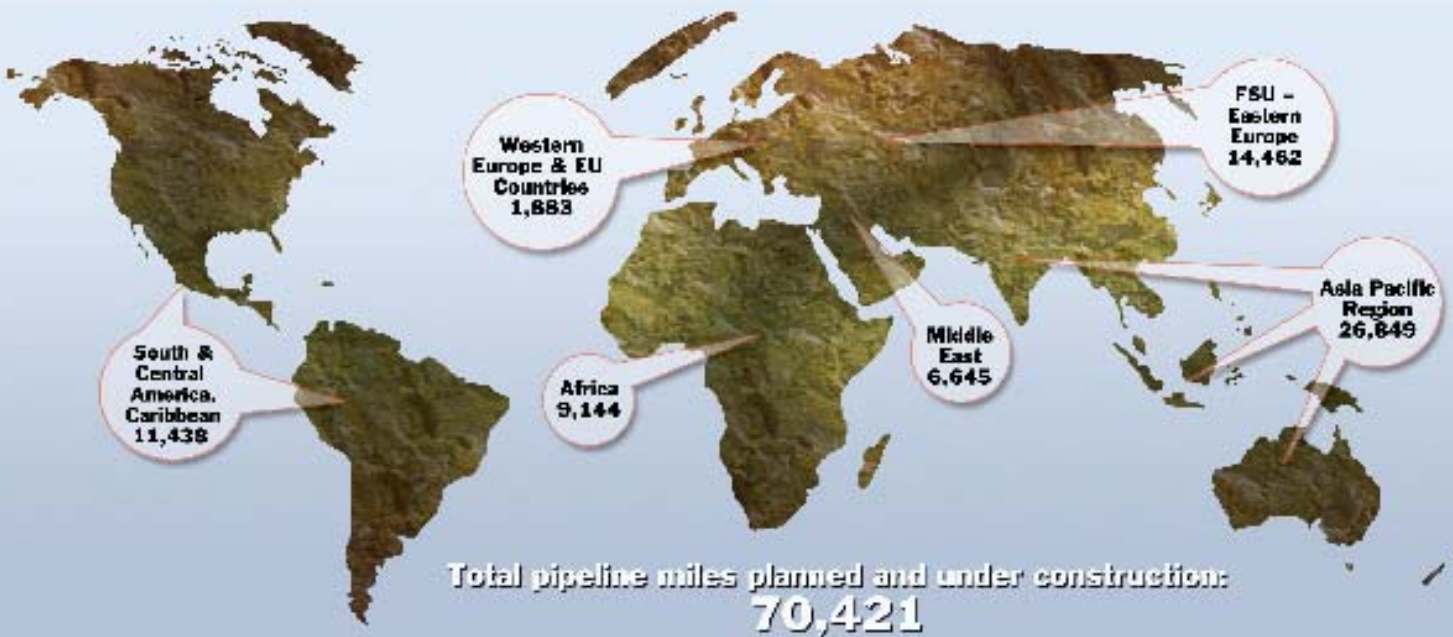


# Pipeline & Gas Journal's 2006 International Pipeline Construction Report



**P**&GJ's 2006 international survey figures indicate 70,421 miles of new and planned pipelines are under construction and planned. Of these, 62,056 miles are projects in the planning phase and 8,365 miles account for pipelines in various stages of construction. Since a year ago, new and planned pipeline mileage has increased more than 15,650 miles.

Here is a breakdown of the pipeline miles planned and under construction in the six basic nation groupings used in this article (see accompanying map). South and Central America, Caribbean – 11,438; Western Europe and European Union – 1,883; Africa – 9,144; Middle East – 6,645; Former Soviet Union and Eastern Europe – 14,462; and the Asia Pacific Region – 26,849.

## Construction Overview

Following is a discussion of many major projects planned and under construction. Additional information is provided in *P&GJ's* sister publication, *Pipeline News*.

## Middle East

As the world's energy market dramatically increases, Middle East nations deal with a host of problems. Terrorists continue to pose a threat to oil and gas operations, pipelines, and export facilities in several countries. Nevertheless, the significance of the Middle East to global oil and gas markets for the foreseeable future cannot be overestimated.

Supporting this is the growing number of new and planned pipelines miles that have nearly doubled over the past year, going from 3,742 to 6,645.

As to ongoing projects, Dolphin Energy's \$10 billion Dolphin Gas Project continues to account for the largest single energy initiative ever undertaken in the Middle East. Starting later this year, Qatar will initially sell around 730 Bcf/y of its North Field natural gas to the UAE and Oman, creating a regional energy network for the first time between the Qatar, the UAE and Oman.

Dolphin Energy recently awarded two EPC contracts to upgrade the Eastern Gas Distribution System (EGDS) in the UAE. Consolidated Contractors won a contract for engineering, procurement and construction of civil, pipelines, mechanical, SCADA, telecommunication and electrical works with respect to expanding, modifying and upgrading the existing EGDS, construction of an administration building and expanding the control building at the Al Ain Gas Terminal. Punj Lloyd Ltd. was awarded the civil and fiber-optics cable EPC works with respect to the existing EGDS.

Apart from these projects, Qatar and Pakistan have signed an accord to construct the Gulf South Asia (GUSA) Gas Pipeline between the two countries. The \$2.7 billion pipeline would involve 945 miles of 44-inch diameter pipeline onshore and a 76-mile, 44-inch diameter line offshore. No timeline has been set for construction.

## South/Central America & Caribbean

Despite a major upturn in new and planned pipeline projects — which increased from 3,550 miles last year to more than 11,400 today — things are anything but tranquil in

this region. Events began heating up in 2005 when the Venezuelan socialist government under President Hugo Chavez required foreign petroleum companies to sign over a controlling stake of their oil interests to the state or get out.

In May 2006, Bolivian President Evo Morales nationalized his country's natural gas industry which holds South America's second-largest natural gas reserves after Venezuela. In Ecuador, the Congress ratified a hydrocarbons reform law designed to cut into windfall profits of foreign crude producers, among them U.S.-based Occidental Petroleum.

As to pipeline activity, there have been recent announcements of major new cross-border pipeline projects. Despite a lag in construction, several of the planned projects are ambitious, including a proposal put forward by the governments of Argentina, Brazil and Venezuela to build the 6,300-mile Gran Gasoducto del Sur pipeline to link the three countries. The three governments jointly approved \$9.2 million in funding for design engineering and environmental studies for the natural gas pipeline that will run from Venezuela to Buenos Aires. Depending on length, route and capacity, the overall project

cost could run as high as \$17 billion.

On the construction scene, state-owned Petrobras is working to complete a portion of the 850-mile Gasene Pipeline. Plans are to bring the 185-mile Cabiunas-Vitoria section of the line into operation in October 2007. Petrobras and China's Petroleum & Chemical Corp. (Sinopec) signed a \$239 million EPC contract for the work last year. As to other construction, work on a 475-mile stretch of Gasene to link Cacimbas to the town of Catu in the northeastern state of Bahia is expected to start in November and conclude in November 2007.

Completion of Gasene will provide a link to import gas from Bahia and link Brazil's northeastern and southeastern sections with markets in both regions. It will also open markets between Cabiunas in Rio de Janeiro, and Catu in Bahia state.

### Asia-Pacific Region

The Asia-Pacific region's 26,849 miles of new and planned pipelines is the highest in the world and more construction is anticipated as China, Japan and India embark on major expansions of oil and gas infrastructure.

Of the pipelines slated for near-term completion, JFE Engineering Corp. is working to complete Phase I of the South Samatera-West Java Pipeline for PT Perusahaan Gas Negara (PGN) by next year. The contract covers the construction of a 170-mile, 32-inch diameter pipeline from Pagardewa to Labuhan Maringgai, Sumatera. The \$161 million project is being developed to meet gas demand for industries in western Java. The pipeline will have a capacity of 460 MMcf/d which can be expanded to 600 MMcf/d.

Aside from these proposals, Sinopec has announced that its Puguang gas field is one of China's largest and the company plans a \$4.7 billion development of the field and a 1,000-mile gas pipeline. According to the proposal, production of commercial gas will exceed 4 Bcm/a by 2008 and be expanded to 8 Bcm/a by 2010.

### Australia

Ongoing tensions between pipeline companies and regulators are blamed for halting

or slowing construction of planned projects and discouraging the entry of new investors. Nevertheless, development activity off Australia is on the rise and a large investment is needed in the country's pipeline network to bring more natural gas into the grid. In fact, industry officials say it will require \$5.5 billion of investment over 10 years to efficiently use natural gas to generate power.

Despite low level pipeline construction, Australia's planned projects include several mega proposals like the 2,485-mile Papua New Guinea (PNG) Gas Pipeline. Australia's biggest energy retailer, The Australian Gas Light Company (AGL), a major stakeholder in the project, is confident the long-planned \$3 billion pipeline to link PNG with Australian markets will go ahead, given the nation's looming gas supply shortfall projected on the east coast by 2015. If built, it will be the longest pipeline in the southern hemisphere.

A project almost equally as ambitious is a proposal by the Australian government, in conjunction with the mining industry, to build the TransContinental Pipeline. This \$3 billion 1,800-mile project would transport gas from the Carnarvon and Browse Basins to southeastern domestic markets. A feasibility study has been carried out on the proposed pipeline to serve the nation's Northwest Shelf area where 80% of Australia's known gas reserves are located.

### Western Europe & European Union

Although energy security remains a major concern for many western European and European Union nations, it is not reflected in new and planned pipeline construction activity. In fact, this is the only region in the international sector where new and planned pipeline construction declined in the past year, falling from 1,288 miles to 1,183 miles.

### World's Longest Subsea Trunkline

Nevertheless, the region accounts for the world's longest deepwater subsea trunkline, the 745-mile Langed Pipeline. The trunkline will export gas from Norway's Ormen Lange

View of the semi-submersible pipelay barge Acergy Piper laying the Langed Pipeline.





field, then onshore to Nyhamna in Norway, before exporting it via the Sleipner platform to Easington in the UK. Once onstream, Ormen Lange field will supply 70 million m<sup>3</sup>/d of gas to the UK market, meeting up to 20% of its current gas demand.

Ormen Lange Communication Manager Vegar Stokset told *P&GJ* that in November 2005, the laying of the southern part of the world's longest subsea pipeline — from north-west Norway to Easington, was completed by Stolt Offshore's **LB 200**.

In April 2006, the Acergy-owned *Acergy Piper* started laying the northern part of Langed from Nyhamna to Sleipner. More than 140 miles has been installed so far this year.

In mid July, Allseas' pipelay vessel *Solitaire* arrived to continue laying the production pipes out toward the Ormen Lange field, to halfway down the edge of the Storegga slide area, 62 miles from Nyhamna. From here, Saipem's pipelay vessel *S7000* will take over to lay the last demanding 13 miles, further down the edge of the steeply sloping Storegga slide terrain and down to the well templates located in up to 2,790 feet of water.

Since this last stretch is so steep, the *S7000* will lay the pipes in a J-formation, i.e., four pipes at a time welded together, which will be laid from a high tower mounted rigidly to the vessel. The remaining, northern section of Langed will be laid from Nyhamna next year. Hydro is operator during development of the Ormen Lange/Langed phase while Statoil has project management of the pipeline-laying project.

## Africa

Oil industry hostage-taking and civil unrest continue to cause problems in several nations. Despite the many challenges, the region accounts for 9,144 miles of new and planned pipeline projects and companies continue to work on projects and take on new ones in most areas.

For 44 years, Willbros' units have been active in Nigeria providing turn-key or individual project services, including fabrication for onshore, swamp and offshore pipeline and field projects. A company spokesman told *P&GJ* the company had 16 pipeline projects in various stages of completion when they were faced with a hostage situation earlier this year. Militants

holding the hostages later released them.

Today, Willbros remains active in the area and holds contracts in Nigeria totaling more than \$500 million.

One of Willbros' most significant projects is the \$600 million, 420-mile West African Gas Pipeline (WAGP) that is being built to pipe gas from Nigeria to Ghana, Togo and Benin. Willbros West Africa was awarded a contract by the West African Gas Pipeline Co. Ltd. to install custody transfer metering in Nigeria and a 100-mile, 30-inch diameter gas pipeline from the existing Escravos Lagos gas pipeline system to the initial compressor station at Lagos Beach and the point of departure for the offshore section.

Additional pipeline, regulation and metering facilities for the onshore portion in Benin, Togo and Ghana are included in Willbros' project scope, as well as the engineering, procurement, construction and tie-in of the initial compressor station and land pipeline section.

Horizon Marine Construction is building the 353-mile main offshore segment of the WAGP. Once completed, the offshore section will be connected to a new onshore pipeline and compressor station in Nigeria and the entire 420-mile pipeline will link the Volta River Authority's power plant at Takoradi, Ghana to Nigerian natural gas from an existing pipeline located near Lagos.

The first gas delivery is scheduled for December 2006. When complete, the project will be the first regional natural gas transmission system developed to date in sub-Saharan Africa.

Also in Nigeria, CRC-Evans Automatic Welding has a letter of intent from Daewoo International to provide automatic welding for the EGGS Phase II Pipeline project in Nigeria. The pipelines, owned by SPDC — Shell Petroleum Development Company Nigeria Limited, include 27 miles in two land-based spreads, and a swamp barge spread of eight miles.

There are a number of additional pipeline projects in various stages of completion in Nigeria. Pipeline projects are under way in Oman and Egypt.

## Former Soviet Union & Eastern Europe

For several years, the considerable number of cross-border pipeline projects waiting to be implemented accounted for a far greater number of pipeline miles than actual construction. This year is no different. Of the 14,462 miles of new and planned pipeline throughout the region, only 4,332 miles represent work now in progress.

As to current pipeline construction, one of the most significant of the EE/FSU projects is associated with the \$20 billion Sakhalin II development. Work has progressed past the half-way point and Sakhalin Energy Development expects to ship the first Russian LNG in 2008.



Lunskeye-A gas platform mating off Sakhalin Island.

Pipeline construction for the project — 995 miles onshore and 185 miles offshore — is under the direction of Starstroi and LUKoil-Neftegazstroi of Russia and the European contractors Saipem and AMEC Spie Capag.

The route of the onshore oil and gas pipelines, each almost 500 miles long, runs from the landfall in the northeast of Sakhalin Island via the onshore processing facility to Prigorodnoye in the south. Earlier this year, construction of the two pipelines had progressed well past the 50% completion mark.

Saipem and subcontractors CORDALUX (Jan de Nul Group of Companies) say construction of the 185 miles of offshore pipelines will be completed this year.

As to other work on the project, Sakhalin Energy recently completed the installation of the Lunskeye-A gas production platform topsides in a record-breaking operation in the Sea of Okhotsk, northeast of Sakhalin Island.

Sakhalin Energy Phase II Project Director David Greer called the event "major" in the Sakhalin II Phase 2 Project, as the platform will be the main source of gas for Russia's first LNG plant at Prigorodnoye. The platform will now undergo hook up and commissioning work before drilling of the gas production wells commences. LNG production is expected to start in 2008.

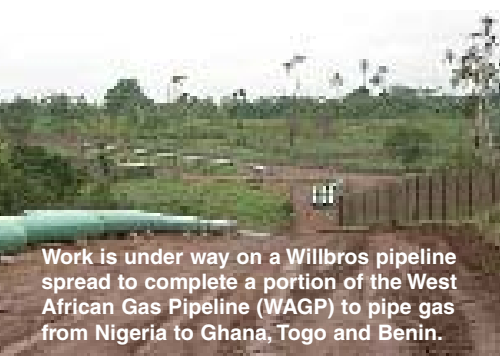
Serbia will build a 400km cross-country gas pipeline together with Gazprom, a project worth more than \$800 million.

Sources familiar with the plan said the pipeline in Serbia would ultimately be linked to the Bluestream pipeline — running from Russia to Turkey under Black Sea.

"The Serbian pipeline is to be built south of the Sava and the Danube rivers. Pipes should run from Dimitrovgrad to Nis and on towards Croatia and Bosnia," a source in the government said. "The pipes will have a capacity of 20 billion cubic meters."

Another source familiar with the plan said the deal would help Serbia repay a debt to Kuwait.

"Gazprom has agreed to take over Serbia's \$370 million debt to Kuwait," the source said. "Serbia would start repaying the debt to Gazprom once the gas starts flowing, getting



Work is under way on a Willbros pipeline spread to complete a portion of the West African Gas Pipeline (WAGP) to pipe gas from Nigeria to Ghana, Togo and Benin.

25% of transit fees and spending it on debt servicing. That means there will be no threat to the liquidity of the budget. But it also sends a signal to the authorities that Gazprom wants control of Srbijagas (the Serbian-owned gas company) once it is ripe for sale.”

Construction began earlier this year in Eastern Siberia on Transneft's 2,500-mile Eastern Siberia-Pacific Ocean Oil Pipeline soon after President Vladimir Putin changed the proposed route to avoid approaching Lake Baikal, the world's deepest freshwater lake. When completed in 2015, the \$11.5 billion pipeline will carry 80 tons of crude per year from eastern Siberia to the Pacific Ocean for consumers across the Asia Pacific region, including China.

And in June, energy ministers from five European Union nations agreed to go ahead with construction of the \$5.8 billion Nabucco Pipeline to pipe 8 billion m<sup>3</sup> per year and ultimately 25-30 billion m<sup>3</sup> per year from the Caspian region and Middle East — namely Iran — to Central and Western Europe. As proposed, the 2,050-mile pipeline would originate in Russia and run through Turkey, Bulgaria, Romania, Hungary and Austria. Should work begin in 2008, the pipeline is expected to start carrying gas in 2011.

While the Nabucco project is seen by the European Union as a means to diversify routes and improve the EU's energy security, Russia is promoting an alternative — its Southern Gas Pipeline project. The route of the latter — which would compete with the Nabucco Pipeline — would deliver Russian gas via Turkey to Southern and Central Europe. While it is too early to tell what the final outcome will be, it is unlikely both projects will be built. Instead, modifications may be made to the Nabucco route.

FSI Energy, lead developer of the KoRus Sakhalin Pipeline, continues to seek interested partners for the project. South Korean development partners will participate in construction and operation of the 1,575-mile pipeline to connect Far East Russian gas at Sakhalin with the Korean Peninsula and Japan. The project cost is estimated at about \$3 billion and the pipeline is expected to begin operation in 2008 or 2009.

Still awaiting a construction start is the 177-mile Bourgas-Alexandroupolis oil pipeline for stakeholders Bulgaria, Greece and Russia. The pipeline is designed to connect the Black Sea port of Burgas with the northern Aegean port of Alexandroupolis in Greece and bypassing the congested Bosphorus Strait in Turkey. Although all three partners had previously agreed to split the project into three equal 33 1/3% stakes, it appears Russia is now jockeying for a 51% stake in the venture. If the partners accept this, the 770,000-bpd pipeline could be operating by 2008. **P&GJ**