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ENFORCEMENT OF ENERGY EFFICIENCY LEGISLATIVE INSTRUMENTS (1815, 1932 AND 1958) AT PORTS OF ENTRY (With Relevant Indicators/Statistics)

JANUARY – DECEMBER 2020

JANUARY, 2021

| Securing Ghana's Future Energy Today

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Summary of Key Findings

The Summary of Key Findings highlight the following:

S.1 Data on New Refrigerating Appliances Imports

1. A total of **534,434** units (about 3,097 containers) of new refrigerating appliances were imported and inspected at the Tema Port in accordance with L.I. 1958 in 2020, representing an increase of about 38.0% of the 2019 total imports.
2. Of this number, **523,615 units**, representing 98.0% of the total imports, were regulated appliances¹, while **10,819** units, accounting for 2.0% of the total imports, were unregulated appliances².
3. A total of 229,930 units, accounting for 43.9% of the total regulated appliances, were fridge/freezers. The expected average annual consumption of each of these fridge/freezers is **328.7 kWh/year**.
4. A total of 154,043 units, constituting about 29.4% of the total regulated appliances, were chest/upright freezers. The expected average annual consumption of each of these chest freezers is **390 kWh/year**.
5. A total of 139,642 units, representing 26.7% of the total regulated appliances, were refrigerators. The expected average annual energy consumption of these refrigerators is about **196 kWh/year** per unit.
6. A total of **3,093,148** new refrigerating appliances (including showcases) were imported through the Port of Tema since 2005.
7. In terms of star ratings, about 35.6% of all the regulated appliances were of 2-stars, 23.0% were 4-stars, 25.2% were 1-star, 15.8% were 3-stars and only 0.4% were 5-stars.
8. The **overall expected average** annual energy consumption of these new refrigerating appliances is **340 kWh/year** per unit.
9. About 97.0% of all the new refrigerating appliances were compliant in 2020.

S.2 Trends of New Versus Used Refrigerators Imports (2005 – 2020)

The importation of the new refrigerating appliances into the country has seen an upward trajectory over the years while that of the used fridges has seen a drastic reduction. Historical data suggests that there is a decline in the importation of used fridges from 2013, as a result of the implementation or enforcement of L.I. 1932. Figure S.1 shows that the proportion of

¹ Fridge/Freezer, Chest Freezer and Refrigerator as defined in L.I 1958

² Showcase (Beverage coolers and display cabinets/units)

new refrigerators imported into the country, however, has generally been on the rise, significantly from 2013.

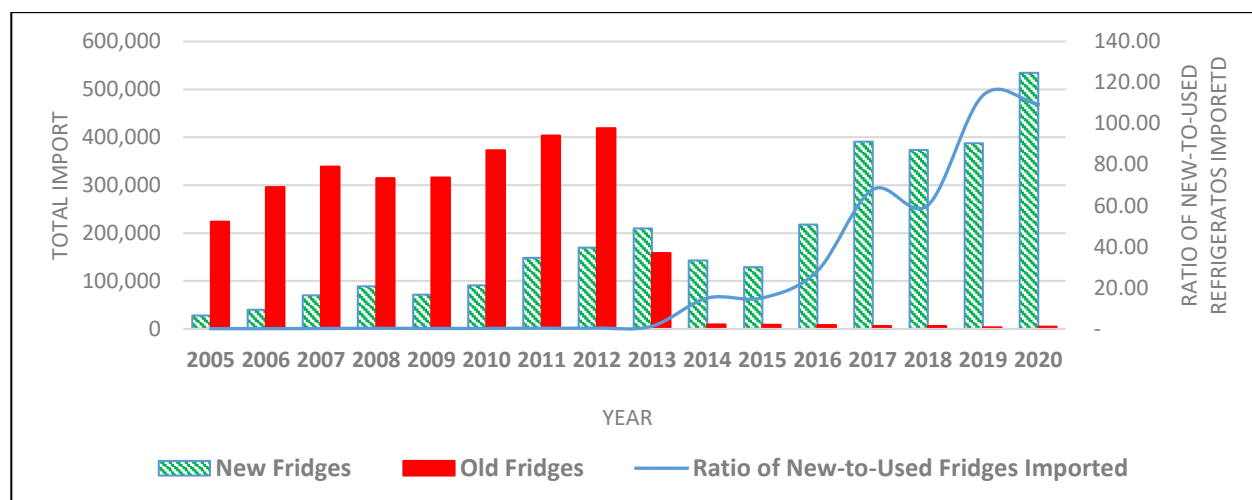


Figure S.1: Trends in New Versus Used Refrigerators Imports (2005 – 2020)

S.3 Major Importers and Popular Brands of Refrigerating Appliances

1. Electroland Ghana Limited was the largest importer of refrigerating appliances in 2020. It accounted for 30.6% of the total imports, followed by Sun Electronics Ltd. (12.0%), Somotex Ghana Ltd. (9.1%), Menkish Impex Ltd. (6.9%) and the rest of the percentages for the other remaining importers.
2. NASCO was the most imported refrigerating appliance or brand (27.0%), followed by Hisense (13.5%), MIDEA (9.1%), Bruhm (8.4%), Akai (6.7%) and Legacy (5.3%).

S.4 Data on Non-ducted (New) Room Air conditioners (RACs) Imports

1. A total of **170,472** units (989 containers) of new RACs were inspected at the Port of Tema in accordance with L.I. 1815, accounting for an increase of just 2.0% over 2019 total imports. Of this number, **167,063** units, representing 98.0% of the total imports, were regulated appliances, while the remaining **3,409** units, accounting for about 2.0% of the total imports, were unregulated appliances (cassette/commercial and other ducted or commercial types).
2. About 56.5% of the regulated RACs were of 1-star ratings, 20.1% were 2-stars, 22.0% were 3-stars and 1.4% are 4-stars. The average EER of the 1-star RACs was 2.88W/W, which is above the MEPS of 2.80W/W and with an average annual consumption of **3,759.6 kWh**. There were no 5-star RACs.
3. A total of **904,923** new RACs have been imported and inspected at the Port of Tema since 2014.
4. About 97.0% of the regulated RACs were compliant.

S.5 Major Importers and Popular Brands of RACs

1. Electroland Ghana Limited was the largest importer of the RACs appliances in 2020. It accounted for two-fifths (about 40.2%) of the total RACs imported and inspected, followed by Sun Electronics Ltd. (10.9%), Somotex Ghana Ltd. (8.2%) and TLC (2.5%).
2. NASCO was the most popular imported RACs or brand (30.0%), followed by MIDEA (12.4%), Hisense (10.6%) and BRUHM (7.5%).

S.6 Data on Used Fridges and Used RACs Imports

1. A total of **4,884** used fridges and **678** RACs were seized in 2020.
2. A total of **46,666** old refrigerators and **11,003** RACs have been confiscated/intercepted at ports of Tema and Takoradi since the inception of the enforcement of L.Is. 1932 in 2013.
3. A total of **10,472** units of old and inefficient refrigerators have also been turned-in through the National Refrigerator turn-in and Rebate Scheme which commenced in July 2012 and ended in 2016.
4. A total of **2,891,030** used fridges have been exported to Ghana since 2005 from Europe and elsewhere.

S.7 Impact of the Enforcement Activities in 2020

A total of **583 GWh** of electricity and a total of **308.9 kilotons of CO₂eq** have been saved in 2020 as a result of the enforcement of L.I.s 1815, 1932 and 1958.

CHAPTER ONE: INTRODUCTION/BACKGROUND

1.0 Introduction

This chapter provides the background of the Energy Efficiency Project, which aims to enforce Legislative Instruments (L.I.s) 1815³, 1932⁴ and 1958⁵, at the Tema and Takoradi Ports as well as the objectives and significance of the project.

1.1 Background

As consumers use inefficient appliances that consume excessive amount of electricity, the demand for electricity will continue to grow and thereby putting strain on the existing national electricity grid. The residential and service sectors' electricity demands have been on the increase over the years and it was believed that a sizable percentage of the demand is wasted on the use of old, obsolete and inefficient refrigerating appliances imported into the country⁶. In 2019, the residential and service sectors electricity demands accounted for 46% and 24%⁷ respectively of total consumption.

The above claim that inefficient refrigerating appliances were responsible for the increases in the household electricity demand called for an investigation. So, in 2003, the Energy Foundation (EF) conducted a study into major electricity consuming household appliances in the country. The study confirmed the claim that the refrigerator was one of the major electricity consuming appliances in households. The Council for Scientific and Industrial Research - Institute of Industrial Research (CSIR-IIR), under the auspices of the Energy Commission (EC), conducted a detailed survey/study into the energy consumption patterns of refrigerating appliances in the residential sector in 2006-2007. The survey revealed that, indeed, these appliances consumed, on average, 1,200kWh per annum compared to 250kWh and 400kWh per annum in Europe and the USA respectively.

In 2010, there was an estimated 1.67 million inefficient refrigerating appliances and about 1.14 million RACs units in the country⁸. To prevent these high energy consuming appliances from entering the country, the Energy Commission commenced the enforcement of L.I. 1932, passed in

³ Energy Efficiency Standards and Labelling (Non-Ducted RACs and Self-Ballasted Fluorescent Lamps) Regulations, 2005.

⁴ Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamp, Used Refrigerator, Used Refrigerator-Freezer, Used Freezer and Used Air-Conditioner Regulations, 2008.

⁵ Energy Efficiency Standards and Labelling (Household Refrigerating Appliances) Regulation, 2009.

⁶ The Success Story of the Ghana Refrigerator Efficiency Project Implemented by the Energy Commission

⁷ Ghana Energy Commission: National Energy Statistics (2000 – 2019)

⁸ Ghana Statistical Service: Ghana Living Standard Survey 4, 5 and 6 Reports

2008, banning the importation or sale of used/illegal refrigerating appliances and RACs; first, at the Tema Port in 2011, and later at Takoradi Port in 2017.

To give more impetus to the enforcement of L.I. 1932, the Government of Ghana, in July 2012, through the EC, launched the National Refrigerator turn-in and Rebate Scheme with the support of the United Nation Development Programme (UNDP), Global Environment Facility (GEF) and Multilateral Fund of the Montreal Protocol (MFMP). The scheme, which encouraged consumers to exchange their old refrigerators for new and efficient ones, available at a discounted price, was to recover about 50,000 inefficient refrigerating appliances from homes and promote the use of more energy-efficient ones and transform the refrigerating appliances market in the country. By mid-June, 2016, a total of 10,472 units⁹ of old energy-inefficient appliances have been replaced across the country with new energy-efficient ones, resulting in an annual electricity savings of 6.3 GWh. The ultimate goal of the scheme was to reduce national energy consumption, household electricity bills and its attendant environmental impacts.

To ensure that only energy efficient refrigerating appliances and RACs enter the country's refrigerating appliance market, the Energy Commission, in 2012, begun the stringent enforcement of L.I.s 1815 and 1958 which mandate all regulated appliances imported into the country affixed with an energy efficiency label (energy guide). As part of the enforcement procedure, the energy efficiency test report of the appliances should be submitted to the EC for approval before the consignment arrives. The data in the test report are used to verify compliance with Minimum Energy Performance Standards (MEPS) at the port of entry by the Inspectors from EC (with specific attention given to the type of appliance, manufacturer, model number, refrigerant, climate class, annual energy consumption, fresh and frozen food volumes, energy star rating and cooling capacity). Appliances found to be compliant are released to the importer whilst non-compliant appliances are detained by the EC, pending compliance with the provision of the respective L.I.s.

1.2 Objectives of the Energy Efficiency Project

The objectives of the project are to:

- i. ensure full and effective enforcement of regulations on standards and labelling of refrigerating appliances and RACs at points of entry (i.e. L. I's 1815 and 1958);
- ii. achieve overall compliance level for both household refrigerating appliances and RACs;

⁹ Ghana Energy Commission.

- iii. ensure full and effective enforcement of the ban on importation of used refrigerators and used RACs (L.I. 1932 & L.I. 1815); and
- iv. assess the status of compliance with Energy Efficiency Regulations through continuous market surveillance.

1.3 Significance of the Project

The project is intended to highlight the compliance level of all the refrigerating appliances and RACs entering the Ghanaian market. The compliance level includes energy efficiency star ratings, recommended refrigerants, climate class, refrigerator types and annual energy consumption patterns of all the regulated appliances. It will also highlight the number of unregulated appliances such as stock lots and coolers/display cabinets coming into the country and developing policies to deal with them. Finally, it will indicate the share of fridge/freezer, chest freezer and refrigerators entering the market.

CHAPTER TWO: ANALYSIS OF DATA AND KEY SUMMARY RESULTS

2.0 Refrigerating Appliances

The refrigerating appliances that were imported and inspected were categorized into three: Fridge/Freezers (fresh and frozen volumes), Chest or Upright Freezers (frozen volume only) and Refrigerators (fresh volume only). Each category was further broken down into three sub-categories depending on the size or carrying capacity (net volume in litres). These measures are listed below and for this report, these sub-categories will henceforth be referred to as “Small” (≤ 340 litres), “Medium” (341 - 510 litres) and “Large” (> 510 litres).

2.1 Analysis of Data

2.1.1 Overall Summary Statistics of the New Refrigerating Appliances

A total of **534,434** units of new refrigerating appliances were imported and inspected at the Tema Port in 2020. This represents an increase of about 37.9% of the 2019 total imports. Figure 2.1 presents the monthly trends or breakdown of the total imports in 2020.

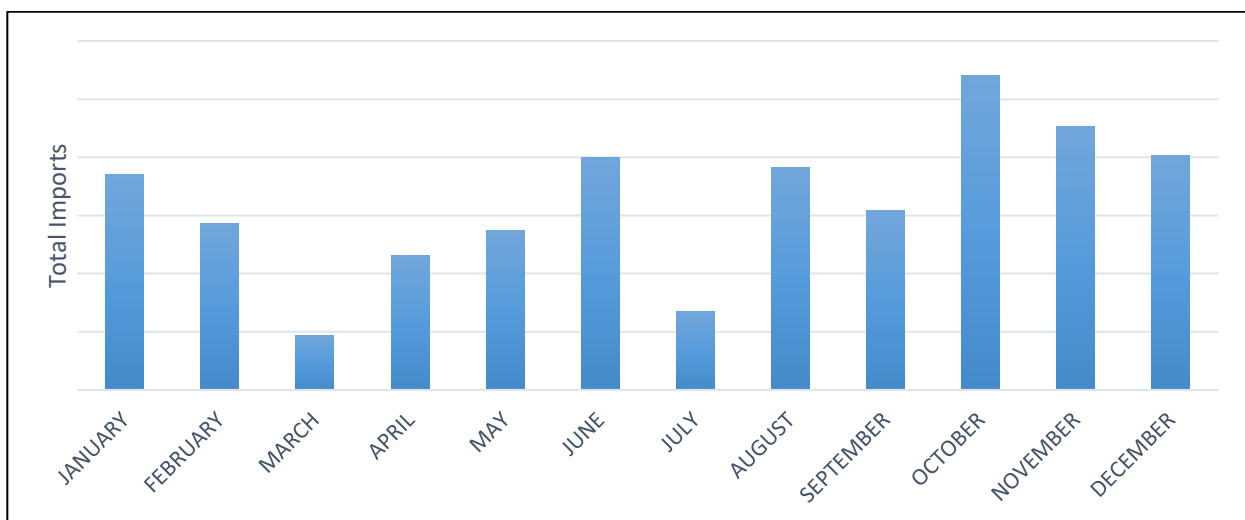


Figure 2.1: Trends in Monthly Imports of New Refrigerating Appliance in 2020

Of this number, 523,615 units, representing 98.0% of the total imports, were regulated appliances, while the remaining 7,365 units, accounting for 2.0% of the total imports, were unregulated appliances. Of the regulated appliances, 229,930 units (43.9%) were fridge/freezers, 154,043 units (29.4%) were chest freezers and 139,642 units (26.7%) were refrigerators. Figure 2.2 shows the share of the various categories.

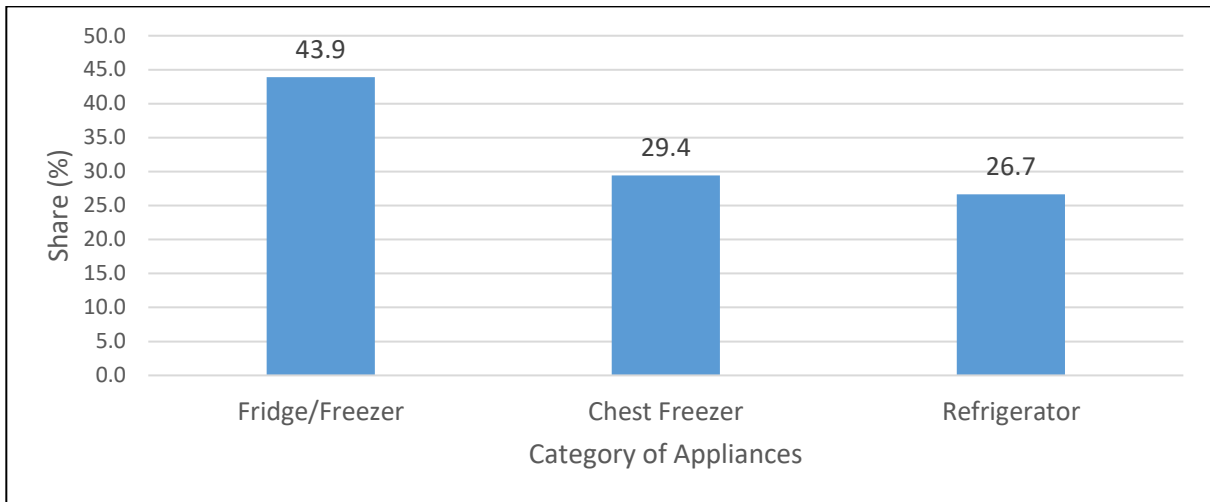


Figure 2.2: Share of Categories of New Refrigeration Appliances in 2020

The trend or the breakdown in the categories of the refrigerating appliances imported since 2017 is depicted in Figure 2.3.

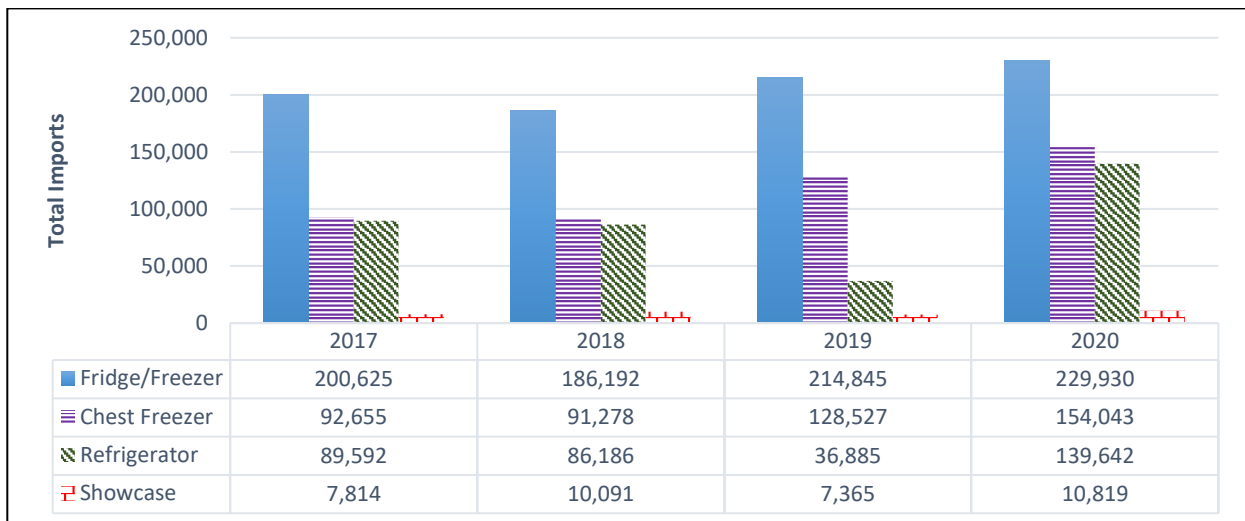


Figure 2.3: Trends in Refrigerating Appliances Categorization since 2017

A total of **3,093,148** new refrigerating appliances (including showcases) have been imported through the Port of Tema since 2005. Figure 2.4 presents the yearly upward trajectory or trend of these appliances imported into the country from 2005 to 2020.

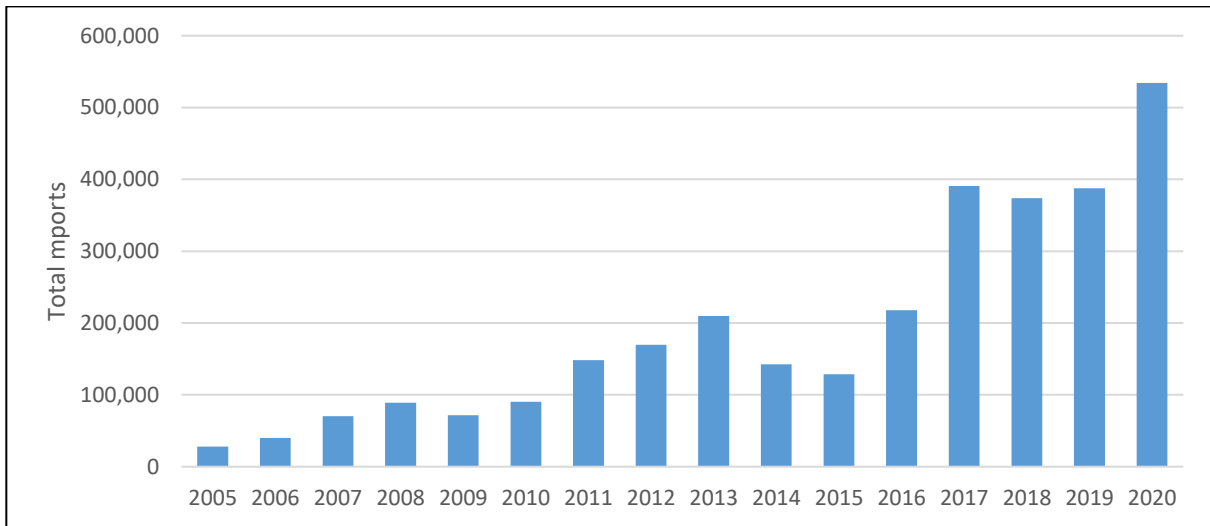


Figure 2.4: Trend in New Refrigerating Appliances Imports (2005 – 2020)

2.1.2 Overall Energy Efficiency Star Ratings of the New Regulated Refrigerating Appliances

The overall energy efficiency star ratings for the regulated appliances in 2020 is presented in Figure 2.5. About 35.6% and 25.2% of the approved refrigerating appliances were 2-star and 1-star ratings respectively, thus making them the most predominant star rated appliances inspected. About 23.0% were 4-stars, 15.8% were 3-stars and only 0.4% were 5-stars.

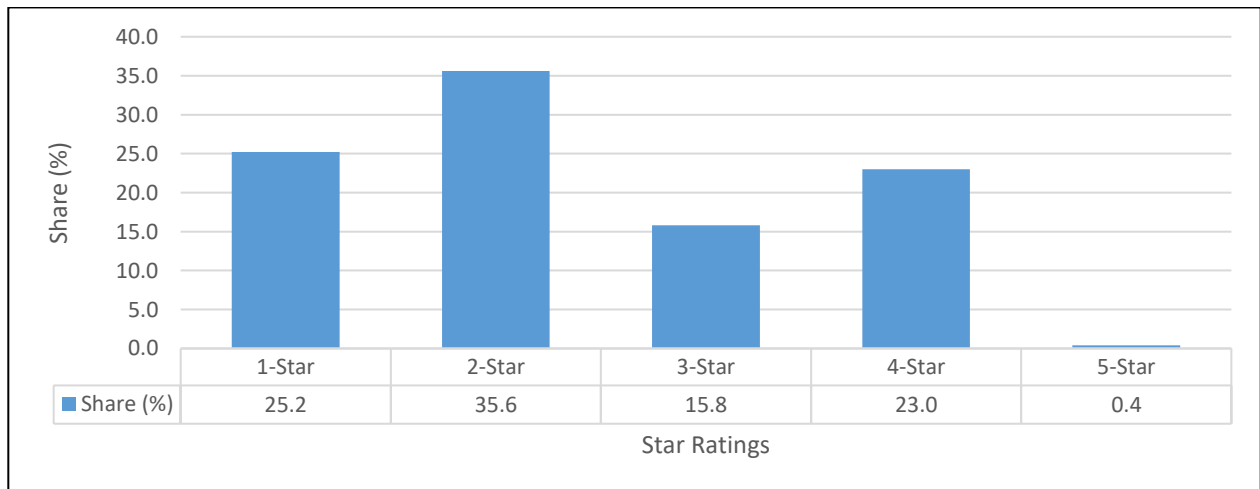


Figure 2.5: Overall Energy Efficiency Star Ratings for the New Refrigerating Appliances in 2020

2.1.3 Types of Refrigerants in Refrigerating Appliance imported and inspected

The types of refrigerants identified in the approved refrigerating appliances imported into the country included R600a, R134a and R290. A total of 456,592 (87.2%) compressors of the new refrigerating appliances imported in 2020 were laden with R600a, 61,263 (11.7%) contained R134a and 5,760 (1.1%) were filled with R290. Figure 2.6 shows the breakdown/share of the refrigerants in the refrigerating appliances inspected in 2020.

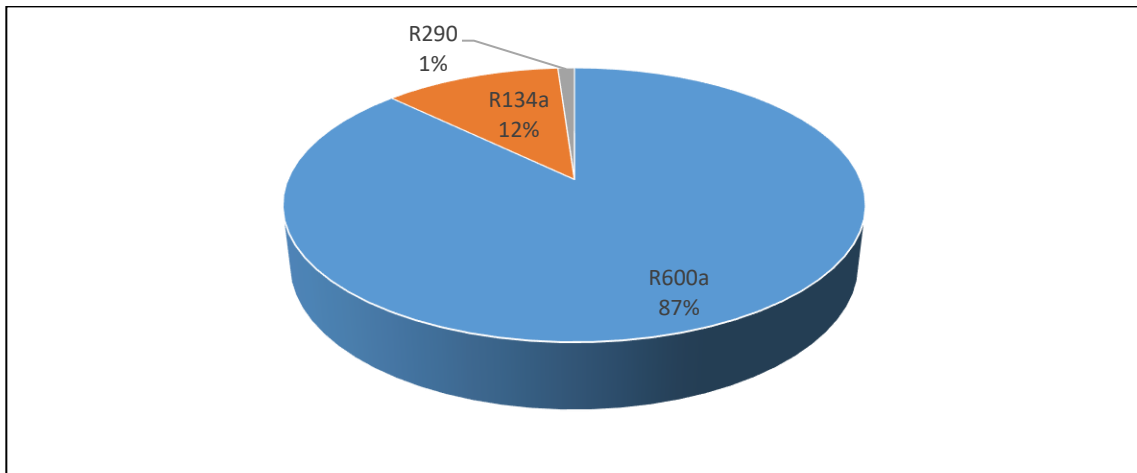


Figure 2.6: Share of Refrigerants in the Refrigerating Appliances imported and inspected in 2020

2.1.4 Climatic Classes for the Refrigerating Appliances

About 85.8% of the appliances imported and inspected were made for sub-tropical (ST) climatic condition while the remaining 14.2% were for tropical (T) climatic condition. The result is depicted in Figure 2.7.

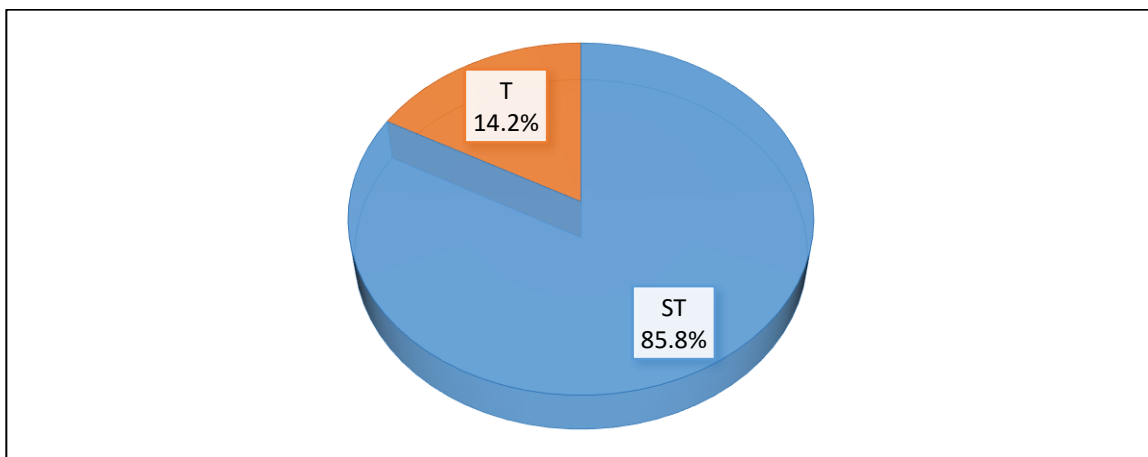


Figure 2.7: Share of Climatic Class of the Refrigerating Appliances imported and inspected in 2020

2.1.5 Expected Annual Energy Consumption Patterns of New Refrigerating Appliances

The expected annual energy consumption values/figures for the various categories and sub-categories of the new regulated appliances in 2020 are presented in Table 2.1.

Table 2.1: Expected Annual Energy Consumption Patterns for New Refrigerating Appliances in kWh/year

Category	Fridge/freezer			Chest Freezer			Fridge		
Sub-category	Small (=<340L)	Meduim (341-510L)	Large (>519L)	Small (=<340L)	Meduim (341-510L)	Large (>519L)	Small (=<340L)	Meduim (341-510L)	Large (>519L)
Average	303.4	409.5	512.5	327.1	448.6	635.0	171.3	297.0	N/A
Category Average	328.7			390.0			196.0		
Overall Average	340.0								

N/A = Not Available

2.1.6 Compliance Level

About 97.0% of the regulated refrigerating appliances were compliant at the point of inspection. The non-compliance cases, which ranges from no technical documentation to mislabelling, were forwarded to the market surveillance team for enforcement actions.

2.1.7 Importers and Popular Brands of Refrigerating Appliances

Electroland Ghana Limited was the largest importer of refrigerating appliances in 2020, accounting for 30.6% of the total imports, followed by Sun Electronics Ltd. (12.0%), Somotex Ghana Ltd. (10.4%), Melcom Limited (6.9%), Madson Japan Eng. Co. Gh. Ltd. (5.8%) and Menkish Impex Ltd. (5.1%). The most dominant/popular imported brand was NASCO (27.0%), followed by Hisense (13.5%), MIDEA (9.1%), Bruhm (8.4%), Akai (6.7%) and Legacy (5.3%).

2.1.8 Trends and Summary Statistics on Used Fridges and Used RACs

Since the enforcement of L.I. 1932 commenced in 2013, a total of **46,666** old refrigerators and **11,003** used RACs have been confiscated/intercepted at ports of Tema and Takoradi. In 2020, seizures, totalling **4,884** used fridges and **678** used RACs were made at the Ports of Tema and Takoradi. Figure 2.8 presents the yearly downward trend in the seizures made between 2013 and 2020. Since 2005, a total of **2,891,030** used fridges have been exported to Ghana from Europe and elsewhere.

The average annual energy consumptions of new refrigerators and RACs are 340 kWh/unit and 3,447.4 kWh/unit respectively, compared with 1,200 kWh/unit and 4,000 kWh/unit for used fridge and used RAC respectively. The rigorous enforcement of L.I. 1932, yielded a total electricity savings of **8.71 GWh** in 2020.

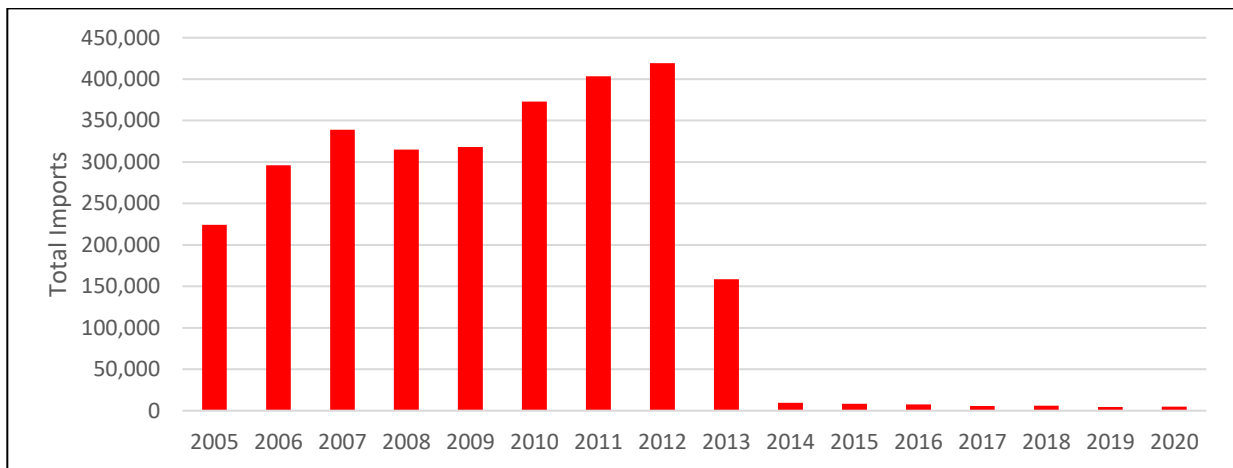


Figure 2.8: Yearly Trend of Used Fridges (2005 – 2020)

2.1.9 Top ten countries exporting used fridges to Ghana

The top ten (10) countries exporting used fridges into the country are as shown in Figure 2.9. The United Kingdom accounts for 21.8% of the total export, Denmark (20.0%), Belgium (12.1%), United States (10.8%), Finland (9.7%), Netherlands (6.4%), Australia (5.9%), Germany (5.1%), France (4.3%) and Japan (3.9%).

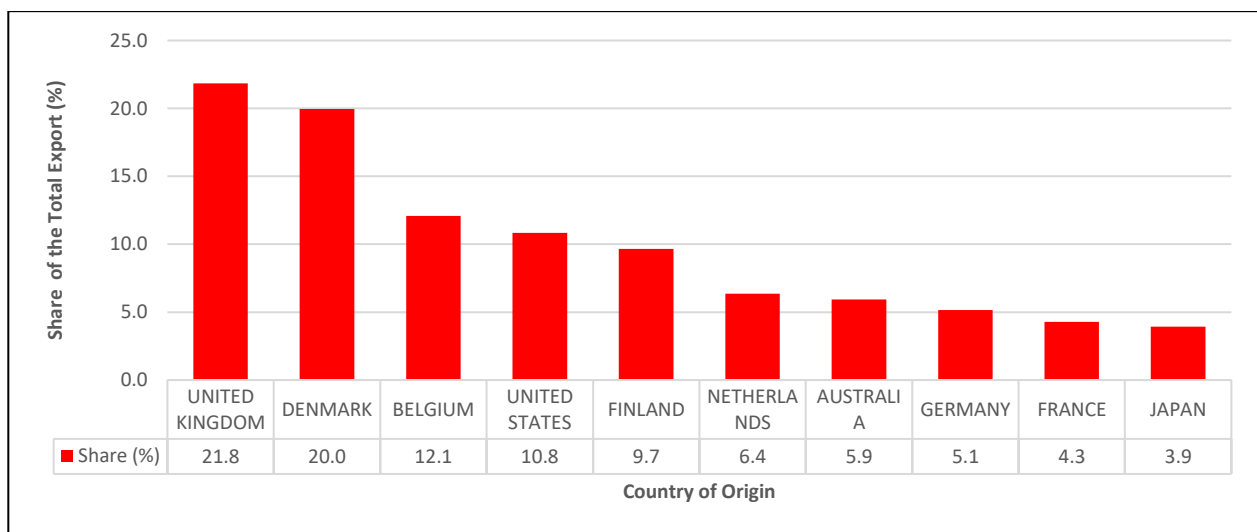


Figure 2.9: Top Ten Countries Exporting Used Fridges to Ghana

2.1.10 Trends of New Versus Used Refrigerators Imports (2005 – 2020)

The importation of the new refrigerating appliances into the country has seen an upward increase over the years, whilst that of the used fridges has seen a drastic reduction from 2013 due to the enforcement of L.I.s. 1958 and 1932 respectively. Fig. 2.10 shows the number of refrigerating appliances imported into the country from 2005 to 2020. It can be observed that the number of used refrigerators imported into the country peaked in 2012, after which it started to decline, giving way

to the new refrigerators. The peaking was as a result of the transitional arrangement put in place for the importers of the used appliances to wind up their businesses. The numbers of new refrigerators imported into the country began to rise significantly from 2013. This rise in importation of new refrigerators is primarily due to robust enforcement of the regulations at the ports of entry to ensure that only appliances that meet the minimum energy performance standards (MEPS) are permitted into the Ghanaian market.

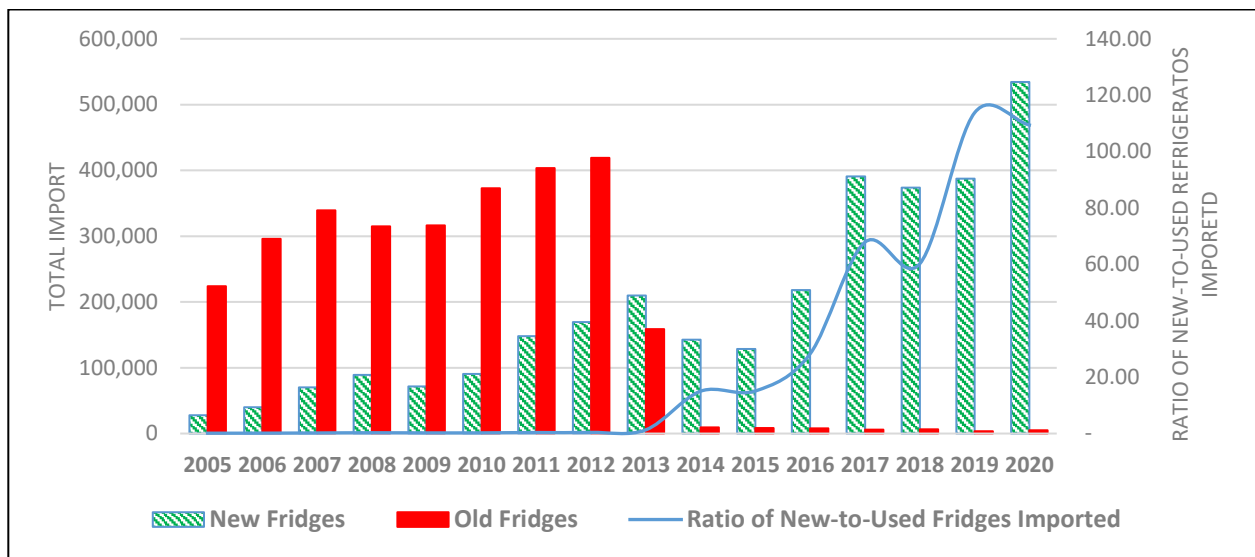


Figure 2.10: Trends in New Versus Used Refrigerators Imports (2005 – 2020)

2.2 Room Air Conditioning Appliances

2.2.1 Overall Summary Statistics on New RACs

A total of **170,472** units of new RACs were imported and inspected at the Tema Port in 2020. Of this number, **167,063 units**, representing 98.0% of the total imports, were regulated appliances (RACs), while the remaining **3,409** units, accounting for about 2.0% of the total imports, were unregulated appliances such as cassette/commercial or other ducted types. A total of **904,923** new RACs have been imported and inspected at the Port of Tema since 2014. Figure 2.11 presents the yearly trend of imported RACs.

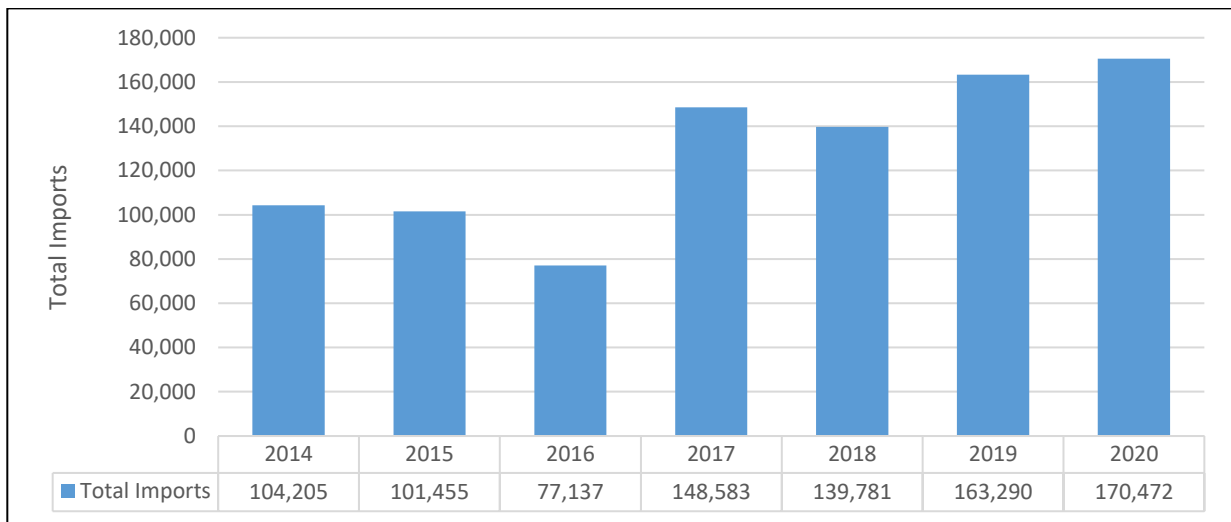


Figure 2.11: Yearly Trend in Air Conditioner Imports (2014 – 2020)

2.2.2 Overall Energy Efficiency Star Ratings of the New RACs

The overall energy efficiency star ratings for the regulated RACs in 2020 is presented in Figure 2.12. About 56.5% of the regulated RACs were of 1-stars, 20.1% were 2-stars, 22.0% were 3-stars and 1.4% were 4-stars. There were no 5-stars. About 96.0% of all the imported RACs were compliant with L.I. 1815.

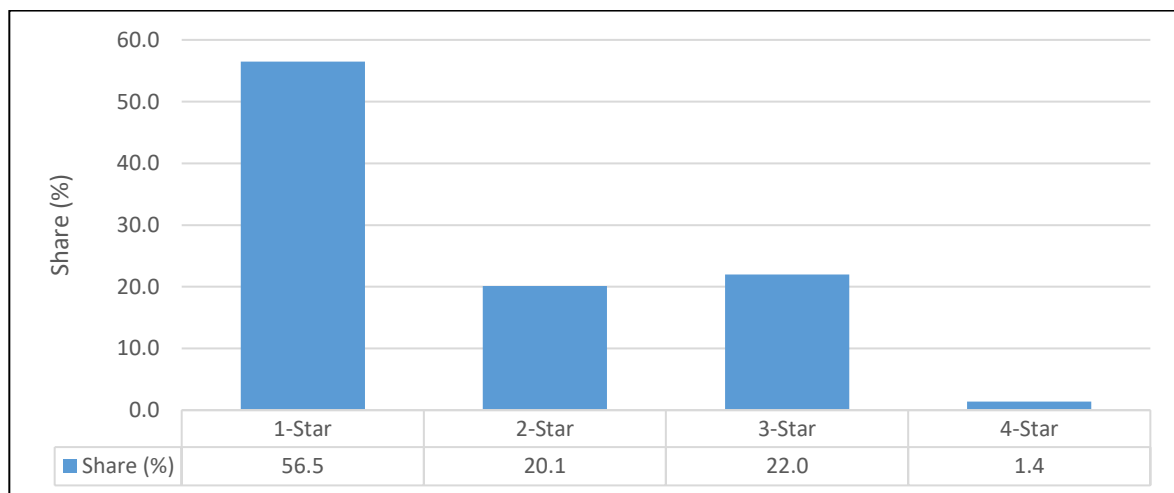


Figure 2.12: Overall Energy Efficiency Star Ratings of the New RACs in 2020

2.2.3 Types of Refrigerants in RACs imported and inspected

The types of refrigerants identified in the approved RACs imported into the country were R22 (51.0%) and R410a (49.0%). A total of 85,202 units of the regulated RACs were laden with R22 whilst 81,861 units were filled with R410a. Figure 2.13 shows the breakdown/share of the refrigerants in the RACs inspected in 2020.

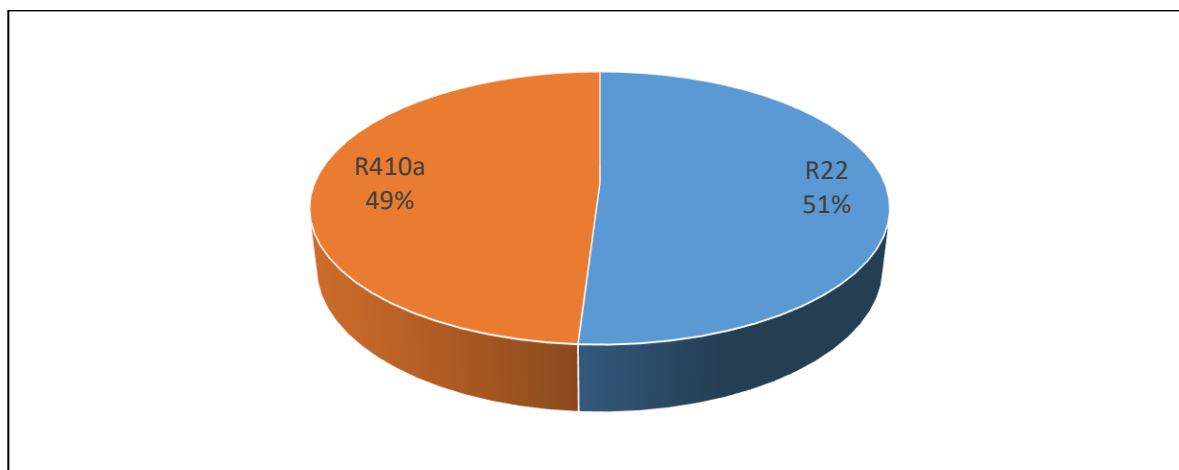


Figure 2.13: Share of Refrigerants in RACs in 2020

Table 2.2: Expected Annual Energy Consumption Patterns of New RACs

The expected annual energy consumption values of the new RACs are presented in Table 2.2.

Star Rating	Average EER (W/W)	Average Rated Power (kWh/yr.)
1 - Star	2.88	3,759.6
2 - Star	3.23	3,200.7
3 - Star	3.50	2,970.3
4 - Star	3.82	2,561.2

2.2.5 RACs: Importers and their brands

Electroland Ghana Limited was the largest importer of the RACs in 2020. It accounted for two-fifth (about 40.2%) of the total RACs imported and inspected, followed by Sun Electronics Ltd. (10.9%), Somotex Ghana Ltd. (8.2%) and TLC (2.5%). The most dominant/popular brand was NASCO (30.0%), followed by MIDEA (12.4%), Hisense (10.6%), and BRUHM (7.5%).

2.2.6 Compliance levels of Refrigerating Appliance and RACs

Generally, compliance levels of refrigerating appliances and RACs have gone up between 2017 and 2020. The compliance level of imported refrigerating appliance increased from 92.6% to 97.0%, compared with RACs, which also saw an increase from 79.2% to 96.8% within the same period. Figure 2.14 depicts the trends in the compliance levels of these appliances from 2017 to 2020.

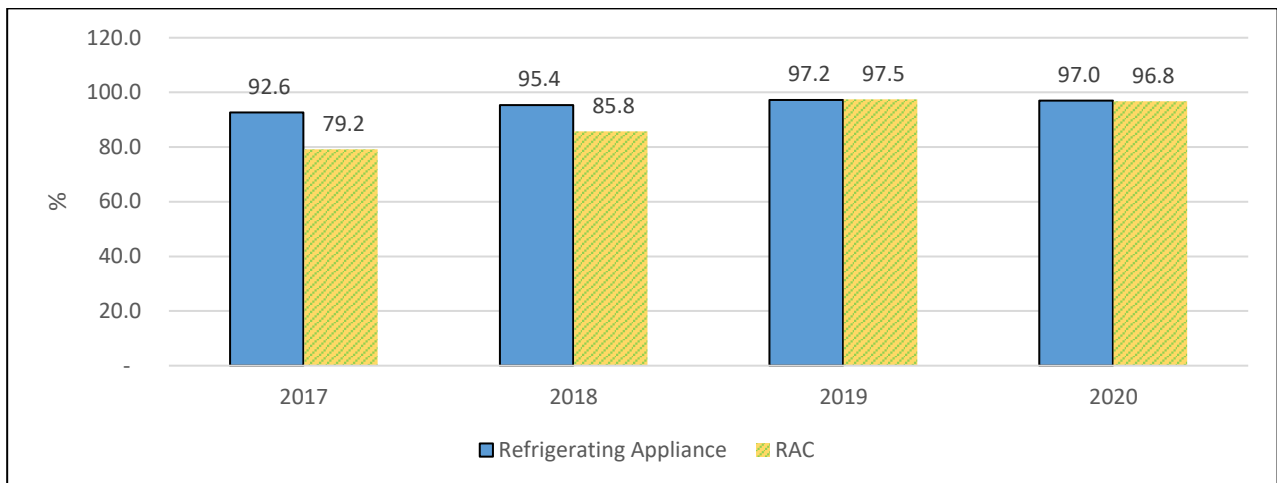


Figure 2.14: Compliance Level Trends for Refrigerating Appliances and RACs from 2017 to 2020

2.3 Impact of the Enforcement Activities in 2020

2.3.1 Electricity savings and CO₂ Emissions Reduction

During the year under review, **523,615 regulated** refrigerating appliances and **167,063 RACs** were imported and inspected at Tema Port. Also, **4,884** used fridges and **678** used RACs were also confiscated and evacuated for destruction. A total of **583 GWh** of electricity and a total of **308.9 kilotons of CO₂eq** have been saved as a result of the enforcement of L. I's 1815, 1932 and 1958 in 2020.

2.3.2 Market Surveillance

Although COVID-19 has impacted negatively on our market surveillance activities, 11 cities and 2 border towns were visited, involving 177 distributing and retailing outlets covering 3,165 refrigerating appliances and 502 RACs. About 95.5% of the refrigerating appliances found in the market were compliant with L.I. 1958 whilst 94.7% of RACs conformed with L.I. 1815. Importers of non-compliant appliances were directed to remove them from the showrooms until the appropriate documentation have been submitted for proper labelling. Also, a total of 543 “use electricity wisely” and “Refrigerating Appliance Standards and Labelling” flyers were distributed during the market surveillance. Full detail can be found in the Appliance Market Performance Report 2020.

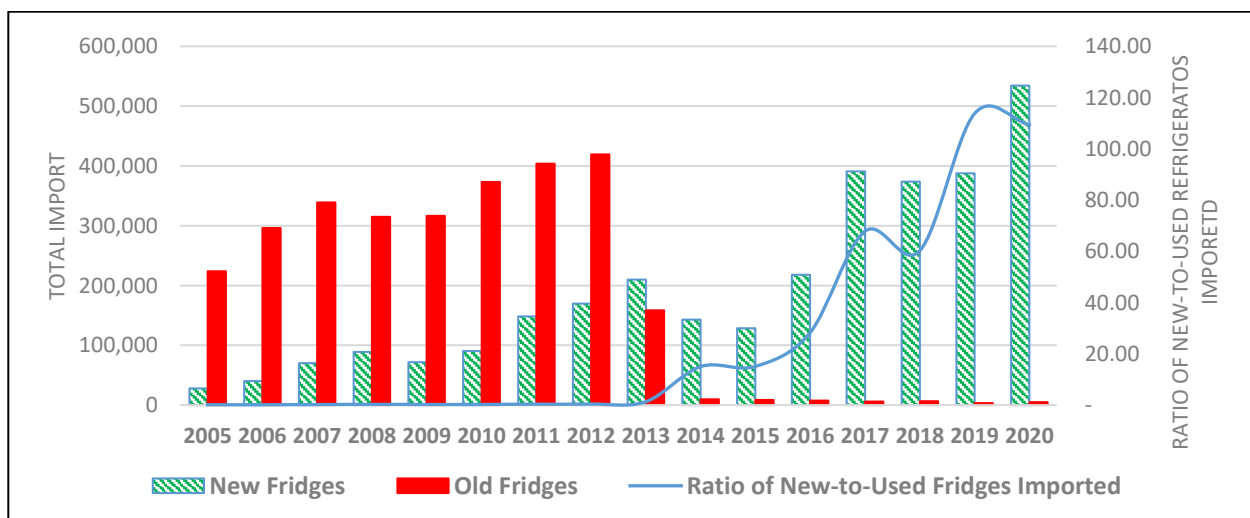
CHAPTER THREE: CONCLUSIONS AND RECOMMENDATION

3.1 Conclusions

The Energy Efficiency Legislative Instruments (L.I.s 1815, 1932 and 1958) give legal backing to the enforcement of minimum energy performance standards (MEPS) for all the regulated appliances entering the country. The analysis of the enforcement activity at the ports of entry revealed that:

- About 98.0% of the total refrigerating appliances imports were regulated appliances, with a compliance level of about 97.0% in terms of labelling. In terms of star ratings, about 35.6% of all the regulated appliances were of 2-stars, 23.0% were 4-stars, 25.2% were 1-star, 15.8% were 3-stars and only 0.4% were 5-stars. The overall expected average annual energy consumption of these new refrigerating appliances is 340 kWh/year per unit.
- Also, about 97.6.0% of the total RACs imports are were regulated appliances, with 97.0% of the regulated RACs being compliant. About 56.5% of the regulated RACs were of 1-star ratings, 20.1% were 2-stars, 22.0% were 3-stars and 1.4% were 4-stars. The average EER of the 1-star RACs were 2.88W/W, which is above the MEPS of 2.80W/W and with an average annual consumption of **3,759.6 kWh**.
- A total of **583 GWh** of electricity and a total of **308.9 kilotons of CO₂eq** have been saved in 2020.

Due to the stringent enforcement at the entry points, the refrigerating appliance market in Ghana has enormously transformed from a used one to an entirely new refrigerating appliance market, especially from 2013, according to the figure below.

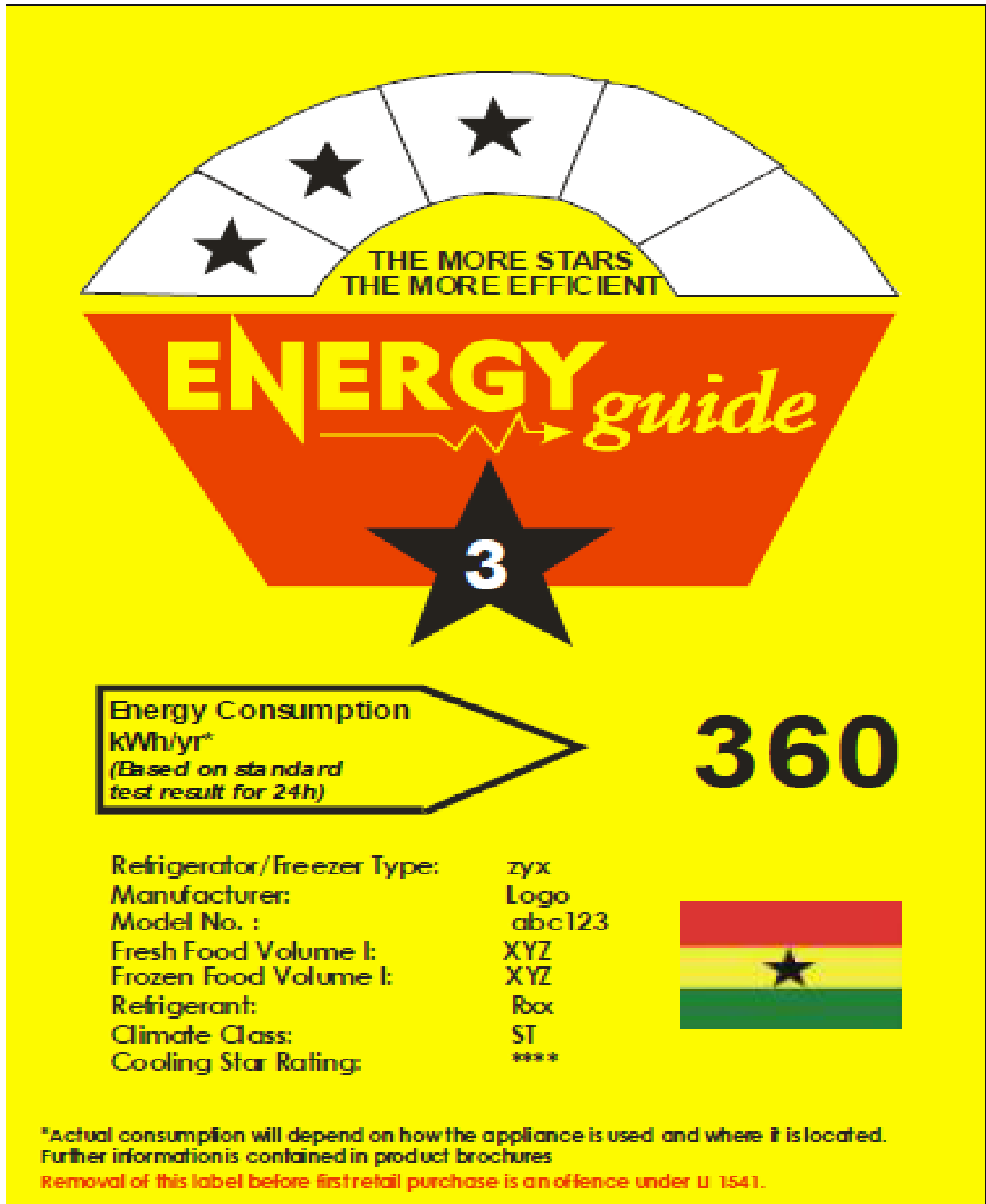


3.2 Recommendation

1. A total of **10,819** unregulated refrigerating appliances (display units/showcase), representing 2.0% of the total imports, were inspected at Tema Port in 2020. These appliances are projected to increase in the coming years as more supermarkets and shopping malls are built across the country. There is, therefore, the need to revise the existing standards and labelling regulations on household refrigerating appliances to cover that category of refrigerating appliances.
2. A total of **3,409** unregulated air-conditioners such as the cassette type, accounting for 2.0% of the total imports, were also inspected. This needs to be equally regulated since the number of imports is gradually increasing.
3. The used fridges and used RACs are still being imported into the country, though the numbers seem to be decreasing over the years, probably as a result of the measures that we have put in place at the port. The Commission should start prosecuting recalcitrant importers as prescribed in L.I. 1932, to serve as a deterrent.

APPENDIX

A.1: Energy Guide Label for Refrigerating Appliance



The image shows a sample Energy Guide Label for a refrigerating appliance. The label is primarily yellow with a red and white starburst graphic at the top. The starburst contains three black stars and the text "THE MORE STARS THE MORE EFFICIENT". Below this, the words "ENERGY guide" are written in a stylized font, with a lightning bolt graphic between "ENERGY" and "guide". A large black star with the number "3" inside is positioned below the "ENERGY guide" text. To the left of the star, a white arrow-shaped box points to the right and contains the text "Energy Consumption kWh/yr* (Based on standard test result for 24h)". To the right of the arrow, the number "360" is displayed in large, bold black digits. Below the arrow and number, there is a table of specifications. To the right of the table is a small graphic of the Nigerian flag with a black star in the center. At the bottom of the label, there is a disclaimer in small text and a red warning statement.

THE MORE STARS
THE MORE EFFICIENT


ENERGY guide

3

Energy Consumption
kWh/yr*
(Based on standard
test result for 24h)

360

Refrigerator/Freezer Type:	zyx
Manufacturer:	Logo
Model No. :	abc123
Fresh Food Volume l:	XYZ
Frozen Food Volume l:	XYZ
Refrigerant:	R60x
Climate Class:	ST
Cooling Star Rating:	***



*Actual consumption will depend on how the appliance is used and where it is located.
Further information is contained in product brochures
Removal of this label before first retail purchase is an offence under U 1541.

A.2: Energy Guide Label for Air Conditioner

The image shows an Energy Guide Label for an air conditioner. At the top, a semi-circular graphic contains five stars; the leftmost star is solid black, while the others are outlines. Below the stars, the text reads "THE MORE STARS THE MORE EFFICIENT". The central part of the label features the words "ENERGY" in large, bold, sans-serif letters and "guide" in a smaller, italicized, sans-serif font, with a lightning bolt graphic between them. Below this, a large black star contains the number "1". Underneath the star is a box containing the text "THIS MODEL'S EFFICIENCY" and "2.8 EER". Below that is a table of specifications. At the bottom, a dark grey box contains the text "ENERGY CONSUMPTION OF THIS UNIT IS" and "3,274 kWh/yr**".

**THE MORE STARS
THE MORE EFFICIENT**

ENERGY *guide*

1

THIS MODEL'S EFFICIENCY
2.8 EER

APPLIANCE: ROOM AIR CONDITIONER
TYPE: NO REVERSE CYCLE LOUVERED SIDES
COOLING CAPACITY: 3.2 kW/hr
MANUFACTURER: COMPANY B
MODEL: 4321
REFRIGERANT: R22

ENERGY CONSUMPTION OF THIS UNIT IS
3,274 kWh/yr**

*EER (Energy Efficiency Ratio) is the measure of energy efficiency for Air Conditioners, expressed as Watt of cooling per Watt of electrical power input. Only models between 2.5 and 11.5kW/hr cooling capacity and with the same features are used for this scale. The given data are according to Ghana Energy Efficiency Labelling requirements for non-ducted air conditioners under Ghana Standard Number GS362.
**Based on 2,000 hours use. Actual consumption may vary depending on actual use of the product.
Removal of this label before first retail purchase is an offence under LI 1541