



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

**Public Joint Stock
Company «Turbogaz»**

**39 Years On The
Turbo-Expander Market**





TURBOGAZ
PUBLIC JOINT STOCK COMPANY

1975-1994 – All-Union scientific-production amalgamation “Soyuzturbogaz”
(before 1991 it was part of “Gazprom”)

1992-1994 – Public scientific-production enterprise “Turbogaz” (it was part of
“Ukrgezprom”)

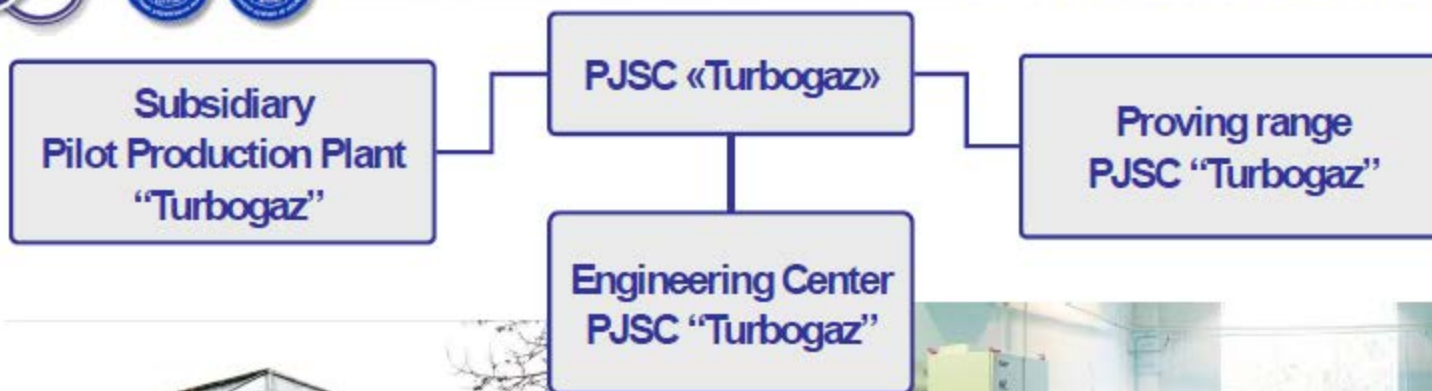
1994-2011 – Open Joint Stock Company “Turbogaz”

2011-to date – Public Joint Stock Company “Turbogaz” including Parent
Enterprise (Kharkov city), Pilot Production Plant and Proving Range (Kharkov
province)





TURBOGAZ
PUBLIC JOINT STOCK COMPANY



Subsidiary
Pilot Production Plant
"Turbogaz"



PJSC "Turbogaz"
Proving range



PJSC "Turbogaz"
Engineering Center



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

PRODUCTS GEOGRAPHICAL SPREAD

- 1- Preventers
- 2- Downhole equipment units
- 3- Shut-off and control valves
- 4- Process facilities for field gas treatment
- 5- Turbo-expander units
- 6- Gas compressor plants
- 7- Gas-distribution plants and points
- 8- Turbo-expander units to recycle NG excessive pressure power
- 9- Pumping equipment
- 10- Spare parts
- 11- Gas-turbine power plants





TURBOGAZ
PUBLIC JOINT STOCK COMPANY

BACKGROUND

Total service life in oil & gas industry since setting
11545 man/years



1975

1987

1990

1991

2000

2012



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

Since 1975 PJSC "Turbogaz" has produced and supplied to customers:

- > 200 turbo-cooling expander units;
- 10 recycling power turbo-expander units;
- 212 gas compressor plants;
- 20 gas turbine plants with total capacity 300 MW;
- > 900 downhole equipment sets;
- Fully equipped gas treatment plants were provided for 16 Ukrainian gas-condensate fields.





Product Range in 1975 – 2001

- Turbo-cooling units to cool NG in the process flow diagrams of NG treatment.
- Recycling power turbo-expander units to convert NG excessive pressure power into electric power.
- Units for well work-over, development and drilling.
- Mobile units to survey NG without gas emission into atmosphere.
- Gas-compressor units with gas-turbine and electric drives.
- Gas distribution plants and points.
- Power plants with gas-turbine drives.
- Crawlers heavy-duty trailers to mount and transport drill rigs modules.
- “Odotron” odorization units for NG
- Gas and air compressors; different purpose pumps.
- Oil & gas fields tooling, etc.



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

Since 2001 and to date PJSC “Turbogaz” profiles in producing and implementing the following facilities:

- Low-temperature turbo-expander units (NTDA) for NG and AG treatment
- Power Recycling Turbo-Expander Units (UTDU)
- Combined Recycling Expander Power Generating Units (UDEU)
- Equipment To Clean Soil Polluted With Oil Products (KPNSh)



NTDA



UTDU



UDEU



KPNSh



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

LOW-TEMPERATURE TURBO-EXPANDER UNITS (NTDA)



Gas treatment at gas condensate fields occurs mainly with the help of low-temperature separation. Using automated turbo-expander units (TDA) for gas treatment provides for considerable increase in gas fields' technical level.

TDA main purpose is gas cooling.

Depending on the TDA output temperature turbo-expanders could be used for:

- NG cooling (- 2 °C)
- Gas condensate recovery (- 30 °C)
- Propane-butane fraction production (- 80 °C)



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

RECYCLING TURBO-EXPANDER UNITS (UTDU)

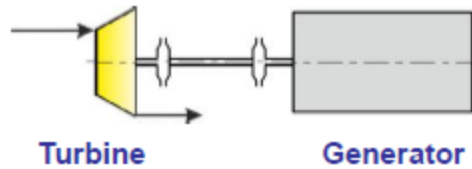


UTDU are designed to convert NG excessive pressure power to environmentally friendly electric power at gas distribution stations, gas distribution points and compressor stations. Several units can work in parallel.

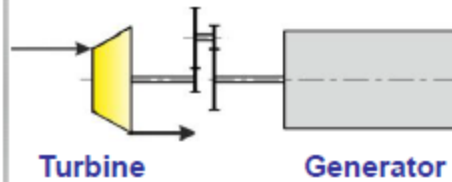


UTDU DIFFERENT DESIGNS

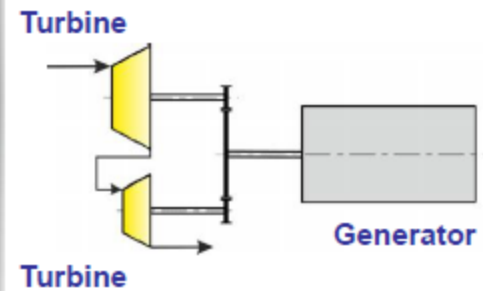
Multi-stage axial-flow
direct-drive turbines



Multi-stage axial-flow
geared turbines



2-stage radial turbines with
Integrated reducing gear
BHS





Advantages of Turbo-Expander Units Produced by PJSC ‘Turbogaz’

Advantages of UTDU and NTDA produced by PJSC ‘Turbogaz’:

- Individual approach to every project, i.e., UTDU and NTDA design and production apply directly to the running conditions of the specific site
- Equipment could be supplied in different configurations depending on the Customer’s requirements, i.e.:
 - NTDA supplied with/without valves unit, cables, spare frequency static converter, etc.
 - UTDU supplied in a set with generator, low/high voltage equipment, ACS, locking-metering unit, bypass-adjusting unit, heat exchanging equipment, etc.
- Supply time is reduced
- Wide range of equipment applications as regards climatic conditions, productivity, capacity
- Wide range of support services (engineering, Feasibility Study development, supervised installation, start-up and commissioning, Customer’s staff training, warranty and post-warranty servicing, spare parts supply)
- Quick response to Customers calls regarding their sites’ visiting



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

UNIT TO RECYCLE OIL SLUDGE AND SOIL POLLUTED WITH OIL PRODUCTS





Unit to recycle oil sludge and soil polluted with oil products

The unit ensures:

- Technological flexibility in stock recovery, adequate replacement of the equipment depending on the composition and features of the feedstock
- Selection of the optimal way of stock recovery (pumps, excavators, transporters, utilization of washable water)
- Uniform recycling of the sludge accumulator with regard to physical and chemical composition of the sludge
- Individual technological process depending on the primary analysis of the feedstock probes
- Feedstock recovery, waste recycling with the consequent bio-remediation, oil sludge recycling
- High quality of heavy sludge recycling (having the pollution age of > 15 years)
- Hydrocarbons recovery to send them back to the industry without additional reprocessing
- Oil sludge recycling without new waste generation
- Stable character of the chemical structure of the hydrocarbons recovery
- Operation with a wide range of oil polluted waste (oil refinery heavy sludge, fresh oil spills during oil production and transportation)



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

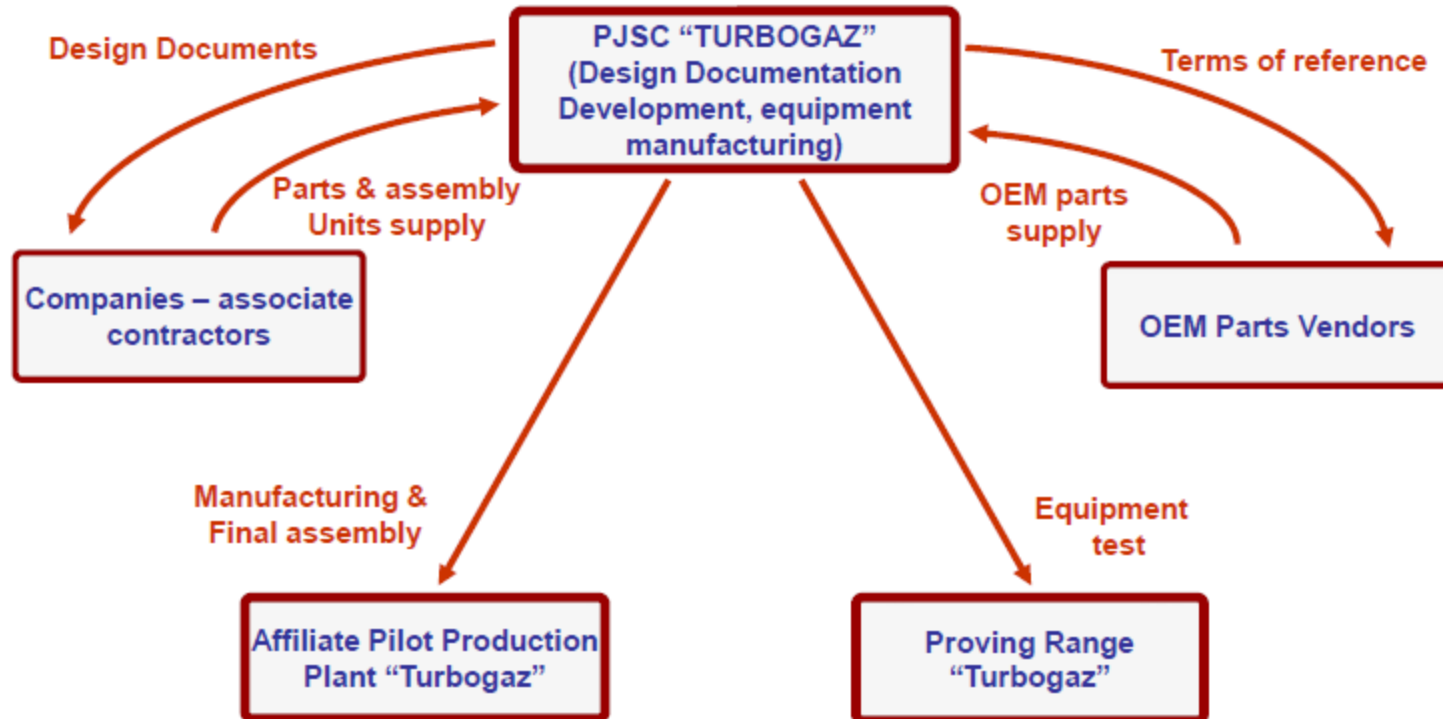
PRODUCTION PROCESS

PJSC “Turbogaz” production process is underlain by the principle – placing orders to manufacture assembly units with profile co-manufacturers being the most competent in their branch segment.

Purchased components are supplied by the vendors agreed with the Customer. Vendors must have reputation of reliable partners manufacturing the highest standards products.

Operations connected with basic units (piping manufacturing, assembling, testing) are performed at the Pilot Production Plant “Turbogaz”





Equipment production diagram



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

PJSC “TURBOGAZ” functions in all production stages beginning from R&D to “turn-key” supply of finished products to include also design documentation development, manufacturing, installation supervision, commissioning operations, customer’s staff training, warranty and post-warranty servicing as well as spare-parts supply



TURBOGAZ
PUBLIC JOINT STOCK COMPANY

CUSTOMERS' REFERENCES

PJSC "Turbogaz" policy is to win Customer's confidence and respect, create and maintain conditions, when present-day and prospective requirements and aspirations of the Customer are dominant in every "Turbogaz" employee routine work.

