

P&GJ's 2017 Worldwide Pipeline Construction Report

By **Rita Tubb**, Executive Editor

Under Construction 45,412
Planned 38,390
Total 83,802

(Note: all figures are in miles)



P&GJ's 2017 survey figures indicate 83,802 miles of pipelines are planned and under construction worldwide. Of these, 38,390 include projects in the engineering and design phase and 45,412 in various stages of construction.

Following is a look at new and planned pipeline miles in the seven basic regional groups (see area map).

Pipeline Mileage Under Construction: North America 15,279; South/Central America and Caribbean 1,821; Africa 1,716; Asia Pacific 10,085; Former Soviet Union and Eastern Europe 10,700; Middle East 4,423; and Western Europe and European Union 1,388.

New and Planned Pipeline Miles: North America 16,535; South/Central America and Caribbean 2,859; Africa 2,268; Asia Pacific 9,753; Former Soviet Union and Eastern Europe 2,006; Middle East 4,794; and Western Europe and European Union 175. For further information on these and other projects, see *P&GJ's* sister publication, *Pipeline News*.

North America

North America accounts for 31,814 miles of new and planned pipelines but several major projects have been delayed. One problem for the industry occurred when, after seven years of delays, President Obama denied the required presidential permit for

TransCanada's 1,179-mile Keystone XL Pipeline, which would have carried 800,000 bopd from the Canadian oil sands to the Gulf Coast.

Further fueled by the Obama's decision, protesters began working to halt other pipeline projects. One of these was the Energy Transfer Partnership, Sunoco Logistics, and Phillips 66 proposed Dakota Access Pipeline to transport production from Bakken three Forks production areas in North Dakota to Patoka, IL. Stretching 1,172 miles, the route passes two major Indian reservations, including Standing Rock, which is located in North and South Dakota. After the Standing Rock Sioux Tribe claimed the pipeline threatened its members' economic and environmental well-being, protesters flocked to the pipeline route and torched millions of dollars of pipeline equipment in Reasnor, IA and at a site in North Dakota.

On Dec. 4, bowing to political pressure, the federal Army Corps of Engineers refused to grant the developers a permit for a required river crossing, a step which could delay completion of the project indefinitely unless President-elect Trump takes action to grant the permit after his inauguration, which he has broadly suggested he will do to ensure final completion of the pipeline.

Litigation has Williams Partners bogged down on two fronts involving the Constitution Pipeline and Atlantic Sunrise Expansion

project. As proposed, the Constitution is a 124-mile pipeline with a capacity to transport 650,000 Dth/d of natural gas. The route stretches from Susquehanna County, PA into New York state.

Williams also revised the targeted in-service date for its Atlantic Sunrise expansion project from the second quarter of 2017 to mid-2018. The revision resulted from an updated schedule of environmental review, published Oct. 20 by the Federal Energy Regulatory Commission (FERC), and anticipated delays of certain permits to begin construction. FERC's revised environmental review schedule establishes Dec. 30 for its issuance of the final Environmental Impact Statement (EIS), which would allow construction to begin. The nearly \$3 billion expansion would increase deliveries by 1.7 Bcf/d. Williams' net investment in the Atlantic Sunrise project is \$1.9 billion.

One project nearing completion is the 515-mile Sabal Trail Pipeline. This interstate pipeline, designed to transport over 1 Bcf/d of natural gas through Alabama, Georgia and Florida, is being built by Sabal Trail Transmission, a joint venture of Spectra Energy Partners, NextEra Energy and Duke Energy. Construction began in May and is expected to be in-service by June.

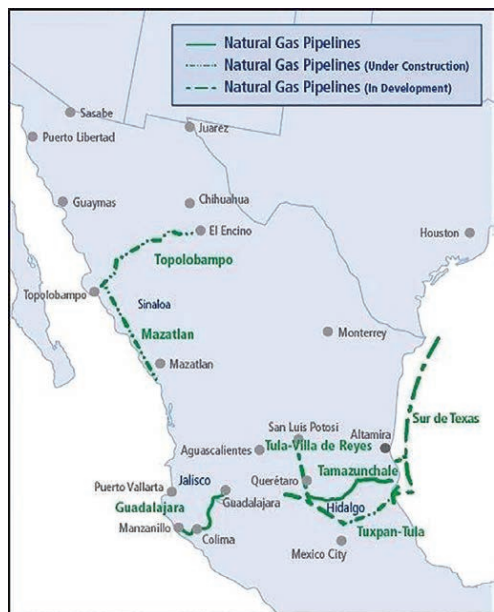
A major planned project is the 564-mile Atlantic Coast Pipeline. Four energy companies – Dominion, Piedmont Natural Gas, Duke Energy and AGL Resources formed Atlantic Coast Pipeline to build and own the project, which will serve several public utilities in Virginia and North Carolina. It is expected to be in-service in late 2019.

In the U.S. Gulf of Mexico, BP has approved the \$9 billion Mad Dog Phase 2 project, highlighting its long-term commitment to the region despite the current low oil price environment. Mad Dog Phase 2 will include a new floating production platform with the capacity to produce up to 140,000 bopd from up to 14 production wells. Oil production is expected to begin in late 2021.

The second Mad Dog platform will be moored 6 miles southwest of the existing Mad Dog platform, which is located in 4,500 feet of water about 190 miles south of New Orleans. The current Mad Dog platform has the capacity to produce up to 80,000 bopd and 60 MMcf/d of natural gas. BP plans to add 800,000 boe/d of new production globally from projects starting up between 2016 and 2020.

Mexico

One bright spot for future North America construction may be Mexico. Experts predict a 75% increase in demand for natural gas over the next 15 years as Mexico's economy continues growing and the country switches to natural gas-fired power generation.



TransCanada has a footprint of assets and projects in development exceeding \$5 billion, all underpinned by 25-year agreements with Mexico's state power company. By 2018, TransCanada plans to operate the seven major gas pipeline systems shown in the accompanying map.

Mexican oil and gas pipeline operator PEMEX and French energy company Engie have selected Emerson to help upgrade and expand Mexico's gas pipeline infrastructure. This involves automation of the southern portion of the Los Ramones Phase II pipeline. When completed, the 180-mile Los Ramones II Sur pipeline will have the capacity to deliver 1.4 Bcf/d.

Canada

Major pipeline construction project delays are also being seen in Canada. These include TransCanada's Energy East project and Enbridge Energy's \$7.9 billion Northern Gateway project.

In August, protesters arrived at that National Energy Board (NEB) during hearings for TransCanada's 2,858-mile Energy East Pipeline, and virtually shut down the hearings, which have not been rescheduled at this time. The \$15.7-billion proposed pipeline would carry oil from Western Canada to New Brunswick and Quebec.

On Nov. 29, the Government of Canada granted approval for Kinder Morgan's TransMountain Expansion. These approvals will allow the project to proceed with 157 conditions.

The original TransMountain Pipeline was built in 1953 and continues to operate safely today. The expansion of the existing 1,150-km pipeline will run between Strathcona County near Edmonton, Alberta and Burnaby, BC. The expansion will create a twinned pipeline increasing the nominal capacity of the system from 300,000 to 890,000 bpd. The project will require 980 km of new pipeline; reactivation of 193 km of pipeline; 12 new pump stations; 19 new tanks to be added to existing storage terminals in Burnaby (14), and Edmonton (5).

Plans call for construction to begin in September 2017 and the line to be in-service in late 2019.

TransCanada also won approval for its CA\$1.3 billion Nova Gas Transmission Ltd. (NGTL) system expansion project, which will provide additional capacity to meet the needs of natural gas shippers. The project includes five new pipeline sections totaling 142 miles, as well as two compression facilities.

The Canadian government approved Enbridge Pipeline's Line 3 Replacement Program. The \$7.5-billion project is the largest in company history and will replace the majority of the existing Line 3 on either side of the Canada-U.S. international border. The total length of the replacement is 1,031 miles. The anticipated in-service date is 2019, pending U.S. regulatory approvals.

Canada's Federal Court of Appeal revoked permits for Enbridge Energy's \$7.9 billion Northern Gateway project, citing government officials' failure to sufficiently consult the First Nations people. The project calls for twin pipelines to cross about 730 miles of Alberta and British Columbia, including large portions of First Nation-owned land.

Completion is scheduled later this year on Enbridge's Norlite Pipeline. The project involves construction of a 24-inch diluent pipeline, originating at Enbridge's Stonefell Terminal, in Strathcona County, AB, and terminating at Enbridge's Fort McMurray South Facility with a transfer line to Suncor's East Tank Farm. The project includes associated pumping and tankage infrastructure. The estimated capital cost is \$1.4 billion.

Middle East

The outlook for the Middle East remains positive. Pipelines under construction and planned in the region total 9,217 miles.

A \$4.8 billion agreement between French energy giant Total SA and the National Iranian Oil Company (NIOC) would develop Phase 11 of South Pars, the world's largest gas field, that will have a production capacity of 1.8 Bcf/d, or 370,000 bpd of oil equivalent. The gas will be fed into Iran's gas network.

In Oman, Punj Lloyd is working on a \$404 million project for the Oman Oil Refineries and Petroleum Industries Co. and Oman Gas Co. to construct a 186-mile, 14-inch NGL pipeline and a 32-inch,

186-mile gas pipeline. Both are scheduled for completion in 38 months. Punj Lloyd will also lay a 32-inch gas pipeline parallel to the existing 32-inch Fahud – Sohar pipeline for Oman Gas.

GC Corporation's affiliated company, JGC Gulf International Co., has a contract for the gas pipeline/gas storage tank construction project in Awali, Bahrain. Completion is slated in September 2018.

Former Soviet Union and Eastern Europe

A total of 24 key crude and natural gas projects could start operations in the Former Soviet Union (FSU) region by 2025, with Russia and Kazakhstan driving production in the region, says research and consulting firm GlobalData.

Rosneft is responsible for nine projects of which eight will involve conventional crude. Key projects could contribute 2.1 MMbpd to global crude production in 2025, and 10.4 Bcf/d to gas production.

Two projects of particular interest in the region are the Trans Anatolian Natural Gas Pipeline (TANAP) and the Trans Adriatic Pipeline AG (TAP) pipeline.

Punj Lloyd, in a 50-50 joint venture with Limak, won the contract to construct a 285-mile segment of the TANAP pipeline in Turkey. Once completed, the pipeline will bring natural gas produced from Azerbaijan's Shah Deniz-2 field and other areas of the Caspian Sea primarily to Turkey and onto Europe.

Trans Adriatic Pipeline AG (TAP) has awarded an EPCI contract to Saipem SpA for TAP's 36-inch offshore pipeline across the Adriatic Sea – between the coastlines of Albania and southern Italy. The pipeline will be 65 miles in length and installed 820 meters below sea level at the deepest point.

Spiccapag, a subsidiary of Entropose (VINCI Group), contracted to build several sections of the onshore TAP project: one involves 115 miles in Greece while another of 133 miles is in Albania. TAP is expected to be completed by 2020.

In the near-term, Gazprom plans to commission the Nord Stream 2 project by late 2019. The proposed 48-inch twin-pipeline system is about 745 miles long. Each pipeline will start in the southwest of St. Petersburg, Russia and end at the German coast in Greifswald.

Western Europe and EU

The North Sea will account for 36 crude and natural gas projects by 2025, according to GlobalData. The UK is expected to account for 25 while nine will be located in Norway and two in Denmark.

In the Norwegian North Sea, Statoil awarded Saipem and Technip contracts for work on the Johan Sverdrup project, one of the largest oil fields in the North Sea. It covers the installation of an 18-inch, 97-mile, gas export pipeline for the Kårstø gas terminal and a 36-inch, 175-mile oil export pipeline linking to the Mongstad terminal.

Technip's contract covers infield pipeline fabrication and installation of 18 miles of plastic-lined, 16-inch water injection flowlines. Pipe lay operations are to start in 2018. The first phase of the Johan Sverdrup development is to be on-stream in 2019.

Asia Pacific

World energy consumption is expected to increase by 48% over the next three decades, led by strong increases in the developing world – especially in Asia, according to the *International Energy Outlook 2016* released by the U.S. Energy Information Administration (EIA). Developing Asia accounts for over half of the projected increase in global energy use through 2040.

McDermott International was awarded further pipeline work for 2017 under a multi-year offshore installation contract with Brunei Shell Petroleum Co. The work includes transportation and installation of pipelines and umbilicals in fields offshore Brunei.

In India, GAIL initiated a major step toward construction of the Jagdishpur-Haldia-Bokaro-Dhamra Natural Gas Pipeline (JHBDPL), by approving orders for the 133-mile section from Phulpur to Dobhi (under phase-IB/Two section) to be constructed simultaneously by JSIW Infrastructure Pvt. Ltd. and IL&FS Engineering & Construction. Work is targeted for completion by late 2018. Once completed, the 1,578-mile pipeline will connect homes in major cities and towns along the route with piped natural gas.

Australia

Australia accounts for several pipeline projects. Jemena was selected by the Northern Territory Government to build and operate the North East Gas Interconnector, which will be known as the Northern Gas Pipeline (NGP). The 387-mile pipeline will connect Northern Australian fields to the east coast market to Queensland. First gas should begin flowing by 2018.

Construction is underway on the Esso-operated 116-mile Longford-to-Long Island Point

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system near Sale, Victoria. It replaces an existing pipeline and is being built by Nacap Australia, a Quanta Services company. Completion is expected in June.

Africa

Some 43 crude and natural gas projects are expected to start operations in Sub-Saharan Africa by 2025, of which 31 are crude and 12 are natural gas, according to GlobalData. Nigeria leads the region in number of planned projects, with 11 followed by Angola with eight.

Tullow Oil and Total S.A. each have five planned projects, nine crude and one natural gas. Chevron is planning three projects. Planned projects in the Sub-Saharan could contribute 1.1 MMbpd to global crude production in 2025 and 7.7 Bcf/d to gas production.

Subsea 7 S.A. is contracted with BP and DEA (Deutsche Erdoel AG), to develop the Giza, Fayoum and Raven subsea fields off the shore of Alexandria, Egypt. This includes engineering, procurement, installation and pre-commissioning of the subsea infrastructure from 12 wells, with 50 miles of umbilicals and 140 miles of pipelines. It also includes installing export lines from the subsea location to the Idku terminal. Commissioning is scheduled in 2019.

Petrobrel awarded Saipem an EPCI contract for the accelerated startup of Egypt's Zohr gas field. This encompasses installation of a 26-inch gas export trunkline and 14-inch and 8-inch service trunklines, as well as EPCI development of six wells in 1,700-meter-deep waters and installation of an umbilical system. Completion is scheduled by the end of 2017.

Caribbean/South & Central America

In 2014, only four countries – the United States, Canada, Argentina and China – were producing commercial volumes of either natural

gas from shale formations or crude oil from shale or other tight formations. Since the beginning of 2014, Argentina has drilled over 275 shale gas and tight oil wells and led shale resource development outside North America in the first half of 2015 with the potential to significantly increase production. Colombia and Mexico are also beginning to explore and produce hydrocarbons from shale and other tight resources, but are short of reaching commercial production.

What's lagging is pipeline construction. The recent shakeup in Brazil that saw top executives from Petrobras, Odebrecht and others jailed for extended periods has affected activity. *The Peruvian Times* reported in March that troubled Brazilian construction giant Odebrecht pulled out as the majority partner in the Southern Peruvian Gas Pipeline amid a major corruption probe.

According to the report, prosecutors, lawmakers and non-government organizations in Peru are investigating whether Brazilian construction firms bribed local officials to win public works contracts. Odebrecht and other Brazilian companies won billions of dollars in contracts during the last three administrations.

Activity is expected in Trinidad and Tobago where BP Trinidad and Tobago is to make an investment decision on developing its Angelin gas field, located 25 miles offshore. In an application for a certificate of environmental clearance, BPTT said the project would involve installing a platform and drilling four development wells. Installation of a 26-inch, 15-mile subsea pipeline to an existing subsea at BPTT's Serrette facility would be needed. Project startup is mid-2019.

BPTT and Atlantic LNG have a project to boost production from low-pressure wells in BPTT's existing acreage in the Columbus Basin using an additional inlet compressor at the Point Fortin Atlantic LNG plant. When it comes on stream, the project has the potential to deliver 200 MMscf/d later this year. **P&GJ**



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