



ISSUES PAPER

LNG PROJECT DELIVERY: WHAT SHOULD BE THE PROPER ROLE AND APPROVAL PROCESSES OF REGULATORS?

There is a clear and pressing need for massive investment in LNG infrastructure to expand APEC natural gas trade, and to strengthen energy security in the APEC region.

Governments and investors must address the project delivery challenge that this poses.

QUESTIONS FOR OPEN FORUM IN SAN DIEGO

- are LNG projects being frustrated by uncertainty?
- what accounts for the idiosyncratic and different character of project approvals in the 21 APEC economies?
- what are the legitimate differences between approvals processes? How different is China from Russia? PNG from Indonesia? Mexico from California?
- are project approvals processes sub-optimal?
- do politics drive project approvals?
- is there any linkage between project approvals and electoral cycles?
- what is the right amount of regulatory latitude?
- do politics encourage NIMBYISM?
- is it the discretionary power of Ministers and government officials that facilitates this?
- is a regulator really a selector or a facilitator?
- how objective can an environmental assessment be?
- does best practice require more professional and independent approvals processes?
- can we have a constructive solution instead of a yes / no answer?
- should project approvals be considered as a single or multiple stage process?
- what is the appropriate remedy for breach of approval conditions? Can revocation of project approvals ever be justified?
- how should variation of approval conditions be dealt with if the need arises?
- is an APEC code of best practice for permitting processes required? Would all parties implement such a code? And would it be reliable?

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PART A: THE GLOBAL AND REGIONAL CONTEXT FOR LNG

1. EXPANDING GLOBAL ENERGY DEMAND

Global energy demand is continuing to expand at an increasing rate, driven by global economic growth, industrialisation and urbanisation.

This expanding global energy demand has brought heightened energy security concerns with it, particularly in relation to oil.¹ Year after year, the concerns are intensifying.²

2. THE ADVANTAGES OF NATURAL GAS

Security concerns exist with natural gas too: while there is an abundance of gas reserves globally, the largest undeveloped reserves are confined to two key areas: the Middle East and Russia.³ Proved global reserves are around 60 times the volume used each year⁴ and potential reserves could last as long as 200 years.⁵ However, as supplies in OECD countries run down, consumers may become increasingly hostage to gas supplied by the very large producers – a future that may not be dissimilar to the past 35 years' history of oil supply.

Governments around the world have not just recognised, but have expressed a clear preference for, natural gas as a bridging fuel to take their economies in the direction of cleaner and more sustainable energy systems for at least the next quarter century. Natural gas is universally recognised as providing one of the key transitional responses to the dual challenge of energy security and climate change until the world achieves a hydrogen-based economy.

Natural gas and LNG projects offer clean, reliable, affordable energy value to the entire world.

However, such projects do not happen automatically; they must be nurtured by governments, and developed by companies that are prepared to take on the vast investments and commercial risks.

¹ In APEC economies (which account for 58 percent of world energy demand), self-sufficiency in oil fell from 77% in 1992 to 67% in 2002. It is projected to fall to 38% in 2030. See Australian Bureau of Agricultural and Resource Economics (ABARE) and ResourcesLaw International, "Energy Security in APEC", Report to the APEC Energy Working Group, APEC Secretariat, Singapore, 2005.

² "Energy Supply and Demand Outlook", APERC, Tokyo, Japan, 2006.

³ There is no problem of "peak gas". In 2002, APEC's self sufficiency in gas was 108%. See ABARE and ResourcesLaw International, note 1 above. Note that APEC's self sufficiency is bolstered by Russia, which holds 26.7% of world gas reserves.

⁴ BP Statistical Review of World Energy, London, UK, 2006.

⁵ International Gas Union, "Gas Prospects, Strategies and Economics", 22nd World Gas Conference, Tokyo, Japan, 2003 (Report of IGU Working Committee 9).



3. WHAT IS SPECIAL ABOUT THE LNG INDUSTRY?

The LNG industry was brought into being as a 20th century response to the need to cater for expanding global energy demand, and to shift emphasis for petroleum supply away from the Middle East.

The global market in LNG is unregulated but the market is almost exclusively a construct of bilateral international contracts amongst investors from exporting and importing economies.

Expansion of the LNG market is entirely dependent on investments being made in production capacity, liquefaction capacity, shipping capacity, terminal capacity, regasification capacity and storage capacity. For their part, LNG investors depend on bankers – who in turn depend on LNG customers and end users of gas to provide the assurance of future project revenues.

LNG investment involves high stakes, high risks and long-term investment cycles. The risks of investing in LNG projects are presently being obscured by a surge in demand for LNG, by the current shortage of liquefaction capacity and by the currently high spot prices being paid for surplus (uncontracted) LNG cargoes. This has given rise to a false impression that there is a global LNG commodity market with real arbitrage potential into which any well-intentioned sellers and buyers of gas can easily tap. Although LNG markets are heading in this direction, they are certainly not there yet.

4. CHARACTERISTICS OF LNG MARKETS

In discussing LNG project development issues, there is a need to recognise that many natural gas markets are still immature. It may be decades, if ever, before there will be a true LNG commodity market that resembles the global oil market.

Natural gas is not a fungible commodity like oil:

- there is no international trading room;
- there is no common price benchmark like there is in the United States;
- natural gas can only be traded and transported in bulk;
- cargoes are not interchangeable because of variations in quality requirements in different markets; and
- LNG requires dedicated, purpose-built tanker fleets and highly skilled crews.

As everyone in the LNG industry understands, there is no such thing as an LNG market in the conventional sense: only a contractual market for delivery of bulk cargoes. Long-term “take-or-pay” contracts remain pivotal for upstream LNG project development, as they are for long distance cross-border pipelines. This is the main financial barrier to new projects.

An upstream LNG project developer must first secure a creditworthy, long-term buyer who is capable of “underpinning” the project before the project scope can be finalised and before capital is expended on upstream development. Given the very large volumes

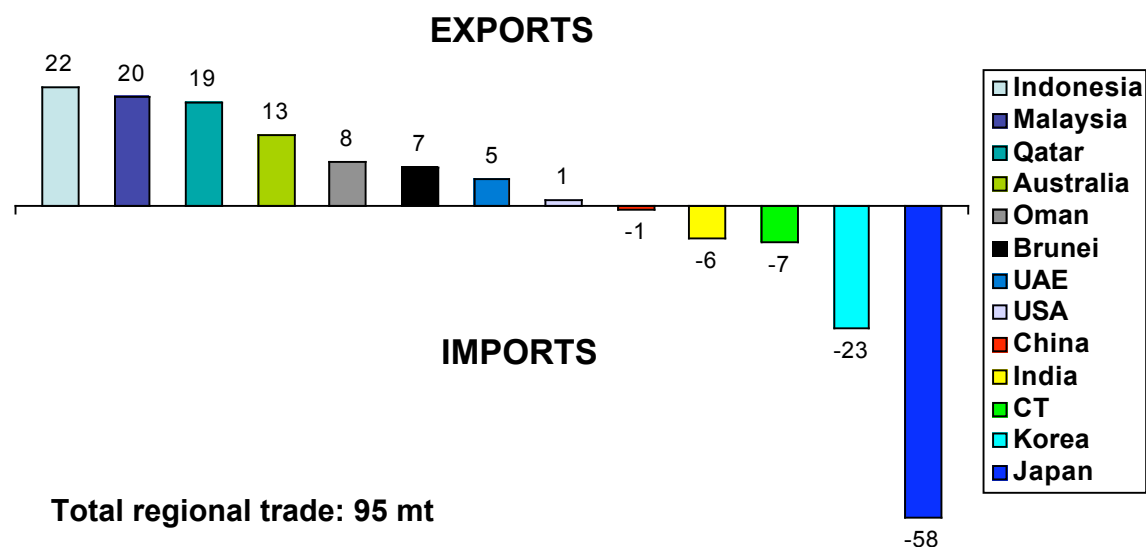


of gas required to sustain a project, the downstream offtaker must have the ability to be able to handle such large volumes and dispose of them into the marketplace in a controlled manner. This typically requires the offtaker to have a suite of customers with varying offtake patterns (both seasonal as well as daily) coupled with sufficient gas storage and sendout systems. Managing the build-up period is a substantial contractual challenge for all parties.

5. THE ASIA-PACIFIC LNG MARKET

There are two largely discrete, regional LNG markets in the world: the Asia-Pacific and the Atlantic Basin markets. In Table 1 below, global LNG trade flows in 2006 have been dissected to depict LNG exports and imports in the Asia-Pacific market.

Table 1: LNG Exports and Imports in the Asia-Pacific Market 2006 (mt)



Source of data in this table: BP Statistical Review 2007. All figures are rounded to the nearest million.

The above bar chart shows eight exporting economies trading with five importers.

Looking at imports below the horizontal line, the most significant features are that:

- the Asia-Pacific market continues to rely on Japan and Korea together for over 80% of total imports
- the US is not an importer from the Asia-Pacific market although in 2006 it imported 12 mt from the Atlantic Basin market



- China commenced taking deliveries at its first terminal in Guangdong in 2006.

Looking at exports above the horizontal line:

- Qatar (third from the left) has overtaken Indonesia (first on the left) as the world's biggest exporter (the chart does not show Qatar's exports to the Atlantic Basin market). The competitive edge that Qatar holds as the swing supplier to both the Asia-Pacific and Atlantic Basin markets (in terms of both volume available and geography) is clear.

How will the chart look in another five years? The short answer is that it **could** be very different but it will not be different unless additional capacity comes on line.

6. THE NEED TO ADD CAPACITY

Cross-border trade in natural gas is inextricably intertwined with the requirement to install costly production, liquefaction and transportation capacity. Substantial additional capacity is urgently needed in both importing and exporting economies.

Following a study commissioned by the APEC Energy Working Group in 2004, it is now accepted by APEC member economies that massive investment in new infrastructure is a prerequisite for the expansion of cross-border natural gas trade.⁶ However, in 2006 and so far in 2007, not a single new LNG project anywhere in the world has reached final investment decision.

The problem is multi-fold and includes (1) access to quality resources, (2) stable fiscal and regulatory regimes, (3) project approvals processes (4) export capacity, (5) import capacity, (6) adequate customer commitments for offtake and (7) rising costs and shortages. However, the focus of this paper is on investment in import and export capacity.

(a) Import Capacity

We can speculate how the import side of the market is likely to evolve:

Japan, with most of its needed downstream infrastructure already installed, is in an advantageous position to negotiate offtake deals with new project developers. Japan is likely to maintain a dominant position.

China is planning to install new LNG receiving terminals and gas distribution systems. The first started operations in Guangdong in 2006, one other is under construction and at least seven others are under active consideration. China could become as large an importer as Korea over the next 10 or 15 years if this capacity is installed.

Korea and Chinese Taipei are both likely to increase their import volumes in the coming years.

India is likely to become a major importer, although the bulk of its supply is likely to

⁶ ResourcesLaw International, "Great Expectations: Cross-Border Natural Gas Trade in APEC Economies", Report to the APEC Energy Working Group, APEC Secretariat, Singapore, November 2004.



come from the Middle East.

In **North America**, three receiving terminals have been approved or are under construction on the West Coast (one in Canada and two in Mexico). In the US itself, there are proposals for six others but there is strong public resistance to new terminals.

Chile may also become an importer by about 2012.

(b) Export Capacity

We can also speculate how the export side of the market is likely to evolve.

The presently installed liquefaction capacity in APEC economies is summarised in table 2 below.

Table 2: APEC Liquefaction Capacity

Economy	Project	Trains	Capacity (mtpa)
Indonesia	Arun	3	6.5
	Bontang	8	22.25
Malaysia	Bintulu	8	23.0
Australia	North West Shelf	4	11.7
	Bayu-Undan	1	3.6
Brunei	Lumut	5	7.2
USA	Kenai	1	1.4
Totals		30	75.65

Qatar poses a major competitive challenge to APEC exporters. Qatar already exports to both the Asia-Pacific and Atlantic Basin markets). It plans to export over 77 mtpa by 2010, with a third of this volume likely to go to Asian buyers. The RasGas project in Qatar recently commissioned train 5 with a capacity of 4.75 mtpa and has commenced construction of trains 6 and 7 with a combined capacity of 15.6 mtpa. These will be the largest LNG trains ever built and they are scheduled to come on stream in 2008 and 2009 respectively. Qatar has been helping Indonesia meet its export commitments. Qatar's main problem is distance from markets, but it has the advantage of very cheap feed gas to balance its higher transportation costs.

Russia's energy export strategy envisages Russia exporting 8.4 mtpa of LNG into the Asia-Pacific market by 2010, 13.9 mtpa by 2015 and 18.25 mtpa by 2020. Russia's strategy also involves exporting another 18.25 mtpa by pipeline to China and Korea by 2020.⁷

In **Indonesia**, the new Tangguh LNG project in Papua is on track for completion to meet

⁷ Vladimir Saenko, "Energy Policy in Russia and the Impact on Trade in Natural Gas", APGAS Forum 2006, Perth, Australia, 31 August and 1 September 2006, www.apgasforum.com.



its first market delivery in 2007. Its initial two trains will produce 7.6 mtpa. The Tangguh site is capable of supporting up to another six trains if reserves permit and the market demands.

Australia has two operating LNG Projects that are capable of further expansion: the North West Shelf project (presently being expanded to 15.9 mtpa) and the Bayu-Undan project. Table 3 shows 6 other Australian projects on the drawing boards.

Table 3: Proposed Liquefaction Projects in Australia

Project	Capacity (mtpa)
Gorgon	10
Pluto	6 potentially expanding to 12
Pilbara	6 – 10
Ichthys	7.6 potentially expanding to 11 or greater
Browse	7 – 14
Sunrise	5 – 10

Peru has embarked on its first 4.4 mtpa LNG project, with an intended completion in mid-2010.

Papua New Guinea is presently considering two potential LNG projects.

7. RISING COSTS AND SHORTAGES OF SKILLS AND MATERIALS

The current major challenges for LNG projects are rising costs and the shortage of skills and materials. Capital costs in the oil and gas sector have risen worldwide by over 50% in the last two year, by 30% in 2006 alone.⁸ According to Bechtel, the cost of building LNG plants has trebled over the last 6 years. For some projects, costs have doubled in the last 18 months.

The skills and materials shortage in some economies is being partially addressed by utilising overseas fabrication facilities and using modular construction techniques. Overcoming the blow-out in costs and the shortage of skills and materials will take time. Projects may be delayed, put on hold or even abandoned. In this environment, brownfield LNG projects that can be expanded will have an advantage over greenfield projects.

The scale and cost of LNG projects and the need for very substantial front-end expenditure on feasibility studies, engineering and design, makes them large immovable targets for objectors. Time is money and completion delays can be very costly.

There is very little, if anything, that governments and regulatory bodies can do about rising costs but there is much that governments, regulatory bodies and investors can do together to address the project delivery challenge.

⁸ Cambridge Energy Research Associates, CERA Week Conference, Houston, USA, 15 February 2007.



PART B: THE PROJECT DELIVERY CHALLENGE: OVERCOMING PROJECT APPROVAL UNCERTAINTIES AND DELAYS

1. WIDE DIFFERENCES IN PROJECT APPROVAL REGIMES AND WIDE REGULATORY LATITUDE

The regimes for granting of project approvals vary widely from jurisdiction to jurisdiction, especially in those economies which have a federal system of government. The approvals process in most economies also requires the involvement of multiple agencies and regulatory authorities, some with overlapping responsibilities.

As a general observation, there appears to be too much scope to negotiate with governments and regulatory authorities over the terms of environmental and other project approvals. Flexibility, reasonableness and common sense are of course always appreciated. However, a lack of standards and overly wide regulatory latitude in any industry give rise to risk and uncertainty for investors.⁹

2. OBJECTORS

Certainly, not all of the responsibility for project approval problems and delays lies with governments. A range of other parties may object to projects, seek to influence outcomes and apply to the courts if any procedural discrepancy occurs. Objectors may include:

- affected communities
- project opponents (people who object, usually on safety, security or aesthetic grounds)
- opportunists (people who object in order to win a benefit for themselves)
- environmental activists and NGOs¹⁰ and
- NIMBY (“not in my backyard”) complainants.¹¹

3. UNCERTAIN ENVIRONMENTAL CONDITIONS

Uncertain environmental conditions can increase completion risk and jeopardise investments.

An example of the difficulties that can arise was the recent dispute between the Russian

⁹ “A common business concern with approval processes is that there is too much latitude for government agencies to make decisions that are beyond the scope of the regulations or are driven by political influence”, Australian Productivity Commission Research Report, “Performance Benchmarking of Business Regulation”, Melbourne, Australia, 19 February 2007.

¹⁰ For a recent example of successful environmental activism in Australia, see the Anvil Hill Mining case: Gray v. Minister for Planning [2006] NSWLEC 720.

¹¹ For example, the Cabrillo Port decision in California.



Government and Sakhalin Energy Investment Co over whether the State Environmental Expert Review approval of the Sakhalin II Project had been invalidated.¹² Eventually, the dispute was settled on confidential terms, but Gazprom emerged as a majority shareholder in the project company.

4. UNCERTAIN CO₂ EMISSION STANDARDS

A specific environmental difficulty often arises from the fact that there are no internationally accepted limits, either in percentage or absolute terms, for allowable CO₂ emissions. Few are suggesting that standards should not be set – but everybody would like to know what the standards will be. Without a high level of certainty, risk management is impossible and investment will suffer.

In **Australia**, LNG projects are required to reduce emissions to the “maximum extent practicable”.¹³ The factors that will satisfy such a highly subjective test are both technical and economic and are a matter for negotiation on a case-by-case basis.

In **Indonesia**, it is reported that the Tangguh LNG project was approved by environmental authorities and financed by the multilateral lending banks without being required to reduce emissions. In this case, it was accepted that natural gas produced by the project would displace coal as a fuel for power generation and this was to the benefit of the environment, the government and investors.

Hanging over all proposed projects is a cloud of regulatory uncertainty about the actions that governments may take about climate change.¹⁴ Although climate change is a global problem, abatement action in individual economies will necessarily differ because of the unique circumstances of each economy. Each economy has different:

- resource endowments (oil, natural gas, coal, hydro)
- resource import dependency
- affordability
- patterns of use
- infrastructure
- transportation systems and
- regulatory systems.

Depending on its particular circumstances, each economy could impose some combination of penalties, carbon taxes, emissions trading systems or arbitrary restrictions on particular domestic activities. The last could include mandatory renewable energy levels, restrictions on particular forms of power generation such as coal-fired,

¹² See the documents available on the company website www.sakhalinenergy.com.

¹³ Guidance Statement for Minimising Greenhouse Gas Emissions, WA Environmental Protection Authority, Perth WA, 14 October 2002.

¹⁴ In September 2006, the APGAS Forum in Perth identified confusion and uncertainty over climate change as a major impediment to new projects, see the Official Recorder's Report, “A Destiny That Cannot Be Assumed”, APGAS 2006, www.apgasforum.com.



nuclear or hydroelectric power generation, mandatory use of biofuels, or statutory requirements for vehicle design. Uncertainty around any of these regulatory risks will impact on international energy trade and investment.

Industry needs to have a widely-understood, transparent and predictable way of pricing carbon in order to make investment decisions.

5. DOMESTIC MARKET OBLIGATIONS (“DMOs”)

The latest project approval problem to emerge is the imposition of DMOs. This is a phenomenon which is hitting gas markets around the world.

Countries and states that have introduced a gas DMO include Venezuela, Bolivia, Argentina, Algeria, Russia (via the Single Channel Export Law), Indonesia and the State of Western Australia. As well, Nigeria, the State of Alaska, Kazakhstan and others are considering such policies.

The characteristics that are common to these areas are:

- a large gas resource base
- a local market that is either under-developed and/or is distorted by low-priced, government-regulated gas or other government forms of intervention and
- producers with an alternative market outlet (LNG or pipeline gas) which offers a substantially higher return than the domestic market.

6. DISCRETIONARY GOVERNMENT POLICIES

The State of Western Australia has imposed what it calls a “flexible” requirement to set aside up to 15% of offshore gas reserves, for future domestic use in the State, as a condition of access to State land for the construction of processing facilities.

Investors have difficulty with discretionary government policies for three main reasons:

- the first is that they do not bind governments
- the second is that they can be changed overnight at governmental whim: today’s 15% could be tomorrow’s zero or 30%
- the third is that they can be applied indiscriminately: one company could win a deferral for five years whilst another might not.

Investors prefer the rule of law, whether it is a law that confers enforceable legal rights or a law that imposes enforceable legal obligations.

Clear development rules, standards and procedures should be framed in order to reduce uncertainty for LNG investors, particularly uncertainties over access to resources and timing. Whatever rules and standards are adopted must bind all parties: governments, industry and the community.

Policies or procedures that provide for discretionary treatment of project development



applications in any industry should be replaced by clear and legally binding rules or, if the rules cannot be stipulated in advance, by transparent and efficient conflict-resolution procedures. If a regulator is given the right to give or withhold a project approval, the process of doing so, including the tests to be applied, must be transparent.

Timeliness, reasonableness and consistency must be observed in the regulatory process.

Discretionary policies can enable a government to hold LNG investors hostage until they negotiate terms that the government accepts. Any governmental approval system that depends on negotiating trade-offs on a case-by-case basis is not an approval system at all; it is simply bad practice that is ripe for irregularity and inequitable treatment.

7. TIMING AND THE NEED FOR LEGAL ASSURANCE

With LNG project development, timing is everything. Domestic political issues, a lack of appreciation of the pivotal role of long-term relationships with reliable customers, and uncertainty over environmental and project approval standards, are unnecessarily impeding the massive long-term investments that are required to expand liquefaction capacity. As a consequence, the global market for LNG is at risk of distortion.

Investors are looking for more than just a right to negotiate with governments – the very high front-end costs warrant more than that. A legally enforceable right to develop a project is what they require before they can be expected to expend hundreds of millions of dollars in front-end costs.

Differences over unresolved issues should be capable of reference to an arbitrator with a mandate for speedy resolution.

Investors need legal assurance at the earliest possible stage that their projects can go ahead subject to compliance with appropriate and ascertainable environmental and other standards. This will reduce front-end risk for the investors and will accelerate project development for the exporting economy.

8. APEC BEST PRACTICE PRINCIPLES

In June 2004, APEC Energy Ministers met in the Philippines and affirmed that APEC economies should move towards best practice in the development of LNG trade. Ministers endorsed a set of 17 best practice principles including the three principles set out below.



Permitting Processes and Regulatory Issues

1. Economies should develop clear, transparent, non-discriminatory, coordinated and timely **project approval processes** for permitting LNG facilities, including providing justifications for decisions.
2. Where appropriate, economies should consider the potential for making available **government-owned land** for the siting of LNG infrastructure (e.g. receiving terminals).
3. Economies should share **information on LNG-related regulations, standards and quality specifications** and, to increase the flexibility of LNG trade, consider ways to further their harmonization.

APEC economies are bound together by consensus and mutuality of interest – not by any legal treaty. Each economy will have its own way of interpreting these principles but it is clear that all member economies wish to improve their respective investment regimes and investment climates.

An important question that is now exercising the minds of both governments and investors is whether the APEC best practice principles should be codified and whether this would effectively lower domestic barriers to project development.

There appears to be a need to harmonise APEC policies with other major global gas markets such as the EU (the Second Gas Directive) and the US. As the LNG market becomes increasingly global, and cargo diversions become more common, uncompetitive regulatory regimes in the APEC region will only encourage the growth in supply from non-APEC sources such as the Middle East, and arbitrage will only serve to push gas supplies in the direction of other, more open markets.

All of these issues will be high on the agenda when APGAS meets in San Diego on 17/18 September 2007.

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For details of the APGAS Forum in San Diego, visit www.apgasforum.com

