



In "Resistance Economy; Implementation and Action" Year (2016-2017)

**IMIDRO was acknowledged as
"Leading Exploration Organization of the Year"
and "Top Organization" by Ministry of Industry,
Mine and Trade**

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IMIDRO

IRANIAN MINES AND MINING INDUSTRIES DEVELOPMENT
AND RENOVATION ORGANIZATION

Deputy of Planning and Empowerment
Planning and Strategic
Supervision Department



“Domination of the world powers and negligence of some nations are the major factors preventing them from using the God- given resources; however, Iranian people due to resistance against the enemies of Islam and Iran, will make use of rich natural resources to create a pure Islamic life,” His Holiness noted, referring to the regulations of Islam on the use of the hidden wealth of the earth.

10 Suggestions of Supreme Leader to Act within Framework of Resistance Economy

1. Identification of and focus on advantageous economic chains and activities
2. Revival of domestic production
3. Serious avoidance of foreign purchases that weaken domestic production
4. Important sectors of the economy to become knowledge-based
5. Utilization of sectors already highly invested in petrochemicals and power plant construction
6. Conditionality of all foreign deals on the transfer of technology to Iran
7. Management of money and financial resources emanating from outside the country
8. Serious and real fight with corruption, rent-seeking and smuggling
9. Enhancing energy efficiency
10. Supportive and particular look at medium and small-sized industries



The Supreme Leader:

“Owing to the hands of religious Iranian workers, as well as intelligence and innovation of managers and scientists of this country, the hidden treasures of Iran’s soil will contribute to the progress and prosperity of the nation.”



The President of Islamic Republic of Iran:

“Today, in order to promote the development of the country, not only natural and human resources but also social capital is required. In this regard, we should trust each other, obey the law and consider the country's future stability and security. It must be ensured that this government is able to maintain peace and stability in the market.

The country's economy needs to look both inward and outward to be consistent with the policies defined in the Resistance Economy. As a result, the movement of mine and industry towards improvement and growth is of crucial importance. Because it contributes to local prosperity, effective participation in the global competitive market, as well as earning foreign exchange to the country.

Mine and industry must permeate all sectors and the country needs to be industrialized. The government will achieve this goal through endeavors of craftsmen and miners, and relying on the experiences of senior managers, investors, and entrepreneurs working in these areas.”





IMIDRO's Measures to Develop Mines and Mining Industries

Mehdi Karbasian

Chairman of Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)

IMIDRO, as a dynamic organization, has successfully overcome the challenges of management crisis and dealt with a decline in the global demand in recent years.

Currently, the organization has a great opportunity to look at its measures undertaken in the past and the conditions ahead. There is no denying the fact that IMIDRO has not been highly efficient in the preceding years due to several unfinished projects.

Fortunately, the organization has adopted a development approach since the second half of 1392 (2013-2014). Therefore, owing to the participation of the private sector, the halted projects became operational and new plans are outlined for the future of mines and mining industries.

The measures undertaken by IMIDRO in the very first year of the 11th government was in consistent with the Resistance Economy. Although the organization has faced some financial problems, it managed to carry out more than 30 suspended projects in all areas including steel, iron ore, coal, gold, aluminum, copper etc.

It turns out that IMIDRO is determined to lead mines and mining industry sector toward development.

In a meanwhile, development and implementation of a 250000 Km² exploration plan was fraught with difficulty but the organization provided an answer to the problems and the project contributed to the supply of raw materials for mining development projects. During this project, in addition to significant increase in mineral reserves of the country-which is mentioned in this report-valuable rare earth elements were explored. Therefore, we witnessed the production of the first ingot of these elements in Iranian Mineral Processing Research Center (IMPRC), in 1394 (2015-2016).

Likewise, in the preceding year, by exporting more than 4MT steel, the organization set a new record for the export of this metal and reduced the tension in the steel industry. As the Supreme Leader pointed out turning domestic products into export-oriented ones is a constructive approach to strengthen the economy.

IMIDRO is also committed to break the ground for the development of mining industries, particularly in the southern coasts of the country. As these areas are located in the vicinity of high seas and gas energy, they enjoy the great advantage of importing raw materials and exporting manufactured goods.

Meanwhile, attracting foreign investment in these areas makes financing and implementing infrastructure projects possible. It is worth mentioning that the companies that were not previously interested in cooperation with Iran are enthusiastic to carry out joint ventures with Iranian parties since the beginning of the 11th government.

Signing 30 international Memorandums of Understanding in the past three years is a primary benefit of developing relations with the surrounding world.

Undoubtedly, the local private companies are the main drives of IMIDRO in this path, contributing to the development of mines and mining industries as well as transferring technical knowledge to the country.

Indeed, the President's visit to Italy and France was a starting point for cooperation in steel and aluminum industries and even insurance affairs. IMIDRO and Danieli of Italy are to start cooperation as a joint company (Persian Metallics) to boost Iran's steel industry.

Since last year, IMIDRO has taken some major steps in the area of research and education and started an extensive program to speed up modern mining methods all over the country. The program is aimed to improve the knowledge of domestic companies relying on the local and overseas experts.

The efforts made by the organization was acknowledged by the Minister of Industry, Mine and Trade and Mr. Nematzadeh honored the organization by presenting it as the "Top Explorer of 2015" and "Top Organization" of the ministry in the National Day of Mine and Industry.

I'm of the opinion that these rewards reflect the measures undertaken by IMIDRO in 3 years of "Prudence and Hope" government.

Role of Mine and Mining Industries in Resistance Economy

Resistance Economy:

Making great efforts to boost the domestic economy and international ties is the main characteristic of the country's mine and mining industries sector. With regard to the benefits of the mining sector and relying on the proper planning, the sector is considered as the most important contributor to the country's economy and plays a key role in achieving the goals of the Resistance Economy. The features of this section are as follows:

- Reliance on a great number of local capacities including human, natural, and scientific resources
- Withstanding against threatening factors
- Increasing the added value, productivity and welfare
- Being independent of oil revenue
- People-centered approach
- Enjoying high and sustainable employment



IMIDRO's Measures in Realizing Objectives of Resistance Economy in 2015

Exploration Operations: Carrying out prospection and exploration operations in 20 provinces (250 km²), discovering 300 new promising mining zones, implementing 74 general, detailed and complementary exploration projects, introducing policies to attract private sector participation in low-risk exploration operations (general and detailed explorations). Likewise, for the first time there was a call for conceding Nikuyeh gold plan in 1394 (2015-2016).

Moving from Raw Retail to Processing: Implementing iron ore pelletizing and concentrate projects by private sector in the country, launching 2 copper concentrate projects (Sungun and Sarcheshmeh), as well as carrying out the plan of processing low-grade ore in Jalal Abad Iron Mine.

Attracting Participation and Investment of Private Sector: Attracting about \$430M investment of private sector for provincial steel projects. IMIDRO made a great attempt to encourage the participation of private sector in provincial steel plans and as a result over \$358M and \$83M investments were made in 1393 (2014 -2105) and 1394 (2015-2016), respectively.

Technology Development: Carrying out antimony processing project in Sefidabeh(Sistan and Baluchestan), developing technology for the extraction of rare earth elements in laboratory scale and launching a pilot project of petroleum coke.

Domestic Production of New Products: Launching projects worth more than \$130M in 1394 (2015_2016) ranging from Kahnuij Titanium(pilot), Petroleum Coke (pilot), Khur and Biabanak Potash, Zarand Tar Refinery to Zarshouran Gold project.

Moving towards Strengthening Resistance Economy

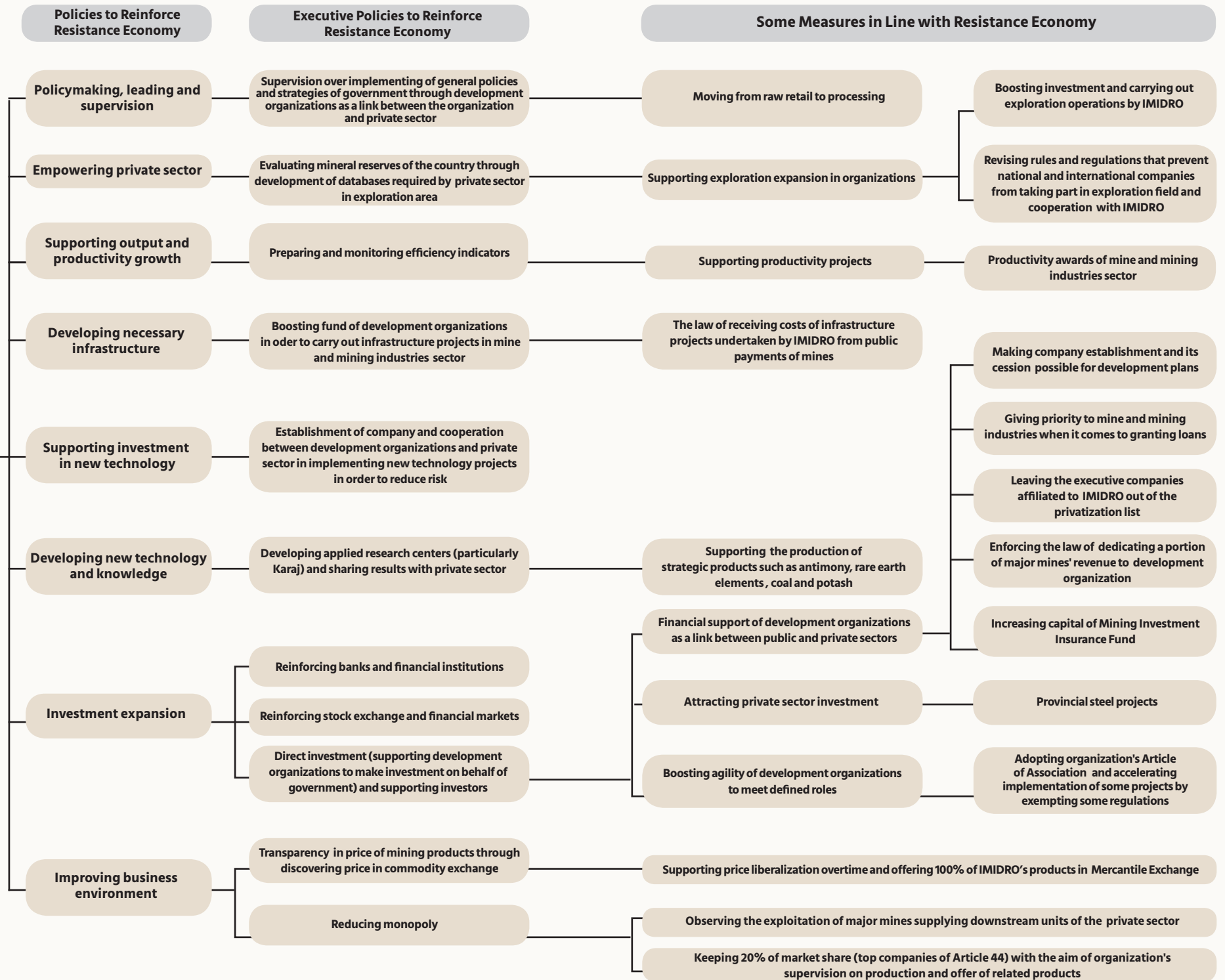




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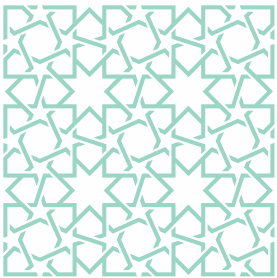


Public Relations of Iranian Mines and Mining Industries
Development and Renovation Organization

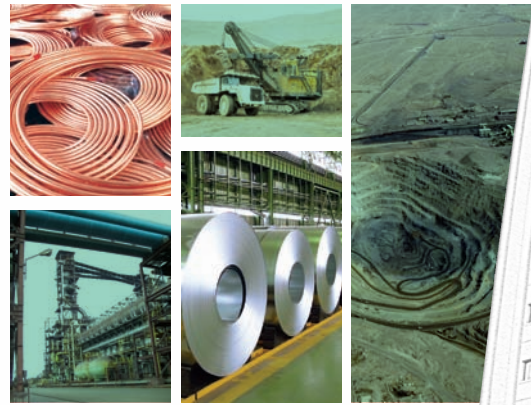
July 2016



Chapter 1
Mission, Outlook
and Strategy of IMIDRO



Position of IMIDRO in Iran's Mine and Industry Sector
Outlook
Values
IMIDRO's Macro Strategies



IMIDRO

Position of IMIDRO in Iran's Mine and Industry Sector

According to the Article 6 of the Law which regulates the formation of Ministry of Industries and Mines and its following clause approved by The Islamic Consultative Assembly, Iranian Mines & Mining Industries Development & Renovation Organization (IMIDRO) was established in 1379 (2000-2001). The organization aims to provide the country with required minerals, evaluate, prepare and implement constructing projects, expand and renovate metallurgy industries, extract and process minerals and carry out exploration operations with an emphasize on enhancing economy system of the country in mines and related industry sectors. Supervising on use of mineral reserves and effective exploitation of deposits are other outlined objectives. The organization will be administrated in accordance with the Law of establishment of Industrial Development & Renovation Organization of Iran dated 1346 (1967-1968) and its statute and regulations.





IMIDRO's Mission

IMIDRO is steering development, empowerment and competitiveness of mine and mining industries sector and turning its resources and products into sustainable wealth of the country.

Outlook

Leader and pioneer in evolution and reaching sustainable development in mine and mining industries sector and remaining competitive in global value chains

Values

1. Respecting human rights and dignity as well as social justice
2. Ensuring safety and health of workers
3. Devoting full attention to deprived areas, creating employment and recognizing the rights of local communities
4. Respecting rights of all stakeholders and gaining client satisfaction
5. Protecting environment, cultural heritage, non-renewable resources and rights of next generations
6. Committing to ethics and respecting material and intellectual property rights
7. Transparency in providing information and accountability

IMIDRO's Macro Strategies

1. Development of mine and mining industries operations enjoying competitive edge in less developed areas
2. Increasing investment in developing mine and mining industries units requiring high risk and modern technologies
3. Development of overseas mining operations and mining industries aiming to complete value chain
4. Expanding modern methods of financing in implementation of development projects
5. Boosting productivity, synergy and competitiveness in mine and mining industries sector
6. Promotion of knowledge, applied researches and technologies needed for mine and mining industries sector
7. Expansion of investment by private sector in mine and mining industry operations and related infrastructure
8. Development of human resources in mine and mining industry sector
9. Strategic marketing and boosting export of products and technical-engineering services

Development of Mine and Mining Industry Activities Enjoying Competitive Edge in Less Developed Areas

- Expansion of explorations in less-developed areas
- Implementation of mine and mining industries development plans in less-developed areas
- Expansion of new methods and supplying required infrastructure for subsidiary units in less developed areas

Increasing Investment in Developing Mine and Mining Industry Units Requiring High Risk and Modern Technologies

- Expansion of mining activities in high-risk areas
- Expansion of strategic elements mining for future technologies
- Expansion of mining activities by making use of modern technologies
- Completing downstream value chain of base metals by using modern technologies
- Expansion of units producing raw materials needed for base metals by using modern technology
- Expansion of mining industries enjoying modern technologies and competitive edge

Development of Overseas Mining Activities and Mining Industries

- Expansion of overseas exploration and mining to supply raw materials required for the country
- Expansion of downstream units of base metals in the targeted countries

Expanding Modern Methods of Financing in Implementation of Development Projects

- Financing essential funds for projects
- Attracting direct foreign investment

Boosting Productivity, Synergy and Competitiveness in Mine and Mining Industries Sector

- Renovation and productivity enhancement in mine and mining industries units affiliated to the organization
- Protecting major mines of the country
- Boosting competitiveness in the sector
- Increasing production of subsidiary mine and mining industries
- Improving environment, safety and health conditions in mine and mining industries sector



Promotion of Knowledge, Applied Researches and Technologies Needed for Mine and Mining Industries Sector

- Promotion of knowledge and technical informations of the sector
- Acquisition of new technologies required for the sector
- Supporting and reinforcing required applied researches for the sector

Development of Human Resources in Mine and Mining Industry Sector

- Development of training in mine and mining Industry sector
- Developing and enhancing the role of specialized bodies in decision making

Expansion of Investment by Private Sector in Mine and Mining Industry Operations and Related Infrastructure

- Transfer of mining exploration operations to private sector or seeking its participation
- Transfer of extraction and processing mineral operations to private sector or seeking its participation
- Development of mining industries due to participation of private sector
- Supplying required infrastructure through investment made by private sector
- Boosting and supporting investment in mine and mining Industry sector

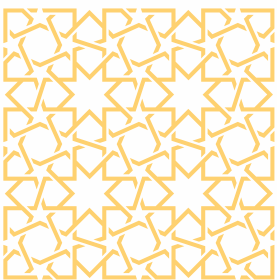
Expansion of Private Sector's Investment in Mine and Mining Industry Activities and Related Infrastructure

- Export of technical-engineering services
- Expanding export of mine and mining Industry products

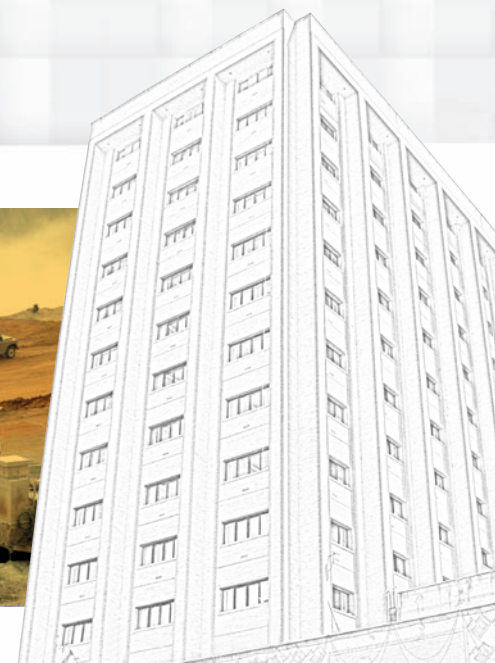




Chapter 2
Development
and Production



- Launching Projects between 1393-1394 (2014-2016)**
- Projects Undertaken in 1395 (2016-2017)**
- Production of Mines and Mining Industry Sector**
- Foreign Trade of Mines and Mining Industry Products**
- Iran's Major Import and Export Partners in 1394 (2015-2016)**
- International Memorandums of Understanding**



One Billion Dollars Investment in 1393 and 1394

Between 1393 (2014-2015) and 1394 (2015-2016), IMIDRO invested over one billion dollars in mines and mining industries projects. The projects were launched while the organization was challenged by shortage of financial resources due to non-specialized privatization in the preceding years. The name of the projects and amount of investment are shown in the table below.

Projects Undertaken in 1393 (2014_2015)

Row	Project Name	Investment (MD)
1	Zarshouran (3T Production Capacity of Gold per Year)	47.6
2	Venezuela Cement (1MT Production Capacity per Year)	315
3	Al-Mahdi Rodding	45.4
4	5 Infrastructure Projects (Roads and Transmission Lines)	11
Total		419

Projects Undertaken in 1394 (2015-2016)

Row	Project Name	Investment (MD)
1	Petroleum Coke Pilot	14
2	Second Phase of Jetty Project-P.G.S.E.Z	30
3	Khur Potash (Project Completed and Exploited)	51.2
4	Zarand Tar Refinery	107
5	8 Infrastructure Projects of Road and Mines Transmission Lines	18.1
6	2 Copper Concentrate Projects: Sarcheshmeh Concentration Plan (Phase 2) and Sungun Concentration Plan (Phase 2)	365
Total		585

Exploitation of Undertaken Projects and Launching New Plans in 2016-2017

Value of IMIDRO's projects and joint ventures with private sector will amount to \$1.4 Bn in 1395 (2016-2017). Also, in line with the planning to launch new projects, this organization scheduled to enforce new investment contracts with contractors valued about \$1.7 Bn.

Projects Undertaken in 1395 (2016-2017)

NO.	Project Name	Goal (Annual Production Capacity)	Investment (MD)
1	Sefidabeh Antimony	Semi-industrial project	1.3
2	Sepid Dasht Steel- Direct Reduction Unit	800 KT	120
3	Shadegan Steel-Direct Reduction Unit	800 KT	120
4	Mianeh Steel-Direct Reduction Unit	800 KT	120
5	Ghaenat Steel-Direct Reduction Unit	800 KT	120
6	Neyriz Steel-Direct Reduction Unit	800 KT	120
7	Jajarm Aluminum (Phase1)	36 KT	177
8	Sangan-Mobarakeh Steel-Pelletizing	5 MT	250
9	Parsian Energy Intensive Special Zone	Land Preparation for Investors	50
10	Lamerd Energy Intensive Special Zone	Land Preparation for Investors	34
11	Kahnuj Titanium Pilot	Semi-Industrial Project	3.3
12	Hormoz, Ghadir and Oxin Power Plant	532 MW	90
13	Savadkooh Coal Washing	500 KT	14
14	Guinea Bauxite	Studies Completed	2
15	Jalal Abad Iron Ore Beneficiation	2.2 MT	20
16	Sangan-Tose-e Melli Concentrate	2.5 MT	120
17	Rare Earth Elements (Laboratory Pilot)	-	-
18	Graphite Electrode	Engineering Phase	5
19	Production of Alumina from Nepheline Syenite-Sarabe	Engineering Phase Completed	6.8
20	Block 4 of Parvadeh 4 (Saman Faraz Qeshm)	Extraction and Sale Contract	19.7
21	Zone 7 of Parvadeh 1 (Esfahan Steel Making)	Extraction and Sale Contract	10
22	Zone 8 of Parvadeh 1(Esfahan Steel Making)	Extraction and Sale Contract	10
23	Gol-e-Gohar 4 (MIDCO)	Extraction and Sale Contract	-
24	Gol-e-Gohar 6 (Golfam Zarand,Kerman)	Extraction and Sale Contract	-
25	Kurdistan Steel	Exploratory Process Completed	-
26	Chabahar Aluminum	Studies Completed	-

Exploitation of Joint Ventures with Private Sector

Row	Project Name	Value (MD)
1	Mobarakeh Pelletizing (Sangan)	250
2	Block 4 of Parvadeh 4 (Saman Faraz)	19.7
3	Tose-e Melli Concentrate (Sangan)	130
4	Iron Ore Beneficiation (Jalal Abad)	20
5	235MW Oxin Power Plant	90
Total		509.7

New Development Projects Outset (Validation)

Row	Project Name	Value (MD)
1	Second Phase of Zarshouran Operation	36.1
2	Kahnuj Titanium Concentrate	162
	Kahnuj Titanium Slag	
3	Kord Abad Coal	46.7
4	Rare Earth Elements Pilot	11.3
5	Infrastructure: 3 Lamerd Projects	9.8
6	Jajarm Aluminum	42.9
7	South Aluminum Power plant	500
8	Mehdi Abad Lead and Zinc	920
Total		1.728.8



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Pass Through Crisis with Caution

Global mining events in 2015 were marked by drastic fall in demand, while China played a leading role in this phenomenon. The decrease in prices of raw materials and minerals in this year forced manufacturers all around the world to cut down the volume of production. On the other hand, such a reduction in price brought about economic problems such as a decline in the companies' revenues. Thus many weak rivals were pulled out of the competition. Nevertheless, most of the Iranian companies managed to maintain their production as well as their share in domestic and foreign markets in the mentioned period. In some cases, the increase in production imposed warehousing and sales costs. Therefore, the producers tend to not increase the production in 1394 (2015-2016) which was in line with the global trend.



Crude Steel Production Increased by 2.8%

In 1394 (2015-2016), crude steel production increased by 2.8% to 16.8MT, compared with the preceding year. Considering the situation of the global market, the production rate will remain constant of that in 1395 (2016-2017).

As the table shows, steel production capacity in the current Iranian year (2016-2017) is equal to 24MT.

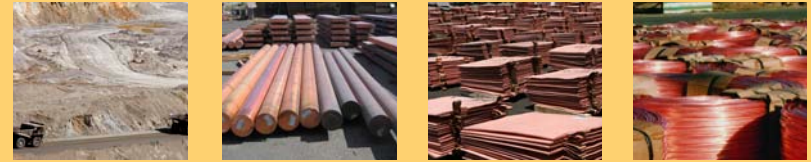
Likewise, the volume of steel production capacity was about 15.2MT in 1395 (2016-2017).

The capacity is projected to rise by 5% to 16MT.

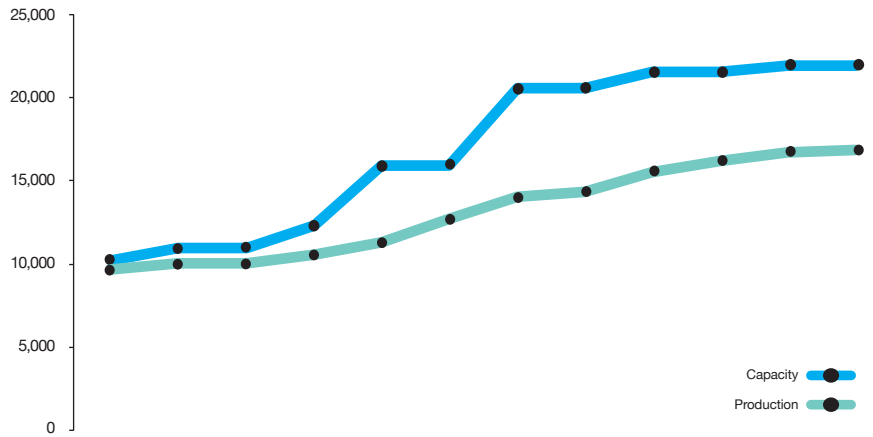
Copper Concentrate Production Growth

The rate of copper production in 1394 (2015-2016) was equal to 194KT and remained constant of that in 1393 (2014-2015). It is predicated that the volume of production reaches 200KT in 1395 (2016-2017), experiencing about 3% growth.

Likewise, copper concentrate production rose by 24% to 1030KT in 1394 (2015-2016).

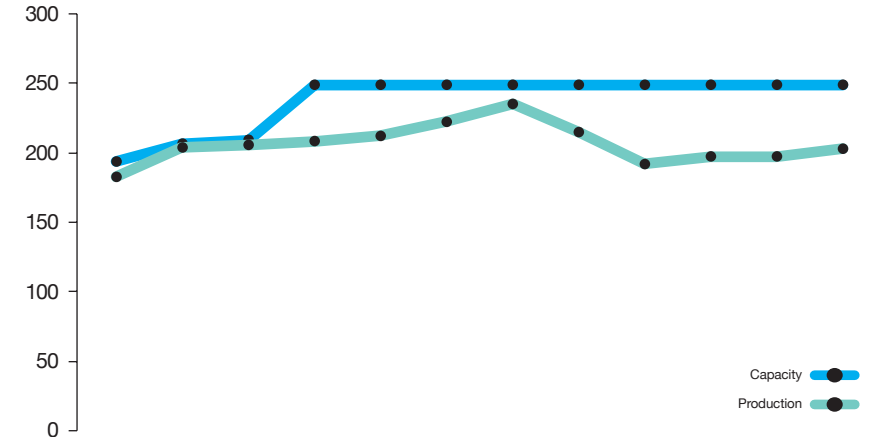


Increase in Capacity and Production of Crude Steel (KT)



	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Capacity	10,100	10,835	10,835	12,235	15,925	15,925	20,665	20,665	21,665	21,665	22,000	22,000
Production	9574	9927	9944	10483	11219	12719	14037	14395	15631	16257	16805	17000

Increase in Capacity and Production of Copper (KT)



	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Capacity	190	204	207	250	250	250	250	250	250	250	250	250
Production	178	201	203	206	210	221	235	213	188	194	194	200

42.5MT Iron Ore Production

In 1394 (2015-2016), about 42.5MT iron ore was produced in the country and it is projected that the production volume increases by 13% to 48MT in 1395 (2016-2017).

Iron ore production capacity is expected to be 52MT in the aforementioned period.



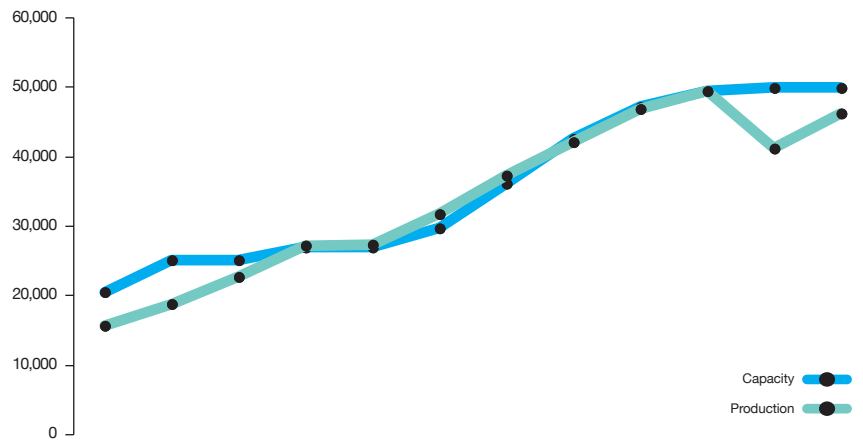
1.4MT Coal Production

Iran's total coal concentrate production was about 1.4MT in 1394 (2015-2016) and it is projected that the figure reaches 1.5MT by 1395 (2016-2017).

The capacity of coal production is expected to hit 2.7MT in 2016-2017.

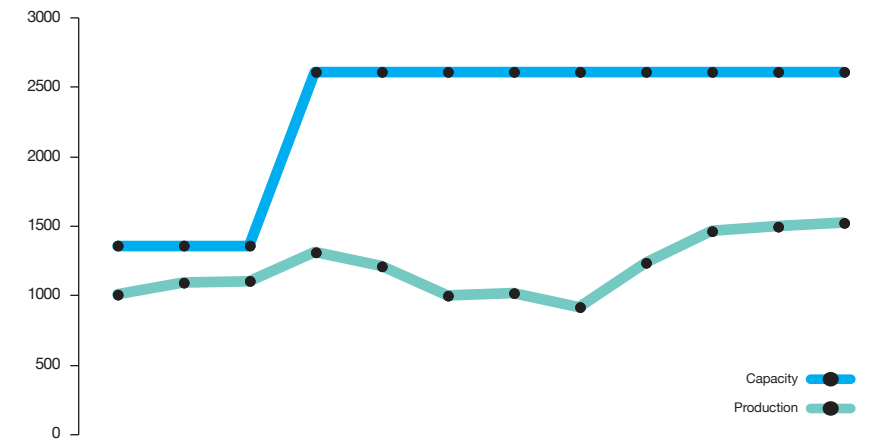


Increase in Capacity and Production of Iron Ore (KT)



	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Capacity	20,000	25,000	25,000	27,000	27,000	30,000	37,000	44,000	49,000	51,500	52,000	52,000
Production	14728	18134	22378	27300	27435	32220	38260	43497	48693	51500	42500	48000

Increase in Capacity and Production of Coal (KT)



	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Capacity	1,320	1,320	1,320	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Production	930	1025	1039	1266	1155	922	942	831	1183	1434	1470	1500

355KT Aluminum Production

Aluminum production stand at 355KT in 1394 (2015-2016) and it is projected to increase to 360KT in 1395 (2016-2017).

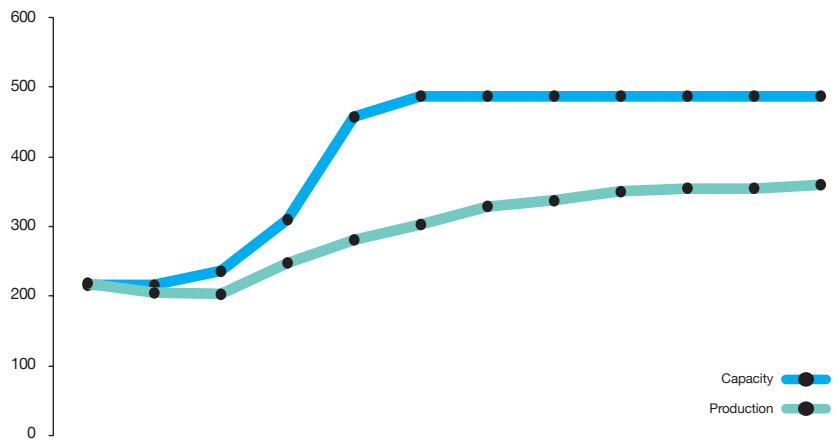


241KT Alumina Production

Alumina powder production exceeded 241KT in 1394 (2015-2016). Whereas, the production of this raw material used for aluminum ingot production reduced by 3.8% in comparison with that of 1393 (2014-2015). Based on the production plans, alumina powder production will reach 248KT in 1395 (2016-2017).

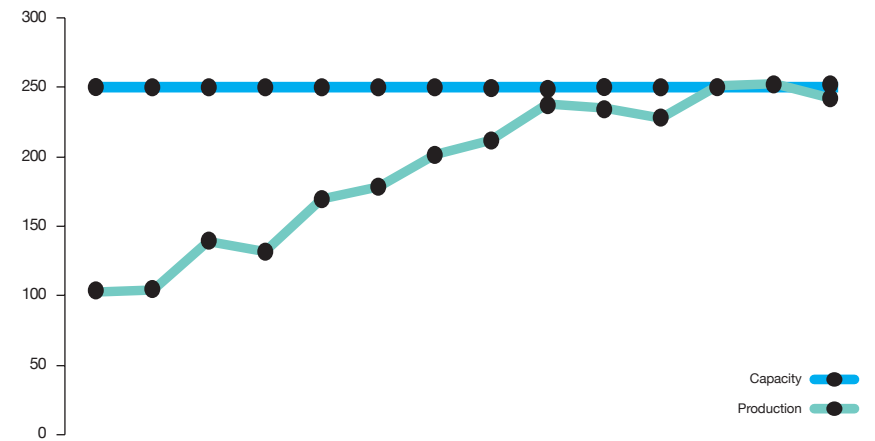


Increase in Capacity and Production of Aluminum (KT)



	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Capacity	216	216	236	310	457	487	487	487	487	487	487	487
Production	219	205	203	248	281	303	329	337	350	355	355	360

Alumina Powder Production (KT)



	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Capacity	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Production	102	103	138	130	168	177	200	210	236	233	227	249	251	241

16% Share of Minerals and Mining Industries Export

Minerals and metals play a key role in the country's export as they are responsible for a great part of non-oil exports. This proves the importance of mining sector in the Resistance Economy and its export-oriented production.

In 1394 (2015-2016), The value of Iran's foreign trade in this sector reached to \$11.4 Bn; in the meantime, the export share of mine and mining industries surpassed \$7 Bn. The share of mine and mining industry sector was 16.5% of total non-oil exports. During this period, the value of import in mine and mining industries reached \$4.4 Bn, accounting for 11% of the country's total import values.

Foreign Trade of Mine, and Mining Industries

Export Product Name	Share in National Export (percent)	Import Product Name	Share in National Import (percent)
Steel Chain and Downstream Products	38	Steel Chain and Downstream Products	68.7
Other Mineral and Mining Industries Products	26.7	Other Mineral and Mining Industry Products	11.02
Cement Chain	10.4	Aluminum Chain and Downstream Products	7.77
Iron Ore	7.4	Various Types of Ferro	2.96
Copper and Downstream Products	4.1	Iron Ore	2.74
Aluminum Chain and Downstream Products	3.2	Titanium Chain	1.92
Zinc Chain	3.1	Coal and Coke	1.42
Various Types of Ore	3.1	Various Types of Ore	0.79
Lead Chain	2.2	Copper and Downstream Products	0.77
Chrome Chain	0.7	Nickel and Products	0.74
Various Types of Ferro	0.6	Zinc Chain	0.50
Molybdenum Chain	0.4	Cement Chain	0.21
Coal and Coke	0.1	Lead Chain	0.18
		Metals and Precious Stones	0.07
		Chrome Chain	0.07

Iran's Major Import and Export Partners in 1394 (2015-2016)

Out of 10 target markets of Iran's mineral and mining industries export in 1394 (2015-2016), Iraq, 18%; China, 15%, and India, 14% had the highest share. On the other hand, China accounted for 33% of the total imports to the country and ranked first, leaving UAE, 19%, and Republic of Korea, 14% behind.



Rank	Country	Value of Export (MD)	Share of Export (percent)	Rank	Country	Value of Import (MD)	Share of Import (percent)
1	Iraq	1.287	18.3	1	China	1.480	33.3
2	China	1.065	15.1	2	UAE	878	19.8
3	India	997	14.1	3	Republic of Korea	616	13.9
4	Italy	662	9.4	4	India	517	11.7
5	UAE	638	9	5	Turkey	337	7.6
6	Afghanistan	366	5.2	6	Taiwan	93	2.1
7	Turkey	334	4.7	7	Germany	64	1.4
8	Turkmenistan	231	3.3	8	Kazakhstan	55	1.2
9	Oman	158	2.2	9	Russia	49	1.1
10	Thailand	142	2	10	Bahrain	35	0.8



International Memorandums of Understanding

In addition to signed presidential level Memorandums of Understanding with other countries, IMIDRO under the post-sanctions opportunities made by the esteemed President, Dr. Rohani, and Minister of Foreign Affairs, Dr. Zarif, made a great attempt to regain its desirable position at the international level. Upon the agreement reached between Iran and the world powers, IMIDRO managed to sign Memorandums of Understanding with major companies of 9 countries including Italy, France, Austria, China, South Korea, South Africa, India, Turkmenistan, and Afghanistan.

The Italian company, Danieli, has signed agreements on construction of seamless pipes, hot and cold rolled steel, as well as iron ore concentrate plant. Likewise, the company voiced its readiness to enter Iran's aluminum industry by signing MoUs on setting up Aluminum billet, foil, wire, and cable units. Specialized training and establishment of a joint steel venture are also included in these MoUs.

The two other Italian companies, SMS INNS and FATA will be active in aluminum industry sector (particularly downstream industries), as well as constructing the required power plants for this industry.

IMIDRO entered into MoUs with Fives Group and AXENS companies based in France to establish a required anode production plant for the country's steel industry and carry out feasibility studies for a petroleum coke project, respectively.

The Austrian SCS company also made a MoU on graphite electrodes project. On the other hand, the South Korean POSCO and Daewoo companies signed MoUs to enter Iran's aluminum industry.

Besides, the Chinese Sinosteel and NFC companies signed MoUs with IMIDRO to cooperate with aluminum industry and getting involved in rare earth element processing, safety, and mining technology.

Aiming to set up an export-oriented joint Aluminum plant in the southern coast of Iran, the Indian National Aluminum Company Ltd. (NALCO) signed a MoU with IMIDRO.

Likewise, the South African MINTEK Company and Iran Mineral Processing Research Center (IMPRC), a subsidiary of IMIDRO, signed a MoU on training and joint venture projects.

In addition, Ehdas Sanat Company (ESCO), a subsidiary of IMIDRO, signed a MoU with Continental Construction Company based in Turkmenistan to develop its cement industry. Ministry of Industry, Mine and Trade, and Petroleum of Afghanistan also signed a contract to boost technical cooperation.



Chapter 3
Empowerment






























- Exploration**
- Research and Localization**
- Rare Earth Elements**
- Training**
- Health, Safety and Environment**
- Future Empowerment Plans**

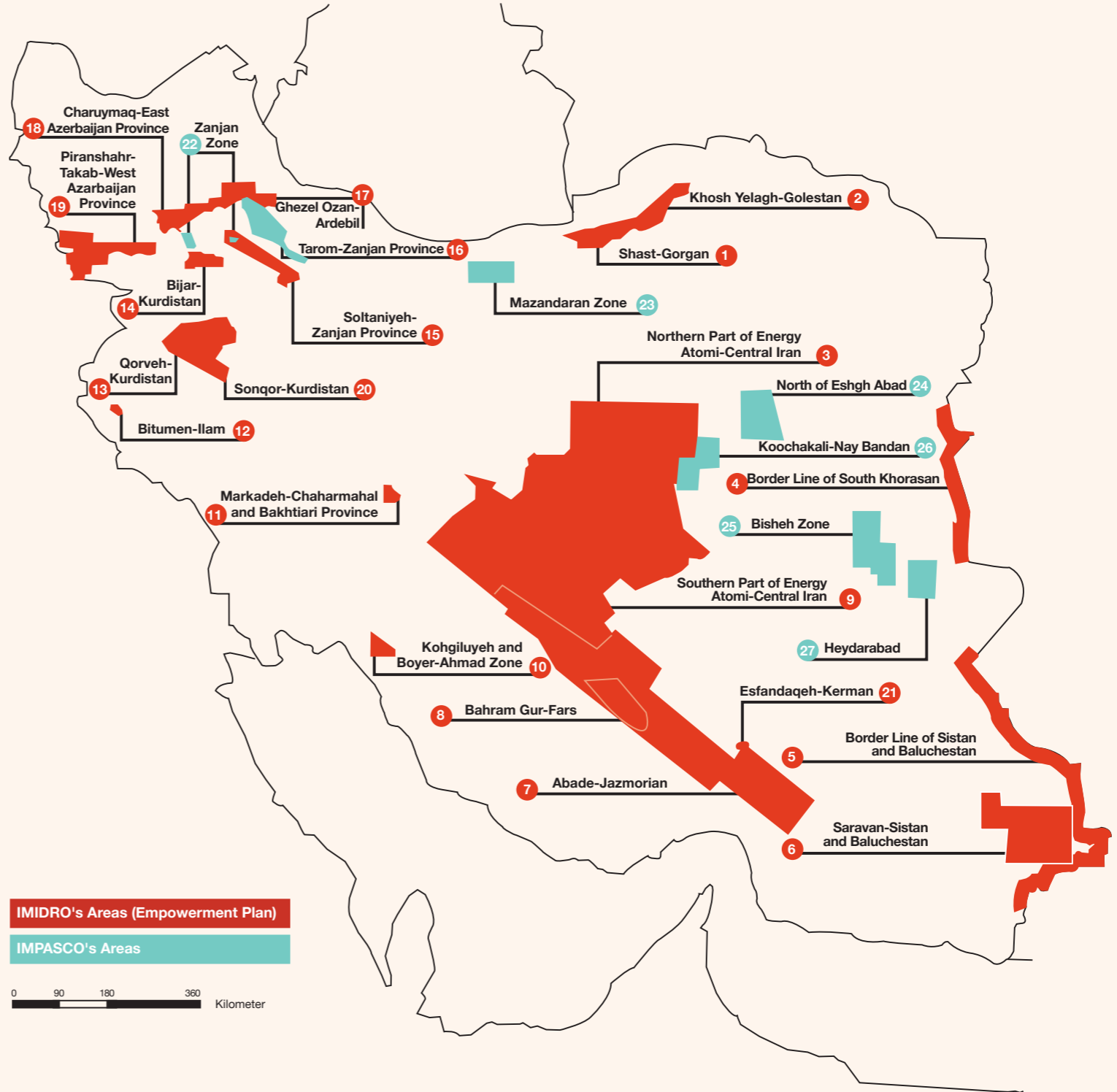


Exploration

Details of Map Location:

-  1. Shast-Gorgan
-  2. Khosh Yelagh-Golestan
-  3. Northern Part of Energy Atomi-Central Iran
-  4. Border Line of South Khorasan
-  5. Border Line of Sistan and Baluchestan
-  6. Saravan-Sistan and Baluchestan
-  7. Abade-Jazmorian
-  8. Bahram Gur-Fars
-  9. Southern Part of Energy Atomi-Central Iran
-  10. Kohgiluyeh and Boyer-Ahmad Zone
-  11. Markadeh-Chaharmahal and Bakhtiari Province
-  12. Bitumen-Ilam
-  13. Qorveh-Kurdistan
-  14. Bijar-Kurdistan
-  15. Soltaniyeh-Zanjan Province
-  16. Tarom-Zanjan Province
-  17. Ghezel Ozan-Ardebil
-  18. Charuymaq-East Azerbaijan Province
-  19. Piranshahr-Takab-West Azarbaijan Province
-  20. Sonqor-Kurdistan
-  21. Esfandaqeh-Kerman

-  22. Zanjan Zone
-  23. Mazandaran Zone
-  24. North of Eshgh Abad
-  25. Bisheh Zone
-  26. Koochakali-Nay Bandan
-  27. Heydarabad





Roadmap of IMIDRO's Exploration Activities

IMIDRO as an organization committed to preparing the ground for development of mines and mining industry sector has started a new program for exploration and optimal exploitation of the country's reserves in 1393 (2014-2015).

The measure was in line with the emphasis made by the Supreme Leader to realize the objectives defined in Resistance Economy, covers 250 thousand Km² of the country's areas and is 2.5 times more extensive than all explorations made in the past 80 years.

There is no denying the fact that the plan plays a crucial role in achieving balanced development in the country, promotes the role of mining in national economy and decreases reliance on oil revenues.

Given a variety of mining potentials and valuable metallic and nonmetallic reserves, Iran, with about 7% of the global reserves, is ranked as one of the top 15 countries in the world.

The country is located at Alpine-Himalayan metallogenic belt which gives it the advantage of being a frontier in the Middle East and Central Asia in terms of mining-exploration operations, IT, and investment in mining sector.

At least 8 world-class mines are located in Iran which will contribute the country in competing at the international level.

In addition, owing to the development and exploitation of the mentioned mines, Iran will be able to acquire the first stand in employment and national income generation. The explored and exploited deposits in Iran are about 57 BT which is not comparable to the size and potentials of the country.

In consistent with its developmental mission, IMIDRO has outlined and undertaken some plans to make up for the historical exploratory backwardness of the country. The exploration plans are set to achieve the following objectives:

1. Discovering a variety of new mining reserves to develop the mining sector and increase its share in GDP
2. Providing a suitable platform to attract domestic and foreign investors by providing exploration documents which comply with international standards
3. Making exploratory investment in deprived regions with high mining potentials to control the reserves, initiate development, create job opportunities, and provide security in these areas
4. Creating multiproduct economy, taking steps toward sustainable development, and turning mine into one of the important pillars of the country's economy
5. Discovering strategic metals and supplying industries with their required raw materials

Since 1393 (2014-2015), in line with the roadmap, broad exploration activities have been planned and implemented in the country, based upon the following priorities:

1. Employing modern exploration technologies such as implementation of airborne geophysics to discover hidden reserves
2. Conducting exploratory operations in a zone with an area of 250 thousand kms on east and west borders of the country and also deprived areas in order to create employment in less-developed regions
3. Carrying out systematic exploration operations based on the most recent scientific achievements in order to discover mining reserves
4. Reviewing and re-evaluating of available exploration–mining results and information that comply with international standards and quantifications in order to reduce investment risk and increase participation rate
5. Diversifying mining exploration activities such as exploration and processing of antimony, titanium, chromite, rare earth elements, low grade iron ore, phosphates etc.





IMIDRO's Exploration Operations in New Areas

IMIDRO's new exploration plan, covering 250 thousand square Kms of the country's area, starts from prone Sangam Mine (in north east) and extends to eastern and other areas of Iran. The result of such a huge project undertaken in 27 zones was identification of 300 mining areas. The details of the plan is as follows:

1. Carrying out identification and prospecting operations in 20 provinces covering 27 areas in more than 250 thousand square Kms of the country's areas
2. Identifying 300 new promising mining areas as follows:
 - a. 76 promising areas in Sangam, Razavi Khorasan
 - b. 28 promising areas on the borders of Sistan and Baluchestan
 - c. 12 promising areas in Saravan, Sistan and Baluchestan
 - d. 16 promising areas on borderlines of South Khorasan
 - e. 100 promising areas in Abadeh, Jazmourian
 - f. 60 promising areas in the central regions of Iran
 - g. 10 promising areas in Ardebil province
3. Carrying out general exploration, detailed, and complementary phases of 74 exploration projects across the country on various minerals such as iron, coal, polymetal, gold, copper, antimony, lead, zinc, chromite, titanium, nickel, molybdenum, barite, phosphate, bauxite, brines (potash, magnesium, lithium, etc.)

Upon carrying out the complementary phase of Zarshouran gold mine, up to 50% was added to the mine's reserves.



Cooperation with Private Sector

In line with IMIDRO's policies on attracting private sector participation as well as foreign investment, several meetings were held. Likewise, the first call for assigning an area to private sector was made in Nikouieh gold mine, Qazvin, in 1394 (2015-2016).

\$49.8Mn Investment in Exploration

In 2015-2016, Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) and its major affiliated mining companies invested over \$49.8Mn in exploration projects, indicating more than 2% growth compared with that of preceding year (\$48.6Mn).

Total drilling operations carried out in this sector was 180,000M in 1394 (2015-2016), indicating 15% decrease compared with 214,000M in the preceding year.

The conducted exploration operations include general explorations and reconnaissance and prospecting which were mainly focused on iron ore, coal, bauxite, rare earth elements, gold, and copper.

Table of Exploration Sector

Row	Description		Drilling (Thousand Meters)				Percent of Operation Progress Compared with Plan	Exploration Investment (billion rials)				Percent of Operation Progress Compared with Plan
			1391 (2012-2013)	1392 (2013-2014)	1393 (2014-2015)	1394 (2015-2016)		1391 (2012-2013)	1392 (2013-2014)	1393 (2014-2015)	1394 (2015-2016)	
1	Iran Minerals Production and Supply Company (IMPASCO)	Exploration of Iron, Coal and Polymetal	12.1	27.90	85.8	74	41.1	50	176	413	327	24.7
2	Sangan Complex	General Exploration in Eastern and Central Areas	9.4	8.55	28.8	13.7	7.6	34	42.8	114	55	4.2
3	Iran Alumina Co.	Exploration of Bauxite Indices	2.1	2.6	4.2	2.1	1.2	8.6	10.8	21.3	9.1	0.7
4	Empowering Exploration Plan	Reconnaissance and Prospecting Exploration	0	0.3	1.3	5.2	2.9	24.6	27	340	527	39.9
5	Zarshouran Gold Complex	Complementary Mining Exploration	8	2.5	0.7	11	6.1	14	10	10	50.8	3.8
6	Rare Earth Elements Project	Reconnaissance Exploration of Sangan and Gazestan	0	0	0	0	0.0	0	0	0	0.9	0.1
7	Sangan Zone Project	Reconnaissance Exploration	0	3	0	7.5	4.2	0	0	30	44.7	3.4
8	National Iranian Copper Industries Company	Copper Exploration	154	148	91.6	66.5	36.9	673	588	361	307	23.2
Total			185	193	212	180	100	804.2	855	1289	1321	100



Exploration Projects in 1395 (2016-2017)

IMIDRO seeks to continue the same trend of carrying out exploration operations and finalizing projects by attracting private sector participation in 1395 (2016-2017). On the other hand, upon exploration operations some new promising areas will be added to the mentioned areas. These projects, eventually, will result in exploration certificate and issuing operation license.

Complementary Exploration Projects

1. Completing exploration and defining development plan for new mines
2. Zarshouran complementary exploration
3. Developing overall bauxite exploration
4. Reconnaissance and prospecting operations of rare earth elements
5. Developing Sangam exploration

Major Infrastructure Plans

As an organization in charge of mines and mining industry sector, IMIDRO considers building infrastructures of mines and mining industries as a prerequisite for decreasing the risk of investment and increasing its attractiveness. Major plans defined by the organization are as follows:

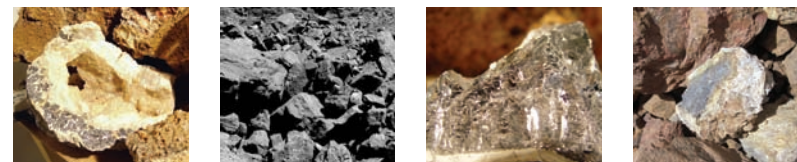
1. Improving Sangam rail fleet efficiency
2. Identifying and tackling the challenges of minerals' import and export from the country's ports
3. Constructing part of the road, electrification, gas transfer, and custom enforcement of Lamerd and Parsian Special Zones
4. Completing and constructing 13 mine roads and electrification projects
5. Studying 29 mine road construction and electrification projects
6. Providing facilities and mining operation insurance coverage for mining projects
7. Providing required infrastructure for Kashan Special Zone
8. Increasing the capital of mining insurance corporation



IRR 200Bn Research and Localization Investment

During 1394 (2015-2016), a total of 32 research projects in mines and mining industry sector were implemented by IMIDRO and its affiliated companies. In addition, IMIDRO has supported 88 higher education dissertations, 19 specialized conferences and books. IMIDRO has financially supported providing hardware infrastructures required for research and technology development. In total, over IRR 200Bn investment was made in research, technology and localization sectors. Some of the research projects are as follows:

1. Optimization of factors affecting Nakhlak Mineral Processing Complex
2. Replacement of mechanical cell with column flotation cells in the Esfordi Phosphate Complex in pilot scale
3. First phase of studying the extraction of precious, rare, and strategic metals from electronic waste
4. First phase of identifying minerals required for future technologies and evaluation of their extraction methods in the country
5. Application of an optimization model to assess and analyze development of the steel industry concerning shortage of water and energy in the country
6. First phase of studying the current situation and future of new technologies in mining exploration
7. Studying and presenting the results of vanadium recovery and extraction (V_2O_5) from vanadium-bearing slags in laboratory scale aimed at designing a pilot plant
8. Studying and providing the results of pre-feasibility tests and conceptual design of gas extraction from coal in Iran—a pilot study
9. Developing an appropriate model for measuring water and energy efficiency and communicating objectives defined in 1394 (2015-2016) to companies and complexes
10. Conducting mineralogical studies and dry magnetic separation of 4 types of iron ore in laboratory scale
11. Research and pilot-scale titanium processing in Qarah Aghaj
12. Conducting 7000 chemistry, mineralogy and processing tests on IMIDRO's explored samples in order to study and analyze samples of iron ore, lead, and polymetal zinc
13. Manufacturing project of dense medium cyclone separator device project for private sector (Noor Investment Development Company and Fluorspar Company) by research center
14. Establishment, launch, and operation of antimony ingot production in Sefidabeh region, Nehbandan



Rare Earth Elements

Aiming to turn Iran into an industrialized country and achieving the highest scientific status in the region, IMIDRO implemented some new projects in a bid to obtain strategic elements and metals at the beginning of the 11th government.

In April, the organization launched Esfordi Phosphate Complex as a semi-industrial unit in Yazd. The project was unprecedented as there has been no technology in the country to extract valuable and rare earth elements using phosphate concentrate. However, local researchers and experts made a great effort to make it happen.

The elements extracted from phosphate are ranging from lithium, neodymium, and cerium to lanthanum. Likewise, the first ingot of rare earth elements (Mischmetal) was produced in collaboration with Rare Earth Elements Unit in Iran Mineral Processing Research Center on March 2015. It is composed of four rare earth elements including cerium, lanthanum, neodymium, and yttrium.

Due to the high price on world markets, these elements bring about great added value to their suppliers. IMIDRO intends to break the ground for the production of the elements on an industrial scale and seeks the help of Iranian scientific centers.

Explored Rare Earth Elements

Row	Element name
1	Cerium
2	Lanthanum
3	Neodymium
4	Yttrium



Other Compounds of Rare Earth Elements

Row	Compound name	Purity
1	Praseodymium Oxide	%99.9
2	Neodymium Oxide	%99.9
3	Titan Ferrous Oxide	Titan %45, Iron %55
4	Yttrium Oxide	%99.5
5	Cerium Oxide	%99.5
6	Ferro Titanium	%99
7	Cerium Oxide Powder	%99
8	Cerium Bars	%99.9
9	Lanthanum Oxide Powder	%99



126 Thousand Hours Training

In 1394 (2015-2016), the affiliated companies of IMIDRO held more than 126,000 hours training courses for 13,170 work force.

Persian Gulf Mining and Metal Industries Special Economic Zone (P.G.S.E.Z) accounts for the highest hours of training, while Iranian Mineral Processing Research Center (IMPRC) and Iran Minerals Production and Supply Company (IMPASCO) are ranked in the second and third place, respectively.

In the preceding year, 686 training courses were held by IMIDRO and its affiliated companies. Iranian Minerals Production and Supply Company (IMPASCO) had the highest contribution, followed by Iran Alumina Company and Iranian Mineral Processing Research Center (IMPRC).

Training Programs in 1394 (2015-2016)

Company	Number of Courses	Number of Participants	Hours of Training	Training Capita	Average Training Affectiveness
National Iranian Steel Co. (NISCO)	36	254	2854	37/4	78/5
Iran Minerals Production and Supply Co. (IMPASCO)	280	3300	8995	24	80
Sangan Iron Ore Complex	10	238	1604	-	-
Iranian Mineral Processing Research Center (IMPRC)	80	598	10147	92/5	85
Persian Gulf Mining and Metal Industries Special Economic Zone (P.G.S.E.Z)	62	1577	13597	18	93
Mining Activities Investment Insurance Fund	4	11	93	14	-
Ehdas Sana'at Co.	19	61	854	3	91
Iran Alumina Co.	195	7131	88705	57	85/9
Total	686	13170	126849	-	-

Health, Safety, and Environment

1. Dealing with air pollution sources such as chimneys, furnaces cells, and refinery outputs in Zarand Coking Complex and Zarand Tar Refinery
2. Purchasing equipment for continuous online monitoring system to be installed on Zarand Coking Complex and Zarand Tar Refinery chimney outputs
3. Conducting a tender for continuous online monitoring system installed on 9 chimneys of Iranian Aluminum Company
4. Setting up tailing dump in Iran Alumina Company
5. Conducting a study to install a pollution control system of bauxite crushing unit in Iran Alumina Company's mine
6. Selecting an appropriate contractor to optimize nepheline dust system
7. Conducting studies on transferring sanitary sewage collection system of Anjir Tangeh Complex
8. Establishing and implementing OHSAS 18000 environmental management system in Sangan Iron Ore complex
9. Using soil stabilization materials in commuting routes of mines
10. Providing a waste site for Mishdovan Iron Ore Complex
11. Preparing a database and environmental pollutants software for selected units to study environmental pollutants
12. Constructing and installing sanitary wastewater treatment system in Zarshouran Gold Mines and Mining Industries Development Company
13. Supplying 400 gas detectors as well as three calibration bases for the mines owned by private sector
14. Supplying and purchasing 10 ambulances to equip the subsidiary companies
15. Holding training courses to promote scientific and technical level of HSE managers and experts of the subsidiary companies
16. Holding 3 HSE training courses
17. Holding safety training course for mines drivers
18. Holding safety training courses for private sector mines in collaboration with Technical & Vocational Training Organization





Empowerment Plans in 1395 (2016-2017)

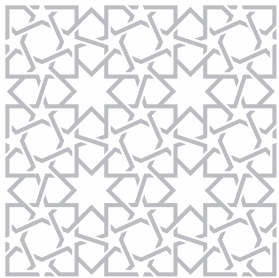
Some of the programs developed by IMIDRO for the empowerment sector are as follows:

Training Programs

1. Higher education and specialized training of private sector in mines and mining industries
2. Training workers and technicians of mines and mining industries in safety issues
3. Providing workers and technicians of mines and mining industries with ICT
4. Training mine drivers on safety issues
5. Technicians training courses
6. Holding specialized efficiency training courses

Major Research and Technology Programs

1. Using an optimization model to evaluate and analyze development of steel industry considering the shortage of water and energy in the country
2. Implementing an efficiency evaluation process in mines and mining industries based on IMIDRO's efficiency model
3. Supporting postgraduate theses and dissertations
4. Studying genesis and factors of gold mineralization formation and concentration in Sanandaj-Piranshahr road using new technologies to provide solutions for exploration operations
5. Conducting laboratory studies on Tangestan samples taken from South Khorasan
6. Designing and manufacturing portable artificial respiration device to work in coal mines
7. Studying feasibility, genesis, and formation and concentration factors of lithium as a strategic metal in outcrops of sediments (hectorite clays) in Semnan by using new technologies
8. Geochemistry and mineralogy of platinum group elements in chromite deposits and peridotite host rocks located at central Iran in order to introduce new indices
9. Complementary phase of studying the extraction of precious, rare, and strategic metals from electronic waste
10. Complementary phase of identifying mineral elements required for future technologies and evaluating their extraction methods in the country
11. Complementary phase of studying the current situation and future of new technologies in mining explorations
12. Vanadium recovery and extraction (V_2O_5) from vanadium-bearing slags in laboratory scale aimed at designing a semi-industrial unit (pilot plant)
13. Testing feasibility and conceptual design of underground coal gasification in Iran- a pilot study
14. Studying the production of metallurgical grade silicon ingots
15. Developing technology of mobile processing units in small mines by gravity method
16. Studying environmental pollutants and developing IMIDRO's data base and environment software
17. Iron and titanium extraction from iron ore placer deposits



1396-1398(2017-2020) Plans
Iran's 20-Year Vision



A Path Toward Development

IMIDRO has always pursued development as its mission, thus the organization, in line with the 6th Development and Iran's 20-Year Vision plans, is determined to reach over 8% (8.8%) growth. Therefore, considering the current and future plans, IMIDRO is paving the way to achieve the outlined goals in mines and mining industry sector.

Thanks to the God-given resources including energy and minerals, skilled and educated human resources, and the country's strategic position in the region, the objectives can be achieved through following projects:

Launching New Projects in 1396 (2017-2018)

By investing more than \$6.7 Bn and by including various sectors such as steel, iron ore, pelletizing, electrode graphite, aluminum, bauxite, coal, titanium and infrastructure affairs, developmental projects of the organization will be exploited in 1396 (2017-2018). Details of these projects are demonstrated in the following table:

Row	Project Name	Goal (Annual Capacity)	Investment (MD)	1396 (2017-2018)	1397 (2018-2019)	1398 (2019-2020)
1	Baft Steel-Direct Reduction Unit	800KT Sponge Iron	120	+		
2	Sabzevar Steel-Direct Reduction Unit	800KT Sponge Iron	120	+		
3	Sangan Pelletizing-Opal	5MT	233	+		
4	Sangan-East Kaveh Steel-Concentrate	2.5MT	125	+		
5	Sangan-Khorasan Steel-Concentrate	2.5MT	125	+		
6	Sangan-Tose-e Melli-Pellet	2.5MT	125	+		
7	Kashan Special Zone-Phase 1	Infrastructure Construction	5	+		
8	Rare Earth Elements	Industrial-Mobile	11	+		
9	Development of Persian Gulf Special Economic Zone	Construction of Industrial Development Infrastructure	100	+		
10	Graphite Electrode-Phase 1	Inoculation, Furnace and Graphitization Unit	50		+	
11	Sangan-Mobarakeh Steel Concentrate	5MT	250		+	
12	Kahnuj Titanium Concentrate	130KT Concentrate	103		+	
13	Kahnuj Titanium Slag	70KT	1006		+	
14	South Aluminum	276KT	123		+	
15	Equipping Khomrud Mine-Concentrate	400KT	185			
16	Mokran Steel-Sponge Iron	1.6MT	500		+	
17	South Aluminum Power Plant	500MW			+	
18	Nema Power Plant	500MW	33		+	
19	Development of Zarshouran Gold-Phase 2 of Zarshouran	2T	37		+	
20	Equipping Kordabad Mine	230KT	1000		+	
21	Mehdi Abad Zinc	800KT Zinc Concentrate, 80KT Lead Concentrate	120		+	
22	Sangan-Phase 2-Opal	2.4MT	115		+	
23	Equipping Tabas Parvadeh 4 Coal	450KT Coal Concentrate	129		+	
24	Construction of Savadkooh Coking	300KT	654		+	
25	Green Coke Production	700KT Crude Petroleum Coke/250KT Calcined Coke	450		+	
26	Providing Required Infrastructures in Major Mines and Mining Zones	Related projects (roads and electrification) will be launched in a year period				
27	Jetty of Parsian Energy Intensive Industrial Special Economic Zone		450			+
28	Sangan-East Kaveh Steel-Pellet	2.5MT	125			+
29	Alumina Production from Sarab Nepheline Syenite (Main Project-EPCF)	200KT Alumina	600			+
30	Chabahar Aluminum(Construction Phase-EPCF)	Due to water shortage in the region, Baft Steel Plan turned into pelletizing plan upon the approval of the Cabinet	2000			+

Mine and Mining Industry Development

- IMIDRO's Outlook 1404 (2025)
- Main Parts of IMIDRO's Outlook 1404 (2025)
- Mine and Industry Sector Outlook
- Quantitative Targets in Mine and Mining Industry Sector

Main Parts of IMIDRO's Outlook 1404 (2025)

Acquiring a top position in economy, science and technology, Iran is considered as a developed country in the region and enjoys an effective relation with international countries. The Islamic and revolutionary identity of the country has been a key factor in inspiring Islam world.

1. A developed country by 1404 (2025)
2. Achieving the first place in the regional economic and scientific ranking
3. Enjoying advanced technology and capable of manufacturing science and technology
4. Active, responsible, having a spirit of cooperation and social harmony, committed to the revolution and Islamic system, as well as prosperity of Iran
5. Secure, independent, powerful with comprehensive defense system based on deterrence and unity between government and people
6. Inspiring, active and effective in Islam world based on strengthening the model of religious democracy
7. Enjoying health, welfare, social security, equal opportunities and advantage of having a favorable environment
8. Having a constructive interaction with international community based on the principles of dignity, wisdom and expediency
9. Entrepreneurship and permanent employment



Mine and Industry Sector Outlook in 20-Year Economic Perspective

Acquiring the first place in economic, industrial ranking with an emphasis on the following features:

1. Developed based on advanced and innovative technologies, providential and self-sufficient in supplying strategic products
2. Export-oriented and significant supplier of the country's foreign currency
3. Balanced in different parts of the country based on capabilities and regional advantages
4. Productive in using available resources
5. Synergic in the form of networks, clusters and chains
6. Consistent with regional and international market standards

Quantitative Targets of Mine and Mining Industry Sector in 20-Year Vision

Production:

1. Steel: 55MT
2. Copper: 440,000T
3. Aluminum: 1.5MT

Production
Capacity

Iran to Produce 55 MT Steel by 2025

Under the Industrial Development Strategy Document, the production capacity of crude steel will increase to 55MT in the coming 9 years.

The objectives of IMIDRO as a development supporter organization will be achieved by 1404 (2025). In the time period, per capita production of steel plants will reach to 951T. In addition, \$700 will be invested for the production of per tonne steel.

Iran to Hit 440,000TPY Copper by 2025

According to Iran's 20-Year Economic Perspective, the production capacity of cathode copper will reach 440,000TPY.

About \$5000 investment is required for the production of per tonne cathode copper during the time period and the amount includes adopting pyrometallurgy production method. The copper production chain includes concentrate, anode and cathode coppers.



Iran to Produce 1.5 MT Aluminum Ingots by 2025

As forecast in Iran's 20-Year Economic Perspective, the production capacity of Aluminum ingots will hit 1.5MT.

To fulfill the objective, approximately \$3000 to \$4000 investment is required for the production of per tonne aluminum. This figure includes the complete production chain such as bauxite extraction, as well as alumina and aluminum ingots production.

IMIDRO

IMIDRO's Status in Prudence and Hope Government

Established in 1379 (1999-2000), IMIDRO practically incepted its operations two years later to develop mining potentials of Iran and to increase share of this sector in the country's economy. Since its establishment until 1384 (2005-2006), the organization launched more than 57 projects. Thereafter, during 1384 to 1391 (2005-2013) concurrent with a global surge in the price of mining products and energy, the organization launched 12 projects.

Considering abundant financial resources in the 9th and 10th government, special opportunity was created to establish new projects and finalize unfinished and suspended plans but it was not used properly. Since the beginning of the 11th government, on the slogan of "Prudence and Hope", 10 projects were completed and launched in 1393-1394 (2014-2016). At the same time, IMIDRO, despite the severe funding shortage, had more than 30 incomplete projects to finalize. Thus completing mentioned projects was one of the main priorities of the organization. A considerable number of projects are undertaken under the supervision of the new Managing Director of the organization and participation of local private sector.





Global Ranking of Mining Production

- Ranked 14th in steel industry; ascending 6 scores in global ranking
- Ranked 22nd in copper cathode industry; ascending 3 scores in global ranking
- Ranked 4th in cement industry; ascending 5 scores in global ranking
- Ranked 19th in Aluminium industry; ascending 2 scores in global ranking

Projects Status Since Establishment of IMIDRO

- Operation of 57 projects during 1381 to 1384 (2002-2006) with IRR 16800Bn
- Operation of 12 projects during 1384 to 1391 (2005-2013) with IRR 5000Bn
- No project was operated in 1392 (2013- 2014)

IMIDRO's Measures to Make Projects Operational

In the second half of 1392 (2013-2014), the new management of Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) gained control over the company's suspended, delayed, stopped, and incomplete projects. High priority was given to these projects and a great attempt was made to make over 30 projects operational. The measure asked for new financial resources which was met through participation of domestic companies and adopting Resistance Economy.

The list of operational projects contains a wide range of mines and mining industries sectors including steel, iron ore, lead, zinc, copper, gold, and coal which are briefly discussed below.

7 Provincial Steel Projects (Direct Reduction and Steel Making Unit)

- Sepid Dasht Steel
- Shadegan Steel
- Neyriz Steel
- Baft Steel*
- Mianeh Steel
- Ghayenat Steel
- Sabzevar Steel

* Due to the shortage of water in the region, Baft steel project changed to Baft pelletizing project upon the request of the Ministry of Industry, Mine and Trade and approval of the Cabinet.

Given some major problems such as allocating location to provincial steel projects, providing water, electricity, gas, raw materials, and market, IMIDRO decided to make the projects operational through attracting the participation of private sector. Concerning the global market of steel industry, high priority was given to sponge iron unit. Therefore, 5 sponge iron (direct reduction) units, and two other units will be launched in 1395 (2016-2017) and 1396 (2017-2018), respectively.



Alumina Production from Nepheline Syenite

This project was due to be implemented for about 3 decades and finally on November 2014 its basic design contract was signed with a European company (Outotec). Implementation of Sarab Nepheline Syenite Project leads to production of 200TT of alumina powder and 150TT of industrial salt from nepheline syenite (a mineral material), per year. Basic engineering of alumina production plant is being finalized by German Outotec. The infrastructures including water, electricity, gas transmission, and mine land ownership is carried out and project's tender will be conducted under an EPCF contract.



Azarshahr Project Pilot

Changing pilot use for producing boehmite, catalyst base, and catalyst is underway (the pilot plant was set up previously to produce alumina powder from nepheline syenite). In this regard, implementation of boehmite production unit is being finalized while the construction of catalyst base and catalyst product lines are in progress.

South Aluminum Project

South Aluminum project, the largest metal ingot production plan, was undertaken on December 2015. The contract of the plant and power plant's gas was inked. Basic engineering is nearly finished while the project's port land in Parsian area is transferred and the land leveling operation is incepted. Likewise, the buildings to support contractors are under construction and equipment order is made based on a long term purchase.

Jajarm Aluminum Project

Contract of completing aluminum ingot production plant (phase 1), with the capacity of 36.6KTPY, is signed. Tender documents for installation of overhead transmission line up to 400KW from Jajarm post to project electricity post, as well as relevant contractor selection were prepared. A tender was conducted and a contractor was selected for two transformers and three compressed air compressors. PTM and Fume Treatment Plant (FTP) installation are the implemented measures.

Guinea Bauxite

A contract for bankable feasibility studies was made between MME Co. (on behalf of the organization), and German DMT Co. and the relevant studies are conducted.



Mehdi Abad Lead and Zinc

Barite mining sector of Mehdi Abad was launched by investment and is currently producing and selling products. The Investment was made in order to process barite and increase the added value. Mehdi Abad is one of the world's largest zinc and lead mines. After solving the problems related to the previous investor and calling for a new investor on February 2015, seven consortiums ranging from Switzerland, Finland, Australia, China and Russia to valid local companies were selected and the tender winner was announced in August.

The processing plant is able to produce 800KT zinc and 80KT lead-silver concentrates.



Graphite Electrode

A contract for design and technology engineering study was signed between IMIDRO and a European Company and basic engineering design of the plant is incepted. Under the achieved agreement, the project is undertaken by forming a consortium of steel companies in the country.

Sefidabeh Antimony

The process of finding a location for the plant in Sefidabeh Mine, Sistan and Baluchestan Province, as well as the pilot phase is completed and Iran is about to join the group of the strategic metal producers. The project became operational at the beginning of the 11th government and was launched on May 2016. Accordingly, Iran joined the 8 top producers of the strategic metal in the world.



Hormoz Power Plant

Aiming to provide Al Mahdy-Hormozal Aluminum Plant and Persian Gulf Mining and Metal Industries Special Economic Zone with sustainable electricity, the plan of Hormoz Combined Cycle Power Plant, with 235 MW production capacity, will be undertaken. It is the first time in the 4-decade history of aluminum industry that aluminum plants enjoy a dedicated power plant.

Hormozan Power Plant

The project of Hormozan Power Plant is set up to provide 500MW electricity and is undertaken with the cooperation of IMIDRO and Ghadir Energy Company.



Zarshouran Gold Complex

As one of the suspended projects of the organization, Zarshuran Gold project, was formally launched in Autumn 2014. Production capacity of the plant, which is the largest producer of gold bullion in Iran, is 3T per year.

Khur and Biabanak Potash

Khur and Biabanak Potash project, as the first potash production plan in the country, was in the line to become operational for almost two decades. The project was launched in 1387 (2008-2009), but stopped after a short time. It was resumed on August 2015 due to the pursuance of IMIDRO's new management. In this project, potash is produced by using brines of Khur and Biabanak Mine located in Isfahan province.

Zarand Tar Refinery

Zarand Tar Refinery Plan, with 30 KT capacity, was suspended for 8 years but the new management of IMIDRO gave a high priority to the project and it was launched on August 2015. The refinery is located near Zarand Coking Plant and is the second of its type in Iran. The first one is located in Isfahan.

Upon operation of this project, the total production capacity in the country increased to 130 KTPY.

Mining Activities Investment Insurance Fund

Mining Activities Investment Insurance Fund was established to reduce the risk of mining activities and encourage the private sector to enter the industry. In order to expand the presence of private sector, the Corporation was first removed from the assignment list done in the previous government, then the necessary measures were taken to increase the corporation capital by 20 times. Authorities of all executive activities are delegated to the Corporation to speed up its function. The expansion of its activities was through giving insurance services within the framework of constitution and negotiating with Bank of Industry and Mine, Mellat, and other banks to obtain credit facilities for private sector applicants.

Exploration Development

The process of mines and mining industries development begins with exploration, therefore; determining proven reserves of mines and prospecting new reserves are of special importance. Development of less- developed areas by using mining potentials of the country is among the major goals of IMIDRO. In this regard, the following policy was adopted in the 11th government.

Implementation of exploration operations in mineral-prone zones (an area of 250 thousand Km² and investment of IRR 12,250Bn), as well as central and western areas of the country.



Change in Strategic Plan of IMIDRO

One of the measures undertaken by IMIDRO at the beginning of the “Prudence and Hope” government was changing its strategic plan due to the following reasons:

1. Change in the government staff following the political epic and glorious election of 1392 (2013-2014)
2. Extensive change in policies defined by the Ministry of Industry, Mine and Trade in “Prudence and Hope” government compared to the previous administration
3. Notification of Resistance Economy policies
4. Change in the conditions of imposed sanctions and supplying materials, product components, market, technology etc.
5. Implementation of the second phase of the targeted subsidies law
6. Change in the country's Industrial Development Plan
7. Implementation of Joint Comprehensive Plan of Action, an international agreement reached between Iran and the P5+1 and its positive impact on the country's economy

The new strategy document of IMIDRO arising from upstream documents, such as the intentions of the Supreme Leader, 5th and 6th Development Plans, policies defined by “Prudence and Hope” government, presented plans of the Ministry to the Parliament, adopted legislation of the Parliament, and Articles

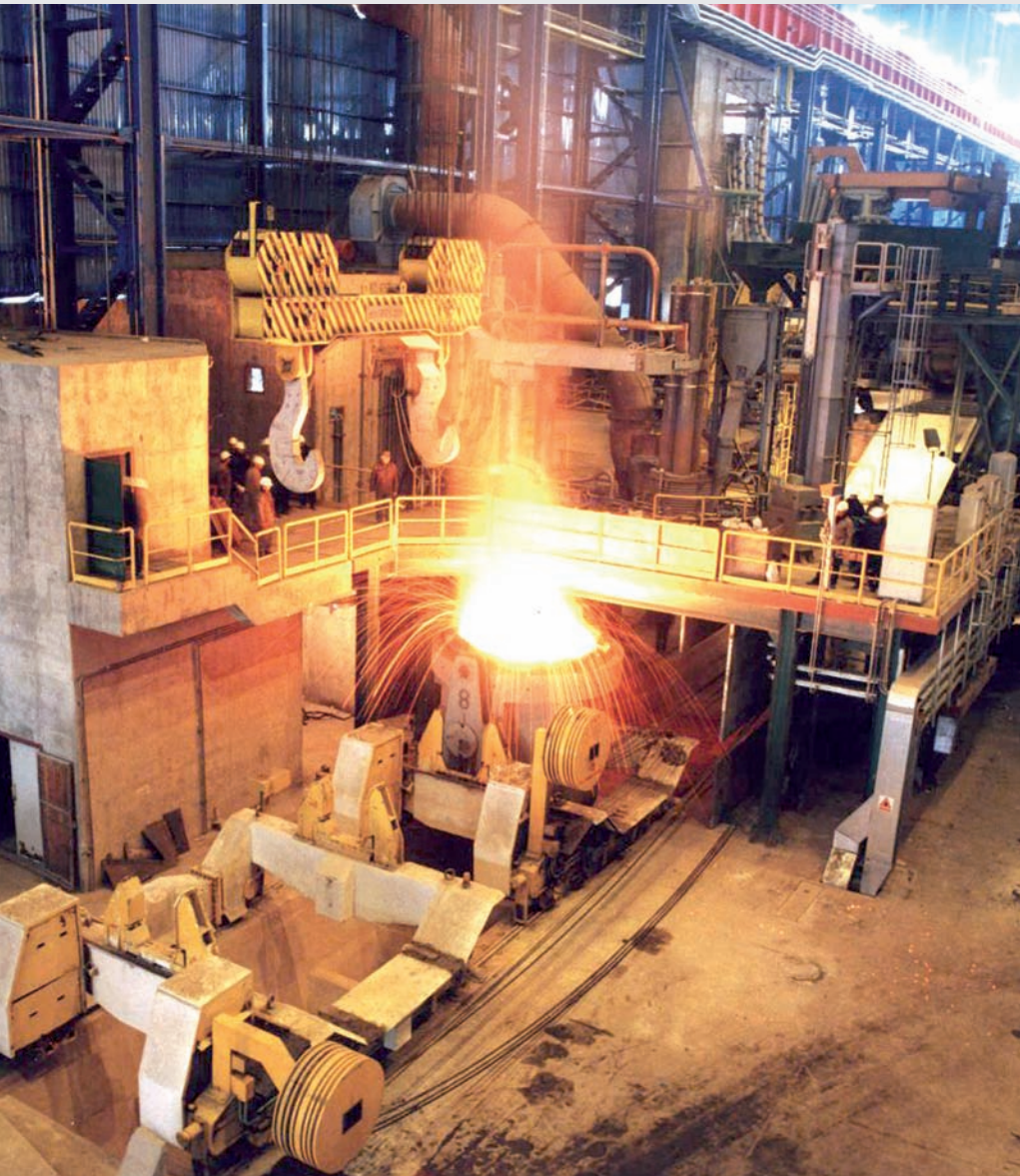
86th of the Association was discussed and passed in IMIDRO’s executive board meetings. The document includes 9 strategies, 30 business strategies, and hundreds of indices and operational targets.

This program is periodically assessed by performance monitoring software. In order to accomplish the mission and make the strategic plan operational, the contributing factors such as outlook, values, goals, and ratified programs of the organization are included in the chart, detailed chart, and processes. Some of the reformed projects undertake coinciding with the zero, one, and two phases of the new strategic plan proved to be efficient.

Change in Structure

To make the new strategy document of IMIDRO operational, some changes were made in the organizational chart. A specialized academic team gathered to review the subject, reinforce the system and its goals, which led to the change of the organization’s top chart and its notification.

After changing the structure, “Iran Minerals Production and Supply Company (IMPASCO)” and “National Iranian Steel Company (NISCO)” has turned into the executive arms of IMIDRO. During previous government’s term, NISCO, an organization with nearly half a century expertise and management experience in the steel industry has faced the challenge of being dissolved yet IMIDRO made a great contribution to maintain the company(the same goes with Mining Activities Investment Insurance Fund).



Overview of Development Project Management in 11th Government

The following table, which consists of 4 sections, presents an overview of projects undertaken in the previous and current governments. The projects details are demonstrated separately:

Overview of Development Project Management and Implementation in 11th Government

Row	Description	Amount	Investment (MD)
1	Projects started in the 10 th government, (going to be) finished and operated in the 11 th government	14	1326
2	Suspended projects in the 10 th government and (going to be) resumed in the 11 th government	34	7300
	1-2- Suspended projects in the 10 th government and (going to be) finished/operated in the 11 th government	13	995
	2-2-Suspended projects in the 10 th government and (going to be) started in the 11 th government	21	6305
3	Suspended projects in the 10 th government with no investor in private sector	2	
4	Projects developed in the 11 th government	16	2889

Detailed information of above table, divided by plan/project (phase), is given below:

Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
1	Graphite Electrode (Phase 1) - Import of Semi-Processed Products and Electrode production	Production of 30KT Graphite Electrode per Year	Executable	Completed	Requires Foreign Investment
2	Cerro Azul Cement - Venezuela	Production of 1MT Cement per Year	Executable	Completed and Launched	Issuing Technical and Engineering Services
3	Zarshouran Gold (Phase 1)	Production of 3T Gold Bullion per Year	Executable	Completed and Launched	
4	Jetty of Persian Gulf Special Zone (Phase 2)	Cargo Handling Capacity Increase from 6 to 12MT	Executable	Completed and Launched	
5	Baft Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
6	Chaharmahal and Bakhtiari Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
7	Sabzevar Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
8	Shadegan Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
9	Gaeinat Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
10	Mianeh Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	
11	Neyriz Steel (Direct Reduction)	Production of 800KT Sponge Iron per Year	Executable	Completed and Launched	Cooperation with Private Sector
12	Providing Required Infrastructures in Large Mines and Mining Areas	Providing Physical Infrastructures (Electricity and Roads) to Undertake Exploitation in Mines in Deprived Areas	Executable and Inaugurated	Completed and Launched	
13	Kahnuj Titanium Pilot	Production of 2T Pigment per Day	Contracted	Completed and Launched	
14	Sefidabeh Antimony	Mining Equipment and Construction of Semi-Industrial Processing Units	Under study	Completed and Launched	

Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
15	Green Coke Production (Pilot)	Production of 700KT Raw Petroleum Coke / 250T Calcined Coke per Year	Suspended	Completed and Launched	
16	Hormoz, Ghadir and Oxin Power Plant	235MW Combined Cycle	Suspended	Completed and Launched	Implemented by Private Sector
17	Jajarm Alumina (Phase 1)	Production of 36KT Aluminium per Year	Suspended	Completed and Launched	
18	Completing Equipment of Khur and Biabanak Potash Reserve	Annual Production of 50KT of KCl	Suspended	Completed and Launched	
19	Zarand Tar Refinery (Supplementary)	Production of 30KT Products (Industrial Naphthalene, Tar Oils, Industrial Bitumen, and Raw Phenol)	Suspended	Completed and Launched	
20	Sangan Concentrate-Tose-e Melli	Production of 2.5MT Concentrate per Year	Suspended	Completed and Launched	Implemented by Private Sector
21	Sangan Pelletizing-Mobarakeh Steel	Production of 5MT Pellets per Year	Suspended	Completed and Launched	Implemented by Private Sector
22	Guinea Bauxite (Supplementary Studies)	Production of 4MT Bauxite from Reserves in Guinea	Suspended	Completed	
23	Graphite Electrode (Project Engineering Phase)	Production of 30KT of Graphite Electrode	Suspended	Completed	
24	Providing Special Zone for Energy Intensive Industries (Parsian) - Land Preparation and Transfer	Establishment of Energy Intensive Industries	Suspended	Completed	
25	Providing Special Zone for Energy Intensive Industries (Lamerd) - Land Preparation and Transfer	Establishment of Energy Intensive Industries	Suspended	Completed	
26	Al-Mahdi Anode Manufacturing- Anode Rodding	Rodding 141 Thousand Baked Anodes per Year	Suspended	Completed	
27	Producing Alumina from Sarab Nepheline-syenite (Completion of Project Engineering Phase)	Production of 200KT Alumina per Year	Suspended	Completed	

Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
28	Jetty of Parsian Energy Intestive Industries Special Zone	Construction of Six Posts with Capacity of 12MT	Suspended	Executable	Requires Decision on Environmental License and Financing
29	Green Coke Production (Main Project EPCF)	Production of 700 KT Raw Petroleum Coke/250T Calcined Coke	Suspended	Executable	Requires Decision on Financing
30	Kahnuij Titanium Processing (Slag)	Production of 70KT Slag Pigments	Suspended	Executable	
31	Kahnuij Titanium Processing (Concentrate)	Production of 130KT Concentrate	Suspended	Executable	
32	Sangan Concentrate -Khorasan Steel	Production of 2.5MT Concentrate per Year	Suspended	Executable	Implemented by Private Sector
33	Sangan Concentrate -Sharq-e Kaveh Steel	Production of 2.5MT Concentrate per Year	Suspended	Executable	Implemented by Private Sector
34	Sangan (Pelletizing) -Opal	Production of 5MT Pellets per Year	Suspended	Executable	Cooperation with Private Sector
35	Sangan Phase 2 (Concentrate) - Opal	Production of 2.4MT Concentrate per Year	Suspended	Executable	Cooperation with Private Sector
36	Sangan Concentrate -Mobarakeh Steel	Production of 5MT Concentrate per Year	Suspended	Executable	Implemented by Private Sector
37	Sangan Pelletizing-Tose-e Melli	Production of 2.5MT Pellets per Year	Suspended	Executable	Implemented by Private Sector
38	Sangan Pelletizing -Sharq-e Kaveh Steel	Production of 2.5MT Pellets per Year	Suspended	Executable	Implemented by Private Sector
39	Gol-e-Gohar 2 - MIDCO	Equipping the Mine and Selecting Contractor for Extraction and Sale	Suspended	Executable	Transferring Mine Equipment to Private Sector
40	Gol-e- Gohar 5-Mahan	Equipping the Mine and Selecting Contractor for Extraction and Sale	Suspended	Executable	Transferring Mine Equipment to Private Sector
41	Gol-e-Gohar 6 Golfam Zarand Kerman	Equipping the Mine and Selecting Contractor for Extraction and Sale	Suspended	Executable	Transferring Mine Equipment to Private Sector
42	Nama Power Plant - BOO	500 MW Electricity	Suspended	Executable	Implemented by Private Sector
43	South Aluminium	Production of 276KT Aluminum Ingots per Year	Suspended	Executable	Cooperation with Private Sector
44	Khomrud Coal Mine Equipment	Production of 750KT Raw Coal (400KT Concentrate)	Suspended	Executable	Transferring Mine Equipment to Private Sector
45	Mehdi Abad Zinc	Concentrate and Zinc Ingot	Suspended	Executable	Transferring Mine Equipment to Private Sector

Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
46	Construction of a Magnesium Oxide Production Plant Fed by Qom Salt Lake	Production of 50KT Magnesium Oxide, 150T Salt	Suspended	-	Lack of Investor
47	Mineral Extraction from Torud Brines	Production of 60KT Potash, 500KT Magnesium Chloride, 150KT Magnesite and Salt	Suspended	-	Lack of Investor



Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
48	Construction of a Coal Washing Plant in Savadkooch	Production of 350KT Coal Concentrate	New Project (Defined in the 11 th Government)	Completed and Launched	
49	Block 4 of Parvadeh 4 (Saman Faraz Qeshm)	Extraction and Sale Contract	New Project (Defined in the 11 th Government)	Completed and Launched	Implemented by Private Sector
50	Iron Ore Beneficiation of Jalal Abad	Extraction and Sale Contract	New Project (Defined in the 11 th Government)	Completed and Launched	Implemented by Private Sector
51	Zone 7 of Parvadeh 1 (Isfahan Steel Company)	Extraction and Sale Contract	New Project (Defined in the 11 th Government)	Completed and Launched	Implemented by Private Sector
52	Zone 8 of Parvadeh 1 (Isfahan Steel Company)	Extraction and Sale Contract	New Project (Defined in the 11 th Government)	Completed and Launched	Implemented by Private Sector
53	Rare Earth Elements (Laboratory Pilot)	Recognizing Potential Reserves, and Localization of Production Technology	New Project (Defined in the 11 th Government)	Completed and Launched	
54	Chabahar Aluminium (Supplementary Studies)	Production of 1MT Aluminum Ingots	New Project (Defined in the 11 th Government)	Completion	
55	Rare Earth Element (Industrial Phase)	Production of Rare Earth Elements	New Project (Defined in the 11 th Government)	Completion	
56	Kurdistan Steel (Exploration Process is Finalized)		New Project (Defined in the 11 th Government)	Completion	Implemented by Private Sector
57	Development of Persian Gulf Special Zone (3000 H New Land)	Providing Infrastructure for Industrial Development	New Project (Defined in the 11 th Government)	Executable	
58	Development of Zarshouran Gold Mine Plant (Phase 2)	Increasing Production of Gold Bullion from 3 to 6T	New Project (Defined in the 11 th Government)	Executable	
59	Kashan Special Zone (Phase1)	Fencing and Constructing Commuting Road	New Project (Defined in the 11 th Government)	Executable	
60	South Aluminium Power Plant	900 MW Electricity	New Project (Defined in the 11 th Government)	Executable	Cooperation with Private Sector

Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
61	Producing Alumina from Nepheline Syenite, Sarab (main project EPCF)	Production of 200KT Alumina	Suspended	Executable	Requires Decision on Financing
62	Construction of Savadkuh Coking Plant	Production of 300KT Metallurgical Coke	Suspended	Executable	Requires Decision on Environmental License and Financing
63	Equipping Parvadeh 4 Coke Production Plant-Tabas	Production of 750KT Raw Coal (450KT Concentrate)	Suspended	Engineering Completed	Requires Decision on Financing



Row	Plan/Project Name	Product / Target	Situation in the 10 th Government	Situation in the 11 th Government	Description
64	Equipping Kord Abad Coal Mine	Production of 230KT Raw Coal	New project (Defined in the 11 th Government)	Executable	Requires Decision on Financing
65	Mokran Steel-Chabahar	Mega Module for Direct Reduction of 1.6MT	New project (Defined in the 11 th Government)	Executable	Requires Decision on Environmental License and Financing
66	Chabahar Aluminium (Construction Phase EPCF)	Production of 500KT Ingot	New project (Defined in the 11 th Government)	-	Requires Decision on Financing

A Brief Look at Mine and Mining Industry Trends in Past 38 Years

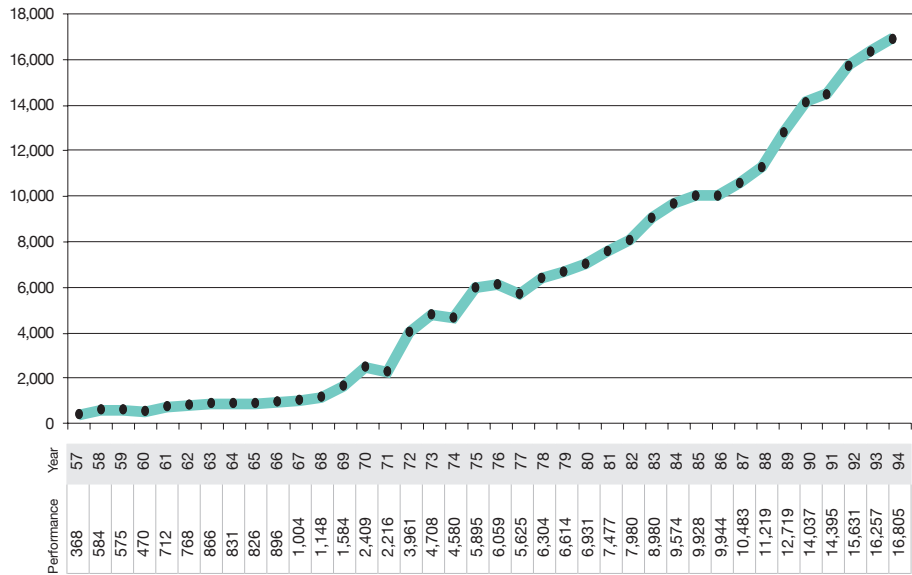
This report statistically looks at the trend of change in main mines and mining industry production since the past decades up to now. These statistics indicate production of each sector since the beginning of the industry formation in Iran.



Crude Steel Production Increased from 368KT to 16.8 MT

There has been a rise in the production of crude steel since 1357 to 1394 (1978- 2016). The rate increased from 368KT in 1357 (1978-1979) to 16.8MT in 1394 (2015- 2016).

Crude Steel Production Trend since 1978 to 2016 (KT)

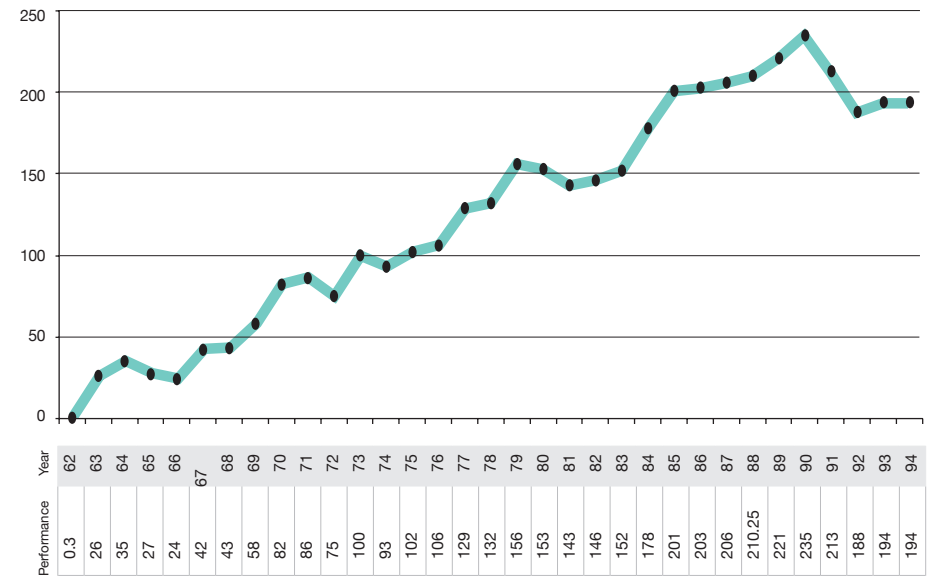


Copper Cathode Production Increased from 300 to 194KT

The production of copper cathode has enjoyed an increase from 300T in 1362 (1983 -1984) to 194KT in 1394 (2015- 2016).



Copper Cathode Production Trend since 1983 to 2016 (KT)



Aluminum Production Increased from 18 to 355 KT

Aluminum production trend shows a production jump from 18KT tonnes in 1357 (1978-1979) to 355KT in 1394 (2015-2016).

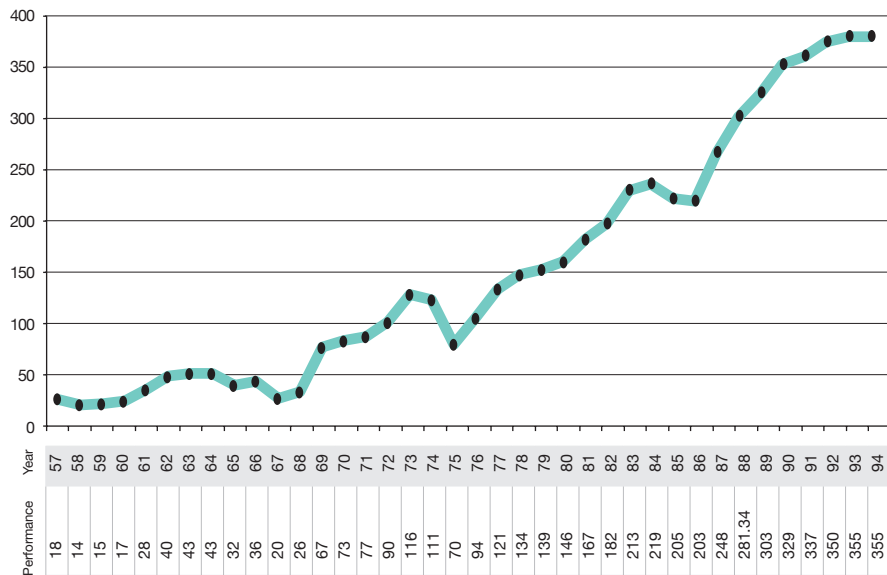


Iron Ore Production Increased from 713KT to 42.5MT

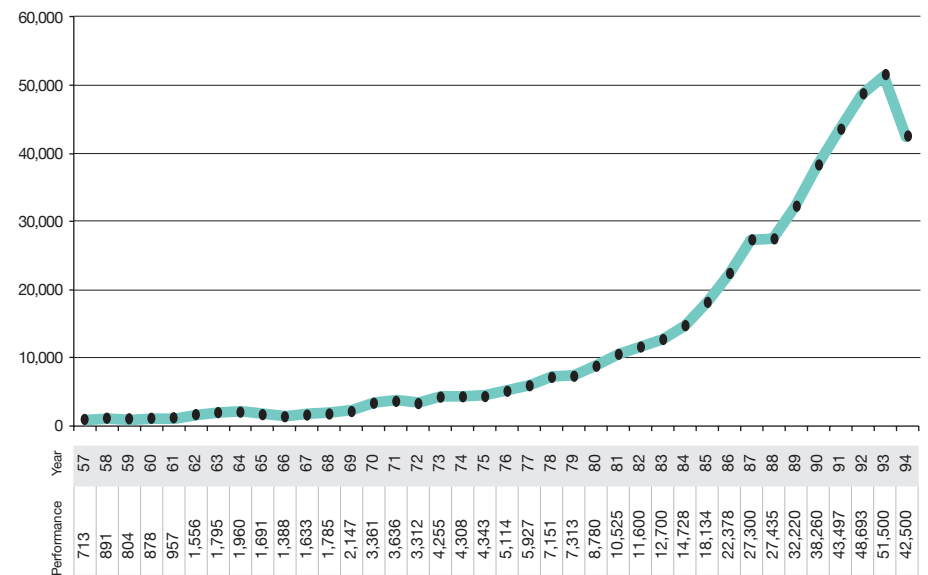
During the last 37 years, the production of iron ore has jumped from 713KT in 1357 (1978 -1979) to 42.5MT in 1394 (2015-2016).



Aluminum Production Trend since 1978 to 2016 (KT)



Iron Ore Production Trend since 1978 to 2016 (KT)



Coal Production Increased from 504,000 to 1.4MT

The production of coal has witnessed an increase from 504KT in 1350 (1971-1972) to 1.4MT in 1394 (2015-2016).

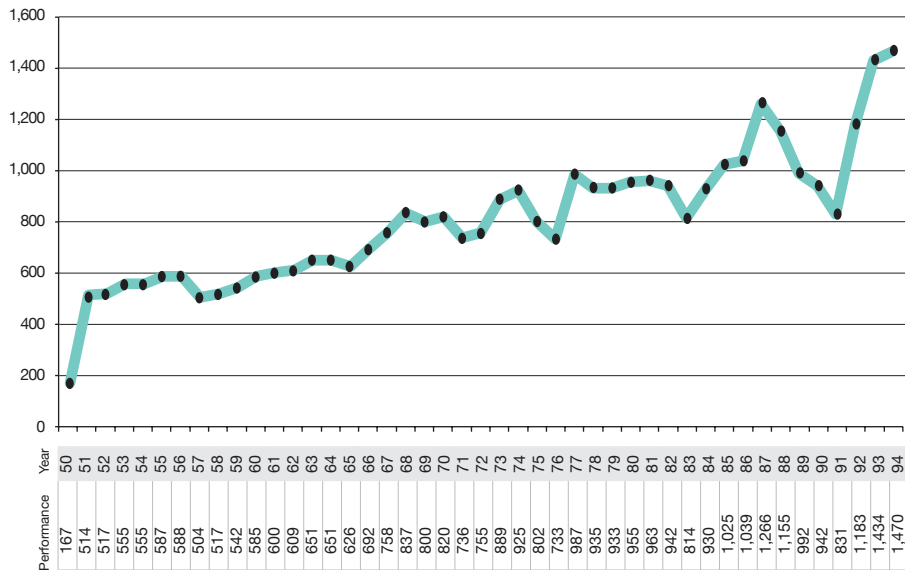


Alumina Production Increased from 102,000 to 241KT

Between 1381 to 1394 (2002-2016), there has been an increase in the production of Alumina from 102KT in 1381 (2002-2003) to 241KT in 1394 (2015-2016).



Coal Production Trend since 1971 to 2016 (KT)



Iron Ore Production Trend since 1978 to 2016 (KT)

