

# EU Green Deal Action Plan

## How Ready are Turkey's Manufacturers?

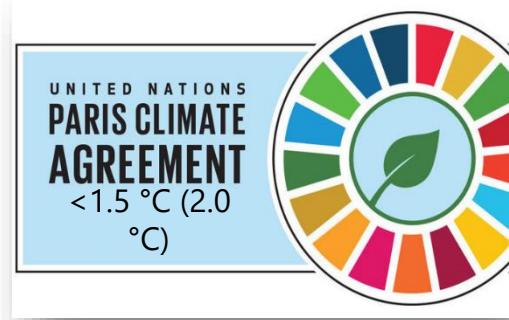
Arkun Andıç  
Barış Akgül  
Eralp Erim

Antalya, 2022

# Agenda

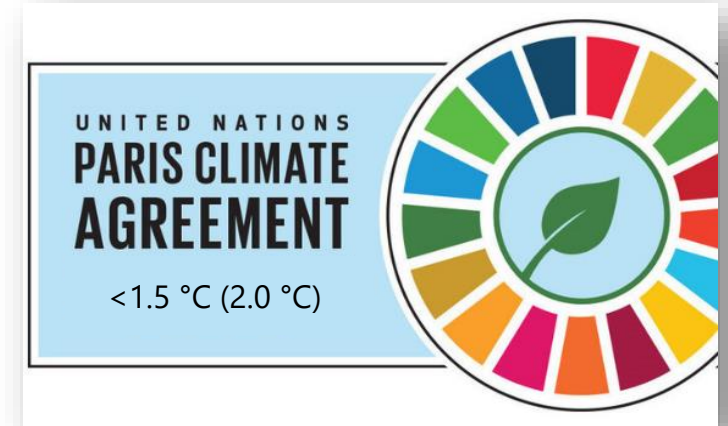


- Paris agreement and 2050 Target
- Factors creating carbon emissions
- EU Green Deal and industrial affects
- The EU's transition to a circular economy
- Corporate carbon footprint
- Carbon border adjustment mechanism
- **Studies for different products groups**
  - Data Center Cooling
  - Rooftop Units
  - Ecodesign & F-Gas Regulation

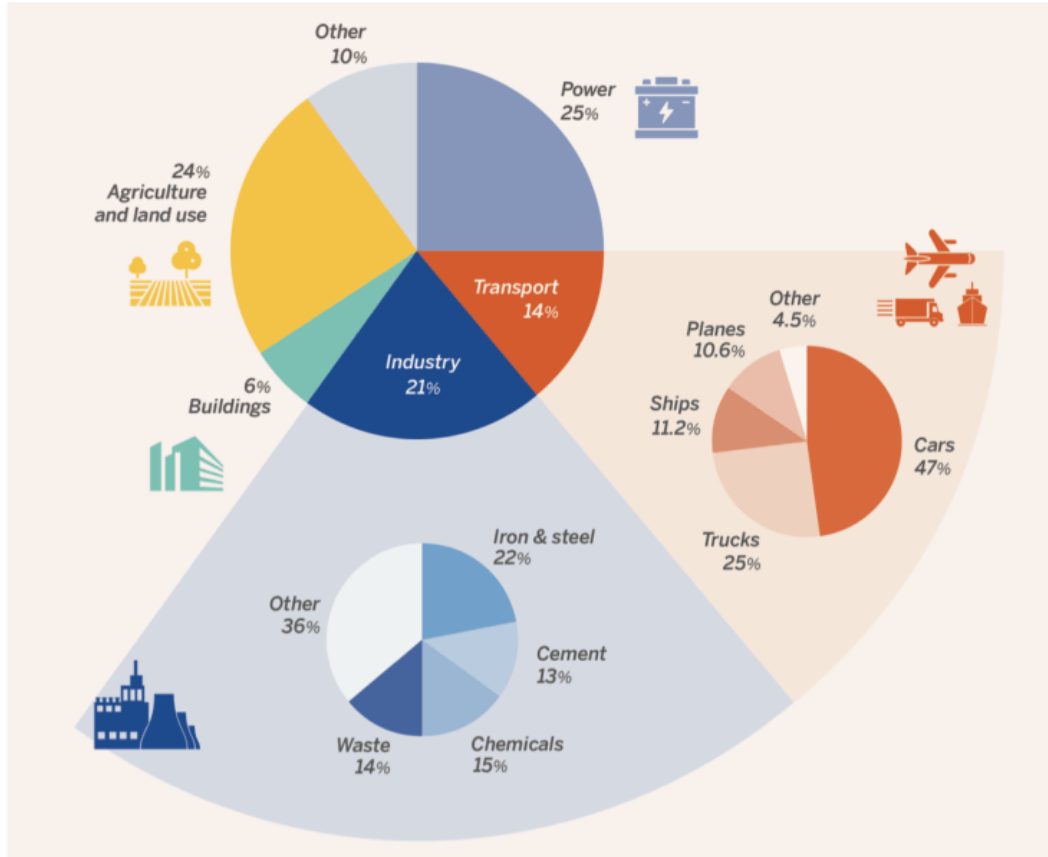


# Paris Agreement and 2050 Target

Aim of the Paris Agreement is to keep Global Warming at 1,5°C in 2050



# Factors creating Carbon Emissions



- Biggest factor is industrial production
- Energy industry stands in 2nd place because of fossil fuels
- Transportation takes 3rd place
- Agriculture is also occupying a significant part because of the greenhouse gases it produces



# EU Green Deal and Industrial Affects

«EU Green Deal» aims to convert European Economy for the sustainable future.



- In 2030 greenhouse gases will be 55% reduced, in 2050 it will be neutralized.
- Clean, accessible and reliable energy
- Zero Waste
- Bio Diversity
- Farm to Fork Strategy
- Sustainable and Smart Transportation
- Circular Economy

# The EU's transition to a circular economy

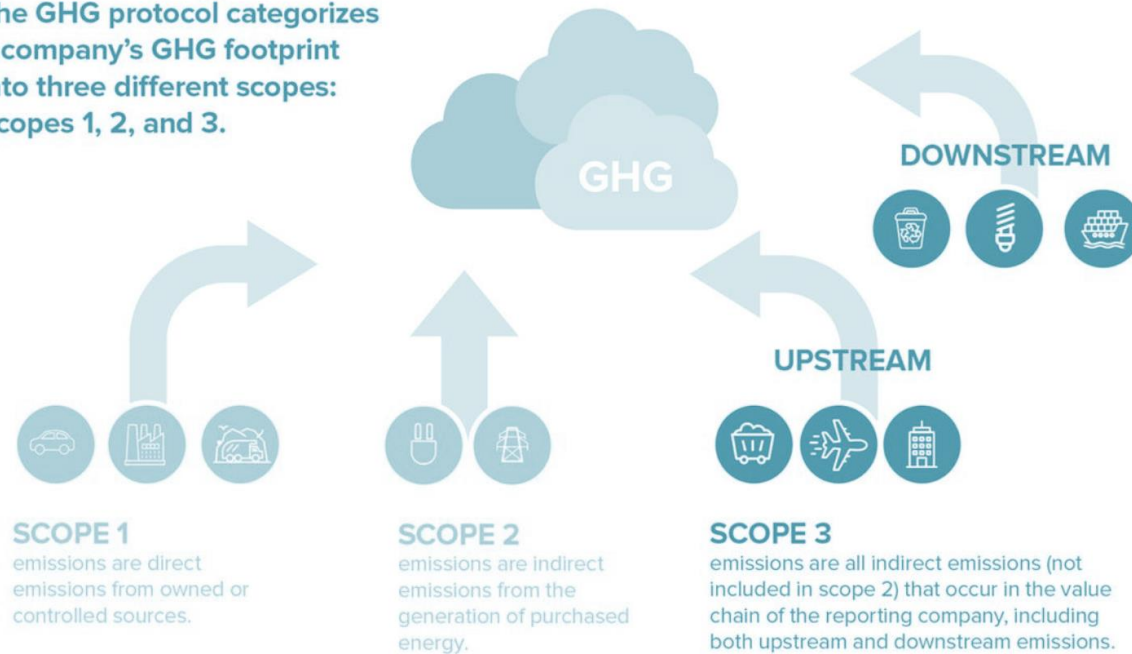
The Circular Economy Action Plan (CEAP) plays a key role in realizing objectives in the EU Green Deal

- Initiatives along the entire life cycle of products
- It targets how products are designed
- Promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented
- The Sustainable Product Initiative (SPI) is an important part of the Circular Economy Action Plan (CEAP)



# Corporate Carbon Footprint

The GHG protocol categorizes a company's GHG footprint into three different scopes: Scopes 1, 2, and 3.

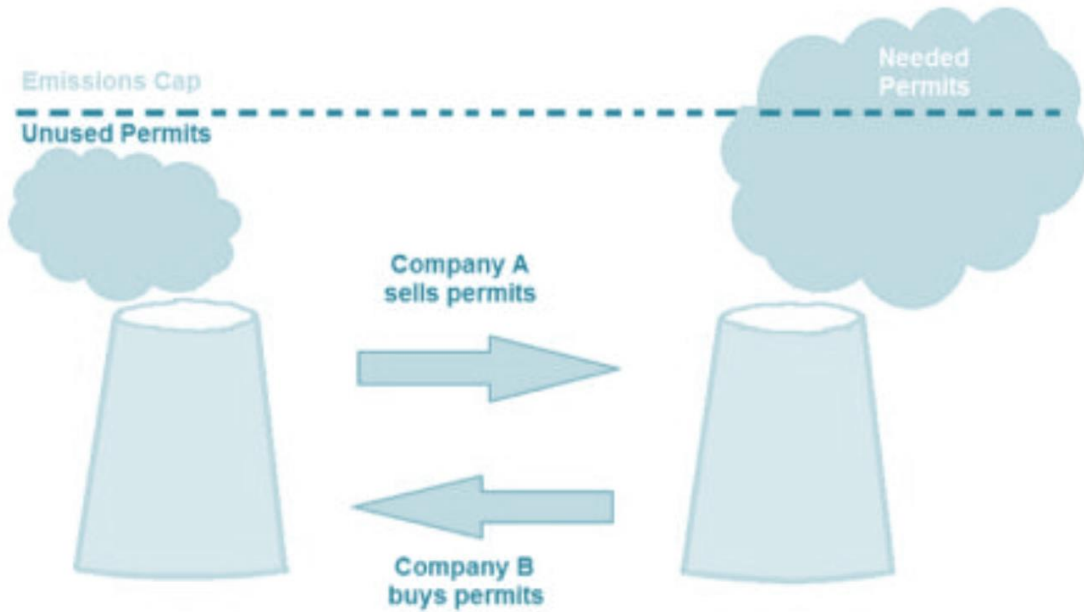


- **Direct Carbon Footprint:** The fossil fuels used by corporations to carry out their production activities.
- **Indirect Carbon Footprint (Energy):** Emissions caused by the electrical energy consumed by the corporations.
- **Other Indirect Carbon Footprint:** The products that corporations use to the subcontracting activities they take, the fuel used by the rental vehicles of the institution, the employees of the institution for business.



# Carbon Border Adjustment Mechanism

ETS (Emission Trading System)



- Since 2005, the EU has been regulating emissions caused by plants and power plants in energy and carbon-intensive sectors under the EU **Emission Trading System (ETS)**.
- EU producers have to buy “emission rights” (European Union Allowance, EUA) for the ton of carbon they release into the atmosphere at a price determined in the free market.
- The number of rights traded in the market has been reduced over time in line with climate targets, increasing the cost of non-transformation for energy and carbon-intensive sectors.

# Carbon Border Adjustment Mechanism

Fear of Carbon Smuggling

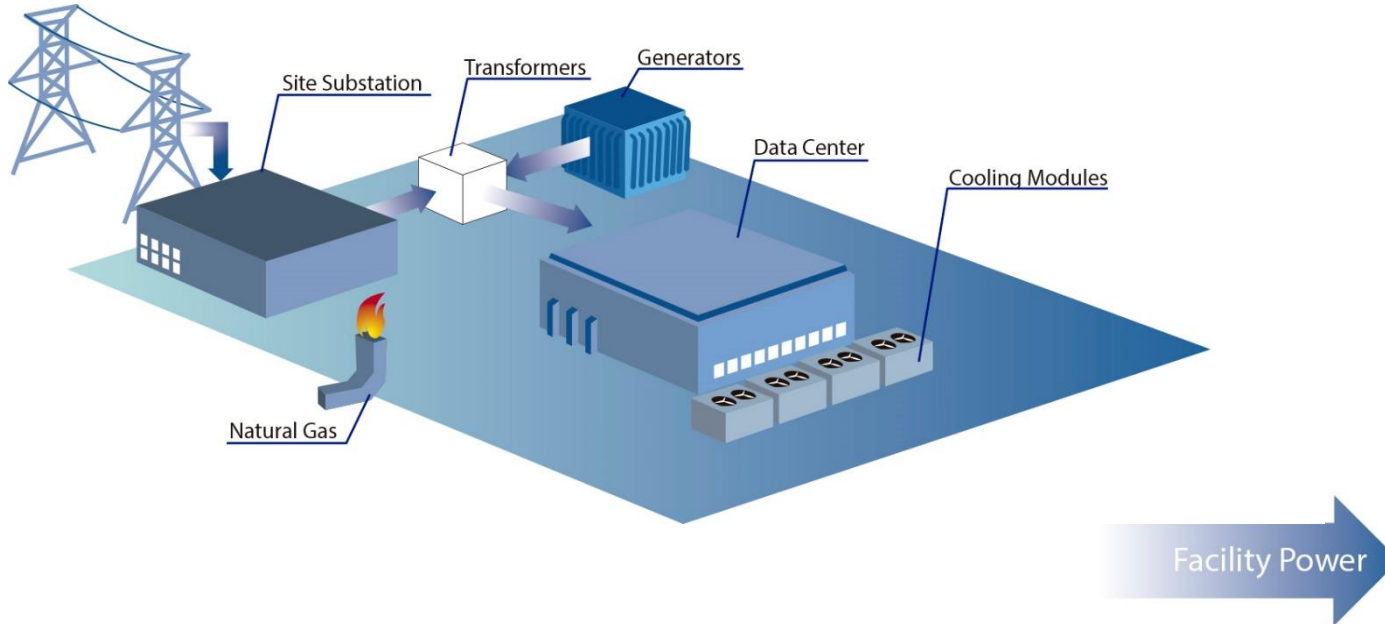


- A policy that only includes carbon taxes for EU countries could result in CARBON leakage to developing countries. For example, the risk of investments shifting to countries such as Albania, Serbia or Turkey to avoid carbon tax.
- Concerns about the loss of competition due to the EU's introduction of a carbon tax and the failure of another country to do so have resulted in the CARBON AT THE LIMIT REGULATION.
- In this direction, it continues to work on new taxes in trade with the SKD (Border Carbon Regulation) mechanism in order to reduce carbon leakage (Carbon Leakage) from the EU.

# Studies for different product groups

## 1. Data Center Cooling

# Energy usage of data centers



Power	IT Load	Cooling	Other
<ul style="list-style-type: none"> <li>• Switching</li> <li>• Distribution</li> <li>• UPS</li> <li>• Battery backups</li> <li>generators</li> </ul>	<ul style="list-style-type: none"> <li>• Telecoms</li> <li>• Network</li> <li>• Servers</li> <li>• Storage</li> </ul>	<ul style="list-style-type: none"> <li>• CRACs</li> <li>• Chillers</li> <li>• Condensers</li> <li>• Cooling Towers</li> <li>• DX Systems</li> <li>• Pumps</li> </ul>	<ul style="list-style-type: none"> <li>• Lighting</li> <li>• Heating</li> <li>• BMS</li> <li>• Security</li> <li>• Fire Supp</li> </ul>
10%	50%	36%	4%

# Data Center Efficiency Parameters:

Key parameters to define Data Center Efficiency:

- ***PUE: Power Usage Effectiveness***
- ***WUE: Water Usage Effectiveness***





## PUE:

Most frequently used parameter of comparison for data center efficiency:

**PUE**

$\frac{\text{Total Facility Power}}{\text{IT Equipment Power}}$

**DCiE**

$\frac{\text{IT Equipment Power}}{\text{Total Facility Power}}$

PUE	DCiE	Level of Efficiency
3.0	33%	Very Inefficient
2.5	40%	Inefficient
2.0	50%	Average
1.5	67%	Efficient
1.2	83%	Very Efficient

*The Green Grid*

Scenario	PUE
Current Trends	1.9
Improved Operations	1.7
Best Practices	1.3
State-of-the-Art	1.2

*EPA Estimated PUE Values in 2011*

## WUE and ERE:

- WUE: becoming more important due to adiabatic cooling.

$$WUE \text{ (l/kWh x year): } \frac{\text{Annual Water Usage}}{\text{IT Equipment Energy}}$$

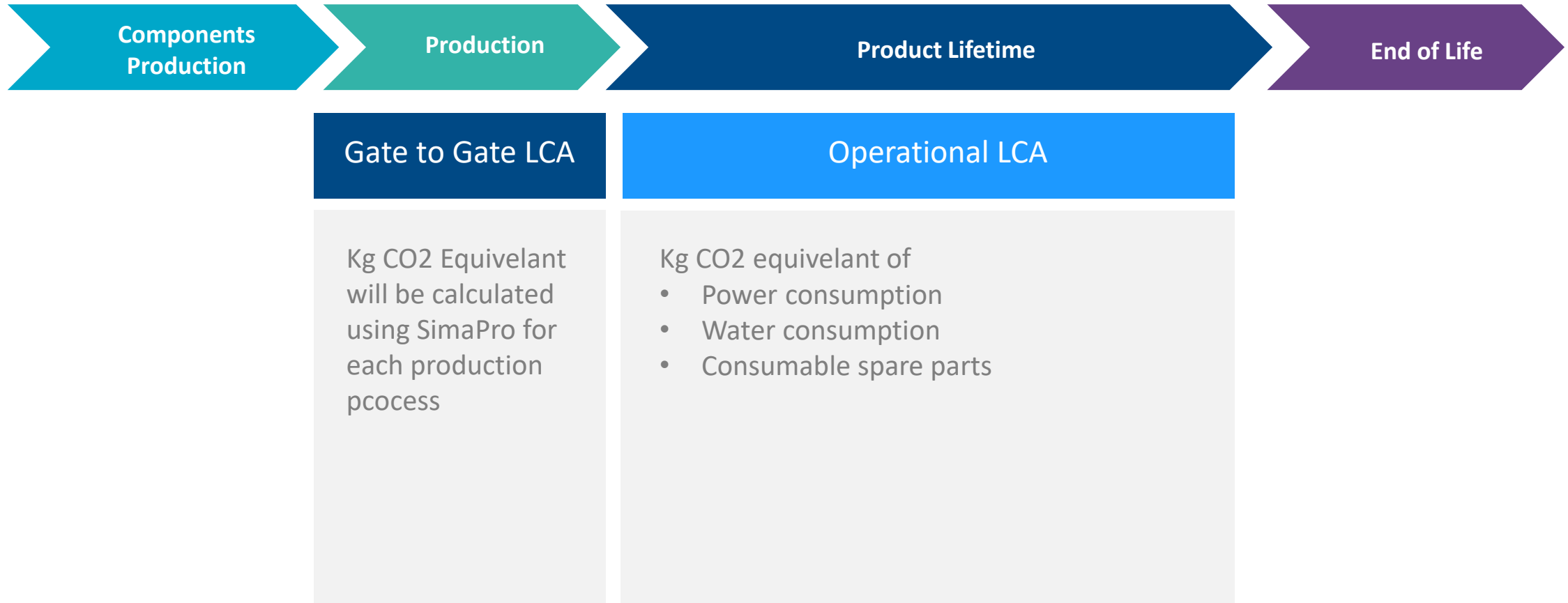
- ERE: key trend for increased Data Center efficiency.

$$ERE: : \frac{\text{Total Data Center Power usage} - *Energy Reuse}{\text{IT Equipment Energy}}$$

*\*Energy Reuse Coil is an option in all our new Effi-Cool AHU series.*

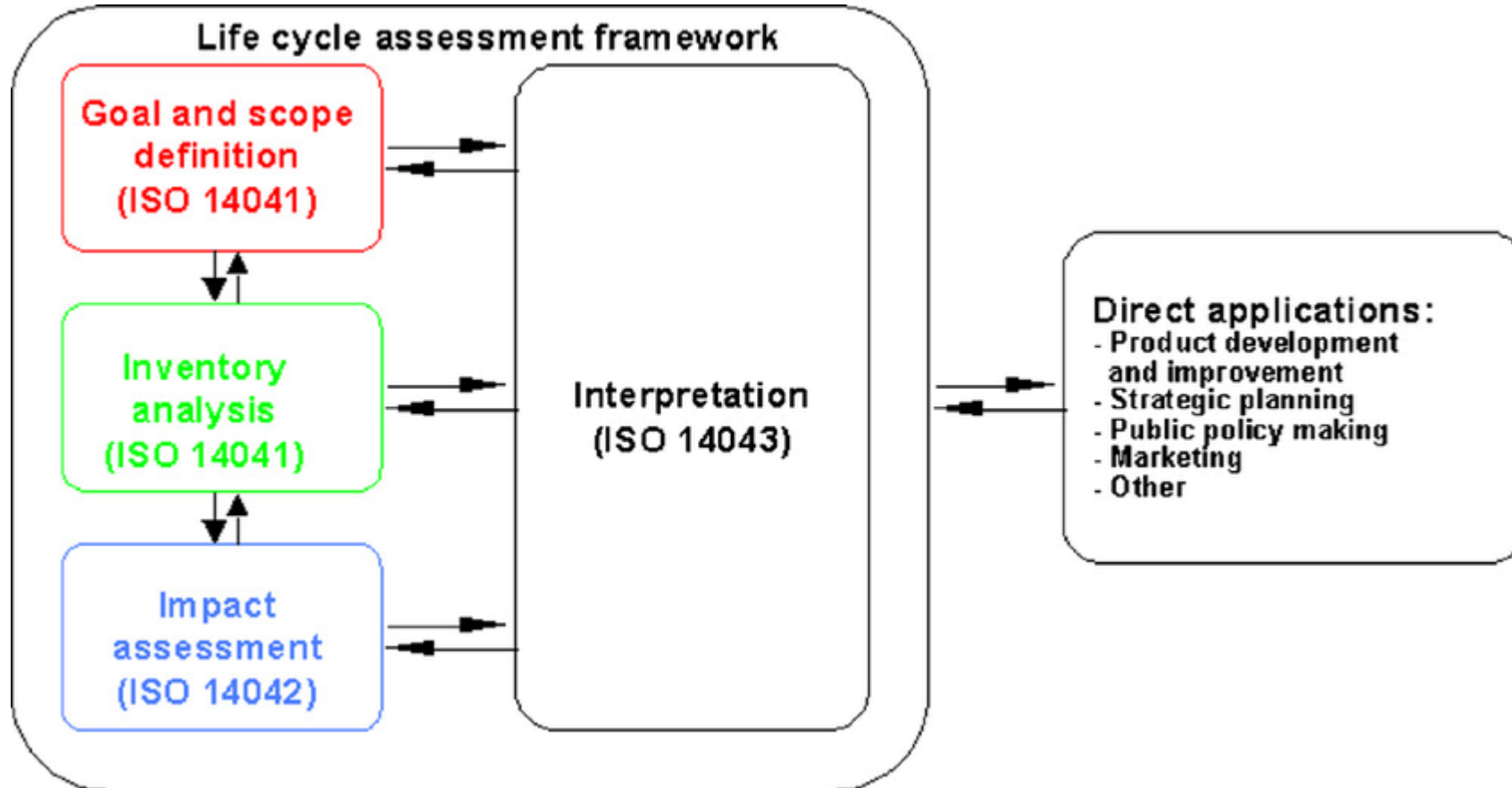
# Life Cycle Assessment

«Gate to Gate» or «Cradle to Grave»



# LCA Framework

Stages to follow in LCA study



## Final Outcomes of the Project

- Measured and verified carbon and water footprint data for Systemair data center cooling units and the new 365 Performance Center
- Holistic views on the environmental impacts
- Insight in how to improve processes to achieve reduced environmental effects both of the product and the production facility
- Basis for the EU Carbon Tax and the Green Deal related activities



# Studies for different product groups

## 2. Rooftop Units / EcoDesign & F-Gas Regulation

# Index

1. EcoDesign
2. F-Gas
3. Rooftop
4. R410A
5. Rooftop - R454B

# EcoDesign

## ENERGY RELATED PRODUCTS ErP



ECODESIGN  
DIRECTIVE  
2009/125



Energy Performance  
requirements for  
manufacturers



	ECO DESIGN	ECO LABELLING
LOT 1. Boilers, and burners	EU 813 / 2013	EU 811/2013
LOT2. Water heaters	EU 814 / 2013	EU 812/2013
LOT 10. Room air conditioners up to 12kW	EU 206 / 2012	EU 626 / 2011 EU 1254/2014
LOT 11. Electrical motors and fans	EU 640 / 2009 EU 327 / 2011	-
LOT 21. Rooftop, others air conditioners & VRF	EU 2016 / 2281	



### Minimum seasonal efficiency requirements

	Tier 1. Starting from 1 <sup>st</sup> Jan 2018	Tier 2. Starting from 1 <sup>st</sup> Jan 2021
$\eta_{sc}$ (SEER)	117% (3,00)	138% (3,53)
$\eta_{sh}$ (SCOP)	115% (2,95)	125% (3,20)



To achieve minimum seasonal efficiency requirements for rooftop units;

- EC Plug fan
- Heat exchangers with more heat transfer area and more efficient
- Multi-scroll compressor or variable speed compressor

To achieve SCOP target value is much more challenging due to transient conditons because of defrost mode

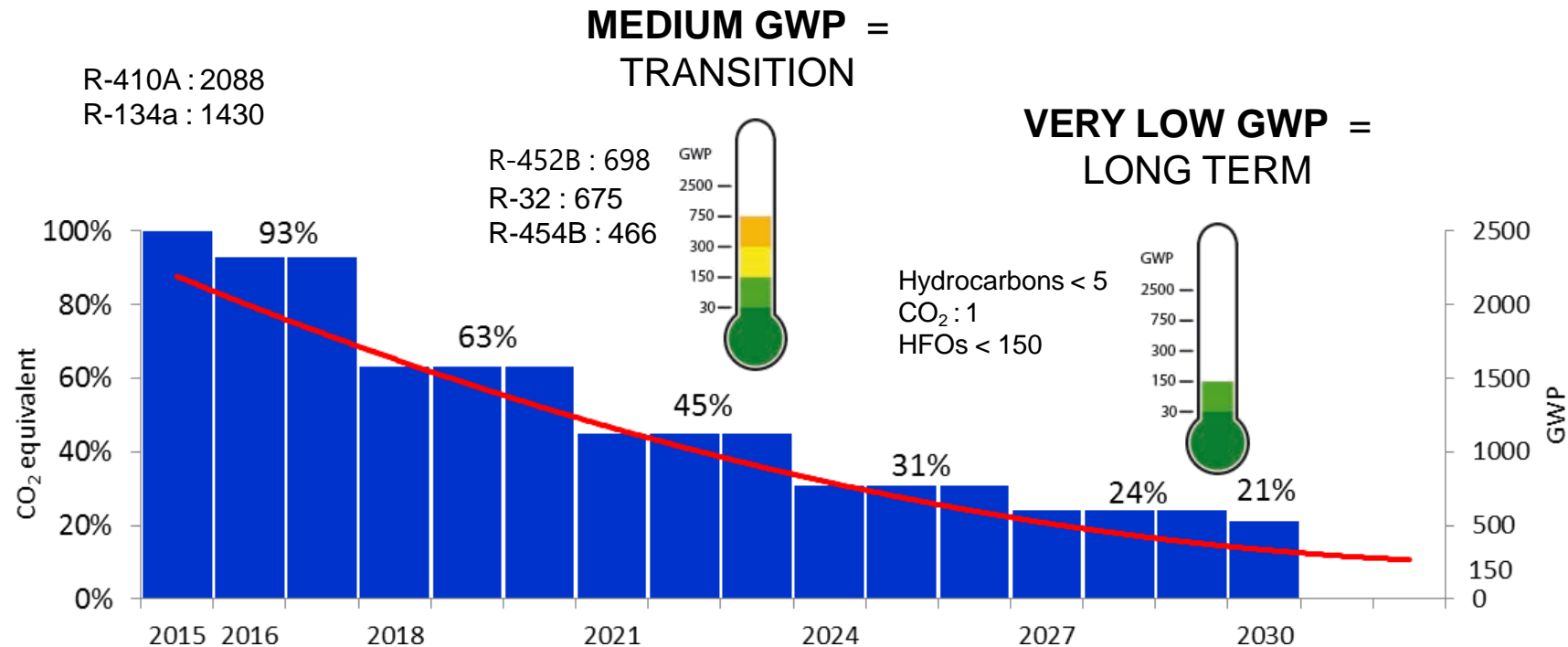
# F-Gas

- EU 2015 F-gas regulation**

- ▶ Refrigerant price driven by GWP value & Quotas
- ▶ Complexity & cost to import equipment in the EU from 2017

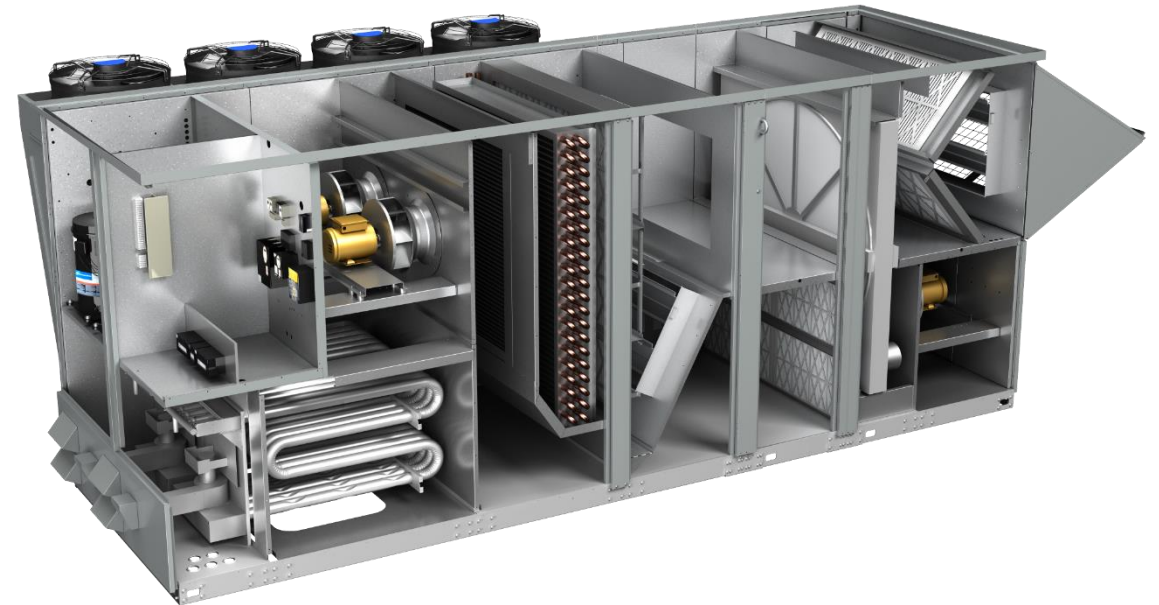
- Local regulations**

- ▶ Taxes in Nordic, Spain, Poland & France
- ▶ Restrictions/bans in Switzerland & Denmark



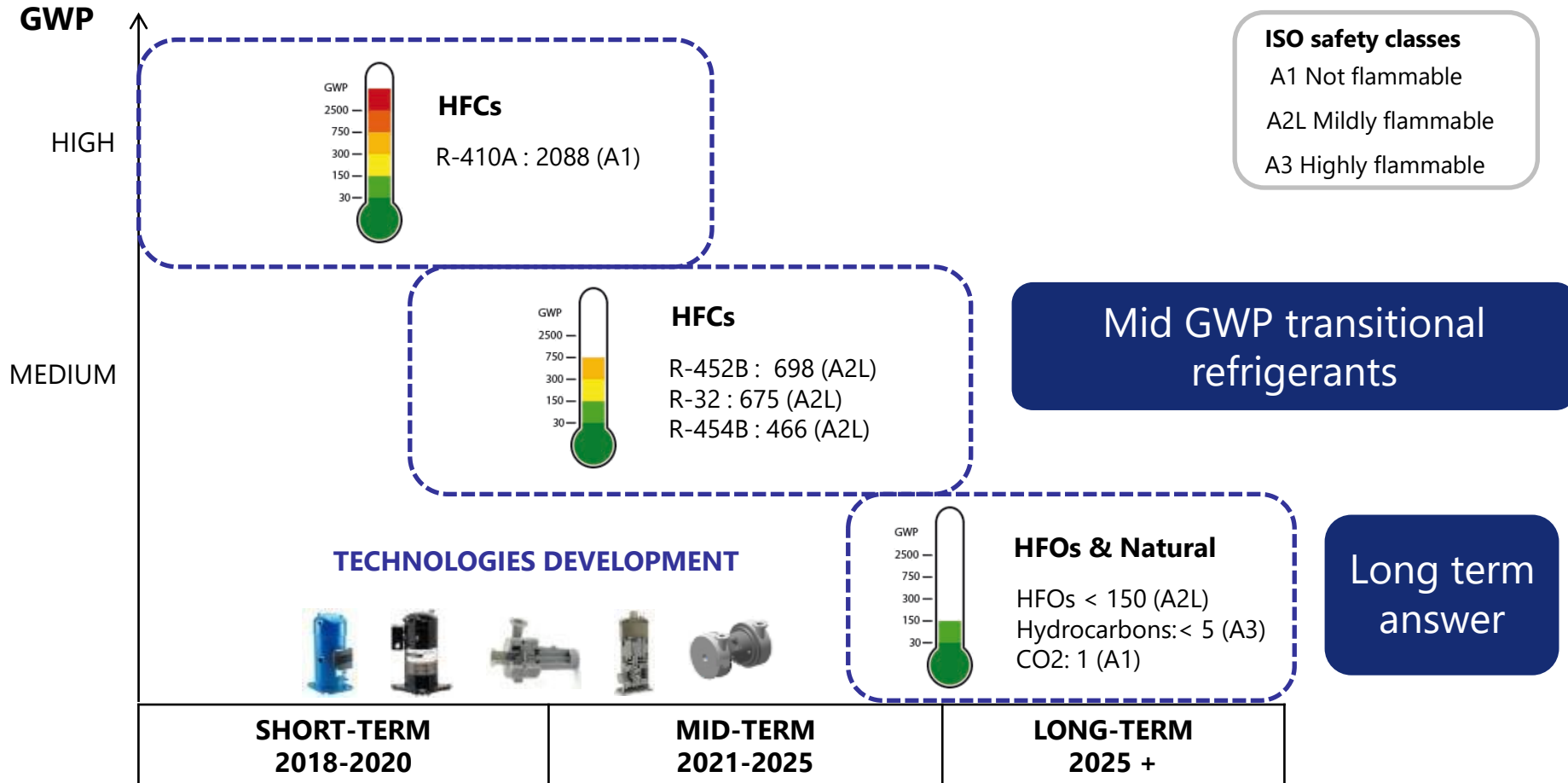
## Rooftop

- A **rooftop** is a unitary system installed outdoors and provides air conditioning of indoor air through ducts with the ability to supply heating, cooling and ventilation in one packaged air to air unit.
  - Coils (Evaporator/Condenser)
  - Compressor
  - Expansion Valve
  - Fans





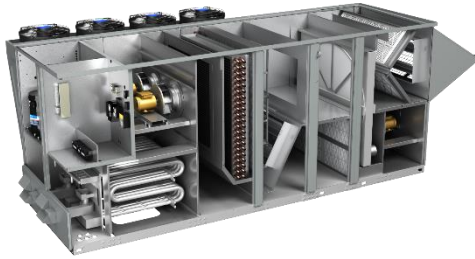
# R410A



# Rooftop-R454B



R410A platform



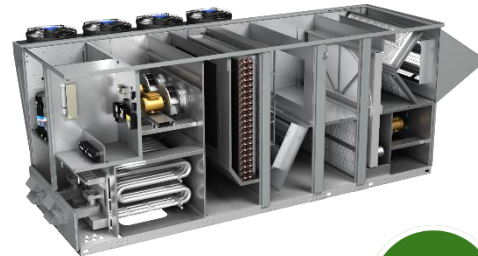
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Multi-refrigerant R454B leak sensor PED Category III



# Rooftop-R454B



**80% less  
CO<sub>2</sub> footprint\***

R-454B helps protecting the environment and preserving HFC quotas.



**Up to 3% more  
energy efficient\***

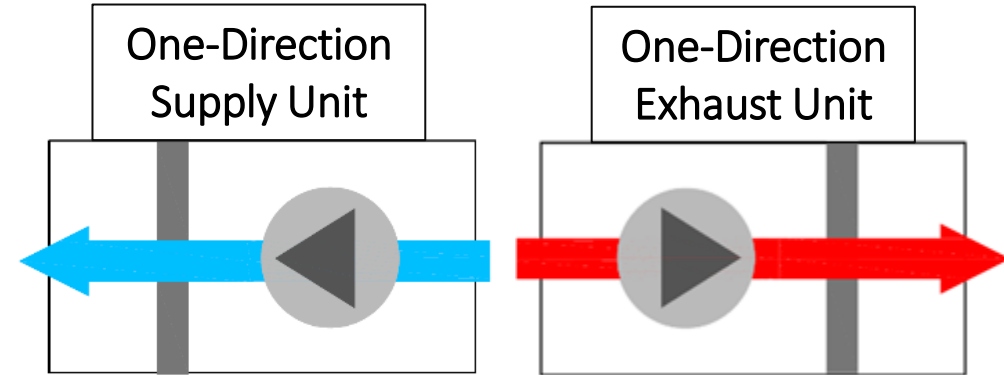
and suitable  
for all climates.

\* Compared with R-410A

## 2.A ERP 2018

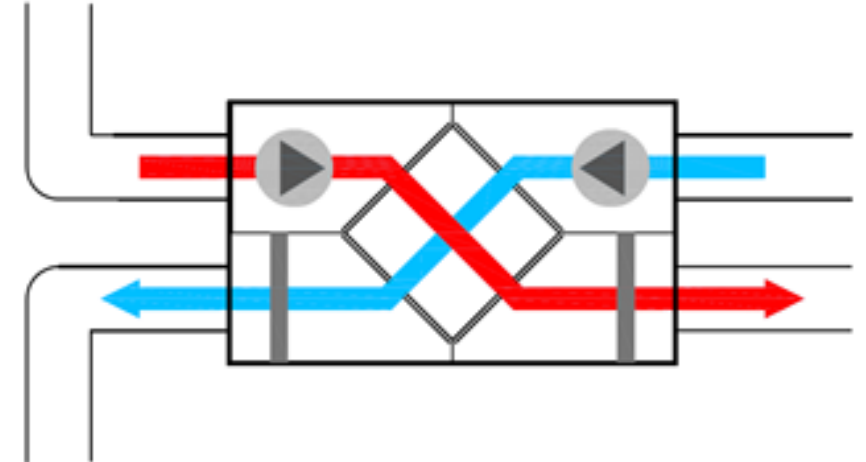
One-Direction Ventilation Units ( UVU - Unidirectional Ventilation Unit):

- The airflow is unidirectional (fresh air or exhaust only).
- One or more fans can be used in the device in the same air line.



Bidirectional Ventilation Units (BVU - Bidirectional Ventilation Unit):

- Air flow is carried out bidirectionally, from inside to outside (exhaust) and from outside to inside (supply).
- RVU units must have a thermal by-pass feature in order to increase efficiency.
- NRVUs must have a heat recovery system with thermal bypass. The heat recovery system must be tested according to EN 308.



## 2.A ERP 2018

**In Europe**, this regulation entered into force on **January 1, 2016** for the first stage and on **January 1, 2018** for the second stage.



**In Türkiye**, this regulation entered into force on **October 01, 2021** (SGM 2021/19)



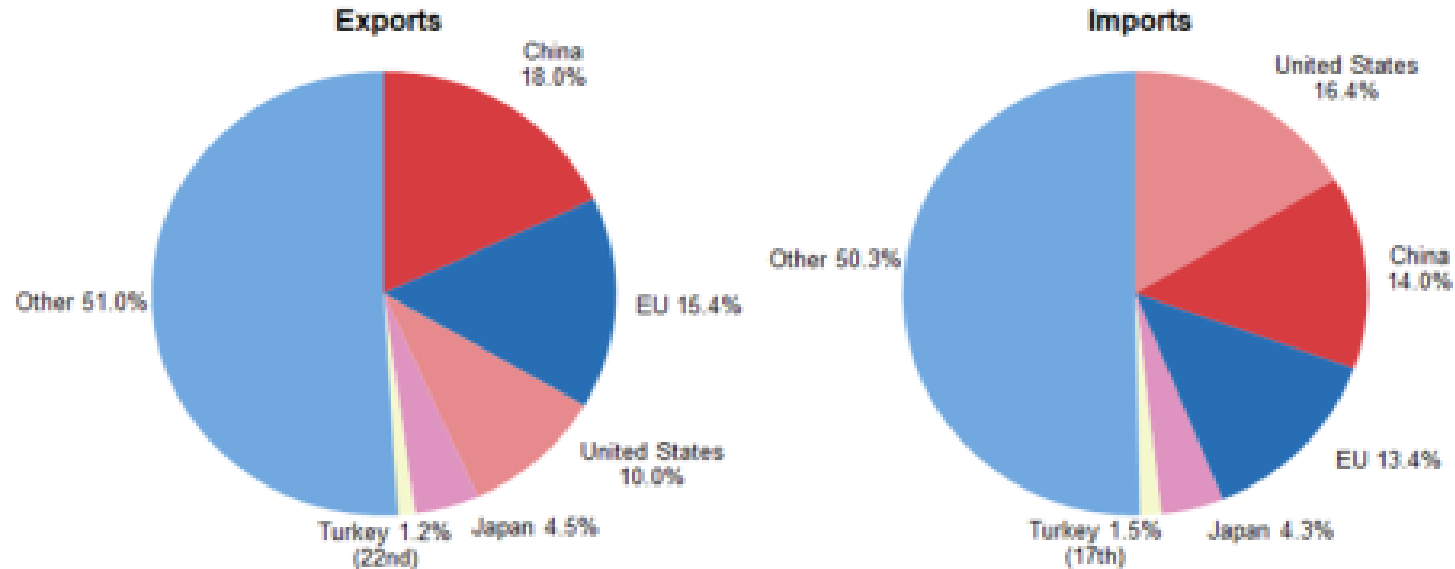
**January 1, 2022**, "Ministry of Industry and Technology" purchased residential type heat recovery units from manufacturers **in Turkey** and tested in TUV laboratories





## 3.A EXPORT POTENTIAL AND OPPORTUNITY FOR TR MANUFACTURERS

**Turkey among the world's largest traders of goods, 2020**  
(% share of world exports/imports)



Source: Eurostat (online data code: ext\_it\_introeu27\_2020) and UNCTAD

## 3.A EXPORT POTENTIAL AND OPPORTUNITY FOR TR MANUFACTURERS

- Likewise, Turkey is the EU's 5th largest trading partner and an important export market.
- Like other EU stakeholders and business partners, Turkey will be directly and directly affected by the Green Deal.
- The effects of the Green Deal will create both opportunities and threats for companies.
- Understanding what the Green Deal aims to achieve and with which tools it plans to achieve this goal is the first and most important step for us to adapt to the green transformation.



## 3.A EXPORT POTENTIAL AND OPPORTUNITY FOR TR MANUFACTURERS








### Opportunities

- It may create an opportunity for Turkey to support low-carbon production and thus increase its market share in exports to EU countries by gaining an advantageous position compared to high-carbon countries.
- It is also possible for businesses that will adapt quickly to the Green Deal targets to gain a relative competitive advantage.



## 3.A EXPORT POTENTIAL AND OPPORTUNITY FOR TR MANUFACTURERS

What needs to be done to create opportunities?

-  Preparations should be made for the carbon regulation at the border and the regulations to be issued by the EU in this regard should be followed closely.
-  Establish a system for measuring and reporting carbon emissions regularly
-  Carbon emission accounting should be created within the company and the additional costs of the carbon tax should be revealed.
-  Clean and renewable energy should be preferred in both production and distribution processes.
-  By using modern technologies, carbon emissions, energy consumption and waste should be reduced.
-  Sustainable and recyclable materials should be used in production processes
-  New investments should be made taking into account the Green Deal targets and carbon emission rates.

## 3.B RETROFIT

HVAC accounts for around 50% of a building's operating energy consumption and HVAC retrofits can account for 40-70% of savings. Reducing this consumption can provide both energy and cost savings as part of the retrofit process, and is therefore a main focus of many green retrofits, especially in colder climates where space heating accounts for over 60% of energy use.



- Many factories can provide this by replacing Air Handling Units, VRF, Chiller, and heat recovery units in the existing ventilation system with new generation units.
- For example, unit fans can be changed as EC fans, systems with fixed compressors can be replaced with systems with inverter compressors, R32, R454B, R452B gases can be preferred as the refrigerant gas used. Even these changes are an indication of a great innovation.

## 3.C APPLICATIONS IN TURKEY

If we categorize the HVAC manufacturers in our country in 3 categories;

- 1- HVAC companies that are globally known in more than one country and also in Turkey
- 2- Companies associated with production in Turkey and exporting to Europe
- 3- Companies that make production in Turkey and do not have a connection with Europe