Kennedy, Jerome

From: Kennedy, Jerome
Sent: Monday, September 03, 2012 11:19 AM
To: Kennedy, Jerome
Subject: Fw: Summary of Wood Mac meeting in London - Aug. 31/12

------Original Message------
To: Kathy Dunderdale
To: Brian Taylor
To: Robert Thompson
To: Ed Williams
To: Charles Bown
To: Lynn Hammond
Subject: Summary of Wood Mac meeting in London - Aug. 31/12
Sent: Sep 1, 2012 8:27 PM

Premier,

Copies of Ziff's natural gas reports on LNG/importation and Grand Banks pipeline options had been provided in advance of the meeting. We had a 2 hour meeting in London with the same analysts we met with in late June and the Ziff Reports were reviewed in detail. There has been ongoing involvement of, and apparent reliance on, the Wood Mac officials whom we had previously met with in New York.

At this point the only comparison we have of the cost of natural gas to Muskrat Falls is Wade Locke's statement during his Harris Center presentation in February 2012 that natural gas would have to be delivered to Holyrood at less than $5.75/mbtu to be cheaper than Muskrat Falls. To date no further work has been done to determine the accuracy of this number.

Ziff did not see the pipeline option as feasible in that we could not order the oil companies to develop natural gas. Wood Mac agreed.

Even if we could get around the first issue Husky has stated that gas would have to be in the [redacted] Henry Hub range to make the development of White Rose gas economically feasible. Natural gas is currently at $2.80 Henry Hub and is not projected by Wood Mac, PIRA or Ziff to rise above [redacted] in the next decade.

Ziff concluded that the Grand Bank Pipeline option would cost between $22-33/mbtu. Wood Mac agreed and stated that because the cost is in the $20-30 range then the building of a pipeline is not commercially feasible.

On the importation of LNG and conversion of Holyrood to a natural gas burning facility Ziff concluded that the cost would be in the range of $19.80/mbtu Henry Hub.

Wood Mac expressed a concern here about Ziff's capital cost estimate of the regasification facility which Ziff estimated to cost between $1.0-2.0 billion. Wood Mac thought this type of facility could be built for $500-700 million. If. Wood Mac is correct, the cost of LNG would be in the $12.00-14.00 range as opposed to $19.80.

Ziff needs to be consulted further to determine how they arrived at the $1.0-2.0 billion dollar figure.

Wood Mac emphasized that in order to do a proper comparison with Muskrat Falls (KEY ISSUE - at what point does natural gas become more economically feasible than Muskrat Falls?) an accurate point of comparison is needed, whether it is Dr. Locke's $5.75 or another number. It is crucial, therefore, that a number be developed, whether by Wade Locke, Nalcor or Wood Mac.

In conclusion, it would be helpful if, at some point, Wood Mac would issue a letter saying that they have reviewed Ziff's reports and are in agreement with Ziff's

conclusions.

Overall, the meeting was very helpful. In my opinion, it is better to identify potential issues now than to give the critics ammunition later on. While we still have work to do I am confident that, based on what we know today, we are in a good position and that Muskrat Falls is a lower cost option than the natural gas options.

Jerome

Sent Via BlackBerry

(1)

JRK's Summary

August 31/12 - Meeting w/ Wood MacKenzie in London re: Ziff reports

(1) Natural gas versus development of Muskrat Falls - cost of $7.0B
/ Conversion of Holyrood to gas-burning facility

LNG importation
/ are facts outlined by Ziff accurate?
/ any concerns about Ziff report?
/ description of overall amount of gas needed - long-term contract versus spot prices
/ what were critics argue?
/ Henry Hub price versus purchase at Holyrood

Pipeline from Grand Banks
- accuracy of cost estimates
- feasibility of building pipeline
/ any new technology
/ Production licences - can govt force oil companies?
/ Availability of European markets for excess gas

- is either option feasible?
/

Ziff
/ overall expertise
/ accuracy of numbers
/ statements of principles
/ will report stand up to scrutiny?

intense debate w/ very vocal critics

(2)

Wood Mackenzie

① domestic option (pipeline) - not sustainable
- economics just don't make sense
- traffic number may be low → not excessively
- cannot compete w/ US → $10.00 market
- would cost $20/mmbtu to develop (very low price)

- cost of producing gas too high for either domestic market or export market
- market not accepting prices.

broadly agree w/ report

② import option - general report is correct
- Henry Hub will not be $2.50 forever
- price will not exceed $5.50-6.00 in longer term

- tolling costs - reasonable assumption

- NBP (National Balancing Point) - European gas price
→ $10.00-$11.00 in longer term

- regasification - $10.00 per mcf ~~mmbtu~~
→ doubling the cost
→ $11.00 - 22.00

* $1.0 - 2.0B way too high - should be low $500 - 700 M

generally fine w/ Henry Hub ($4) price + premium (.75) + transportation (+$2.50-3.00)
$8.85, could be ~~$9~~ 9-10.0

3

- building regasification terminal - cost
  - storage facility - where you would store LNG
  - size depends on level of peak demand
  - Ziff's conclusion re: cost of the tank is way too high
- capex is way too high -
-

tank, berth, regasification facility
- 300 mmcf/d - capex is ½ the cost

Wm's cost - $3.00 - 5.00 versus 11.00 - 22.00 **

* still of $11 - 13 MMBtu *

is project economical of $12-13 MMBtu

Conclusion #1
- long term firm supply - Wm doesn't necessarily agree (depends on the size of the tank)
- → if you are willing to pay European prices you can get long term contract before regasification
  - → $8.85 - still in $12-13 price range

$19.80 vs $12. - $13.00

(4)

Conclusions of WM.

(1) $ 8.85 perhaps too low / $10.00 - 10.50 more appropriate

(2) regas. facil. costs too high / 3.00 - 5.00 - 4.00
11.00 is too high

$ 14.00

Difference b/w WM and Ziff

19.00 (Ziff)
vs.
14.00 (Wood Mac)

→* Need to revisit Wood Mackie's $5.75

p. 3-4 - OK
p. 5 - Trein LNG not under construction → needs to be updated from recent changes
p. 6 - OK
* p. 7 - LNG regas. facility cost * - REAL ISSUE **
→ $26 seems to be trying to pump up N.L. costs.
p. 8 - OK in general
p. 9 - OK

(5)

pp. 10-11 – $2.50 liquefaction fee should be higher (should be $3.00 – $3.50)
– would agree they have to be European price

pp. 12-13 – gas to oil → price risk should stay into hydro being better

(1) * at what number does natural gas become more economically feasible than Muskrat Falls?

(3) * → is it Wade Locke's $5.75 or higher # 2

(2) * Diff regasification

(6)

Pipeline Report —

p. 5 - OK

pp. 6 - 7 - ok

pp. 8 - ok

p. 9 - portfolio decision making - rate of return

pp. 10 - regulatory process
12

pp. 14 - 17 - OK

pp. 18 - 21 - OK. - number on p. 19 seem fine

p. 22 - estimated costs -
some seem a bit on the low side —

p. 24 - pipeline costs -
- $ 187,000 (incl - mile cost too low
(average estimate from North America)
- Russian pipeline of 1,000 km - $ 400,000 - 500,000 / incl - mile

p. 24 - Figure 4 -

p. 26 - Conclusions $ 33 / Mcf

if in 20's or 30's then not economically feasible.

(1)

June 29/12 — Meeting w/ Wood MacKenzie in London – David Bermingham, Alan Gelder, Maximo [illegible], Premier, Charles, Brian, Jen, Tracy, [illegible]

Alan Gelder – oil price outlook – fundamentals
- assessment of oil demand, oil supply, spare capacity
- relatively weak demand outlook
- OPEC spare capacity will remain high
- * looking for Brent to soften to $90 in 2015 ↗
- fear of collapse in Europe
- long-term forecasts in 1 year horizon is very unclear

3 mths ago predicting $103 / yr
$93 in 2014
$92 in 2015

- 0.2% GDP growth in Europe
- China → 8.3% growth
- global GDP growth of 2.5%

- global oil demand growing – Slide 5
- 9.0 M bbls/day in 2012/13/14

- total oil demand – 90 mbbls/day
- China – 10.0 m bbls
- US – 18.7 m/day

2015 – 11.8 mbbls/day
2020 – 14.4 mbbls/day
2030 – China almost equal US.

- income growth in the developing world

- January/Feb – $100 bbl – Iranian reaction
- market responding to fear of loss of future supply

(2)

- Saudi provided comfort that they could replace Iranian oil
- Iranian export - 2.5 mbbls/day
- market stabilized at $120 bbl
- fear of weak economic growth in Spain, Greece, China

Jim / Brian - what fundamentals have changed?

OPEC spare capacity in 2010 - 5m bbls/day
2011 (Libya) - 3m bbls/day

* THINGS ARE ALWAYS DRIVEN BY EVENTS

↓

* price can go up 25% before the end of 2012 - back to $120.00

- * can't see oil going below $70/bbl

- * Oil sands - needs $85/bbl to work (Bitumen)

long-term views can still hold

- Short-term forecast - Slide 20

- 2015-16 - $90/bbl → $100 nominal
2020 - $98/bbl → $118 nominal

2030 - $120 real → 175 nominal

(3)

- significant growth in tight oil (shale oil) in US - Eagle Ford / Bakken
- watching Utica near Ohio.

one of key sources of non-OPEC growth

- * 4.1 bbl/day shale oil in 2022 -

principles which affect price of oil

- need for supply to satisfy demand
- growing demand b/c global economy growing
- over next 5-10 years beyond significant growth in supply
- downward pressure on markets

NATURAL GAS

- Europe a very different market than North America
- long-term import contracts → normally was tied to oil prices
- more competition in Europe
- oversupply of gas → surplus LNG
- UK LNG imports -
- disconnect b/w spot prices and oil index prices
- Russia about 25% of market in Europe
- carbon price ↑ 7 euro/ton, in EU → very low carbon price → need 35 euros to switch b/w carbon and coal.

① is there sufficient supply in Europe?

② any import need from North America

③ price

④ long-term contracts vs spot prices

(4)

- cap and trade system

- electricity prices - 80 euros / mgw - 100 mgw/h
- not enough considering changeover from coal to gas

↑ euros carbon price - adds 5 mgw

UK - 50% gas
- 20% coal
- 15-20% nuclear
-

France - exports electricity
nuclear - 50,000 mgw

hydro almost depleted

Germany - lot of coal

Hydro - 8% of overall production in Europe
(Italy, Spain, Norway)

European market - 60 bcf/day market
- indigenous - 1 bcf
- Norway - 1 bcf/day
- Algeria - .7 bcf/day
- Russia - 1.5 bcf/day

(5)

Input price in European market - $9.00 - 10. /mbtu
Oil-indexed price - 12.00 mbtu

Charter - Henry Hub + 15%. premium
- tolling fee (lower in Charter) - $3.0 mbtu
- transportation - $1-1.50

gas price ↑ $10.0 mbtu

- American gas not being brought into Europe at present - 2015
* Charter already 10%. booked

- Australia, US, East Africa - supply being developed
- Charter will develop Shale gas → not in next 5 years.
Oversupply in Asia

- My optimistic about gas demand in Europe.

* With view that post 2020 there will be a lot of supply into the market
- take the view that at a valuable market is Charter

- Qatar the biggest gas supplier in the world
= before this LNG - 20 year contracts at 10%. ↑ Brent

(6)

- Timing is important – really trying to understand the Asian market
- if you are into the market and you are making a lot of money
- Theirs will break even in 3½ years

↓

- (1) Timing extremely important → opportunity if you are in the market now ||| **

→ projects already in the queue
→ market post-2020 is different, unless China doesn't develop
→ Asian market will not be able to absorb all of supply *

- (2) Economics point of LF / competition will increase //