A perspective on the Iranian metals & mining industry

Ambitious plans to boost production
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Executive Summary

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Authors:

Ilya Epikhin  
Principal Industrial Goods & Services, Tehran  
epikhin.ilya@adlittle.com

Nima Obbohat  
Partner Energy & Utilities, Tehran  
obbohat.nima@adlittle.com

Jaap Kalkman  
Partner and Global Head Energy & Utilities, Dubai  
kalkman.jaap@adlittle.com

Stephen Rogers  
Partner Energy & Utilities, London  
rogers.stephen@adlittle.com
Iran is a strong, growing economy. It experienced significant recovery in 2016 as a result of sanction relief. GDP growth in the six months to March 20, 2017 reached 7.4 percent. The boost in growth was largely a result of the oil sector’s bounce-back, in both production and exports, following the removal of sanctions in January 2016 through the Joint Comprehensive Plan of Action (JCPOA).

With some recovery in foreign direct investments, Iran’s economy is expected to experience strong growth, around 4–5 percent per annum until 2021 – twice the global average. However, the growth rates can be much higher (up to 10 percent) if all the remaining constraints are lifted. Along with obvious commitment to further development of the oil & gas sector, the Iranian Government is strongly focused on structural reforms, aiming to significantly increase the non-oil share of the GDP. The major driver of this change is the “industrial goods” sector, particularly “metals & mining.” The Iranian government and IMIDRO are striving to minimize risks and improve attractiveness for international investors in the sector.

To streamline sector activities, Iran’s government created the Mines and Mining Industries Development and Renovation Organization (IMIDRO) to be in charge of implementation of the sector growth plans.

IMIDRO is working on further improvement of the country’s investment climate to promote FDIs in the metals & mining sector. The first step was introduction and implementation of the Foreign Investment Promotion and Protection Act (FIPPA).

With the introduction of FIPPA, Iran has offered confidence and support to foreign investors. The features and advantages of FIPPA create the opportunity for foreign investors to tap into Iran’s wealth and resources:

- No restrictions on percentage of foreign shareholding and ownership
- Registration of an Iranian company with 100 percent foreign capital
- Full repatriation of principal capital, dividend and profits
- Equal rights and treatment with that accorded to local investors
- Permission and opportunities to invest in all areas that are available to the private sector
- Granting protection coverage to all foreign investment schemes
- Prompt approval of the foreign investment application
A set of further incentives have been introduced:

- Special tax-free zone for mining investments
- Flexibility: long-term contracts in exchange for low energy prices (natural gas)
- Access to raw materials from local mines
- Support for local partners with financing from the “Iran Oil Fund”
- Overall, there is a need for further market restructuring and transparency building. Having been initially set up as a sector regulator, IMIDRO is currently playing two roles: both regulator and active market player. Going forward, the government might need to rethink IMIDRO’s functions so it is not perceived as a competitor to independent market players.
1. Ambitious yet achievable plans over the next 10 years

In the post-sanction period, the Iranian government has charted a strategic 10-year plan to boost its metals & mining production across the key commodities by 2025. The plan suggests a two-to-five-times increase in the production of steel, iron ore, zinc, copper, aluminium and gold.

To achieve the above production levels across key commodities by 2025, the sector requires another USD 20 billion in investments across the metals & mining value chain. Iran is very active in attracting foreign financing. Many international companies have recently visited Iran and signed investment-related Memorandums of Understanding with the government entities.

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**Figure 1: Iran’s plans to boost its production**

<table>
<thead>
<tr>
<th>Product</th>
<th>2015</th>
<th>2025</th>
<th>Key projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>16.3 M</td>
<td>52 M</td>
<td>- Sangan Iron Ore concentrate and pellet (5Mt)</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
<td>- Persian Pelletizing and DRI (20Mt)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Persian Gulf New Steel Mills +Pellet (10Mt)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Chahar Steel (3Mt); Qeshm Steel Mills (1.6Mt)</td>
</tr>
<tr>
<td>Copper cathode</td>
<td>200 K</td>
<td>800 K</td>
<td>- 250K ton/year projects in National Iranian Copper Industries Co. (NICICO) + related mine development and concentrate facility + further expansion</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
<td>- SALCO (276KT); Jajarm (110 KT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Alumina-Nepheline (200KT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Phase III of Almahdi (500K MT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Chabhar Aluminum (500KT); SALCO-phase II (500KT)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.3 M</td>
<td>1.5 M</td>
<td>- Mehdi Abad Concentrate &amp; Ingot (800KT)</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
<td>- Phase II of Zar Shuran (additional 3T)</td>
</tr>
<tr>
<td>Zinc ingots</td>
<td>150 K</td>
<td>300 K</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
<td></td>
</tr>
<tr>
<td>Gold</td>
<td>3 tons</td>
<td>6 tons</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Signed investments-related MoUs with government entities by international companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Iron Ore</th>
<th>Steel</th>
<th>Gold</th>
<th>Copper</th>
<th>Zinc</th>
<th>Aluminum</th>
<th>Technical/Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ore Search Group Australia</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFC China</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multilateral Investment Guarantee Agency</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian National Aluminium Company</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trafigura Germany</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nippon Steel &amp; Sumitomo Metal Corporation</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitsubishi Holdings Japan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kawasaki Japan</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toshiba Japan</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danieli Italy</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posco South Korea</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fives Group France</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Sanyo Steel</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREC Investment China</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vallourec Germany</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS INNSE Italy</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATC Williams Australia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Source: Arthur D. Little analysis
2. The current state of the metals & mining sector in Iran

Metals & mining is already a sizable segment of the Iranian economy, but it has huge potential for development and can be the driver of further growth. Mining, coupled with base metals and non-metal minerals, already exceeds 6 percent of the country’s GDP. More than 20 out of the top-100 Iranian companies come from metals & mining and the broader IG space. Moreover, metals & mining accounts for 21 percent of overall market capitalization on the Tehran Stock Exchange.

The sector has huge potential and rich untapped reserves. Overall, Iran has 37 billion tons of proven mining resources, valued at USD 700 billion. Having just 1 percent of the world’s population, the country possesses 7 percent of its mineral resource base, which makes it the 15th most mineral-rich country.

Iran has 68 types of minerals, including gold, coal, iron ore, copper, lead, zinc, chromium, barite, salt, gypsum, molybdenum and rare-earth elements.

Iran is especially rich in key industrial metals, such as iron ore, copper, zinc and gold, for which it has been placed among the top 10 reserve holders globally, in both reserves and production volumes. Iran ranks ninth and 12th in terms of global reserves for copper and iron, respectively. It also has the world’s largest combined lead and zinc reserves, with 11 million tons of proven zinc and potentially 222 million tons of lead and zinc. Iran is also a major producer of iron ore, steel, copper and zinc. However, Iran’s major resources are largely underdeveloped, including copper (reserves to production 137 years), gold (reserves to production 83 years), zinc (reserves to production 73 years), and iron ore (reserves to production 56 years).

Figure 3: Metals & mining accounted for 21% of the total market cap due to positive trends in sector development

<table>
<thead>
<tr>
<th>Sector</th>
<th>% of Market Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals &amp; By-products</td>
<td>19.6</td>
</tr>
<tr>
<td>Basic Metals</td>
<td>11.9</td>
</tr>
<tr>
<td>Monetary Intermediation</td>
<td>9.1</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>7.7</td>
</tr>
<tr>
<td>Refined Petroleum Products</td>
<td>6.8</td>
</tr>
<tr>
<td>Metal Ores Mining</td>
<td>6.2</td>
</tr>
<tr>
<td>Diversified Industrials (Holdings)</td>
<td>5.9</td>
</tr>
<tr>
<td>Motor Vehicles and Auto Parts</td>
<td>5.0</td>
</tr>
<tr>
<td>Computer &amp; Related Activities</td>
<td>4.2</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>3.9</td>
</tr>
<tr>
<td>Utilities Supplying</td>
<td>3.9</td>
</tr>
<tr>
<td>Investment Companies</td>
<td>2.6</td>
</tr>
<tr>
<td>Transportation and Storage</td>
<td>2.3</td>
</tr>
<tr>
<td>Technical &amp; Engineering Services</td>
<td>2.2</td>
</tr>
<tr>
<td>Cement, Lime &amp; Plaster</td>
<td>2.0</td>
</tr>
<tr>
<td>Food Products and Beverages Except Sugar</td>
<td>1.9</td>
</tr>
<tr>
<td>Electric Machinery &amp; Apparatus</td>
<td>1.3</td>
</tr>
<tr>
<td>Real Estate and Construction</td>
<td>1.0</td>
</tr>
<tr>
<td>Insurance &amp; Pension Funding</td>
<td>0.8</td>
</tr>
<tr>
<td>Fabricated Metal Products M&amp;E</td>
<td>0.7</td>
</tr>
<tr>
<td>Other</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>98.9</td>
</tr>
</tbody>
</table>

Source: TSE report, August 2017; ADL analysis
There are 5,000+ active mines in Iran, which are mostly open-pit and high-grade. More than 620,000 people are employed in metals & mining across the country.

However, the sector is currently substantially underdeveloped, mainly due to relatively old equipment and technologies, as well as lower productivity compared to global benchmarks. For example, labor productivity per worker in Iran in metals is just 25 percent of the productivity level in Turkey.

Despite its mineral wealth, Iran is one of the least explored resource-rich countries in the world. Iran's reserve-to-production ratios are much higher than the global average, which indicates the huge underdeveloped mining potential of the country.
3. Investments in Iran’s metals & mining sector are very attractive

The metals & mining sector in Iran is highly competitive. It has all the indicators to enable further growth and attract investments. There are several key elements contributing to it:

- Low energy costs
- Skilled workers, low salaries
- Predominantly young and highly educated workforce
- Biggest market in the Middle East
- Developed transport and infrastructure network
- Overall, very low production costs per ton

Iran’s position on the global cost curves of the key commodities is quite attractive. The country is consistently placed in the second quartile of the iron ore, copper and aluminium curves.

The current pipeline includes approximately 30 projects under development. Most of the projects are related to the steel, copper and aluminium value chains. We structured them based on required investment volume and level of attractiveness, which include the following factors:

- Positioning of the country on the cost curve
- Level of market growth
- Greenfield/brownfield project
- Proximity to the special economic zone

Figure 7: Copper based on total cash cost\(^1\) – CRU BOC curve in % of production

Source: Arthur D. Little analysis based on aluminum insider
Note: All metals prices, wage rates, exchange rates, fuel & reagent cost for forecast periods are based on values in 2016 & presented in constant 2016 US dollars. Mine Economics covers 78.12% of 2017 global recovered copper production. Total cost includes labor, energy, reagents, other on-site costs, TCRC+ shipment as well as royalty costs.

Source: Arthur D. Little analysis based on SNL Mine Economics

1) Figures for Iran are based on the average costs of 5 mines (Sargen, Kerman, Yazd, Hormozgan, North East)

Source: Arthur D. Little analysis based on Wood Mackenzie, HSBC estimates, Iron Ore Producers and Exporters Association of Iran
The most attractive projects are related to the copper and aluminium sectors. Many are conveniently located in special economic zones, with close proximity to the Persian Gulf and cheap sources of energy. There are multiple small (less than USD 0.5 billion) and mid-sized projects (USD 0.5–1 billion), which can be exceptionally attractive to foreign investors.

Several major projects in the steel value chain require significant investments, and more preparation structuring and focus on risk sharing.

Recent price dynamics and market outlook for the key commodities further support the investment attractiveness of the metals & mining sector: the steel, iron ore, zinc, copper and aluminium sectors experienced 25–35% price growth over the last 12 months.
4. The way forward for Iran

Overall, the metals & mining sector in Iran has very significant potential and can become a flagship sector for foreign direct investments. The key for Iran is to demonstrate quickly that it has a very strong commitment to the sector’s development, and is open and transparent to international partners.

The country also needs to focus on this set of initiatives to make sure it achieves its strategic agenda in metals & mining:

- **Productivity improvement**
  - Based on Arthur D. Little project experience, focused productivity improvement and de-bottlenecking initiatives in the sector can boost its output per worker by up to two times within a relatively short period of time.
  - Even some of the top-performing Australian mines are still achieving 3–5 percent productivity improvement annually by using specialized, focused task-force teams.
  - To start the process and demonstrate efficiency, several mid-performing mines with good, disciplined management practices should be picked up for the program roll-out. It will be relatively easy to demonstrate success within a short period of time (six to 12 months).

- **Capex optimization**
  - Huge investments need to be carefully planned. Based on Arthur D. Little experience, up to 20–30% of planned costs can be saved if the country creates a focused capex optimization program early on in the process.
  - The major levers include scope reduction early on in the process, lean design/standardization, and careful work on construction productivity, focusing on strategic sourcing and contracting management.

- **Capability development**
  - Ambitious growth plans in metals & mining require alignment of sector-growth targets with human-capital development plans. Iran needs to be able develop, attract and retain critical skill sets. Arthur D. Little has worked with the major global companies across different sectors and successfully helped them to develop viable HR/capability building strategies.

- **Overall sector management practices**
  - Manage the integrated sector development program through the transparent mechanism (e.g., project management office), develop a detailed plan, and tightly control its implementation. Based on Arthur D. Little experience, creation of coordinated system of sector development is usually the major driver of future growth.

Arthur D. Little has extensively worked across the above topics, helping global metals & mining as well as broader industrial-goods clients to achieve excellence in operations, capital stewardship, procurement and supply chain, and organizational and technological development.

Our experts have delivered successful projects across the mining value chain, covering ferrous, base & precious metals, energy (thermal coal) and other minerals.
Contacts

If you would like more information or to arrange an informal discussion on the issues raised here and how they affect your business, please contact:

Austria
Karim Taga
taga.karim@adlittle.com

Belgium
Kurt Baes
baes.kurt@adlittle.com

China
Russell Pell
pell.russell@adlittle.com

Czech Republic
Dean Brabec
brabec.dean@adlittle.com

France
Delphine Knab
knab.delphine@adlittle.com

Germany
Oliver Horlebein
oliver.horlebein@adlittle.com

India
Sri Sri Srinivasan
srinivasan.sri@adlittle.com

Italy
Saverio Caldani
caldani.saverio@adlittle.com

Japan
Yotaro Akamine
guzman.rodolfo@adlittle.com

Korea
Kevin Lee
lee.kevin@adlittle.com

Latin America
Rodolfo Guzman
guzman.rodolfo@adlittle.com

Middle East
Ilya Epikhin
epikhin.ilya@adlittle.com

Norway
Diego Mackee
mackee.diego@adlittle.com

Singapore
Yotaro Akamine
akamine.yotaro@adlittle.com

Spain
David Borras
borras.david@adlittle.com

Switzerland
Oliver Horlebein
oliver.horlebein@adlittle.com

Turkey
Coskun Baban
baban.coskun@adlittle.com

UK
Stephen Rogers
rogers.stephen@adlittle.com

USA
Rodolfo Guzman
guzman.rodolfo@adlittle.com

The Netherlands
Martijn Eikelenboom
eikelenboom.martijn@adlittle.com

Nordics
Nils Bohlin
bohlin.nils@adlittle.com
A perspective on the Iranian metals & mining industry – Ambitious plans to boost production

Arthur D. Little

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Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. Arthur D. Little is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

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