



**CLEAR  
ENERGY**

**INNOVATIVE BIO-LNG  
PRODUCTION TECHNOLOGY  
W/O THE USE OF REFRIGERANTS**

**VIENNA, 27 SEPTEMBER 2023**



# BIOMASS CHP PLANTS

Total installed power

**22.4**

MW

Total annual production

**170**

Million kWh

**22**  
RE  
FACILITIES

# CENTRAL HEATING PROJECTS

Total installed power

**71.5**

MW

Total annual production

**260**

Thousand Gcal





# LANDFILLS DEGASATION AND WASTE MANAGEMENT PROJECTS



Total installed power

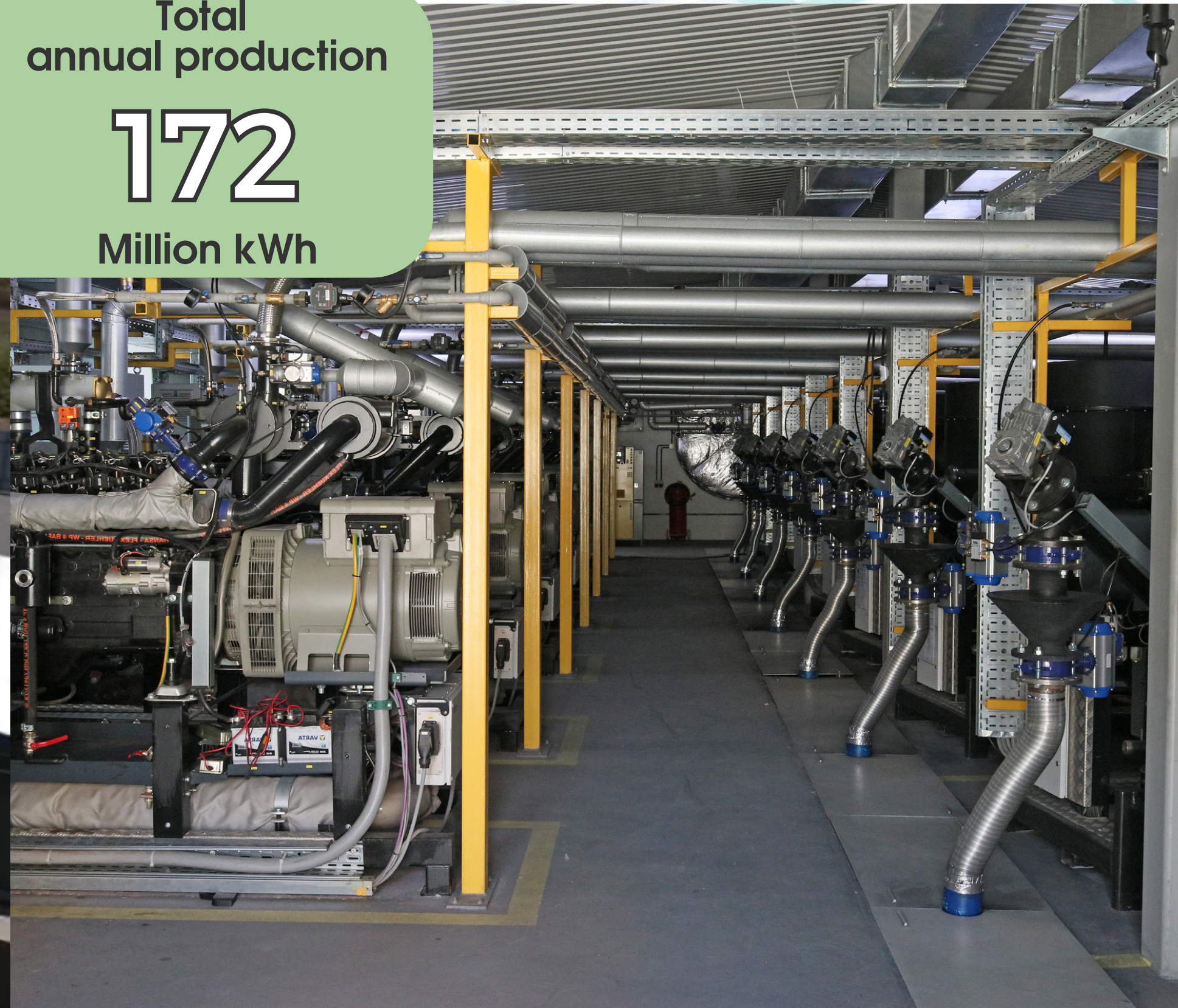
**21**

MW

Total annual production

**172**

Million kWh





# EUROPEAN DIVISION OF CLEAR ENERGY



## RSE - Czech power generation equipment manufacturer

### PRUMYSLOVESTA

- Industrial hot water boilers 3 - 20 MW
- Industrial steam boilers 1 - 25 t/hour
- Thermal oil boilers 1 - 15 MW
- CHP plants with ORC cycle
- GAS-engine CHP module 300 - 3000 kW
- Biomethane liquefaction equipment





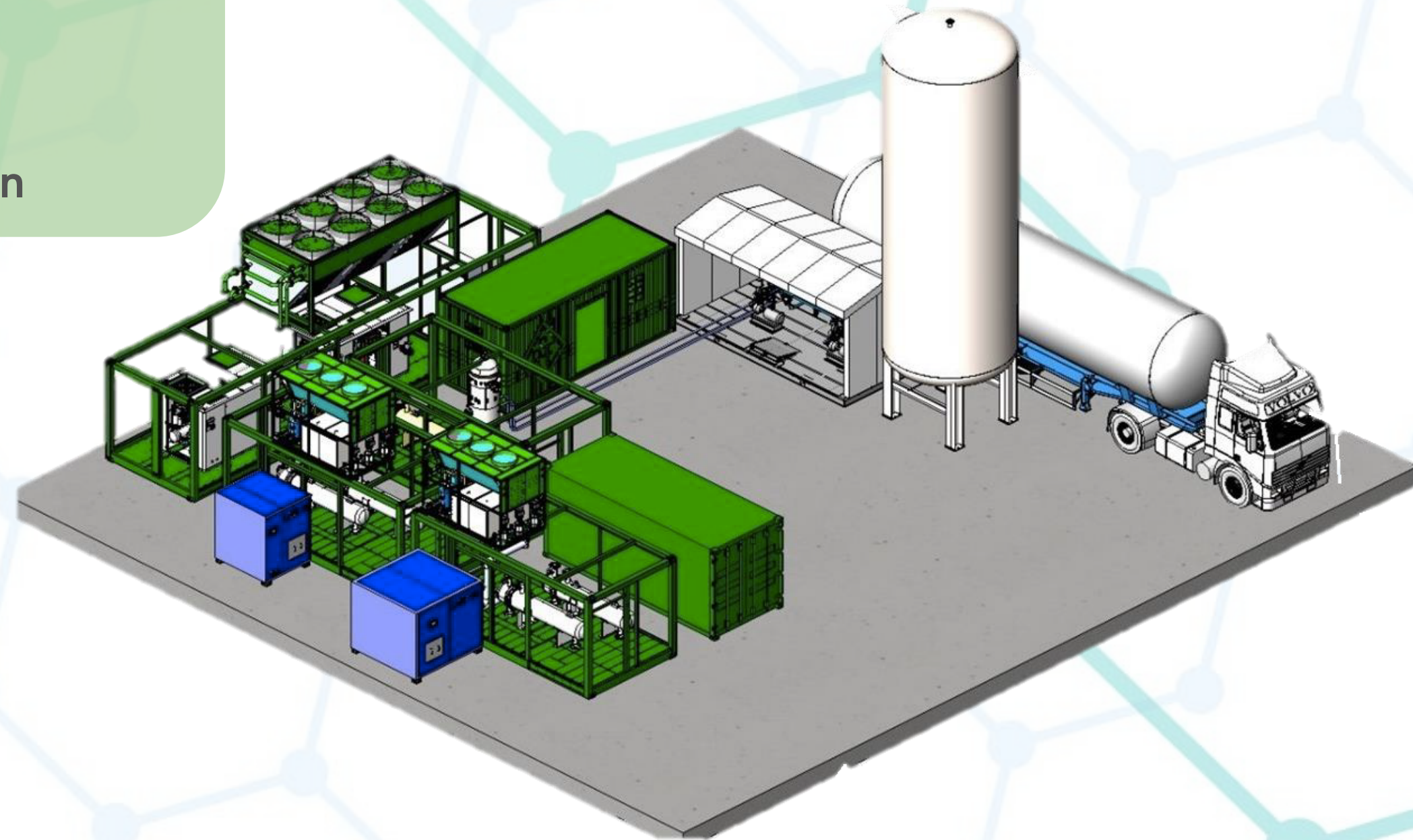
# REFRIGERANT – NATURAL AIR



**NATURAL** refrigerant  
**ZERO** ODP  
**ZERO** GWP  
**NO** environmental regulations  
**FOREVER** free of charge  
**LOW** temperatures (down to  $-160^{\circ}\text{C}$ )  
**GREATER** efficiency at low temperatures  
**MORE** economical than Liquid Nitrogen

**R729**  
GWP 0

**F - Gas 0**





# THE HEART OF SYSTEM IS MIRAI TURBO-MODULE



## COMPRESSOR AND EXPANDER

- Sharing one shaft

## ENERGY RECUPERATION

- Expander → Compressor
- Up to 30 % of energy savings

## USE OF AIR BEARINGS

- No contacting pairs
- No oil
- No wear

### Compressor OUTLET

high pressure  
high temperature

### Expander OUTLET

low pressure  
ultra-low temperature

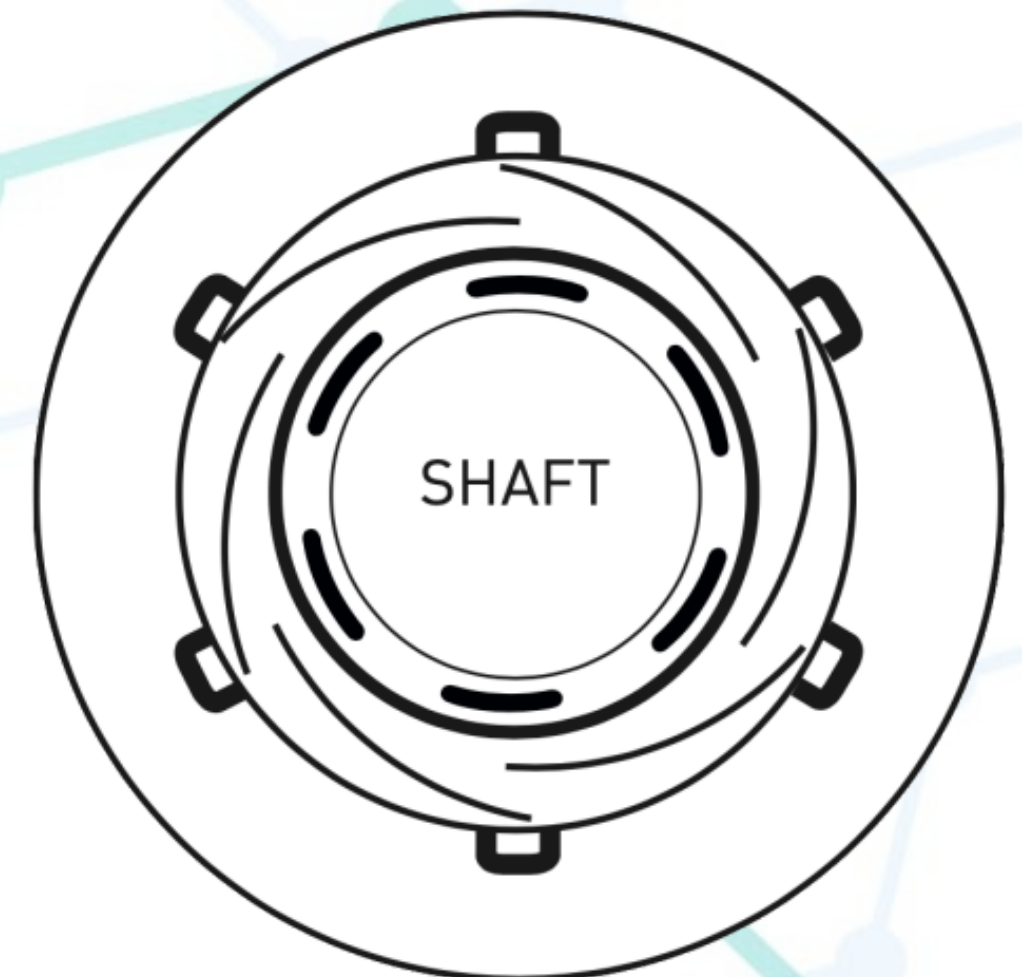
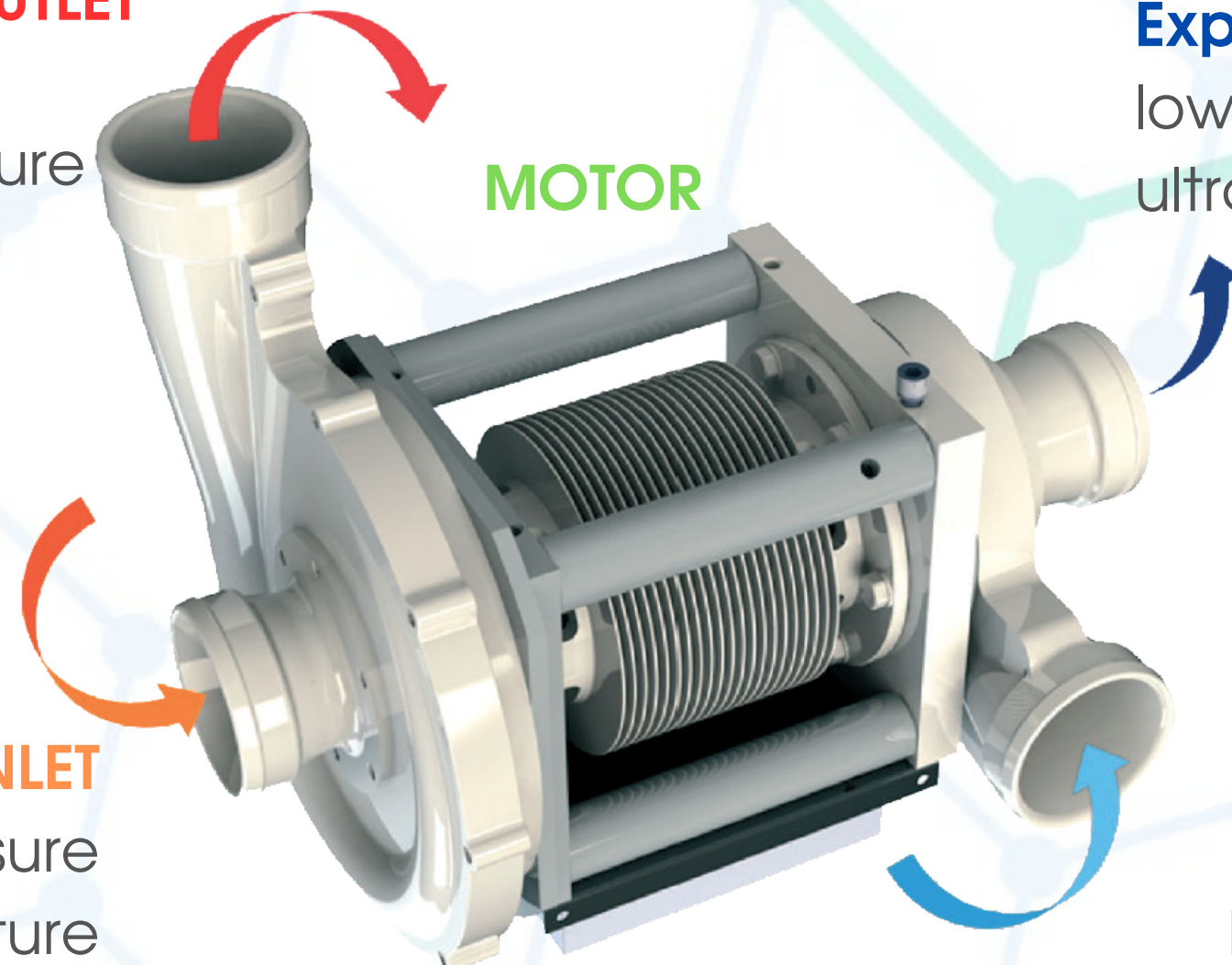
### MOTOR

### Compressor INLET

low pressure  
low temperature

### Expander INLET

high pressure  
low temperature



**EFFICIENCY** - down to 0.7 kW/kg



# THE MAIN ADVANTAGES OF OUR EQUIPMENT FOR BIOMETHANE LIQUEFACTION TO BLNG



- ENVIRONMENTALLY FRIENDLY
- ENERGY EFFICIENCY
- REDUCTION OF OPERATING COSTS
- SAFE SOLUTION
- STABILITY OF WORK
- TEMPERATURE STABILITY
- NO VIBRATION OR NOISE
- COMPLIANCE WITH LEGISLATION

**BIO-LNG from 3 to 20 tons per day**







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ENERGY**

**THANK YOU FOR YOUR ATTENTION**