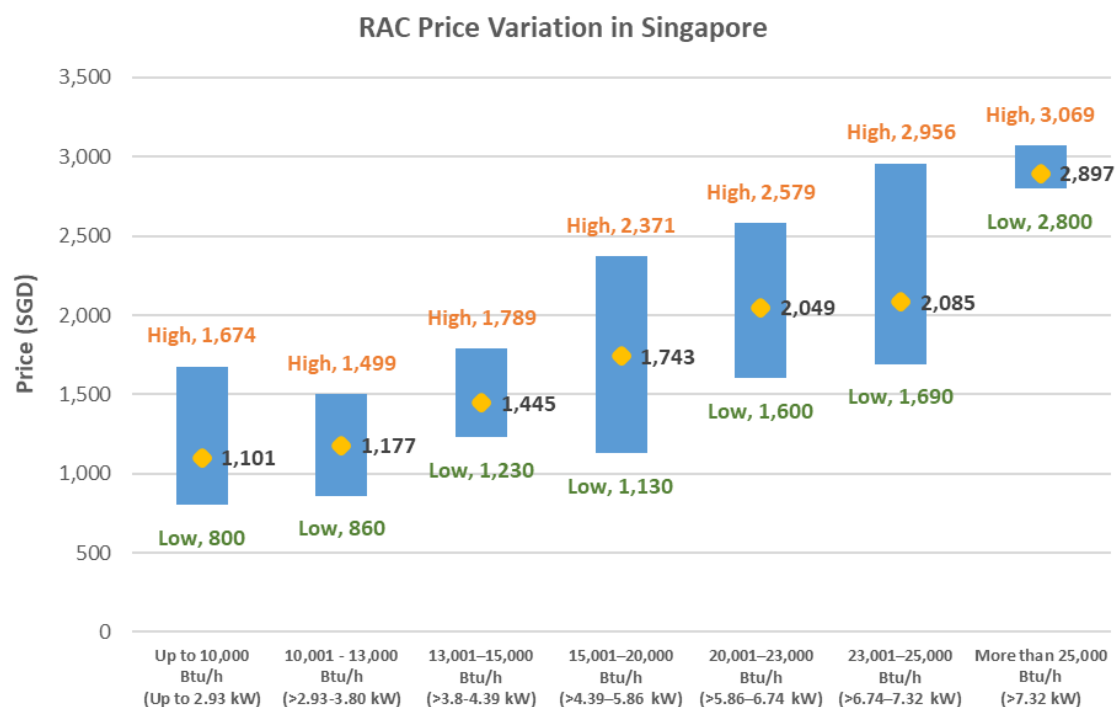
Figure 2-11 shows the mapping of prices and cooling capacities of single-split RAC models in Singapore. The prices generally rise with capacity — starting at SGD 800 to 1,674 for RACs with cooling capacities up to 10,000 Btu/h and reaching SGD 3,069 for 38,200 Btu/h models. There are also large variations in RAC prices for the same cooling capacities. Moreover, some large-capacity units are priced lower than smaller capacity units, for example, a 24,000 Btu/h unit is priced at SGD 1,600 SGD which is at the same level as the most expensive 9,000 Btu/h model, pricing at SGD 1,674. Variations of RAC prices in Singapore do not demonstrate direct relationships with the numbers of RAC models within each cooling capacity category



Source: Retailer and Online Store Surveys conducted by IIEC (2024)

**Figure 2-11: Prices and Cooling Capacities of Single-Split RACs in Singapore**

Figure 2-12 illustrates the highest, lowest, and average prices of single-split RACs, categorized by cooling capacity (BTU/h).

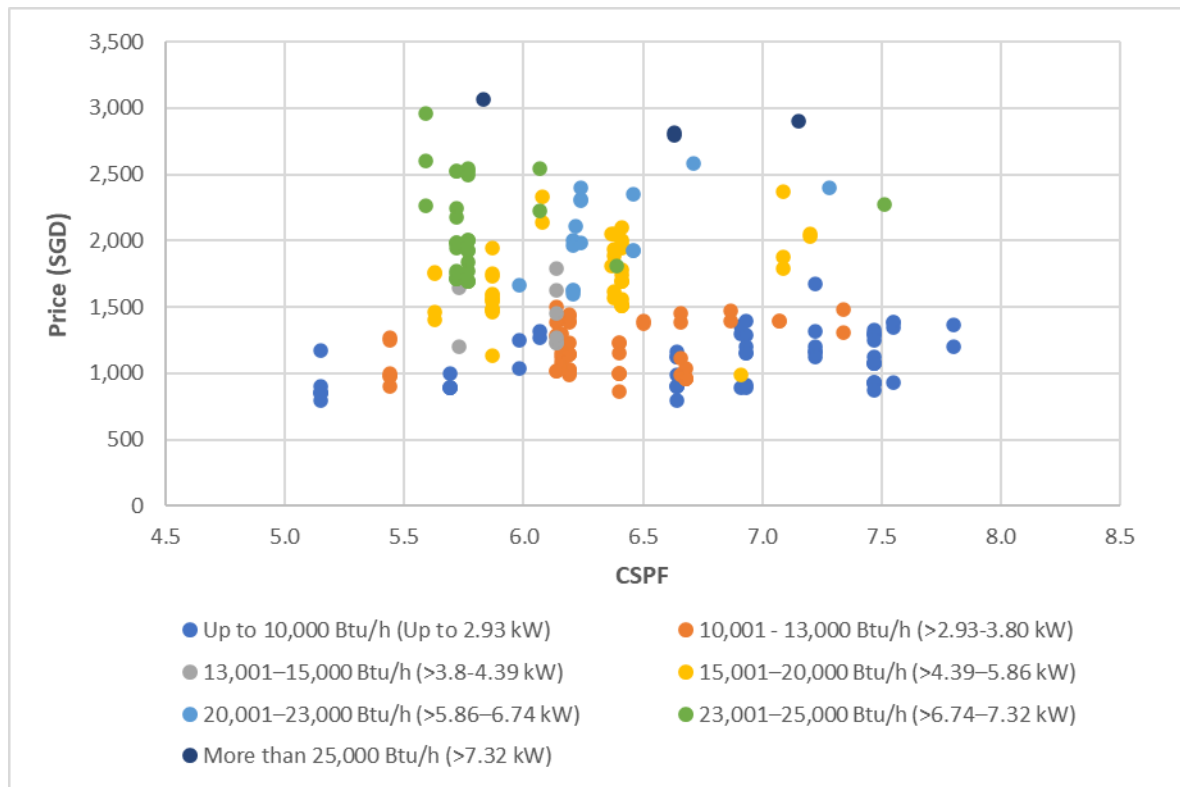


Source: Retailer and Online Store Surveys conducted by IIEC (2024)

**Figure 2-12: High, Low, and Average RAC Prices by Range of Cooling Capacities in Singapore**

### 2.3.2 Prices versus Efficiency Levels

Figure 2-13 illustrates the mapping of prices and efficiency values in CSPF of RAC models available in retailers and online stores in Singapore. There is no distinct relationship between prices and efficiencies across cooling capacities. For example, in the up to 10,000 Btu/h range (blue dots), CSPF values vary from 5.2 to over 7.8, while prices range from about SGD 900 to just over SGD 1,600. Similarly, in the 10,001–13,000 Btu/h range (orange dots), prices range from SGD 900 to 1,500, with CSPF values from 5.4 to 7.3. Models with similar prices can have significantly different efficiencies, and higher-efficiency models do not necessarily cost more than lower-efficiency ones. This pattern holds across all cooling capacities, showing no consistent correlation between CSPF and price. In summary, consumers may find RAC models with high efficiency at the same price as lower-efficiency models, regardless of additional features like air purifiers or Wi-Fi connectivity.



Source: IIEC's Singapore Retailer and Online Store Surveys in 2024

**Figure 2-13: Prices and Efficiencies of Single-Split RACs in Singapore**

### 3 ANNEXES

#### 3.1 Annex A: Minimum Energy Performance Standards for Air Conditioners

##### Current Regulated Air-Conditioners

Single-phase non-ducted room air-conditioner (not being second-hand goods) having a cooling capacity of:

- 8.8 kW or lower, in the case of casement or window type air-conditioner;
- 17.6 kW or lower, in the case of split type (inverter) air-conditioner; or
- 17.6 kW or lower, in the case of split type (non-inverter) air-conditioner.

Single-phase non-ducted room air-conditioner means an encased assembly or assemblies of one or more evaporators, compressors, and condensers, designed to be used as a permanently installed piece of equipment to provide conditioned air to any enclosed space. It includes a prime source of refrigeration for cooling and dehumidification and may include other means for dehumidifying, circulating, and cleaning the air.

Casement or window-type air-conditioner means an assembly of refrigeration system components fixed on a common mounting to form a single unit.

Split type (non-inverter) air-conditioner means an assembly of components of a refrigeration system fixed on 2 or more mountings to form a matched functional unit that employs technologies that vary the output of the compressor by start-stop operation.

Split type (inverter) air-conditioner means an assembly of components of a refrigeration system fixed on 2 or more mountings to form a matched functional unit that employs technologies that vary the output of the compressor, by means other than start-stop operation.

Type of Air-Conditioners	Cooling Capacity	Minimum Coefficient of Performance (COP)
Casement and window	Up to 8.8 kW	$COP_{100\%} \geq 3.78$
Single-split (non-inverter)	Up to 17.6kW	$COP_{100\%} \geq 4.04$
Multi-split (non-inverter)		$COP_{100\%} \geq 4.04$
Single-split (inverter)		Weighted $COP^1 \geq 4.04$ and $COP_{100\%} \geq 3.34$
Multi-split (inverter)		Weighted $COP^1 \geq 4.04$ and $COP_{100\%} \geq 3.34$

## Revised MEPS for Split-type Air Conditioners

With effect from **1 April 2025**, all single-phased split-type air-conditioners sold in Singapore shall meet the revised MEPS requirements as illustrated in the table below:

Type	Cooling Capacity	Revised MEPS	
Single-split (inverter)	Up to 17.6 kW	$COP_{\text{Weighted}} \geq 4.86$	Standby power $\leq 18W$
Single-split (non-inverter)		$COP_{100\%} \geq 4.86$	Standby power $\leq 18W$
Multi-split (inverter)		$COP_{\text{Weighted}} \geq 5.50$	Standby power $\leq (7 \times N) W$
Multi-split (non-inverter)		$COP_{100\%} \geq 5.50$	Standby power $\leq (7 \times N) W$

- $COP_{\text{weighted}} = 0.4 \times COP_{100\%} + 0.6 \times COP_{50\%}$
- N is the number of indoor and outdoor units



## 3.2 Annex B: Tick Rating for Air Conditioners

The current tick rating is defined as follows:

Single-phase Air-Conditioners (as of October 2024)					
Type	COP (W/W) and Standby Power (W)				
	1-tick	2-tick	3-tick	4-tick	5-tick
<b>Casement and window (Up to 8.8 kW)</b>	N/A	$3.78 \leq \text{COP}_{100\%} < 4.29$	$4.29 \leq \text{COP}_{100\%} < 4.86$	$\text{COP}_{100\%} \geq 4.86$	$\text{COP}_{100\%} \geq 5.50$ and Standby power <sup>5</sup> $\leq 4$
<b>Single-split (non-inverter)</b>	N/A	$\text{COP}_{100\%} \geq 4.04$	$4.29 \leq \text{COP}_{100\%} < 4.86$ and Standby power $\leq 18$	$\text{COP}_{100\%} \geq 4.86$ and Standby power $\leq 18$	$\text{COP}_{100\%} \geq 5.50$ and Standby power $\leq 4$
<b>Multi-split (non-inverter)</b>	N/A	$\text{COP}_{100\%} \geq 4.04$	$4.29 \leq \text{COP}_{100\%} < 4.86$ and Standby power $\leq 9 \times N^4$	$\text{COP}_{100\%} \geq 4.86$ and Standby power $\leq 9 \times N^4$	$\text{COP}_{100\%} \geq 5.50$ and Standby power $\leq 7 \times N^4$
<b>Single-split (inverter)<sup>2</sup></b> • $\text{COP}_{100\%}$ • Weighted $\text{COP}^3$	N/A	Weighted $\text{COP} \geq 4.04$ and $\text{COP}_{100\%} \geq 3.34$	Weighted $\text{COP} \geq 4.29$ , $\text{COP}_{100\%} \geq 3.78$ and Standby power $\leq 18$	Weighted $\text{COP} \geq 4.86$ , $\text{COP}_{100\%} \geq 4.29$ and Standby power $\leq 18$	Weighted $\text{COP} \geq 5.50$ , $\text{COP}_{100\%} \geq 4.86$ and Standby power $\leq 4$
<b>Multi-split (inverter)<sup>2</sup></b> • $\text{COP}_{100\%}$ • Weighted $\text{COP}^3$	N/A	Weighted $\text{COP} \geq 4.04$ and $\text{COP}_{100\%} \geq 3.34$	Weighted $\text{COP} \geq 4.29$ , $\text{COP}_{100\%} \geq 3.78$ and Standby power $\leq 9 \times N^4$	Weighted $\text{COP} \geq 4.86$ , $\text{COP}_{100\%} \geq 4.29$ Standby power $\leq 9 \times N^4$	Weighted $\text{COP} \geq 5.50$ , $\text{COP}_{100\%} \geq 4.86$ and Standby power $\leq 7 \times N^4$

<sup>1</sup>  $\text{COP}_{100\%}$  is defined as the ratio of total cooling capacity to effective power input at full load cooling capacity

<sup>2</sup> For split (inverter) type air-conditioners, the model shall meet both the minimum  $\text{COP}_{100\%}$  and weighted COP

<sup>3</sup> Weighted  $\text{COP} = 0.4 \times \text{COP}_{100\%} + 0.6 \times \text{COP}_{50\%}$

<sup>4</sup> N is the number of indoor and outdoor units

<sup>5</sup> Standby power is expressed in Watts