EPPAM BÜLLETIN

Istanbul Aydin University EPPAM Year 5, Issue 1, Winter 2020

EUROPEAN ENERGY POVERTY

EPPAM joined European Union COST Action CA16232-European Energy Poverty: Co-Creation and Knowledge Innovation from Turkey. In the project, EPPAM contributes to Working Group 1: Integration-Transformation of State of Art, Working Group 2: Indicators-Developing an operational European Energy Poverty Framework, and Working Group 4: Innovation-Introducing path-breaking perspectives to the understanding of energy poverty.

CA16232-European Energy Poverty Agenda Co-Creation and Knowledge Innovation

Working Group 1: Integration-Transformation of State of Art

Working Group 2: Indicators-Developing an operational European Energy Poverty Framework

Working Group 4: Innovation-Introducing path-breaking perspectives to the understanding of energy poverty

MULTU-DISCIPLINARY INNOVATION FOR SOCIAL CHANGE

EPPAM joined European Union COST Action CA18236-Multi-Disciplinary Innovation for Social Change (SHIINE) from Turkey.

CA18236-Multi-Disciplinary Innovation for Social Change (SHIINE)

UN INTERNATIONAL DAY ON WOMEN AND GIRLS IN SCIENCE

EPPAM Director Assist. Prof. Dr. Filiz Katman participated United Nations (UN) International Day on Women and Girls in Science, which was declared in 2015 by the UN, to video by women scientists at Istanbul Aydin University on raising awareness organized by UNESCO Chair at Istanbul Aydin University on 11 February 2020

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SUSTAINABLE UNIVERSITY SEARCH CONFERENCE

Sustainable University Search Conference was organized on 3 February 2020 at Istanbul Aydin University. EPPAM Director Assist. Prof. Dr. Filiz Katman served as Organizing Committee Member at the conference. At the conference status analysis, areas for development, and policy recommendations at Istanbul Aydin University on United Nations Sustainable Development Goals are determind.

Organization Committee:Saygın, H., Yengin, D., F. Katman, F., Oral, S. S., Ozkan, A. D. Sustainable University Search Conference, Istanbul Aydin University, 3 February 2020, Istanbul, Turkey

II. BUNKER WORKSHOP

II. Bunker Workshop was organized on 2-4 March 2020 in Antalya, EPPAM Director Assist. Prof. Dr. Filiz Katman served as Consultant to the National Bunker Policy Project at AFAD, Turkish Ministry of Interiror. At the workshop, steps to be taken on the outcomes of the I. Bunker Workshop are discussed by the working groups composed of representatives of Civilian Defense Directorates, relevant ministries and units from various districts in Turkey. After workshop, the outcomes of working groups will be evaluated for Final Report by Prof. Dr. Sukru Ersoy (Yildiz Technical University), Assist. Prof. Dr. Ozcan Erdogan (Bezmialem Foundation University), Assist. Prof. Dr. Filiz Katman (Istanbul Aydin University) and Serhat Yilmaz (Istanbul Aydin University) and presented to AFAD, Ministry of Interor.

Ersoy, S., Erdogan, O., Katman, F. ve S. Yilmaz, II. Bunker Workshop, 2-4 March 2020, Antalya, Turkey.

TURKSTREAM PROJECT

EPPAM Director Assist. Prof. Dr. Filiz Katman participated Opening Ceremony of TurkStream Project on 8 January 2020 at Istanbul Congress Center.

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EPPAM DIRECTOR AS.PRO.DR. FILIZ KATMAN

24 TV - 16:00 MODERATOR - 28 FEBRUARY 2020

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EPPAM DIRECTOR ASSIST. PROF. DR. FILIZ KATMAN

TGRT HABER- 18:30 GÜN ORTASI - 28 FEBRUARY 2020

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NTV - 10:00 HABER – 28 FEBRUARY 2020

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EPPAM DIRECTOR ASSIST. PROF. DR. FILIZ KATMAN

24 TV - 16:00 MODERATÖR - 11 FEBRUARY 2020

EPPAM AT PRESS

EPPAM DIRECTOR ASSIST. PROF. DR. FILIZ KATMAN

NTV - 10:30 HABER – 11 FEBRUARY 2020

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BLOOMBERG HT -18:30 FOKUS–31 JANUARY 2020

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EPPAM DIRECTOR ASSIST. PROF. DR. FILIZ KATMAN

NTV - 21:00 YAKIN PLAN – 30 JANUARY 2020

EPPAM AT PRESS

EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN

24 TV - 21:00 KÜRESEL OYUN - 29 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
24 TV-21:00 MASADA NE VAR? -29 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
24 TV-21:00 MASADA NE VAR?-29 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
TRT HABER-21:00 ÖZEL YAYIN-19 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
24 TV-22:00 HABER-12 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
NTV - 21:00 YAKIN PLAN – 9 JANUARY 2020

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EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
TRT HABER - 12:00 HABER- 7 JANUARY 2020

EPPAM AT PRESS

EPPAM DIRECTOR AS.PROF.DR. FILIZ KATMAN
TGRT HABER-13:00 GÜN ORTASI-6 JANUARY2020

DEİK
DIŞ EKONOMİK İLİŞKİLER KURULU
FOREIGN ECONOMIC RELATIONS BOARD

ENERJİ ÇALIŞTAYI

26 Ocak 2015, İSTANBUL

Sonuç Raporu

TurkStream starts on the Russian coast near the town of Anapa, runs over 930 km through the Black Sea and comes ashore in the Thrace region of Turkey.

TurkStream directly connects the large gas reserves in Russia to the Turkish gas transportation network, to provide reliable energy supplies for Turkey, south and southeast Europe.

The offshore component of the system consists of two parallel pipelines running through the Black Sea. The pipelines enter the water near Anapa, on the Russian coast, and come ashore on the Turkish coast in the Thrace region, near the town of Kiyikoy.

From the receiving terminal in Kiyikoy, one of the two underground onshore pipelines connects to the existing Turkish gas network at Luleburgaz. The other pipeline continues to the Turkish-European border, where it ends.

Technology

TurkStream is a project that advances the technical boundaries of the industry: TurkStream is the first system with a diameter of 81 centimeters laid at depths exceeding 2 kilometers.

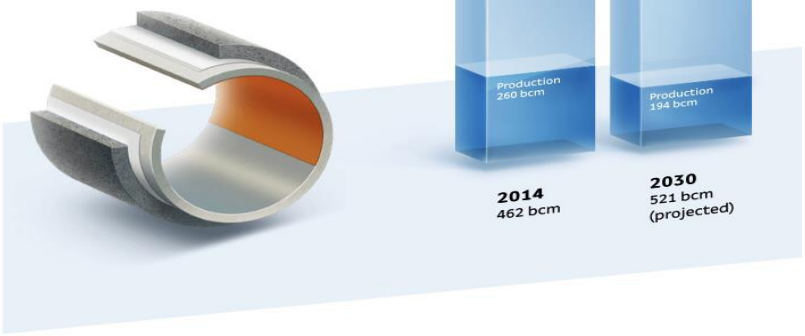
The two offshore pipelines are made up of thousands of individual pipe joints of 12 meters in length.

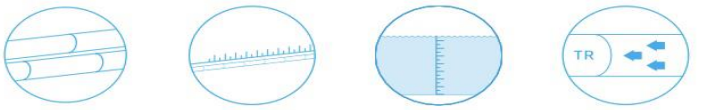
Benefits

The TurkStream Project not only ensures the reliability of energy supplies to Turkey and Europe, but also contributes to Turkey's economic development through the resources it has allocated for the construction and operation of the pipeline. In addition, TurkStream supports the development of the Kiyikoy area via local social investments.

Gas demand EU and Turkey

Source: IEA, World Energy Outlook 2016 (The New Policies Scenario)





2 offshore pipelines

930 kilometres per line

2200 metres maximum depth

31.5 billion cubic metres transport capacity

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A Unique Project

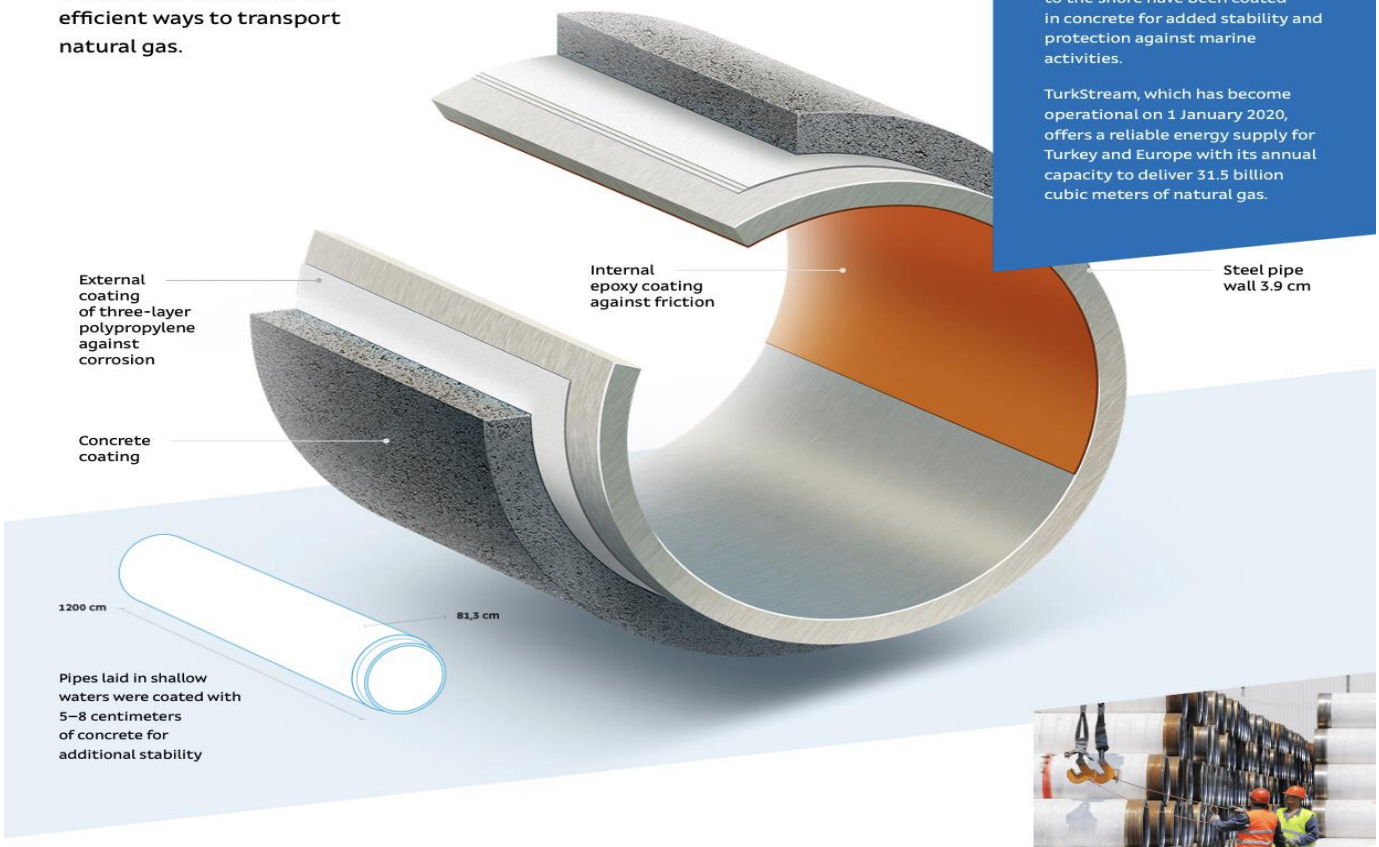
As the first 81 centimeter diameter system laid at depths exceeding 2 kilometers, TurkStream advances the technical boundaries of the industry.

Pipelines are one of the safest, most convenient and most efficient ways to transport natural gas.

Designed for maximum safety

Each of the two offshore pipelines of TurkStream is made up of thousands of individual pipe joints of 12 meters length. The pipes have been made from 39 millimeters of specially designed carbon manganese steel plates so that it can withstand the huge pressure under the sea. Pipes laid in shallow waters closer to the shore have been coated in concrete for added stability and protection against marine activities.

TurkStream, which has become operational on 1 January 2020, offers a reliable energy supply for Turkey and Europe with its annual capacity to deliver 31.5 billion cubic meters of natural gas.



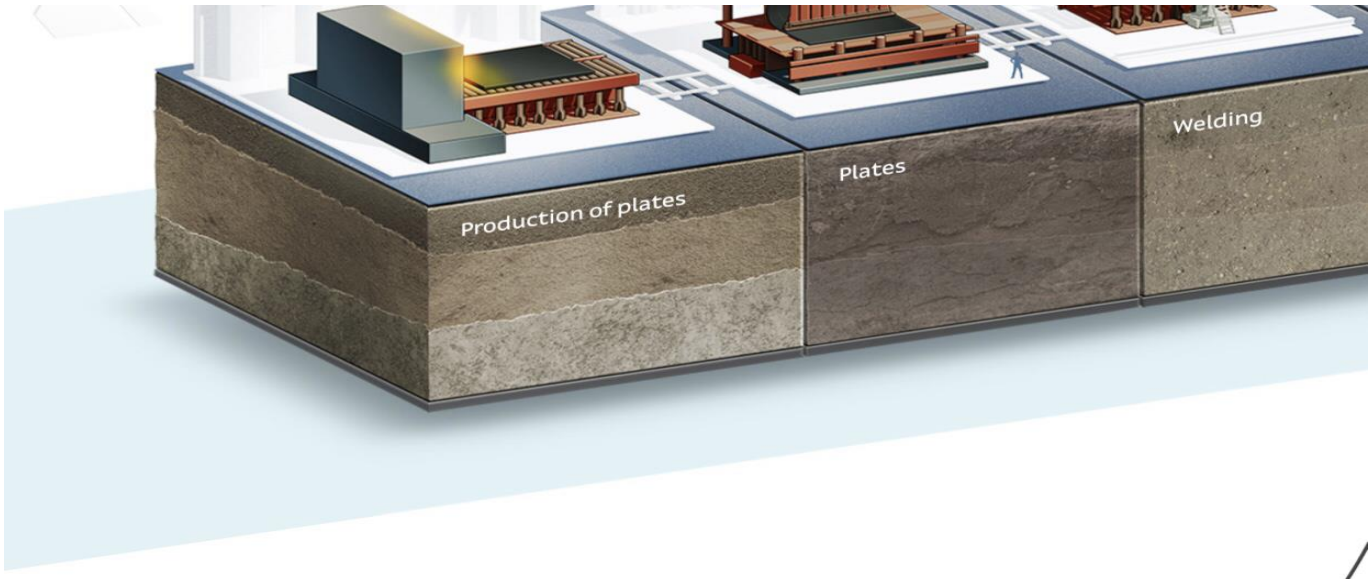
After production, the individual pipes were stored in ports on the Black Sea coast.

Offshore pipe laying

The biggest construction vessel in the world, Pioneering Spirit, carried out the offshore construction of the TurkStream Project.

The pipe joints were welded to each other and to the main string on board. Each weld was tested and coated for protection before the pipeline string was lowered into the water.

Pioneering Spirit completed the construction of the two pipelines across the Black Sea over 15 months, adding new sections to the pipe string as it progressed. Operating around the clock, the vessel laid 5 kilometres of pipeline each day on average. In August 2018, it set a world record in the industry by constructing 6.3 kilometers of the pipeline in a single day. Offshore construction in the deep-water section was completed in November 2018.



A new benchmark in the industry

The technical and material specifications of TurkStream set new benchmarks for the gas transport industry. The TurkStream Offshore Gas pipeline is the largest system ever laid at depths as low as 2,200 metres.

Underwater Visual Inspection

Using a Remotely Operated Vehicle (ROV), it is possible to film in the deep seas to investigate objects in detail and perform a visual inspection of the route, the pipeline and other structures that are installed. For its main activities, the ROV carries other instruments as well, such as sonars, magnetometers, pipe-trackers, or manipulators.

High-resolution seismic survey

A vessel produces a strong sonic pulse that hits the seabed and propagates under the surface. The seabed reflects a part of the pulse which returns, whilst a part travels through the seabed. Measuring the timing, geometry and the intensity of the returns of the sonic pulse, geophysicists can map the different layers underneath the seabed.

Echo sounding

A multi-beam echo sounder (MBES) emits several acoustic pulses, which hit the seabed or any object that is on the seabed, and are reflected back in different times and geometries, depending on the shape of the object. Hence, a 3D model is formed which shows the seabed topography, the shape and the depth of objects.

Sub-bottom profile (SBP) survey

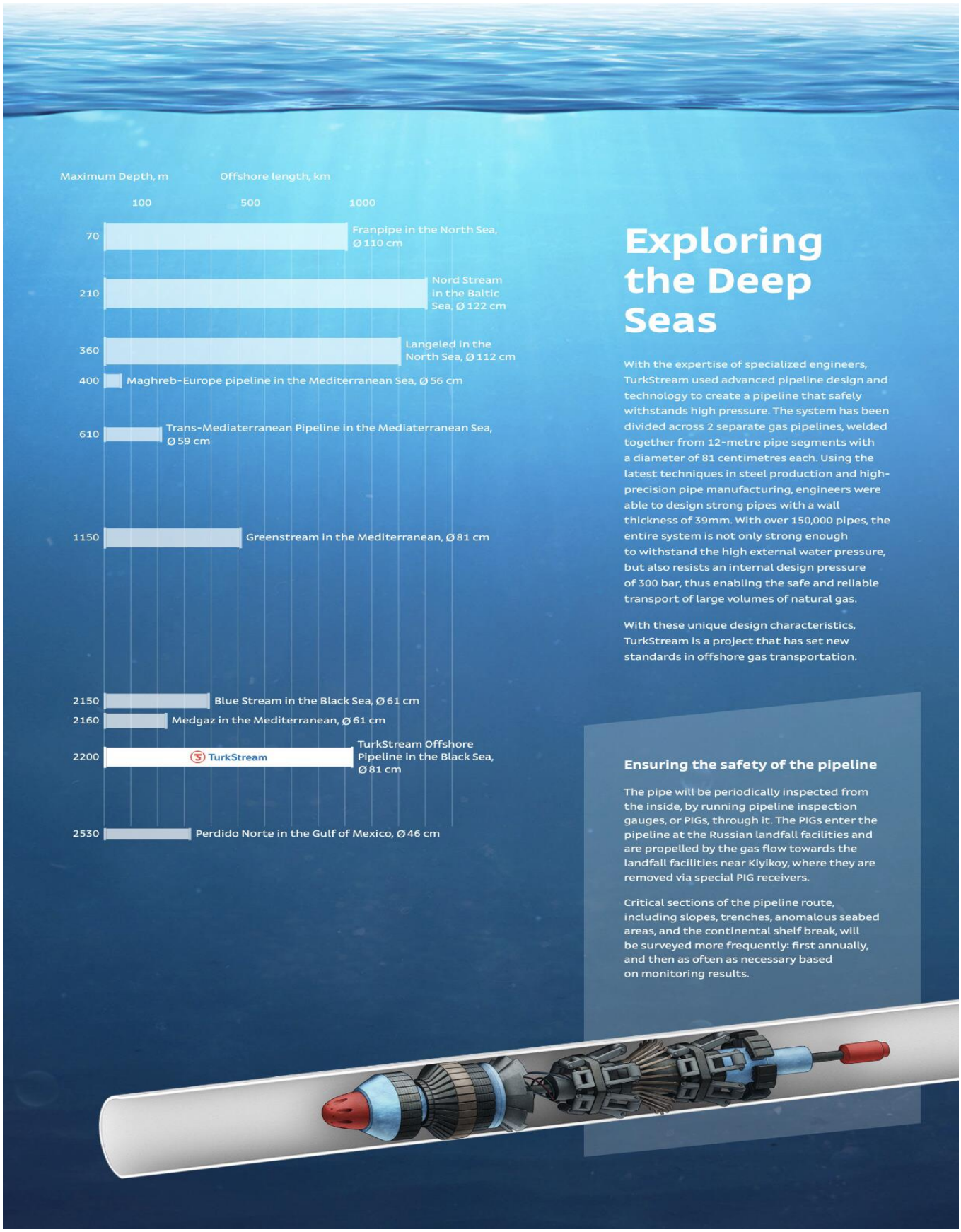
A transducer emits a sound pulse vertically towards the seafloor, and a receiver records the return of the pulse. This technique helps create an image of the layers of sediment under the seabed. As a mini-seismic tool, the SBP is usually towed closer to the seabed, if not directly mounted on a ROV.

Side scan sonar (SSS) survey

The SSS is used to create an acoustic image of large areas of the adjacent sea floor, by scanning up to 500 meters each side of the equipment in order to investigate any possible obstacles near the route. The sonar uses high frequency pulses, and can be towed directly from the vessel, or installed on a ROV. By analyzing the acoustic shadow, the time of the pulse, the intensity and other acoustic factors, the dimensions of objects, obstacles or seabed features can be determined.

Seabed samples

Using a range of different techniques, samples are taken from the seabed at different depths, and analyzed in a laboratory to determine the environmental, geological or geotechnical properties. The result of these analyses, studied in correlation with other geophysical properties of the seabed, are used to produce a geological map of the sub-seabed, and to ascertain if the seabed is suitable for pipeline laying.


Maximum Depth, m
Offshore length, km
100
500
1000
70
Franpipe in the North Sea, Ø 110 cm
210
Nord Stream in the Baltic Sea, Ø 122 cm
360
Langeled in the North Sea, Ø 112 cm
400
Maghreb-Europe pipeline in the Mediterranean Sea, Ø 56 cm
610
Trans-Mediaterranean Pipeline in the Mediaterranean Sea, Ø 59 cm
1150
Greenstream in the Mediterranean, Ø 81 cm
2150
Blue Stream in the Black Sea, Ø 61 cm
2160
Medgaz in the Mediterranean, Ø 61 cm
2200
TurkStream
TurkStream Offshore Pipeline in the Black Sea, Ø 81 cm
2530
Perdido Norte in the Gulf of Mexico, Ø 46 cm
Exploring the Deep Seas
With the expertise of specialized engineers, TurkStream used advanced pipeline design and technology to create a pipeline that safely withstands high pressure. The system has been divided across 2 separate gas pipelines, welded together from 12-metre pipe segments with a diameter of 81 centimetres each. Using the latest techniques in steel production and high-precision pipe manufacturing, engineers were able to design strong pipes with a wall thickness of 39mm. With over 150,000 pipes, the entire system is not only strong enough to withstand the high external water pressure, but also resists an internal design pressure of 300 bar, thus enabling the safe and reliable transport of large volumes of natural gas.
With these unique design characteristics, TurkStream is a project that has set new standards in offshore gas transportation.
Ensuring the safety of the pipeline
The pipe will be periodically inspected from the inside, by running pipeline inspection gauges, or PIGs, through it. The PIGs enter the pipeline at the Russian landfall facilities and are propelled by the gas flow towards the landfall facilities near Kiyikoy, where they are removed via special PIG receivers.
Critical sections of the pipeline route, including slopes, trenches, anomalous seabed areas, and the continental shelf break, will be surveyed more frequently: first annually, and then as often as necessary based on monitoring results.

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Supplying Energy for the Future

Russia takes its responsibility to provide consumers with reliable gas supplies very seriously and has always fulfilled its contractual obligations in this regard. Pipelines deliver gas directly and hence play a key role in securing reliable energy supplies.

Anapa

TurkStream starts on the Russian coast of the Black Sea near the town of Anapa and runs for 930 kilometers under the sea towards Turkey.

31.5 billion cubic metres of natural gas per year

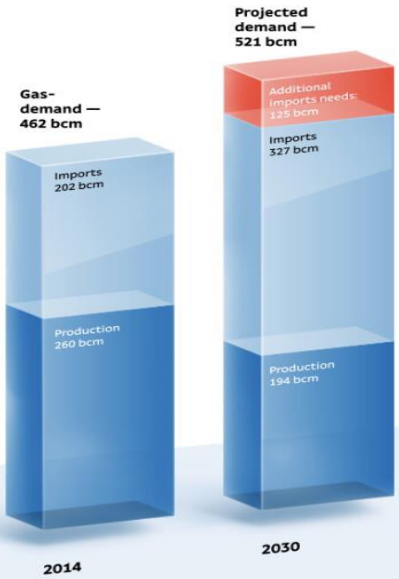
Kiyikoy

Luleburgaz

The offshore section of the TurkStream Gas Pipeline connects to landfall facilities onshore Turkey near the town of Kiyikoy on the Black Sea coast.

The Nord Stream pipeline has been in operation since 2011 and guarantees uninterrupted gas flows to Germany and other northern European countries. Since 2003, gas has been transported directly to Turkey through the Blue Stream pipeline.

Gas deliveries to the west of Turkey and a number of southern and southeastern European countries have been relying on an older system which runs via Ukraine. Over the past 20 years, lack of investments in its modernization has made this system less reliable, posing a risk for those countries that depend on it for all their energy.



Gas demand EU and Turkey

Source: International Energy Agency (IEA), World Energy Outlook 2016 (The New Policies Scenario), bcm: billion cubic meters

A Reliable Route

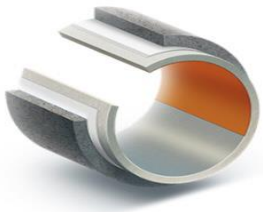
TurkStream offers a key solution for the energy supply security of Turkey and Europe by providing a direct connection to Russian gas reserves, to transport up to 31.5 billion cubic metres of gas to the region each year.

Local investments and opportunities

We believe that it is important for the TurkStream Project to contribute to the economic and social development of the local communities in our project area. Our Community Investment Program has been aiming to respond to the needs and aspirations of our local communities, a priority that we ensured through community participation in identifying, prioritizing and delivering projects.

On a wider level, the development of the necessary infrastructure in Turkey and beyond supports the further modernization of the Turkish industry.

Additionally, with an annual capacity of 31.5 bcm, TurkStream further boosts Turkey's geostrategic importance.



Designed for maximum safety

Laid at depths exceeding 2 kilometers, TurkStream advances the technological boundaries of the industry.

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Environment

At TurkStream, we have taken every measure to ensure safety and safeguard the environment during both construction and operations phases.

Health & Safety

Compliance with strict Health, Safety, Security and Environmental Standards throughout all project stages.

EIA in Russia and Turkey

Environmental Impact Assessments (EIAs) have been carried out in Russia and Turkey for both the offshore and the onshore segments of the project.

Environmental and social monitoring is undertaken throughout construction and operation to check that any impacts are in line with the forecasts in the EIA reports.

A safe track record

Since the first-ever underwater gas pipeline was built in the 1950s, technology has developed significantly and offshore pipelines are now one of the safest and most efficient ways of transporting hydrocarbons such as natural gas. To date, there have been no major incidents involving offshore gas pipelines.

Environmental Impact Assessments

We have made significant investments in surveys and environmental and social studies to facilitate safe and optimum pipeline design. Part of this process has been carrying out national Environmental Impact Assessments (EIA) for both Russia and Turkey.

Working with international specialists on both sea and land, the EIA process helped us learn more about the potential impacts of the Project on the environment and the local community. Accordingly, we were able to develop strategies based on these assessments to enhance the Project's positive impact and to reduce any potential adverse effects.

An EIA had been completed and approved for the Russian section of the project as part of the South Stream Offshore Gas Pipeline. An EIA was also prepared for the Turkish section and approved by the relevant official authorities.

We continue to adopt the necessary mitigation and management measures to enhance benefits and reduce adverse effects in the light of both these EIA reports and the outcomes of the environmental and social monitoring works.

Finding the Best Route

Thousands of kilometres of offshore surveys have been performed to find the most suitable path to lay the pipeline across the Black Sea. After assessing different options, a route was chosen from Anapa in Russia to a site near Kiyikoy in Turkey, and further surveys were conducted to optimize this route.

Using modern survey techniques, engineers created a detailed profile of the seabed and analyzed the different soil types. Near the coast, the pipeline runs along the relatively shallow part of the sea called the continental shelf. At the so-called continental shelf break the Black Sea suddenly becomes deeper and the seabed plunges from about 80 to over 1,500 metres deep, creating a considerable challenge for the pipeline route. We took these challenges into careful consideration in the pipelaying process and successfully implemented the designed route.

Protecting the Black Sea's Cultural Heritage

One of the remarkable characteristics of the Black Sea is that there is little to no oxygen below depths of around 100–200 metres due to high levels of hydrogen sulphide. While this is not good for fish and sea life, it is good news for archaeologists. Due to the lack of oxygen and bacteria, shipwrecks and other underwater items of cultural importance barely decay in the deep Black Sea and are often well preserved, even after hundreds of years.

We are one of the first entities to survey the Black Sea bed in a 500-metre wide corridor from east to west. These surveys have helped finding a number of objects of potential cultural importance, including shipwrecks that may date as far back as the late Byzantine period (11-14th century). Further surveys were conducted on the new section of the route to Turkey. Measures were taken to protect and preserve cultural heritage found along the pipeline route.

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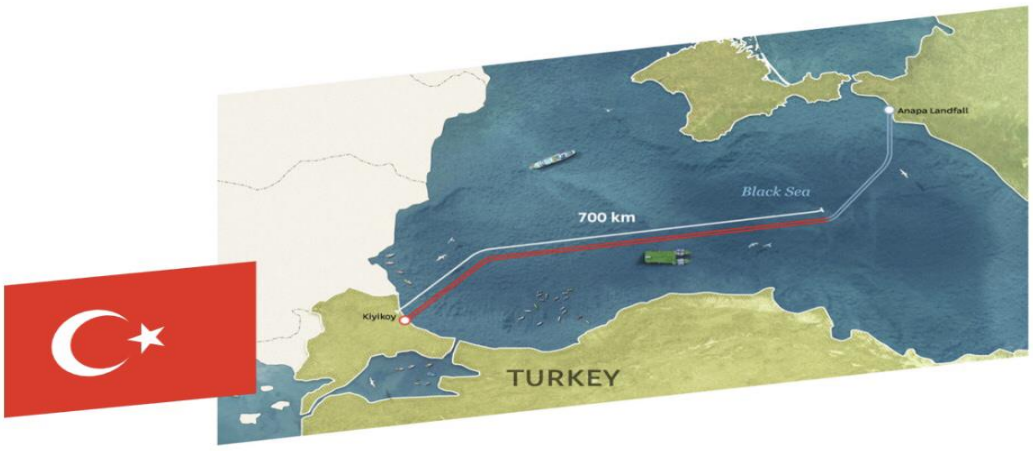
EIA in accordance with Turkish Legislation

Approximately 700 km of the offshore pipeline lies within the Turkish Exclusive Economic Zone and the Turkish waters in the Black Sea. An EIA has been conducted to ensure that this section is developed in line with Turkish legislation, environmental and permitting requirements.



The Environmental Impact Assessment (EIA) in Turkey has taken into account local environmental conditions, communities and overall pipeline safety in the development of the TurkStream Offshore Gas Pipeline to minimize the impact of the Project on the local environment and community.

The Turkish section of the Project has been developed in compliance with Turkish permitting and environmental requirements.

Available data

The EIA and permitting process for the Turkish section of the offshore pipeline is divided into two parts.

An EIA was already conducted and approved in 2014 in the context of the South Stream Offshore Gas Pipeline for the section that extended from Russia to the border of the Turkish and Bulgarian Exclusive Economic Zones (EEZ). The findings of the extensive surveys and assessments already conducted for the South Stream Offshore Gas Pipeline were used for the development of the TurkStream Offshore Gas Pipeline.

A separate EIA has been conducted within the scope of the TurkStream Pipeline Project for the section that stretches from the border of the Turkish and Bulgarian Exclusive Economic Zone (EEZ) to the Turkish coastline, with a length of approximately 275 km.

Turkish stakeholders have been consulted with as part of these assessments. Comprehensive consultations were undertaken as part of the EIA process for the new section of the offshore route and landfall facilities to ensure that stakeholders in the Kiyikoy region had the opportunity to comment on the Project.

EIA in Russia

The TurkStream pipeline starts on the Russian coast near Anapa, and runs through the Black Sea for nearly 230 km in Russian waters.

İSTANBUL AYDIN ÜNİVERSİTESİ
EPPAM
ENERJİ POLİTİKALARI VE PİYASALARI UYGULAMA VE ARAŞTIRMA MERKEZİ

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