



Vol. 51, n°7, May 9, 2012

Main news

LNG: Processing

- PetroChina Co started building the country's largest onshore gas liquefaction plant with home-grown technology and equipment in eastern Shandong province.
- A new proposal for an LNG processing terminal in Warrenton, Oregon, is likely to be beginning the permit process.
- Sabine Pass Liquefaction, LLC and Sabine Pass LNG, L.P., have received authorization to site, construct and operate facilities for the liquefaction and export of domestically produced natural gas at the Sabine Pass LNG terminal in Louisiana.

LNG: Supplies- Imports - Exports

- Japan's Kyushu Electric Power Co Inc agreed to extend its liquefied natural gas supply contract with Australia's North West Shelf project. Under the agreement, Kyushu will buy an additional 5 million tonnes over six years ending in 2023.
- GDF Suez signed a long term agreement with Norwegian LNG firm GASNOR to supply 7.5 TWh of liquefied natural gas over a 12-year period, starting in 2013.

LNG: Storage

- Andhra Pradesh Gas Distribution Corporation selected GDF Suez as partner to develop floating liquefied natural gas import terminal project in India.
- Enagas, said that Spain's new LNG terminal at Musel will effectively be put into "hibernation" once it is completed.
- FERC vacated recently an order authorizing Jordan Cove Energy Project LP to construct and operate an LNG import terminal in Coos County.

Natural Gas: Production

- The Shah Deniz consortium approved the decision to commence front-end engineering and design on Shah Deniz Stage 2 project.

Natural Gas: Reserves

- Brazil has found sufficient gas reserves to ensure self-sufficiency in the coming five years.

Natural Gas: Processing

- Saudi Aramco started up processing facilities at Khursaniyah associated with the offshore Karan gas development.

Natural Gas: Transportation - Distribution

- Proponents of Kitimat liquefied natural gas export terminal in Canada have won an application to widen the pipeline feeding the facility.
- Pakistan issued tenders for the construction of 785 kilometre Iran-Pakistan natural gas pipeline.
- Nord Stream completed offshore pipelay for the second of its twin 1,224 km gas pipelines through the Baltic Sea.

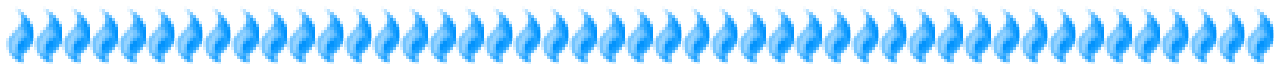
Natural Gas: Supplies- Imports - Exports

- Petronas signed a deal to supply an additional 43 million cubic feet a day of natural gas to a unit of Singapore conglomerate Keppel Corporation.
- The Orca exploration group agreed with the government of Tanzania to increase deliverability from the Songo Songo field to 200 million cubic feet a day.

Natural Gas: Storage

- E.ON UK is looking to gain formal planning permission for the Whitehill Farm underground storage facility.

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Natural Gas	Exploration-Discovery p. 7-8 / Production p. 8-9 / Reserves p. 9 / Processing p. 9-10 Transportation-Distribution p.10-11-12 Supplies-Imports-Exports p.12-13 / Storage p. 13-14 Use for Power Generation p. 14



LNG

PROCESSING

CANADA: Planned project – Partnership – CNR51/7/1

Mitsubishi said recently that it was in talks with Royal Dutch **Shell** as well as a Chinese and a South Korean firm to produce liquefied natural gas in Canada. The deal would see the four companies including **China National Petroleum** and **Korea Gas** build an **LNG terminal in the western province of British Columbia**. The facility would produce about 12 million tons of the gas annually. Production is expected to begin around 2020. (April 25, 2012)

CHINA: Ongoing project – Construction start-up – CNR51/7/2

PetroChina Co started recently building the country's largest **onshore gas liquefaction plant with home-grown technology and equipment**. The Tai'an plant in eastern Shandong province will be able to liquefy 2.6 million cubic metres of gas per day and supply **600,000 tonnes per year of liquefied natural gas** when it is ready for operation in late **2013**. PetroChina, via its LNG unit Kunlun Energy, started operating its first 1 mcm per day LNG plant on April 21, 2012 in south-western Sichuan, and its Ansai plant in

northern Shaanxi, with liquefaction capacity of 2 mcm per day, is due to be ready for use in June 2012. "We now have the technological capability to build a 3 million tpy plant, but that scale is beyond domestic manufacturing capability for key equipment," said a company source. Many of China's existing LNG plants use technology from companies such as U.S. firm Black & Veatch Corp, Germany's Linde Ag and France's Technip SA. Black & Veatch and its partner Chemtex alone have secured 14 such projects in China since 2005, the firm has said. (April 26, 2012)

KOREA: Partnership agreement – CNR51/7/3

DNV and Korea Gas Corporation (KOGAS) agreed recently to **cooperate on research and development in the LNG sector**. Based on the signed MOU, DNV and KOGAS will co-organise conferences and cooperate on R&D projects throughout the entire LNG value chain, from upstream to downstream, including gas reservoir exploration, natural gas production, liquefaction, transportation, storage, regasification and supply. (April 16, 2012)

RUSSIA: Planned project – Partnership – CNR51/7/4

OAO NOVATEK reported recently that **OAO Gazprom** and the Company have signed a Memorandum of Cooperation whereby NOVATEK and Gazprom are considering the possibility to **establish a joint venture to increase liquefied natural gas production capacity on the Yamal peninsula** as well as jointly developing hydrocarbon resources on the Gydan peninsula. The Parties will consider establishing a joint venture (preliminary shareholdings: Gazprom -

75%; NOVATEK - 25%) based on the hydrocarbon resources of Gazprom's Tambey fields to increase LNG production on the Yamal peninsula. The Parties also plan to establish a joint venture based on NOVATEK's Utrenneye (Salmanovskoye) field to develop the existing assets located on the Gydan peninsula with equal shareholdings (Gazprom - 50% and NOVATEK - 50%). Gazprom and NOVATEK will formulate and approve an integrated program for developing their fields on the Gydan peninsula. (April 18, 2012)

UNITED STATES: Planned project – CNR51/7/5

A new proposal for an **LNG processing terminal in Warrenton** is likely to be beginning the permit process soon. **Oregon LNC and Oregon Pipeline** plan to collaborate on a facility to bring natural gas from Canada by pipeline and ship up to 9 million tons of liquefied natural gas per year from a terminal in Warrenton. The gas would be destined for Asia markets. Oregon LNG's terminal project has been in development since 2004. It began the permit process in 2007 and has received the necessary permissions from the U.S. Coast Guard for the dock and turning basin.

The proposed pipeline bringing gas to Warrenton is 86 miles long; 40 miles shorter than the one previously proposed. It also follows a different path. The pipe will cross the Columbia River at Woodland, Wash., cross a sparsely populated portion of Columbia County to Hwy 26, then up the coast to Warrenton. Hansen expects the plant to be operational by **2017 or 2018**. (April 23, 2012)

UNITED STATES: Planned project – Approval – CNR51/7/6

Cheniere Partners announced recently that its subsidiaries, Sabine Pass Liquefaction, LLC and Sabine Pass LNG, L.P., have received authorization under Section 3 of the Natural Gas Act from the Federal Energy Regulatory Commission to site, **construct and operate facilities for the liquefaction and export of domestically produced natural gas at the**

Sabine Pass LNG terminal located in Cameron Parish, Louisiana. The order authorizes the development of up to four modular LNG trains. Sabine Pass initiated FERC's National Environmental Policy Act pre-filing process for the Liquefaction Project in July 2010, and submitted an application to the FERC for authorization to site, construct and operate the Liquefaction Project in January 2011. (April 16, 2012)

SUPPLIES - IMPORTS - EXPORTS

ARGENTINE: Supply contract – Talks – CNR51/7/7

YPF announced recently that it would **continue to provide liquefied natural gas** to local customers despite the decision of Repsol to cancel deliveries. Repsol has been the majority owner of the Repsol YPF business alliance until the **Argentine government decided to nationalize the company**.

The team charged with expropriating Repsol's interest, headed by Argentine Federal Planning Minister Julio de Vido, said in a statement the company would increase supplies of liquefied natural gas. In 2011, Argentine public energy company Enarsa Repsol contracted to buy 10 of the 81 LNG shipments Repsol planned to import into Argentina in 2012 to alleviate a shortage of local production. The first delivery was scheduled for May 14. During the controversy over the Argentine government's decision to expropriate 51 percent of the shares of YPF from its Spanish owners, Repsol informed Enarsa it was suspending delivery of the LNG. (April 29, 2012)

AUSTRALIA to JAPAN: Supply contract – Extension – CNR51/7/8

Japan's **Kyushu Electric Power Co Inc** agreed recently to **extend its liquefied natural gas supply** contract with Australia's **North West Shelf project**, North West Shelf Australia LNG said in a statement. Under the agreement, Kyushu will buy **an additional 5 million tonnes from the North**

West Shelf over six years ending in 2023. The North West Shelf is operated by Woodside Petroleum Ltd. Other shareholders include BHP Billiton Petroleum Ltd, BP Developments Australia, Chevron Australia, Japan Australia LNG (MIMI) Pty Ltd and Shell Development. (April 16, 2012)

AUSTRALIA to JAPAN: Supply contract – Agreement – CNR51/7/9

Apache Corp. and its partners agreed recently to **sell liquefied natural gas from the Chevron-operated Wheatstone Project in Western Australia to Chubu Electric Power Company Inc**. Under the terms of the agreement, the Wheatstone partners will supply **1 million metric tons per annum of LNG for up to 20 years to Chubu**. Through its 13-percent share in Wheatstone, Apache's Australian unit, Julimar Pty Ltd, will supply 0.13 MTPa to Chubu. (April 17, 2012)

INDIA: Supply contract – Talks – CNR51/7/10

The **Union Minister of Commerce, Industry and Textiles**, Shri Anand Sharma requested recently **Qatar to supply immediate requirement of 3 million tonnes of LNG to India**. The LNG is to be imported by Petronet LNG Ltd and GAIL. The amount will further increase to 15 million tonnes in the next three to four years. The Qatar Minister of Energy & Industry Mohammed Bin Saleh Al-Sada informed that RasGas, Qatar and Indian agencies are involved in negotiations and assured that needed urgency will be imbued in the proceedings. India is currently importing 7.5 MMTPA of LNG from RasGas, Qatar. A 25 year contract in this regard was signed by Petronet LNG limited (PLL) in July 1999.

The supply of 5 MMTPA LNG from Qatar commenced in 2004, with the balance 2.5 MMTPA starting in January 2010. India needs additional long-term tie up to 15 MMTPA of LNG. An immediate requirement of 3 million tonnes of LNG was indicated by the Indian side to be imported by Petronet LNG Ltd and GAIL, which will further increase to 15 million tonnes in the next three to four years. (April 20, 2012)

INDONESIA: Supply contract - First delivery – CNR51/7/11

The Indonesian unit of **Total** made recently its **first LNG delivery to the Nusantara Regas floating storage and regasification unit** in Jakarta Bay, West Java, Elisabeth Proust, president director and general manager of Total E&P Indonesia said. The start of LNG supplies to the first FSRU in Indonesia will take the Mahakam block's contribution to domestic supply beyond 2012 to over 25% of its production. Total and Japan's Inpex, which each hold 50% stakes in the Mahakam block in East Kalimantan province, are contracted to supply **a total of 11.75 million mt**

in LNG cargoes during 2012-2022 to the FSRU.

This floating terminal is the first LNG receiving terminal to be built in Indonesia. Pertamina holds a 60% stake in Nusantara Regas, with the remaining 40% stake held by Perusahaan Gas Negara. The project will have a capacity of 3 million mt/year, but Nusantara Regas has only secured LNG supplies from the Mahakam block. The company is mulling importing as much as 2 million mt/year of LNG from the US. The FSRU will supply gas to state-owned power utility Perusahaan Listrik Negara for its combined cycle power plants in North Jakarta. (April 26, 2012)

NORWAY: Supply contract – Agreement – CNR51/7/12

GDF Suez signed recently a long term agreement with Norwegian LNG firm **GASNOR** to supply **7.5 TWh of liquefied natural gas over a 12-year period, starting in 2013**. The LNG volumes will be sourced from GDF Suez portfolio and will be loaded by trucks or by small vessels from Zeebrugge LNG terminal in Belgium. (April 13, 2012)

THAILAND: Supply contract – Talks – CNR51/7/13

PTT will seek **additional LNG and oil supplies** as well as incremental gas output from other fields to deal with a shortfall in natural gas output resulting from **maintenance shutdowns at the country's two major offshore fields later in 2012**. Bongkot, operated by PTT Exploration & Production, is scheduled to suspend output between May 25-31, while Chevron-operated Erawan, will be closed between August 1-8. The shutdown of Bongkot will deprive the kingdom of 630,000 Mcf/d, representing about 14% of the kingdom's total gas output, while the closure of Erawan would mean a loss of 612,000 Mcf/d or 13% of total deliveries. A senior energy ministry official said the shortfall in gas supplies will be

essentially offset by additional imports of LNG, raising the supplies of fuel oil and diesel and ramping up deliveries from other gas fields in the Gulf of Thailand. Meanwhile, PTTEP said that test runs of Greater Bongkot South field, part of Bongkot structure, has proceeded with the delivery of 50,000-70,000 Mcf/d of gas and 3,000-4,000 b/d of condensate. PTTEP CEO Anon Sirisaengtaksin said that Greater Bongkot South's gas delivery to parent PTT will ramp up to the contractual rate of 320,000 Mcf/d of gas and 9,000 b/d of condensate within the second quarter of 2012. PTTEP is the operator of the entire Bongkot project, and holds 44.4%, with Total holding 33.3% and the UK's BG Group 22.2%. (April 23, 2012)

UNITED STATES to JAPAN: Supply contract – Talks – CNR51/7/14

Sumitomo Corp and Tokyo Gas Co Ltd said recently that they will hold talks with **Dominion Resources Inc** to import up to **2.3 million tonnes of liquefied natural gas per year for 20 years from 2017**. Sumitomo said it had signed a preliminary agreement with Dominion Resources that would lead to the right to buy LNG produced at a 5-million tonne-per-year gas liquefaction facility to be built by Dominion at the Cove Point project in Maryland, and that Tokyo Gas would join Sumitomo when a formal contract was signed.

If the project receives formal U.S government approval in 2017, its shipments to Japan will likely be priced at less than \$10/mmBtu, said Kunio Nohata, senior general manager of gas resources department at Tokyo Gas, well below current Asian prices at around \$17/mmBtu. The LNG output could be exported to anywhere in the world, he added. (April 27, 2012)



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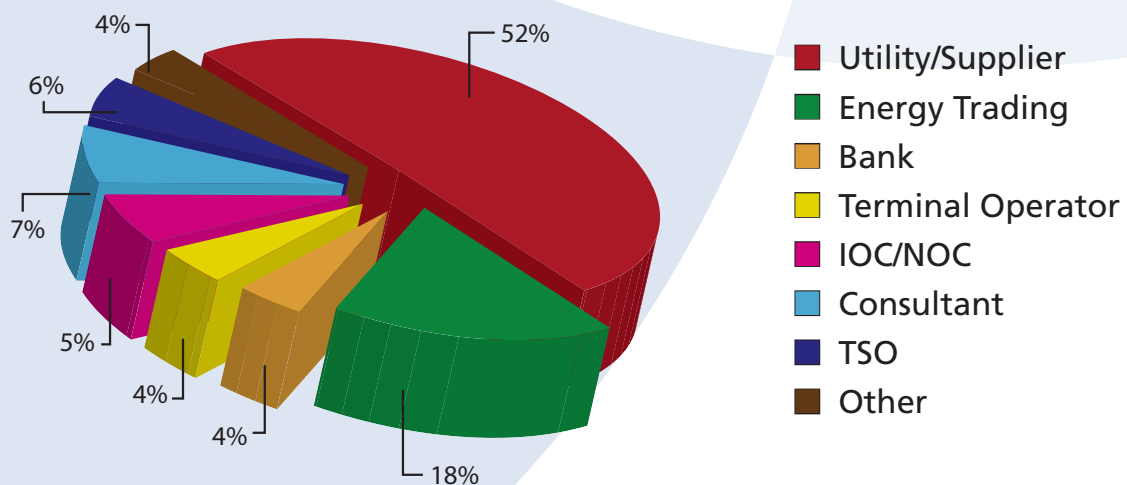
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Breakdown of 2011 attendees by company type



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STORAGE

CHILE: Shareholding Talks – CNR51/7/15

Enagas agreed recently to acquire **BG Group's 40% interest in GNL Quintero SA**, operator of an LNG terminal in Chile. The terminal, in Quintero Bay has total storage capacity of 330,000 cum and regasification capacity of 3.4

billion cu m/year. At conclusion of the acquisition, Enagas will own 51% of the acquired stake and others partner, 49%. The other Chilean based partners, ENAP, Endesa Chile, and Metrogas, each presently hold a 20% interest. (April 27, 2012)

INDIA: Planned project – Partnership – CNR51/7/16

Andhra Pradesh Gas Distribution Corporation (APGDC) selected recently **GDF Suez** as the strategic partner to develop floating liquefied natural gas import terminal project in India. The import terminal will have a 3.5 million tonnes per annum capacity using a floating storage and regasification unit.

The feasibility study is to be completed by the end of 2012, followed by a final investment decision. **GDF Suez will hold a 26% stake in the terminal** with access to equity regasification capacities. APGDC is a joint venture of state-owned GAIL Gas and Andhra Pradesh Gas Infrastructure. The LNG terminal is expected to start operations in early 2014. (April 19, 2012)

JAMAICA: Planned project – Bid – CNR51/7/17

Three companies placed recently **bids to build and operate a liquefied natural gas floating storage and regasification terminal in Jamaica**.

An evaluation will be done before the winning bid is chosen and approved by Cabinet before the **end of June 2012**. The LNG project aims to lower energy costs through fuel diversification. The **Jamaica Public Service Company (JPS)** has

committed to construct 360 megawatt of additional generating capacity, which will run on natural gas. Previously, the Cabinet announced its approval of the formation of **Jamaica Gas Trust (JGT)**, the new company that will handle the purchase and sale of natural gas in Jamaica. JGT is supposed to establish a subsidiary that will schedule LNG imports, inventory management, pipeline nominations and gas sales. (April 29, 2012)

LITHUANIA: Planned project – Partnership – CNR51/7/18

Energy Minister Arvydas Sekmokas said recently that **Lithuania may offer a 20 percent stake** in the country's **planned liquefied-natural-gas terminal** on the Baltic Sea to foreign investors. The shares may be offered to companies providing equipment, technology or gas supply. Lithuania plans to begin operations at the floating LNG terminal at the end of 2014. (April 18, 2012)

SINGAPORE: Planned project – Engineering – CNR51/7/19

The **Maritime and Port Authority of Singapore** announced recently that the **construction of the jetty for the Singapore LNG Corporation's secondary terminal on Jurong Island** has started. The work will go on until September 29, 2012, the MPA port master advised. The secondary terminal will handle LNG carriers of 60,000-265,000 mt.

SLNG's 6 million mt/year LNG regasification terminal is set to begin commercial operations in the **second quarter of 2013**, the company said. The LNG terminal will have an initial throughput capacity of 3.5 million mt/year, increasing to 6 million mt/year once additional jetties and regasification facilities are completed by the end of 2013, SLNG said. (April 27, 2012)

SPAIN: Planned project – CNR51/7/20

Antonio Llarden, the CEO of gas infrastructure operator **Enagas**, said recently that Spain's **new LNG terminal at Musel will effectively be put into "hibernation" once it is completed**. The 7 billion cubic meter/year terminal under construction on Spain's northern coast is expected to be completed by the end of 2012, Llarden said, but will not be brought online "until demand justifies it," as specified by a recent government decree.

With the gas system running at a deficit in 2011, the government decreed in March 2012 that the Musel regasifier's startup would be delayed, with a potential saving of \$88 million in regulated costs each year.

Spain operates six LNG terminals on its mainland with a maximum combined capacity of 60.4 billion cubic meters/year. It also has a gas import capacity of 22 Bcm/year. Enagas is expecting the government to publish a new infrastructure plan covering the period 2012-2020 in the second half of this year, in which plans for a proposed second LNG terminal on the Canary Islands from 2015 should be included, Lladen said. (April 24, 2012)

UNITED STATES: Planned project – Non approval – CNR51/7/21

FERC vacated recently without prejudice an order authorizing Jordan Cove Energy Project LP to construct and operate an LNG import terminal in Coos County and the related Pacific Connector Gas Pipeline that would have run from the terminal to a point near the Oregon-California border. In the order that eliminated the authorization, FERC dismissed as moot the requests for rehearing of its authorizing order filed by the National Marine Fisheries Service, Oregon

and the Western Environmental Law Center, the last of which represented a group of environmental and citizen organizations and individuals. FERC said its decision does not change its policy of letting the market determine which gas infrastructure projects go forward, as long as the commission finds that there would be no substantial adverse impacts. FERC said Jordan Cove may submit a new application for an import terminal if the company identifies a demand for import service. (April 19, 2012)

GTL

PROCESSING

MOZAMBIQUE: Planned project – Talks – CNR51/7/22

Gareth Shaw, PetroSA's business development manager for GTL, said recently that his company was proposing to Mozambique the building of a 40,000 barrels-per-day plant at a cost of around \$4 billion. The plant could feed a growing need for fuels, and diesel in particular, in the southern African region. Shaw said the plant could use PetroSA's new low-temperature Fischer-Tropsch technology, which would boost the share of diesel produced in the plant to 70 percent from 40 percent seen in other types of GTL technology. The country's total recoverable resources are seen at more than 100 trillion cubic feet, industry officials and analysts have said. (April 25, 2012)

NATURAL GAS

EXPLORATION – DISCOVERY

AUSTRALIA: Discovery – CNR51/7/23

BHP Billiton Ltd. announced recently a natural gas discovery offshore Western Australia state that could significantly increase the size of its Scarborough gas field. "Drilling and logging of the North Scarborough appraisal well proves a significant extension to the Scarborough gas resource," a BHP Billiton spokesman said. "Commercialisation options are being evaluated. We are unable to comment further on potential

development options," he added. BHP wholly owns North Scarborough, located near one of the company's biggest gas discoveries in recent years, held in a joint venture with ExxonMobil Corp. Options available to BHP and Exxon include building a standalone liquefied natural gas terminal on the coastline or processing the gas through separate terminals being built by Chevron Corp. and Woodside Petroleum Ltd. (April 18, 2012)

BAHRAIN: Drilling campaign – Partnership – CNR51/7/24

According to Energy Minister Dr Abdulhussain Mirza an agreement has been signed recently between Bahrain and the US Occidental Petroleum Corporation for deep gas exploration. Occidental will carry out drilling for gas and Bahrain would not be charged for the operations since all drilling costs would be borne by the company for the first seven years. By then it would be known whether they have found results, Dr Mirza said. (April 28, 2012)

CHINA: Discovery – CNR51/7/25

CNOOC Limited made recently a discovery at **Dongfang(DF)13-2** in high-temperature and high-pressure natural gas reservoir in Yinggehai. The new discovery DF13-2 is located in the north of

central sag in Yinggehai Basin of Western South China Sea. During the test period, the well flowed at an average rate of **42.4 million cubic feet of natural gas per day**. (April 23, 2012)

HUNGARY: Discovery – CNR51/7/26

Ascent Resources plc reported recently that PetroHungaria kft in which Ascent has a 48.3% interest has completed the drilling of the **PEN-105A sidetrack in the Penészlek Project in Eastern Hungary**. The PEN-105A well was designed to drain gas reserves from the northern half of the structure which is bisected by a sealing fault.

The original well has recovered some **0.85 Bcf of gas** from the smaller southern part of the structure since production started from it in March 2010. Preliminary testing of a 7m perforated section of PEN-105A produced gas at a rate of 0.928 MMscfd and work now progresses to reconnect the well to the production facilities. (April 18, 2012)

IRAN: Discovery – CNR51/7/27

Iran found recently a new natural gas field in the country's south-western province of **Khuzestan** which is estimated to contain **reserves as much as the South Pars gas field** in the Persian Gulf, the semi-official Mehr news agency reported. Seyyed Mahmoud Mohaddes, the National Iranian

Oil Company (NIOC) exploration director, said a 5000-meter well will be drilled in the field to find more information about the condition of the field and the amount of its natural gas reserves. The report has been independently confirmed by the Iranian Oil Ministry. (April 29, 2012)

NORWAY: Discovery – CNR51/7/28

RWE Dea Norge announced recently that it finished drilling a well in production license area 435 in the Norwegian Sea on the **Zidane 2 prospect**. Preliminary estimates of the discovery range from **140 billion-450 billion cubic feet of recoverable natural gas**. The company said it would assess the results of the well before moving with field development plans. (April 27, 2012)

PRODUCTION

ALGERIA: Planned project – Approval – CNR51/7/29

Petroceltic is expected to achieve formal government approval for the **future development of its headline Isarene/Ain Tsila gas field asset** in Algeria by the end of July 2012. The company has in 2011 increased its resource estimates for the asset by about 70% to 10.3tn cubic feet and has forecast 2017 as the date for first commercial gas flow from the site. (April 27, 2012)

AZERBAIJAN to EUROPE: Planned project – Engineering – CNR51/7/30

The **Shah Deniz consortium** recently approved the decision to **commence front-end engineering and design on Shah Deniz Stage 2 project**, during which an export pipeline route will be selected. The project is set to produce 16 Bcm/a of gas, with **first gas exports scheduled for the end of 2017**. BP President of the Azerbaijan, Georgia and Turkey Region Rashid Javanshir said "With over 30 Tcf of gas resources, Shah Deniz is truly a giant field. And with more than 26 wells, two new platforms, a terminal expansion, and up to 4,000 km of new pipelines to Europe, this chain of major projects represent one of the largest oil and gas developments in the world". The Stage 2 development of the Shah Deniz Field, which lies approximately 70 km offshore in the Caspian Sea, is expected to include:

Two new bridge-linked production platforms; 26 subsea wells to be drilled with two semi-submersible rigs; 500 km of subsea pipelines built at up to 550 m of water depth. Three options are being considered to carry gas into Europe: the Trans Adriatic Pipeline, with a route to Italy; Nabucco West, taking gas from the Turkish-European border through Eastern Europe to the West; and the South East Europe Pipeline taking gas through Hungary, Bulgaria and Romania. The Shah Deniz consortium will make a final route selection in 2013. (April 27, 2012)

12TH ANNUAL GLOBAL GAS VILLAGE SUMMIT

"Creating Value in a Shifting UGS Marketplace"

We are pleased to invite you to the 12th Annual Global Gas Village Summit which will be held in Manchester on 6, 7 & 8 June, 2012. This year's theme is 'Creating Value in a Shifting UGS Marketplace'.

While it is true that the IEA is predicting that EU gas demand will increase to 635 bcm by 2035, storage operators continue to be cautious. According to Team Consult there are some 47 bcm of working gas volume (WGV) in North West Europe and it is anticipated that this will increase to 74 bcm in 2030; some 51bcm are planned but only 55% of these projects will be implemented, mostly in Germany and the UK. The rate of developing projects will, of course, be dictated by the economic climate.

Based on our annual survey there is every indication to believe that operators may, for the short-term, delay starting up new projects, and instead focus on technical innovation and project maintenance for the short term.

We have chosen to have a stronger emphasis on technical and technology issues. We are also putting a strong emphasis on market, regulatory & financial issues. In particular, we are seeking presentations that exemplify dexterity, innovation and insight.

A key highlight will be the tour of the Holford UGS site, sponsored by Eon on 6 June, 2012.

Participating Companies:



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RUSSIA: Ongoing project – Production start up – CNR51/7/31

Eni started recently the production of hydrocarbons in the Russian Federation, from the **Samburskoye field**, located in the autonomous district of **Yamal-Nenets in western Siberia**. The initial gas and liquids production of the field, which is operated by SeverEnergia, a company in which Eni holds a 30 percent stake, will be **43.000 barrels of oil equivalent per day**. The maximum gas and liquids production of 145,000 barrels of oil equivalent per day will be reached in 2015. The gas produced will be sold to Gazprom, while Eni will retain the buy back and marketing rights on the Russian domestic market. The condensates will be destined for foreign markets. (April 23, 2012)

RESERVES

BRAZIL: Reserves estimates – CNR51/7/32

Mines and Energy minister Edison Lobao said recently that Brazil has found sufficient reserves to ensure self-sufficiency in the coming five years. The report from the **National Petroleum Agency (ANP)** said Brazil has natural gas reserves on land which can **increase supply by 360% in the coming decade**. This in practical terms means the current output of 65 million of cubic metres per day could easily reach 300 million cubic metres towards 2025-2027. The ANP report has identified 28 sedimentary basins on land with natural gas

potential, among which **Paranaiba to the northeast of the country with a proven reserve of 15 billion cubic feet and of which 15 million cubic metres per day can be extracted**. According to the report a majority of the basins with identified potential have yet to be explored and will soon be auctioned under a concession's system. Brazil has a daily consumption of 86 million cubic metres, of which 30 million are imported from Bolivia. According to ANP, natural gas consumption could soar to 200 million cubic metres per day by 2020. (April 30, 2012)

PROCESSING

ISRAEL: Planned project – Agreement – CNR51/7/33

The partners in Israel's offshore **Tamar natural gas field** said recently that they will pay \$380 million to **use the gas processing facilities of the Yam Tethys consortium** allowing the Tamar partners to meet their goal of starting natural gas production in **2013**. According to the agreement, the Tamar partners will use the compression system, pipelines, natural gas terminal and other facilities.

The agreement will allow the partners in Tamar to use the facilities until December 15, 2015. Partners in Tamar will also have the right to build more gas storage facilities at the Yam Tethys site. (April 18, 2012)

NORWAY: Planned project – Engineering – CNR51/7/34

Shell recently awarded **Kvaerner** with an engineering, procurement, construction and management (EPCM) deal for **modifications and projects at its Ormen Lange/Nyhamna onshore facilities** on the west coast of Norway. The Nyhamna gas plant processes natural gas from the Ormen Lange gas field located in the Møre

Basin in the southern part of the Norwegian Sea. The contract scope includes all modifications and projects on the Ormen Lange/Nyhamna facility and is established to meet the expected, significant increased project activity over the next 5-to-10 years. This includes the facilities at Nyhamna for gas from new fields such as Linnorm and Aasta Hansteen (formerly Luva). (April 19, 2012)

SAUDI ARABIA: Ongoing project – Start up – CNR51/7/35

Saudi Aramco recently started up processing facilities at **Khursaniyah** associated with the offshore Karan gas development. One gas-treatment train and one sulfur-recovery train are now fully operational at the Khursaniyah Gas Plant (KGP).

The facility is dedicated to processing 1 bcf/d of non-associated gas from the Karan offshore field. By mid-year, two further gas trains will be in service, lifting the **Karan gas processing capabilities at KGP to 1.8 bcf/d**. The platforms are remotely operated and controlled from Khursaniyah. From the tie-in platform, gas is sent via an underwater pipeline, to the facilities at Khursaniyah. The hydrogen sulfide and carbon dioxide are directed to the sulfur recovery unit where the hydrogen sulfide is converted to elemental sulfur. (April 25, 2012)

UNITED STATES: Planned project – CNR51/7/36

ONEOK Partners announced recently plans to develop a natural **gas gathering system and processing plant** and related infrastructure in the **Cana-Woodford Shale**, US. The company will invest \$190m to construction of a new 200 million cubic feet per day natural gas processing facility, the Canadian Valley plant in Oklahoma, which will be in service by 2014. It will also allocate \$160m for expansions and upgrades to its existing natural

gas gathering and compression infrastructure, thereby increasing the company's capacity to gather and process natural gas to **390 MMcf/d** in the Cana-Woodford Shale. Upon completion, the Canadian Valley plant will increase the total natural gas processing capacity in the state to 690 MMcf/d. The partnership also announced a total investment of \$4.7bn to \$5.7bn in natural gas gathering and processing, natural gas liquids and crude-oil infrastructure through 2015. (April 20, 2012)

TRANSPORTATION-DISTRIBUTION

AZERBAIJAN to EUROPE: Planned project – Talks – CNR51/7/37

EU Energy Commissioner Guenther Oettinger said recently that talks between the European Commission and **Azerbaijan** on **guarantees for the Trans-Caspian gas pipeline** could be completed in mid-2012. The Ministry of Foreign Affairs of Russia has expressed regret about the decision of the EU to hold negotiations on the construction of the Trans-Caspian gas pipeline with Azerbaijan and Turkmenistan, as it is made without taking into account actually existing international law and the geopolitical situation in the Caspian basin. SOCAR President Rovnag Abdullayev stated that Azerbaijan is not actually a member of the Trans-Caspian gas pipeline. According to Abdullayev, after the European Union and Turkmenistan agree on this project, the Azerbaijani side might consider ensuring gas transit through own territory. (April 27, 2012)

CANADA: Planned project – Approval – CNR51/7/38

Proponents of **Kitimat** liquefied natural gas export terminal have won an application to **widen the pipeline feeding the facility**. The revamped Pacific Trails pipeline, stretching from the northeast corner of the province to the marine terminal, will now be **42 inches in diameter instead of 36 in.**, according to documents from the British Columbia Environmental Assessment Office. The Summit-to-Kitimat pipeline will be the main supply link for Encana Corp., Apache Canada and EOG Resources' LNG facility, set to

launch in 2015. "The proponent has indicated to (environmental assessment office) that the purpose of the larger diameter pipe is not to increase the flow of gas, but to decrease friction of gas movement and therefore energy usage and operational costs," the partnership said in its application. The Kitimat LNG project was the first in Canada to be approved for an export licence by federal regulators in October 2011. The plant would have an initial capacity of five million metric tons per annum, with the potential to expand to 10 mmtpa or more. Industry estimates the plant could be online by 2020. (April 18, 2012)

CHINA: Planned project – Engineering – CNR51/7/39

China Offshore Oil Engineering (COOEC) has recently awarded a **pipeline installation contract to Technip for the Liwan 3-1** shallow-water project in China. The shallow water project is located in the Pearl River Mouth Basin, 300km South of Hong Kong. The 260km-long pipeline will link the Liwan gas platform to China National Offshore Oil Corporation's Gaolan gas plant. Technip will install 160km of 30-inch export oil and gas two-phase pipeline from the Liwan platform. The offshore installation is scheduled to be completed by the end of 2012. (April 27, 2012)

GERMANY: Planned project – Development plan – CNR51/7/40

Proposals for improved access to storage facilities in Germany have been added to the natural gas transmission grid operators' final version of their grid development plan. **The plan outlines the needed additional gas infrastructure in Germany until 2022.**

It estimates the cost of building new transport capacity to improve access to storage facilities in Haidach, 7Fields (in Austria, close to the border) and Etzel at E750m. Both planned and under-construction grid developments such as the NEL pipeline connecting the Rehden and Nordstream have been added too.

The lack of time to answer the consultation was the most common criticism of the 46 submissions from market participants about the last draft of the plan. But German regulator Bundesnetzagentur (BNetzA) only approved the natural gas demand scenarios to be used for the development plan at the beginning of February 2012, shortening the time frame for the TSOs to revise the plan. The TSOs did not calculate the costs for all the three scenarios on future gas demand, but focused solely on the second scenario because of the time frame. **According to this scenario, considered the most probable, total gas consumption in Germany is forecast to be 784TWh in 2015.**

By 2022, consumption is predicted to be 737TWh a reduction of 11% compared with 2009. In the first stage of grid expansion, up to 2015, the TSOs forecast that E600m is needed to build 200km of new pipelines. The second stage, 2015-2022, will require 730km of new pipes and an additional 360MW of compressor capacity. The costs by 2022 are predicted hit E2.2bn. BNetzA now has to approve the final version of the plan. (April 9, 2012)

PAKISTAN: Planned project – Tender – CNR51/7/41

Pakistan issued recently tenders for the **construction of 785 kilometre Iran-Pakistan natural gas pipeline**. The successful bidder will be expected to complete the pipeline in two years. The interested companies will be bound to submit

their technical and financial bids for the project by June 8, 2012. Under the gas sales purchase agreement (GSPA), the official said, Pakistan is bound to have a **first take of Iranian gas by December 2014** and in case of failure, it will have to pay \$1 million per day to Iran as penalty. (April 28, 2012)

PERU to BRAZIL: Planned project – CNR51/7/42

Brazilian construction firm **Odebrecht** said recently that a consortium of three Brazilian firms plans to spend up to \$5 billion on **building a pipeline and related infrastructures for bringing Peruvian gas into the market**. The companies said they decided to increase total joint investment on exploration and future production as they saw increased potential for Peru's natural gas sector. Petrobras said it expects to find 8 trillion-10 trillion cubic feet of natural gas in the Camisea fields currently under exploration and development. Construction on the first part of a pipeline from the fields **will start in June 2012 and be completed in 2014**, Odebrecht's Peru General Manager Jorge Barata said.

The final stretch of the pipeline to the southern Tacna region, 22 miles north of the Chilean border, is planned to be operational by 2020. Barata said that as part of the first phase the pipeline will be extended to the mainly agricultural town of Quillabamba where a power plant will be built. Braskem has said it plans to build a major petrochemical plant in southern Peru to cater for local needs and export customers.

The petrochemical plant, due for completion in 2016, will feed off the Camisea oil and gas fields, officials said. Peruvian officials remain circumspect about Petrobras plans to export some of the gas extracted from the fields as liquefied natural gas shipments to Chile. (April 27, 2012)

RUSSIA to EUROPE: Ongoing project – Update – CNR51/7/43

Nord Stream completed recently offshore pipelay for the **second of its twin 1,224 km gas pipelines through the Baltic Sea**. Following extensive pre-commissioning and commissioning, Line 2 is scheduled to begin transporting gas towards the **end of 2012** as part of a fully automated twin-pipeline gas transport system capable of transporting 55 Bcm/a of gas from Russia to the European Union. The twin pipelines were developed with three different design pressures and pipe wall thicknesses as the gas pressure drops between Russia to the landfall in

Germany. Pre-commissioning activities for Line 2 have already started. Following the completion of the pressure tests, these three sections will be connected by underwater hyperbaric tie-ins in May and June 2012 off the coasts of Finland and Sweden where the design pressure changes from 220 to 200 bar and from 200 to 177.5 bar respectively. After de-watering and drying, the completed pipeline will then be linked to the landfalls in Russia and Germany and put into operation towards the end of 2012 as part of Nord Stream's fully-automated twin pipeline system. (April 27, 2012)

RUSSIA to EUROPE: Planned project – Talks – CNR51/7/44

Gazprom CEO Alexey Miller recently met with President and Chief Executive Officer of **Itochu** Eizo Kobayashi to discuss possible cooperation on the **South Stream pipeline**. The meeting was set up to talk about the two companies' cooperation on an LNG project currently under development.

The companies discuss the interim results of the construction of this LNG plant as well as the future steps for the construction of a gas chemicals plant in Salavat, Russia. (April 26, 2012)

TURKEY: Planned project – Update – CNR51/7/45

The portion of the "Turkey-Bulgaria-Romania-Hungary-Austria Natural Gas Pipeline," known as **Nabucco**, belonging to **BOTAS** has **dropped from 20 percent to 16.67 percent**, according to a

recent announcement from the Cabinet in the Official Gazette. The announcement also said **BOTAS** will be able to **form a separate company** that could be active in natural gas trade, investment and management for the countries involved in the Nabucco project. (April 28, 2012)

SUPPLIES - IMPORTS - EXPORTS

AZERBAIJAN to BULGARIA: Supply contract – Talks – CNR51/7/46

The State Oil Company of Azerbaijan Republic (**SOCAR**) and **Bulgarian Energy Holding** (BEH) signed recently a Memorandum of Understanding to **cooperate on gas**. The MoU will see increased supply of Azeri gas to Bulgaria, as well as cooperation on gas projects between the two. Under this agreement with **SOCAR**, **Bulgaria could begin importing up to 1 billion cubic metres** of gas from Azerbaijan from 2014. (April 27, 2012)

INDONESIA: Supply contract – Agreement – CNR51/7/47

Petronas Carigali Sdn Bhd signed recently a GSA to supply some **50mmscfd of natural gas to PT Jatim Utama (PJU)** in Indonesia. In a statement, BP Migas, the upstream oil and gas executive agency in Indonesia, said under the agreement **KKS Contractor** will supply gas to **PJU**

from Bukit Tua field of Block Ketapang in East Java. "PJU will then distribute the gas to PT Pembangkitan Jawa Bali in Gresik," BP Migas said. At oil production peak, the Bukit Tua field is expected to reach 20,000 barrels per day, with follow-up gas at 50 mmscfd. "This field is expected to start production in mid-2014," BP Migas said. (April 23, 2012)

IRAN to TAJIKISTAN and KYRGYZSTAN: Supply contract – Talks – CNR51/7/48

Tajikistan and Kyrgyzstan expressed recently their **willingness to import natural gas from Iran**. "The talks between Iran and these two Central Asian countries are expected to begin in the nearest time," said gas official Abdulhusein Bayat. Iranian Ambassador to Tajikistan Ali Asgar Sherdust recently said that Iran is planning to export gas to Tajikistan, Kyrgyzstan and China using a new pipeline.

"According to the agreement recently achieved by top Tajik, Iranian and Afghan officials in Dushanbe, the new pipeline with link Iran to Tajikistan through Afghanistan going further to Kyrgyzstan and China," the Iranian ambassador said. Tehran Times reported that Iran currently produces 554mln cubic meters of gas per day. In 2011, Iran has increased gas export by 10.5% as compared to previous year up to 7.6bln cubic meters. (April 30, 2012)

MALAYSIA to SINGAPORE: Supply contract – CNR51/7/49

Petronas signed recently a deal to **supply an additional 43 million cubic feet a day of natural gas to a unit of Singapore** conglomerate **Keppel**

Corporation Ltd. Keppel said that the gas would be used to support the energy needs of its wholly-owned subsidiary **Keppel Energy Pte Ltd.** (April 23, 2012)

TANZANIA: Supply contract – Agreement – CNR51/7/50

The **Orca** exploration group recently agreed with the government of Tanzania **to increase deliverability from the Songo Songo field to 200 million cubic feet a day** in parallel with its investment in gas processing and pipeline infrastructure.

During 2011, the company had signed a rating agreement with Songas and the electricity utility Tanesco that enabled the gas processing capacity to be increased from 90 MMcfd to 110 MMcfd. As a consequence, the overall infrastructure capacity increased to 102 MMcfd (limited by the pipeline diameter).

The gas supplier has also signed a portfolio gas sales agreement with Tanesco for the supply of a maximum of 37 MMcfd through to about 2023. At the moment gas processing and pipeline capacity remains a restriction in Tanzania. Subsequent incremental investments in gas processing capacity and the construction of a new offshore pipeline to Songo Songo could increase gas deliverability.

The target for project completion is currently the end of 2013. Since June 2011, 217 MW of new gas fired generation has been commissioned in Tanzania. The new gas fired generation capacity comes from the recommissioning of the Symbion 112 MW plant and the recent start up of a 105 MW Jacobsen plant. At maximum capacity the power sector can utilise 90 MMcfd of additional gas.

Orca reports that it has an excellent gas reservoir in the Songo Songo field that continues to perform above expectations. As at 31st December 2011, the independent reserve evaluator McDaniel and Associates assessed the additional gas gross proven (1P) and proven and probable (2P) Songo Songo reserves available to Orca to the end of the licence period as 469 billion cubic feet and 548 Bcf respectively. This is compared with 369 Bcf and 451 Bcf respectively in 2010. These significant increases were recorded

UNITED STATES: Supply contract – CNR51/7/51

Buccaneer Energy Limited reported that **ENSTAR** recently commenced **injecting gas into the Cook Inlet Natural Gas Storage, Alaska (CINGSA)** facility located immediately south of the Company's Kenai Loop project. The Company is currently producing 5.1 million cubic feet per day from the Kenai Loop # 1 well on a 5/64" choke and is seeking to increase that production rate for delivery to ENSTAR in the short term. ENSTAR is currently injecting 100% of the gas it receives from the Kenai Loop # 1 well into CINGSA storage

facility. Buccaneer's gas sales contract with ENSTAR entails the Company delivering **a minimum of 5.0 MMCFD and a maximum of 15.0 MMCFD to ENSTAR, at an annual weighted average price of US\$6.24 / MCF.** Buccaneer has also extended its Gas Sales Agreement with ConocoPhillips to supply its LNG Facility in the event that ENSTAR experiences any mechanical issues during the CINGSA start-up period, meaning 100% of all gas produced from the Kenai Loop Project can be sold. (April 26, 2012)

STORAGE

GERMANY: Unbundling – CNR51/7/52

RWE Dea transferred recently its natural gas storage operations to the company **RWE Dea Speicher** at Inzenham-West near Rosenheim, Germany. RWE Dea with this step fulfils the requirements of the Energy Sector Act in relation to the **unbundling of the operation of storage facilities.** These operations are related from the company's other activities, which include pooling the construction, operation and marketing of storage capacities in the new company. (April 27, 2012)

IRAN: Planned project – CNR51/7/53

Massoud Samivand, managing director of **Natural Gas Storage Company (NGSC)** said recently that Iran is planning to **build underground storage facilities** to store natural gas produced from South Pars field. The country will make operational two natural gas storage facilities in 2012. Iran's natural gas storage capacity should hit **14 billion cubic meters by the end of the 2015**, he added. Iran should be able to withdraw a

daily total of 130 million cubic meters of natural gas from underground storage facilities. Construction of three underground gas storage facilities is simultaneously going on in Sarajeh region of Qom province, Yortsha region near the city of Varamin, and Shourijeh region in Khorasan Province. Samivand noted that the three new stores will be able to contain eight billion cubic meters of natural gas per year. (April 27, 2012)

UKRAINE: Storage capacity – CNR51/7/54

According to Roman Shymko, the head of external relations department at **DP Ukrtransgaz Ukraine** will **reduce the amount of natural gas in its underground storage in 2012**. Ukraine may pump between 17 billion cubic meters and 18 billion cubic meters of natural gas in its underground storage in 2012, compared with usual range of 22 billion and 25 billion cubic meters. Ukraine is only planning to pump gas sufficient for its heating season in winter in 2012, Shymko said. (April 27, 2012)

UNITED KINGDOM: Planned project – Approval – CNR51/7/55

E.ON UK is looking to gain formal **planning permission** for the facility, which will have 10 underground storage caverns, at **Whitehill Farm**, near Witherwick. A Commons select committee in 2011 said the amount of gas storage nationally needed to be doubled to avoid price hikes and energy interruptions – and in the longer term ensure a supply to the gas plants needed to provide “back-up” to the vast arrays of offshore and onshore wind turbines generating intermittent energy. The committee will be told of various changes to plans, following an internal engineering review. Instead of a single wellhead

compound, there will now be three and provision for drilling up to 12 wells to make sure E.ON gets 10 operational wells in the end. Each cavern will be up to 100m in diameter and store up to 750m cubic metres of gas. In October 2011, Commons select committee said the Department of Energy and Climate Change should be concerned about the lack of gas storage used to manage seasonal demand fluctuations. It should aim to double the UK’s current gas storage levels by 2020 in order to avoid exposure to gas supply interruptions and price spikes and in the longer term to ensure a resilient gas supply to flexible as plants acting as a ‘back-up’ to intermittent electricity generated by wind”. (April 24, 2012)

UNITED STATES: Ongoing project – Start up – CNR51/7/56

East Cheyenne Gas Storage, LLC recently completed and successfully **commissioned facilities** to allow for withdrawal of natural gas from its FERC-certificated storage reservoir in Logan County, in north-eastern Colorado. The ECGS project received its amended FERC authorization on April 12, 2011 to develop the West Peetz and Lewis Creek reservoirs for natural gas storage under the Commission's market-based rate structure. ECGS began building the initial injection facilities in the summer of 2011 and commenced injections in November 2011.

Withdrawal facility construction, which began shortly afterwards, was completed prior to April 1, 2012. Withdrawal tests have been completed and the facility now offers a full range of storage services as provided in its FERC-approved tariff. **ECGS will continue to develop the reservoir capabilities to the facility's certificated 18.9 BCF of working gas capacity**. ECGS is currently connected to the Trailblazer pipeline and will eventually connect to Rockies Express, on the same right of way, as provided in its FERC authorization.

Trailblazer can provide firm access to the Cheyenne Hub for injection and withdrawal on a year-round basis. Current capacity at ECGS is greater than 50,000 Dth per day for injection and withdrawal, with 3 BCF of working gas capacity available for firm service and expanding up to 11.5 BCF of working capacity in the first phase of facility development at West Peetz. (April 11, 2012)

USE FOR POWER GENERATION

INDIA: Planned project – CNR51/7/57

The government in **Tamil Nadu**, India revealed recently plans to **build two 500-MW LNG-based power plants**. One of the plants will be located near the Indian Oil Corporation terminal and the other would utilise GAIL's Kochi-Bangalore LNG

pipeline in the state. The state expects that LNG projects will also serve as alternative sources as India was not providing enough coal for thermal power plants. The state government will now proceed with land acquisitions near the terminal. (April 9, 2012)



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