

# Columbia Center on Sustainable Investment

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CCSI Policy Paper

Jared Talkin<sup>1,2</sup>  
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## Key Points

- 1 Oman has established free-zones with very attractive incentives to encourage FDI. The success of this strategy is evidenced in the establishment of large industrial facilities such as Vale's iron ore depot and pelletization plant in Sohar.
- 2 The Sultanate is expending large amounts of capital on its port infrastructure, making it an attractive location for investment in terms of logistics.
- 3 Oman is leveraging the regional abundance of natural gas to foster downstream activities.
- 4 Poor planning has resulted in shortages of natural gas, which is acting as a limiting factor to their strategy of downstream diversification.

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## Downstream Beneficiation Case Study: Oman

### Introduction

The Sultanate of Oman (Oman) was selected as a downstream beneficiation case study due to the unique conditions under which its fledgling iron and steel industry is developing. What really stands out about Oman is that they are leveraging their domestic reserves and the regional abundance of natural gas to push their economic diversification strategy, in part through the growth of their iron and steel industry. Oman hopes to secure a steady supply of competitively priced natural gas, either through negotiating deals with neighboring countries or through the renegotiation of current liquefied natural gas (LNG) export contracts in order to re-allocate more gas for domestic use. In terms of the traditional inputs, such as coking coal and iron ore, Oman has no significant reserves. While the Gulf Mining Group is active in developing iron ore mines in Oman, currently there is no significant domestic production in The Sultanate. Oman has experienced steady expansion of their iron ore beneficiation and steel production capacities from 2007 to 2015, with a number of additional works either currently under construction or in the planning phase. While there are some steel works in other parts of Oman, such as Sur, this case study will specifically examine the Sohar Port and Freezone, due to the presence of significant growth of both the iron ore processing capacity there and the recent establishment of the 3<sup>rd</sup> largest integrated steel plant in the Gulf region.

<sup>1</sup> Jared Talkin is a research fellow at the Columbia Center on Sustainable Investment.

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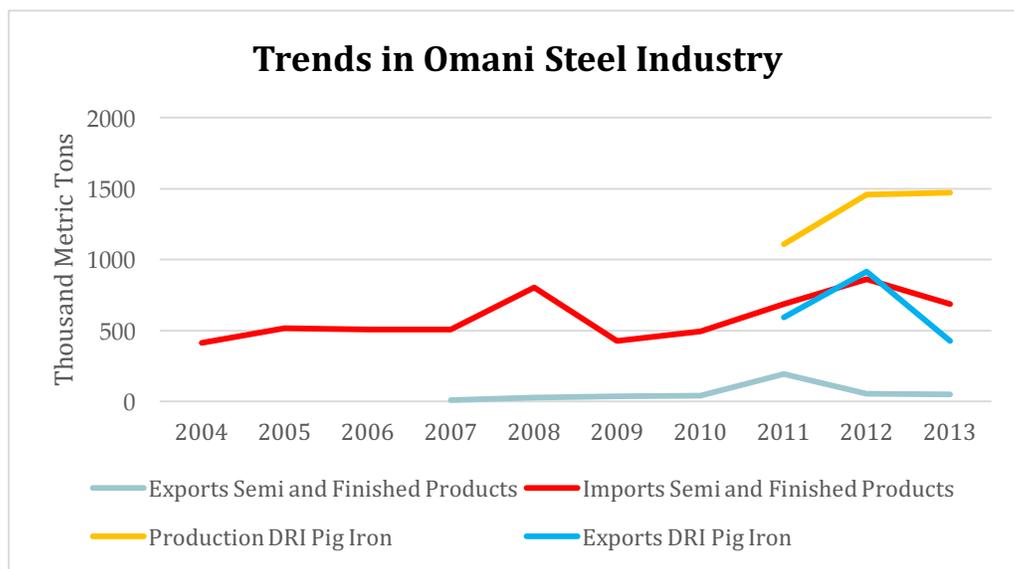
## Industry Overview

Oman's current economic diversification strategy was outlined in its Vision 2020 document, released in 1996. Some of the major targets set out by the plan include the reduction the contribution of the oil sector to 9% of GDP by 2020 (in 2011, the oil sector accounted for 35% of GDP)<sup>i</sup> and to raise the contribution of manufacturing to 10% by financing infrastructure and industrial projects.<sup>ii</sup> In 2013, the government announced that more than US\$50 billion worth of development projects were planned for the next few years. However, these plans are likely to be scaled back as a result of lower commodity prices.<sup>iii</sup>

All of the iron and steel plants in Oman are employing either direct reduced iron (DRI) or electric arc furnace (EAF) production processes. The advantage of using the DRI process to transform ore into pig iron, is that it can use either natural gas or coal as a feedstock. DRI smelting is also an attractive choice for Oman because the upfront capital investment and operating costs of DRI plants are lower as compared to integrated steel plants and are more suitable for countries where supplies of coking coal are limited. The motivating factors for producers to employ EAF's in Oman are twofold. First, EAF's allow for the use of scrap metal as a percentage of the inputs. Secondly, they allow for continuous steel casting and are used in conjunction with DRI pig iron production in integrated steel mills to maximize energy efficiency.

The country has a growing iron ore-pelletizing sector, with Brazilian mining and metals giant Vale having commissioned its \$1.35bn iron ore beneficiation plant in early 2012 with the objective of servicing ore imported from Brazil. This plant consists of two processing lines, each having a capacity of 4.5 million metric tons (MMT) per year for a total capacity of 9 MMT/year. Vale has plans in the works to commission two more processing lines at Sohar by 2018, with a capacity of 4.5 MMT/year each, for a total pellet production capacity of 18 MMT/year. The plant and ore depot is intended to serve as a supply base, with a stockpiling capacity of 40 MMT of iron ore, and act as a distribution hub for the regional and international markets.<sup>iv</sup> This activity suggests that Oman is positioning itself to become a major center for downstream industries such, as steel that depend on secure supplies of energy and raw materials with easy access to global markets.<sup>v</sup>

**Graph 1:** Trends in the Omani Steel Industry



This graph was created from data sourced from the World Steel Association, Steel Statistical Yearbook, 2015.

## Vale

According to former CEO of Vale Oman, there are a number of factors that led Vale to choose Oman as a prime location for its iron ore pelletizing plant and distribution center. Oman's strategic location with regard to its placement in the center of the Middle East and its close proximity to Vale's largest customers in the Middle East, North Africa, India and Asia.<sup>vi</sup> Additionally, Vale's selection of Oman had to do with the fact that the country has world-class industrial infrastructure and availability of competitive energy, in the form of natural gas, a key input to running their direct reduction iron production (DRI) and pelletizing plants. Most significantly, Sohar Industrial Port is the only deep-water port in the Gulf Cooperation Council (GCC) states that has the capacity to receive the Very Large Ore Carriers (VLOC), which Vale operates. Furthermore, Vale decided to capitalize on Sohar's competitive edge to create a steel cluster with an ore depot that can serve as a virtual mine to supply regional iron and steel producers. After receiving iron ore from Brazil, Vale can distribute both blended iron ore and pellets in smaller quantities to customers in the region.<sup>vii</sup> Furthermore, Vale hopes that its ventures in Oman will facilitate further downstream activities and, in the process, add more value to the country while encouraging more private sector participation in downstream activities, thus supporting the creation of a steel cluster in Sohar.

Former Vale Oman CEO Marcos Beluco outlined the specifics of the deal:

"Vale entered into a partnership with the Sohar Industrial Port Company (SIPC) to rent the land in Sohar and build [their] 1.5 kilometer deep-water terminal. It is a dedicated port for Vale to handle its iron ore and pellets. The contract that [was] signed covers the use of the resources [in Oman] as well. SIPC is an important partner and [Vale's] investments [in the project] amount to US\$250 million.

In October 2008, [Vale] signed the gas supply agreement with the Ministry of Oil & Gas. To demonstrate [their] commitment to developing the local supply chain, Vale signed a contract with the Oman Shipping Company (OSC) worth US\$500 million to build four VLOCs, with the capacity of 400,000 tons each. These vessels [are] dedicated to bringing iron ore from Vale's operations in Brazil to Oman.

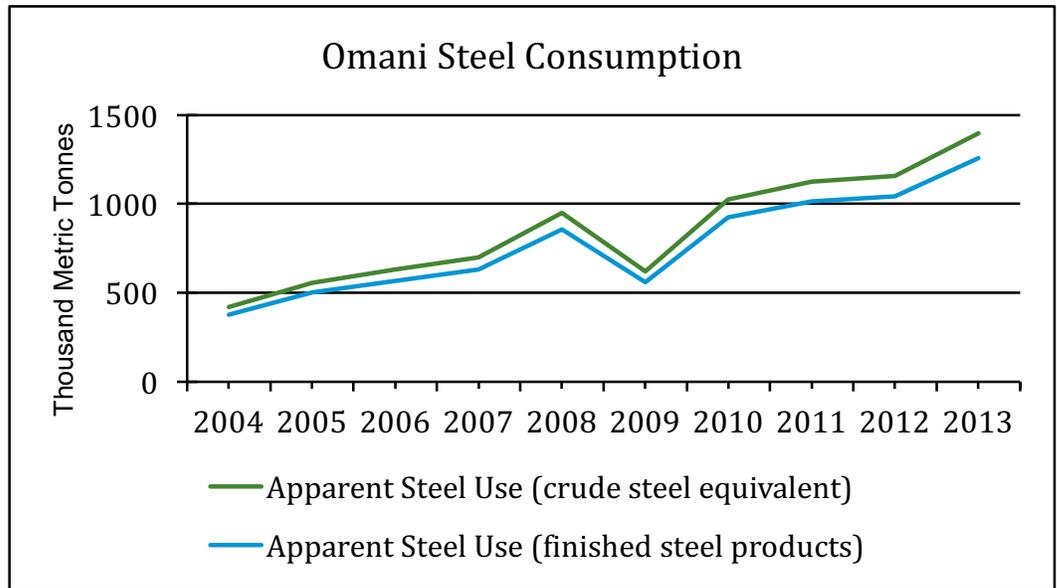
In May 2010, Oman Oil Company (OOC) acquired 30% of the Vale's Pelletizing Company's shares. Vale, in turn awarded a total of US\$420 million in contracts to local companies for the construction of [their] facilities."<sup>viii</sup>

## Jindal

Beyond Oman's emergence as a significant processor and throughput point for iron ore, the country is also becoming a significant steel producer among the GCC. A large portion of Oman's steel industry is operated by India's Jindal Shadeed Iron & Steel, which operates a 1.5 MMT/year direct reduced iron (DRI) plant in Sohar. The company had acquired Shadeed Iron and Steel and its 1.5 gas-fired hot briquetted iron (HBI) plant in 2010 for \$500 million. As a step towards forward integration, the company set up a 1.8 MMT/year DRI plant which has been operating since 2012.<sup>ix</sup> In April of 2014, Jindal-Shadeed, commissioned its integrated steel plant in Sohar, with a capacity to produce 2 MMT/year of steel. The plant is Oman's first and largest fully integrated steel mill and is the third largest in the Middle East and Gulf region. In addition, Jindal is also constructing a 1.4 MMT/year rolling mill at Sohar for the manufacture of rebar which it expects to be commission by the end of 2015.<sup>x</sup> These production facilities use iron ore provided by Vale's ore depot.

Jindal is using its works at Sohar as a platform to meet strong demand for steel in the Middle East and North Africa, where it estimates a shortfall of more than 12 MMT (as of 2014). The new plant will also send a portion of its production to the local market, reducing the need for Oman to import steel for its infrastructure projects. Oman imported

**Graph 2: Omani Steel Consumption**



approximately half of the 1.4 MMT of steel it

This graph was created from data sourced from the World Steel Association, Steel Statistical Yearbook, 2015.

consumed in 2013 as show in **Graph 2**. Oman had a domestic demand of about 1.4 MMT in 2013, with balance of production above that, intended to be allocated to supply nearby regions such as North East Africa and the Gulf Corporation Council member countries.<sup>xi</sup>

## Ferrochrome

One of the fastest-growing metal sectors in Oman is ferrochrome production, which utilizes the Sultanate’s reserves of chromite. The Port of Sohar provides an ideal location for this metals cluster due to the fact that there is modern infrastructure in place that can readily support this energy intensive industry. The ferrochrome industry is taking advantage of the port infrastructure and services that were initially established to support iron ore beneficiation and steel production. Ferrochrome is mainly utilized to produce stainless steel with the remainder being used for the production of specialized alloys of steel. Ferrochrome industries in Oman are clustering in the Sohar Freezone, using chrome from Oman and adding value to this raw product by smelting the raw ore and selling it to downstream stainless steel industries. The modern infrastructure available at Sohar can support these industries, which are very energy intensive. In May 2010, Freezone Sohar signed an agreement with a new joint venture (JV) company comprised of South African stainless steel product manufacturer SMI Steelmor and Oman's Teejan Group of Companies to set up the sultanate's first stainless steel company. With a capacity of 1 MMT/year, the factory will produce stainless steel and produce semi-finished and finished products for the local and export markets. The Port of Sohar will be used as a hub to supply the GCC, European, and American markets. The focus of these producers will be to supply a variety of stainless steel products to the petrochemical industry and refineries. Oman’s Sohar Port and Freezone has unveiled a new \$19 million ferrochrome smelter, the second of five planned for Sohar, with production being led by Gulf Mining Group, a leading producer and exporter of chromium ore.

## Determinants

A crucial component to the future growth and success of Oman's steel industry is to have a robust domestic demand and/or unfettered access to regional markets for its semi-finished and finished products. The consumption for finished steel products in the Middle East was estimated by the World Steel Association to be around 47.4 MMT in 2013, up from 23.2 MMT in 2003. The annual domestic demand for steel in Oman has risen from around 400 thousand metric tons in 2004 to 1.4 million metric tons in 2013 as illustrated in **Graph 2** (above). One of the main drivers of demand for steel products within the GCC is spending on infrastructure and the growth of the construction sector.<sup>xii</sup> For example, Oman is an active partner in the 2177 km GCC rail network project, currently in the engineering and design phase. This rail project is representative of the kind of infrastructure projects within the GCC that are driving the booming construction industry and stoking hopes for a large expected demand increase regionally for steel products. Industry experts believe that construction projects in the GCC will be the key in supporting the steel industry's growth in the near term and the GCC's multi-billion dollar infrastructure projects planned across the region will be the main driver of the region's economic growth in the coming years.<sup>xiii</sup>

## GCC and Access to Markets

Through its membership in the GCC, comprised of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, Oman will reap the benefits of the recently established GCC customs union. Plans for this customs union were fomented by the GCC beginning in 2003 and finalized through the implementation of the union as of January 1<sup>st</sup> 2015. One aspect of the customs union, that addresses the issue of access to markets in the Middle East, is that products manufactured within the GCC states, including iron and steel, are considered national products and their movement within the region is free of custom duties and tariffs.<sup>xiv</sup> In terms of access to external markets, the GCC has established free trade agreements (FTAs) with Australia, China, Mercosur, Japan, Jordan, Korea, Turkey, New Zealand, India, Iran, ASEAN, Syria, Singapore, the European Free Trade Association and the European Union.<sup>xv</sup>

**Map:** Area of Investment in Steel Industry



This map shows the two most significant regions for expansion of the iron and steel industry.

## Industrial Free Zones Incentives

In an effort to catalyze the diversification of its economy, Oman has created three Freezones that offer incentives to businesses that operate in the designated areas. The three Freezones are Salalah, Sohar, and Al Mazunah. The large free zones in Salalah and Sohar are important features of the Omani economic landscape, while Al Mazunah is a smaller, lesser-known free zone located in the Dhofar region near the Oman-Yemen border. There are three major industrial clusters in the Sohar Port area, namely the hydrocarbon or petrochemical sector, metals and minerals sector, and logistics with international terminal operators. The Sohar Freezone is the most relevant to this case study due to the fact that the bulk of Oman's ore beneficiation and steel production is located there.

The Omani government offers a variety of incentives to encourage businesses to set up their operations in these areas. The specific incentives for Sohar can be found in **Table 1a** (below) and, while there are variances in the incentive structure between the three Freezones, in general they are pretty much uniform. Unique advantages of each of the three Freezones are the strategically good position of their respective locations with regard to coastal access and existing or planned infrastructure. In addition to that, there are various economic incentives common to all three Freezones. For example, enclaves are exempt from national import and export duties and/or formally operating outside customs area of the Omani Government. Incentives appear to play a significant role in the location of recent-past, current, and future growth of the Omani steel industry, as evidenced in **Table 1b**.

**Table 1a:** Government Incentives Provided in SOHAR Port and Freezone

Incentives provided in SOHAR Port and Freezone, The Sultanate of Oman	
Type of exemption/allowance/benefit	SOHAR Port and Freezone
Foreign Ownership	100% foreign ownership allowed with a minimum of 2 shareholders
Corporate income tax	0% rate guaranteed for the first 10 years, can be extended for up to 25 years
Personal income tax	0% for individuals coming in and working in the Freezone
Free Trade Agreements	Benefit from Free Trade Agreements between Oman-USA and Oman-Singapore
Import or Re-export Duties	0% rate on goods brought into Freezone
Relaxed level of Omanization	Minimum Omanization in SOHAR is 15% to receive exemption from corporate tax -reached 25% after 10 years will ensure exemption of corporate tax -reached 35% after 10 years will ensure exemption of corporate tax -reached 45% after 10 years will ensure exemption of corporate tax

Source: SOHAR Port and Freezone (<http://www.soharportandfreezone.com/en/setting-up-business/incentives>)

This table was created from data sourced the SOHAR Port and Freezone  
\*Omanization is the percentage of employees of a company that must be Omani citizens

**Table 1b:** Past, Current and Future Iron and Steel Projects in Oman

Company	Shareholding	Type	Location	Benefits	Equipment	('000 tpy)	Status	Year
Jindal Shadeed	Jindal Steel & Power	Private	Sohar	Freezone	EAF	2000	operating	2014
				Freezone	DR	1800	plan	n/a
Moon Iron & Steel (MISCO)	N/A	Private	Sohar	Freezone	EAF	1200	underway	2015
Muscat Steel	N/A	Private	Sur	No Taxes/Duties	EAF	200	underway	2014
Sharq Sohar Steel Rolling Mills	Middle East Traders Oman	Private	Sohar	Freezone	EAF	500	operating	2014
Steel Authority of India Ltd (SAIL)	State-owned India (86.00%)	State Owned	Sohar	Freezone	DR	3000	plan	n/a
Sun Metals	N/A	N/A	Sur	No Taxes/Duties	EAF	2500	plan	2017
Vale	Vale/Oman Oil	Private/Public	Sohar	Freezone	DR	9000	operating	2012

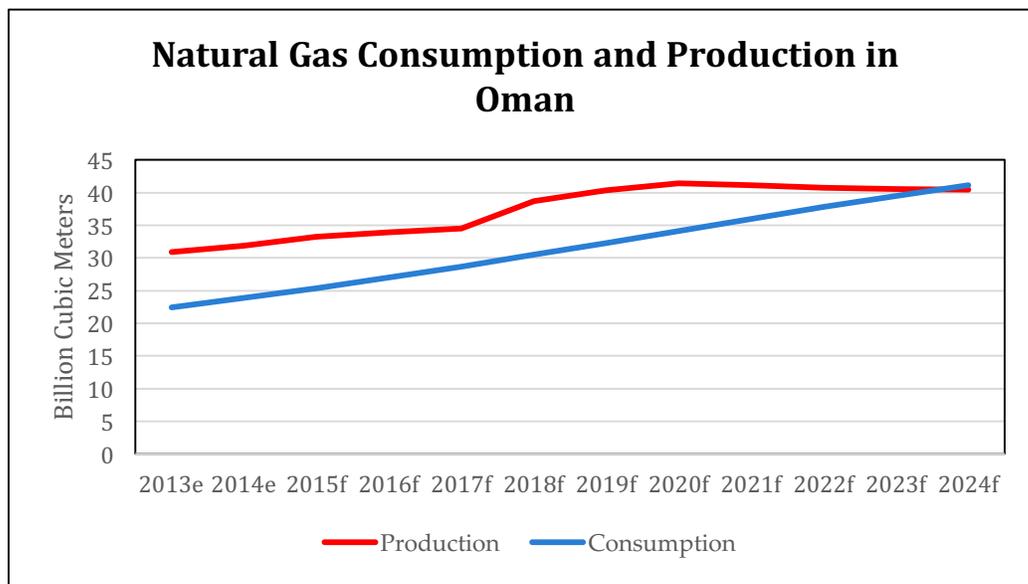
This table was created from data sourced the OECD

While the Government incentives have played an important role in the development of the iron ore processing and steel production capacity in Oman, they are not the sole reason for the success thus far. The former Vale Oman CEO cited the social, political, and economic conditions in Oman as being driving factors for Vale to set up shop there, noting that government has been very supportive of all aspects of their expansion efforts in Sohar, from planning to construction. This, coupled with the high incentivizes of operating in the Sohar Freezone, culminated in Vale’s decision to come to Oman.

### Role of Natural Gas

One of the strategies that Oman has been pursuing in its push toward diversification is to utilize its domestic reserves of fossil fuels to grow its downstream industries. Specifically, Oman has been expanding its power generation infrastructure and natural gas pipelines to supply sufficient inputs in order to foster growth in industrial zones such as the Sohar Freezone. Oman is relying upon natural gas to fire both its DRI

**Graph 3: Natural Gas Consumption and Production in Oman**



This graph was created from BMI’s Oman Oil and Gas Report Q3 2015

\*Note: e/f stands for estimate/forecast

smelters and to generate electricity to supply power to the Electric Arc Furnace’s (EAF) at its iron and steel mills. While this has been successful, the expansion of the steel industry is constrained by a shortage of gas reserved for domestic use. Rising electricity demand due to power intensive industries has led to the domestically reserved gas allocation being used up for electricity generation. Natural gas consumption in Oman jumped to 22 billion cubic meters (bcm) in 2013, from 14.7 bcm in 2009. According to the U.S. Energy Information Administration, Oman's natural gas, consumption is forecasted to increase by an annual average of 5.6% between 2014 and 2024. Considering only marginal increases in gas production, as illustrated in **Graph 3** (previous page), the rapidly growing gas demand has led to a gas deficit. Exporting less gas to allocate more for domestic consumption is not a feasible option due to the nature of the long-term gas export contracts Oman is currently has in place.

The growth of the Omani steel industry has not only been hampered by gas shortages, there have also been issues with the excessive sulfur content of the gas, which is not conducive to making high quality steel.<sup>xvi</sup> As a result of the gas shortage and quality issues, some projects have been delayed and others have been put on hold indefinitely. One example of the negative impact that the shortage of gas has had on the proliferation of beneficiation is that of Sun Metals. It has plans to build both DRI iron ore beneficiation and pelletizing plants, as well as DRI plants to produce pig iron for steelmaking

feedstock from ore mined at its open-pit mines in Ibra. This project has been temporarily suspended due to lack of gas allocation in Oman.<sup>xvii</sup>

In response to the gas shortages, Oman is looking to cooperate with Iran and Qatar, which respectively hold the second and third largest gas reserves in the world, to supply additional gas.<sup>xviii</sup> In August 2013, Oman signed a memorandum of understanding with Iran on a natural gas import contract. If realized, it would be a \$60 billion, 25-year supply deal beginning in 2017 and will connect the two countries via a pipeline under the Gulf of Oman. Oman plans to use over 350 billion cubic feet per year of the contracted volumes for domestic purposes and to process additional volumes of Iranian gas for export through its LNG terminals, which are currently running at only about 67% of capacity.<sup>xix</sup> The new pipeline from Iran is also expected to carry 1 billion cu ft/d of gas to Oman's petrochemicals center in Sohar, providing a significant boost to all industries located there. The prospective gas pipeline from Iran will help to meet rising domestic demand and keep Oman LNG plant in Sur operating at full capacity. This will allow Oman to meet the current LNG contracts it has with Japan and Korea, which expire in 2024. These two countries are the recipients of nearly all the LNG that Oman exports. With the continuing rise of Oman's natural gas demand (168% increase between 2002 and 2011), Oman plans to divert all the gas used for its LNG exports towards the domestic market by 2024.<sup>xx</sup> The pipeline's proposed 2017 completion date appeared optimistic, but the recent international resolution regarding Iran's nuclear program, which has resulted in the lifting of the sanctions on Iran's oil and gas exports, should remove some of the barriers to its construction.<sup>xxi</sup> Beyond the potential natural gas import deal with Iran, it is forecasted that Omani natural gas production will increase over the next several years, due to supply additions from new projects such as Block 61 and Musandam. These projects will likely increase production up from 2014's estimated figure of 31.9 bcm to 33.2 bcm the following year. However, production is likely to peak in 2020 at 41.4bcm, with marginal deterioration post-2020 as depicted in **Graph 3** (previous page).<sup>xxii</sup> In order for Oman to be able to support the expansion of the domestic iron ore beneficiation and steel industries, there needs to be not only a short-term solution to the gas deficit, but a comprehensive plan that is designed to meet the growing demand of the population, the expanding industrial, and manufacturing sectors over the long haul.

## Key Conclusions

Oman has leveraged its natural gas to move into the iron-ore processing sector and steel industry. Growing these sectors is part of the Sultanate's strategy to diversify its economy away from oil and gas. Its strategic location along major trading routes and key export markets with which the country has signed trade agreements, along with increasing demand within its GCC customs union due to ambitious infrastructure construction plans, have attracted investors looking to supply both markets. Apart from granting investors access to competitively priced gas supplies, Oman has developed free economic zones with first class infrastructure around its deep-sea ports to lower operating and trading costs. Companies setting up in these zones also benefit from tax incentives. The success of this strategy is evidenced by the establishment of large industrial facilities, such as Vale's ore pelletizing plant and depot along with Jindal's large integrated steel plant, both located in the Sohar Freezone.

Domestic gas demand has grown so rapidly as a result of these large industrial projects and increasing electricity demand that Oman will need to secure gas from neighboring countries to continue to grow its iron and steel industry. This is because most of the gas being produced in the country is tied up in long-term LNG export contracts with Japan and Korea. This experience highlights

the importance of projecting domestic gas demand, which is in line with industrial and diversification strategies prior entering into long-term export contracts.

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