

5th IEF-IGU GAS MINISTERIAL GAS FORUM

NEW DELHI • INDIA

GAS FOR GROWTH: IMPROVING ECONOMIC
PROSPERITY AND LIVING STANDARDS



• GLOBAL GAS MARKETS SUPPORTING GROWTH AND SUSTAINABILITY •



EXECUTIVE SUMMARY

CLEAN

As the cleanest burning fossil fuel, natural gas is well positioned to play a growing role in the world's future energy mix. When used in place of higher-emitting coal and oil, natural gas can help reduce global greenhouse gas emissions, improve air quality and provide access to affordable and clean energy in rich and poor countries alike.

INTERCONNECTED

Gas markets around the world are increasingly interconnected, and low-cost floating regasification technology allows a growing number of countries to quickly tap into the global LNG trade. Thanks to an unprecedented wave of investment in new LNG export capacity, the rapid expansion of global natural gas trade is set to continue through 2020 and beyond. The global gas market has entered a period of abundance with lower gas prices across the main importing regions. To benefit from a buyer's market, prospective natural gas importers will have to invest in new infrastructure, including regasification terminals, pipelines, electricity networks and gas-fired power plants.

MARKET LIBERIZATION

Natural gas is thriving mainly due its intrinsic advantages as a relatively clean, versatile, and abundant fossil fuel. But further market liberalization, greater gas-on-gas competition and a strong carbon price signal could accelerate gas' growing share in the future energy mix and provide public policy benefits. A relatively high and predictable carbon price would facilitate longer-term substitution of coal in particular. But even where carbon pricing exists, price levels are often too low to influence fuel choice or investment decisions.



GAS FOR GROWTH & SUSTAINABILITY

Natural gas, the cleanest burning fossil fuel, is set to play a growing role in the future global energy mix. According to the International Energy Agency (IEA), natural gas is the only fossil fuel that will see its share in the primary energy mix increase by 2040 even under the 2C scenario. This favorable outlook is underpinned by the recognition that burning coal to satisfy global energy demand is incompatible with our climate goals and presents serious air quality problems globally and particularly in developed and developing countries alike.

Using natural gas instead of coal can reduce CO₂ emissions by about half, when methane leakage is controlled, and NO_x emissions by about 80%, while almost completely eliminating SO_x and particulate matter emissions associated with coal burning. In several of the world's leading economies, switching from coal to gas remains the easiest, cheapest and most readily available medium-term lower carbon option. Nonetheless, strong policies towards renewables while not adequately taking into consideration or placing an appropriate price on carbon have often meant countries favor cheaper coal and greener renewables, with gas squeezed.

In comparison to low carbon energy sources, gas requires no subsidies from taxpayers—as has not been the case thus far with renewables in all but the sunniest and windiest locations—or extensive government backing and loan guarantees like nuclear investments typically do. There are cases, however, where inefficient fossil fuel subsidies do exist, and these should be phased out. On the other hand, natural gas is often considered the best complement to renewable energy sources in power generation. Efficient modern gas-fired power plants can ramp up and down very quickly, which makes them ideally-suited to balance intermittent wind and solar generation in the electricity system.



Gas can also facilitate access to cheaper and cleaner energy in places as diverse as the US Northeast, where a substantial number of households continue to rely on heavier carbon content and more expensive heating oil due to the lack of gas pipeline infrastructure, and Sub-Saharan East Africa, where recently discovered natural gas reserves can displace expensive and inefficient diesel generators and fuel the region's booming economies in a sustainable way.

Gas is becoming increasingly accessible from diversified sources worldwide. Thanks to the proliferation of low-cost floating regasification terminals (so-called floating storage and regasification units, or FSRUs), even small importers like Lithuania can quickly and easily tap into the global liquefied natural gas market, often on a seasonal or "on-demand" basis. In 2015 alone, four new countries entered the club of LNG importers, and three of them—Egypt, Jordan and Pakistan—are using FSRU technology. Access to the global LNG market—and a large number of potential suppliers—can also provide substantial energy security benefits, particularly for those countries that are highly dependent on pipeline gas from a single source. Poland and Lithuania built LNG import terminals with the specific purpose of diversifying their energy supplies and strengthening their hands in negotiations with Russia, the dominant gas supplier for both countries.

For the developing and energy poverty regions, greater access and use of natural gas creates significant improvements to the quality of life and drives economic development. Use of gas or LPG for cooking leads to reduced indoor air pollution and thus rapidly and significantly improves health and environmental indoor conditions. In these regions of expanding infrastructure, it is easier to integrate gas as a transportation fuel for passenger, return to base fleets and heavy transport including marine applications.

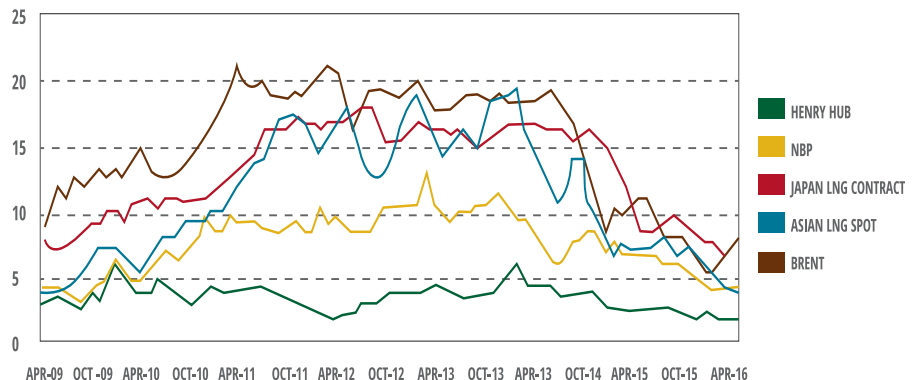


The global gas market is undergoing a period of rapid and promising transformation. Global natural gas trade doubled in the period between 2000 and 2015, and global LNG trade increased about 2.5-fold over the last 15 years, according to the BP Statistical Review of World Energy. The rapid expansion of natural gas trade—mainly driven by LNG—is set to continue. The International Energy Agency’s World Energy Outlook anticipates inter-regional gas trade to increase by a third between 2015 and 2021, and global LNG supply will rise by 45% in the same period, as an unprecedented wave of new LNG export capacity enters service in the US and Australia.

REGIONAL GAS MARKETS, NEW PROSPECTS FOR TRADE & INTEGRATION

Thanks to the rapid expansion of global natural gas trade and the emergence of new, flexible sources of LNG supply, gas markets around the world are increasingly interconnected. As the new supply wave started to hit the market from 2015, gas prices around the world have started to converge and remained considerably lower than during the 2011-2014 period. Due to the unique flexibility embedded in American LNG contracts, the ramping up of US LNG exports will especially contribute to global gas market liquidity, and continuing price convergence across gas consuming regions around the world.

Figure 1. Gas Prices in Asia, Europe and the US (\$ per MMBtu)



Source: IEA Medium-Term Gas Market Report 2016



In the period between 2009 and 2015, US and Australian project developers alone made final investment decisions on LNG export projects representing about \$250 billion in capital investments. But as demand struggles to keep up with supply growth and buyers remain reluctant to sign new long-term gas contracts in the midst of the current price environment, the outlook is increasingly uncertain for planned LNG projects in Canada, East Africa and other prospective LNG exporting regions. The current slowdown in the sanctioning of new LNG projects—if sustained for too long—may well set the stage for another underinvestment cycle in LNG export capacity, especially if markets begin to tighten sooner than the majority of forecasters currently expect to happen sometime in the first half of the next decade. The IEA warned in the 2016 edition of the agency's Medium-Term Gas Report that a protracted investment shortfall could sow the seeds for tighter markets in the next decade. The exact timing will depend on a number of factors including the number of new final investment decisions in 2016-2017, the demand response to lower prices, and supply risks affecting existing supply.

Before the next tightening phase sets in, gas-consuming countries around the world are well advised to seize the opportunity of lower natural gas prices. To take advantage of a temporary buyers' market, some of the world's fastest-growing potential markets for natural gas (including India, China and other growth economies) need to invest in new regasification terminals, gas pipelines, transmission networks and gas-fired power plants. Apart from local gas utilities and national energy companies, sellers of LNG also increasingly participate in developing downstream gas markets themselves, for example by investing directly in regas terminals and power projects in gas importing countries.



To facilitate the development of efficient and competitive gas markets around the world, governments should take further steps towards the liberalization of their respective gas and electricity markets. The development of one or more gas trading hubs and efficient spot natural gas markets in Asia can also ensure that prices are transparent and reflect the fundamentals of supply and demand at all times. To ensure these fundamentals are driven by regional gas market dynamics rather than by the market dynamics of another unrelated commodity (such as crude oil or refined products), governments should also continue to facilitate gas-on-gas competition and continue to shift away from oil indexation in gas pricing.



POLICY TRENDS FOR INVESTMENT ACROSS REGIONS

Carbon pricing—in the form of carbon taxes or emission trading schemes—has been slowly gaining ground around the world. According to the World Bank's latest annual survey, carbon pricing (under various national, regional and city-level schemes) was used in as many as 40 countries in 2015, twice as many as in 2012. The share total of emissions covered by various carbon pricing schemes has grown three-fold over the last decade, according to the same survey, now covering about 12% of global greenhouse gas emissions.

But in most parts of the world (including in the European Union's Emissions Trading System, the biggest carbon market in the world), carbon prices remain far too low to provide a meaningful price signal to market participants, let alone to influence long-term investment decisions in the energy sector. One of the few exceptions to this general rule is the United Kingdom, where a carbon price floor (on top of the EU ETS carbon price) has been sufficient to incentivize meaningful levels of coal-to-gas switching in the power generation sector since 2013.

Elsewhere in continental Europe, per-ton carbon prices remain in the low single digits, too low to have a measurable impact on fuel choice or to accurately reflect the social costs of emitting CO₂. The proposed reform of the EU-wide emissions trading scheme appears too little, too late, and the adopted measures are not expected to deliver meaningful carbon price levels in the foreseeable future. Given the resistance of EU officials and some EU member states to the introduction of a similar price corridor at the EU-level, unilateral actions by individual member states may be the best hope of strengthening the carbon price signal in continental Europe. France's recent proposal to introduce a 30-euro (\$33.5) carbon price floor or carbon tax to curb coal-fired generation is a step in this direction.



The waxing and waning of political commitment to implement carbon pricing schemes in major economies outside Europe have not inspired much confidence among energy investors so far. Japan planned to introduce a nationwide cap-and-trade scheme, but abandoned the idea in 2010, although Tokyo and the Saitama prefecture introduced sub-national emissions trading schemes starting in 2010 and 2011, respectively. The Japanese government is now reportedly once again considering a national-level carbon cap as a means to achieve the country's climate commitments made in Paris. Australia implemented a relatively ambitious carbon tax in 2012, but Tony Abbott's government only two years later abolished the scheme. After a failed campaign to introduce a nation-wide carbon tax in Canada in 2008, the current government now appears determined to introduce a national carbon tax, despite opposition from some of the provinces.

Carbon taxes or cap-and-trade schemes (ideally with price corridors and predictable ranges) are recognized as the economically most efficient ways to bring down CO₂ emissions. These are the so-called "first best" solutions to the climate problem. Industry participants also tend to favor clear, transparent and predictable carbon prices over costlier and intrusive top-down or "command-and-control" policy measures, as evidenced by the fact that some of the world's largest oil and gas companies are now actively advocating for carbon pricing.

In countries where carbon pricing is not politically feasible, other policy measures can be similarly effective—and even beneficial to gas—in the short term. Modeling shows, for example, that U.S. natural gas demand over the medium term is higher under the Obama Administration's Clean Power Plan regulation of the power sector than it would be without it. But command-and-control policy measures that directly influence fuel choice more are generally less cost-effective.



POLICY SUPPORT

To continue to play a prominent role in the future energy mix—and contribute to a more sustainable energy future—natural gas requires a balanced playing field from policy makers.

Four sets of policies could accelerate the growth of natural gas in the coming decades.

- First, a strong and predictable carbon price signal would support gas (and zero carbon energy sources) against higher carbon emitting fuels in most major economies around the world. At a minimum, a strong carbon price must be taken into account in government policy decisions.
- Second, continuing market reforms could ensure that gas supply and demand responds to clear and transparent market price signals, and that natural gas is traded in an increasingly deep and liquid global market (much like crude oil). Japan's recent deregulation efforts illustrate the type of policy changes needed to create more competitive domestic gas and power markets.
- Third, continued support for free trade in LNG remains critically important to enable gas to flow freely around the world, especially in the face of growing calls for protectionism on both sides of the Atlantic.
- And fourth, the industry would benefit from a more stable and predictable regulatory approach, especially for unconventional gas production, which is increasingly controversial and the target of environmental opposition from the United States and United Kingdom to Colombia and China.