

Croatian Insights into Oil & Gas Pipeline Construction and Maintenance: Key Points and Specifics



member of



PICO FLOW CONTROLS
GROUP

About us

FEROMIHIN IS THE MEMBER OF PICO FLOW CONTROLS:

Croatian regional Group of companies with complete package of products, services and solutions for oil & gas industry.

One-stop solution for oil & gas industry - EPCM & specific products manufacturer & Integrator

Founded: 1992.

Employees: 160

Head office: Zagreb, Croatia

Two production/warehouse locations in Croatia: Začretje & Novoselec

Regional offices: in Serbia (Belgrade) and Italy (Mirandola)



Our Team

This is a multidisciplinary problem solving team that has a diverse set of skillsets, including engineering in different areas, such as petroleum, mechanical, electrical, software and project management.



Dubravko Kamenečki

CEO



Iva Ljubčić

COMMERCIAL
DIRECTOR



IT DIRECTOR



Vedran Prica

HEAD OF COMMERCIAL
OPERATIONS AT
FEROMIHIN D.O.O.



Filip Smrečki

HEAD OF COMMERCIAL
OPERATIONS AT
FEROMIHIN D.O.O.

We cover all life-circles of the project



Our Divisions



The solutions we offer uphold the values of effectiveness, efficiency, and are highly relevant to the market situation and society.

EPC division

Engineering procurement construction for:
Oil and gas projects
Hot water / steam pipeline projects
Road infrastructure installation projects
Construction projects

IT & integrity division

AYMO - pipeline integrity management system
AMS - asset management system
Custom software solutions
ILI and NON-ILI inspections

Integrated solutions division

MRS, CNG, MEGC, LPG & LNG stations
Fluid flow monitoring and quality analysis control system (Gas chromatograph)
GRIZO - Blending units (LPG+air; Hydrogen + natural gas)
KPPP - Compressor unit for transferring natural gas
Boiler rooms
Dehydration units
Block valve stations
Corrosion protection solutions
Pipeline repair solutions

Services division

Designing
Procurement & project management
Metal machining, assembly & installation
Construction supervision
Commissioning
Maintenance & Service
Calibration of safety valves

Production division

Production of electronic devices & components
Production of mechanical components
Production of synthetic natural gas
Production of Three-dimensional diamond structured plastic mesh - AEGIS Rockshiled

Distribution & trading division

Measuring, regulating and control equipment
Safety equipment
Valves (range of types)
Actuators (range of types)
Insulation materials and joints
Pipes and pipe material
Screw and sealing material
Corrosion protection systems

Our Export products



Three-dimensional diamond structured plastic mesh, designed for pipeline protection in challenging environments, particularly rocky backfill scenarios.

IT-solutions

Pipeline Integrity management system - **AYMO**

Asset management system - **AMS**



Electronical devices

Protecting the pipeline by using ELBC unit to monitor and automatic block of the pipeline during the sudden pressure drop.

For locations without power options, LBC unit with solar panel is available.



Markets' presence



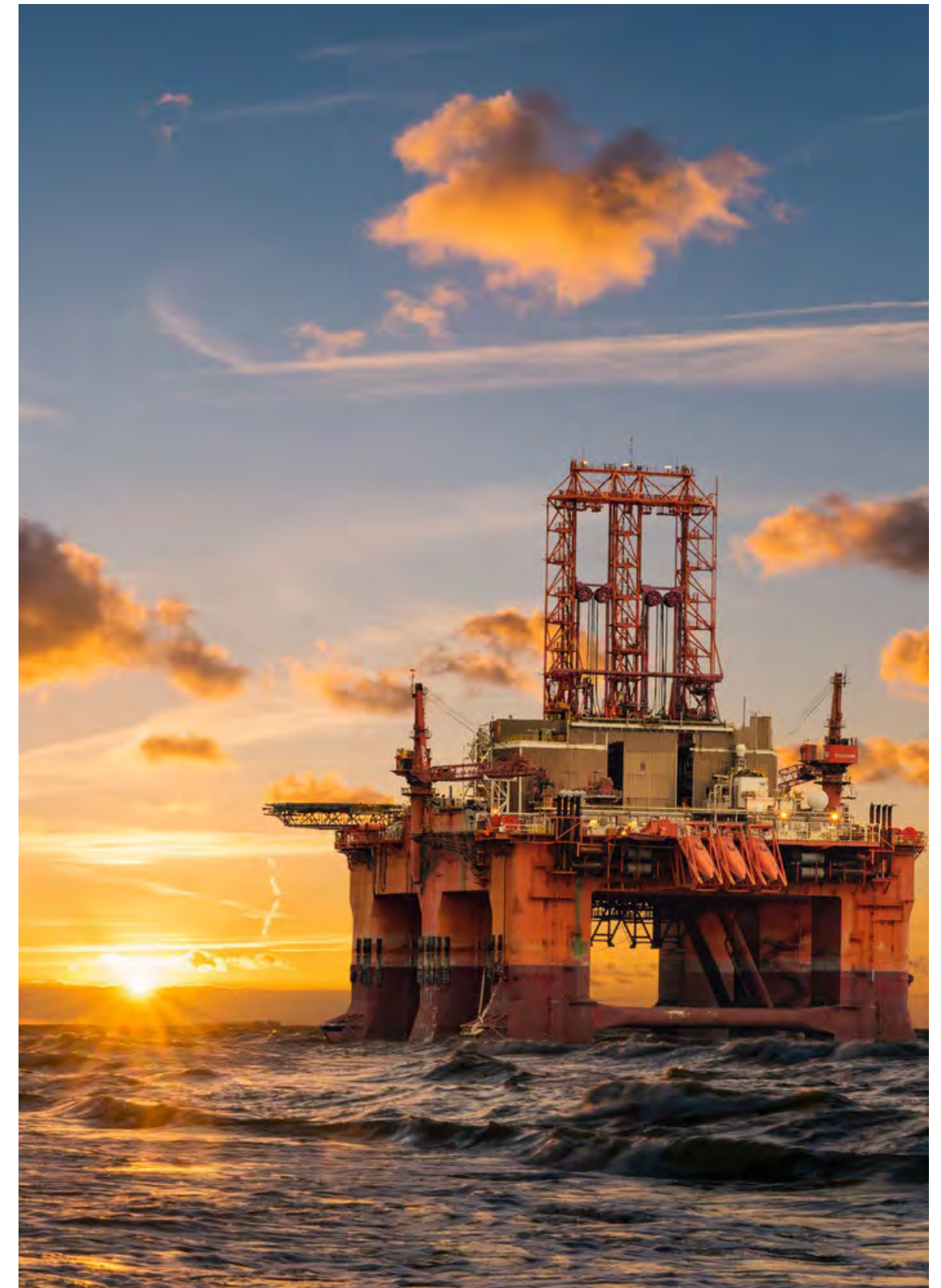
EUROPE: Croatia, Slovenia, Serbia, Montenegro, Bosnia & Herzegovina, North Macedonia, Albania, Kosovo, Italy, Latvia, Turkey

AMERICA: USA, Brazil

ASIA: India

AFRICA & MIDDLE EAST: Algeria, Libya, Namibia, Nigeria, Egypt, Saudi Arabia, UAE

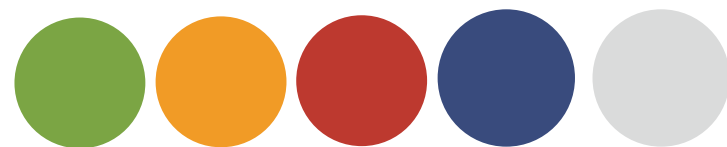
CIS: Azerbaijan, Kazakhstan, Uzbekistan



Strategic partners

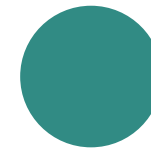


Pico flow controls (PFC group) specialize in production, equipment purchasing, installation, commissioning, maintenance & service. In digitalization era we are integrated our digital solution as a close circle for better & efficient results during maintenance & service stage - AYMO + AMS.



Mašinoprojekt

The design house expertise extends to tender preparation, technical review of foreign documents, and the production of documents necessary for construction permits and execution.



Monter -strojarske montaže

The leading Croatian company in construction of gas, oil and water pipelines, and placed among the most experienced in the field of construction and maintenance of industrial plants and production of process equipment.

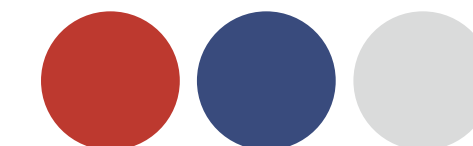


Offshore oil services Namibia

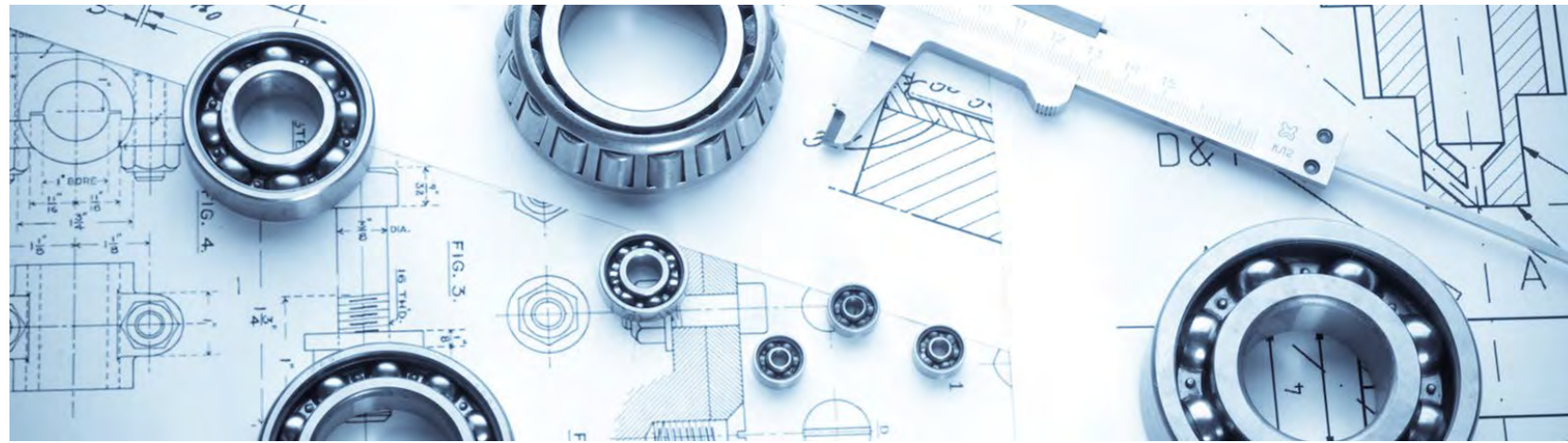
Our local partner in Namibia who will cover all questions at site & be our point of contact with all market players.

SCAN

Instrumentation and control systems integration, including installation services – within EPC projects



Design first



Masino projekt, founded in 1949, is a renowned design house with a rich history and a wide range of capabilities. Specializing in the development of technical investment documentation,

An overview of what we're working towards.

Masino projekt excels in creating comprehensive documentation that adheres to current regulations. Their expertise extends to tender preparation, technical review of foreign documents, and the production of documents necessary for construction permits and execution.



Construction of pipelines

Our experience

01

TRANSPORT GAS
PIPELINES over
1.000 km

02

CONNECTING
GAS PIPELINES
over 500 km

03

GAS PIPELINE
CITY NETWORKS
over 50 cities

04

TRANSPORT AND
CONNECTING OIL
PIPELINES
over 1.000 km

05

STEAM AND HOT
WATER
PIPELINES
over 250 km

06

ROAD AND RIVER
CROSSINGS
over 50 crossings

07

TRANSPORT
WATER
PIPELINES
over 250 km

Delivering the results.

Our first key focus.

Overview of the Croatian Pipeline Industry

Historical
Context

Brief History of Pipeline
Development in Croatia

Current
Industry
Status

Size of the Industry, Major Players,
and Market Overview

Strategic
Importance

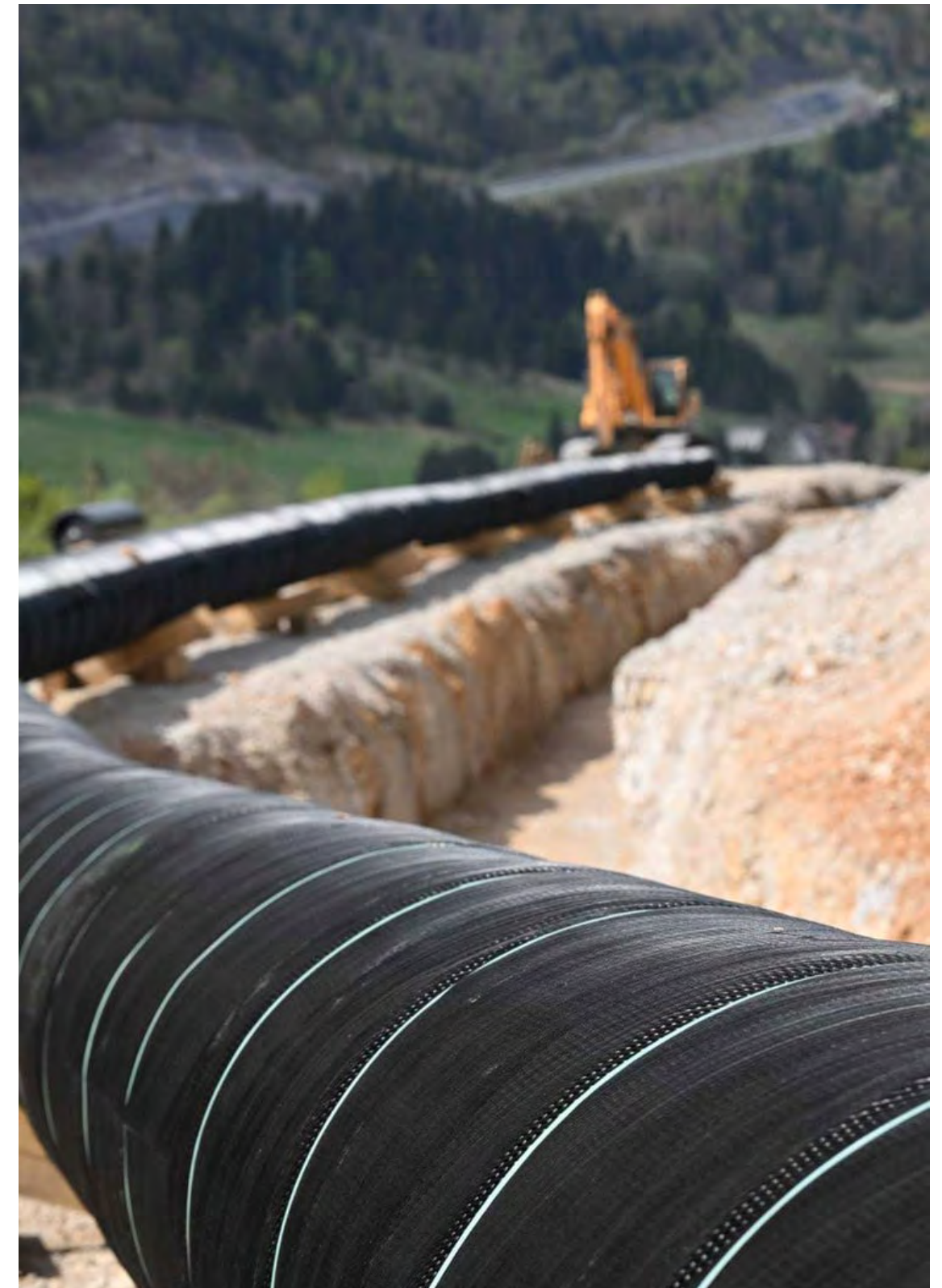
Development Plan Overview of
Gas Transmission System



Brief History of Pipeline Development in Croatia

The former Yugoslavia. During the Yugoslav period, pipeline development began in the 1960s to transport oil and natural gas across the region. Croatia's strategic position in the Balkans, with access to the Adriatic Sea, made it a critical transit country for energy supplies moving between Central Europe, the Mediterranean, and the broader Balkan region.

After gaining independence in 1991, Croatia inherited a significant portion of Yugoslavia's pipeline network. The 1990s were a turbulent period due to the Croatian War of Independence, which impacted the maintenance and expansion of pipeline infrastructure. However, post-war reconstruction efforts and integration into European markets in the 2000s spurred further investment and modernization of the pipeline network.



Size of the Industry, Major Players, and Market Overview

As of today, Croatia's pipeline industry is relatively small but plays a crucial role in the country's energy sector. The industry includes both oil and natural gas pipelines, with natural gas being the dominant sector.

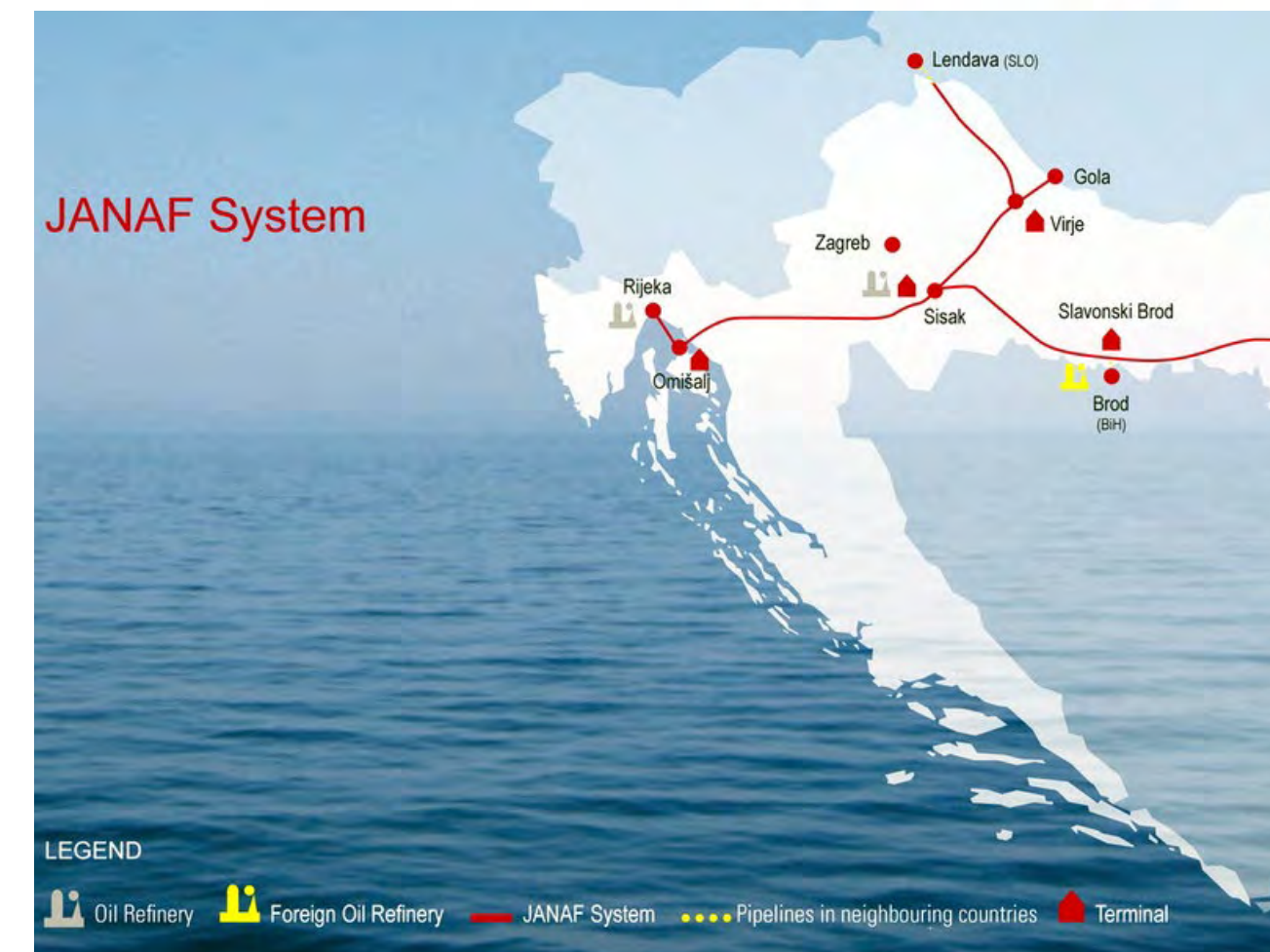
Natural Gas Pipelines

The most significant player in the natural gas sector is Plinacro, the state-owned company responsible for natural gas transmission. Plinacro operates a network of over 2,600 kilometers of high-pressure natural gas pipelines, ensuring the distribution of gas to domestic consumers and acting as a transit route for gas flowing to neighboring countries.

Oil Pipelines

JANAF operates the Adria oil pipeline, which runs from the Adriatic coast to Hungary, connecting with other European oil pipelines. The Adria pipeline has a total length of approximately 759 kilometers within Croatia. JANAF also provides oil storage services, with significant facilities at Omišalj on the island of Krk, which serves as a key hub for the import and export of crude oil.





Development Plan of the Gas Transmission System in Croatia

In April 2002, first Development, Construction, and Modernization Plan for the gas transmission system in the Republic of Croatia (2002 - 2027).



The plan was divided into:

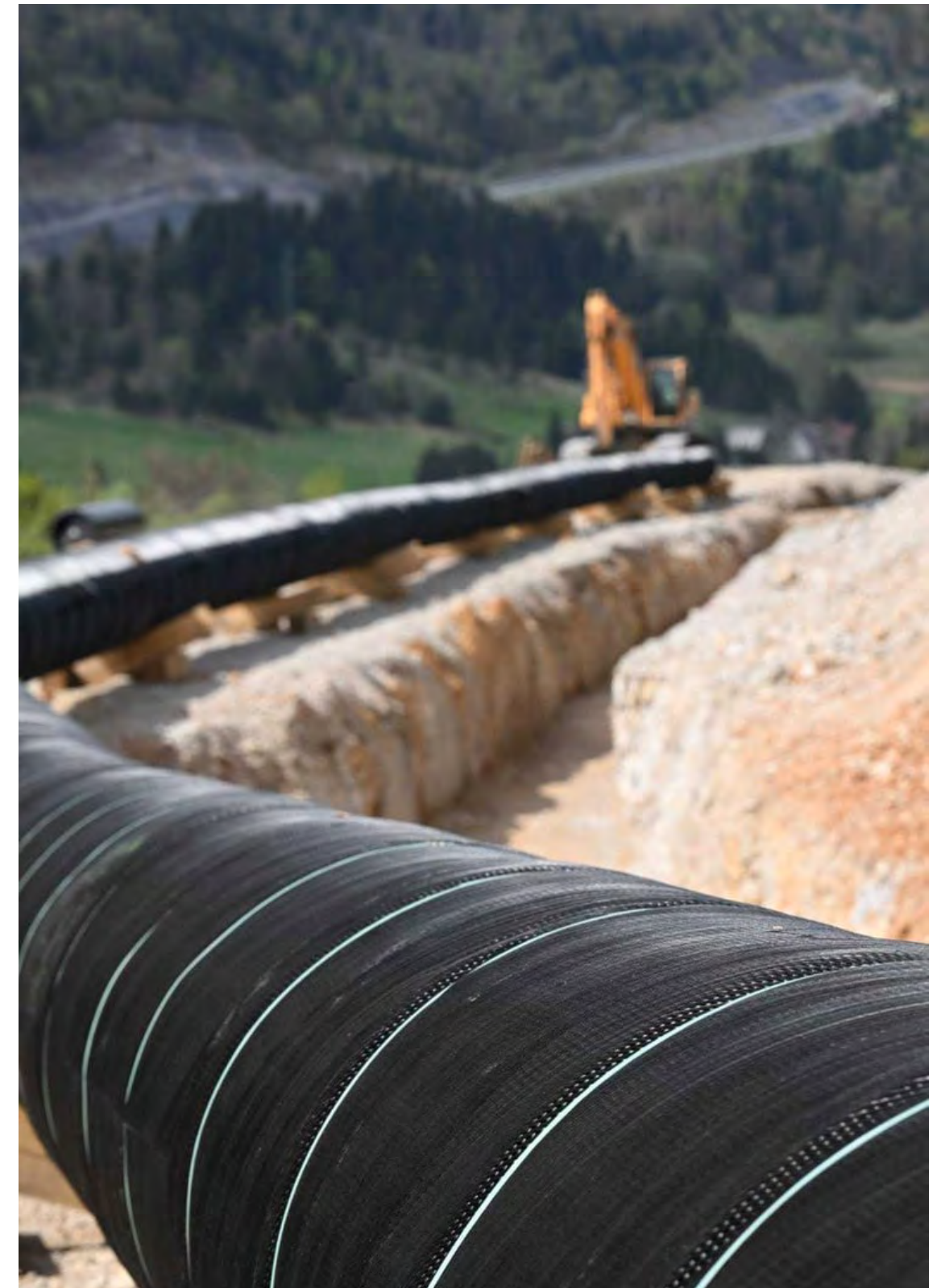
- First Development and Investment Cycle (2002–2006): Construction of the first modern main pipelines
- Second Development and Investment Cycle (2007–2011): Development of the gas network in Istria, Lika, and Dalmatia
- Third Development and Investment Cycle: Focus on Gas Transit (2011-2027)

First Development and Investment Cycle (2002–2006)

- The construction of the Pula – Karlovac trunk gas pipeline (191 km) ensured the direct reception and transportation of gas produced from the northern Adriatic fields into the Croatian transmission system, instead of the previous transport through Italy and Slovenia.
- Construction of the Lučko – Ivanja Reka main gas pipeline (20 km)
- Construction of the Zagreb East – Kutina main gas pipeline (68 km)
- Construction of the Kutina – Slavonski Brod main gas pipeline (108 km)
- Construction of the Slobodnica – Slavonski Brod main gas pipeline (7 km)
- Construction of the Belišće – Osijek main gas pipeline (40 km)
- Construction of the Nova Kapela – Požega main gas pipeline (29 km)
- Construction of the Bjelovar – Žabno main gas pipeline (26 km)
- Construction of regional gas pipelines Bolman – Beli Manastir (8 km)
- Construction of the regional gas pipeline Dobrovac – Omanovac (11 km)

In total: 508 km was constructed, 9 new main pipelines

- Numerous measurement-reduction stations, optical communication systems, and the SCADA system, responsible for remote monitoring and management of the transmission system.





Second Development and Investment Cycle (2007–2011)

- The construction of the transmission system towards Istria, Lika, and Dalmatia, and the construction of an interconnection gas pipeline with Hungary.
- The first section of the Lika and Dalmatia gas pipeline system, the Bosiljevo – Josipdol main gas pipeline (26 km).
- The third section, the Gospić – Benkovac main gas pipeline (91 km), was completed.
- The fourth section, the Benkovac – Dugopolje gas pipeline (96 km), was officially put into operation in April 2013, thus connecting that part of Croatia with the existing gas pipeline system and enabling the gasification of the Zadar, Šibenik-Knin, and Split-Dalmatia counties.
- The construction of branch pipelines were built along this route: for the MRS Otočac (11 km), MRS Obrovac (9 km), MRS Biograd (13 km), MRS Tisno (11 km), and MRS Trogir (14 km), as well as regional gas pipelines Benkovac – Zadar (36 km) and Šibenik – Knin (45 km).
- the Vodnjan – Umag main gas pipeline (72 km)
- In December 2010, both sections of the pipeline forming the Croatian side of the 75-bar interconnection gas systems between Croatia and Hungary were completed, with a total length of 80 km.
- In total: 504 km was constructed, 11 new main pipelines
- With the construction of the Pula – Karlovac gas pipeline the second development and investment cycle was completed, achieving a high level of gas availability in Croatia through two import routes from Slovenia and Hungary.



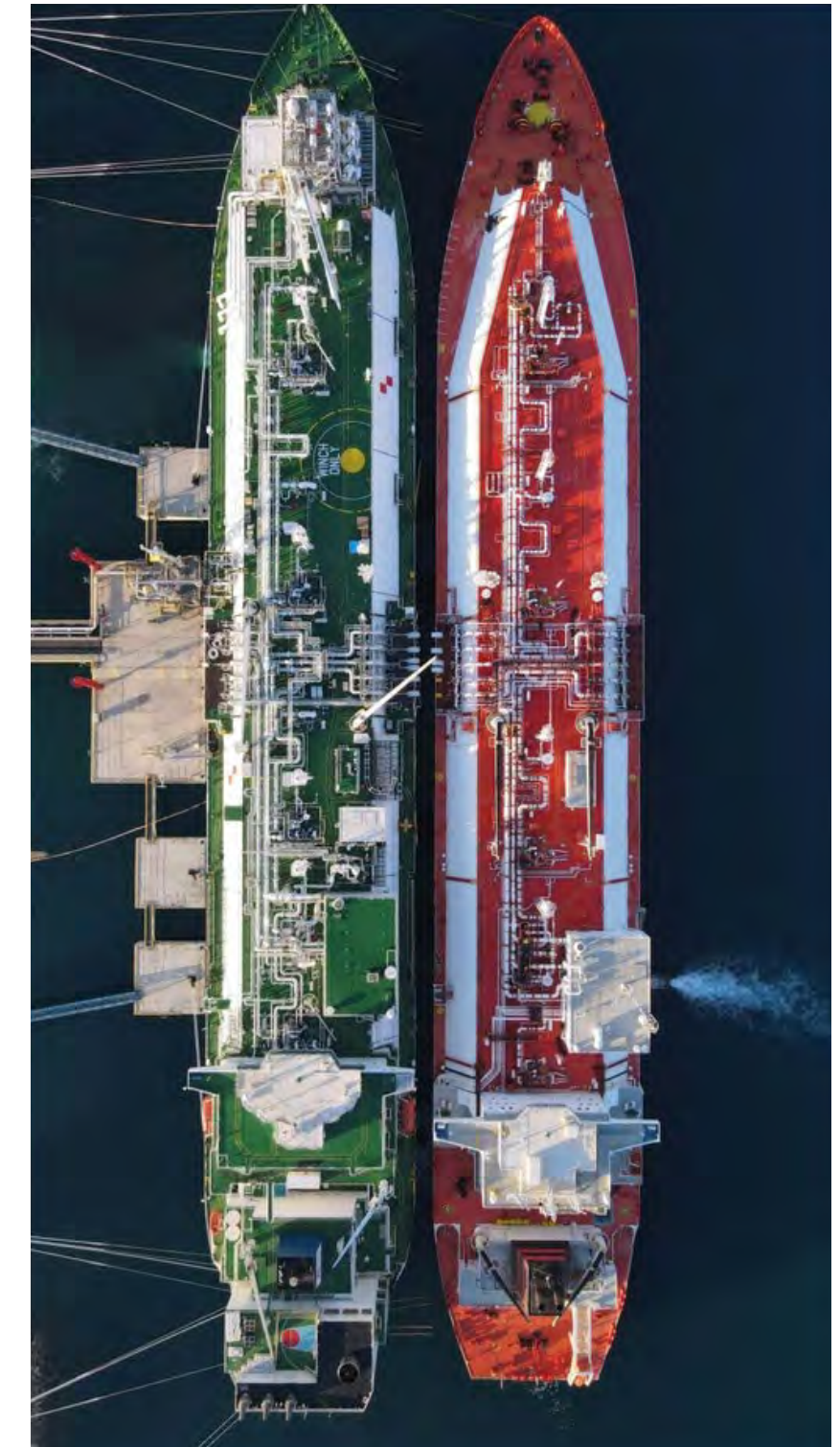


Third Development and Investment Cycle: Focus on Gas Transit

The consideration of projects enabling the transit of natural gas to neighboring countries, including the transport of liquefied natural gas (LNG) from the island of Krk and Caspian gas from the Southern Gas Corridor, specifically through the TAP and IAP pipelines, began.

As part of the third cycle, the first compressor station on the gas transmission system was built, worth 210 million HRK (27.87 million EUR), creating the conditions for bidirectional flow and the transport of larger gas quantities at the interconnection with Hungary. Additionally, the reconstruction of the Rogatec – Zabok main gas pipeline enabled bidirectional gas flow with Slovenia, fulfilling EU legislation requirements for ensuring continuous bidirectional gas flow at interconnections between EU member states.

The commissioning of the 430 million HRK (57.07 million EUR) Zlobin – Omišalj transmission gas pipeline connected the LNG terminal on the island of Krk with the mainland gas transmission system. This 17.5 km long pipeline is of vital importance for the functionality of the LNG terminal in Omišalj.













LNG TERMINAL

MAINTENANCE OF THE LNG TERMINAL ON THE ISLAND OF KRK (OMIŠALJ), FROM THE LOADING ARMS TO THE GAS HUB OMIŠALJ



ABOUT PROJECT

The terminal has a geopolitical and strategic dimension within the framework of strengthening the European energy market and increasing the security of gas supply to the countries of the European Union, especially the countries of Central and Southeastern Europe that want to secure a new reliable gas supply route for themselves. It is a project of strategic importance for the European Union and the Republic of Croatia.



SCOPE OF MAINTENANCE

The UPP terminal consists of:

- FSRU ship
- The land part of the Terminal

The onshore part of the Terminal consists of:

- piers
- suspension forts for docking the FSRU ship
- mooring forts for mooring the FSRU ship and the UPP transport ship
- quick-release hooks
- access bridge
- high-pressure transfer arms with connecting gas pipeline
- gas pipeline transmitter-cleaning station
- fire protection system
- control building, and
- supporting facilities.

End user: LNG HRVATSKA d.o.o.

Subject of the contract:
MAINTENANCE OF THE LNG TERMINAL ON THE
ISLAND OF KRK (OMIŠALJ), FROM THE LOADING
ARMS TO THE GAS HUB OMIŠALJ

2020-2022





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SFL Services

SFL Services

SEALCORR LIFE

- SEALCORR LIFE
- STOPAQ
- Covintence
- Polyken
- Powercrete
- Arzobetter

STOPAQ
CASING FILLER



SEALCORR
Engineering & Services



Grubišno polje

DELIVERY, COMMISSIONING, AND MAINTENANCE
OF EQUIPMENT FOR UNDERGROUND STORAGE
OF GAS „GRUBIŠNO POLJE“



ABOUT PROJECT

The start of the primary trial exploitation of gas from the Grubišno Polje field is underway.

The planned duration of trial exploitation is four to six years, during which all the necessary data will be collected for the final formation of the underground gas storage.

The maximum daily gas production during the trial exploitation is 240,000 cubic meters per day, while the annual gas production will be a maximum of about 40 million m³.

According to PSP Okola data, if the production data confirm the possibility of forming an underground gas storage facility, it can be operational in 2027/2028 at the earliest. with a maximum injection capacity of 70,000 m³/hour and a maximum withdrawal capacity of 100,000 m³/hour. The expected working volume of that gas storage is 60-100 million m³, which is significantly less than Okoli, which has a capacity of 553 million m³.



DELIVERED EQUIPMENT

The majority of equipment for the underground gas storage facility:

- Block valves with actuators and SCADA systems Ball valves operated by gas actuators
- Cone valves
- Pressure reduction assembly
- Gas heaters
- Ultrasonic and turbine flow meters, Chromatograph container
- Dehydration unit
- Instrument air unit
- Gas and diesel generators.

End user:

PSP (Podzemno skladište plina) d.o.o.

Project name:

DELIVERY, COMMISSIONING, AND MAINTENANCE OF
EQUIPMENT FOR UNDERGROUND STORAGE OF GAS
„GRUBIŠNO POLJE“

2020-2021





DOLAZ T.S.

ARMATURY







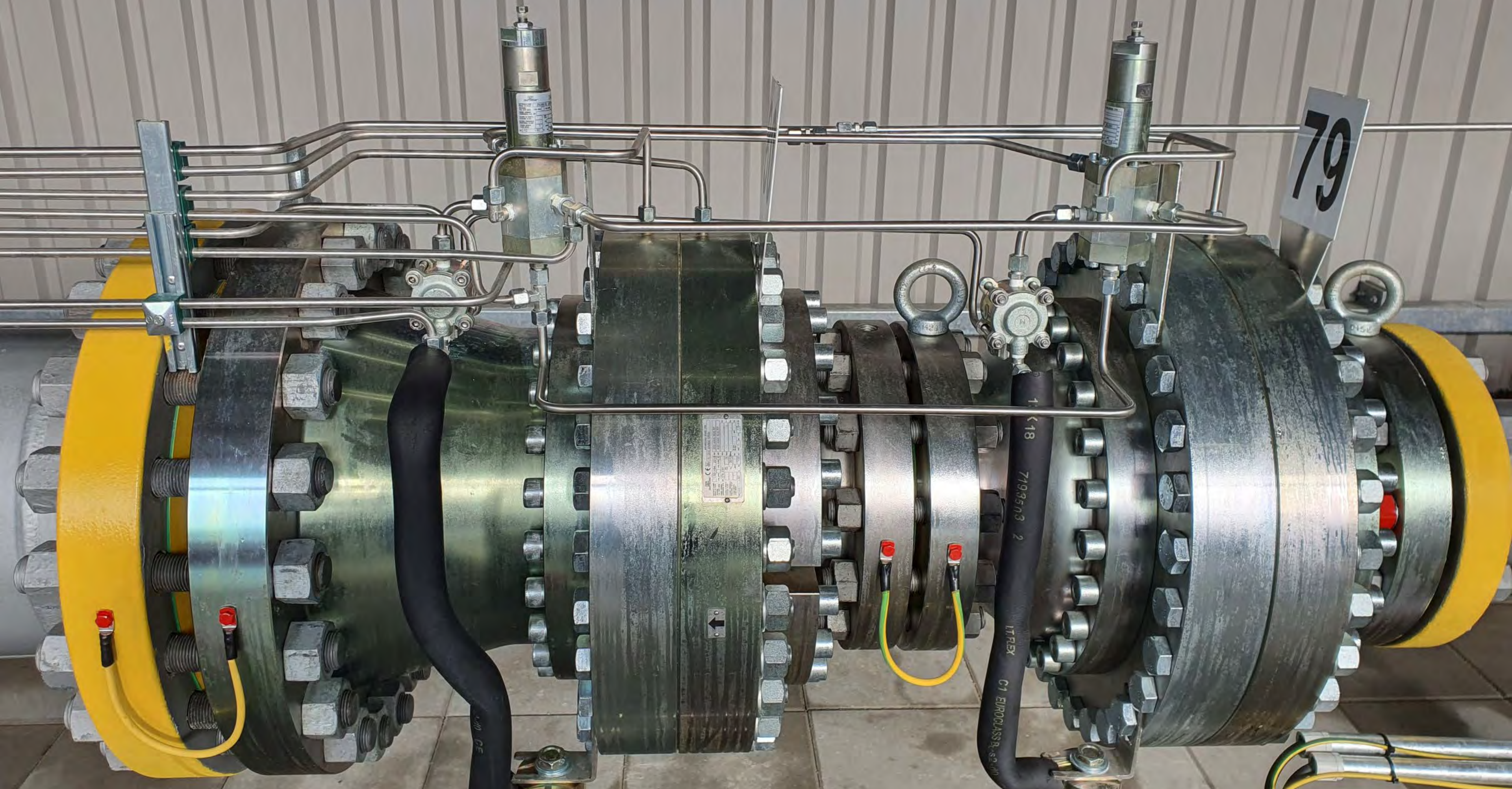












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Technical specifications label with various parameters and a CE mark.

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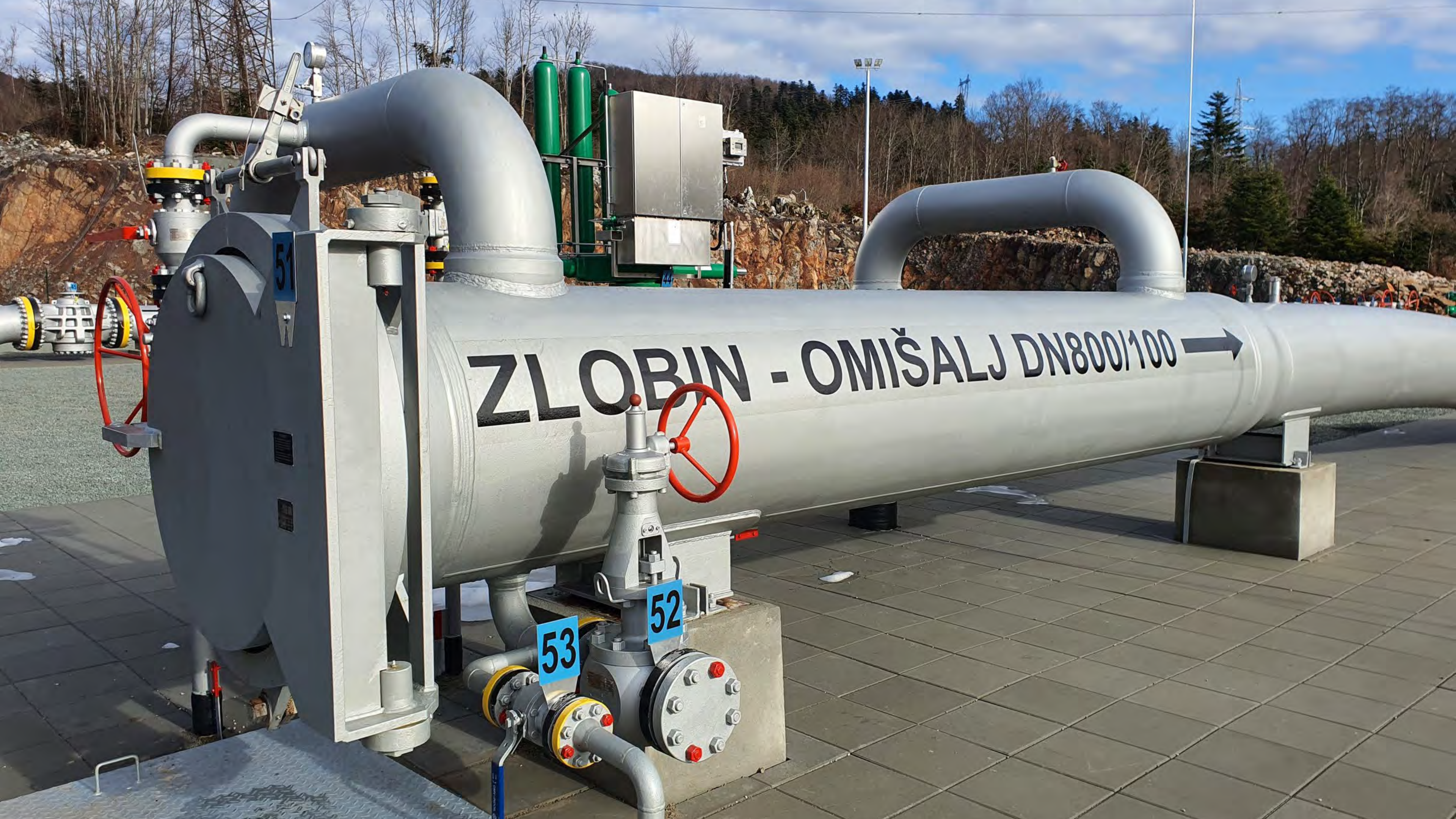
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89



← ZLOBIN - OMIŠALJ

55



ZLOBIN - OMIŠALJ DN800/100 →

51

52

53







Croatian Gas transmission system today

- 2694 km high pressure gas pipelines

952 km - 75 bar

742 km - 50 bar

- 157 MRS (282 metering lines)
- 10 entry points
- 172 exit points
- 2 interconnections
- 95% covering the territory of Croatia





Positioning Croatia as a regional energy hub requires additional investments

I. Expanding the capacity of the liquefied gas terminal in Omišlje

from 2.9 billion cubic meters of gas per year (338,000 cubic meters per hour)
to 6.1 billion cubic meters of gas per year (700,000 cubic meters per hour)

II. Investments in gas pipelines that could transport said gas to Slovenia and Hungary, which would ensure gas imports and strengthen the security of gas supply for the countries of Central and Southeastern Europe

LNG Krk evacuation direction

1 - MAIN ROUTE

Pipeline system: Omišalj-Zlobin-bosiljevo-sisak-Kozarac

2 - EASTERN SECTION

pipeline Kozarac - Slobodnica

2a - Transport route Hungary

Slobodnica - donji Miholjac-Dravaszerdahely-Varosfold
(supply of HU, UA, SK, RO, BG, SRB)

2b - Transport route Serbia

Slobodnica - Sotin- Bačko Novo Selo
(supply of SRB, BG, RO)

2c - Transport route Bosnia and Hercegovina

Slobodnica - Brod - Zenica (supply to BIH)

3 - WESTERN SECTION

Transport route Slovenia

Kozarac - Lučko-Zabok-Rogatec

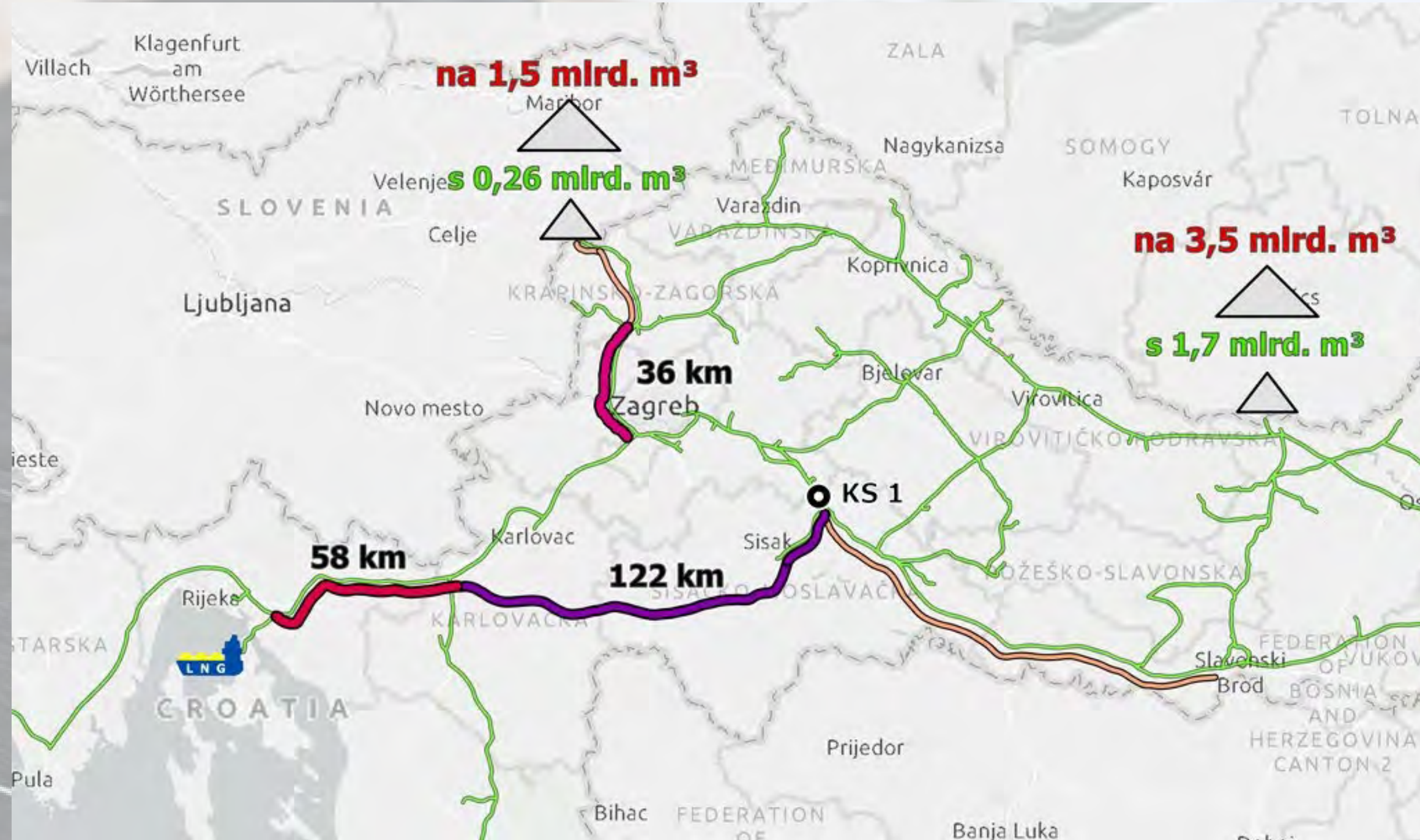
(supply of SLO, IT, AT, CZ, HU)



Upcoming projects:

4 new gas pipelines:

- 1. Zlobin - Bosiljevo (ZB)
- 2. Bosiljevo - Sisak (BS)
- 3. Kozarac - Sisak (KS)
- 4. Zabok - Lučko (ZL)



2024-2026



Conclusion

Until recently, Croatia was the second country in the EU (after Norway) that covered over 80% of its gas production needs domestically. Alongside a well-developed oil and gas exploration industry, Croatia simultaneously built an infrastructure network of oil and gas pipelines.

After the partial depletion of its own oil and gas resources, these networks now serve transport and transit purposes, delivering natural gas from other sources and the LNG terminal, thereby ensuring that Croatian industry and citizens have the necessary conditions for continued growth and a comfortable life.

In conclusion, energy infrastructure projects are the foundation for the development of any community.

We would be happy to share our experiences with you during the Exhibition.

References

 **plinacro**

 **INA**

 **PSP**
PODZEMNO SKLADIŠTE PLINA

 **STS**

 **Crosco**

 **G.P.**
1862
ZAGREB
**GRADSKA
PLINARA
ZAGREB**

 **HEP** OPERATOR
DISTRIBUCIJSKOG
SUSTAVA d.o.o.

 **energo**

 **TET**

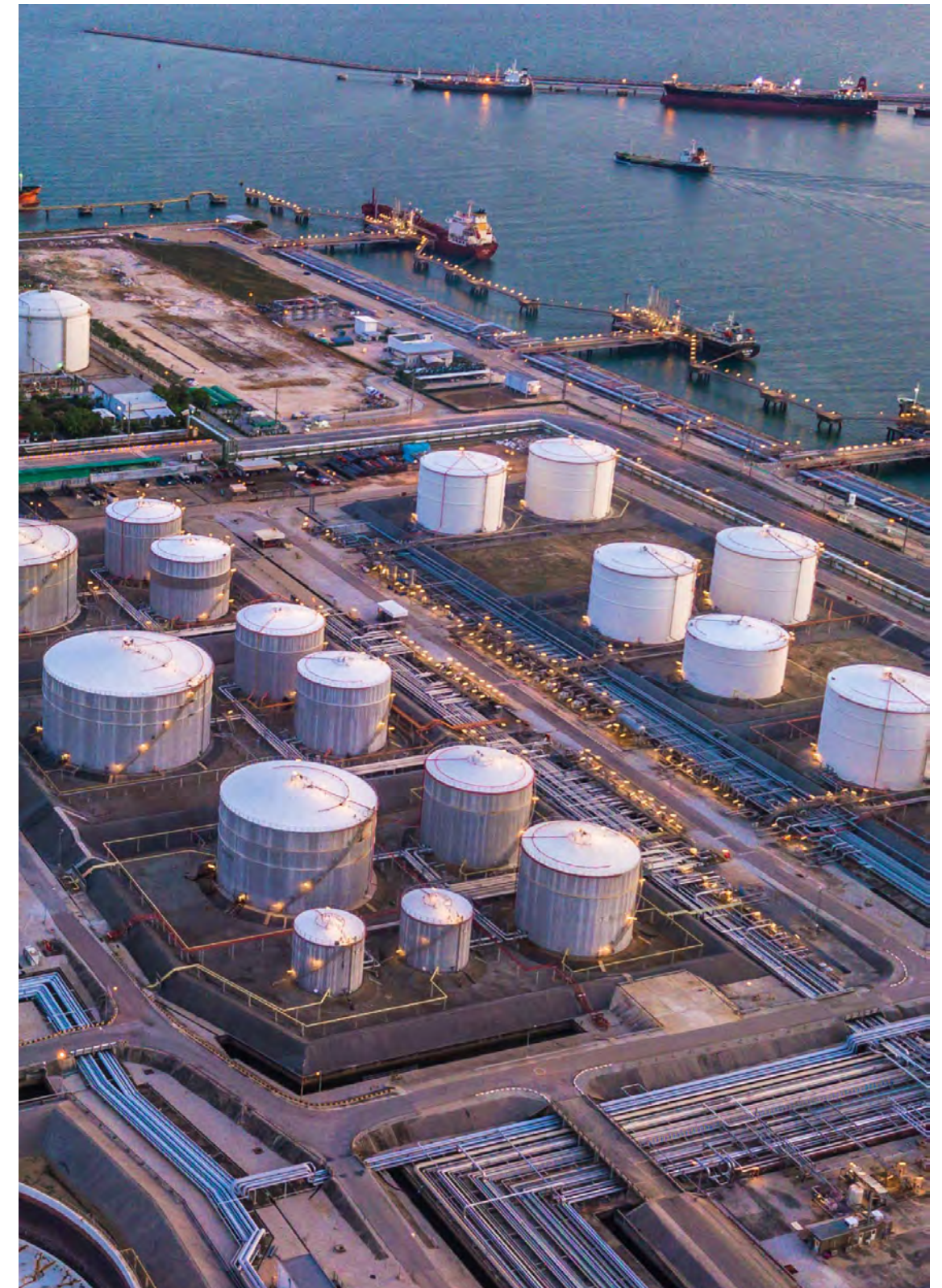
 **EKO HOLD**

 **HEP PROIZVODNJA**

 **MONTER**
ISTROJFERSKE MONTIŽE D.O.O.

 **PLINARA**
d.o.o. PULA

 **PETROKEMIJA**
KUTINA



References



Quality

- ISO 9001:2015
- ISO 29001:2010 / ISO 29001:2020
- ISO 14001:2015
- OHSAS 18001 / ISO 45001:2018
- SCCp
- ISO 3834-3:2007
- ISO/IEC 17020:2012
- AIV – HSUP
- TN-IN - Ex Agencija
- TN-ODA – Ex Agencija
- A database of authorized & educated individuals expert in various fields: from design and production, to maintenance and service





Thank You

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