

What's the net present value of peace?

Cyprus' natural gas export options

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Will test NPV (viability) of

- LNG sold to Asia
- LNG sold to Europe
- Pipeline to Greece
- Pipeline to Turkey
- Compressed Natural Gas (CNG) exports

Please note

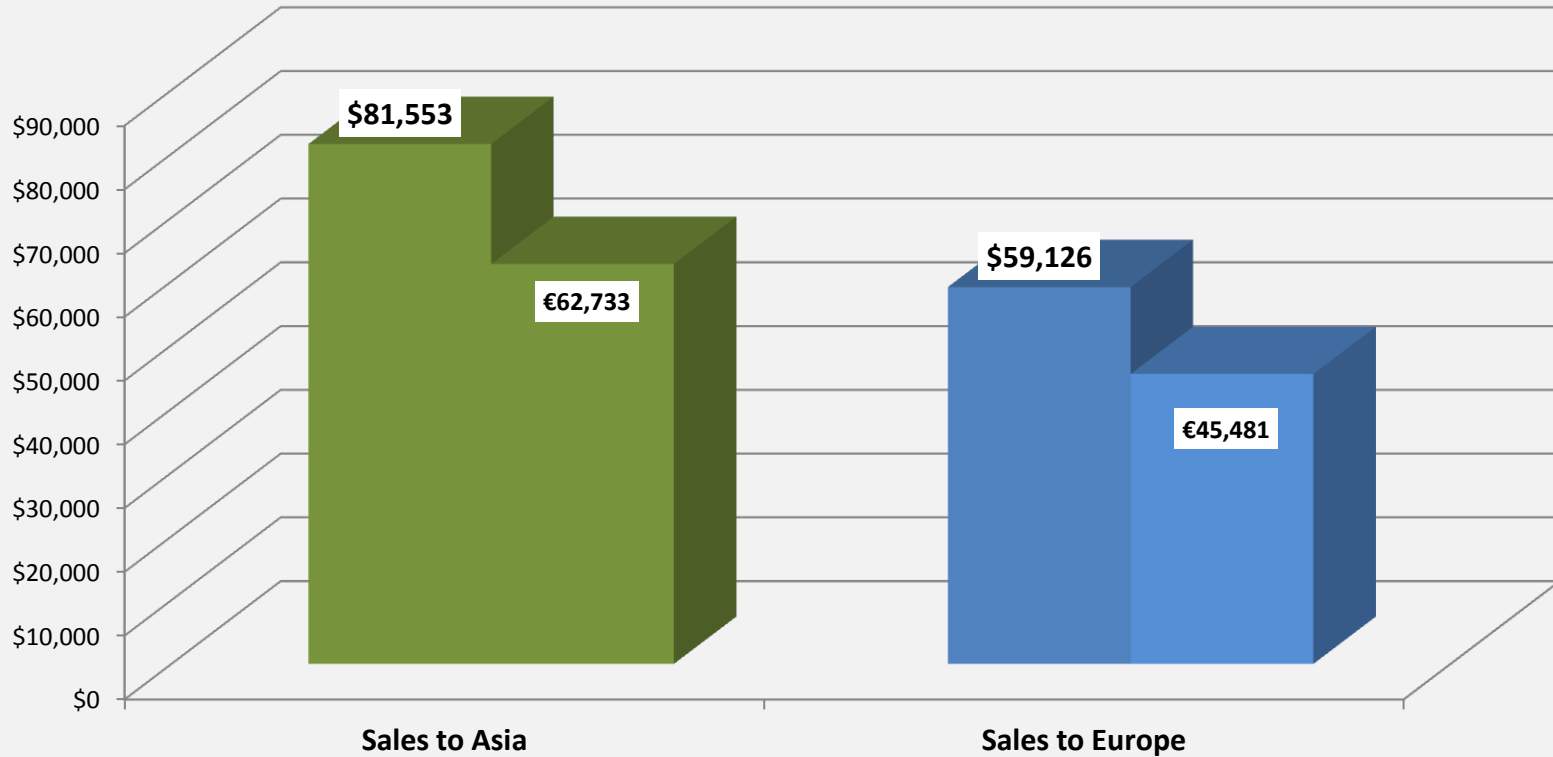
- **No interest in any particular export option**
- **Aim is to present options on informed basis**
- **Neither Sapienta, Strata nor Fiona lobbies for companies or governments**
- **Calculations are ongoing work in progress**
- **Numbers improved & cross-checked since PRIO Feb 2013 report**

First reactions to MIT report

- Excellent & worth reading, but:
- Assumes only 4 years LNG build (prime variable)
 - It took us 4 years to build a desalination plant!
- Assumes only 1.5% inflation (major variable)
- GR pipeline \$5.5bn v. Nord Stream \$9.6bn+
- No break-even for gas volume (based 7 tcf)
- Assumes costs in Y0, CF Y1 (mine spread out)

Value of 5 tcf in ground (no expenses)

Value of natural gas in the ground
(no expenses, \$ million)



Then deduct:

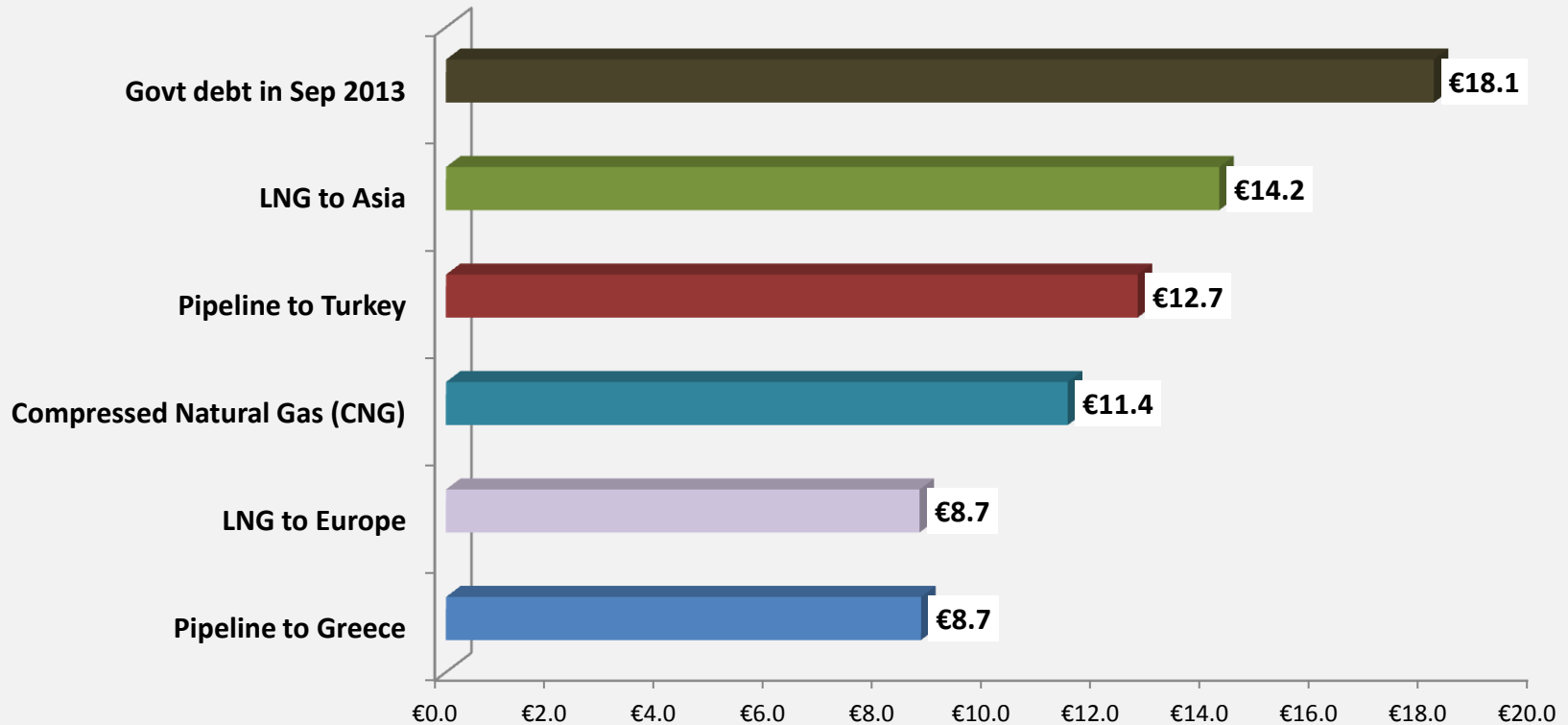
- **Exploration costs**
- **Production costs**
- **Profit to E&P companies**
- **Capital costs (LNG/Pipeline/CNG)**
- **Operating costs (LNG/Pipeline/CNG)**
- **Transport costs (LNG/Pipeline/CNG)**
- **Regasification costs (LNG)**

Value to govt of different options

Govt 5 tcf revenue potential (IF exploitable)



**Potential govt revenue from 5 tcf
(but only if exploitable, EUR bn)**



Govt revenue potential (**IF** exploitable)

- LNG to Asia €14.2bn
- Pipeline to Turkey €12.7bn
- Compressed Natural Gas (CNG) €11.4bn
- LNG to Europe €8.7bn
- Pipeline to Greece €8.7bn
- (Govt debt is €18.1bn)

Critical Q: is it financable today?



- Investors will need to know:
- Is net present value positive?
- How high is the internal rate of return?
- How does it compare with other projects?
- Realistic construction schedule?
- (MIT says four years to build LNG: hmm....)

Is net present value (NPV) positive?

- \$1 today worth less than \$1 in 10 years
- Like compounding, but backwards
- +ve NPV = adds value, -ve NPV detracts
- No investment if negative NPV
- Industry cost of capital is high and
- No investment if low Internal Rate of Return

Drum-roll for the results...

Even Asia LNG fails with only 5 tcf

 STRATA INSIGHT <i>the deeper view</i>	 SAPIENTA ECONOMICS	NPV value	NPV test	IRR	Payback in years	Viability threshold tcf
CNG		€7,290	PASS	66%*	3	1.5
Pipeline to Turkey		€1,351	PASS	17%	18	5
LNG to Asia (today's prices)		-€547	FAIL	n/a	n/a	6
LNG to Europe		-€1,445	FAIL	n/a	n/a	9
Pipeline to Greece		-€4,429	FAIL	n/a	n/a	10
<i>*High initial sunk tech development cost</i>						
Source: Sapienta Economics.						

Threshold for finance at today's price

- Pipeline to Greece: 10 tcf
- LNG to Europe: 9 tcf
- LNG to Asia: 6 tcf at today's price
 - 7 tcf if prices drop by 10%
 - 8 tcf if prices drop by 20% (investor preference?)
- Pipeline to Turkey: 5 tcf (financeable today)
- CNG: 1.5 tcf (financeable today)

But money not only consideration

LNG pros and cons

- Asia market is fastest growing ✓
- Asia market highest l/t revenue to govt ✓
- May not have to depend on one market ✓
- Complements regional energy hub position ✓
- Have to wait 3-4 years for LNG finance ✗
- Then add ≤ 10 years to build LNG plant ✗
- =A long time before the revenue flows

Greece pipeline pros and cons

- Link to Europe pipeline networks ✓
- No need to wait for Cyprob ✓
- High cost (MIT underestimated?) ✗
- High 10 tcf threshold for breakeven ✗
- =Another “*grand projet*” like dead Nabucco?

Turkey pipeline pros and cons

- **Faster government revenue than LNG ✓**
- **Higher revenue than Europe LNG ✓**
- **Link to Europe pipeline networks ✓**
- **Can finance today ✓**
- **Have to wait to solve Cyprob ✗**
- **Depend on buyer who has not been trusted ✗**
- **=Probably only possible with Israel**

CNG pros and cons

- Fastest government revenue ✓
- Can supply Turkey but not sole market ✓
- Link to Europe pipeline networks ✓
- Can finance today ✓
- Don't have to wait for Cyprob ✓
- Partly new technology (ships but not CNG) ✗
- Each ship tailored to specific unloading bay ✗
- Could CNG be the middle way?

	LNG	TR Pipeline	GR pipeline	CNG
Positive NPV today?	X	✓	X	✓
Revenue w/n 10 yrs?	X	✓	?	✓
Market diversification?	(70%)✓	X	X	(70%)✓
Asian growth market?	✓	X	X	X
CRUDE SCORE	1.7	2.0	0.5	2.7

Summary

- **LNG: long buck**
- **TR pipeline: quick buck**
- **GR pipeline: no buck?**
- **CNG: newbuck**

Actual outcome will depend on

1. Volumes of gas found in 2014-15 drills
2. How desperate government is for money :
 - *Need to return to market in 2016*
3. Geopolitics
 - *Progress of Cyprus negotiations*
 - *Addressing fear of Turkey over-dependence*
4. Israel's moves (eg for CNG/pipeline)

Thank you for listening

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