



ECOBALTIC  
BUSINESS PARK



Project  
presentation

# TRIGENERATION

ECOBALTIC industrial business park  
Bagrationovsky city district  
Kaliningrad Region

2018



## INVESTMENT IDEA

Construction of a stand-alone CHP station for combined production of cooling, heat and power by utilizing three ready-to-use block-modules produced on the basis of gas-piston aggregates, boiler equipment and absorption refrigerating machine by the GazEnergostroy Corporation. The gas-piston generating units are fueled by natural gas. The equipment is to be used as the main source of electricity, the gas reciprocating power plant is supposed to work concurrently with the external network.



## IMPORTANCE

The project is oriented towards supplying residents of the ECOBALTIC industrial park. However, electricity and heat could be consumed not only by the residents of the park but also by the municipality. Meanwhile, the energy price is expected to be lower than the current rates by 5%.



## OBJECTIVE

Improvement of reliability of the energy power supply by the Baltfarmatsevtika LLC. through the introduction of the own, reliable source of energy.



## GOALS

1. Generation of electric power, heat and cold for the needs of the industrial enterprises, which are the residents of the ECOBALTIC industrial park.
2. Productivity improvement and cost reduction.

INITIATOR  
OF THE PROJECT

Baltfarmatsevtika LLC



## LOCATION

ECOBALTIC industrial business park,  
Bagrationovsky city district,  
Kaliningrad Region

IMPLEMENTATION  
PERIOD

IV quarter 2019



Amount of investment

approx. \$**2,3**M  
(I stage)

Production output (electric power)

**3,159** MW  
(I stage)

Production output (heat)

**3,633** MW  
(I stage)

Production output (cold)

**1,023** MW  
(I stage)

Production area

**5 500** m<sup>2</sup>

Implementation period

approx.  
**IV** quarter **2019**





## Baltfarmatsevtika LLC

BALTFARMATSEVTIKA LLC is the managing company of the ECOBALTIC industrial park, the creation of which has become possible thanks to the regional authorities' support in utilities connection and regulatory support.

It has been the Special economic zone resident since [2009](#).

The company obtained the certificate of compliance with the conditions of the investment declaration on [May, 17, 2012](#).



ECOBALTIC  
BUSINESS PARK





High **ENERGY CONVERSION EFFICIENCY** of the system (electricity and heat) -

up to **92%**

Eco-friendly production of cooling, heat and power



- Minimizing costs, while excess of heat with the “zero” production cost is used to produce cold, which is caused by seasonal climatic changes
- High energy conversion efficiency of the system (electricity and heat) – up to 92%
- Minimum maintenance costs: no depreciation of equipment, due to the absence of moving parts in the absorption refrigerator system.
- Economy through cost reduction for electric power
- Eco-friendly production of cooling, heat and power, as the use of water as the cooling agent does not cause harm to the environment
- Silent running of the absorption system





## SYSTEM CAPACITIES:



electric power

3,159

MW



heat

3,633

MW



cold

1,023

MW

## MAIN POWER EQUIPMENT OF THE PLANT:

## GPA block module GES EH 1053 G

The ready-to-use GPA block module produced by the GazEnergostroy Corporation, certified as a finished product, is a generator unit that has passed factory tests and is mounted on a single platform with the control panel, waste-heat recovery system, muffler, exhaust gas ducts, remote cooling radiator of the engine, ready for transportation and on-site installation.

Gas-piston aggregates have the basis of V-shaped engines with the four-valve cylinder heads, turbocharger, water cooling. The use of lean combustion technology significantly reduces amount of harmful substances in the exhaust.

- Generator voltage: 0,4 kV
- Current frequency: 50 Hz
- Fuel: natural gas
- Gas consumption for units: 3 un. x 280,2 nm<sup>3</sup>/h = 840,6 nm<sup>3</sup>/h
- Electric power: 3 un. x 1 053 kW = 3 159 kW
- Heating power: 3 un. x 1 211 kW = 3 633 kW (hot water)
- Engine life before overhaul: up to 60 000 hours of work
- Total life: up to 240 000 running hours





## GENERAL LIST OF EQUIPMENT:

- 3 gas-piston block modules GES EH 1053 G with the generators of 0,4 kV;
- launch system;
- fuel conditioning system (gas-distributing point);
- waste-heat recovery system;
- 2 block-modules of the hot-water boiler with the burner GES H 2500 G;
- 1 absorption refrigerator machine 1,023 MW;
- electrical plant equipment;
- TPP management and monitoring system;
- cable routes, gas venting system, air induction (exhaust) system;
- all necessary auxiliary systems (cooling, oil supply etc.);
- automation and power distribution systems;
- modular building with engineering systems (heating, air conditioning, lightning, fire and security alarm).

## Block-module of the hot-water boiler GES H 2500 G

Nominal heat output - 2 500 kW

- Boiler water space - 2,19 m<sup>3</sup>
- Max. temperature of water in the boiler - 110°C
- Operating pressure - 6 bars
- Fuel consumption - 292,2 nm<sup>3</sup>/h
- Boiler efficiency: not less than 92%

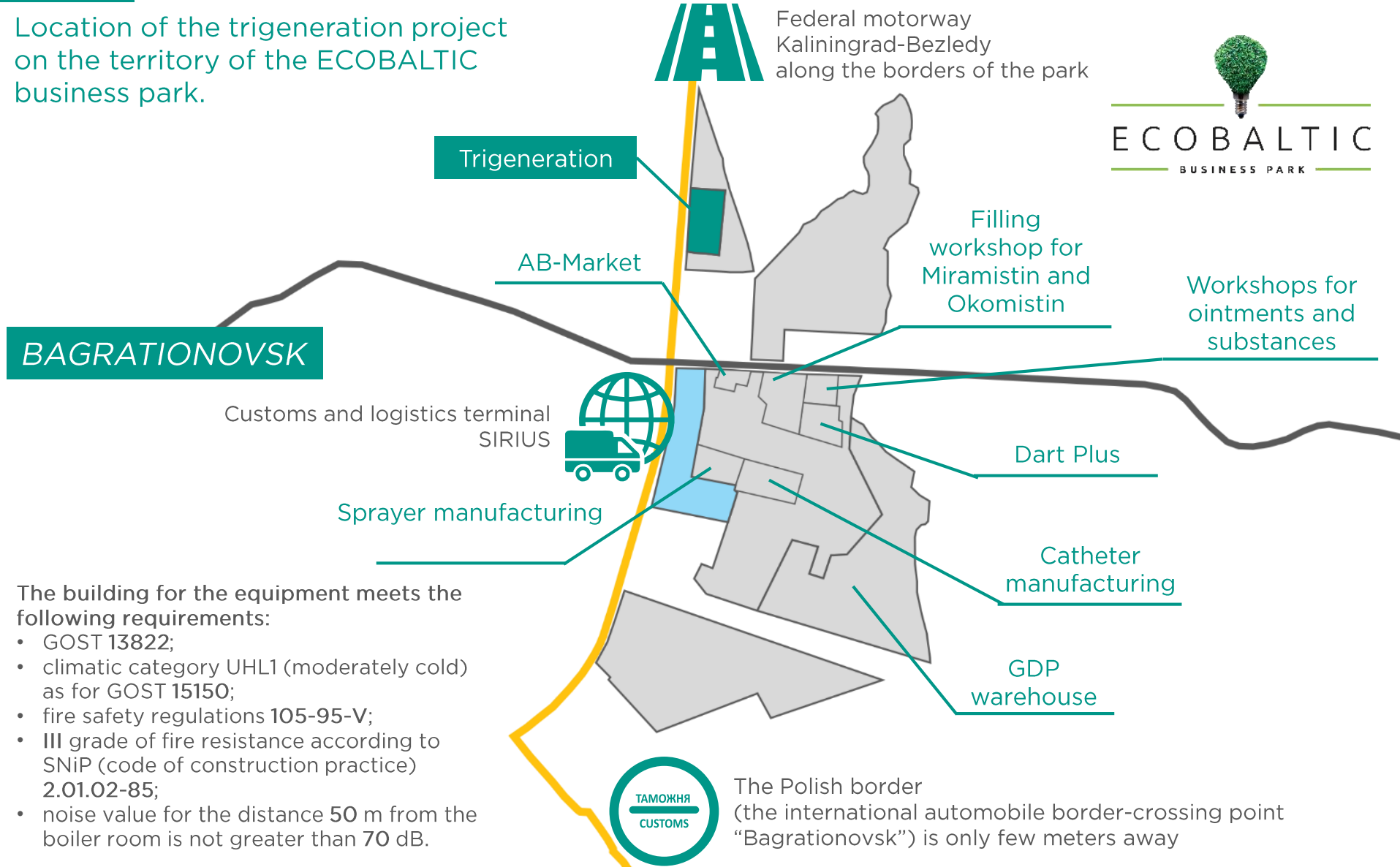


## Absorption refrigerator machine

- Refrigeration output - 1 023 kW
- Cooling water inlet/outlet temperature - 7/12 °C
- Electric power consumed - 5 kW
- Voltage/frequency - 400V/50Hz
- Coefficient of performance - 0,75
- Energy source - hot water of the waste-heat recovery system of the gas-piston aggregates



Location of the trigeneration project on the territory of the ECOBALTIC business park.



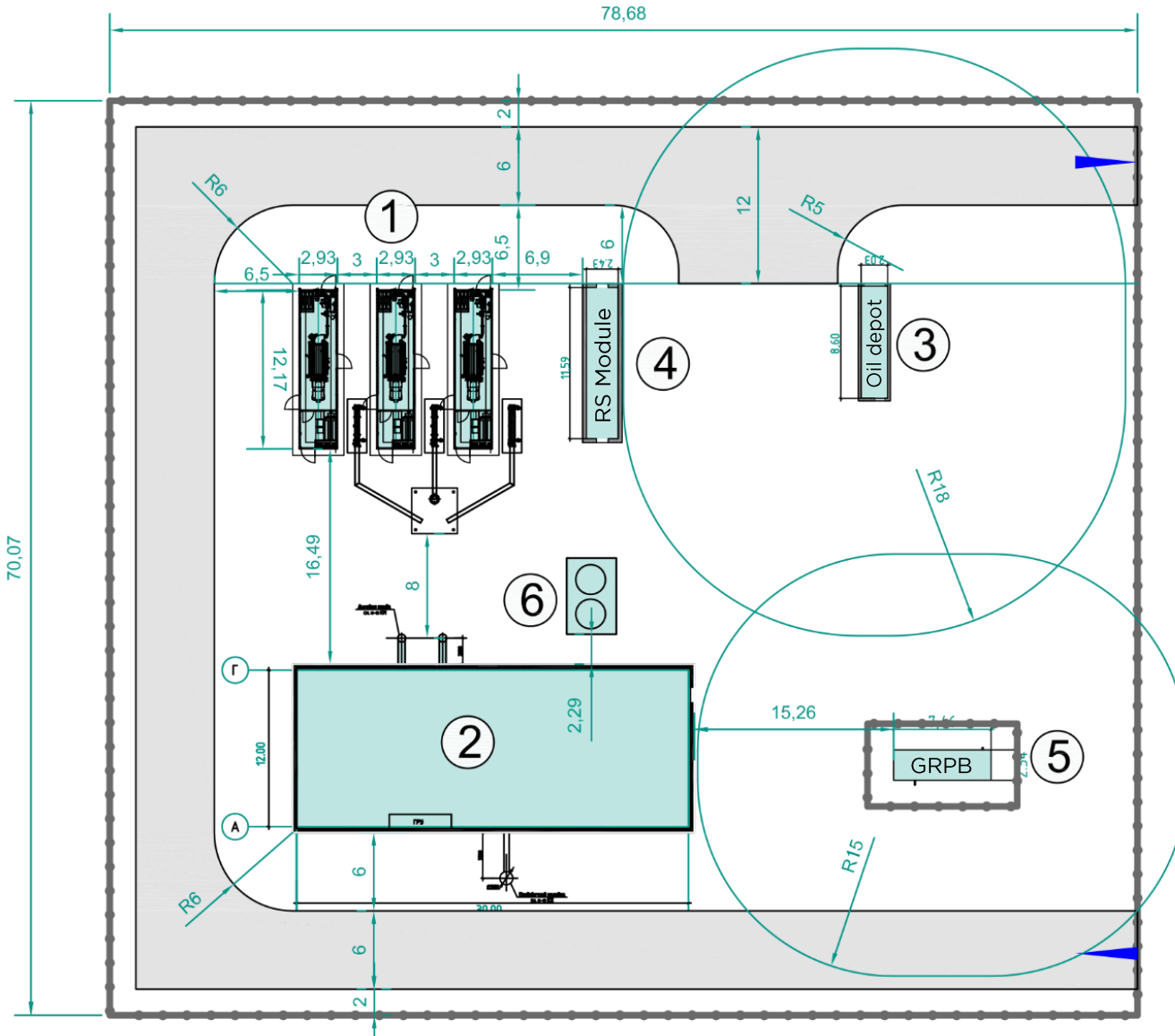
The building for the equipment meets the following requirements:

- GOST 13822;
- climatic category UHL1 (moderately cold) as for GOST 15150;
- fire safety regulations 105-95-V;
- III grade of fire resistance according to SNiP (code of construction practice) 2.01.02-85;
- noise value for the distance 50 m from the boiler room is not greater than 70 dB.





## Preliminary layout scheme of the territory of the power center construction



### SCHEDULE OF PREMISES

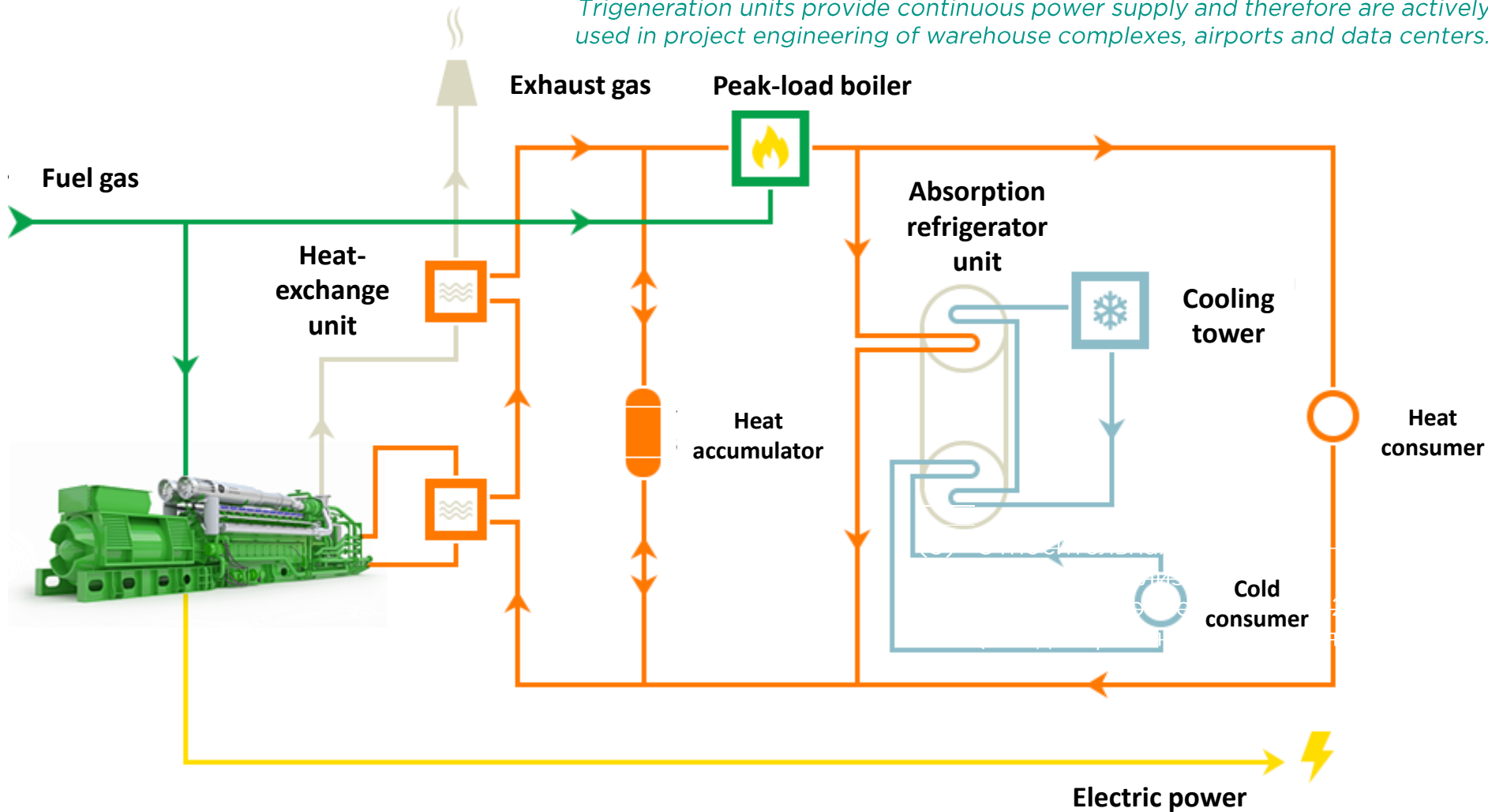
1. Container-module GPA (3 un.)
2. Boiler room
3. Container-module of the oil depot
4. Container-module of the reactor system - 0,4 kV
5. Container-module of the block-type gas control unit GRPB-U-80G-2N(V)
6. Cooling tower

The architectural solutions are based on the concept of optimum configuration of main and auxiliary equipment for the purpose of shortening technological communications and manufacturing tides



**Trigeneration** is the technology of combined production of electric power, heat and cold. The technology works due to the combination of a cogeneration unit with the absorption refrigerator machine. The cogeneration unit produces electricity and heat, whereas the absorption refrigerator machine transforms thermal energy into cooling water for the systems of conditioning and ventilation. Such cooling production is much cheaper than the use of compressor-driven refrigerator units.

*Trigeneration units provide continuous power supply and therefore are actively used in project engineering of warehouse complexes, airports and data centers.*





## ELECTRIC POWER

\$ **0,05** /kWh

## WATER SUPPLY

\$ **0,27** /m<sup>3</sup>



## WATER DISPOSAL

\$ **0,13** /m<sup>3</sup>

## GAS SUPPLY

\$ **75** /m<sup>3</sup>



## LAND PLOT

\$ **60 000** /ha



## OFFICE RENT

The price is negotiable

## AVERAGE SALARY

\$ **6 360**

per year

## RENT OF PRODUCTION PREMISES

\$ **6** /m<sup>2</sup>

The price for resources is calculated according to the state tariffs

The tariffs are changed 1-2 times a year

Calculation of variable expenses: monthly with metering devices

The prices do not include VAT



WE ARE READY TO SHARE  
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