



# NATURAL GAS EXPANSION TURBINES

Enertime expansion turbines improve the energy efficiency of natural gas expansion stations.

Industrial gas consumers, gas transportation and distribution networks can use gas expansion energy to generate power and cold.

Their grid intake reduction is combined with lower operation cost and environmental footprint.

Enertime developed its own gas expansion technology that guarantees a high isentropic turbine efficiency and a capacity to offer tailor-made solutions to meet the needs of its customers.

Enertime solution has been designed to exploit the energy which is lost during pressure letdown, while ensuring the quality of supply to the end customer (flow, pressure and temperature required by the latter).

## APPLICATIONS:

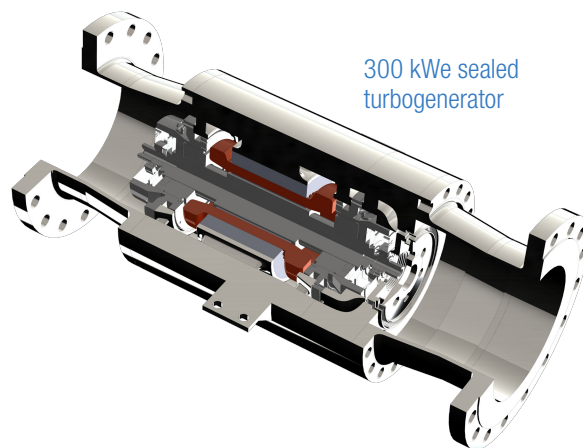
- Gas letdown stations to distribution networks
- Gas letdown stations to industrial consumers
- Simultaneous electricity and cold production

## POSSIBLE SCOPE OF SUPPLY:

- Turbo-generator and auxiliaries, safety valve
- Complete system

## POSSIBLE FUNDING SUPPORT:

- Eligible to Energy Savings Certificates in some countries
- Self-consumption incentives
- Regional, national and European grants



Enertime axial multistage turbine

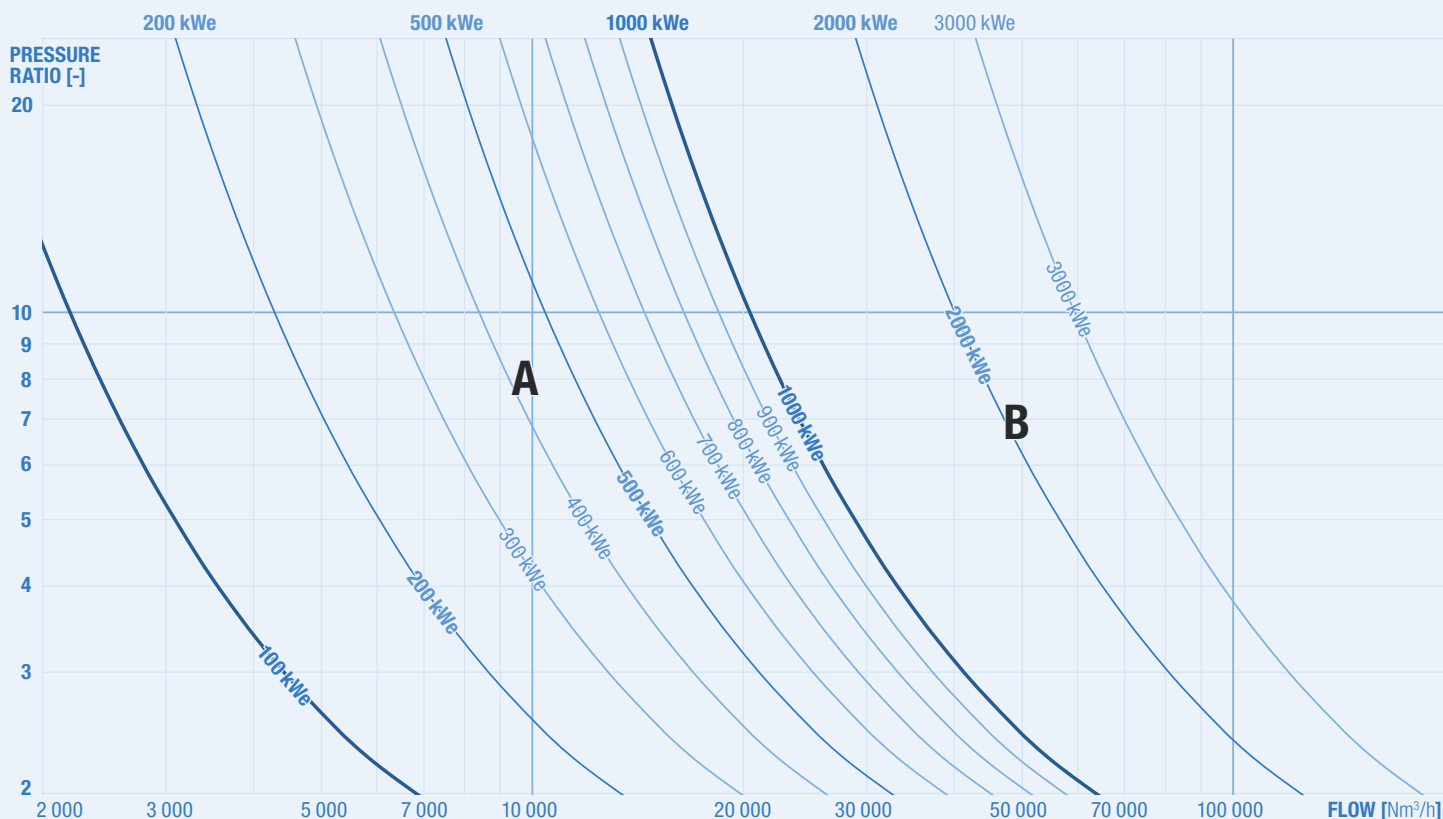
## BELOW 1 MWe :

- Completely sealed multistage turbo-generator
- High speed generator cooled by the natural gas
- Active Magnetic Bearings

## ABOVE 1 MW :

- Multistage overhung turbine assembled on reducing gear
- Gear shafts supported by hydrodynamic bearings
- Coupled to a 2 or 4 poles generator (synchronous or asynchronous)
- Dry gas seal (tandem or double pressurized)

# GAS EXPANSION POTENTIAL



## AN EFFICIENT SYSTEM:

- Turbine efficiency above 80%
- High part-load efficiency
- Modular configuration
- Lifetime above 20 years

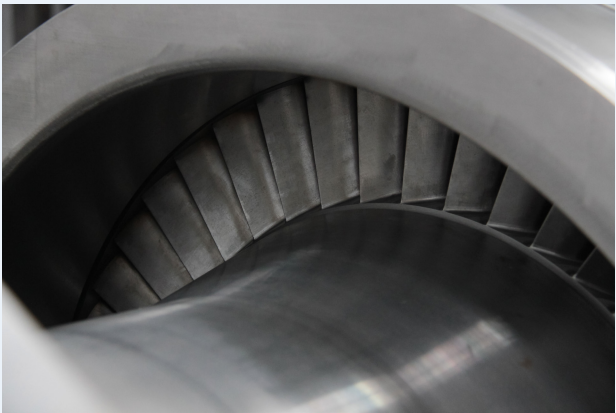
## FULLY AUTOMATED:

- Automatic start and stop
- Load control
- Advanced Power Electronics
- Unattended operation
- Low operating costs
- Limited maintenance required

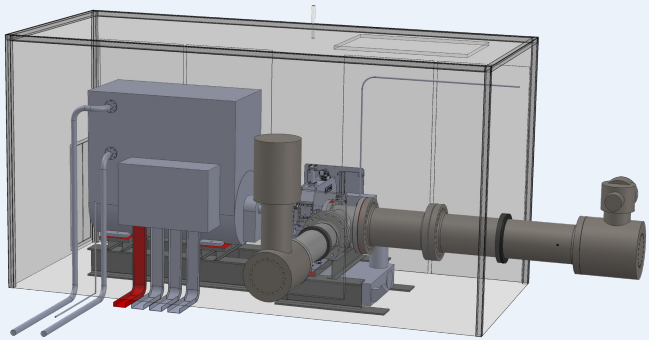
## FLEXIBLE:

- Large operating range (50% to 110% load)
- Simple and compact design

EXAMPLES	UNIT	CASE A	CASE B
FLUID	-	Natural gas	Natural gas
FLOW	Nm³/h	10 000	50 000
INLET PRESSURE	bar	40	70
INLET TEMPERATURE	°C	30	50
OUTLET PRESSURE	bar	5	10
PRESSURE RATIO	-	8	7
ELECTRIC OUTPUT	kWe	400	2000
COLD PRODUCTION	kWth	470	2350



Enertime axial multistage turbine



2.5 MWe expansion turbogenerator  
Villiers le Bel, France