

# New F-gas Regulation

Ready for the 2030 A/C market

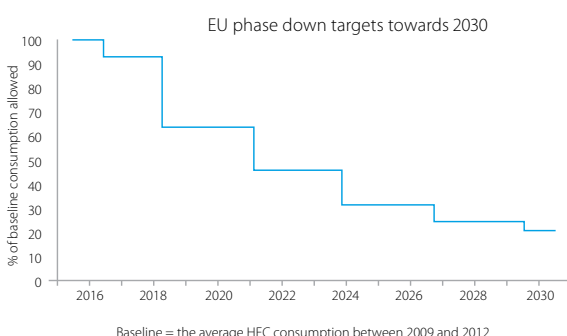


## No HFC ban but a **phase down**, why?

To reduce the environmental impact of refrigerants, the EU wants to reduce the consumption and consequently reduce the use in air conditioners and other applications.

**However, HFCs remain necessary in many applications because of their energy efficiency, safety and economic benefits. There is no ban nor a phase out of HFCs, but a gradual phase down to a level that remains necessary for a sustainable growth of the air conditioning, heat pump and refrigeration industry.**

There are **3 main areas** with specific actions to achieve the phase down:



**1. Minimising the impact of new equipment**, by reducing the use of high GWP F-gases

- › Changing to lower GWP HFCs and non-HFC gases for specific sectors (e.g. use of R-32 for residential sector, etc.)
- › Reducing refrigerant charges

**2. Reducing the use of refrigerants for servicing HVAC-R equipment**

- › Reducing leakages
- › Servicing ban on HFC with GWP > 2,500 for refrigeration equipment above 40 TCO<sub>2</sub>eq charge, (e.g. R-404A)

**3. Increasing recovery and reuse of HFCs**

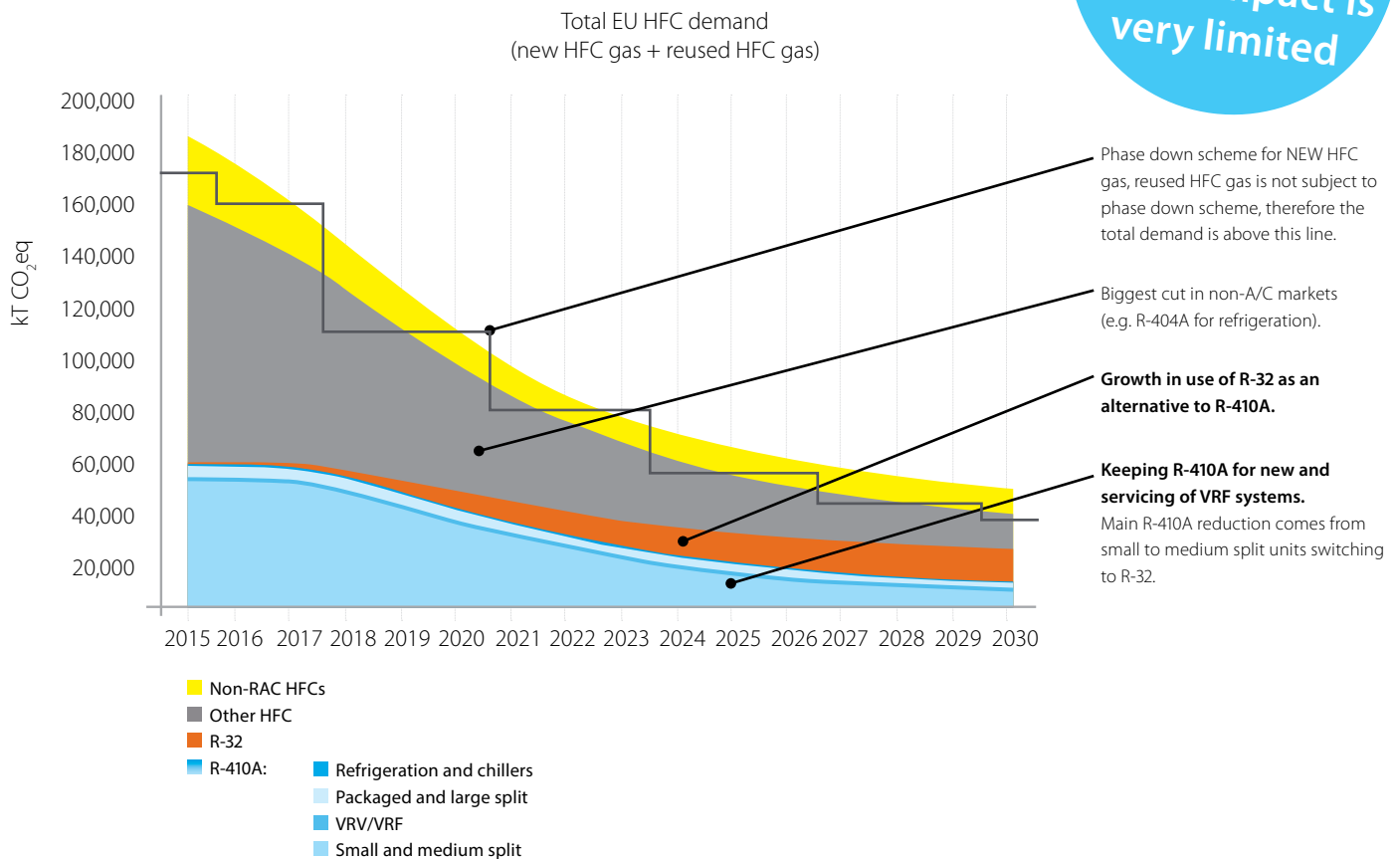
(only new HFC gases are part of the HFC phase down scheme)

# Why is the target expressed in CO<sub>2</sub> equivalents?

The HFC phase down targets are expressed in CO<sub>2</sub> equivalents [= GWP x kg] and are **not refrigerant-specific** (the legislation only imposes a ban in specific cases, such as the ban on R-404A for refrigeration applications). This allows the market **the flexibility to use different types of HFCs and measures**: changing to a lower GWP refrigerant, lowering the refrigerant charge or a combination of both.

## Where does the main contribution come from?

**For the VRF market the HFC phase down impact is very limited**



## Some refrigerants are being banned in a limited number of sectors

### ✓ Passenger car A/C

GWP limit of 150 from 2017 → ban on R-134a

### ✓ Supermarket refrigeration

- › GWP limit of 2,500 from 2020 for new stationary refrigerant equipment<sup>1</sup> → ban on R-404A
- › **Proactive approach from Daikin using R-410A inverter condensing units** (-50% CO<sub>2</sub> equivalents)
- › GWP limit of 150 from 2022 for large multipack systems → ban on Multipack centralised refrigeration systems for commercial use with a rated capacity above 40 kW<sup>1</sup>

### ✓ Single split systems with refrigerant charge below 3kg

- › GWP limit of 750 from 2025 → ban on R-410A only for single split systems with a refrigerant charge below 3kg
- › **Proactive market reaction led by Daikin**, switching to R-32 (up to 80% lower CO<sub>2</sub>eq refrigerant charge)  
→ **An advantage** of the new legislation is that systems using R-32 refrigerant with a charge below 7,4 kg do **not need frequent leak checks** lowering maintenance costs

In all applications the refrigerant remains available for servicing existing units, the limit is only to sales of new equipment except for stationary refrigeration units with a refrigerant charge of 40 TCO<sub>2</sub>eq or more.  
Some product bans or GWP limits also apply for fridges, freezers, aerosols, fire protection and other sectors.

(1) Exceptions applicable

# Daikin products remain ahead of the F-gas regulation targets thanks to:

1

The use of lower GWP refrigerants in split systems and refrigeration

**Daikin is leading the way in converting the market for residential and commercial systems to R-32**

- › Full Daikin R-32 portfolio for Split and Sky Air systems
- › Clear shift of competition to R-32 as well

**Daikin is leading the way in using R-410A, CO<sub>2</sub> and hydrocarbon solutions for refrigeration applications**



2

Reduced charge in new equipment

**Development of new products and technologies to reduce the amount of refrigerant needed in a system**

- › More efficient refrigerants such as R-32 reduce the charge by 5% up to 30% compared to R-410A (Split, Sky Air)
- › Other technologies such as microchannel technology in Daikin cooling only chillers reduce the refrigerant charge by at least 15%



3

Reducing servicing and maintenance use

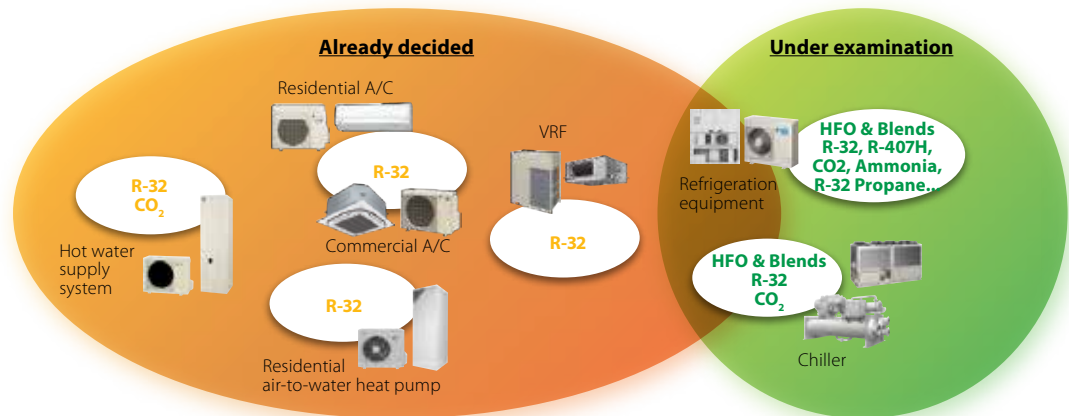
**Further reduction of leakage rates**

- › VRV and DX split systems already have low leakage rates (on average below 1%) as proven by track records

# Daikin's strategy for achieving the HFC phase down goals

The environment has a special place in our heart. An integral part of our corporate philosophy is to be a company that leads in applying environmentally friendly practices. Not only are we ahead of legislation, we are also ahead in environmental innovation, challenging our competitors.

Our refrigerant policy is not limited to R-32 but is very diverse and can be summarised as follows:



## The right refrigerant for the right application

There is no ideal "one size-fits-all" refrigerant for all applications. The future will show a **diversity in refrigerant choices**, in which existing HFCs, new HFCs and non-HFC refrigerants each play a role. Daikin has identified **R-32** as a very beneficial refrigerant for single and multi-split type air conditioners (including VRV) and heat pumps based on the above criteria. We were the world's first manufacturer to introduce equipment with R-32 refrigerant. Many of our competitors have since followed our lead.

## Offer worldwide free access to patents for equipment using R-32 refrigerant

Since September 2015, Daikin has offered **free access to 93 patents**, facilitating global conversion to R-32 refrigerant for air-conditioning, cooling and heat pump equipment. These patents have been available in emerging markets since 2011, to accelerate the phase out of ozone-depleting refrigerants such as R-22.

## Achieve sustainability in the **entire lifecycle** of the installation and its refrigerant charge

Daikin strives continuously to reduce the environmental impact as a whole, not only looking at refrigerant CO<sub>2</sub> emissions, but by ensuring the best total lifetime efficiency through energy saving VRV systems for example.

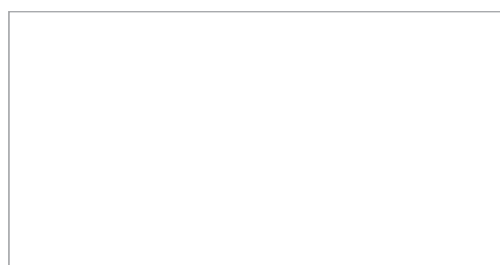
## Quotas?

Daikin's chemical division, which imports and produces bulk HFCs, has a **privileged access to quotas**.

# Conclusion for VRV:

- For the VRF market, HFC phase down impact is limited
- R-410A will NOT be banned for VRF applications

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