

The Club of Major LNG producing countries: transformation trends

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The world of LNG has dramatically changed since the first train and the first contract in the 60's. This paper aims at reviewing its development trend and the main drivers for its major future role.

The pioneers

To valorise stranded and locally non used gas

The first considerations of commercial LNG development date back the 1960 when some stranded gas could be considered to be liquefied and exported to a developing gas market. The first commercial LNG plant started in 1964 (Arzew).

15 years later, in early 80's (period when Algeria, Indonesia, Malaysia, to name a few, have already started operations), the business model was indeed based on long term agreements with dedicated buyers ensuring the feasibility of the project, hefty local reserves compared to limited local consumption, and being a way to enhance further export revenues based on gas sales.

Then the same rationale prevails up to the 90's for development of sizeable plants (+/- 30 mtpa capacity) or less (6-8 mtpa), but all linked to a certain market or dedicated to certain customers (point to point/firm outlet).

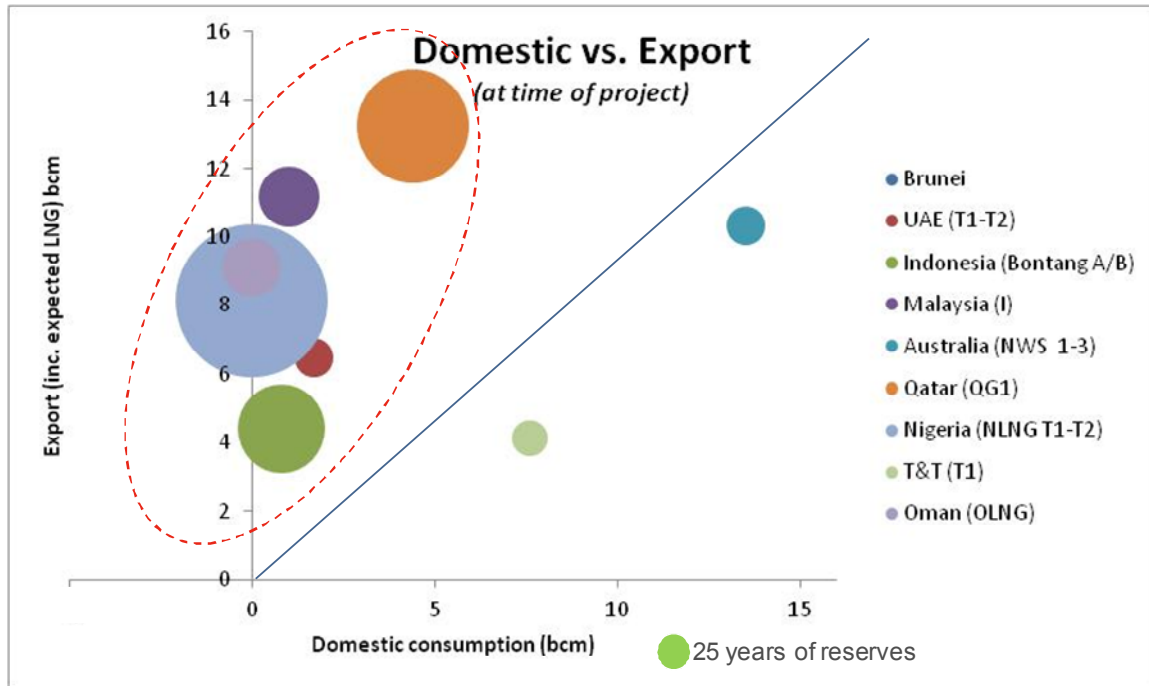
LNG PROJECT MILESTONES

Project	Country	Project Sanction/ Construction	Start-Up	Capacity (MTPA)
Kenai	Alaska	1967	Oct 1969	1,5
Lumut	Brunei	1970	Dec 1972	7,2
Adgas	Abu Dhabi	1973	April 1977	2,8
Bontang	Indonesia	1974	Aug 1977	3,2
Arun	Indonesia	1974	Oct 1983	4,5
Bintulu	Malaysia	1980	Jan 1983	8,1
NWS	Australia	1985	June 1989	7,5
Qatargas	Qatar	1993	Jan 1997	9,6
NLNG	Nigeria	1995	Q1 1999	5,9
Rasgas	Qatar	1995	Q3 1999	6,6
Atlantic LNG	Trinidad	1996	Q3 1999	3
Oman LNG	Oman	1996	Q1 2000	6,6

(Total, from various sources, 2002)

For instance, the following graph shows that for most of countries that started LNG export plans during that period,

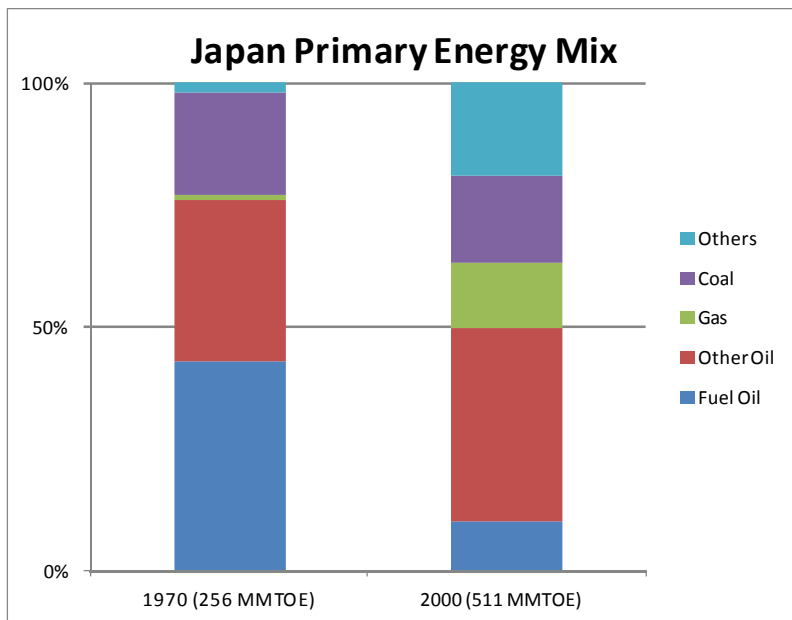
- 1) The domestic consumption was far less than the planned export LNG (to the exception of T&T and Australia),
- 2) the reserves in place were equivalent to 25, 70 or couple of hundred years (in the case of Qatar and Nigeria) to the domestic consumption + LNG export project.



(Data from BP statistic review, 2011)

Contribution to reduce the dependency to oil

The emergence of gas/LNG as a potential source of primary energy for countries was also due to the willingness to lessen the dependency to oil (as primary fuel for power), after the oil shock, as can be seen in the example of Japan below.

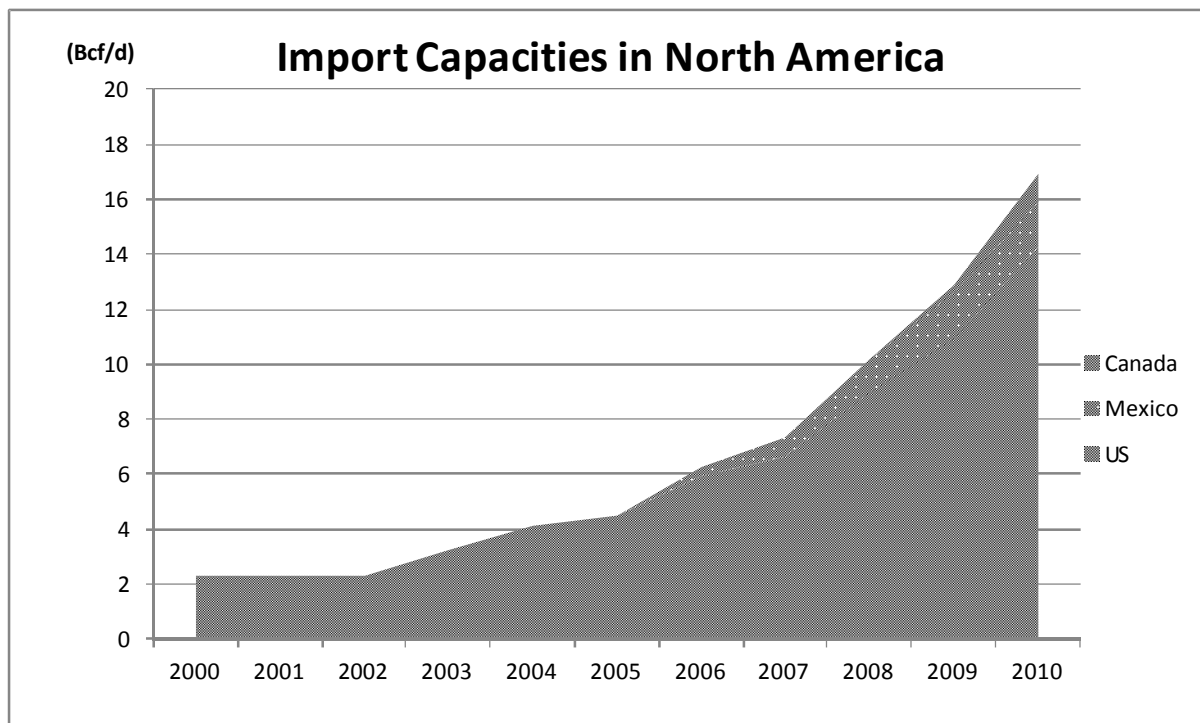


(Total)

Emergence of giants

Expectation of a favourable market demand structure

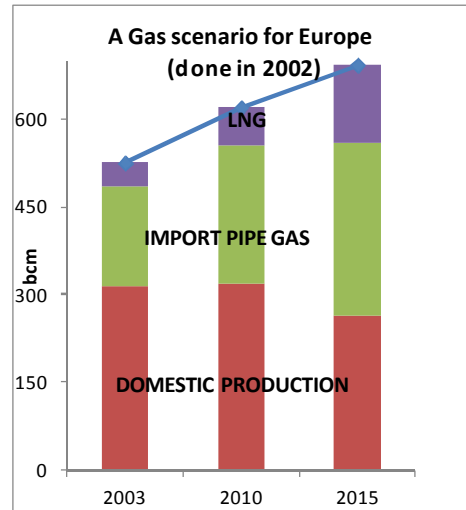
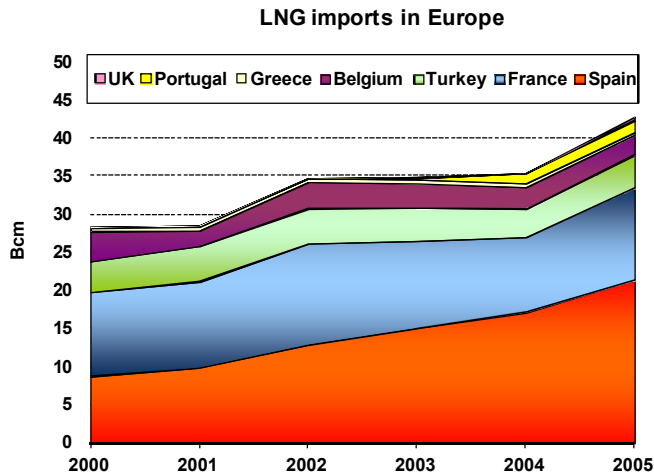
End 90's sees the high expectation of US as a major future market for LNG. With a production of 550 Bcm and proved reserves of 4.5 Tcm¹, the market seems poised for imports of LNG. Numerous regasification terminals have been built in this respect.



(FERC, Total)

It is also at that time that the deregulation takes place in the UK (monopoly broken in 1986 but wide use of Hub system-NBP only in 95-96) as a front runner of what may happen in Continental Europe (at least partially), along with a long term view that EU would need to import more gas in order to replace its declining domestic gas production.

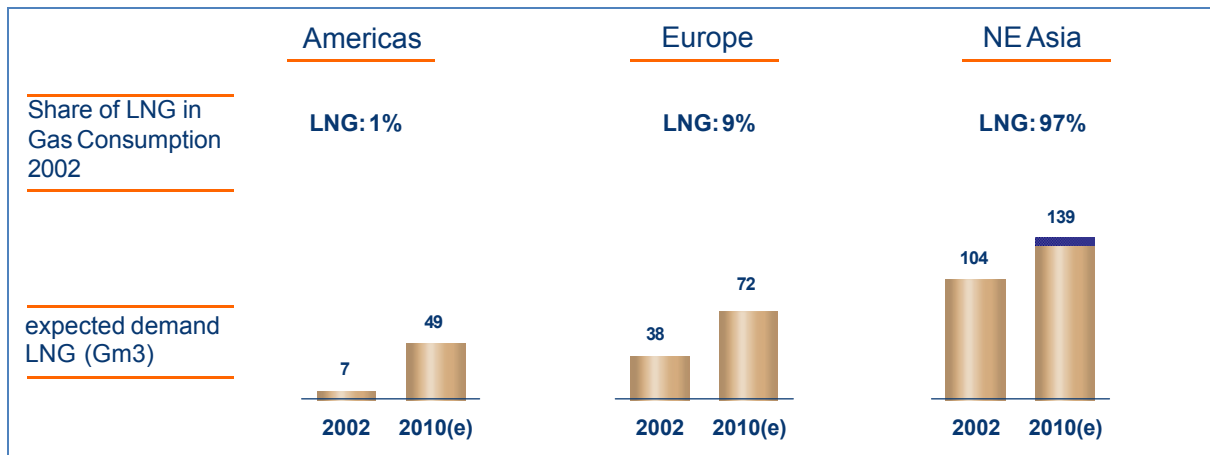
¹ BP Energy Statistical Review (figs 1999)



(Total)

Asia sees the emergence of China (still a very small gas consumer) but the fact that it became a net oil importer in 1995, as well as the dynamism of other regional economies, advocate for further gas demand in the mid to long term, which local resources may not be able to satisfy.

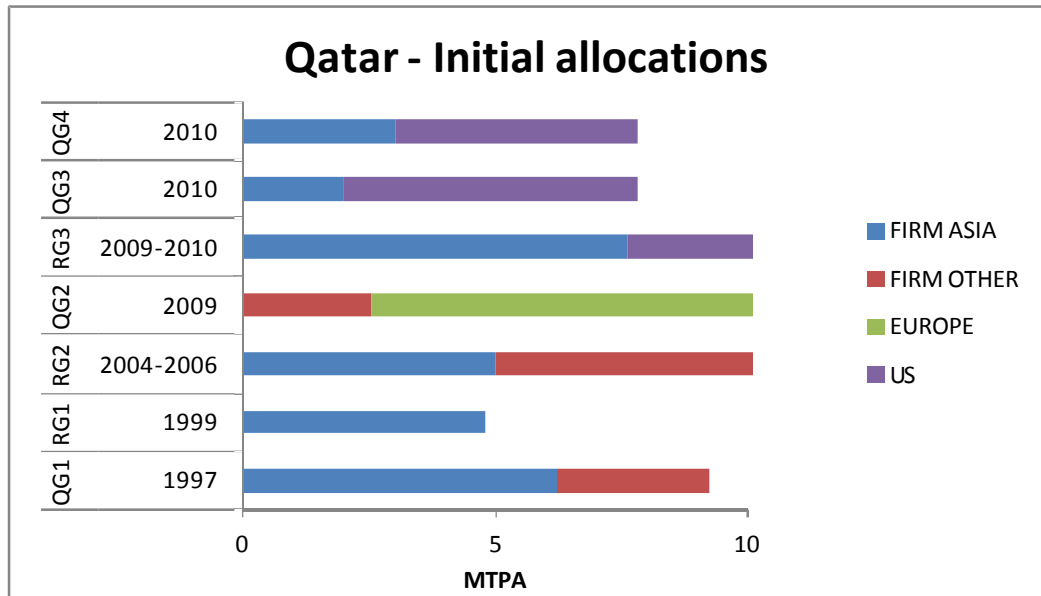
A reflection of what could be regarded as a consensual view on the future as of 2002 :



(Total from various sources, 2002)

The development of major projects

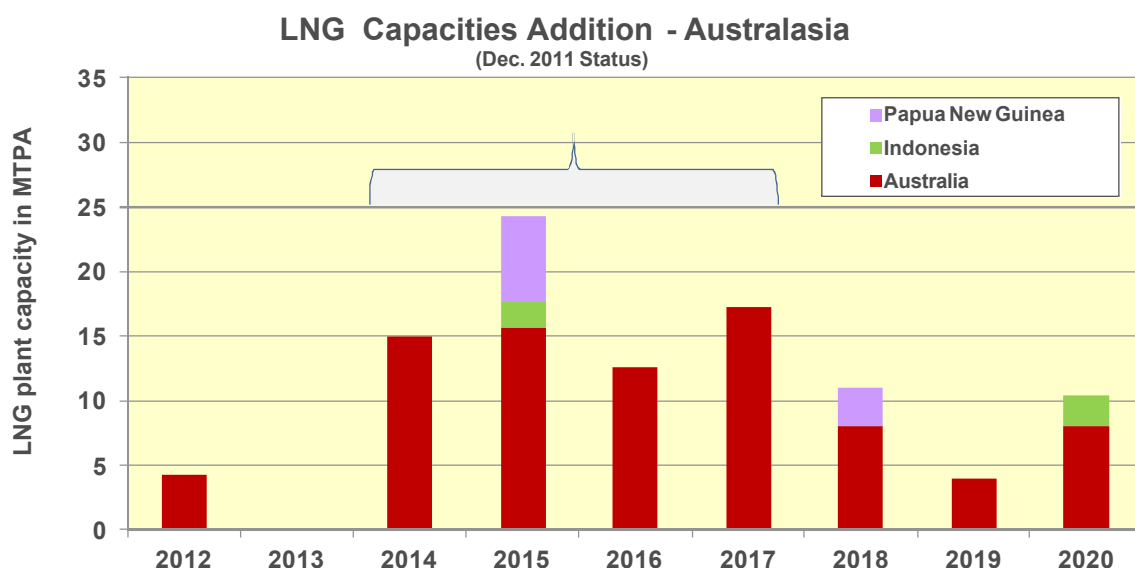
In line with these considerations, Qatar has implemented a determinate policy of what can be seen as a two-fold strategy by looking for Asia and Continental Europe to secure long term contracts, while targeting US and UK as liquid markets, with positions in regasification in these markets.



(Public sources)

The result is that by end 2010, Qatar has been able announce the commissioning of its last train to produce an aggregate of 77 mtpa, with the “US volumes” being mostly redirected to other markets.

On the other side, though starting a little bit later, international and particularly Australian oil and gas companies have recently sanctioned more than 60 mtpa liquefaction capacity (on top of the existing 19 mtpa) in Australia. Surfing almost exclusively on the wave of growing demand in Asia, Australia will become the other giant LNG provider in the world. Unlike Qatar, Australia has also based partly its gas export on unconventional gas, typically Coal Seam Gas.

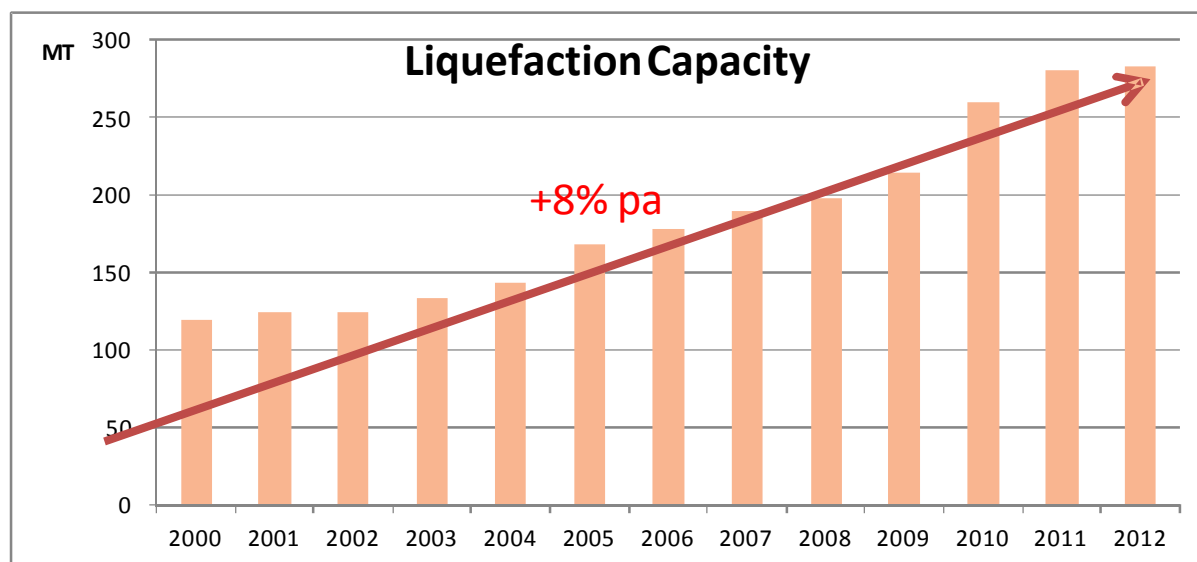


(Total)

A third country, Russia, tapped with gigantic resources but challenging conditions is also looking to increase substantially its output of LNG. Potential use of North Sea Route thus opening the Asian markets to Western Siberia fields is a rewarding challenge.

As a result, a major change of scale

Overall the LNG industry has been able to achieve a tremendous growth over the past 10 years as the 2000-2010 era outpaced by far the growth of precedent decade (140Mt increase versus approx. 50 Mt between 1990-2000).



(Total)

Domestic vs. Export : a conundrum ?

A recent acute issue faced by some LNG supplying countries is the decrease of local resources and/or the increase of domestic demand.

Indeed, with the growth of the population and the general life quality increase expectation, energy access and gas for power in some developing and exporting countries has been a major consideration. The question is raised on the appropriate balance between domestic and export.

In some other countries, it is just that the demand of domestic gas is increasing following a general trend that goes beyond the capacity of gas production of the country, whether it produces LNG (and generally exports) or not : there are couple of neighbouring countries here with comparable outcome. Typically, either because historically the primary energy mix is relying more on gas, or when it appears that coal base power is no longer enough, nuclear not being an option, gas becomes a larger part of the base load power.

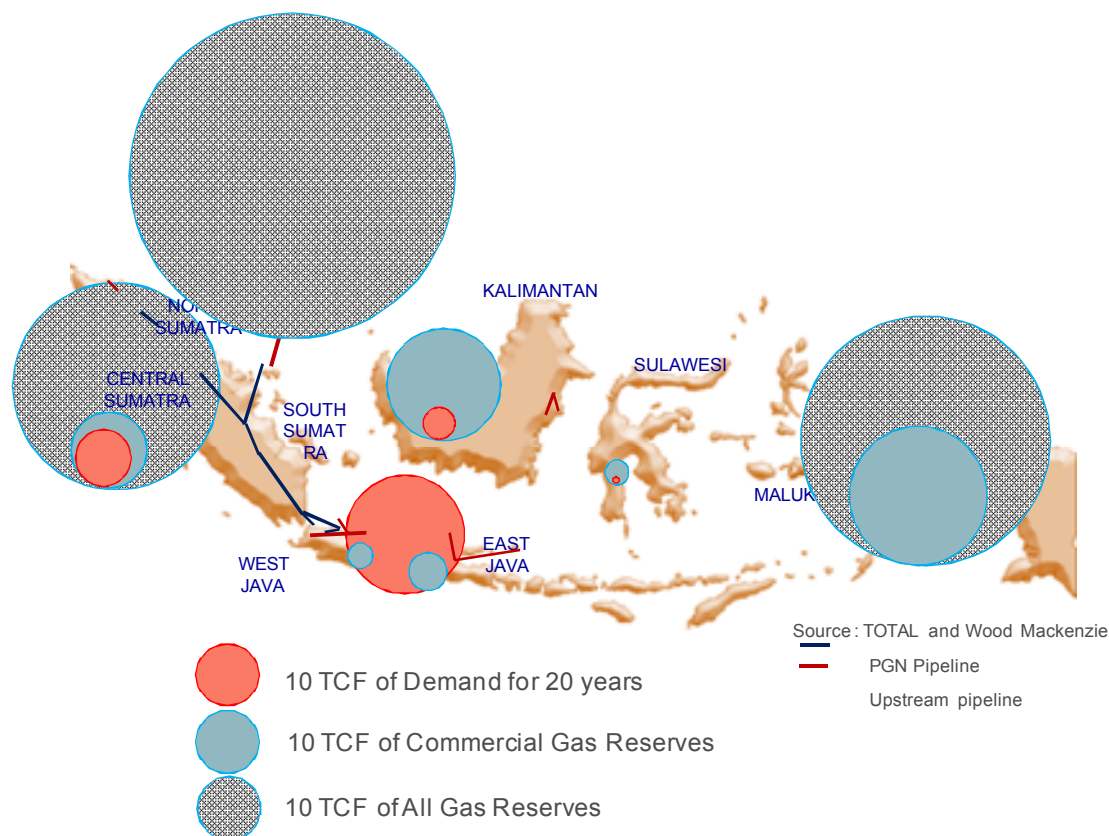
However, one main issue is often considered as crucial : the incumbent domestic gas pricing system. This may represent a big gap with the potential selling price of LNG on international markets, and hamper decisions for upstream investment (whether foreign or domestic).

More generally, it has been questioned whether the domestic gas should be used as the basis for power domestically in order to support the local industry to create added value on more elaborated products than just exporting commodity.

Finally, some other industrial routes using natural gas as feedstock are also popular such as the ethane (and the subsequent petrochemical) chain or to a lesser extent the thermo-chemical chains based on methane.

At the same time, logistics constraints can prevent some parts of a certain country to access gas resources, unless it is supplied through ...LNG. A good example could be Indonesia.

Indonesia demand and resources by areas :

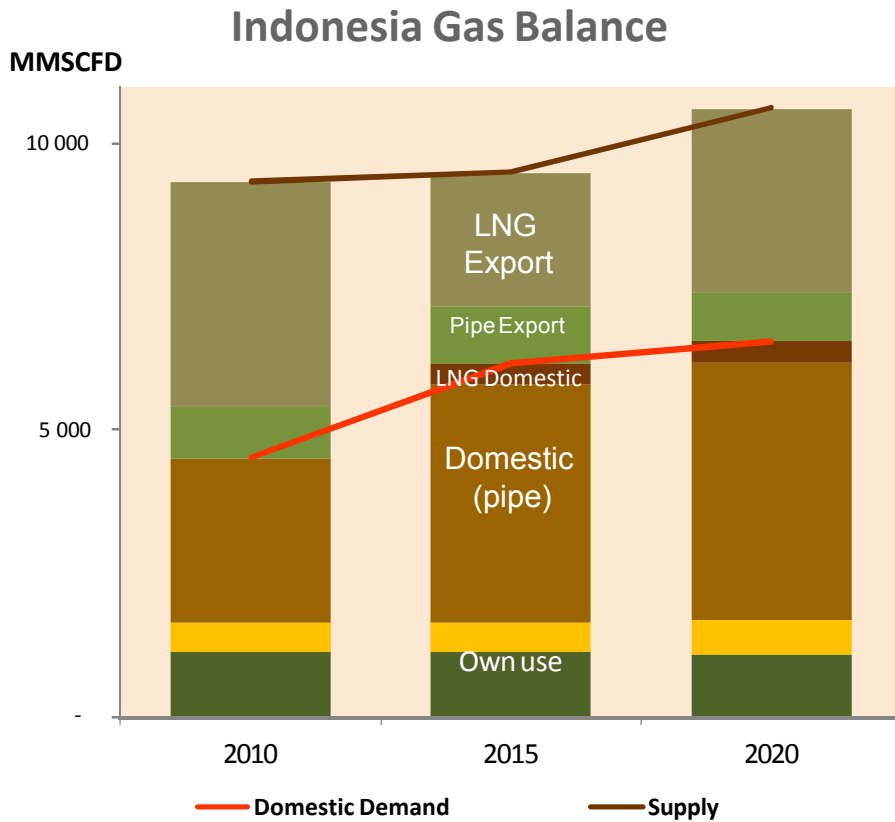


(Total)

Furthermore, in Indonesia, the combination of uneven domestic demand growth, various regionally located resources, existing gas export stream, future export requirements to sustain further upstream investments, all will create multiple possible scenarios, out of which :

- Gas Export is and remains needed to attract upstream investments (whether domestic or international) to develop domestic gas fields,
- Which in their turn will be partly dedicated to domestic consumption

- As domestic demand is currently hampered by low regulated price and limited infrastructure.
- Domestic LNG (as well as potentially imported LNG) are likely to focus on high value/niche markets.

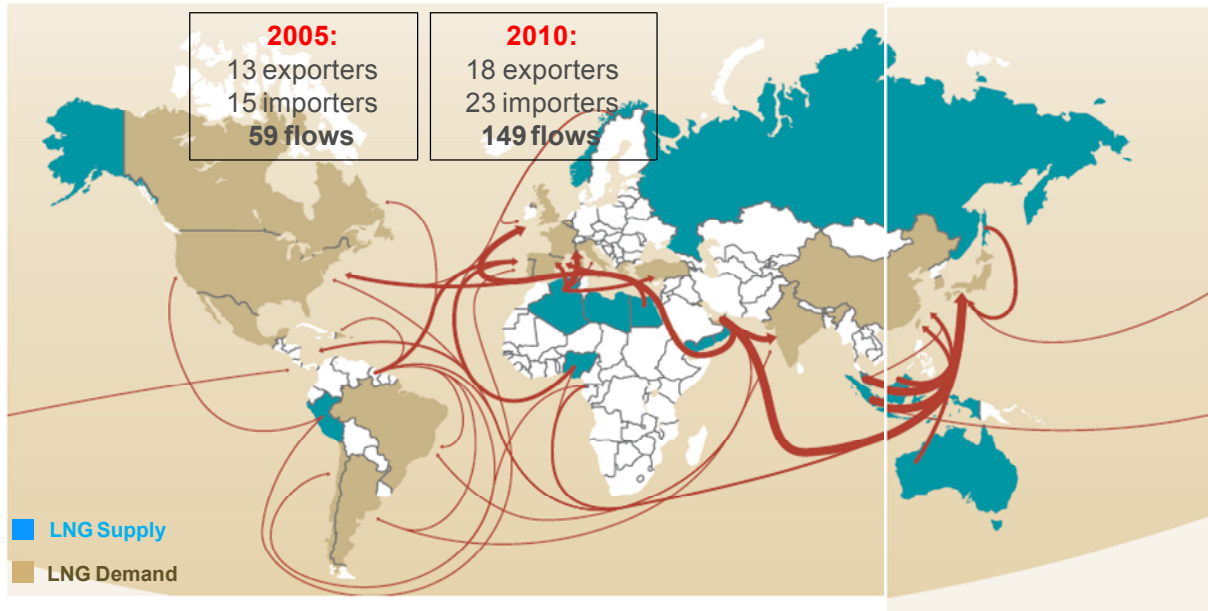


(Total scenarios)

An increasing role in a global gas world

LNG will play a larger role in the future and LNG suppliers are and will remain the key actors in the process.

LNG demand is emerging even in gas exporting countries, and market structure tend clearly towards a multi polar and multi directional world : the world is hungry for LNG.



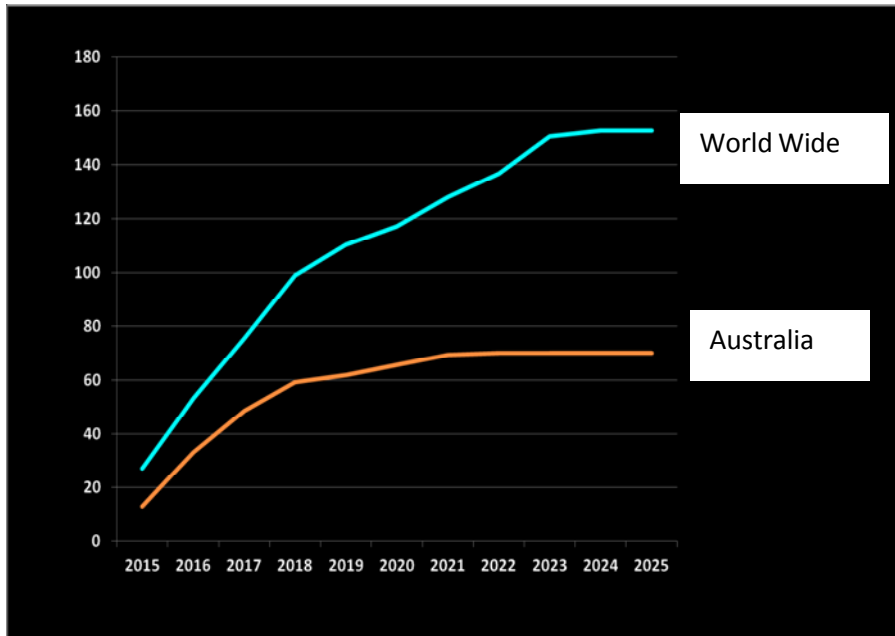
Source GiiGNL

However, the knowledge, the experience, the credibility of exporting countries on one side, of producing companies on the other side are necessary to put new projects on stream : whether we are talking about new exporting projects in existing LNG exporting countries or some new countries like the US, or in East Africa.

It is foreseeable that 140 MT additional liquefaction capacities will be added between 2014 and 2025, at least the same pace as between 2000 and 2010.

As indicated previously, Australasia, and mainly Australia, will be the larger single contributor to growth of supply in the coming decade.

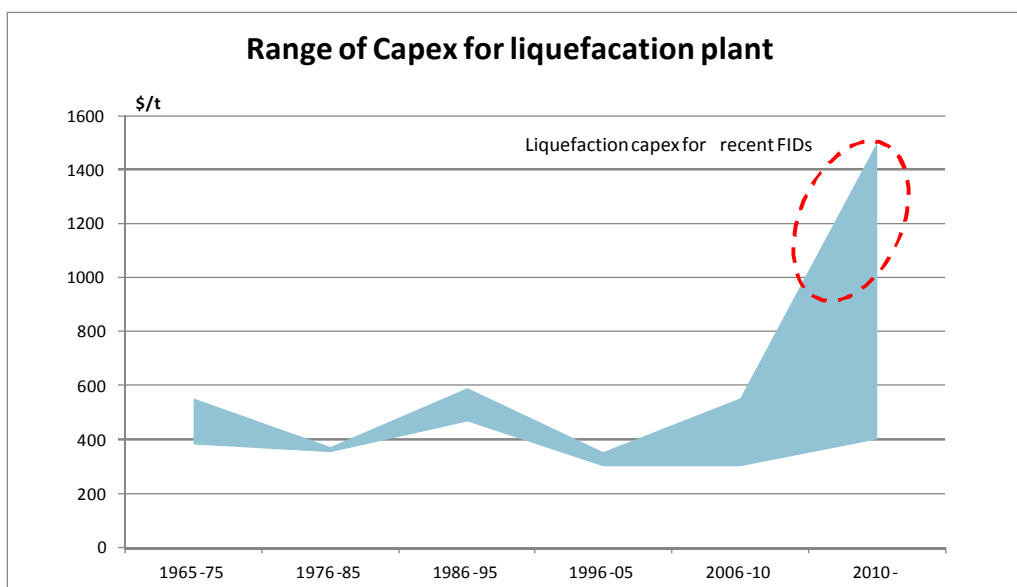
Future additional LNG capacity post-2014



(Total 2011)

Higher and higher investments needed :

However, the cost of a LNG plant has much increased, more than two fold when we compare projects with existing plants. The “entry ticket”, thus becoming higher, with a more challenging money supply market, requests always higher credibility, payback, reserves and feasibility projects. Geopolitical risks are more acute, but technological innovation opens new possibilities. Major experienced producers with track records will be the best placed to fulfil this pro-active role.



(Total, various sources)

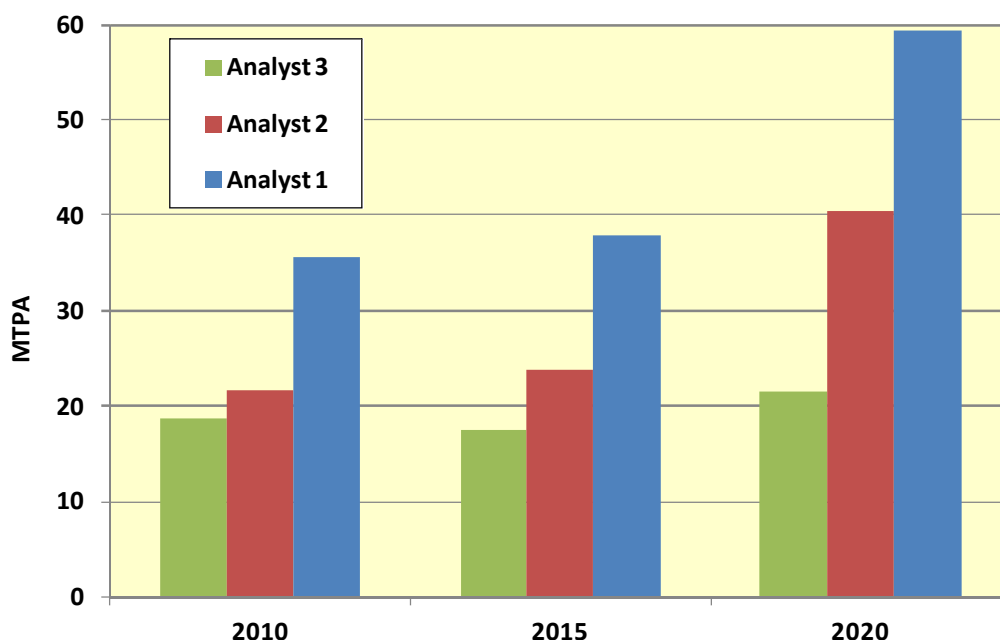
The role of shareholder/portfolio buyer

As we are now clearly drifting away from a simple point to point / dedicated outlet system, many if not all projects have now a noticeable share of uncommitted volumes, or committed by non end-user buyers, whether shareholders or not.

It is very much the case of equity lifting, whereby shareholders will offtake a certain volume and sell it either back to back to an end user, dedicate it to a certain market, which may be more or less liquid, or keep the position (or a part of it) open for future spot or short term deals.

It is without saying that the credibility of such new type of non end-user/portfolio buyers will be essential to the viability of greenfield projects.

The following chart shows an estimation of the flexible Portfolio Volume of 6 LNG players², done by three different analysts. Though the figures are not very in line (difficult to appreciate LNG marketing activity), it is understood that the trend is clearly an increasing one. It is and will be varying between 10 and 15% of the market.

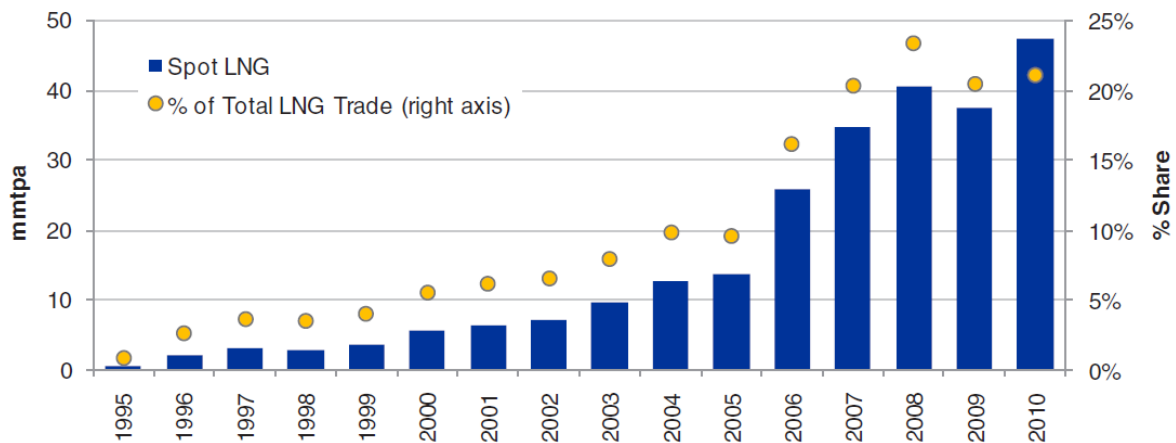


(Total, from various sources)

² BG, BP, GDFSuez, Shell, Stream, Total

The increase of Spot LNG :

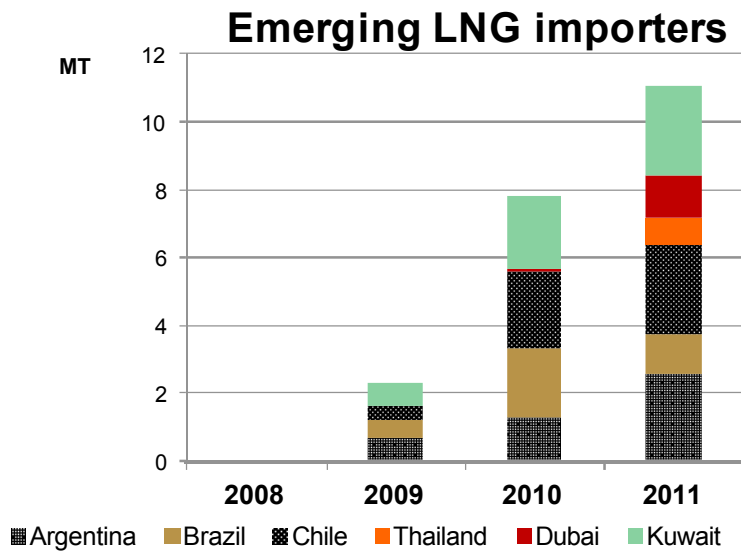
As can be seen in the following chart, the increase of the portfolio of the above mentioned buyers is a way to address the increase of the volume of spot LNG deals. In general, incremental capacities of liquefactions, high regasification availability, market deregulation have contributed to the development of the spot activity. In Asia, some buyers are structurally short and will during peak seasons look for short term or spot cargoes. In Europe, the deregulation of markets allows the delivery of LNG/gas on a spot trading basis.



(IGU)

A bridge for new potential buyers :

These portfolio buyers will be able to bridge between a demanding finance market and the emergence of new end user buyers. While the former requires high certainty, low execution risks, the latter may form a group of potential customers which may be small at the beginning (less than 1mtpa for instance), seasonal (mostly in summer for instance), not always certain of the conditions of the start up of their LNG imports, including the timing, the technical (FSRU or fixed terminal) or the commercial (tender or not) solutions retained.



(Total)

Other potential LNG Buyers :

Asia :

Pakistan
Bangladesh
Vietnam
Malaysia (confirmed)
Indonesia (domestic confirmed)

Europe/Africa/Middle East :

Bahrain
Morocco
Lebanon
Baltic
Poland (confirmed)

Americas :

Jamaica/Panama
Uruguay

The impact of rating of potential buyers:

Special mention should be given here to this topic. The currently much debated rating of economic actors has already been a component that promoters of LNG projects had to take into account. Indeed, in order to ensure project financing, one of the criteria is the credit worthiness of potential buyers. Having high grade (investment grade) buyers committing a long term Sales and Purchase Agreement (all remaining the same for the operational risk), the project will lead to a more easily third-party financeable scheme. In a case of new buyers, if on top of potential operational uncertainties (as seen above) it is more of a speculative grade (not bankable) the external financing may be more difficult based on such commitment. In such case, the shareholder buyer (if of investment grade itself) could bridge the financial and operational risk of such end-user buyer by contracting to the project on one side and to the potential buyer on the other side.

A further role : bridging energy demand

So the role of LNG has widened beyond its primary export value creation to the destination of a club of some long established buyers.

Subject to certain conditions, LNG is allowing the bridge of energy demand development. Recent years have seen the growing appetite for gas for industry and power, coupled with the stalled nuclear ambitions, driven by its relatively fast implementation process compared to coal based power or a new gas field development, low emission qualities being a plus.

In a developing world environment, the LNG is flexible enough to be part of the base load structure for power when there is no cheaper alternative, but when energy infrastructure has reached its optimum to cover a certain base demand, LNG and its infrastructure may naturally shift from the base to mid or peak load role.

Moreover, even if the cost issue is a strong point, LNG will allow the markets requesting it (where domestic supply is by definition constrained) to be aware of and accustomed to the price to pay for a reputable, tradable alternative source. Of course, such price may be an issue for fertiliser production, while it is at the same time more palatable when it comes to replace the fuel oil which runs in a boiler. Again, as we witness here in Asia, a developing world needs fuel to grow, and it is expected that this entire growth is not based only on low cost, cheap industry or services.

If we look further, the domestic supply constraint mentioned here above may be of two possible natures: 1) no local reserves and thus the imports through LNG or pipeline gas is the only solution (case of most North East Asian countries); 2) there are some existing potential resource but either technically difficult or financially uninteresting to develop and/or to transport. In this second case, LNG, by setting an economic benchmark for a reputable, tradable alternative may actually contribute to improve the economic conditions of such resource and allow its development, which in its turn will be able to provide a still competitive (though less cheap than before) fuel for growth.

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Thanks to its flexibility, its mature technology, its long history of reliability, LNG has been playing a stable but growing role in the global energy world.

The demand for more LNG has appeared in countries which were not contemplating it some years ago, due to economic growth in general, and constrained supply, especially in developing countries.

Major LNG producers will continue to take the lead role in this industry to satisfy this demand, as the even more demanding financing market requires a higher degree of certainty. At the same time, the producing countries are to consider the balance between domestic demand and export revenues.

For the importing countries such alternative fuel will enable the said country to diversify its energy sources, which may ultimately be a key contributor for its own gas (and energy in general) resources development.