Types of air conditioners

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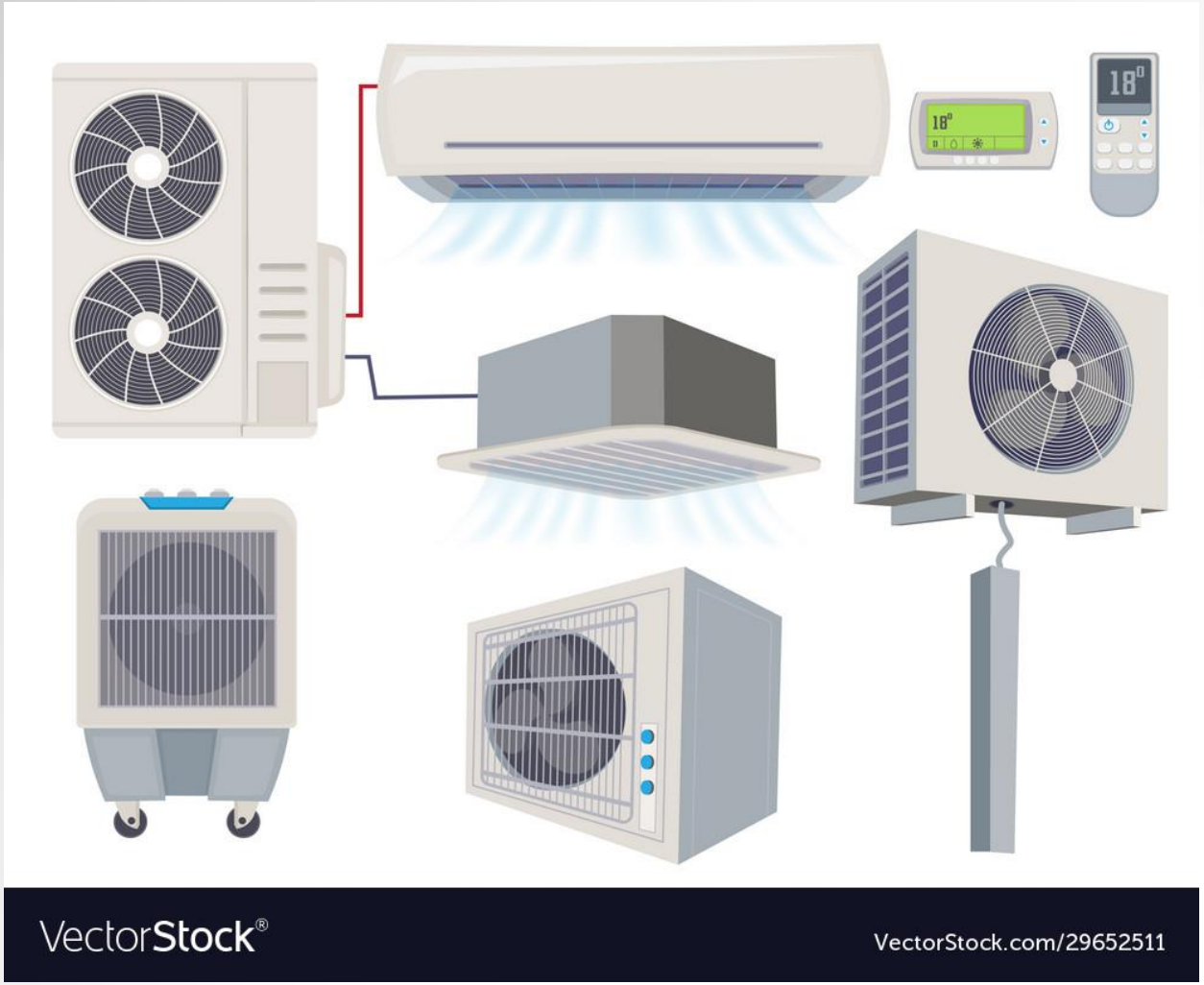

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Types of air conditioners

- There is a wide variety of types of air conditioners on the market.
- If we had to divide them into some basic categories, then we will see:
  I. air conditioners for **home**,
  II. for **business**
  III. specialized categories, such as
  portable and **multi-split** air conditioners.
- Each type of air conditioner has advantages and disadvantages

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MAIN TYPES OF AIR CONDITIONERS

- Window air conditioners
- Divided air conditioning units
- Multi-split system
- "Wardrobe" type air conditioners
- Air Condition Channel
- Floor air conditioners
- Portable air conditioners
- VRV
- Heat pumps

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Window air conditioners

This type was the first manufactured and it is still available in a few countries around the world due to the rapid development of technology.

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Divided air conditioning units

- They are the most common air-conditioning units on the market.
- Most homes or small business have an indoor air conditioning unit as well as an outdoor one.
- This is a smart and economical option for cooling, heating and air conditioning, separately for each space.

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Multi-split air conditioning system

- One of the most well-known and economical air conditioners on the market
- They are similar to wall inverter air conditioners.
- It is possible to connect more than one indoor unit to one outdoor unit.

IMPORTANT

1.The outdoor unit has to be sufficient in power, for the needs of the connected indoor units.

2. In addition, the outdoor unit should be installed in such a way that the length of the connecting pipes to the indoor units does not exceed the length specified by the manufacturer.

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"Wardrobe" type air conditioners

- They are high power air conditioners which are recommended for very large spaces.
- Their installation is easy and they don’t need much space.
- They easily cover the air-conditioned space due to the large air flow.
- They have high efficiency in heating through the auxiliary electrical resistance.

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Air Conditioner channel

These are **hidden** type roof units (canal)

They are selected mainly for large spaces.

It is necessary to install a false ceiling in the indoor unit.

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Floor Air Conditioners

- They are multi-split machines
- They stand out for their low noise level
- They are designed to fit for both business and home installation.
- An important advantage is the even distribution of the air thanks to the large slope of the blinds and its various output options.

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Portable air conditioners

- These are air conditioners without outdoor unit
- They can be moved
- It is necessary to “communicate” with the external environment through a pipe.
- It needs low power and it is quite economical.

They are divided in 2categories:

1) Portable cold air
2) Portable air coolers

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VRV air conditioners

- The amount of coolant delivered to each indoor air conditioning unit is completely controlled and proportional to the refrigerant loads.
- They reduce energy consumption by optimizing seasonal efficiency with efficient indoor and outdoor units, innovative technologies and intelligent energy control-management systems.
- The VRF / VRV system provides high comfort conditions and saves space.

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Heat pump

It is a complete cooling and heating system in which there is the possibility of reversing the cooling cycle so that the condenser becomes an evaporator and vice versa.

Use:

1. heating or cooling, connection with fancoil, underfloor heating, radiators
2. domestic hot water (DHW)
3. heated pools

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Effects of air conditioners on the environment

- Conventional air conditioning systems consume a significant amount of electricity and use refrigerants which are necessary to create cooling mechanisms with greater capacity.
- in recent years there has been an urgent need to address the environmental problems they cause

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CONSEQUENCES OF USING REFRIGERATOR IN THE ENVIRONMENT

- In recent years the use of refrigerants is constantly increasing due to the demand for cooling in more and more buildings (installation of air conditioners).

- Research has shown that the environmental impact of refrigerants from leaks and misalignment of refrigerants at the end of the life of refrigerants has a significant share of responsibility in climate change.

- in recent years there has been an urgent need to address the environmental problems they are caused.

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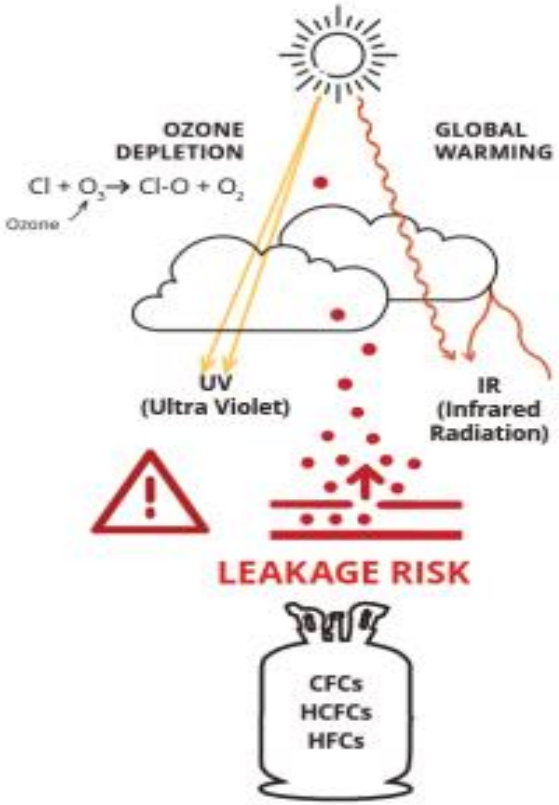
EFFECT FROM REFRIGERATOR LEAKS



Εικόνα 5: Επίδραση από τις διαρροές των ψυκτικών μέσων (Harmot, et al., 2020)

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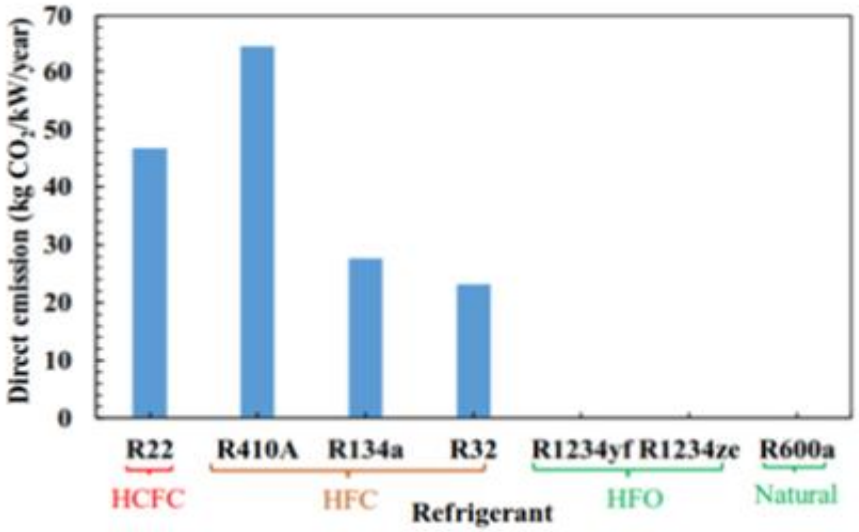
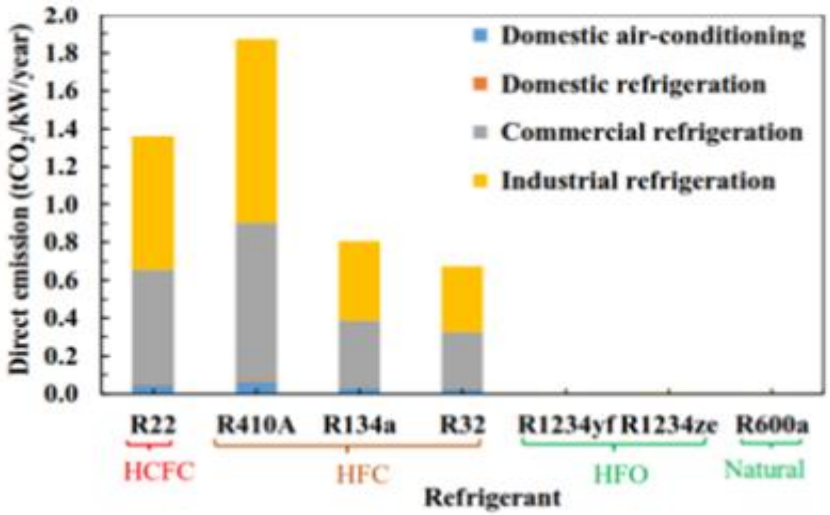
The R32 has the lowest emissions compared to other HFCs while the promising HFO refrigerants and of course have almost zero emissions.





direct emissions from the refrigerators of home air conditioners (left) and comparison of direct emissions in different systems (right)

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coolant scales

- **R410A** is the most common refrigerant in air conditioners.
- **R32** coolant is the one that has been receiving the most interest lately because it has less environmental impact but can still reduce energy consumption by up to about 10%

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Environmental effects and trends of refrigerants in air conditioning

	Ozone Depletion Potential (ODP)	100 Year Global Warming Potential of Different Refrigerants*1
R12 (CFC)	1.0	10,900
R22 (HCFC)	0.055	1,810
R410A (HFC)	0	2,090
R32 (HFC)	**0**	**675**

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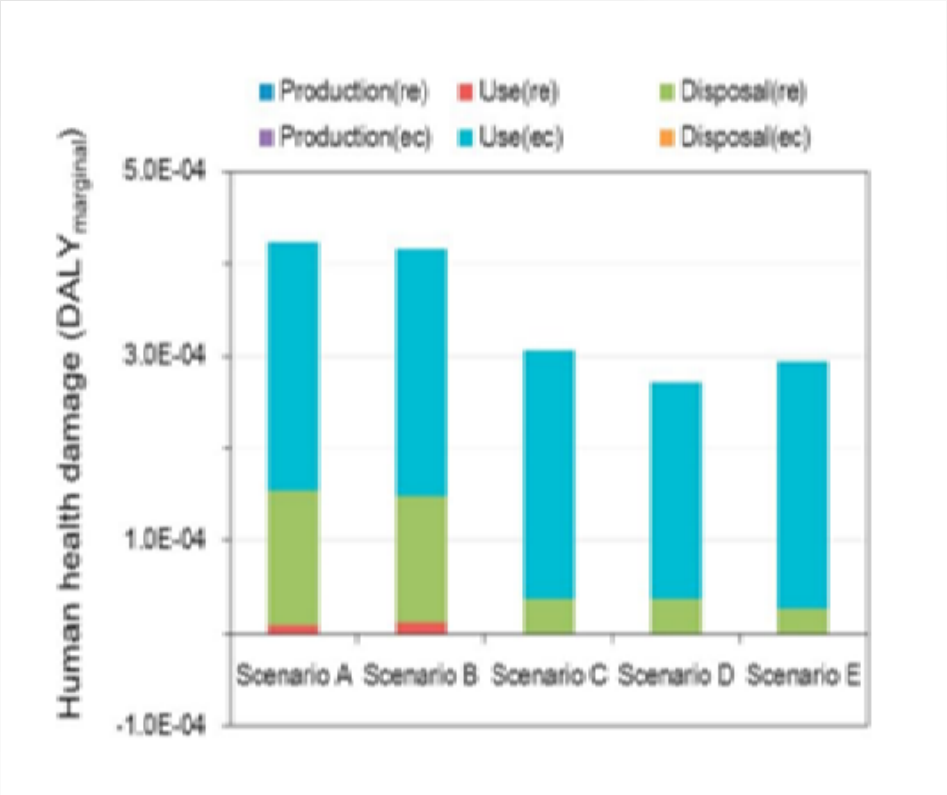
- Various studies have been carried out to find high-efficiency but environmentally friendly alternative refrigerants.

- In the next table we can see the recommendation, GWP and ODP for some of the refrigerants used impact on human health from 1) (in) refrigerants and 2) (ec) electricity consumption



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