

LNG Unlimited

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E.ON will weather delay in LNG terminal start-up offshore Italy

European regasification capacity holders are set on building assets for recovery down the line

The last piece of infrastructure the European energy market would seemingly require right now is another LNG terminal in the current economic slump and amid high demand for cargo diversions to East Asia for better prices.

Slump

However, European utilities and LNG users have to play a long game even as LNG intake has dropped during 2012 in key importer countries such as the UK, Spain and France.

LNG Toscana, a project offshore Italy being developed by companies including one of Europe's largest utilities E.ON, has just announced a delay in its start-up until the end of the first quarter of 2013.

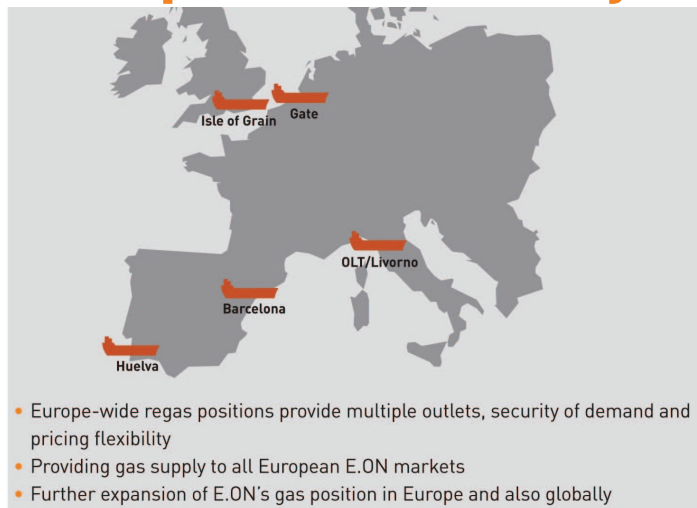
The facility is based around an LNG carrier, the former "Golar Frost", being converted into a floating storage and regasification unit, but the shareholders said there were conversion hold-ups at the Drydocks World shipyard in Dubai.

The vessel has been renamed "FSRU Toscana" and will be permanently moored just inside the 12-mile limit off the Tuscan city of Livorno, Italy's second-largest Mediterranean port after Genoa.

Portfolio

LNG Toscana shareholder E.ON has been building up its regas holdings in Europe. The German company inherited a substantial interest in OLT as part of an asset deal with Endesa of Spain over four years ago.

The Essen, Germany-based



German utility E.ON will soon have regas capacity in four countries

company has said LNG Toscana will eventually supply E.ON's customers in the Italian market or E.ON's gas-fired power plants.

E.ON also presently operates 2 billion cubic metres per annum of regas capacity at the Barcelona and Huelva terminals in Spain and 1.7 Bcm on the Isle of Grain in the UK. There is also 3 Bcm held by E.ON at Gate LNG in Rotterdam.

Venturers

The LNG Toscana facility will be Italy's third LNG import terminal. The onshore and long established Panigaglia facility near Genoa has been in operation since 1969. It is owned by Snam Rete Gas, a subsidiary of Italian energy company Eni.

LNG Toscana, in addition to E.ON, has Italy's Iren Group as a large shareholder. E.ON and Iren together hold almost 94 percent of the shares. The balance of the shareholding is held by Golar LNG affiliate Golar Offshore Toscana Ltd. and OLT Energy Toscana SpA.

The regasified LNG when it starts to flow in 2013 will be transferred onshore through a

36.5-kilometres pipeline operated and managed by Snam Rete Gas, of which 29.5km are at sea and 7km on land.

Italy's other facility is the Porto Levante offshore gravity based structure, known as Adriatic LNG. It has been in operation since 2009 and its shareholders are Qatar Petroleum, ExxonMobil and Edison Gas.

The LNG Toscana facility is authorized for an annual send-out capacity of 3.75 Bcm of natural gas and will be able to receive LNG carriers with capacities ranging from 65,000 to 138,000 cubic metres.

The full terminal capacity was exempted from Third Party Access and there are several features that render OLT unique, including the fact that it's the first real offshore LNG FSRU turret moored in open sea, and is the first LNG facility that relies entirely on ship-to-ship transfer of LNG.

So with LNG Toscana back on track and other import facilities emerging in new members of the European Union, LNG players are looking to the medium term for a market improvement. ■

UNLIMITED AGENDA

PROJECTS

Petronas seals its Canadian takeover with new expanded LNG project plan for Prince Rupert

2

PRODUCTION

BP tells analysts it has enough LNG for now in terms of new projects

3

DEVELOPMENT

Chevron's Gorgon cost blowout is offset by value of that asset and Wheatstone LNG

5

REGULATORY

Full Summary of 230-page NERA report on US LNG export economics

Plants Investment Cost by Region (\$millions/ MMTPA Capacity)

	\$Millions/MMTPA	Capital Cost (\$/MMBtu produced)
Africa	\$1,031	\$3.05
Canada	\$1,145	\$3.39
US America	\$802	\$2.37
Europe	\$802	\$2.37
ITU	\$802	\$2.37
Middle East	\$859	\$2.54
Oceania	\$1,317	\$3.90
Ukraine	\$802	\$2.37
Southeast Asia	\$1,145	\$3.39
US	\$544	\$1.61

AND latest on plan to turn Marcellus shale-gas into LNG for overseas by Cove Point project run by Dominion

7-8

Petronas seals Canada takeover with new expanded LNG project

The Malaysian-led venture will be called Pacific Northwest LNG and will open Vancouver office

Malaysian energy company Petronas said it was moving into pre-front end engineering and design in its Prince Rupert LNG project in Canada, and has boosted the scale and spending on the venture to over \$10Bln, with two large Trains producing 12 million tonnes per annum.

Deadline

Petronas and Progress Energy Resources said they were going ahead with the venture and Canada's federal regulator also cleared the previously stalled Malaysian takeover of Progress for over \$5 billion.

The Canadian government had blocked the Petronas bid for Progress, though gave the Malaysian company until the end of 2012 to change that perspective.

Petronas now views the takeover of Progress and its shalegas assets as a launch-pad for building the LNG plant at Prince Rupert port on the coast of British Columbia. The revised project plan, now larger in scale and in the amount the Malaysian company is prepared to spend can now advance with the blessing

of the government in Ottawa.

One of the main assets Petronas brings to the Canadian LNG industry is its vast experience in terms of liquefaction plants, shipping and trading LNG under contract.

"The Pre-FEED phase will be undertaken to provide certainty around project scope and a further understanding of construction timelines, costs and labour force requirements," the two companies said in a statement.

"We are excited to have completed the detailed feasibility study phase and are now moving into the next phase of our engineering work, which will include the submission of our project description to Canadian regulators in early 2013," said Michael Culbert, President and Chief Executive of Progress.

Named

"In addition, we are pleased to have officially named our project Pacific Northwest LNG and will continue to move the project forward at an aggressive pace," Culbert said.

Petronas and Progress said the project would now include two



The Petronas liquefaction plant will be constructed near Prince Rupert port and feed-gas will be brought by pipeline from northeast BC shale-gas plays

liquefaction Trains when initially constructed and planning would include the ability to expand with the addition of a third Train in the future.

The LNG throughput is currently designed for about 3.8 million tonnes per annum per Train based on the LNG export joint venture that was announced between the two companies in 2011.

Petronas said its Canadian investment plans now comprised three projects: the plant, a pipeline and its Montney shale-gas. "The throughput of natural gas at the LNG export facility is expected to increase by approximately 60 per cent to 6 MTPA per Train which will also

result in concurrent enhancements to the productivity.

The estimated investment in the LNG export facility is expected to be between \$9 billion and \$11Bln, depending on the final project scope. Pacific Northwest LNG will be opening its Vancouver, British Columbia, office in early 2013 and will be growing its project team, they added.

In a statement that pleased the regulators, Petronas and Progress said the Pacific Northwest LNG project "represents significant revenue and royalties to the provincial and federal governments, and the opportunity for economic benefits to the local First Nations and communities." ■

Greece moves to revamp its sole LNG terminal

Greece, currently in the financial life support system of the European Union and the World Bank, plans to increase LNG imports under an expansion project now going forward for its sole regasification facility at Revithoussa.

The Italian classification and certification society, Registro Italiano Navale (Rina), has been awarded a contract to carry out a basic engineering and design, as well as an environmental and social impact assessment for the import terminal located on an is-

land west of Athens. The four-month project was awarded to Rina by the terminal owner, Hellenic Gas Transmission System Operator (DEGSA).

The facility currently has just two LNG storage tanks of 65,000 cubic metres capacity and is unable to handle the largest LNG carriers.

Under a previous stalled expansion, DEGSA planned to construct an additional storage tank of 95,000 cubic metre capacity, work on which has been started,

and to enlarge the jetty to allow berthing for vessels with capacity of up to 180,000 cubic metres.

Rina will now plot the best way forward to open up the bottleneck of the present constricted facilities.

"The expansion of the LNG Revithoussa terminal will boost the maximum sustainable gas send-out rate to 1400 Nm³/h (with a peak send-out rate of 1650 Nm³/h)," Rina said.

"The existing terminal consists of an import jetty, two full

containment storage tanks, plus one under construction, regasification equipment and send-out facilities," the class society said.

The Revithoussa terminal receives up to 680 million cubic metres of natural gas annually, or 550,000 tonnes of LNG, mostly imported from Algeria by Sonatrach.

"The expansion project will analyse potential interfaces not only with the existing LNG terminal, but also the third tank under construction," Rina said. ■

UK major BP says it has enough LNG for now in terms of new projects

For BP LNG will not be a priority after Tangguh expansion and maybe Alaska project as strategy focuses on other ventures

UK major BP said it was probably involved in a sufficient number of LNG projects for now and would be concentrating on other energy developments apart from the liquefaction ventures it is already committed to such as the expansion of the Tangguh plant in Indonesia.

The statement on future LNG strategy came from Andy Hopwood, Executive Vice-President of Upstream Strategy. He was speaking at BP's Upstream Investor Day at Sunbury, near London, and hosted by Bob Dudley, BP's Chief Executive.

Balanced

"We have a balanced approach to gas and its full value chain. In LNG, with Trinidad the North West Shelf and Tangguh, after its third



The LNG carrier 'British Trader' is one of the vessels in the fleet of BP, one of the industry's leaders and innovators. However, while the carriers will be in operation for years to come, strategy may change

Train expansion, and with much longer-term optionality in Browse and possibly Alaska we probably have enough LNG," Hopwood said.

"In unconventional gas we will export learnings from our deep heritage from the US very selectively, and if we can reach agreement with the government that will be first in Oman.

"In piped gas resources, we will participate only in high quality resources and attractive markets; for example in Shah Deniz for the European markets and in India," Hopwood said.

Bob Fryar, Executive Vice President of Production, said that in Oman, an LNG producer, the UK major continued to progress its multi-year appraisal program to understand the nature of the "tight gas" reservoirs in the Block

61 production-sharing agreement which includes the Khazzan and Makarem gas. He said the scale of these fields was substantial, with 100 trillion cubic feet of gas in place and it had the potential to supply more than 30 percent of Oman's gas needs for several decades, with multiple development phases over many decades.

"We think of Oman as another 'long life asset' - with long plateau production which will be material for decades to come," Fryar said.

BP recently received approval from the Indonesian Government for its development of a third LNG Train for the Tangguh plant.

Approval of the plan is an important step in preparation for the final investment decision for this expansion, which is currently expected to be taken in 2014.

This would potentially enable commissioning operations for the new Train to begin in late 2018, seen as a long way out for new LNG.

Investment

The total investment in Train 3 by the Tangguh project partners is currently estimated to be up to \$12 billion.

The Browse LNG project in Australia, where BP is one of five partners in a joint venture including Royal Dutch Shell and Woodside, is not moving forward at any great pace at the moment.

BP, in contrast to Shell, said it would maintain its bias to oil, with more than 65 percent of its operating cash coming from oil production and around 20 percent coming from gas with margins linked to oil prices. ■

Exmar secures \$280M LNG financing for Pacific Rubiales

Belgian LNG carrier and development company Exmar signed a loan agreement of up to \$280 million with the International Finance Corp. of the World Bank and China Ex-Im Bank for a liquefaction barge to be built at Wison Heavy Industries in Shanghai and chartered to Pacific Rubiales Energy.

The FLNG hull will be permanently moored off Colombia's North coast.

Black & Veatch of the US has been contracted for the engineering and procurement of the topside liquefaction equipment and the US Ex-Im Bank is also expected to participate in the financing.

Exmar and Pacific Rubiales are co-developing a small-scale Floating LNG production

vessel to produce around 500,000 tonnes per annum of LNG.

Under the agreement, Exmar will design, operate and maintain the liquefaction barge.

It will be a non-propelled barge moored to a jetty, supplied with gas by pipeline from the onshore La Creciente field.

The IFC will act as global arranger and agent to the facility.

Exmar Chief Financial Officer Miguel de Potter commented: "We are very pleased to start a new relationship with those three institutions and will benefit from their extensive knowledge of the energy industry to further capitalize on this relationship.

"This floating liquefaction barge is a tech-

nological breakthrough and we hope to be able to convince other clients to develop their gas reserves in the near future through this technology," De Potter said.

Shanghai-based Wison Offshore was awarded a contract in June by Exmar for the engineering, procurement, construction, installation and commissioning of the production barge, which will also have regasification and storage capability.

Exmar and its partners expect the Pacific Rubiales project to begin operations at the end of 2014.

Black and Veatch said it would assemble a team to work from offices in several countries to support the Wison yard on the joint venture project. ■

Woodside of Australia lines up large stake in Leviathan gas and a possible FLNG project in the East Mediterranean

The experienced Australian operator will run any FLNG development that emerges

Woodside Petroleum, the leading Australian LNG operator, has signed a \$US1.25 billion agreement to acquire a 30 per cent stake in the Leviathan natural gas discovery offshore Israel where LNG projects are being planned.

Agreement

Under the deal just signed, Woodside will be the operator of any LNG development of the field licences, while Houston, Texas-based Noble Energy will remain upstream operator. The venture for LNG will be on a floating hull offshore.

Noble targets initial production to the domestic gas market of Israel in 2016, though a pre-front-end engineering and design assessment for an LNG project is underway. This is separate from another FLNG project being planned by the Tamar field partners.

Woodside is operator of Australia's oldest LNG plant, the Northwest Shelf facility in Western Australia, as well as the newest, the Pluto LNG plant that went into production earlier this year. However, this would be its first FLNG participation.

Woodside Chief Executive Peter Coleman said the agreement was a significant step towards realising Woodside's ambition to secure world-class growth opportunities.



LNG plans are progressing quickly. The Tamar and Leviathan projects have Israeli, US, South Korean, and now Australian participation

"We have a proven track record of safe and reliable operations in Australia and being selected as the Leviathan Joint Venture's preferred partner in a competitive bidding process demonstrates the value of our LNG development capabilities," Coleman said.

Exciting

"Acquiring an interest in these permits is an exciting opportunity to grow our portfolio in the emerging Eastern Mediterranean basin and

we look forward to finalising the agreement," Coleman added.

The Leviathan Joint Venture participants include Noble, Israel's Delek Drilling, Avner Oil Exploration and Ratio Oil. Woodside will acquire a participating interest in each of the 349/Rachel and 350/Amit licences which contain the Leviathan field.

The agreement involves an initial upfront payment of US\$696 million and Woodside has offered contingent payments including: a

payment of \$200M once laws permitting LNG export from Israel are in force; and a payment of \$350M on a final investment decision in relation to an LNG development.

Conditions

The agreement is subject to a number of conditions including execution of fully termed agreements, completion of confirmatory due diligence and obtaining the necessary government and regulatory approvals.

The East Mediterranean is an area Woodside is keen to expand into. In May 2012 the Australian company confirmed it was one of over a dozen, including oil majors, to bid on nine offshore natural gas blocks in Cyprus.

Noble and its partners, in addition to advancing with a Tamar FLNG project plan, have also signed a 15-year sales agreement with Israel Electric Corp. for gas supplies to come from the Tamar gas field.

Under that agreement, the Tamar partners will sell a total of 75.6 Bcm to Israel over the term of the contract, which averages 5 Bcm per annum of natural gas.

Initial gas deliveries are expected to begin in about a year. The potential production estimate of the Tamar gas field alone is 8.2 Bcm per annum. ■

Dutch shipping company gets royal seal for small-scale LNG

Dutch small-scale LNG tanker owner, Anthony Veder, saw its latest vessel, the 15,600 cubic metres capacity LNG carrier "Coral Energy", named by Princess Maxima of the Netherlands in a ceremony at the Cruise Terminal in central Rotterdam on December 7.

The "Coral Energy" is world's first direct driven dual-fuel, ice-class 1A LNG carrier.

It was built at the Neptun Werft yard in Rostock, Germany, and developed by Anthony Veder and Norwegian gas provider Skangass.

The LNG-fuelled ship will distribute LNG to areas where there is no easy access to natural gas via pipeline, but where there is a clear

demand, the owners said. The vessel will distribute LNG in Scandinavia. It will load the LNG in Rotterdam, Zeebrugge in Belgium, or Norway and transport it to Sweden for the city of Stockholm, among other places.

The vessel has the highest ice class 1A for trading in the Baltic during winter, the owners added.

Anthony Veder is a specialist in small-scale LNG distribution and the company said it was certain that the demand for small-scale natural gas will continue as an alternative to oil and coal.

Anthony Veder Managing Director, Jan Valkier, said: "The smaller-scale LNG market

has a great future because many remote areas are making a transition to LNG for their electricity production and because of the upcoming demand for using LNG as a marine fuel."

Currently, Anthony Veder is working on the development of a whole small-scale LNG fleet, deploying vessels ranging between 5,000 and 40,000 cubic metres capacity.

The Dutch company is also investigating logistics solutions for LNG transport for islands and remote areas worldwide.

"There is increasing interest from LNG producers and terminal operators in smaller-scale LNG opportunities," Valkier added. ■

Chevron Wheatstone LNG development in West Australia advances fair

US major Chevron, will be operator of the Gorgon and Wheatstone projects when they come on stream. Wheatstone Manager Eric Dunning gives an update

The \$29 billion Wheatstone LNG Project will reinforce Chevron's position as a leading supplier and operator in the Asia-Pacific region.

With the even larger and nearby \$52Bn Gorgon LNG project also progressing, the US major has placed itself at the forefront of the industry for years to come.

Pilbara

The liquefaction plant is being constructed in the Pilbara region of Western Australia, the Ashburton North Strategic Industrial Area (ANSIA) near Onslow.

As the foundation tenant of an area set aside by the government as a resource development region, Wheatstone said it was "powering ahead" with the venture.

Chevron Australia Wheatstone General Manager Eric Dunning said the project, initially producing 8.9 million tonnes per annum (MTPA) via two Trains with capacity for future expansion up to 25 MTPA, provides the latest chapter in Chevron's long history in WA, dating back to the early 1960s.

The project currently has more than 2,500 people working on it around the world, with more than 900 of those workers now onsite at Ashburton North.

Workforce

The majority of the workforce are now housed at the new onsite camps, with the remainder in nearby accommodation vessels and motels.

By the New Year, there are expected to be more than 1,000 workers onsite at the Wheatstone project.

"Australia is rich in resources, including vast untapped oil and gas reserves, but it is also a land

of great expanses and challenging environments requiring innovation and determination to bring these resources to market," Dunning said.

"From Rough Range to Barrow Island and now Onslow, Chevron has tackled the toughest of these environments and each project has improved our understanding of the physical and economic variables involved in achieving success.

"We have applied these key learnings to other critical areas, such as realistic work schedules and safety requirements, in order to move our mega-projects forward efficiently, maximising opportunities and reducing risks at every stage," Dunning added.

Location

The project location was finalised following an intensive investigation and community consultation by Chevron and the WA Government to find the most suitable site to develop the venture.

The first two LNG Trains will be supplied with 80 percent of gas from the Chevron-operated Wheatstone and Iago fields. Apache Corp. of the US and Kuwait Foreign Petroleum Exploration Company (KUFPEC) will provide the remaining natural gas from their Julimar and Brunello fields.

"Our joint venture participants' decision to join the Wheatstone project further demonstrates the success of this LNG hub model," Dunning said.

"Chevron is extremely pleased to be on the ground making progress on the Wheatstone Project and using many of the lessons learned and synergies created on the Gorgon project,"



The Wheatstone liquefaction plant near the town of Onslow will get feed-gas from four sources offshore Western Australia. (Graphic courtesy of Chevron)

Dunning explained. "We are confident of first gas in 2016, with 80 percent of our equity LNG from Wheatstone already covered under long-term offtake arrangements.

"We have a clearly defined commercial basis for expansion, and we are confident other companies will recognise the economies of scale created by our initial investment and follow us to this ideal location," he added.

Responsible

In addition to ensuring safe and environmentally responsible operations, Dunning said Chevron also recognised its responsibility to the Onslow community.

"Both the traditional owners of the area, the Thalanyji People, and the current residents have been very receptive and willing to work with us, the WA Government and the Shire of Ashburton," Dunning said.

"Together we are working hard to realise the social and economic benefits for the community as a result of our project, in particular the opportunities to provide lasting educational, health and economic benefits," he said.

There is a commitment to spend around \$250 million in the area on social infrastructure projects.

The social spending will include upgrades to power and health services, school and childcare facilities and emergency services. ■

Gorgon project still 'attractive' despite \$15Bn cost blowout

Chevron Corp., lead developer of the huge Gorgon LNG project offshore Western Australia, said the venture would now cost \$US52Bn, which is US\$15Bn more than a previous published estimate because of currency and schedule impacts, as well as logistic challenges.

Still, Chevron Vice Chairman George Kirkland said the Gorgon project economics were still "attractive".

The three-Train foundation project on Barrow Island has been under construction for three years and is about 55 percent complete. There is also the likelihood of a fourth Train after start-up.

A cost and schedule review has been completed, and the total cost estimate for the foundation project has increased from A\$43Bn (US\$37Bn) to A\$52Bn (US\$52Bn), Chevron said.

Plant start-up is planned for late 2014, leading to the first LNG cargo in the first quarter of 2015, the US major stated. There were earlier indications that actual costs had risen to about US\$45Bn, though now the blowout is confirmed as being more than that.

Other LNG ventures such as BG Group's Queensland Curtis LNG project in Eastern Australia and the Papua New Guinea LNG development led by ExxonMobil have also recently confirmed significant cost increases.

"The factors contributing to the increased costs and schedule impacts include labour costs and productivity associated with Barrow Island site infrastructure, logistics challenges and weather delays," Chevron said.

Chevron explained currency impacts due to a strengthened Australian dollar versus the US dollar also played a part. ■

Dominion starts fight for Marcellus shale LNG flow to Japan by 2018

Cove Point files its environmental review to US regulator and already has compelling support from key stakeholders

Our North America editor

Construction of the proposed Cove Point liquefaction plant is expected to begin in March 2014, US energy company Dominion told US regulators as it seeks permits for the US East Coast state of Maryland to reap billions of dollars from LNG exports over 30 years.

During the construction phase, this project will provide at least 5,000 local jobs, hundreds of business contracts and boost US export support revenues by billions per annum when completed, increasing the state of Maryland's contribution to the positive side of the trade balance by an estimate 40 percent.

Once completed, the liquefaction project is expected to handle natural gas exports that would reduce the US trade deficit by more than \$2.8bln per year and would generate directly and indirectly about \$1Bln annually in additional federal, state and local government revenues.

Dominion's Cove Point US LNG export project will have tolling contracts with Japanese trading giant, Sumitomo Corp., and with the second-largest importer of LNG to Japan, Tokyo Gas.

The company is planning an initial two liquefaction Trains, each with capacity of 5 million tonnes per annum. The Sumitomo preliminary deal only covers a quarter of the planned 10 MTPA production.

Other tolling or supply contracts will follow for Dominion, the Fairfax, Virginia-based company that is one of America's largest producers and transporters of energy and owner of the existing Cove Point LNG import terminal.

Sumitomo is the first Japanese company to participate in the development of shale-gas in the US and currently holds two stakes, including one in the Marcellus.

Cove Point, with its proximity to the US shale boom areas of the Marcellus and the Appalachian Basin, is emerging as an industry test ground for Washington's future LNG export policies.

Cove Point's LNG export ambitions make it emblematic of the US Northeast's participation in a new US export industry.

Supporters say that to site all LNG export projects in the Gulf coast states of Louisiana and Texas, would deprive the state of Maryland of the huge financial and tax benefits of LNG.

Currently the US Northeast has too much natural gas in storage and in the ground. The big money is there to be made by companies such as Dominion by enabling the loading of LNG onto carriers in Chesapeake Bay for export to Japan and China.

The prominent US environmental lobbying group, the Sierra Club, and the Maryland Conservation Council, are expected to be the most vociferous opponents of dominion in its quest for permits to transform into a liquefaction plant.



Dominion President and Chief Executive Thomas F. Farrell, has said that any project of this magnitude would expect some opposition from various special interest groups.

The Cove Point liquefaction plant will be built within the footprint of the existing facility (See graphic) and will be designed, built and operated with minimal additional environmental impacts, Farrell has stated.

He has also pointed out that by adding on to an existing facility,



An aerial view and graphic of the layout of the Cove Point LNG export plant. Areas in red will be developed for production Trains

the Cove Point project would have fewer environmental impacts than other liquefaction projects proposed for greenfield sites.

He also noted that the Cove Point facility has been cited many times for its "environmental stewardship" such as for the restoration of the 190-acre Cove Point freshwater marsh, a Maryland Natural Heritage Area along Chesapeake Bay.

Dominion last week filed its draft resource report for its export project as part of the environmental review by the Federal Energy Regulatory Commission.

It pointed out that Cove Point facility will be constructed within the fenced area of the operating industrial area at the current terminal.

Cove Point's beneficial location will improve markedly after 2014 when the widening of the Panama Canal will be completed to accommodate larger LNG carriers and thereby shortening the maritime route to Japan.

Dominion, as an operator of other natural gas infrastructure, including 11,000 miles of transmission and widespread gathering and storage facilities, is planning expanding existing compressor stations at Loudoun and Pleasant Valley for the Cove Point project. Much of the local opposition concerns these facilities.

However, local and state politicians largely support Cove Point's transformation into a liquefaction plant.

In a FERC filing, the Tri-County Council for Southern Maryland offered its support.

"TCC recognizes the positive impact that Dominion Cove Point has had on those residents in its 30 years of operation.



"Dominion Cove Point plays a vital role in Southern Maryland's economy. Through its financial contributions, the facility assists in allowing the residents of Calvert County to enjoy one of the lowest property tax rates in the State of Maryland.

"Dominion's stellar safety record, dedication to preserving the Chesapeake Bay environment, and contributions to the local economy demonstrates why the Cove Point facility one of the most admired employers in the region.

"TCC represents the three-county region of Charles, St. Mary's and Calvert and we are confident that Dominion will, to the fullest extent possible, ensure that our relevant local and regional businesses will be provided opportunities to participate in the construction and operations contracts associated with this major new project for our region," it stated.

"We also remain confident that Dominion will continue its efforts to ensure the utmost principles of safety and environmental preservation in our community," it said.

Dominion pointed out to the FERC that it had recently completed two expansion projects with no negative impact, including a jetty-pier in Chesapeake Bay and additions to the terminal.



"The most substantial recent project in the Cove Point area is the Cove Point Pier Reinforcement Project, which was authorized by the FERC in 2009 and completed in 2011," Dominion said.

"The Reinforcement Project modified the existing offshore

pier to accommodate a broader range of ships. "Some of these ships include next-generation LNG vessels, which have a much larger cargo capacity than the vessels that historically have offloaded at the pier," it said.

"Another recent substantial project in the Cove Point Area is the Cove Point Expansion Project, which was authorized by the FERC in 2006 and completed in 2008.

"The Cove Point Expansion Project expanded the capacity of the Cove Point Terminal from 7.8 billion cubic feet to 14.6 Bcf. As a result, more ships are able to unload at the DCP pier and use the

increased storage capacity and throughput.



"The only other major project DCP is aware of in the vicinity of the Cove Point LNG Terminal is the potential addition of a third unit at the Calvert Cliffs Nuclear Power Plant.

"The power plant is located approximately 2.9 miles from the LNG terminal and 3.4 miles from the offloading pier and there were no overlapping issues previously raised," Dominion said. ■

Summary of NERA report

Analysis of economic impact of US LNG exports to give projects traction

The LNG report commissioned by the US Department of Energy appears to clear the way for advances in at least six key export projects, and for a surge in regulatory support for the transformation of existing LNG import terminals

The long-awaited report for the US Department of Energy on the economic impact of LNG exports has given resounding approval to such a move, and added that the more LNG cargoes sold abroad the better for the domestic economy and the economic wellbeing of Americans.

The report will give a huge regulatory boost to the 20 LNG export projects that have applied for permits to sell US LNG to Free Trade Agreement countries and Non-FTA nations.

Permits

So far only one LNG export project, the Sabine Pass venture in Louisiana being developed by Cheniere Energy, has been accorded both levels of export permit, allowing the sale of LNG to countries such as Japan and China.

The outcome of the report on the impact on US domestic natural gas prices and the economy of LNG exports was cited by the Administration as the main reason for delaying the award of additional export permits for cargo sales to Non-FTA nations.

The 230-page report was compiled by NERA Economic Consulting of Washington DC, under project leader W. David Montgomery.

Across all scenarios covered by the report, the US was projected to gain net economic benefits from allowing LNG exports.

Outcomes

"Moreover, for every one of the market scenarios examined, net economic benefits increased as the level of LNG exports increased.

"In particular, scenarios with unlimited exports always had higher net economic benefits than corresponding cases with limited exports.

"In all of these cases, benefits that come from export expansion more than outweigh the losses from reduced capital and wage income to US consumers, and hence LNG exports have net economic benefits in spite of higher domestic natural gas prices.

"This is exactly the outcome that economic theory describes when barriers to trade are removed," the report stated.

"Net benefits to the US would

be highest if the US becomes able to produce large quantities of gas from shale at low cost, if world demand for natural gas increases rapidly, and if LNG supplies from other regions are limited," the report explained.

Demand

The report stated that LNG exports are only feasible under scenarios with high international demand and/or low US costs of production - conditions existing now and through 2050 because of the US shale-gas boom.

"If the promise of shale gas is not fulfilled and costs of producing gas in the US rise substantially, or if there are ample supplies of LNG from other regions to satisfy world demand, the US would not export LNG," the report said.

"LNG exports will not drive the price of domestic natural gas to levels observed in countries that are willing to pay oil parity-based prices for LNG imports.

"US exports will drive prices down in regions where US supplies are competitive so that even export prices will come down at the

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Norwegian LNG for Sabine on Dec 22

The 147,200 cubic metres capacity LNG carrier "Arctic Lady" will deliver a cargo from the Hammerfest liquefaction plant in Norway to the Sabine Pass import facility on the US Gulf coast on December 22, according to shipping data.

Togas pays \$828 a tonne for LNG

Tokyo Gas, the second-largest Japanese LNG importer, paid an average price of \$828 per tonne for its LNG cargoes on a customs-cleared basis in the three months to the end of October compared with \$873 per tonne in the previous three-month period. Togas said the price fall would enable it to reduce charges to domestic customers in January 2013 by 2.72 yen per cubic metre relative to meter readings in December 2012

Asia-Europe cargo price gap narrows

East Asian and European LNG price indicators narrowed to their smallest differential in 2012 at \$3.10. That's as the value of an LNG cargo in East Asia was seen at \$14.35 per million British thermal units compared with \$11.25 per MMBtu in Europe.

Gazprom NSR LNG carrier unloaded

The LNG carrier "Ob River" unloaded its cargo at the regasification terminal in the Port of Tobata in Japan after earlier completing the first LNG-loaded Northern Sea Route traverse. The vessel delivered a Gazprom-owned LNG cargo loaded on November 7 at the Hammerfest plant in Norway owned by Statoil.

same time that US prices will rise," the report said.

"Moreover, basis differentials due to transportation costs from the US to high-priced regions of the world will still exist, and US prices will never get closer to those prices than the cost of liquefaction plus the cost of transportation to and regasification in the final destination.

Wellhead

"Thus even in the scenarios with no binding export levels, the wellhead price in the US is below the import price in Japan, where the US sends some of its exports.

"The macroeconomic analysis shows that there are consistent net economic benefits across all the scenarios examined and that the benefits generally become larger as the amount of exports increases," the report added.

"These benefits are measured most accurately in a comprehensive measure of economic welfare of US households that takes into account changes in their income from all sources and the cost of goods and services they buy.

"This measure gives a single indicator of relative overall well-being of the US population, and it consistently ranks all the scenarios with LNG exports above the scenario with No-Exports. Welfare improvement is highest under the high export volume scenarios be-

Plants Investment Cost by Region (\$millions/ MTPA Capacity)

	\$Millions/MTPA	Capital Cost (\$/MMBtu produced)
Africa	\$1,031	\$3.05
Canada	\$1,145	\$3.39
C&S America	\$802	\$2.37
Europe	\$802	\$2.37
FSU	\$802	\$2.37
Middle East	\$859	\$2.54
Oceania	\$1,317	\$3.90
Sakhalin	\$802	\$2.37
Southeast Asia	\$1,145	\$3.39
U.S.	\$544	\$1.61

US investment cost per MTPA of LNG is most competitive because the projects will convert existing regasification facilities to liquefaction plants

cause US consumers benefit from an increase in wealth transfer and export revenues," the report said.

Capital cost

To derive the capital cost per MMBtu of LNG production plants worldwide, the authors obtained a set of investment costs per million tonnes per annum of LNG per region (See graphic).

The US's investment cost per MTPA is competitive because most domestic projects convert existing idle regasification facilities to liquefaction plants.

This implies a 30 percent to 40 percent cost savings relative to greenfield projects. Offshore LNG export projects are more costly, raising the investment costs per unit of capacity in Southeast Asia and Oceania.

	2010	2015	2020	2025	2030	2035
Africa	7.80	9.70	11.10	12.20	13.30	14.10
Canada	6.10	7.00	7.70	8.30	8.70	9.00
China/India	4.60	5.60	6.70	8.00	9.60	9.70
C&S America	6.80	7.90	8.30	9.20	10.50	11.70
Europe	9.50	8.10	7.40	7.50	7.90	8.30
FSU	28.87	30.05	32.12	34.89	37.77	39.94
Korea/Japan	0.20	0.20	0.20	0.20	0.20	0.20
Middle East	16.30	19.70	22.40	24.60	26.70	28.80
Oceania	2.10	2.60	3.10	3.80	4.80	5.70
Sakhalin	0.43	0.45	0.48	0.51	0.53	0.56
Southeast Asia	9.30	10.00	10.70	11.60	12.60	13.40
U.S.	21.10	22.40	23.40	24.00	25.10	26.40
World	113.10	123.70	133.60	144.80	157.70	167.80

The table above shows the leading global natural gas producers through 2035 and US domestic exploration activities will ensure abundant supplies

The total investment cost is then annualized assuming an average plant life of 25 years and a discount rate of 10 percent. The capital cost per MMBtu of LNG produced is obtained after applying a 72 percent capacity utilization factor to the capital cost per MMBtu of LNG capacity, they said.

"Gains from trade are shifted in the same way. Another part of the increased income of natural gas producers comes from foreign sources. This added revenue from overseas goes immediately to natural gas producers and exporters but does not come from US consumers," the report explained.

Conclusion

"Therefore, it is a net benefit to the US economy and is also shifted back to the workers and owners of

businesses involved directly and indirectly in natural gas production and exports," it said.

"In the end, all the costs and benefits of any change in trade patterns or prices are shifted back to labor and capital income and to the value of resources in the ground, including natural gas resources.

"One of the primary reasons for development of computable general equilibrium models like NERA's is to allow analysts to estimate how impacts are shifted back to the different sources of income and their ultimate effects on the economy at large.

"In conclusion, the range of aggregate macroeconomic results from this study suggests that LNG export has net benefits to the US economy," the report stated. ■

Yemen LNG chief Rafin leaves his post unbowed by year of eight sabotage attacks and will be succeeded by Azibert

Yemen LNG has held a farewell event for outgoing General Manager Francois Rafin and to welcome his successor Jacques Azibert as the liquefaction plant owners reflected on an eventful year that saw eight sabotage attacks on the feed-gas pipeline.

The event was attended by the shareholders of Yemen LNG, including France's Total and Hunt Oil of the US, Yemen's Ministry of Oil, Ministry of Defense, and the ambassadors of France, Egypt, Japan, Algeria and Lebanon, and local dignitaries.

In a speech, Arnaud Breuillac,

President of Total in the Middle East, thanked Rafin for having solidly installed Yemen amongst the small club of LNG exporters, "in spite of all the difficulties that the country has met in the recent years."

Breuillac noted that it would now cost three or four times more to build a project like Yemen LNG given current project prices.

The Balhaf plant on the Gulf of Aden began cargo exports in 2009 from its two Trains producing 6.7 million tonnes per annum of LNG.

"The perspectives of income

for the country are now very robust and the expected government income over the duration of the Gas Development Agreement have doubled and are currently estimated at US\$60 billion," Breuillac said.

Rafin noted that he had worked for the Yemen LNG project since its inception and he recognized that the "merit for this successful project was shared by the thousands of Yemeni and foreign workers and engineers who have taken part."

"The robustness of Yemen LNG is well known in Yemen and out-

side Yemen and in the better times to come, Yemen LNG will rank at the highest international level in the LNG industry," Rafin added.

Rafin paid special tribute to the Ministry of Defence and to the Governors of Shabwa and Marib for ensuring the security of the personnel and of the assets even at the most difficult of times.

Rafin's successor Jacques Azibert noted his satisfaction in taking up the position of General Manager on January 1 and his desire to continue the work of his predecessors. ■