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Future of Natural Gas in India:
Paving the Way to Benefit from Upside Risks of LNG Supply

Thomas Elmar Schuppe

For over a decade, the Observer Research Foundation (ORF) and the India Energy Forum (IEF) have been jointly organising national and international conferences under the brand name Petro India. These annual conferences have been focussing on key issues impacting the hydrocarbon sector in India. Petro India has created a niche for itself by hosting a large number of professionals and policy makers connected with this sector. The remarks made by the speakers at these events are widely covered in the media. This year the Petro India Conference was organised on December 11, 2013 on the theme **"Hydrocarbons: India's Regulatory Dilemma—Too Much or Too Little?"**
This Issue Brief is based on a presentation made at Petro India 2013.

Introduction

During the mid 1990s, when most of the national electricity and natural gas markets were still monopolised, the European Union (EU) decided to gradually open the markets of the Member States to implement a higher degree of competition in its internal energy market. Besides the US, Europe could already draw on longstanding experiences with the liberalisation of its grid-based energy industry. As a consequence, it might turn out to be instructive for countries like India that are developing gas markets to have a look at some of the experiences and features as well as risks and opportunities which could arise out of changing institutional frameworks and market conditions. Correspondingly, this Issue Brief may be regarded as an input for further discussion to gain from potential windfall opportunities that might arise for India's natural gas industry as well as lay the requisite foundation for a future plan.

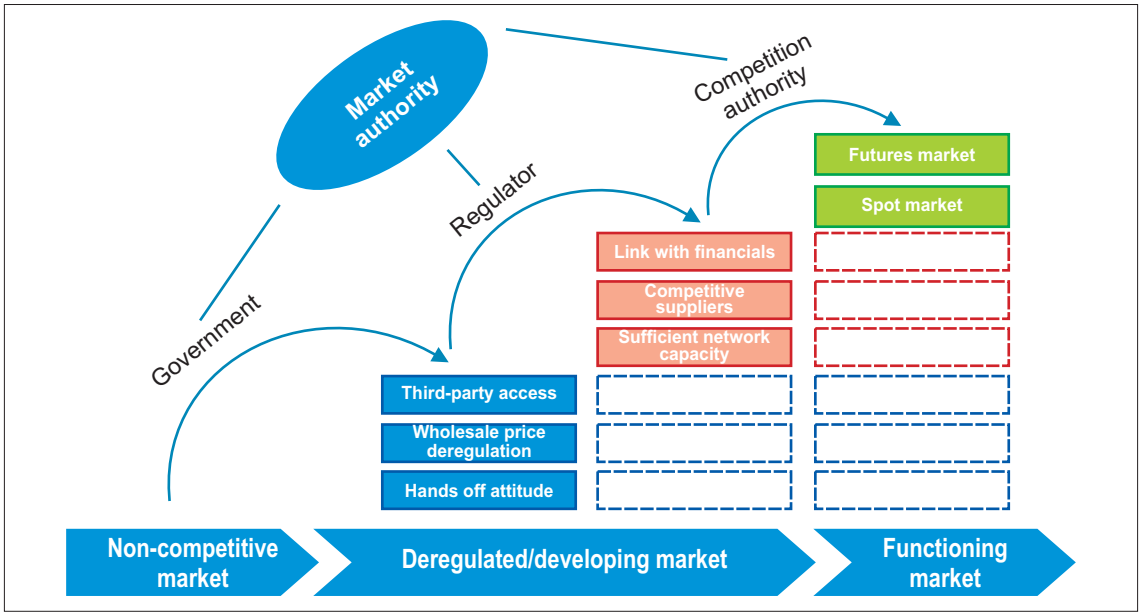
Market Liberalisation in Europe

In theory, the successful and efficient deregulation of gas markets could be facilitated by some favourable and supportive initial market conditions, even if these might vary a lot from country to

country. For example, in Europe the points of departure in the numerous natural gas markets of the EU member states have been quite different. The lack of a comprehensive pipeline system can currently be regarded as the biggest drawback for a far-reaching midstream gas market opening in India. Some crucial features that are required include:

- Sufficient available infrastructure (or even better a functioning integrated network)
- Sufficient number of wholesale suppliers
- Sufficient availability of supply
- Expanding markets

Figure 1: Creation of a competitive gas market



Source: EIA (2013a)

In conjunction with the gradual implementation of some key policy measures, monopolised energy markets can be transformed into functioning competitive ones characterised by liquid (financial) future markets as well as liquid (physical) trading hubs (Fig. 1). These were enforced by the EU by means of three regulatory milestones: (I) the 1st Gas Directive (1998/30/EC), (II) the 2nd Gas Directive (EC 2003/55/EC) and (III) the so-called 3rd Package (EC 715/2009).The latter was based on a broad sector inquiry in 2005 to identify the barriers that had been preventing more competition in gas markets.[1]

- Unbundling

The 1st Directive called for separation of the accounts and implemented "Chinese walls" for integrated companies as well. The 2nd one claimed legal/functional unbundling right up to effective ownership unbundling of the transmission network (i.e. independent Transmission System Operators (TSOs). The current regime (3rd Package) requires effective ownership unbundling, i.e. the TSOs will have to be legally and functionally unbundled from sales activities (although the incumbent gas company can still be the owner of the TSO).

- Third Party Access (TPA)

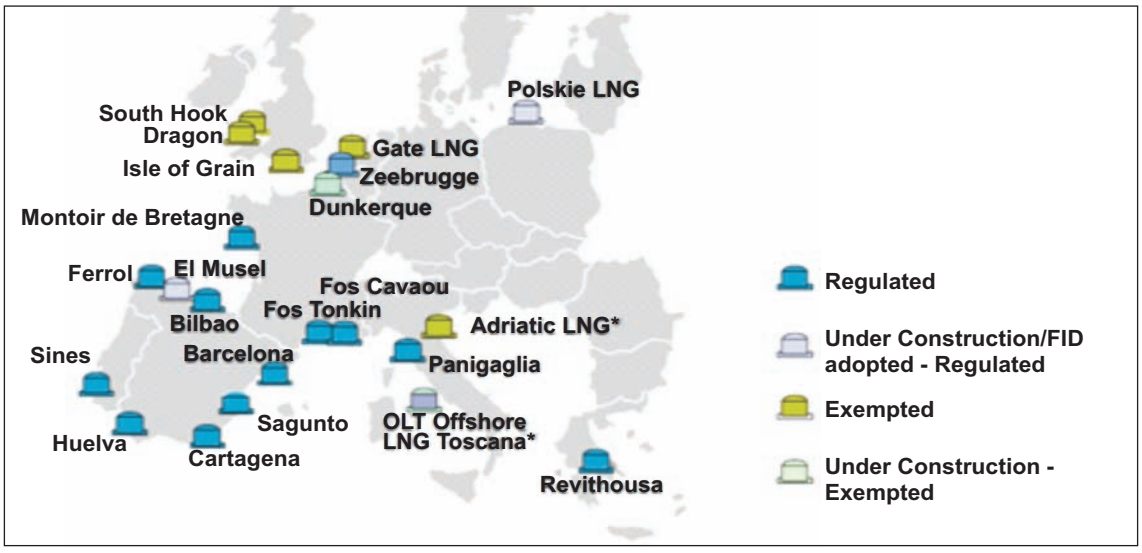
The 1st Directive had given the choice between negotiated and regulated TPA; the 2nd Directive made regulated TPA based on published tariffs mandatory.

- Independent Regulators

The 3rd Package has required the formation of a single national regulatory authority (NRA), rather than allowing only competent bodies to regulate as determined by the 2nd Directive. The NRA shall be legally and functionally independent from the government, entrusted with all regulatory duties. On a supranational level, the new institutional framework has yielded the Agency for the Cooperation of Energy Regulators (ACER) which, as a central EU institution, will provide a framework for the cooperation of the various NRAs.

In the current legal and regulatory EU-framework, the regulated gas system applies to transmission (cross-border and domestic), storage and to the activities of LNG regasification terminals (rLNG) as well. In Europe, therefore, rLNGs are subject to the rTPA regime and are required to share access under transparent and non-discriminatory conditions. Besides, the European legal framework offers the possibility for new large-scale rLNG capacities (be it a new or expanded facility) to obtain an exemption from TPA from the national regulator. Still, the implementation of a secondary market and anti-hoarding mechanisms are mostly claimed as pre-conditions to grant exemptions. Currently exemptions have been granted to five terminals, predominantly in the UK (Fig. 2).

Figure 2: Regulated rLNG facilities in Europe



(*) Exempted LNG terminals in Italy are obliged to offer 20% of the capacity under rTPA

Booked rLNG capacities will have to either be used by the capacity owner or are imposed to be released by the means of Congestion Management Procedures (CMPs). CMPs require the optimal and maximum use of the available technical capacities so as to avoid capacity hoarding by withholding firmly booked but unused or not nominated capacity to the market demand. To overcome this,

effective principles such as Use-It-Or-Lose-It (UIOLO) or even secondary market trading (via bulletin boards) have to be applied. Also, Capacity Allocation Mechanisms like first-come-first-served or pro-rata rules ensure clear and transparent TPA. Among other things, "Guidelines for Good TPA Practice for LNG System Operators" and an appropriate "LNG Terminals Transparency Template" have been set up by ERGEG[2] in 2008 and 2012, respectively, to ensure harmonised access to all required terminal information.

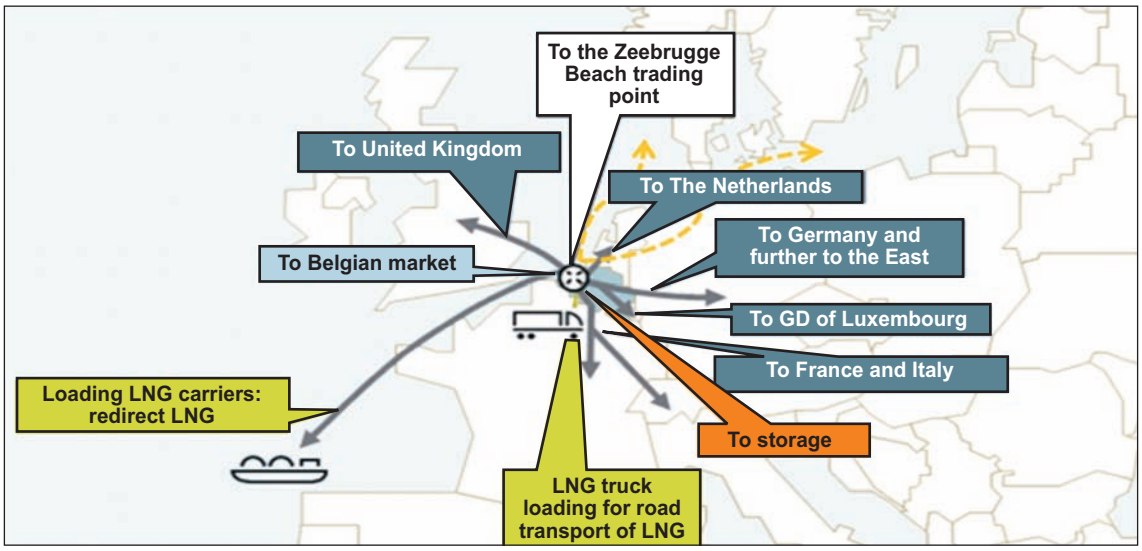
Flexibility trumps in challenging market conditions

Within this regulatory market framework towards a competitive and deregulated internal natural gas market in the EU, a broad LNG industry with more than 20 rLNG terminals has been well established.[3] However, the European gas industry has traditionally been characterised by international gas trade based on long-term (pipeline) import contracts. Nevertheless, with the first unload of an LNG cargo about 25 years ago in Zeebrugge, the upcoming LNG technology has opened new opportunities in terms of supply diversification as well as some arbitrage opportunities from switching between LNG and piped supplies. Furthermore, LNG has been expected to be a potential gap filler for the continuously dwindling indigenous European gas production. Confronted with sluggish gas demand since 2011, a rising number of European LNG importers have been actively seeking to take advantage of emerging arbitrage opportunities by turning their LNG facilities towards a newly experienced export mode due to the drastic demand drop and constantly higher priced Asian LNG markets.[4]

Under the pressure of changing market conditions and embedded in the liberalised European market regime several terminal operators have given it a go and adapted the regasification facilities technically, operationally and strategically to meet the market requirements. In this respect the evolution of the Zeebrugge LNG terminal (ZeeLNG) in Belgium "from a regasification terminal to veritable LNG Hub in North-Western Europe"[5] is an appropriate example for the build-up of flexibility to perform with the global LNG market challenges.

In fact, the ZeeLNG was the first LNG regasification terminal in Europe. Since its commissioning in 1987 about 1,300 LNG carriers have docked at the terminal. In 2004 ZeeLNG doubled its import capacities to 9 bcm/a and has become an open access, multi-shipper destination. The terminal operator Fluxys LNG has sealed long-term contracts with the three principal terminal users (Qatar Petroleum/ExxonMobil, Distrigas and SUEZ LNG Trading). Given its central North-Western-European location (Fig. 3), the ZeeLNG can offer favourable destination flexibility for regasified LNG: the gas could either be traded on the Zeebrugge Hub, delivered for consumption on the Belgian market, or redelivered at the border for onward transmission to the large consumer markets in the UK (via the subsea "Interconnector"), Germany, France or the Netherlands.

Figure 3: Zeebrugge rLNG's destination flexibility

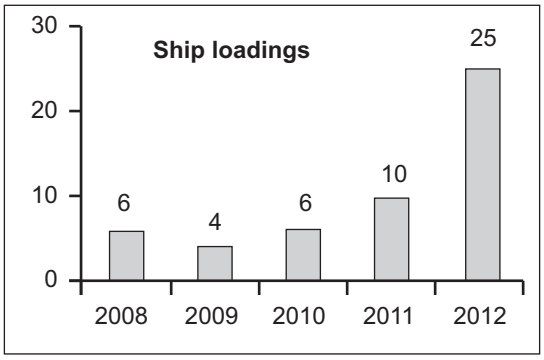


Source: Renier (2013)

However, responding to the market needs the terminal operators have kept enhancing its service offers:

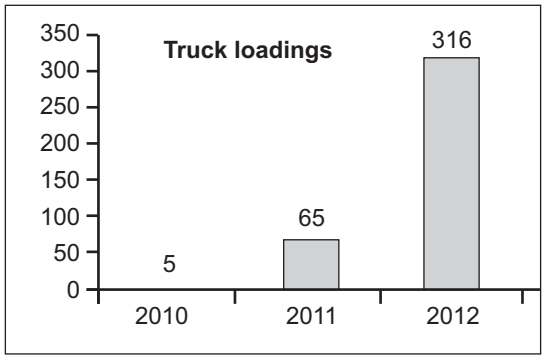
- Since 2008 the huge Q-Flex/Q-Max carriers are able to moor at the terminal's jetty.
- In 2008 the "open transfer" service was implemented in the Zeebrugge area, enabling shippers to easily transfer gas between all entry points. This has boosted liquidity and established the creation of a Zeebrugge Beach price reference for the more than 80 active shippers in the Zeebrugge area.
- As early as 2008 LNG re-loading services were introduced in response to the demand from terminal users to be able to capitalize more effectively on arbitrage opportunities by means of re-exporting their loads towards the higher priced Asian premium markets. Due to the drop of European gas demand re-loadings saw a sharp increase in 2012 (Fig. 4).
- In 2010 the first small-scale LNG carrier was loaded.
- 2010 also saw the commissioning of the truck loading services for LNG transportation to truck fuelling stations (with capacity to accommodate more than 3,000 LNG truck loadings per year (Fig. 5)).
- At the end of 2011 the first inland barge in NWE running on LNG was filled up.

Figure 4: Ship loadings at Zee LNG



Source: Renier (2013)

Figure 5: Truck loadings at Zee LNG



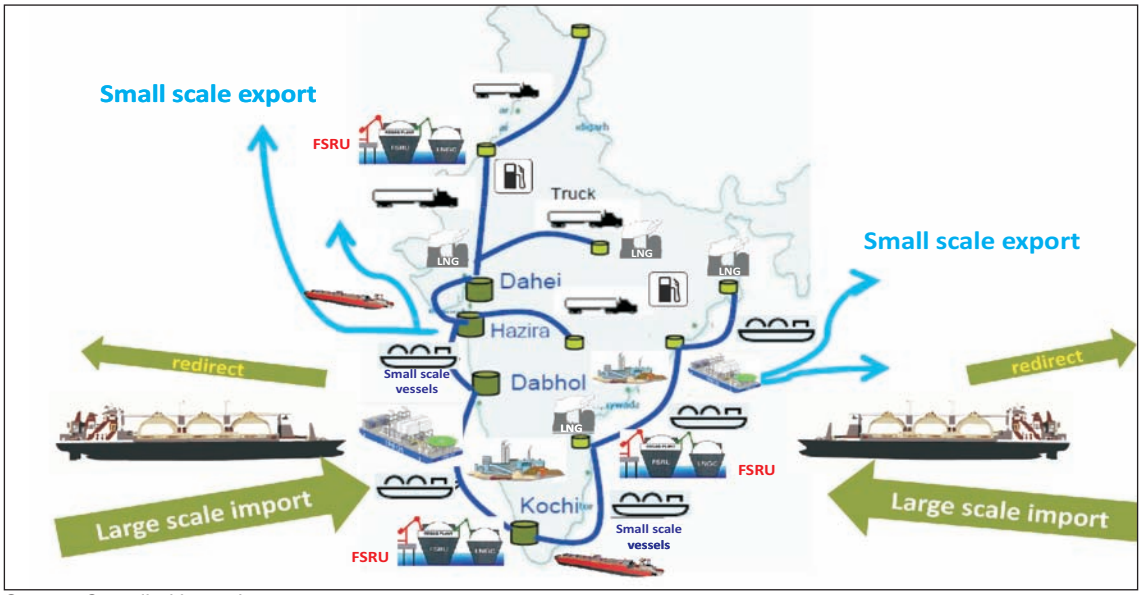
Source: Renier (2013)

Also for the future, ZeeLNG carries forward its strategy towards the additional expansion of small-scale LNG solutions for supplying LNG to ships and trucks. In addition to bunkering LNG with ships, another option is for tanker trucks to load up with LNG at the terminal's loading station (a first truck-to-ship bunkering operation in Belgium took place at the end of 2012 in the port of Antwerp). Further small-scale LNG chain options are studied according to LNG fuelling stations, intermediate storage and LNG bunker barges besides the "Northern LNG Infrastructure Project", which aims for small-scale LNG supply in the Baltic and North Sea. Based on an international market consultation in 2007, a second multifunctional jetty is currently under construction to supply all types of barges with LNG.

Small-scale LNG vision for India

Given the demonstrable developments in Europe and keeping in mind the current lack of a comprehensive natural gas transportation network in India, the development of decentralised small-scale LNG supply might serve as an attractive and lucrative alternative to satisfy the natural gas demand as well as connect and attract new customers that might be able and willing to stick to LNG market prices: For example, natural gas users in non-core sectors like industries, refineries, petrochemicals, LPG plants as well as power generation and/or city gas might benefit from these projects.

Figure 6: Small-scale LNG vision for India



Source: Compiled by author.

Given below is a "loose vision"(in the sense of what might be possible rather than an exhaustive sector strategy or business plan) which gives some of the potential key options that could be either commercialized stand-alone or matched to a more wide-ranging small-scale LNG downstream chain (illustrated in Fig. 6).

- Creation of the technical and contractual prerequisites for LNG reloading at the rLNG terminals. The is the basis to open up the flexibility possibilities for realizing potential arbitrage

opportunities and windfall profits arising from developments on the global LNG market and as a back-up for unexpected demand drops in the target markets as well. (For sure, even better and more efficient would be direct route diversions, if contractual permitted).

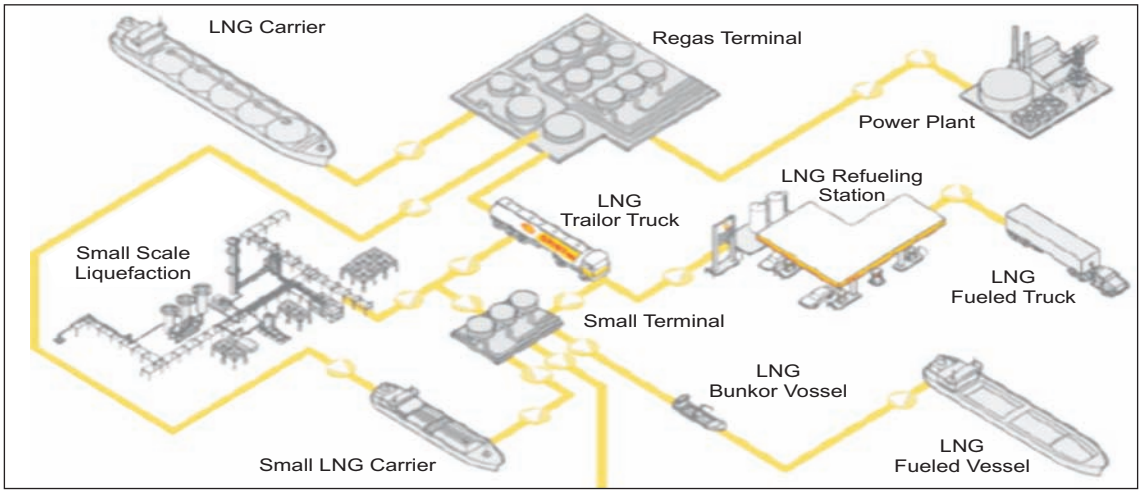
- Floating rLNG options like Floating Regasification and Storage Units (FSRUs) show typically some considerable advantages like
  - Significantly shorter project lead time (particularly if no new port related facilities are to be developed);
  - Less regulations to be fulfilled being an offshore facility;
  - Small environmental impact onshore (thus less NIMBY[6] resistance) and
  - Competitive cost in comparison with traditional onshore rLNGs.

  H?egh LNG and Excelerate Energy are examples for the successful development and marketing of innovative concepts for the floating regasification of LNG (e.g. dockside and offshore floating regasification ("Gateway")). Some FSRUs are currently proposed in India; Shell's east coast Kakinada project will likely see the light of day by 2015.

- Development of small-scale LNG vessel lines along India's coast for the establishment of smaller local LNG landing "hubs", in addition to the principal large-scale import rLNGs. LNG trucks can be used for further distribution to the customer site, where the gas will have to be regasified and fed into the pipeline system. Besides trucks, also trains and barges can be either fueled with LNG or used for transport means. (Petronet has stated that it has commissioned a truck loading facility at the Dahej terminal as a Pilot Project in 2007 and that currently about 4-5 trucks are loaded daily. The facility can handle up to 2500 loadings/a.[7] Presently LNG (by road tanker) is being sold to limited consumers in the Western region.)

- LNG fueled power stations might be situated next to these local hubs as well as industry sites. In addition, the development of floating LNG power plant barges also might contribute to overcoming the existing onshore infrastructure shortcomings.

Figure 7: Schematic overview of a small-scale LNG network



Source: Royal Dutch Shell plc. Taken from GLE (2013).

It must be noted, that due to the fact that the global LNG market is presently characterised by a tight supply situation (at least according to the Asian LNG consumer) the expansion of (both small-scale and large-scale) LNG importing infrastructure might currently turn out to be less profitable. Nevertheless, given that the LNG industry is confronted with long project lead times and therefore has to anticipate future development opportunely to commercialize its strategic plans successfully, it would be prudent to begin the thought process now, as to not miss any opportunities in the future.

Light at the end of the tunnel in the global LNG market's tightness

The general assessment of market experts can be focussed on the following statements in regard to the future developments of the global LNG market and with particular emphasis on the Pacific submarket:

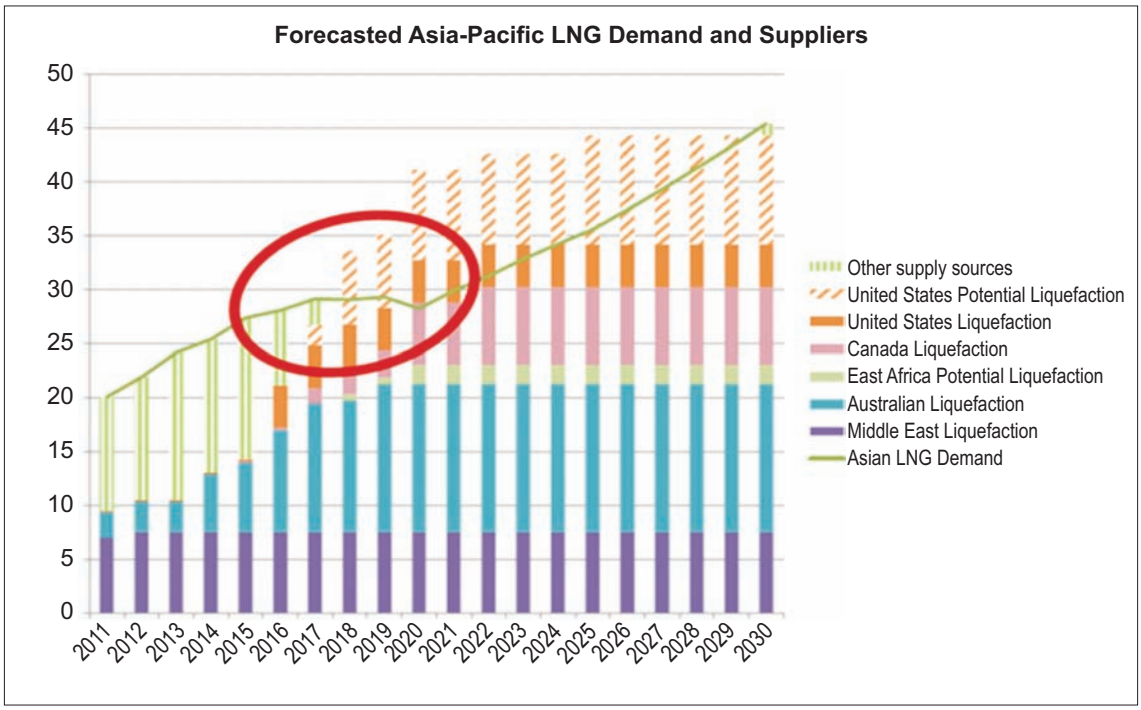
- The current prevailing tightness might reverse at earliest in 2015, thus 2016 might turn out to be the first year with a healthy supply to the unsatisfied Asian LNG demand.

- Nevertheless, the time slot for the expected tipping point is critical on the timely commission of the Australian LNG tranche, which is presently overshadowed by announcements of severe cost overruns and delays of completion.[8] According to IEA, seven of twelve new LNG export plants under construction are in Australia.[9]

- Another new wave of LNG crashing on the global LNG market is expected to come from North America, starting with the commissioning of Sabine Pass LNG in 2015 and the concurrent (re-) opening of the Panama Canal, which is going to redefine the world wide LNG trading due to considerably faster shipping times and thereof huge cost reductions in transportation of LNG from the Gulf of Mexico to the Asian premium markets.

Fig. 8 illustrates the recent forecast from the Canadian Energy Research Institute (CERI), which highlights the massive ramp-up of LNG liquefaction capacity in the latter half of the decade that is expected to double between 2011 and 2020 and constitute about 50% more in 2018 than current level.[10] According to IEA (2013b) the worldwide liquefaction facilities under construction have a combined export capacity of 130 bcm/a as of Oct. 2013 with upside potential from North America.

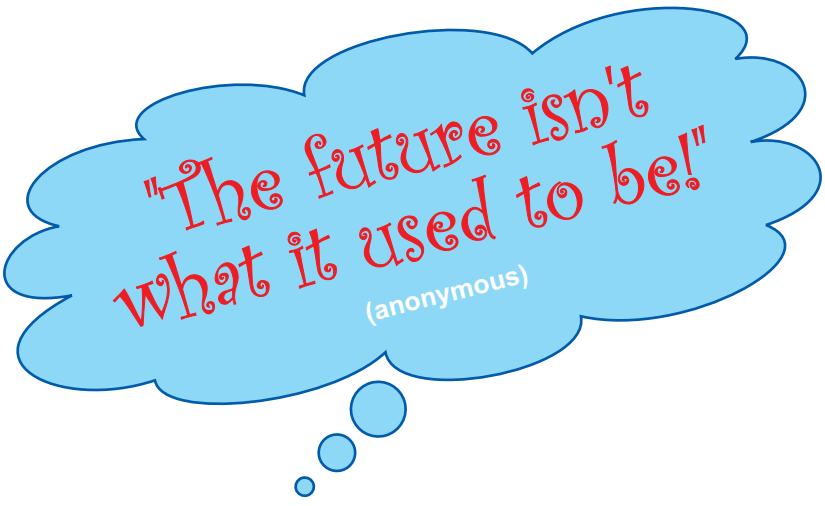
Figure 8: Asia-Pacific LNG Demand and Supply Forecast (2011-2030)



Source: CERI (2013)

Gas market forecasting increasingly sophisticated

Preparing a trustworthy gas market outlook in the past (before gas industry "globalization") has been relatively simple, because the markets have been fairly isolated (less interconnected, only few supply inputs via domestic production or import pipelines) and both the supply as well as demand could be forecasted with more or less simple deterministic models. However, nowadays only few of these remote natural gas islands are left. Instead, against the backdrop of rising global LNG trade, we increasingly face the emergence of an interconnected global natural gas market. Consequently for a reliable and accurate forecasts these simple former approaches are not adequate anymore; on the contrary there is more and more need for the implementation of comprehensive and consistent interlinked global models for fundamental analyses and forecasts (as provided by some industry consultancies e.g. Wood Mackenzie's or McKinsey's "Global Gas Model").



These need to comprise the rising supply challenges on the one hand as also the more complex nature of gas demand forecasting with its cross-sectoral interplay of substitution with rival fuels like coal, oil,

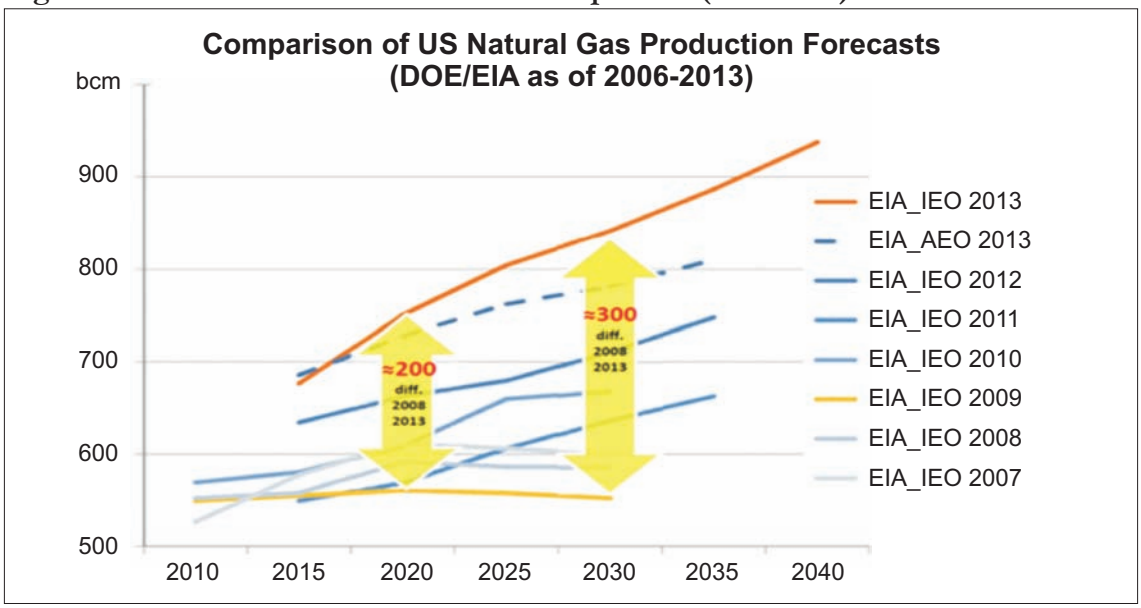
nuclear energy and renewables for each consuming sector. Due to this comprehensive feature of global natural gas market forecasting, one has to take into consideration a more stochastic element for the outcome, i.e. unforeseen developments in any part of the gas world like the surprisingly rapid establishment and global influence of unconventional gas (till now primarily spreading out from the U.S.), which would have hardly been foreseen in any ever so seemingly perfect forecast model.

However, there are two sides to this issue. On one side, long-term forecasting of the global gas developments is getting more complex and difficult. On the other, there might arise business opportunities and significant windfall profits out of each exceptional occurrence in future markets. Some of these gas market situations that are fraught with large uncertainties (labelled as "anyone's guesses" below) and therefore might be stigmatised with inherent upside and downside risks are briefly described as follows:

Anyone's guess (I): US shale gas bonanza unfractured?

The US shale gas bonanza has already shaken the global energy scene in the last ten years and is expected to perpetuate in the foreseeable future due to its massive LNG exporting potential and the opening of the Panama Canal at the same time in 2015. According to IEA (2013b) exports from North America are expected to reach about 50 bcm/a by 2020 with a huge upside risk of (theoretically) more than 250 bcm/a, if all 28 applications to export LNG from US at various stages of the approvals process are summed up. However, to what extend these forecasts could be built on sand can be unveiled by a view into the "official" gas production forecasts from the US energy authority EIA in recent years (Fig. 9):[11] Between forecasts of only 5 years time (the lowest 2008 vs. the highest 2013: yellow lines in the graph) a massive gap of about 200 bcm/a by 2020 and 300 bcm/a by 2030 can be demonstrated (as measured by the expected Indian demand this bias accounts about double the amount).

Figure 9: US Gas Production Forecast Comparison (2010-2040)



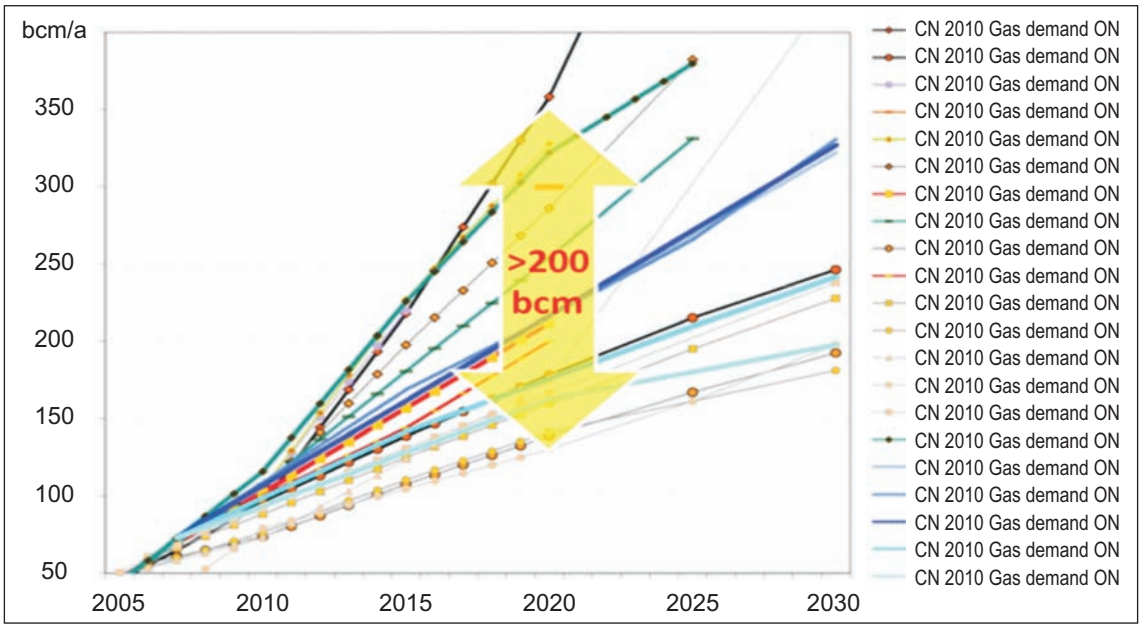
Source: Different EIA publications, compiled by author.

To sum up, there are significant uncertainties to various aspects of the in-coming LNG wave out of North America. However, based on current production trends and the huge amount of "exportable" low-priced shale gas in conjunction with considerable shipping improvements towards the Asian markets, an upside risk for LNG supply can clearly be identified.

Anyone's guess (II): China LNG and shale gas – Yin and Yang?

Taking the Chinese gas market as another example of "anyone's guess" about the future LNG supply in Asian markets, massive variations both on the demand and supply side may be observed. Fig. 10 reveals the extensive disagreement about the probable future gas demand in China provided by numerous energy institutions (like EIA or IEA) and also well-known industry consultancies. The difference between the lowest and the highest amounts sums up to 200 bcm of gas demand in 2020, which is twice as much as the foreseeable Indian demand at the same time.

Figuer 10: China Gas Demand Forecast Comparison (2010-2035)



Source: Compiled with data from different forecasts (published 2007-2010), anonymised.

Apart from demand side uncertainties, it has to be seen whether the Chinese are keen enough to exploit unforeseen high volumes of marketable unconventional gas and turn their LNG imports down consequently on the supply side. According to an IEA study the difference between very optimistic "golden rules" unconventional gas production case and a low case could be more than 100 bcm by 2020 and 280 bcm by 2035, respectively (Table 1).

Table 1: China Unconventional Gas Production Forecast Comparison (2020, 2035)

		Golden Rules Case		Low Unconventional Case		Delta*
	2010	2020	2035	2020	2035	2035
Production (bcm)	97	246	473	139	194	279
Unconventional	12	112	391	37	112	279
Share of unconventional	12%	45%	83%	27%	58%	25%

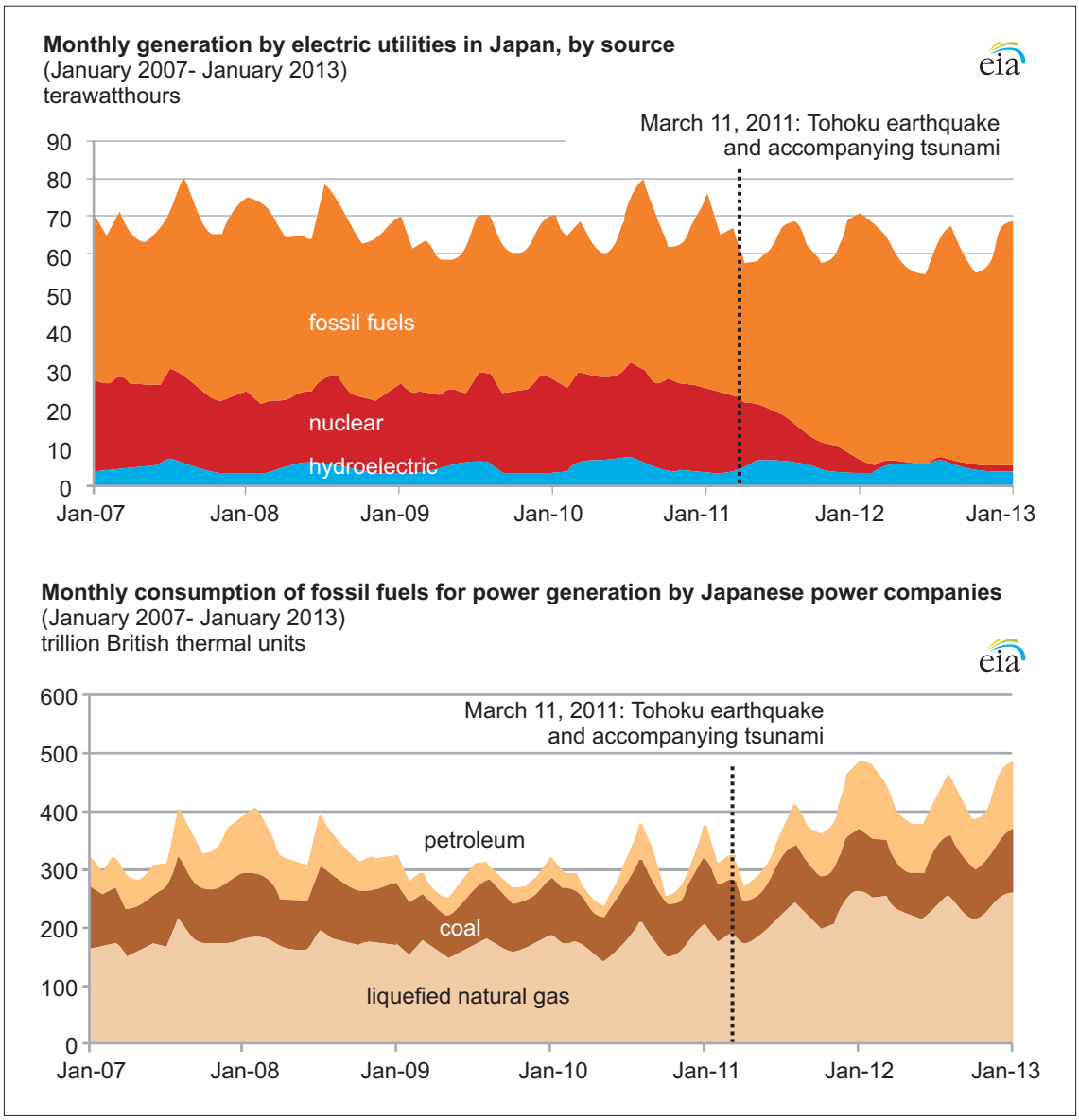
Source: IEA (2012). Note: * Difference between the "Golden Rules Case" and the "Low Unconventional Case".

So far the Chinese have already proven to the energy world that they undoubtedly have the will and the resources to cope with some (formerly thought) "impossibilities". If this turns out to be true (or even partially true), another massive upside risk for the Pacific LNG market can be identified due to a lack of Chinese LNG demand that favours indigenous shale or tight gas production.

Anyone's guess (III): Japan sticking to nuclear power?

Last but not least, the third exemplary uncertainty refers to the future composition of Japans post-Fukushima Daiichi power generation. Prior to the tsunami, nuclear energy provided about 30 % of Japan's power generation, however, the nuclear disaster triggered a shutdown of virtually all of the nation's nuclear power stations and in response, an increase of about 20 % in fossil fuel use (Fig. 11).

Figure 11: Electricity generation by source/fuel in Japan (2007-2013)



Source: EIA (2013)

Nevertheless, in December 2013 Prime Minister Abe has declared nuclear power as "important" in the country's energy plan and is pushing for as many of the country's 50 usable reactors to restart as soon as possible after passing safety checks by the Nuclear Regulation Authority. According to CERI (2013) an additional gas demand of about 50 bcm would hang in the balance assuming that all nuclear capacities would be converted to gas (notwithstanding that actually the vacant nuclear power plants are only substituted to a certain degree by gas capacities). Sticking more to nuclear power in future again would release significant volumes of LNG to the Asian market, which can be designated as another upside risk.

In addition to the stated issues above there is still the latent risk that natural gas demand will not materialize because some of the most important economies (e.g. India and/or China) might fail to achieve proper economic growth rates in the future, leaving some amount of LNG supply idle for neighboring gas markets to contract. In summary, even if it is not very likely that all these upside risks will occur at the same time and in full strength, already slight divergences out of the conventional wisdom forecasts (which fail to incorporate these risks appropriately) might lead to misleading outcomes but at the same time open chances to realize significant windfall profits under certain circumstances.

Going long in rLNG capacities, market liberalisation and the attraction of foreign investment might prepare the ground for gaining in future LNG upside risks

The long history of gas market liberalisation in Europe has proven wrong doubters who stated that liberalised energy markets were not able to provide workable and efficient outcomes. More deregulated markets have left more opportunities and therefore given more freedom to market players to withstand unfavourable market developments, as the example of the evolution of Zeebrugge LNG has shown. By enlarging the marketing options through creative solutions towards small-scale LNG chains, ZeeLNG has been successful. The build-up of adequate LNG import capacities over time has proved advantageous: it is the logistical base for import optimizations in terms of gains from enhanced arbitrage opportunities arising from access to different markets and/or via different transportation modes (pipe vs. LNG). As a result it can be determined that the recent move to a more globalized gas (LNG) market has shown that "flexibility" is going to replace "volume" as the key success factor in creating value.[12]

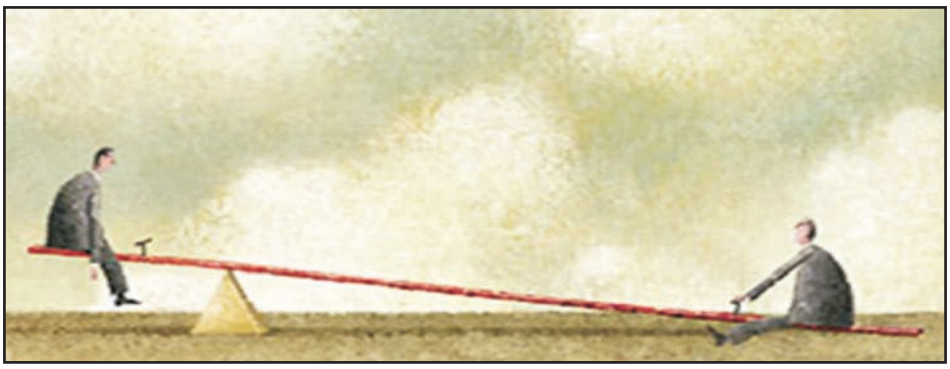
As a result the realisation of further LNG regasification capacities in India (this means in effect beyond the expected midterm demand) might prove a good idea to pave the way for gaining from future market opportunities. As the (gas) world is moving faster and faster it will leave even more space for gas forecast biases and failures. Coupled with some supply upside risks (for example those from US, China or Japan) these opportunities should be attempted immediately.

Nevertheless, the ability to realize potential windfall profits grows and falls with the physical import opportunities, flexibilities and more open market structures. Significant fixed costs of providing long

rLNG (and shipping) facilities will be the price of this option. However, once there are existing rLNG capacities the market is expected to respond favourably.[13]

To realise the target of going long in rLNG facilities it would be good to attract foreign investment to break into the Indian gas market, also because a greater number and variety of wholesale players are important for the establishment of an efficiently deregulated market. Hence, in conclusion, some (more or less universal and non-exhaustive) principles shall be proposed on how to encourage foreign players to invest in India's promising gas market. These include:

- Support of market based solutions and a push towards market pricing as already announced by the Planning Commission and Prime Minister Singh[14] (international players favour market pricing and liquid markets because of hedging options)
- Strengthen investor confidence by providing trust and fair institutions; providing "good governance"
- Stability of fiscal and legal framework as a base for investments (e.g. no nasty (tax) surprise)
- Reduction of prohibitive bureaucracy; "consumer friendly" administration (e.g. "one face to the customer" principle)
- "Pacta sunt servanda": fulfil and respect contractual agreements as well as the grandfather clause principle
- Strong and independent regulator
- Provide a level playing field to create a centre of attention for small-scale solutions, niche players and more risk-averse investors



Beyond that, the government as well as national and state institutions should actively promote the increased utilisation of natural gas as an abundantly available and relative environmental/climate friendly large-scale source of energy: they should strategically open up the gas supply option via LNG by promoting investments e.g. reducing the time and regulatory effort of site allowances and/or offer favourable funding (loan agreements, tax reliefs, accelerated depreciation).

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Endnotes:

1. Only aspects according to gas midstream (and more specifically) to rLNG market are considered in this article. The features mentioned here and above should rather be regarded as selective but exhaustive lists.
2. European Regulators' Group for Electricity and Gas, an unofficial predecessor of ACER.
3. The momentum for the expansion of the European LNG industry is usually driven by independent strategic and commercial considerations of the market players under the given regulatory and institutional framework. Nevertheless, sometimes specific projects are being funded by the EU or on a national level, mostly motivated by security of supply issues or the "Trans-European Energy Network (TEN-E)" policy, which provides financial support to the projects "with the highest trans-European added value". Some LNG terminals (and/or studies) have been financially supported herewith (follow the link below for a project list 1995-2012). Furthermore, various specific small-scale LNG projects have been funded in 2013 by the "Trans-European Transport Network (TEN-T)" program: the use of bio-LNG as a fuel for heavy goods vehicles, studies and trials to assess the use of LNG as a shipping fuel in the European inland waterway sector, new LNG storage projects in North Sea ports, study of LNG in the maritime sector and for LNG fuelled vessels, a project to convert an existing vessel into a LNG bunkering ship (to refuel other ships), the use of LNG for road transport (i.e. refuelling technology). (http://ec.europa.eu/energy/infrastructure/tent_e/doc/2013_ten_e_financed_projects_1995_2012.pdf)
4. Schuppe (2013) provides a more in-depth survey on the latest developments in the European LNG market, which is currently challenged by some unfavourable global market developments and has evolved to be the world's LNG balancing market.
5. Renier (2013)
6. Not in my backyard. According to Wikipedia the NIMBY phenomena is a pejorative characterization of opposition by residents to a proposal for a new development (like an rLNG) because it is located close to them, often with the connotation that such residents believe that the developments are needed in society but should be further away.
7. http://www.petronetlng.com/LNG_RLNG_SUPPLY.aspx
8. Against this backdrop it might not only lead to significant delays in commissioning but also to an increase in the already high breakeven costs of Australian LNG projects, and furthermore might have negative effects on future investment decisions as well. It is therefore necessary not to ignore the potential downside risks from some LNG projects and market developments in general.
9. IEA (2013b)
10. CERI (2013). The Asian LNG demand forecast has been assembled by using the total gas demand curve from the Institute of Energy Economics Japan (IEEJ) and deducted supplies from pipeline and domestic production.
11. EIA (div.)
12. Since the European gas prices are stuck more or less stable in the midst of the global (post-Fukushima Daiichi) gas pricing order there is a relatively stable probability given to use the eastern LNG outlet towards the significant higher priced Asian premium markets. This might be more restrictive for the diversion of "Indian LNG" as the intra-Asia price spreads usually tend not to be that high. However, according to the estimates from FERC (2013) there was a prevailing stable order with an average price difference of 1.5 and 2 $/MMBtu of China and Japan being above India in 2013.
13. This article is not about LNG prices or pricing. Nevertheless it should be mentioned that the U.S. alone has an immense potential of releasing "cheap" LNG on the global market for a longstanding period. On the demand side the bargaining power might shift towards Asia as the future demand centers China and India might emerge as the price setters on a well-supplied global market.
14. http://articles.economictimes.indiatimes.com/2013-12-03/news/44710504_1_gas-price-formula-shale-resources-12-month-trailing-average-price and InfralinePlus (May 2013), Gas prices-Plan Panel favours increase, others oppose.

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ABOUT THE AUTHOR

Thomas Elmar Schuppe joined ORF in September 2013 as a Senior Fellow with the collaboration of The Centre for International Migration and Development. (CIM is the competence centre for global labour mobility in the international cooperation activities of the German Government). After graduating in economics with special focus on environmental/ecological economics, Schuppe worked at the Institute for Energy Economics at the University of Cologne (EWI) for about seven years. He has gained professional expertise in the German energy industry while working with RheinEnergie AG in Cologne as a Contract Manager for Energy Procurement and at RWE Supply & Trading dealing with strategic planning and market analysis.

Observer Research Foundation,
20, Rouse Avenue, New Delhi-110 002
Phone: +91-11-43520020 Fax: +91-11-43520003
www.orfonline.org email: orf@orfonline.org