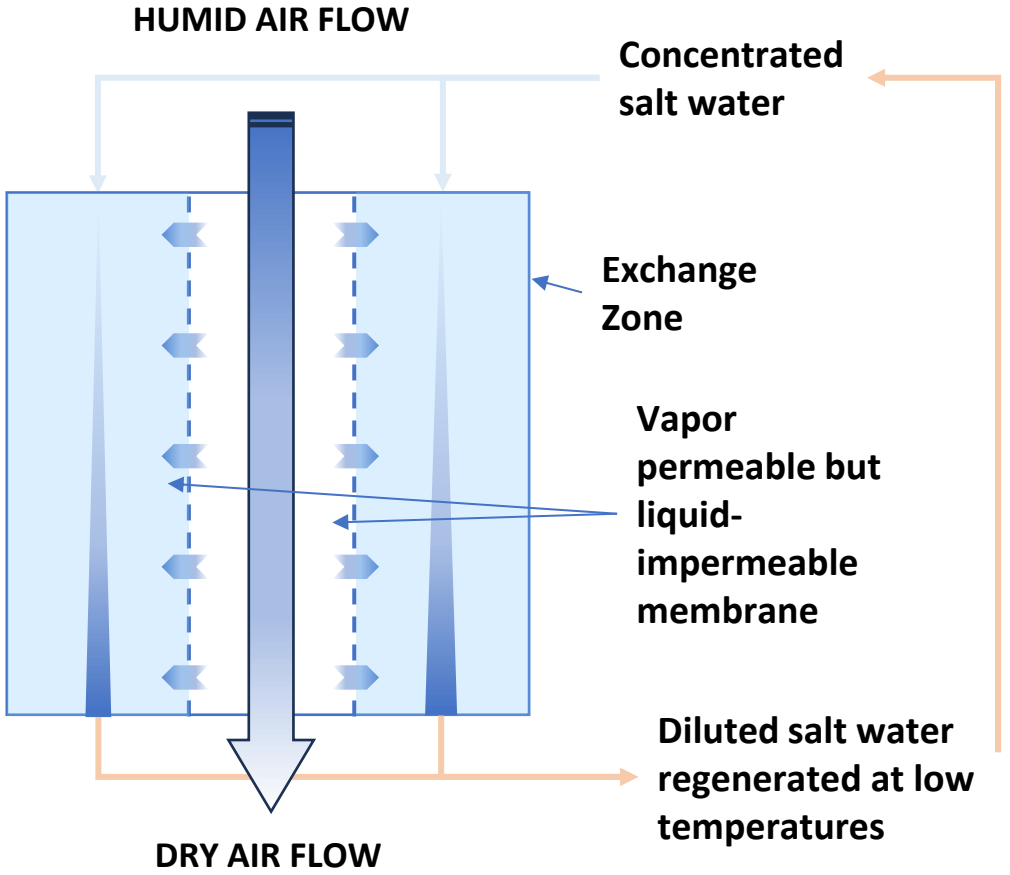
NEODRY

Energy-efficient dehumidification
Reduce your electricity consumption by 50% to 75%

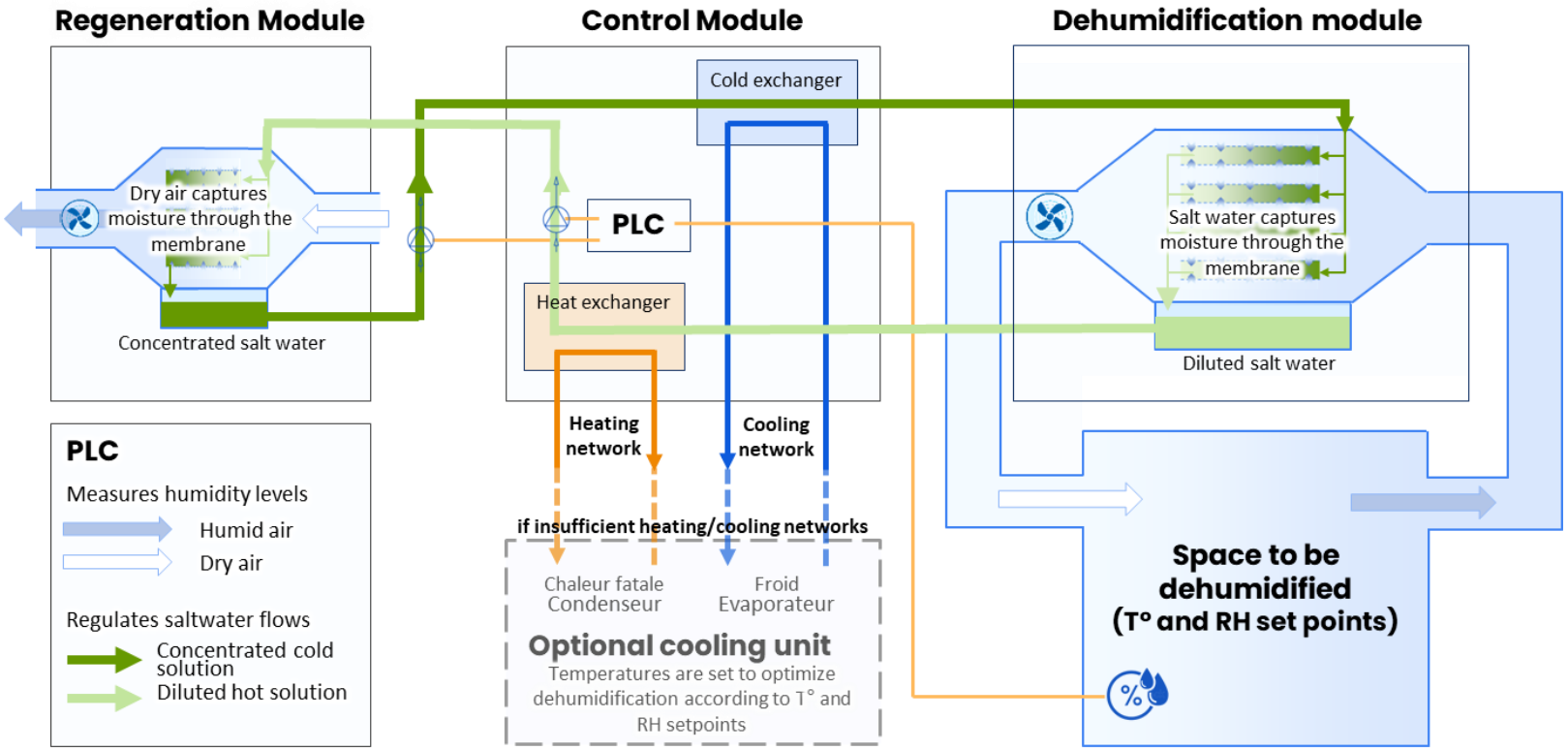
AIR TREATMENT

NEODRY

Water vapour in the air passes through the membrane



OPERATIONAL LAYOUT



PERFORMANCES 1/2

- **Dehumidifies** the air in a room **precisely at a constant temperature** in outdoor conditions between -15°C and +40°C
- Can achieve a **very low absolute humidity level (up to 1 g/Kg - dry air)** at any room set temperature
- Dehumidification possible at **negative dew temperatures** without doubling systems for continuous operation
- **Simultaneous cooling** of dehumidified air possible **without overconsumption** for regeneration

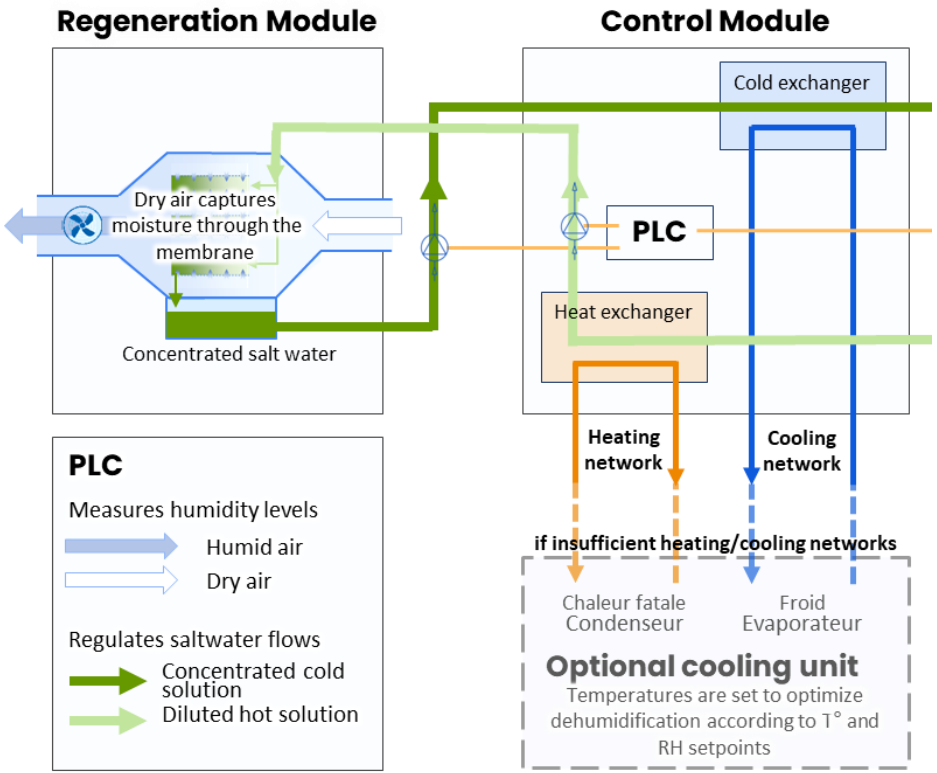
PERFORMANCES 2/2

- **High energy efficiency**
  - Dehumidification by desiccant solution at room temperature
  - Regeneration at very low temperatures (between 30°C and 40°C)
  - Thus reduces the carbon footprint

- **Simplified installation management**
  - BMS connection via Modbus
  - Built-in alarm detection and management
  - Very quick return to instructions

- **Simplified maintenance**
  - Inexpensive polymer membrane, easily replaceable
  - CaCl2 desiccant solution for food and beverage compatibility

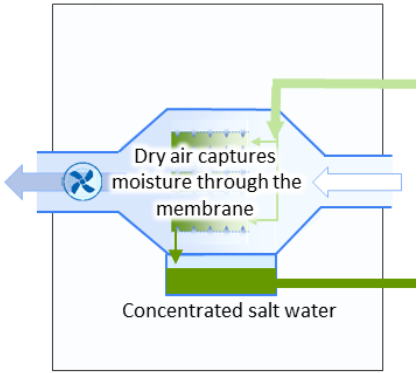
ENERGY SAVINGS 1/3



- ✓ The **regeneration** of the desiccant solution takes place at temperatures of the **order of 30-40°C**. This heat is directly available on the condenser of the refrigeration unit and therefore at **no extra cost**
- ✓ Low regeneration temperature contributes to up to **4x lower power consumption** than desiccant wheels
- ✓ Regeneration is decoupled from the blowing, so **it does not penalize the temperature regulation** of the dry air

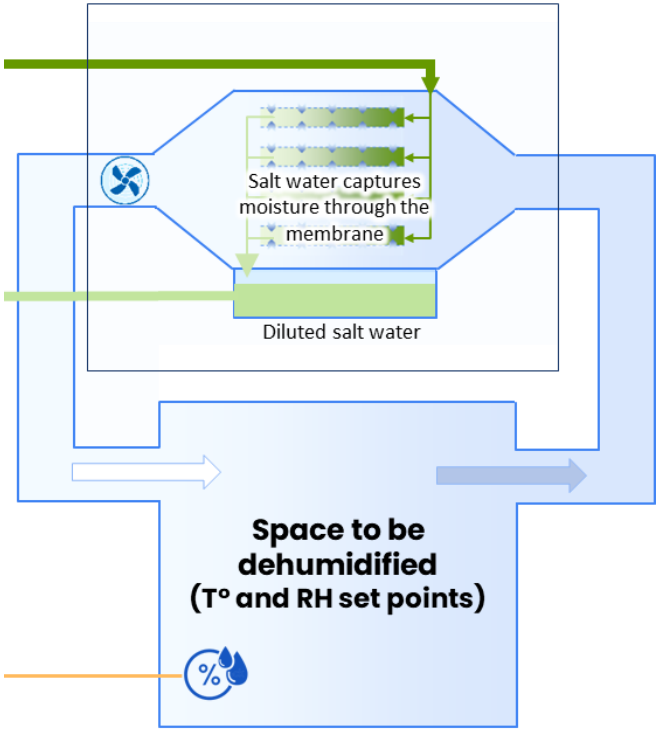
ENERGY SAVINGS 2/3

Regeneration Module



✓ **The pressure drop is limited,** which optimizes the sizing of the fans

Dehumidification module

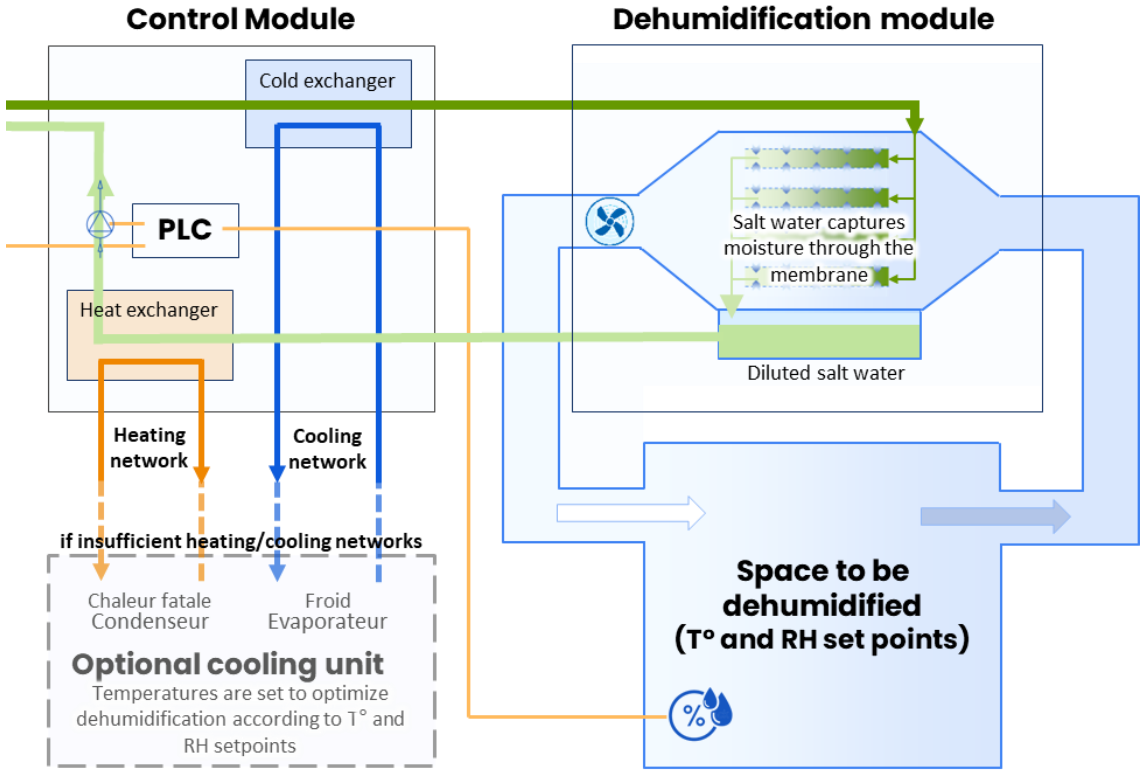


✓ The regeneration does not interfere with the flow of cooled air, which does **not cause overconsumption** on the cold

ENERGY SAVINGS 3/3

- ✓ **Air cooling is possible** by lowering the water temperature

- ✓ **Cooling power is useful** for dehumidification and room temperature. **This relieves existing refrigeration systems**



USE CASE #1

Poultry Cutting Plant

Control targets:

- Temperature maintained at 2°C and 70% relative humidity (3g/kg)
- Continuous operation with an air flow rate of 15,000 m3/h

Operating Parameters

- Cold solution temperature: -6°C (supplied per cooling unit)
- Hot solution temperature: 35°C (heat recovery from the refrigeration unit condenser)

Energy comparison

	DESICCANT WHEEL	NEODRY
ANNUAL CONSUMPTION	192 MWh *	48 MWh
ENERGY SAVINGS		**75%**

Reference technology: Desiccant wheel
*Based on Munters MLT30 data sheet

USE CASE #2

Yeast Manufacturing Plant

Control targets:

- Absolute humidity: 4g/kg (Air pre-dehumidified to 6g/kg per cold battery
- Continuous operation with an air flow rate of 15,000 m3/h

Operating Parameters

- Cold solution temperature: -6°C (supplied per cooling unit)
- Hot solution temperature: 35°C (heat recovery from the refrigeration unit condenser)

Energy comparison

	DESICCANT WHEEL	NEODRY
ANNUAL CONSUMPTION	556 MWh *	224 MWh
ENERGY SAVINGS		**60%**

Reference technology: Desiccant wheel
*Based on Munters MX280 datasheet

PILOT UNIT

Ice cream manufacturing site

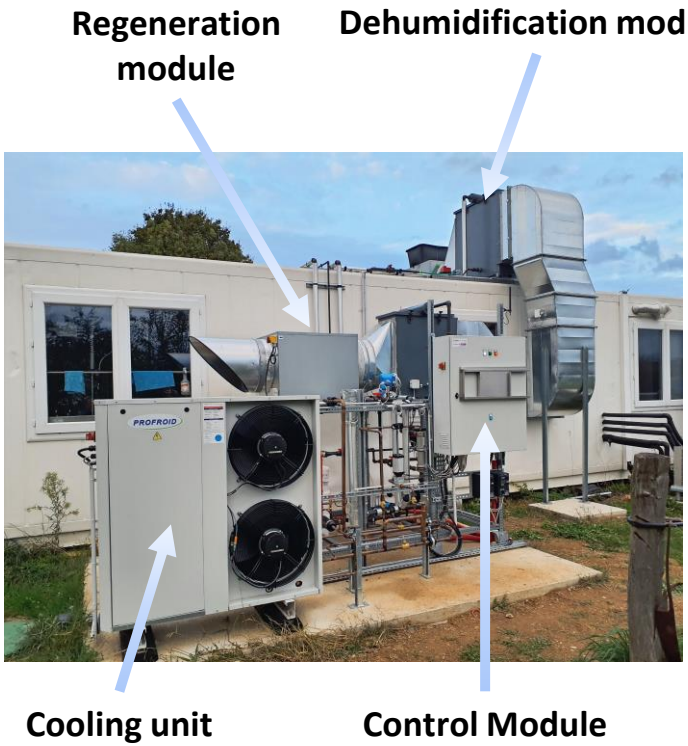
Control targets:

- T° maintained at 15°C
- 60% relative humidity (6.3 g/kg)
- Continuous operation with an air flow rate of 5,000 m3/h

Operating Parameters

- Cold solution temperature: -3°C (supplied by the cooling unit)
- Hot solution temperature: 35°C (heat recovery from the cooling unit condenser)

PILOT UNIT



In operation since January 2024

Operational status:
- Membrane Condition: NTR
- Nozzle Status: NTR

Estimated lifespan of more than 3 years

Consumption report

	AHU	NEODRY
ANNUAL CONSUMPTION	16MWh *	6,5 MWh *
ENERGY SAVINGS		**60%**

Reference technology: AHU with cooling and heating coils

*Based on on-site power measurements when both systems are operating at full load

LES AVANTAGES

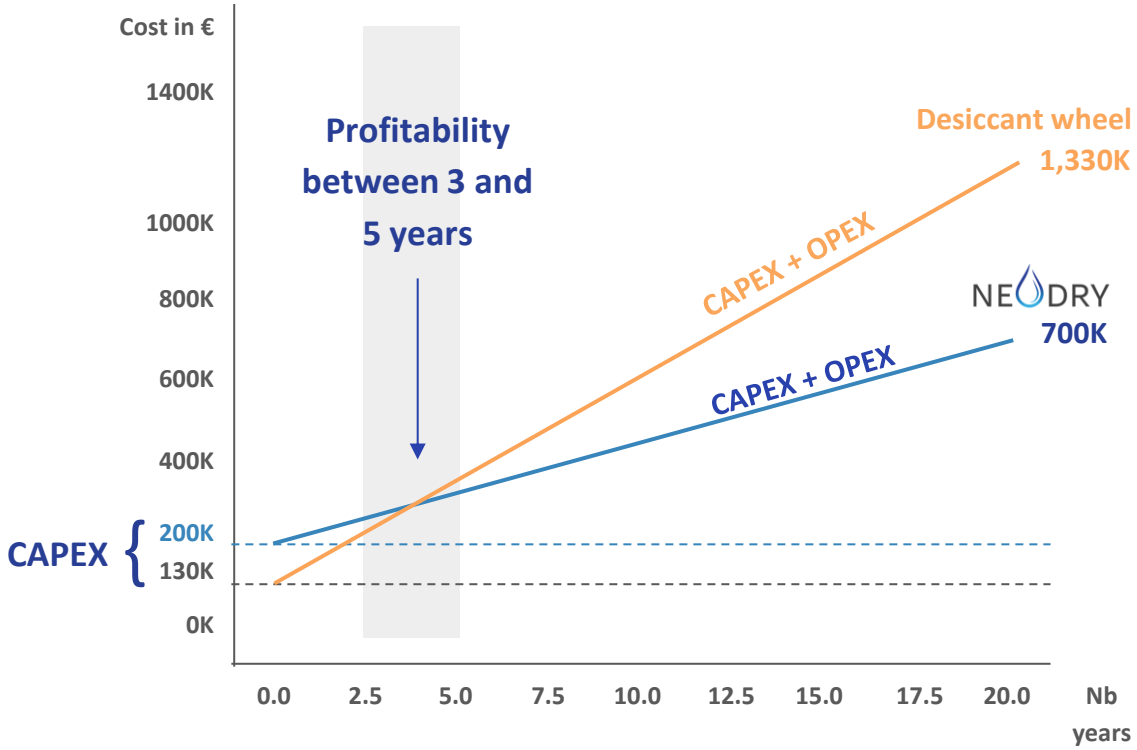
	ADSORPTION DESICCANT WHEEL	NEODRY
Performance	High efficiency at low temperatures (< 10°C)	
Performance	Very low absolute humidity at any temperature	
Operations		**Simultaneous cooling possible**
Operations		**Very quick return to setpoints**
Operations		**Simplified maintenance**
Installation	Humid air outlet required	**Regeneration module can be placed outdoors**
Electricity consumption		**50% to 75% lower**

AN INVESTMENT TO REDUCE THE CARBON FOOTPRINT

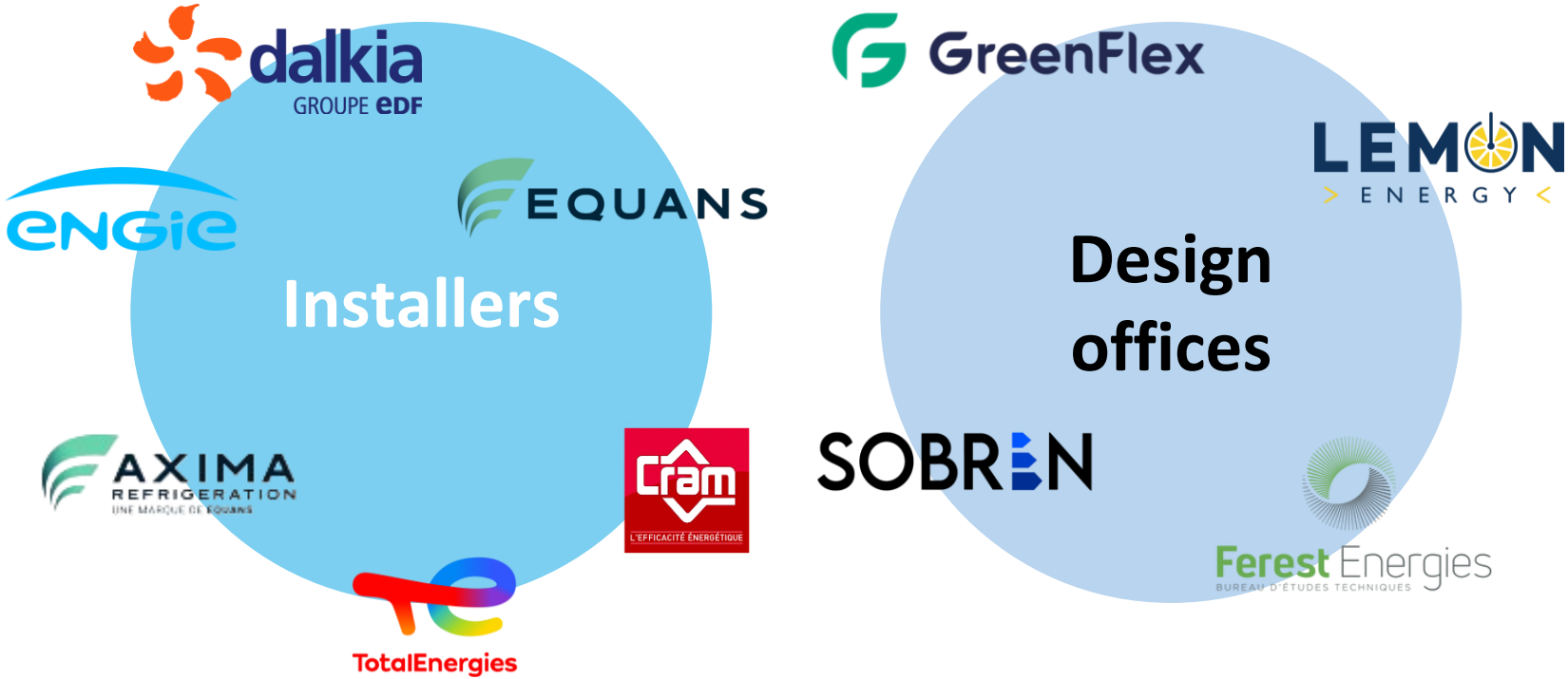
With a larger investment at the start

NEODRY becomes more economical after **3 to 5 years**

Calculation based on €180/MWh electric.



PARTNERS


dalkia
GROUPE EDF
ENGIE
EQUANS
Installers
AXIMA
REFRIGERATION
UNE MARQUE DE EQUANS
Cram
L'EFFICACITÉ ÉNERGÉTIQUE
TotalEnergies
GreenFlex
LEMON
ENERGY
Design
offices
SOBREN
Ferest Energies
BUREAU D'ÉTUDES TECHNIQUES

ROADMAP

Performance and connectivity

A.I.

Digital twin optimization and deep learning

Supervised mode

Connected monitoring for predictive maintenance

DELIVERY TIMES

- Quote in 2 weeks after visit
- STEM modules (dehumidification, regeneration and control) in 12 to 16 weeks after ordering
- PLC (automation) provided by STEM or by the installer

CONCLUSION

The **best solution** to achieve low humidity levels and/or with an operating temperature <10°C **while significantly reducing your energy bill**

STEM SAS

Contact us:
sales@stem-tech.fr