



ENED

Energy  
**and industrial**  
construction



# ENERGY

## Energy and industrial construction

**We lead the Polish construction market,  
based on our 50-year tradition.**

We carry out infrastructure projects for the road, railway, airport, hydraulic engineering, general construction, power engineering and general industry markets, using state-of-the-art technologies and equipment to guarantee the highest quality. Since 1995 the company has been listed on the Warsaw Stock Exchange. Budimex is also listed on the WIG-ESG index of socially responsible companies (replacing the RESPECT Index, in which we were listed continuously since 2011).

Budimex is one of the signatories of the Agreement for Safety in the Construction Industry – an initiative established in 2010, associating the largest general contractors in Poland in order to increase the level of occupational safety in the construction industry.







Value:  
**PLN 333**  
million net

# 01

## Municipal waste disposal plant in Białystok

The municipal waste disposal plant we built in Białystok is one of the first installations in Poland to thermally convert waste into electricity and heat. Its start-up made it possible to reduce the volume of waste by a factor of 15 and its mass by 3. The project was carried out in a consortium with: Keppel Seghers, Cespa Compania de Servicios Publicos Auxiliares S.A. in the EPC formula, under FIDIC contract conditions. The plant is capable of processing 120,000 tonnes of waste per year and producing approx. 43,000 MWh of electricity and approx. 360,000 GJ of heat energy (maximum gross electrical power – 7.5 MWe). The facility is

equipped with a flue gas cleaning system to remove nitrogen oxides (NOx), acid pollutants, heavy metals, dioxins and furans and dust, making it fully safe for the environment. Waste emissions are at a minimum level, much lower than the permissible values set out in the Regulation of the Minister of the Environment on Standards for Emissions from Installations.

### Implementation:

**12/2013 – 12/2015**

### Investor:

**PUHP „LECH”  
SP. Z O.O.**





# Peak boiler house for EDF Gdynia

Implementation:

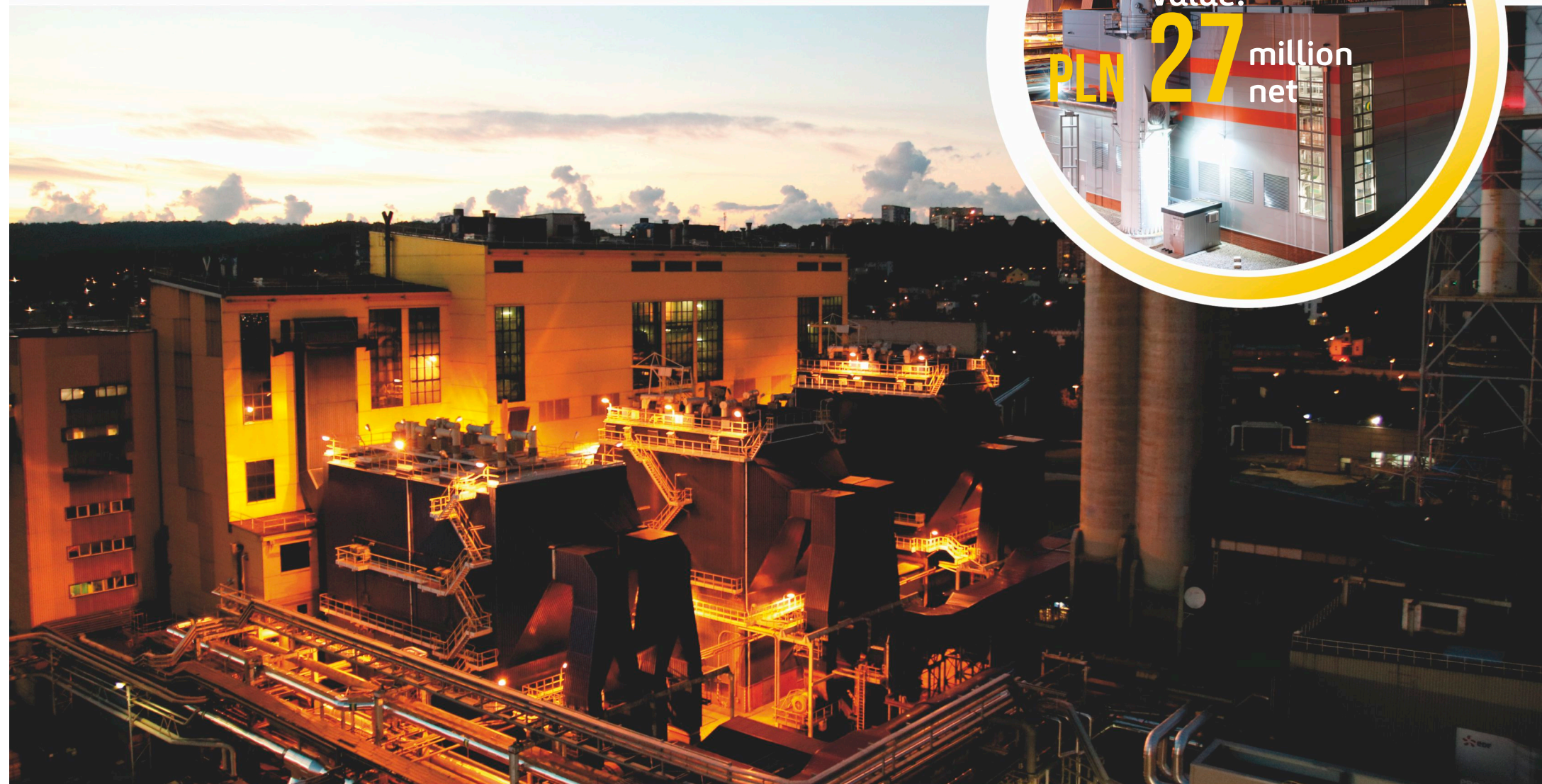
**12/2014 – 06/2016**

Investor:

**EDF POLSKA S.A.**

We designed and built a reserve-peak boiler house, ensuring full coverage of heat demand in the heating season.

The scope of our work included: construction of a 3x30 MW peak boiler house and infrastructure of heating water pipelines and light oil installation together with integration into the existing grid water system of the plant, modernisation of the mazout pumping station and adapting it to the new type of fuel (light oil), construction of a 1600 m<sup>3</sup> light oil tank together with infrastructure, and an auxiliary system for heating the feed water to the existing boilers.





Implementation:

MAY 2021

Investor:

PGE BRANCH  
OF TURÓW POWER PLANT

# Elektrownia Turów

## Construction of a power unit

As part of a consortium with Mitsubishi Hitachi Power Systems Europe GmbH and Tecnicas Reunidas S.A., we built a separate 450 MW power unit, which operates on supercritical steam parameters. The generating unit is a single-pass tower flow boiler with a pulverised fuel furnace and a low-emission combustion chamber, in combination with a condensing steam turbine.

As part of the contract, we equipped the unit with all the technological systems necessary for its operation. We carried out the work from site preparation to delivery of components, their assembly and commissioning.

Value:

PLN **3.646**  
billion net





# Czeszów-Kietczów

## gas pipeline (Dolny Śląsk)

Implementation:

**11/2017 - 09/2018**

Investor:

**OPERATOR  
GAZOCIĄGÓW  
PRZESYŁOWYCH  
GAZ-SYSTEM S.A.**

Value:

**PLN 63.7**  
million net

As part of the investments carried out in the Dolny Śląsk region, we built a 32.5 km high-pressure gas pipeline. This section ran from ZZU Czeszów to Kietczów junction. Apart from laying the pipes themselves, the project also involved the construction of linear barrier and relief valve facilities with bypass systems in the area of Miłonowice and the Kietczów gas interconnection point. Working as a consortium with Mostostal Kraków S.A. (Partner), we executed 28 trenchless crossings of terrain obstacles by means of jacking, drilling and microtunnelling in DN 1200 and DN 1400 casing pipes, as well as two crossings of environmentally valuable areas by means of horizontal directional drilling (HDD) with a total length of 1250 m. The scope of work also included gasification and commissioning of the gas pipeline.





# Combined heat and power plant in Vilnius

producing energy in cogeneration from combustion of waste and biomass

Implementation:

02/2021

Investor:

VILNAUS  
KOGENERACINĖ JĖGAINĖ

We completed the project (EPC) of construction of CHP plant in Vilnius, generating energy from combustion of waste. The plant was equipped with a waste-fired boiler (municipal and RDF), operating on a turbine with a capacity of 18.8 MW. We built a 72.7 MW turbine powered by two biomass-fired boilers.

We constructed the waste boiler in a consortium with Steinmueller Babcock Environment GmbH. According to the contract, a complete waste-to-energy plant was built, including auxiliary equipment and a turbine island, together with the power output of the biomass-fired plant. The electrical output of the new CHP plant is approximately 91.5 MWe and 227 MWt.


The CHP plant has been designed with the heat demand of the Lithuanian capital in mind and will be able to meet 20% of the heat demand on the coldest days and about 40% of all the heat that Vilnius needs throughout the year. The heat energy from the cogeneration unit under construction is supplied to the city's district heating network and the electricity generated to the 110 kV network, the transmission grid operator.



Value:

EUR 178  
million





Value:  
**PLN 63**  
million net  
(including Budimex S.A.  
– PLN 32 million net)

## Denitrification and desulphurisation installation for a coal boiler at the **Siekierki CHP plant**

Environmentally friendly solutions have appeared at the Siekierki CHP plant. Working in a consortium with Andritz AG, we were responsible for their construction. According to the project assumptions, we installed a selective catalytic reduction unit (SCR) and modernised the semi-dry desulphurisation unit for the K2 boiler, type OP 230, fired with hard coal. All this enabled the reduction of nitrogen trioxides in the flue gases to the level of  $\leq 100 \text{ mg/Nm}^3$  and reduction of sulphur oxides to the level of  $\leq 100 \text{ mg/Nm}^3$  for maximum flue gas stream amounting to approx.  $250\,000 \text{ Nm}^3/\text{h}$ .

Implementation:

**08/2015 – 09/2017**

Investor:

**PGNIG TERMIKA S.A.**

The scope of the contract included design works, supply of equipment, assembly and start-up of the following technological and auxiliary systems:

- flue gas duct system
  - SCR reactor system
  - ammonia water dosing system
  - draught fans
  - rotary air heater (modernisation)
  - semi-dry flue gas desulphurisation system (modernisation)
  - electrical installations, including power supply systems for the thrust fans
  - control and measurement system with CEMS
  - ventilation and air conditioning system for electrical rooms
- along with necessary construction works, including equipment foundations and support structures.





# Wieliszew northern plant

In the northern plant, located in Wieliszew near Warsaw, we performed the following works:

1. Modernisation of preliminary ozone treatment. The scope of works included:
  - delivery and assembly of an installation for production and dosing of ozone as well as assembly of an ozone transit pipe
  - replacement of existing fittings DN 1200 (wedge gate valves) for new throttles on the water inlet to the ozone pre-dosing chambers
  - relocation of the existing residual ozone destructor
  - replacement of existing shandoor closures
  - preparing the site for the construction of an oxygen storehouse
  - general overhaul

2. Modernisation of the quick sand filters. The scope of works included:
  - replacement of panel drainage in 24 filters with prefabricated slotted drainage and replacement of filter bed with a new two-layer anthracite and sand bed
  - equipping the filters with fittings and drives on the filtered water system
  - installation of an outlet system to the first stage pumping station for the first filtrate from each filter
  - installation of equipment for filtered water quality control and measurement and control equipment on each filter
  - modernisation of the blower installation and filter rinsing water pumping station
  - replacement of fittings and measurement and control equipment (AKP)
  - reconstruction of the central heating installation and related works

## Implementation:

- 1: 07/04/2016 – 27/12/2017
- 2: 12/09/2016 – 17/12/2019
- 3: 18/12/2019 – 17/03/2021

## Investor:

MPWIK S.A.  
CAPITAL CITY OF WARSAW  
WIELISZEW NORTHERN PLANT

All works were carried out while maintaining the continuity of the northern plant's operation.

3. Modernisation of the lime installation. The scope of works included the modernisation of:
  - technological installation for preparation and dosing of lime milk
  - technological installation of accelerator and technological pumping stations
  - lime milk installation
  - removal and dewatering of lime sludge from the accelerator
  - feed system for lime milk preparation system with lime water
  - automation and power supply system and the leachate pumping station as well as general construction works, including thermal modernisation of the accelerator building.



Total value:  
PLN 72,106,720.8



# ZW Kraków Tameh Polska

(site of Steelworks Arcelormittal Poland SA)

As part of the investment, we designed and built a 55 MW turbogenerator together with an external busduct overpass and a 2x40 MVA transformer station.

The two-stage implementation of the investment consisted of installation (replacement) of feedwater pumps at Stage 1 and installation of the turbogenerator at Stage 2.

**Stage 1** – a system of two pumps with a motor power of 1150 kW, capacity of 52 l/s and head of 1620 m, pipelines, fittings, inverters, power and control cabling, sampling and measurement system, and instrumentation.

**Stage 2** – construction of a 55 MW turbine-generator with a complete set of multi-branch technological installations, construction of the central control room, 2 x 40 MV transformer station with

generator switches and fire extinguishing system, external bus duct routing, and adaptation of the engine room building to meet the fire protection requirements. The works were carried out in the operating engine room of Tamehu ZW Kraków, built and equipped in the 1950–60s, with its full capacity maintained.

Implementation:

**07/2017 – 07/2020**

Investor:

**TAMEH POLSKA  
SP. Z O.O.**

Value:  
**PLN 125**  
million net





# Strachocina pipeline

## Border of the Republic of Poland

Implementation:

**07/2019 – 02/2022**

Investor:

**OPERATOR  
GAZOCIĄGÓW  
PRZESYŁOWYCH  
GAZ-SYSTEM S.A.**

Value:

**PLN 521.5**  
million net

We are working on the construction of a gas pipeline between Strachocina and the Polish border. We are performing the works in a consortium with Mostostal Kraków. As part of this investment, we are constructing a high-pressure gas pipeline with a length of approx. 61k m 270 mm and with a diameter of DN 1000 and operating pressure of 8.4 MPa. During the implementation we use such trenchless technologies as: HDD (horizontal directional drilling) and microtunneling. The gas pipeline route runs through the Podkarpackie voivodship – in the following gmina districts: Sanok, Bukowsko and Komańcza, and due to areas at risk of geodynamic movements, we apply landslide protection using stabilising micropiles. The investment aims to connect the natural gas transmission systems between Poland and Slovakia. It is an important element of the concept of building the North-South Gas Corridor. The parties to the project are Gaz-System and Eustream A.S. – the Polish and Slovak transmission system operator.



# 10

## Modernisation of the existing flue gas desulphurisation installation and the flue gas removal system at the Łaziska power plant

We carried out the works in consortium with Mitsubishi Hitachi Power Systems Europe. As part of the project, we partially modernised the existing flue gas desulphurisation system and the flue gas removal system at the Łaziska power plant. We implemented the investment under the “design and build” system. The scope of our works included:

- liquidation of the GAVO exchanger on FGD (Flue Gas Desulphurisation Installation),
- construction of an additional “wet” chimney for flue gas discharge from the absorber,
- modernisation of the absorber, consisting in the installation of a sieve shelf improving desulphurisation efficiency,
- connecting the flue pipes of units 9 and 10 with the flue pipes of units 11 and 12 together with the installation of air-tight dampers, which will enable the configuration of the units for any FGD.

As part of the investment, we installed a screen shelf in the absorber on FGD lines 1 and 2 for OP-650 boilers, together with the decommissioning of the GAVO exchanger on lines 1 and 2 and adaptation of the chimney for wet flue gas discharge. The completed installation of the sieve shelf will allow the production to be adjusted to the European Union regulations (BAT of 2017) regarding gas emission limits. One of the major undertakings of the task in progress was the construction of an additional GRP duct in the existing 200 m high glass fibre reinforced plastic chimney for the discharge of wet flue gases. As part of the reconstruction, holes were drilled in the reinforced concrete chimney core at level +3.00 m and in the upper slab at level +195.1 m for the new pipe. We had previously reinforced the shaft of the chimney with reinforced concrete pilasters. The installation of the new flue was carried out using “heavy-lifting” technology, i.e. lifting the flue in segments using cylinders placed on top of the chimney.

Implementation:

02/2019 – 02/2021

Investor:

TAURON WYTWARZANIE S.A.  
JAWORZNO POWER PLANT

As part of the work we also carried out:

- modernisation of the existing steel ducts, consisting in the removal of old coatings and installing new protection of the ducts in the form of resin,
- modernisation of Control and Measurement Instruments and Automation (automation, control and measurement fittings) for FGD installation, which was achieved within the existing PROCONTROL P14 system,
- replacement of the rubber lining in the absorber with a diameter of 14.5 m and a height of 35.3 m (with a volume of nearly 6 000 m<sup>3</sup>) together with the installation of a screen shelf and a system of condensers,
- replacement of compensators and installation of a new flue gas duct connecting the flue pipe of units 9 and 10 with the flue pipe of units 11 and 12,
- liquidation of the GAVO regeneration exchanger together with its auxiliary installations,
- modernisation of the flap system, consisting in ensuring a seal by applying double louvre flaps into which sealing air will be injected,
- we replaced the old pumps with new ones of the same parameters.





# Construction of the **KG2 gas-fired peak** and reserve boiler plant at the Żerań combined heat and power plant

The project involves the construction of the KG2 gas-fired peak and reserve boiler house at the Żerań combined heat and power plant in place of the existing electrical filters and flues of the WP-120 water-tube boilers.

The boiler house will consist of two natural gas-fired water-tube boiler units with a thermal capacity of approx. 130 MWt each, together with auxiliary equipment and multi-branch systems and flue gas discharge through a 70-metre high double-duct chimney.

The investment constitutes one of the tasks of the programme for reconstruction of production capacities of the Żerań combined heat and power plant in connection with the programme for decommissioning of worn-out, obsolete production assets which do not meet the expected environmental standards (resulting from the BAT and IED Directives).

Implementation:

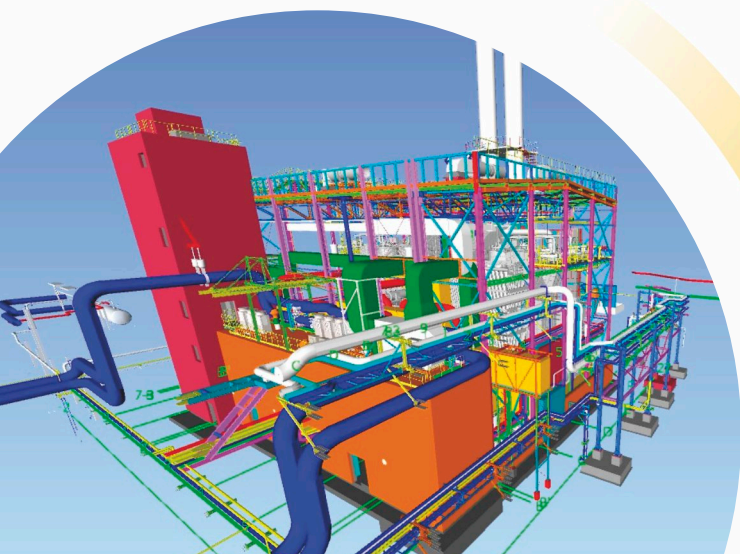
**07/2019 – 01/2023**

Deadline for construction  
and assembly works:

**05/2020 – 09/2022**

Investor:

**PGNIG  
TERMIKA S.A.**



Value:  
**PLN 114**  
million net



# Pumping station

Implementation:

31/01/2017 – 30/09/2020

The task included replacing worn-out equipment and optimising energy consumption, but also improving the safety of the facilities' use and bringing them into line with current health, safety and fire safety regulations. The aim of the modernisation was to achieve full and smooth interaction of all elements of the modernised pumping stations, both existing and newly constructed ones.

The scope of works carried out included the following facilities:

- Level 1 pumping station – located on the premises of the SUW water treatment station for the northern pumping station at ul. 600-lecia 20 in Wieliszew
- Level 3 pumping station – located at the Białotęka zonal station at ul. Waligóry 2 in Warsaw
- Level 3 BIS pumping station – located at the Białotęka zonal station at ul. Waligóry 2 in Warsaw
- stand-alone oil and gas boiler house – located at the Białotęka zonal station at ul. Waligóry 2 in Warsaw.

The scope of works included:

- replacement of pumps with a total capacity of 27,000 m<sup>3</sup>/h
- renovation of a clean water tank with a capacity of approx. 15,000 m<sup>3</sup>
- renovation of existing underground pipelines with a total length of approx. 3.5 km
- renovation of over 1.7 km of cable ducts
- renovation of over 100 technological chambers
- replacement of fittings in the main distribution chamber with a diameter of 1200 mm
- replacement of connection flanges with a diameter of up to 1200 mm
- replacement of gate valves with a diameter of 400 mm at a depth of up to 7 m

In addition, the ordering party decided and ordered the execution of additional works, such as:

- renovation of pipelines in the area of the 3rd level and 3rd level bis pumping stations in the Warsaw district of Białotęka
- replacement of flange connections on the premises of the SUW north pumping station and the Białotęka zonal station
- modernization of chamber no. 6 of clean water tank no. 2 at the Białotęka zonal station
- modernization of chamber no. 4 of clean water tank no. 1 at the Białotęka zonal station
- designing and modernising pipelines and fittings in technological chambers of the 3rd level and 3rd level bis pumping stations in the area of the Białotęka zonal station
- designing and constructing renovation of steel process pipelines with diameters from DN800 to DN1600, drainage pipelines DN200 and DN400, and chlorine mixers within the premises of the Białotęka zonal station
- designing and modernising the roof of the first level pumping station, third level bis pumping station, and third level pumping station
- construction of cables 4X240 in relation SFC-RNH2 and SFC-RNNL (ozone) – RNH2 in the area of SUW Wieliszew.

Value:

OVER 57.6

mld zł netto







# 13

## Goleniów-Ciecierzycze gas pipeline

The Baltic Pipe project has been recognised by the European Commission as a “Project of Community Interest” (PCI) and has had this status since 2013. The Baltic Pipe project received financial support from the European Union under the Connecting Europe Facility (CEF). The new pipeline will ensure that an increased volume of gas can be received from the Baltic Pipe offshore pipeline and the LNG Terminal in Świnoujście. The implementation of this investment will optimise the capacity of the Polish transmission system and will constitute an important element of the North-South Gas Corridor in Europe. In addition, the implementation of the Baltic Pipe Project, of which this investment forms a part, will strengthen Poland's energy security.

Construction of new transmission infrastructure will also affect the development of the gas market and its competitiveness.

The scope of the investment includes:

- construction of the linear part of the gas pipeline with a diameter of DN1000 MOP 8.4 MPa, from the Goleniów compressor station to the Ciecierzycze sluice station;
- reconstruction of the Goleniów Gas Compressor Station, including: Goleniów-Płoty, DN 500 MOP 6.3 MPa Odolanów-Police, DN700 MOP 8.4 MPa Szczecin-Lwówek;
- construction of a linear shut off and relief valve system, at ZZU Kolonia Kiczarowo, with bypass systems;
- construction of linear shut off and relief valve systems, at ZZU Przywodzie and ZZU Buszów,

together with bypass systems equipped with collectors enabling the connection of new stations/receivers, energy connections, control and measurement installations, telemetry installations and other infrastructure;

- construction of an active corrosion protection system for the gas pipeline;
- filling the pipeline with gas and launching it.

Implementation:

**10/2020 – PRESENT**

Investor:

**GAZ SYSTEM S.A.**



Value:  
**PLN 335**  
million net



# Construction of the Vistula collector

## Stage 2

This undertaking is being carried out as part of the EU project "Water Supply and Sewage Treatment in Warsaw – Phase VI", which also involves the construction of collectors: Linde Bis and Mokotowski Bis and the central control system of the combined sewage system. A retention reservoir, that has been put into operation this year at the "Czajka" plant is an integral part of this project.

The collector is made in trenchless technology using the microtunneling method. As the head advances the new sections of the pipe are installed.

The Vistula collector will be founded at a depth of 6 m to 15 m along Wybrzeże Gdynskie Street. The primary diameter will be 3.2 m to achieve a 40,000 m<sup>3</sup> total storm water capacity.

The aim of the construction of the Vistula Collector is to improve the drainage of wastewater during heavy rainfall. During their occurrence, the task of the collector will be to collect sewage from the storm overflows of the combined sewage system located on the left bank of Warsaw. The collected waste will be temporarily retained and then directed through the "Wiślana" pumping station, planned as part of stage 3 of the investment, to the "Czajka" waste

water treatment plant. The project is delivered under the EU project "Water supply and wastewater pre-treatment in Warsaw – Phase VI" and includes the construction of the Linde Bis and Mokotowski Bis and the central control system of the combined sewage system. A retention reservoir, that has been put into operation this year at the "Czajka" Plant is an integral part of this project.

AVN machine technical specifications

- Target tunnel length: 9.5 km
- AVN overall weight: 145 t
- Overall length: 8.1 m
- Shield diameter: 3.8 m
- Boring speed: 14 m/24 h
- Scheduled start of the excavation: December 2020
- Planned boring end: Q2 2022

Implementation:

**12.2020 – PRESENT**

Investor:

**MPWIK IN WARSAW**



Value:  
**PLN 429**  
million net