

# DYNAMICS OF NATURAL GAS PRICING: THE CRITICAL NEED FOR A NATURAL GAS HUB IN SOUTH ASIA

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by Maha Kamal

*This paper will examine three main pricing mechanisms for gas contracts: oil-indexation, gas-gas competition and netback from final product (e.g. prices linked to Ammonia etc.) in light of the gas contracts in this region that are oil-indexed or linked to oil prices. It will analyze the long term viability and competitiveness of this mechanism for South Asia and discuss natural gas demand in South Asia, conventional and unconventional sources of Natural Gas, as well as the effects of geopolitics in the region on Natural Gas contracts. Remaining cognizant of these developments, this paper proposes the creation of a new natural gas trading hub in South Asia.*

## INTRODUCTION

The natural gas market in the Asia-Pacific region is seeing great changes, as markets like Japan and South Korea mature and newer markets like India look towards different gas pricing mechanisms. As new players enter the market, existing literature on the subject indicates the need for greater competition and a break from old pricing mechanisms linked to oil. One of the most prolific experts on international gas pricing, Jonathan Stern, wrote that while hub pricing may be a solution for some markets, this solution may be unique for different countries: “In Asia, there is no reason to expect China and India to adopt price mechanisms identical to those of Japan and Korea.” Similarly, the International Energy Agency proposed a new gas pricing hub in Asia, saying that a mature natural gas market may need more transparency.

The global natural gas market has seen many changes that have influenced the supply of natural gas, such as the Shale Gas Revolution in North America, the Fukushima disaster, Japan’s increased demand for liquefied natural gas (LNG), and new entrants in the natural gas market through unconventional gas (shale

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gas, tight gas, coal bed methane etc.). While the Henry Hub in the U.S. is seeing prices in the range of \$2-4 per MMBtu (million British thermal units, a unit for the heating value of natural gas), LNG prices in Asia have been as high as \$18 per MMBtu in peak demand seasons. As global oil prices fell from their peak price of \$115 per barrel in June 2014, the volatility of the oil market has been greater than the natural gas market. As the natural gas market continues to diverge from the oil market, oil-indexed contracts no longer reflect the realities of the natural gas market.

This paper examines the pricing mechanisms in Europe and the Asia-Pacific region, and analyzes oil-indexed contracts in comparison to gas-on-gas trade. It will then analyze the long-term viability and competitiveness of this mechanism for South Asia, and discuss natural gas demand in India and Pakistan, the two biggest natural gas markets in South Asia. Lastly, it looks at the geopolitics of natural gas for South Asia and the impact of some interesting changes that have not yet been explored in the literature.

This paper proposes the creation of a new natural gas trading hub in South Asia, to promote the liberalization of natural gas markets in South Asia, particularly in light of new political factors such as the Iran nuclear deal of 2015, the China-Pakistan Economic Corridor (CPEC) and the U.S. exit from Afghanistan. It concludes that this may conservatively take more than a decade to develop since the evolution of natural gas pricing mechanisms took more than five years in Europe, and are projected to be longer for more mature Asian markets. South Asia as a whole is still a new entrant in the global natural gas market, and regional politics greatly influences infrastructure developments. However, this paper will argue for South Asian nations to work towards the creation of this natural gas trading hub, in order to a) reduce the impact of oil price volatility on South Asian economies; b) increase competition in the natural gas market; and c) promote regional integration through greater trade.

#### GLOBAL NATURAL GAS MARKETS ARE CHANGING

As global oil prices fell from their peak price of \$115 per barrel in June 2014 (see figure 1), importing natural gas indexed to oil could not remain economically viable for oil-importing countries. With oil prices falling at a slower rate than natural gas prices in some hubs, old pricing mechanisms linked to oil were no longer competitive.<sup>1</sup> Since the ease of the global financial crisis in 2009, oil prices have steadily decreased. The average Brent Crude price peaked in 2011 at \$117 per barrel, and fell roughly \$17, to average \$98.95 per barrel in 2014. With high volatility in 2015, average oil prices may be lower than 2014 prices at the time of this paper's publication. In contrast, natural gas markets are evolving in

response to increased supply from shale gas, new LNG export terminals coming online, and expansion of LNG supply (for example, Papua New Guinea entered the market in 2014).<sup>2</sup>

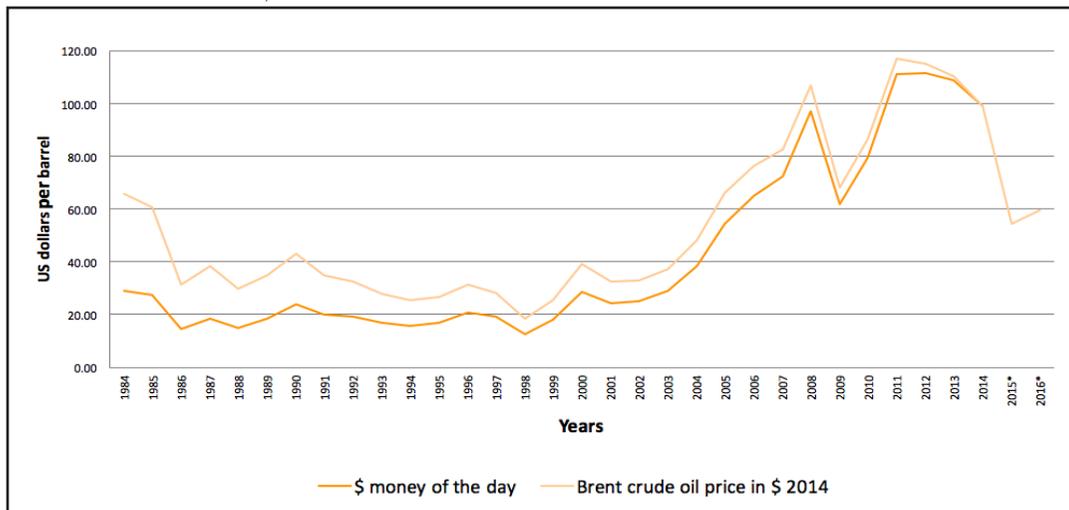


Figure 1: Crude oil prices 1984-2014 (Source: BP Statistical Review of World Energy 2015. \* denotes source EIA Short-term Energy Outlook August 2015)

Production and consumption of oil increased by a greater percentage than that of natural gas, and while this may have multiple factors, the effects of plunging oil prices on shale gas production cannot be understated, and may become even more pronounced post-2015. Once prohibitively expensive, hydraulic fracturing has been economically viable since 2009, and contributed to the shale industry’s growth until June 2014, when falling prices affected the competitiveness of shale oil. As Figure 1 shows, from 2013 to 2014 the production rate of both natural gas and oil was greater than the consumption, which signals an imbalance in demand and supply.

Before the discussion progresses to the nature of natural gas markets, and before we delve into the specifics of natural gas pricing, it is crucial to discuss some types of natural gas contracts and pricing mechanisms. Their implications for South Asia will be explained in later sections, but this brief overview will be essential to understanding natural gas trading hubs and why they will be important for South Asia.<sup>3</sup>

Traditionally, as a result of the heavy infrastructure and financial commitments required for natural gas project development, natural gas contracts were of a long-term nature. This can be more clearly understood through Stern’s idea of “crisis of fundamentals.”<sup>4</sup> He presents a distinction between “economic fundamentals”—referring to “the cost of developing and delivering domestic or imported gas to end-users”—and “market fundamentals,” defined as “the price of gas, compared with the price of market substitutes.”<sup>5</sup> This reflected the

idea of “price risk,” that the determined price would commensurate for the investment by the seller, and the “volume risk” that the buyer would be able to sustain a natural gas market large enough for the commitments in the contract.<sup>6</sup>

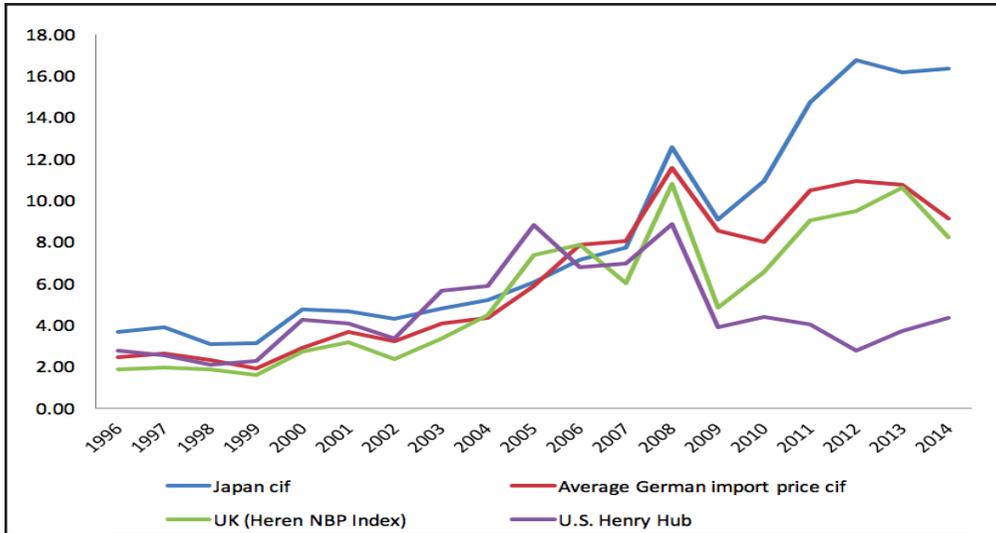


Figure 2: Natural Gas Prices 1996- 2014 in \$ per MMBtu (BP Statistical Review of World Energy 2015)

In some contracts, price review or price re-opener clauses aim to minimize price risk, which allows the price to be revisited through future negotiations. Similarly, the volume risk is diminished by the “take or pay” clauses, an almost ubiquitous feature of long-term contracts that subjects the buyer to penalties if they do not take the agreed quantity of gas. It is interesting to note that long-term contracts in South Asia, such as the Iran-Pakistan agreement, the Turkmenistan-Pakistan-Afghanistan-India (TAPI) agreement, and even India’s LNG deal with Qatar’s Rasgas have all featured the “take or pay” clause.<sup>7</sup> The implications of this and other liabilities are discussed in later sections. Much of the details of these contracts remain hidden from the public eye because of commercial confidentiality. Sellers of natural gas included upstream gas developers and their affiliates or gas aggregators, and more recently, trading companies for the LNG spot market.<sup>1,8</sup> In new natural gas markets, long-term contracts started and stimulated the growth of the new gas industry, especially the LNG industry, which required heavier investments.<sup>9</sup>

With the evolution of the LNG spot market, the natural gas market has become more competitive and reduced the need for collaterals. The majority of contracts in the Asia-Pacific region continue to be linked to oil, particularly the

<sup>1</sup> Upstream is a commonly used term in the oil and gas industry to refer to the exploration and production of oil and gas. According to Inkpen and Moffett, in the LNG industry it refers to exploration, development, and production. (Andrew C. Inkpen and Michael H. Moffett, *The global oil & gas industry: Management, strategy & finance* (Pennwell: Tulsa, 2011).

Japan Crude Cocktail and Brent oil price indices. Both are popular choices for sellers, but a truly in-depth discussion of every pricing mechanism is outside the scope of this paper. Regional gas prices have seen a far greater spread than oil prices, a phenomenon clearly visible in Figure 2, which shows natural gas prices from 1996 to 2014.

Until 2009, natural gas price trends were similar. At that time, the shale gas revolution brought down U.S. natural gas prices significantly, while demand in Japan increased post-Fukushima. The demand for nuclear energy has fallen since then, yet LNG prices remained indexed to the “Japan Crude Cocktail” (JCC), an oil index connoting the average price of Japan’s crude oil imports.<sup>10</sup> The average price that Japan paid for its natural gas imports reached \$16.75 per MMBtu, which stands in sharp contrast to the lowest price of the Henry Hub in 2012, which was \$2.76 per MMBtu. Thus in 2012, Japan paid on average 84 percent more for the same unit of gas. Once oil prices started tumbling in 2014, production of shale oil and gas slowed. Pressure on the global supply side, among other factors, brought LNG spot prices up from 2012 prices. Japan, as the world’s largest importer of LNG, buys from a diverse mix of exporters, including Australia, Qatar and Malaysia.<sup>11</sup> It remains bound to its old oil-indexed long-term contracts, though the country has tried to increase its share of U.S. LNG with the hope of better prices.<sup>12</sup>

Interestingly, European markets also showed a downward trend in gas prices after 2013, consistent with the literature on the region on the effects of liberalized markets in Europe, and the development of natural gas trading hubs in that region.<sup>13</sup> Newer pricing mechanisms emerged out of energy regulation and greater competition. Regulatory mechanisms have allowed more third party access, ownership unbundling, and greater liberalization of the market. Natural gas trading hubs have emerged, prices have become more transparent and accessible due to the internet, and the public has greater access to information.<sup>14</sup> As gas sellers began to lose their monopoly in the natural gas market, they had to pay more attention to buyer demands for transparency in pricing. Greater access to information meant that “exclusivity” was weakened as buyers gained access to other sellers. If one seller was charging high natural gas prices linked to high oil prices, the buyers could seek lower prices that were more reflective of the natural gas market. “Market fundamentals” were moving closer to hub prices.<sup>15</sup> As the gas market in Europe matured, gas pricing mechanisms began to clear, reflecting both the market fundamentals and the diverse nature of the sellers and buyers.

AN EMERGING NATURAL GAS MARKET IN SOUTH ASIA WILL NEED BETTER PRICING MECHANISMS

Natural gas is commonly viewed as a transition phase while the world moves towards cleaner energy sources. Multiple studies show that natural gas is much cleaner than oil and coal.<sup>16</sup> In fact, for thermal power generation, natural gas combined cycle power plants have achieved fuel efficiency of 61 percent, considerably higher than both oil and coal.<sup>17</sup> This translates into lower carbon emissions for every unit of electricity generated using natural gas. The need for a cleaner fuel at low costs is evident by the rising demand for natural gas in the South Asia region. India continues to dominate the South Asia natural gas market, with newer LNG players also emerging. Pakistan injected its first LNG supply in its pipelines in March 2015, and Bangladesh & Sri Lanka are working towards LNG terminals on a fast-track basis.<sup>18</sup>

As of 2013, India consumed about 5.3 billion cubic feet (bcf) per day, as opposed to 150 million cubic feet per day in 1980-81.<sup>19</sup> It is able to internally produce 3.9 bcf per day and must import gas in order to close the consumption-production gap. India has an estimated reserve of 96 trillion cubic feet (tcf) of shale gas that is technically recoverable, according to an international assessment by the U.S. Energy Information Administration.<sup>20</sup> However, the development of unconventional gas sources such as shale is slow and faces challenges, and India is forced to primarily rely on offshore production and imports. In 2012, India imported about 2.0 bcf per day of natural gas into two re-gasification facilities in Gujarat, and by 2013 imported up to 10 million tons a year of LNG.<sup>21</sup> Moreover, India's planning commission hopes to increase the share of natural gas in India's energy mix from the current 12 percent to 20 percent by 2025, which increases demand for gas imports. India continues to rely more on short-term deals and spot market imports than long-term contracts because India's gas market is still evolving. Creating a natural gas trading gas hub in South Asia would offer a long-term solution by connecting India to various gas-rich countries in Central, South, and East Asia, and throughout the Middle East with projects such as the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline, the Iran-Pakistan-India (IPI) pipeline, the Myanmar-Bangladesh-India pipeline, and a possible undersea pipeline linking India and Oman.

Pakistan faces greater problems associated with natural gas shortages because of its dependence on natural gas as a fuel source. Natural gas demand in Pakistan is over 6 bcf per day against a total supply of 4 bcf per day, creating a shortfall greater than 2 bcf per day.<sup>22</sup> Pakistan has estimated technically recoverable reserves of shale gas of 105 tcf, though developments have been very slow towards the exploration of this unconventional gas.<sup>23</sup> Forecasts for 2022 suggest

the shortfall of natural gas may increase as much as 6 bcf per day. The country continues to be deeply reliant on natural gas with 44 percent of primary energy needs met through this method.<sup>24</sup>

Dwindling profit margins threaten to harm the profitability of producers in the international market in the midst of a severe energy crisis that largely stems from reliance on expensive thermal sources of energy, especially crude oil. Pakistan also suffers from the consequences of weak regulatory and pricing mechanisms. However, despite these obstacles, the government of Pakistan remains committed to creating greater competition in natural gas markets, as was evident in the State Bank of Pakistan's recent analysis of the energy sector.<sup>25</sup> This is a step in the right direction towards creating the right signals for the natural gas market.

In South Asia, the natural gas market is still very young. The bulk of natural gas contracts reflect "economic fundamentals" of the market, but not changes in global market fundamentals. That is, the scale of investment and the costs of investment are accounted for, but the persistence of oil-indexed long-term contracts shows a disconnect with the changing dynamics of the global gas market. As mentioned earlier, the majority of long-term contracts in the region are linked to oil, and feature many of the mechanisms that Europe's market moved away from, like exclusivity or "take or pay" clauses. This is seen in the long-term contracts for LNG, and in the gas sale purchase agreements with Iran and Turkmenistan. India and Pakistan, as the largest natural gas markets in South Asia, are increasingly looking towards the spot market for lower LNG prices, but the spot market entails volume risk, which the gas-guzzling economies of India and Pakistan may not be able to afford.

One landmark development was GAIL India's contract with Cheniere in the United States. In 2013, it had a projected landing price for LNG of \$10.50 per MMBtu, and anticipated deliveries starting in early 2017.<sup>26</sup> This price included a fixed component plus a component linked to the Henry Hub. At the time of the contract, Cheniere LP's Sabine Pass terminal was the only terminal allowed to export LNG to countries that do not have a free trade agreement with the United States. India's contract between GAIL India and Cheniere was the first in South Asia that was indexed to Henry Hub, the U.S. gas market-based pricing mechanism, as opposed to the oil indexed contracts that were the norm.<sup>27</sup> Such hybrid pricing mechanisms may be crucial in the medium term before the South Asian natural gas market matures towards its own natural gas pricing hub.

Moreover, India is also signaling that the needs of the natural gas market are not being met through long-term agreements indexed to oil. This was clear in 2015, when India sought its first cut in LNG imports from Qatar, the biggest

supplier of LNG imports.<sup>28</sup> The 25-year oil-indexed LNG deal with Qatar's RasGas is proving costlier than importing LNG off the spot market, with India paying around \$13 per MMBtu in August 2015, as compared to spot prices in the range of \$6-7 per MMBtu.<sup>29</sup> Similarly, for the Iran-Pakistan gas pipeline, the two countries continue to negotiate over the price, and experts in Pakistan have called for a fairer pricing mechanism that is more reflective of changing natural gas market fundamentals.<sup>30</sup>

As these natural gas buyers become more cognizant of the pricing trends and spreads, they want more reliable price signals. They recognize it will be in their interest to call for greater competition in national and regional natural gas markets.

The International Energy Agency, in its report discussing a natural gas trading hub for Asia described it as a "chicken or egg" situation: "The move towards a competitive natural gas trading hub cannot depend solely on external shocks in the global market. Governments will need to signal whether they would accept such a change to happen." This paper argues that India, Pakistan, and other players in the South Asia natural gas market will need to work towards creating a regional natural gas trading hub that better reflects their specific market. In fact, a South Asian natural gas trading hub would be able to reflect the emerging changes in the natural gas market in this specific region. It could potentially improve supply of natural gas through inter-regional pipelines (onshore and offshore), which may reflect market fundamentals that diverge from the Asia-Pacific region.

Geography will be a driver if South Asia decides that it will work towards a physical natural gas trading hub. As Jonathan Stern and Howard Rogers wrote in the 2014, "due to the simple fact of geography, Japan, Korea, Taiwan, China and India will never achieve pipeline interconnections, and so even if these countries were to liberalize their gas markets, it is unlikely that their individual reference prices would be well-correlated."<sup>31</sup> Any developments towards a regional natural gas trading hub may be affected by the unique geopolitics of South Asia, which will be explored in the next section.

## GEOPOLITICS OF A NATURAL GAS TRADING HUB IN SOUTH ASIA?

In international relations, new literature is exploring the link between energy trade, energy security and international political stability. One paper by Brenda Shaffer explores the stability of supply, stating that it is affected by gas trade relations and dependence, the political economy of the relationship, and the domestic supply of the country of production.<sup>32</sup>

These factors suggest that for the success of any natural gas trading project

in South Asia, the countries in question must first create an atmosphere of trust. This will signal greater confidence in the natural gas market—a crucial factor in the success of natural gas trading hubs. Yet anyone who is an observer of the regional politics of South Asia can sense the high levels of mistrust. Before there can be trust in the market, there must be trust amongst the market players. Shaffer's idea that stability of natural gas supply is influenced by the political relationships between countries, among other factors, is a useful lens through which to understand why developments on the Iran-Pakistan (India) gas pipeline and the Turkmenistan-Afghanistan-Pakistan-India pipelines have been slow. In fact, some analysts have gone on to say that they will be “unlikely to come to fruition in the near term.”<sup>33</sup>

The political climate in South Asia has persistently influenced regional energy trade. Regional politics and global politics will continue to influence energy projects like this one, particularly in such a strategically important region of the world. Literature from the start of the twenty-first century spoke about “peace pipelines” in South Asia, a term commonly used for the Iran-Pakistan pipeline (while India was part of the consortium), and now used for the Turkmenistan-Afghanistan-Pakistan-India pipeline. In the past, India and Pakistan, the two nuclear powers of South Asia, have had a relationship of mistrust. They have gone to full-scale wars in 1947, 1965, and 1971, and have regular skirmishes and battles. Pakistan's civilian government, under the leadership of Prime Minister Nawaz Sharif since elections in May 2013, has on occasion expressed the intention to have closer ties with India.<sup>34</sup> In July 2015, India and Pakistan's PM released a joint statement in Russia, recognizing “a collective responsibility to ensure peace and promote development.”<sup>35</sup> The actual power dynamics in Pakistan and its civil-military imbalance are not tilted in favor of the Sharif government. It does not help, of course, that the Nationalist Indian Prime Minister Narendra Modi is pursuing a harsher position towards Pakistan than Congress has taken in recent years.<sup>36</sup>

Given this backdrop, it is fair to say that politics will continue to greatly influence energy developments in the region. However, from an economic standpoint, and from the lens of energy security, the creation of a natural gas trading hub will be beneficial for all parties. Onshore natural gas pipelines have a price advantage over costlier LNG project infrastructure, and it is in the economic interest of the buyers to negotiate collectively rather than as a single company or aggregator, or through bilateral negotiations. Energy security—in this case, the reliability and affordability of natural gas supply—is fundamental to any country.<sup>37</sup> Ripples in energy security have important economic implications.<sup>38</sup> From a defense standpoint, as energy interests across nations become more

enmeshed, negotiation and trust-building is essential to successful project implementation. Since this paper advocates the creation of a natural gas trading hub, it recommends South Asian nations to take a realpolitik approach and strengthen economic ties and greater regional integration.

For greater regional integration, energy projects are of utmost importance. Energy requirements continue to increase in South Asia, and for India and Pakistan in particular. In these countries, the rate of increasing demand is greater than the rate of natural gas production. In the future, natural gas pipelines may have greater geopolitical importance in South Asia.

This section briefly analyzes three major regional developments in natural gas infrastructure that could promote a natural gas trading hub in South Asia. As these are recent political developments, the full implications of these three factors may be understood better in later years, as more academic work is produced. However, a discussion on South Asia's natural gas pricing would remain incomplete without a brief discussion on these points.

#### REVIVING THE IRAN-PAKISTAN-INDIA (IPI) PIPELINE IN THE LIGHT OF THE IRAN NUCLEAR DEAL

Pakistan and Iran signed the Gas Sales Purchase Agreement on 24 May 2009. According to the agreement, gas would flow at 750 million cubic feet per day (mmcf/d) through a 781-kilometer pipeline. Later, this would increase to 1 bcf per day at a cost of \$700 million. As per the contract, Iran completed its infrastructure, from Assaluyeh (near Gwadar, Pakistan) to Iranshehr. The \$1.5 billion Pakistani infrastructure remains to be completed.<sup>39</sup>

The Iran-Pakistan pipeline has historical roots.<sup>40</sup> In 1989, India conceived of an undersea pipeline from Iran to India. India had been looking for a route to access Central Asia for a long time. The preliminary plans for the undersea pipeline that would have run for 3,000 miles were deemed unfeasible by Italian firm Snamprogetti.<sup>41</sup> The construction and maintenance would have caused too many technical and financial problems. Pakistan joined the consortium, but in 2009 India withdrew from the project, due to multiple factors, including a nuclear deal with the United States, global sanctions and security. In 2013, Pakistan debated whether it would be able to obtain a waiver or exemption from sanctions, but failed to do so.<sup>42</sup> Under the Iran Sanctions Act, the U.S. president has the authority to waive sanctions if they are “essential to the national security” of the country.<sup>43</sup> However, in proving the Iran-Pakistan agreement was not an essential threat, Pakistan would have had to exhaust other energy options, and with the TAPI pipeline in the works—a project strongly advocated by the United States—it seemed unlikely.

With the historic Iran nuclear deal signed in July 2015, between Iran, the United States, and other western powers, prospects for the Iran-Pakistan project are looking up.<sup>44</sup> Though the current political atmosphere suggests that India may still be reluctant to join a consortium with Pakistan, rejoining Iran-Pakistan may be a pragmatic idea. A natural gas pipeline can play a stabilizing role in the region, as interdependence on natural gas pipelines makes the stakes of going to war higher.

It remains to be seen if the Iran-Pakistan project gains greater international support, now that the Iran nuclear deal has been reached. The progress on both TAPI and Iran-Pakistan have been slow because of multiple issues including setbacks in negotiations on the sales purchase contract, well-head prices (the price of gas production at the source), and transit prices. Given these delays and political issues, the Associated Chambers of Commerce of India have called for an Iran-Oman-India undersea pipeline.<sup>45</sup> The South Asia Gas Enterprises Pvt. has also proposed such a pipeline for transporting 1.1 bcf per day from Chabahar, Iran to Ra's al Jifan, Oman to Porbandar, India. It must be noted that under-sea pipelines are much more expensive than over-land pipelines, and so the finances would still not favor an under-sea route.<sup>46</sup> However, costs have come down significantly since the 1980s, when India had originally envisioned importing natural gas directly from Iran. The Iran-Pakistan or Iran-Pakistan-India project, whatever shape it may take, has the potential to lead the natural gas markets in South Asia towards greater maturity, and if the pricing can be negotiated to reflect greater market realities, it will be instrumental in the future of a natural gas trading hub in this region.

#### AFGHANISTAN AND THE STATUS OF THE TURKMENISTAN-AFGHANISTAN-PAKISTAN-INDIA (TAPI) PIPELINE

U.S. forces were originally poised to exit Afghanistan in 2015, but President Obama changed his stance in October 2015, and the United States will continue to support Afghanistan militarily until at least 2017.<sup>47</sup> Stability in Afghanistan is of significant importance for both India and Pakistan. Pakistan continues to be a vital trade partner for Afghanistan, and India is a major investment player in the country. These developments are going to be critical to the success of the TAPI pipeline, which may pass through unstable areas.

Experts, such as the scholar Saleem Ali, have written about peace pipelines and the possibilities of creating “one of the world’s most important energy hubs” through TAPI.<sup>48</sup> Although the implications this could have for natural gas pricing mechanisms were not evident at that time, this paper shows that the creation of a competitive natural gas trading hub will be instrumental to the

market signals responding to what the players (both buyers and sellers) want, and reflective of the market and economic fundamentals. The TAPI project is often promoted by the United States and other NATO allies as an initiative for strengthening ties between the South Asian and Central Asian regions.<sup>49</sup> Theoretically, like the Iran-Pakistan pipeline, the transnational project could help foster better economic relationships in the region. Specifically, it would help promote Afghanistan as a bridge between Central and South Asia, and could therefore be an important project in meeting the regions energy demands. India joined the consortium in 2008, and from a political standpoint, TAPI has more support in the international community as an inter-regional pipeline than the Iran-Pakistan project, at least at the moment. The Asian Development Bank officially endorsed the national gas company of Turkmenistan, Turkmengaz, to lead the consortium.<sup>50</sup> TAPI is a strong consortium, supported by international donor agencies. However, its multilateral stakes make it a difficult project to implement, as once NATO and U.S. forces exit Afghanistan, the responsibility to protect the pipelines will be in the consortium's hands. The project's foremost concern is security, since it is supposed to pass through the Herat and Kandahar regions of Afghanistan, which both Pakistan and India view as a potential risk to supplies. The existing political relations mean that India views Pakistan's role as a transit state with suspicion. Overall, the project can play an important role in creating a bigger natural gas market in South Asia, but its competitiveness may remain risky under Turkmengaz.

#### THE CHINA-PAKISTAN-ECONOMIC-CORRIDOR (CPEC), NATURAL GAS INFRASTRUCTURE DEVELOPMENTS AND GWADAR

China's economy continues to consume energy, and is looking towards the China-Pakistan Economic Corridor (CPEC) as one of multiple routes to secure its energy supply.<sup>51</sup> According to forecasts for 2025, China has an estimated annual demand between 110 and 140 bcm.<sup>52</sup> It is uncertain whether its natural gas demand will continue in this trend. China is currently exploring shale gas and has an estimated 1,115 tcf of shale gas reserves.<sup>53</sup> Moreover, it is exploring Russia, Central Asia, and Myanmar (with the infrastructure for pipelines laid) for greater natural gas imports. China seeks to reduce its energy security dependence on the eastern Straits of Malacca because of the presence of the U.S. Sixth Fleet, and its icy relations with Japan.<sup>54</sup> According to the "String of Pearls" theory, China seeks to secure multiple allies across the global chessboard.<sup>55</sup> Gwadar may be an important "pearl" in this regard. From this paper's perspective, it is of particular importance that during Xi Jinping's visit to Islamabad in April 2015, Pakistan and China signed a framework agreement for an LNG terminal at Gwadar, and a

pipeline to Nawabshah.<sup>56</sup> This is good news for South Asia because it may bring greater maturity to the natural gas market. Moreover, the pipeline to Nawabshah shows that the Iran-Pakistan and TAPI projects, when completed, will have greater access to the Pakistani market. Overall, if geopolitical actors looked at this event from beyond the strategic lens (Sino-Pak versus Japan-India), natural gas developments in Pakistan could mean access to greater supply for the Indian natural gas market as well.<sup>57</sup> The full implications of this project and its implementation remain uncertain.

## CONCLUSION

The projected timeline for creation of a South Asia natural gas trading hub may be more than a decade, given that South Asia as a whole is still a new entrant to the global natural gas market, and that regional politics greatly influence infrastructure developments. However, South Asian nations must work towards the creation of a natural gas trading hub to reduce the impact of oil price volatility on South Asian economies, increase competition in the natural gas market, and promote regional integration through greater trade.

It is important to note that the evolution of natural gas pricing mechanisms took more than five years in Europe, and in more mature natural gas markets in Asia, the projections are as long as ten years for the creation of a natural gas trading hub. This projected timeline, then, is less than optimistic, and may take even more than a decade, given that South Asia as a whole is still a new entrant in the global natural gas market. One point that must be stressed is that a competitive natural gas market gas price will not translate into lower prices, in comparison to volumes indexed to oil.<sup>58</sup> However, it does mean that the price will display market fundamentals and be more transparent, with greater access to information.

South Asian natural gas actors will have to consider some of the following policy issues if they wish to realize a natural gas trading hub in the region: Creating greater competition in domestic natural gas market; promoting liberalization of natural gas market; building the infrastructure necessary to create more robust natural gas market; and limiting role of government regulatory authorities so that price signals are more reflective of market.

The Gwadar deep sea-port is one of many potential sites for a physical natural gas trading hub (in the footsteps of the Henry Hub), by virtue of geography.<sup>59</sup> It is in very close proximity to the Strait of Hormuz, and the oil and gas-rich Middle East. TAPI and the Iran-Pakistan pipeline projects both traverse the site, and the China-Pakistan Economic Corridor infrastructure projects include an LNG terminal at Gwadar. Given its strategic importance as a physical natural

gas trading hub for many potential energy projects, research in the future should focus on the feasibility of this site as a natural gas trading hub. The South Asian natural gas markets, however, are still nascent. Before a site is discussed in detail, policy steps must be taken towards regulatory and economic frameworks that would lead toward a natural gas trading hub in South Asia. 

## NOTES

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