



INSIDE EUROPEAN ENERGY

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- Oleg Vukmanovic **Thierry Bros, senior gas analyst at French bank Societe Generale, is joining us in the forum today to talk about “The Impact of Shale Gas on Energy Markets” in Europe and globally. Thierry is also the author of “After the US Shale Gas Revolution.”**
- Oleg Vukmanovic So, to kick things off - Thierry, the U.S. shale boom has already impacted European energy markets with greater supplies of coal. What do you see as the medium to long-term impact of continued shale gas production?
- Thierry BROS Hello, the US will start to become a major LNG exporter (on top of the old Kenai plant in Alaska).
- Thierry BROS I believe in 2020e we could see as much as 50mtpa of exports from North America.
- Thierry BROS Those exports will be targeting Asia. The top 3 LNG exporters in 2020e could be: 1/Qatar; 2/Australia and 3/North America (US + Canada).
- Oleg Vukmanovic Do you see any of that US LNG coming to Europe?
- Thierry BROS No Europe is facing very poor demand growth and Russia has invested the capex needed for extra production.
- Thierry BROS The consequences of shale production in the US are: 1/ US coal is displacing today Russian gas today in Europe and 2/ in 2020e US LNG could displace Russian pipe gas in China.
- Oleg Vukmanovic Ah, interesting. So can we expect the impact of shale in America on Europe to be limited only to greater coal supplies and cutting Russia's market share?
- Thierry BROS It is also interesting to note the increased in LNG capex (QCLNG +36% in May, Gladstone LNG +16%, Santos +16%). So yes in the short term US shale gas means greater coal supply in Europe but it also means no more FID of expensive LNG projects in Australia when it could be possible to build cheaper liquefaction plants in North America.
- Oleg Vukmanovic **This question from one forum member:** Thierry, what are your assumptions on US shale gas production costs development?

Thierry BROS This means the US shale will put pressure on European gas prices. Russia has so far cut production / exports but it will have to adapt to a new environment.

Thierry BROS Cost of producing shale gas is around 4\$/MBtu and could go further down due to technology improvements.

Henning Gloystein Hi Thierry. Do you think the U.S. will export gas to the Baltics from 2015 and, if so, at what price?

Thierry BROS Hi, I think that most projects will have long term buyers that are in Asia (China, Japan, South Korea and Taiwan). The price structure could be on a HH basis. So we could see this gas arriving in Asia at HH+7\$/MBtu. It doesn't mean it's going to be cheaper than oil-indexed price, but it means buyers will have a portfolio with different prices to hedge.

Thierry BROS North American exports will start in 2016e and will grow fast in 2017-2020e.

Oleg Vukmanovic In your view, to what extent will this help erode oil-indexation in Asian LNG contracts?

Henning Gloystein Thanks. Got another one that may be a bit besides what you look at. But anyways, here you go: Recent exploration success in the North Sea has rekindled interest in the region, and challenges the common perception that the North Sea is a mature basin, according to some analysts. Do you feel that the North Sea could remain a major producer of oil and gas much longer than what was forecast a few years ago? Will the supply from new blocks and better extraction from depleted wells will be big enough to impact prices? Or is the capability to exploit new fields (and prolong mature ones) on a large scale overhyped? To what extent will developments in global LNG and shale gas production impact the viability of new E&P in the North Sea? What minimum prices are needed to make new projects viable?

Henning Gloystein Sorry. Big question

Oleg Vukmanovic Phew!

Thierry BROS If you assume most of this North American LNG flows into Asia, then you end up with 16% spot indexation in Asia in 2020e.

Thierry BROS Shale gas in Europe could happen (perhaps not in a big way and mostly after 2020e). UK could be the place to look at. If shale gas is allowed (onshore and offshore) in UK we could see the conventional decline being reversed. But this needs: 1/Gvt approval and 2/capex. And as the ratio Proved Reserves / Production in the UK is now less than 5 years I think that the decline will continue for at least another 7 years...

Thierry BROS Perhaps in 2020e (if we start new) could the UK produce some shale gas. For cost, I don't think analysts can have an estimate now as we

need to find the "sweet spots" first and see what could be the fiscal regime.

Oleg Vukmanovic **Here's a question from a forum member:** I have heard that US Industry are/will lobby against the granting of export licences allowing the export of LNG from the US, as they see this leading to higher US Nat gas prices. What do you think about this?

Thierry BROS For UK, in fact decline of production has accelerated in recent years, so I don't see this as a major play this side of 2020e. And Norway doesn't have a need to increase exports to Europe in a big way.

Carlos Torres Hello Thierry, what is your opinion regarding the granting of further export licenses for American LNG terminals. Could this limit the volumes exported from the US to Asia? Until now, only one terminal has received an exporting license and it is not clear if any others will.

Thierry BROS Industry always lobby but the question is more about the cost structure of shale production in the US. I believe there is a lot of gas available at 4\$/MBtu then this means US could produce the gas needed for internal and international markets. And if the US doesn't give any more exports licences (which I don't believe) then Canada will have to find a way to export its gas directly.

Thierry BROS I believe the limitation in North American exports is project finance not licences. You have to find at least \$6bn to transform an LNG regas into a liquefaction plant...

Thierry BROS You need an export licence from the US DoE but also an approval from the FERC (regulator) and Lake Charles (BG) is already in the process of filing for FERC.

Reiny Fercho I'm curious if the Cda/US Free Trade Agreement allows Cda to access US gas exports and then through displacement flow volumes to Cdn LNG export facilities and offshore markets? Comments?

Thierry BROS LNG exports create job, brings royalties and can balance trade deficit with Asia. Industry can lobby against but at a time of crisis and deficit I believe the US State will look at what is in the general interest.

Oleg Vukmanovic That's interesting: so project finance limits will whittle down viable projects to a number compatible with government's ideas?

Thierry BROS FTA allows this: Canada could do it, South Korea could re-export LNG cargoes and Singapore later (when operational). But remember that Canadian production has been cut by 30bcm in the last years as the US don't need Canadian gas anymore. So monetising national gas could become a priority in Canada.

Thierry BROS Yes Oleg, I think that project finance will limit projects.

Oleg Vukmanovic Thanks. Just picking up on Canadian issue, it seems some plants

there hope to export oil-indexed LNG. Do those Canadian projects stand a chance given spot indexed exports from U.S.?

Thierry BROS No, Cheniere has been a game changer in pricing LNG out of HH. Buyers (even in Asia) don't want oil-indexation anymore and Canadian projects will have to adapt. Either they stick to oil-indexation and no buyer will take the risk of signing a new contract or they offer some inovative pricing and win buyers approval.

Oleg Vukmanovic **Question from one of our reporters:** to what extent will currency fluctuations impact the viability of export projects in U.S., PNG, Australia and elsewhere? Which projects in which countreis are particularly exposed?

Thierry BROS All projects that have been FIDed will go ahead irrespective of the capex increases and delays. But already the Wheatstone, Prelude FLNG and Ichthys look expensive with more than \$3bn/mtpa capacity. My estimates is that Australian projects will continue to see capex increases and could start to report delays.

Thierry BROS A brownfield project in the US could be done at less than \$1bn/mtpa.

Oleg Vukmanovic And that about wraps things up for today

Thierry BROS Thanks

Oleg Vukmanovic Thanks for joining us Thierry, some really interesting issues covered there