THE PRIME MINISTER OF VIETNAM	**SOCIALIST REPUBLIC OF VIETNAM** **Independence – Freedom – Happiness** **----------**
No. 866/QD-TTg	*Hanoi, July 18, 2023*

DECISION

APPROVAL FOR PLANNING FOR EXPLORATION, EXTRACTION, PROCESSING AND USE OF MINERALS FOR THE PERIOD OF 2021-2030, WITH A VISION TO 2050

THE PRIME MINISTER

Pursuant to the Law on Government Organization dated June 19, 2015; the Law on amendments to some Articles of Law on Government Organization and Law on Local Government Organization dated November 22, 2019;

Pursuant to the Mineral Law dated November 17, 2010;

Pursuant to the Law on amendments to some Articles concerning planning of 37 Laws dated November 20, 2018;

Pursuant to the Law on Planning dated November 21, 2017;

Pursuant to Resolution No. 10-NQ/TW dated February 10, 2022 of the Politburo on strategic orientation for geology, mineral and mining industry by 2030, with a vision to 2045;

Pursuant to Resolution No. 81/2023/QH15 dated January 09, 2023 of the 15th National Assembly on national master plan for 2021 – 2030 with vision scheduled for 2050;

Pursuant to Resolution No. 88/NQ-CP dated July 22, 2022 of the Government on promulgation of action program of the Government for implementation of the Resolution No. 10-NQ/TW dated February 10, 2022 of the Politburo on strategic orientation for geology, mineral and mining industry by 2030, with a vision to 2045;

Pursuant to Decision No. 334/QD-TTg dated April 01, 2023 of the Prime Minister on approval for the Strategy on geology, mineral and mining industry by 2030, with a vision to 2045;

Pursuant to Decision No. 295/QD-TTg dated February 25, 2020 of the Prime Minister on approval for planning for exploration, extraction, processing and use of minerals for the period of 2021-2030, with a vision to 2050;

At the request of the Minister of Industry and Trade in Report No. 3065/TTr-BCT dated May 19, 2023 and Appraisal Report No. 26/BC-HDTDQHKS dated April 21, 2023 of a Council for appraisal of planning for exploration, extraction, processing and use of minerals for the period of 2021-2030, with a vision to 2050.

HEREBY DECIDES:

Article 1. Approval for planning for exploration, extraction, processing and use of minerals for the period of 2021-2030, with a vision to 2050 with the following contents:

A. SCOPE AND BOUNDARIES OF PLANNING

Scope and boundaries of the planning: Planning for exploration, extraction, processing and use of minerals, except for petroleum, coal, peat, radioactive ores (uranium, thorium, etc.), minerals used as building materials and scattered and small minerals according to regulations in the mineral law. Boundaries of the planning are areas of mineral distribution and processing in land area of the country.

B. DEVELOPMENT VIEWPOINTS AND OBJECTIVES

I. VIEWPOINTS

1. Exploration, extraction, processing and use of minerals shall conform to the national overall planning, national planning, sectorial planning and local planning; and satisfy requirements for protection of natural scenery, historical-cultural sites, famous landscapes and people's lives.

2. Minerals are non-renewable resources; minerals shall be extracted, processed and used on the basis of exploration and overall assessment of factors of reserves, resources and quality of minerals, capacity for extraction and processing, demands for economic and effective use of minerals and requirements for national mineral reserves.

3. Manage minerals in a strict, public and transparent manner; encourage economic components that have experience and capacity for processing and extracting minerals to invest in exploration, extraction, processing and use of minerals on the basis of respect for market rules and assurance about harmony of national interests and interests of enterprises and people; balance import and export of minerals in a reasonable and effective manner, give priority to satisfaction of domestic demands.

4. Develop exploration, extraction, processing and use of minerals in association with application of modern and advanced science and technology associated with national economy shift towards green economy, circular economy, and low-carbon economy and in conformity with international commitments to which Vietnam is a signatory.

5. With regard to minerals with big reserves, importance and strategic meanings (bauxite, titanium, rare-earth elements, chromite, nickel and gold), enterprises issued with

extraction permits shall be fully capable and invest in appropriate processing projects that use advanced technology and modern equipment and protect the environment sustainably.

6. Phase out operation of mines with low reserves, scattered and small mines, gather minerals from small mines/mine sites together to create large mine clusters to serve synchronized investment in exploration, extraction and process with advanced technology and modern equipment.

II. OBJECTIVES

1. General objectives

a) Strictly manage, extract, process, economically and effectively use minerals in association with demands for economic development, environmental protection, adaptation to climate change and achievement in carbon neutral level. Promote investment and establish synchronous and effective extraction and processing industry with advanced technology and modern equipment in conformity with trends of the world.

b) With regard to minerals with big reserves, importance and strategic meanings (bauxite, titanium, rare-earth elements, chromite, nickel, copper and gold), enterprises issued with extraction permits shall be fully capable and invest in appropriate processing projects that use advanced technology and modern equipment and protect the environment sustainably.

c) Phrase out operation of mines with low reserves, scattered and small mines, gather minerals from small mines/mine sites together to create large mine clusters to serve synchronized investment in exploration, extraction and process with advanced technology and modern equipment.

2. Objectives in respect of minerals with big reserves, importance and strategic meanings for the period of 2021-2030

a) Bauxite: Combine exploration and extraction with in-depth processing to produce at least aluminum products; select investors in extraction and processing projects. These investors shall be fully capable of carrying out these projects in a synchronous manner from exploration to in-depth processing that use advanced technology, modern equipment and ensure environmental protection. Especially, it is necessary to focus on methods of discharging and processing red mud in a sustainable and effective manner. Encourage enterprises to research and apply new technology to recycle red mud. Aluminum production projects using electrolysis technology shall apply electric prices under the market mechanism. The use of renewable energy is encouraged.

b) Titanium: Develop titanium extraction and processing industry with reasonable roadmap and scale according to each period, gradually establish mining – flotation complexes and titanium processing industrial clusters in synchronicity with

infrastructure. Coastal titanium projects shall have solutions to balance water supply for production and people's needs, agricultural development and aquaculture. Focus on promotion of cooperation in research, technology transfer and investment in extraction and processing of titanium in synchronicity with deep-processed products (pigment, titanium dioxide, metal titanium, high-grade zirconium, monazite, etc.).

c) Rare-earth elements: Develop rare-earth element extraction, processing and use industry in a synchronous, effectiveness and sustainable manner. New enterprises issued with extraction permits shall extract rare-earth elements in association with processing projects with total rare earth oxides, hydroxides and salts with TREO content ≥ 95%, and rare earth oxides (REO)) (as encouraged) that use advanced technology and modern equipment and ensure maximum recovery of accompanying minerals, environmental safety and radiation safety.

d) Nickel, copper and gold: Extract nickel, copper and gold ores in association with processing investment projects in a synchronous, effective and sustainable manner and maximum recovery of accompanying minerals and environmental protection.

dd) Chromite: In the process of extraction of chromite, have a project on extraction and processing of chromite mineral in order to serve maximum recovery of accompanying minerals (nickel, cobalt and bentonite).

Iron: Study and issue permits for exploration and extraction of iron ores to units that have experience and capacity for processing and extracting iron ores in order to process limonite, hematite, depleted iron, iron minerals in laterite ores in the Western Highlands, iron ores in the country for the purpose of production of iron ore products with high quality to be used in blast furnaces of domestic iron and steel facilities.

e) Apatite: Utilize internal resources, promote international cooperation in scientific research, transfer of technology applied to flotation of apatite II, apatite IV and depleted apatite and production of flotation reagents. Focus on promotion of investment in extraction, flotation and processing of apatite II and apatite IV in order to effectively and economically use resources.

g) Other minerals such as copper, gold, lead, zinc, etc.: Well manage resources, and apply advanced technology and equipment to extraction and processing, thereby ensuring safety and environment protection, and ensure maximum recovery of minerals to meet domestic demands, issue permits for exploration and extraction of minerals in association with in-depth processing location. To unify state management, mineral extraction and processing authorities shall give their opinions about mine extraction projects and investment projects on processing of bauxite, titanium, rare-earth elements, chromite, nickel, copper, gold, lead, zinc and iron before permits are issued.

3. Specific objectives:

a) Exploration objectives

Table 1 shows objectives for exploration of types/groups of minerals for the period of 2021-2030, with a vision to 2050:

Table 1: Objectives for exploration of types/groups of minerals during the planning period

No.	Minerals	Unit	Exploration objectives			
			From 2021 to 2030		From 2031 to 2050	
			Number of projects	Reserves	Number of projects	Reserves
1	Bauxite	10^3 tonnes of original ore	19	1.709.498		
2	Titanium	10^3 tonnes of heavy mineral	11	36.293		
3	Lead - zinc	10^3 tonnes of metal	42	1.434	7	550
4	Iron	10^3 tonnes	35	105.095	4	348.200
5	Chromite	10^3 tonnes	1	11.500		
6	Manganese	10^3 tonnes	7	1.750		
7	Tin	10^3 tonnes	14	46,5	3	4,5
8	Wolfram	10^3 tonnes	8	139,3		
9	Antimony	10^3 tonnes	3	25,9	1	10
10	Copper	10^3 tonnes	15	603	8	229,7
11	Nickel	10^3 tonnes	3	409	1	30
12	Molybdenum	10^3 tonnes	3	30		
13	Gold	Tonne	26	101,0	2	232
14	Rare-earth elements	10^3 tonnes of TR_2O_3	8	983,1	1	1500
15	Apatite	10^3 tonnes	9	255.243	1	65.000
16	White marble	10^6 tonnes of $CaCO_3$ powder	10	147.000		
17	Magnesite	10^3 tonnes	1	6.000	1	10.000
18	Serpentine subgroup	10^3 tonnes	2	75.500		

19	Baryte	10^3 tonnes	6	3.050		
20	Graphite	10^3 tonnes	2	5.500	1	1.300
21	Fluorite	10^3 tonnes	1	50		
22	Bentonite	10^3 tonnes	2	4.292		
23	Diatomite	10^3 tonnes	2	25.321	1	3.500
24	Talc	10^3 tonnes	5	5.102		
25	Micas	10^3 tonnes	2	69,5		
26	Quartzite	10^3 tonnes	3	23.790	3	28.414
27	Quartz	10^3 tonnes	22	11.487		
28	Vermiculite	10^3 tonnes	1	100		
29	Mineral water and hot water	m^3/ 24 hours	149	56.990	2	1.000

From 2031 to 2050: Exploration of new mines shall be carried out after report on survey and assessment of geology and minerals has been approved.

b) Objectives for ore extraction and flotation

- Maintain extraction permits that have been issued in accordance with regulations of the law in order to ensure stability for projects on processing and use of minerals that have been invested in construction.

- Make investment in new projects that have proven consumption in order to meet demands for materials serving the economic development of the country.

Table 2 shows estimated objectives:

Table 2: Objectives for extraction of minerals under the planning

No.	**Minerals**	**Unit**	**Extraction and flotation objectives**			
			From 2021-2030		**From 2031 to 2050**	
			Number of ores	**Mineral production**	**Number of ores**	**Mineral production**
1	Bauxite	10^3 tonnes of original ore/year	18 (3)	114.500	41	118.000
2	Titanium	10^3 tonnes of heavy mineral/year	51 (23)	2.839	41	3.720
3	Lead - zinc	10^3 tonnes of original	60 (13)	2.387	48	2.163

		ore/year				
4	Iron	10^3 tonnes of original ore/year	66 (24)	25.480	64	33.811
5	Chromite	10^3 tonnes of original ore/year	2 (0)	4.700	2	4.700
6	Manganese	10^3 tonnes of original ore/year	11 (0)	352	10	210
7	Tin	10^3 tonnes of original ore/year	23 (9)	3.280	19	3.026
8	Wolfram	10^3 tonnes of original ore/year	9 (3)	5.115	7	7.390
9	Antimony	10^3 tonnes of original ore/year	4 (2)	40	3	50
10	Copper	10^3 tonnes of original ore/year	16 (5)	7.976	18	9.226
11	Nickel	10^3 tonnes of original ore/year	6 (3)	7.800	5	13.800
12	Molybdenum	10^3 tonnes of original ore/year	1 (0)	200	1	200
13	Gold	10^3 tonnes of original ore/year	45 (8)	1.790	39	1.967
14	Rare-earth elements	10^3 tonnes of original ore/year	10 (2)	2.020	13	2.112
15	Apatite	10^3 tonnes of original ore/year	30 (16)	14.506	25	16.799
16	White marble					
	- Wall tile	10^3 m^3/year	106 (71)	6940	106	6840
	- Calcium Carbonate Powder	10^3 tonnes/year		39.596		39.319
17	Magnesite	10^3 tonnes of original ore/year	2 (0)	700	3	1.100
18	Serpentine subgroup	10^3 tonnes of original ore/year	7 (3)	3.960	7	3.960
19	Baryte	10^3 tonnes of original ore/year	9 (3)	624	9	619
20	Graphite	10^3 tonnes of original	7 (4)	1.151	6	1.151

		ore/year				
21	Fluorite	10^3 tonnes of original ore/year	5 (3)	756	5	756
22	Bentonite	10^3 tonnes of original ore/year	5 (1)	426	5	476
23	Diatomite	10^3 tonnes of original ore/year	4 (1)	540	4	740
24	Talc	10^3 tonnes of original ore/year	10 (2)	431	10	444
25	Micas	10^3 tonnes of original ore/year	3 (1)	10	3	10
26	Quartzite	10^3 tonnes of original ore/year	8 (1)	1.570	8	1.820
27	Quartz	10^3 tonnes of original ore/year	23 (2)	990	20	930
28	Sericite	10^3 tonnes of original ore/year	3 (0)	172	3	172
29	Vermiculite	10^3 tonnes of original ore/year	1 (0)	5	1	5
30	Mineral water and hot water	m^3/ 24 hours	232 (66)	79.661	234	81.961

c) Objectives for mineral processing

Mobilize domestic resources and promote international cooperation in investment in in-depth processing of minerals, including bauxite, titanium, rare-earth elements, chromite, nickel, etc. Table 3 shows objectives for processing of each mineral:

Table 3: Objectives for processing of minerals under the planning

No.	**Minerals/mineral products**	**Unit**	**Processing objectives**				**Quality and requirements**
			Number of projects	**From 2021-2030**	**Number of projects**	**From 2031 to 2050**	
1	Bauxite						
a	Aluminum	10^3 tonnes/year	10 (2)	11.600 - 18.650	10	12.000 - 19.200	Meet domestic and export standards

							Mineral processing plants shall be associated with ore zones
b	Aluminum ingot	10^6 tonnes/year	3 - 5 (1)	1,2 - 1,5	3 - 5	2,25 - 2,45	
2	Titanium						
a	Titanium slags	10^3 tonnes/year	18 (9)	853-1.113	18	1.063 - 1.323	New projects only meet requirements for materials used for pigment production.
b	Reconstituted ilmenite	10^3 tonnes/year	2 (1)	20 - 40	2	40 - 60	
c	Zirconium powder/ compounds	10^3 tonnes/year	17 (9)	302 - 359	16	362 - 425	
d	Artificial rutin	10^3 tonnes/year	2 (0)	60 - 70	2	100 - 110	
e	Pigment	10^3 tonnes/year	6 (2)	350 - 420	6	370 - 500	
f	Titanium sponges/metals	10^3 tonnes/year	2 (0)	10 - 15	2	15 - 25	
g	Ferrotitanium	10^3 tonnes/year	2 (0)	20 - 30	2	20 - 30	
3	Lead - zinc	10^3 tonnes of metal/year	27 (16)	380	27	402,5	
4	Chromite (Ferrochrome)	10^3 tonnes/year	2 (2)	90	2	90	High Carbon Ferrochrome, average Cr content of more than 54%
5	Manganese (ferromanganese, silicomanganese)	10^3 tonnes/year	13 (13)	356	12	406	Meet domestic standards
6	Tin	Tonne of metal/year	6 (6)	3400	6	3400	

7	Wolfram	Tonne of product/year	3 (3)	13.500	3	13.500	(APT, BTO; YTO)
8	Antimony	Tonne of metal/year	3 (3)	3.300	3	3.300	
9	Copper	Tonne/year	11 (9)	110.000	11	110.000	Copper ingot
10	Nickel	Tonne/year	2 (0)	27 - 48	2(0)	42 - 78	Nickel metal
11	Molybdenum	Tonne/year	1 (0)	200	1	400	Produce $(NH_4)_2MoO_4$ or smelt ferromolipden)
12	Gold	Kg/year	8 (6)	6.146	7	6.346	
13	Rare-earth elements	Tonne of REO/year	7 (1)	62.500	7	82.500	
14	White marble						
a	Types of wall tiles	10^3 m^3/year	43 (43)	11.000	43	10.700	
b	Lump, granule, powder products	10^3 tonnes/year	58 (52)	9.461	58	9.684	
15	Caustic calcined magnesite	10^3 tonnes/year	1 (0)	70	1	70	
16	Serpentine subgroup (powder)	10^3 tonnes/year	6 (3)	3.950	6	3.950	
17	Baryte	10^3 tonnes/year	10 (7)	292	10	392	BaSO4 powder $\geq$ 95%
18	Graphite	10^3 tonnes/year	5 (1)	110	5	111	C > 80%
19	Fluorite	10^3 tonnes/year	4 (1)	256	4	460	CaF_2 > 80%
20	Bentonite	10^3 tonnes/year	5 (2)	165	5	260	
21	Diatomite	10^3 tonnes/year	3 (2)	143	3	350	
22	Talc (powder)	10^3 tonnes/year	5 (1)	380	5	460	
23	Micas	Tonne/year	4 (4)	1.700	2	1.500	

24	Quartzite	10^3 tonnes/year	9 (6)	730	9	1.040	
25	Quartz	10^3 tonnes/year	10 (4)	1.454	10	1.454	
26	Sericite	10^3 tonnes/year	2 (1)	138	2	146	
27	Mineral water, hot mineral water		Meet demands for bottled mineral water and resort tourism				

C. MINERAL DEVELOPMENT PLANNING

I. MINERAL RESOURCES AND RESERVES

Table 4 shows mineral resources and reserves to be mobilized during the planning period (by 2030), with a vision to 2050 (details are provided in Appendix I enclosed with this Decision)

Table 4: Mineral resources and reserves to be mobilized during the planning period

No.	Minerals	Unit	Reserves	Resources and forecasted resources	Total
1	Bauxite	10^3 tonnes of original ore	3.084.674	6.465.328	9.549.419
2	Titanium - Ilmenite	10^3 tonnes of heavy mineral	109.053	502.301	611.354
	Zirconium				82.426
3	Lead - zinc	Tonne	865.190	4.943.816	5.809.006
4	Iron	10^3 tonnes of original ore	491.282	663.248	1.152.365
5	Chromite	10^3 tonnes of Cr_2O_3	14.484	7.288	21.773
6	Manganese	10^3 tonnes of metal	3.989	6.779	10.769
7	Tin	Tonne of metal	23.251	125.198	148.449
8	Wolfram	Tonne of metal	172.908	136.499	309.407
9	Antimony	Tonne of	54.375	90.501	144.876

		metal			
10	Copper	Tonne of metal	432.106	1.098.520	1.530.626
11	Nickel	10^3 tonnes of metal	611,8	3.454,5	4.066,4
12	Molybdenum	Tonne	7.400	21.000	28.400
13	Gold	Kg	75.012,7	124.613	199.626
14	Precious stone	Kg	229	631	860
15	Rare-earth elements	Tonne of TR_2O_3	3.472.347	16.349.207	19.821.554
16	Apatite	10^3 tonnes of original ore	126.247	1.854.257	1.960.126
17	White marble	10^3 tonnes	1.684.905	2.899.892	4.664.798
18	Magnesite	10^3 tonnes	23.575	71.434	95.010
19	Serpentine subgroup	10^3 tonnes	32.342	67.079	99.421
20	Baryte	10^3 tonnes	17.321	5.615	22.936
21	Graphite	10^3 tonnes	9.715	21.670	33.243
22	Fluorite	10^3 tonnes	16.035	4.038	20.074
23	Bentonite	10^3 tonnes	15.401	114.418	129.819
24	Diatomite	10^3 tonnes	566	302.656	303.222
25	Talc	10^3 tonnes	1.061	8.700	9.761
26	Micas	10^3 tonnes	70,5	370	440
27	Pyrite	10^3 tonnes	18.187	34.759	52.946
28	Quartzite	10^3 tonnes	12.848	157.954	170.801
29	Quartz	10^3 tonnes	4.173	20.229	24.403
30	Sillimanite	10^3 tonnes	218	5.933	6.151
31	Sericite	10^3 tonnes	2.816	2.108	4.924
32	Vermiculite	10^3 tonnes		3.807	3.807
33	Mineral water	m^3/ 24 hours	≈ 90.000		≈ 90.000

II. MINERAL EXPLORATION, EXTRACTION AND PROCESSING PLANNING

1. Bauxite

Exploring and extracting bauxite, and producing aluminum and aluminum metal in such a way to synchronize with development of infrastructure of traffic, seaports, electricity supply, water supply, ensure environmental protection and biodiversity conservation according to each specific period, ensure national security and defense, preserve national cultural identities and protect the ecosystem in Western Highlands.

a) Exploration

- By 2030: Carrying out 19 projects in Lang Son (1), Dak Nong (7), Lam Dong (8); Binh Phuoc (2), Gia Lai (1) with target reserves of about 1.709 million tonnes of original ore.

- From 2031 to 2050: Carrying out exploration of new mines after report on survey and assessment of geology at potential areas from 2021 – 2030 has been approved.

Details about projects on exploration of bauxite are provided in Appendix II.1 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the designed capacity of existing mines; expanding capacity of Tay Tan Rai mine and Nhan Co mine; making investment in new mine extraction projects in Dak Nong (4-5), Lam Dong (2-3), Binh Phuoc (1), Gia Lai (1). Achieving total extraction capacity of 68,150 -112,200 million tonnes of original ore/year.

Making investment in 03 new projects on extraction and flotation of bauxite ores in Northern region: Lang Son (1) and Cao Bang (2) with total capacity of 1.550.000 to 2.250.000 tonnes of original ore/year.

With regard to bauxite mines in Western Highlands (near densely populated areas), considering exploration of such bauxite mines and early issuing extraction permits in order to serve maximum recovery of bauxite resource and be permitted to repurpose land for economic development…

With regard to low-quality bauxite mines in Northern region, making maximum recovery of bauxite resource, reforming and improving the quality of cultivation land in order to serve domestic and export demands under permission of competent authorities according to regulations of the law.

- After 2030: Maintaining the designed capacity of existing mines, making investment in new mine extraction projects in Dak Nong, Lam Dong, Binh Phuoc and Kon Tum, etc. in order to provide bauxite concentrates for aluminum plant projects that have been invested and expansion projects when necessary. By 2050, total extraction capacity is estimated to be 72,3 - 118,0 million tonnes of original ore/year. In addition, considering issuance of extraction permits to explored areas for the period of 2031-2050 if proposed by investors.

Details about projects on extraction of bauxite are provided in Appendix III.1 enclosed with this Decision.

c) Processing

- By 2030:

(1) Aluminum production: Investing in increase in capacity of 02 aluminum plants (Tan Rai – Lam Dong and Nhan Co - Dak Nong) from 650.000 tonnes/year to about 2.000.000 tonnes/year. Increasing the capacity to 800.000 tonnes aluminum/year in the initial period and 1.200.000 tonnes aluminum/year in the subsequent period).

Making investment in new aluminum production projects in Dak Nong (4), Lam Dong (2), Binh Phuoc (1), and Gia Lai (1) with capacity of at least 1.000.000 tonnes aluminum/year/project. Applying advanced technology to new aluminum production investment projects. To be specific: applying red mud treatment technology with dry disposal method in order to protect environment and encouraging projects on production of building materials from red mud. Investors and local authorities shall select locations appropriate to disposal of red mud and close to mine sites that have undergone flotation.

By 2030, total capacity is estimated to be 11.600 - 18.650 thousand tonnes aluminum/year.

(2) Aluminum metal production: Completing the pilot project on Dak Nong Aluminum Electrolysis Plant with capacity of 300.000 - 450.000 tonnes of aluminum ingot/year. Making investment in new aluminum metal production projects in Dak Nong, Lam Dong, Binh Phuoc and provinces meeting requirements for energy supply. By 2030, total capacity is estimated to be 1.200.000 - 1.500.000 tonnes of aluminum ingot/year.

The plants can be located in provinces that have material sources and energy supply. Operating aluminum electrolysis plants according to market mechanism, encouraging investment in renewable energy projects, thereby ensuring partial energy in bauxite mines that have been explored, producing aluminum products and developing manufacturing mechanical engineering and supporting industries under Decision No. 09/QD-TTg dated February 11, 2023 of the Prime Minister on promulgation of action plan for implementation of Conclusion No. 31-KL/TW dated March 07, 2022 of the Politburo on orientation to development of bauxite - alumina – aluminum industry by 2030, with a vision to 2045.

- From 2031 to 2050

(1) Aluminum production: Maintaining the designed capacity and investing in expansion of capacity of existing plants.

Total capacity is estimated to be 12.000 - 19.200 thousand tonnes aluminum/year.

(2) Aluminum metal production: Maintaining capacity of Dak Nong Aluminum Electrolysis Plant; making investment in new aluminum metal production projects in association with self-assurance about material sources and encouragement to invest in renewable energy projects in bauxite mines that have been extracted. Specific locations and projects shall be decided by investors according to the efficiency in the economy.

Total capacity is estimated to be 2.250.000 ÷ 2.450.000 tonnes of aluminum ingot/year.

Details about projects on processing of bauxite are provided in Appendix IV.1 enclosed with this Decision.

2. Titanium

Issuing new permits for exploration and extraction in association with processing and production of pigment; selecting new investors in extraction projects. These investors shall be fully capable of carrying out these projects in a synchronous manner from extraction to processing and production of pigment that use advanced technology, modern equipment and ensure environmental protection.

a) Exploration

- By 2030: Completing exploration projects that have been issued with permits in Thai Nguyen (2), Quang Binh (3); executing new exploration projects in Thai Nguyen (3), Quang Tri (3), Binh Thuan (2) with production of 36.200.000 tonnes of heavy mineral.

- From 2031 – 2050: Carrying out new exploration after report on survey and assessment of geology and minerals has been obtained for the period of 2021-2030.

Details about projects on titanium exploration are provided in Appendix II.2 enclosed with this Decision.

b) Extraction

- From 2021-2030: Maintaining titanium production of mines issued with extraction permits (23 mines; total capacity of about 1.450.000 tonnes of heavy mineral/year), issuing new extraction permits to about 32 mines in Thai Nguyen (5), Ha Tinh (1), Quang Binh (3), Quang Tri (4) and Binh Thuan (1). Total capacity is about 2.759.000 tonnes of heavy mineral/year.

- From 2031 to 2050: Maintaining production of mines issued with extraction permits and increasing capacity in Luong Son Mine I, Luong Son Mine II, and Luong Son Mine III. From 2021- 2050: Total capacity is estimated to be about 3.634.000 tonnes of heavy mineral/year.

Details about projects on extraction of titanium are provided in Appendix III.2 enclosed with this Decision.

c) Processing

- By 2030:

Maintaining existing processing projects with total capacity of about 319.000 tonnes of titanium slag/year (09 invested projects); about 20.000 tonnes of reconstituted ilmenite/year (01 invested project); about 154.500 tonnes of zirconium powder and compounds/year (10 invested projects).

Making investment in new processing projects:

(1) Titan slag: Making investment in 7-9 new projects with total capacity of about 770.000 tonnes/year; new projects shall be only issued with permits to serve production of pigment and other industries. Investors and local authorities shall select appropriate locations.

(2) Reconstituted ilmenite: making investment in a new project with estimated production of 20.000 - 40.000 tonnes/year.

(3) Zirconium powder, compounds and products: Making new investment or reforming and expanding 4-5 processing projects with total capacity of about 230.000 tonnes/year;

(4) Pigment: Making investment in 3 - 4 new processing projects with total capacity of 320.000 - 450.000 tonnes/year; appropriate locations shall be selected by investors and local authorities.

(5) Artificial rutin: Making investment in 1-2 new production project(s) with total capacity of 60.000 – 70.000 tonnes/year.

(6) Titanium sponges/metals: Making investment in 1-2 new project(s) with total capacity of 10.000 – 15.000 tonnes/year;

(7) Ferrotitanium: Making investment in construction of 1-2 new plant (s) with total capacity of 20.000 – 25.000 tonnes/year.

(8) Monazite: Making investment in new monazite processing plants with capacity of 10.000 – 15.000 tonnes/year to process monazite recovered from flotation of ilmenite ore.

In case of elimination of extraction of titanium mines in Ninh Thuan province, accompanying projects on titanium processing in Ninh Thuan province will also be eliminated.

- From 2031 to 2050:

Maintaining projects issued with permits and issuing new permits to projects that ensure the designed capacity with the following products and total production:

(1) Titanium slag: about 1.323.000 tonnes/year.

(2) Reconstituted ilmenite: maintaining a capacity of 40.000 – 60.000 tonnes/year.

(3) Zirconium powder, compounds and products: total capacity of about 450.000 tonnes/year;

(4) Artificial rutin: processing projects with total capacity of about 110.000 tonnes/year.

(5) Pigment production: Maintaining existing projects and increasing their capacity with total capacity that is estimated to be 400.000 – 500.000 tonnes/year.

(6) Titanium sponges/ titanium metal: Maintaining existing projects. It is possible to make investment in expansion or addition of new projects (in case the market is available) and investors in 01-02 project(s). Total capacity is estimated to be 15.000 - 25.000 tonnes /year.

(7) Ferrotitanium: Maintaining ferrotitanium production of plants and considering issuance of new permits to 01-02 project(s) with capacity of 15.000 – 25.000 tonnes/year when investors apply for implementation.

(8) Monazite: Maintaining monazite plants that have been invested and expanding these plants where necessary with capacity of 15.000 – 20.000 tonnes/year to process monazite recovered from flotation of ilmenite ore.

Details about titanium processing projects are provided in Appendix IV.2 enclosed with this Decision.

3. Lead and zinc

a) Exploration

- By 2030:

+ Completing 09 exploration projects issued with permits in the previous period with target reserves of 450.000 ÷ 500.000 tonnes of lead and zinc metals.

+ Issuing new permits to 34 exploration projects in Tuyen Quang (5), Bac Kan (18), Lao Cai (3), Yen Bai (2), Dien Bien (2), Thai Nguyen (3), Quang Binh (1) with target reserves of 1.000.000 ÷ 1.050.000 tonnes of lead and zinc metals.

-From 2031 to 2050: Carrying out exploration for additional reserves, carrying out in-depth exploration of existing mines and issuing new exploration permits to 810 mines with target reserves of about 555.000 tonnes of lead and zinc metals.

Details about lead and zinc exploration projects are provided in Appendix II.3 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining production of projects issued with permits (12 mines, total production of about 700.000 tonnes ore/year).

Making investment in new projects in Cao Bang (2); Tuyen Quang (8); Bac Kan (23); Thai Nguyen (3); Lao Cai (3); Yen Bai (3); Dien Bien (3); Quang Binh (1) with total capacity of about 1.689.000 tonnes ore/year to increase lead and zinc production in respect to mine sites with expired permits.

- From 2031 to 2050: Maintaining production of projects issued with permits, making investment in 5 - 10 new projects with total capacity of about 2.163.000 tonnes ore/year.

Details about lead and zinc extraction projects are provided in Appendix III.3 enclosed with this Decision.

c) Processing

- By 2030:

+ Maintaining the operation of projects that have been invested in Cao Bang; Ha Giang; Tuyen Quang; Bac Kan; Thai Nguyen, etc. with total processing capacity of about 215.000 tonnes of lead and zinc metals/year.

+ Completing projects issued with permits: projects on investment in construction of a multiple non-ferrous metal production plant in Yen Bai with a capacity of 40.000 tonnes/year; a lead smelting plant in Bac Kan with a capacity of 20.000 tonnes/year; a lead and zinc plant in Nam Quang - Ha Giang with a capacity of 10.000 tonnes/year.

+ Making investment in new lead - zinc smelting plants in Cao Bang (1); Tuyen Quang (2), Bac Kan (3); Thai Nguyen (2); Yen Bai (2) with total capacity of about 165.000 tonnes of metal/year.

- From 2031 to 2050: Maintaining the operation of projects issued with permits, considering issuance of new permits or increase in capacity of projects when it is proved that raw materials for these projects are available.

Details about processing projects are provided in Appendix IV.3 enclosed with this Decision.

4. Iron

a) Exploration

- By 2030:

+ Completing projects on exploration of mines in Ban Tan, Banh Tuong, Lung Vien - Bac Kan; Tan Son - Phu Tho; My Village II - Yen Bai; Khoang Mountain, Vom Mountain - Quang Ngai; etc.

+ Carrying out new exploration and exploration for additional reserves of projects in: Ha Giang (4); Cao Bang (2); Bac Kan (9); Tuyen Quang (1); Phu Tho (1); Thai Nguyen (3); Dien Bien (1); Lao Cai (3); Yen Bai (9); Ha Tinh (1); Quang Nam (1); Quang Ngai (2); with target reserves of 105.095 million tonnes of original ore.

- From 2031 to 2050:

Carrying out new exploration and in-depth exploration, expanding and increasing reserves of 5 - 10 projects with target reserves of 40-50 million tonnes of original ore and carrying out exploration of laterite iron in Chu Se and Duc Co regions in Gia Lai province.

Details about exploration projects are provided in Appendix II.4 enclosed with this Decision.

b) Extraction

- By 2030:

+ Maintaining iron production and restoring production of projects issued with permits with total production of 5 – 5,5 million tonnes of original ore (excluding production from the Thach Khe iron mine which has halted operation, has been issued with a permit with a capacity of 5 million tonnes/year, and mobilized into the planning when the competent authority decides to continue extraction).

+ Making investment in new projects in Ha Giang (7); Cao Bang (2); Bac Kan (12); Tuyen Quang (1); Phu Tho (2); Lao Cai (5); Yen Bai (9); Hoa Binh (1); Dien Bien (1); Thai Nguyen (4); Thanh Hoa (1); Ha Tinh (3); Quang Ngai (2); Quang Nam (1), with total new capacity of 14.8 million tonnes of original ore provided for domestic iron and steel projects.

- From 2031 to 2050:

Maintaining production of mines, making new investment, expanding and increasing capacity of 20 mines and issuing a new extraction permit to laterite iron ore in Gia Lai with national mining production of about 33,7 million tonnes of original ore/year.

Details about iron extraction projects are provided in Appendix III.4 enclosed with this Decision.

c) Processing

Maintaining the operation of existing iron ore flotation plants to ensure the supply of refined ore with Fe content ≥ 60% for domestic iron and steel plants. Constructing or reforming and expanding iron ore flotation plants in association with new steel production projects.

5. Chromite

a) Exploration

- From 2021 to 2030: Executing a project on assessment and conversion of reserve for chromite placer in Tinh Me - An Thuong area, Nong Cong district of Thanh Hoa province.

- From 2031 to 2050: Unknown

Details about chromite exploration projects are provided in Appendix III.5 enclosed with this Decision.

b) Extraction

- From 2021 to 2030:

+ Issuing an extraction permit to Co Dinh - Thanh Hoa chromite mine with a capacity of about 2.300.000 tonnes of original ore/year; prioritize mobilization of extraction of mine sites near Co Dinh lake to finish extraction and hand over the land fund for local authorities to serve socio-economic development.

+ Making investment in extraction of chromite in Tinh Me - An Thuong area, Trieu Son and Nong Cong districts with a capacity of about 2.500.000 tonnes of original ore/year.

New chromite ore extraction and flotation projects shall recover accompanying minerals including Nickel, Cobalt and Bentonite.

- From 2031 – 2050: Maintaining production of mines issued with permits and considering investment in exploration in new areas when proposed by enterprises.

Details about chromite extraction projects are provided in Appendix III.5 enclosed with this Decision.

c) Processing

Maintaining production of ferrochrome projects issued with permits, failing to issue permits for investment in new ferrochrome projects, encouraging existing plants to find imported materials or convert products to maintain production.

Details about chromite processing projects are provided in Appendix IV.4 enclosed with this Decision.

6. Manganese

a) Exploration

- By 2030:

+ Completing exploration projects issued with permits, including Trung Thanh, Coc Hec - Ha Giang; Roong Thy - Cao Bang;

+ Carrying out exploration of 4 new mines at Tuyen Quang (1); Cao Bang (2); Ha Tinh (1), with target reserves of about 1,75 million tonnes of original ore.

- From 2031 – 2050: Carrying out exploration of new areas after report on survey and assessment of geology and minerals for the period of 2021-2030 has been obtained.

Details about manganese exploration projects are provided in Appendix II.6 enclosed with this Decision.

b) Extraction

- By 2030:

+ Maintaining production of mine sites issued with permits by the Ministry of Natural Resources and Environment and People's Committees of provinces.

+ Making investment in 9 new extraction projects after there are results of exploration in Ha Giang (3); Tuyen Quang (1); Cao Bang (5); Ha Tinh (1) with total production of 352.000 tonnes of original mineral/year.

- From 2031 – 2050: Maintaining extraction of mines issued with permits, making new investment when new exploration projects are added to the planning.

Details about manganese extraction projects are provided in Appendix III.6 enclosed with this Decision.

c) Processing

- By 2030: Maintaining operation, achieving the designed capacity of existing plants in Ha Giang, Cao Bang, Tuyen Quang, Bac Kan. Total capacity will be about 256.000 tonnes/year; (excluding iron-manganese smelting project in Bac Kan with a capacity of 100.000 tonnes/year).

- From 2031 to 2050: Maintaining the operation of existing plants. Failing to invest in new plants, only expanding and increasing the capacity of plants when raw materials are available. Total capacity will be about 306.000 tonnes/year (excluding iron-manganese smelting project in Bac Kan).

Details about manganese processing projects are provided in Appendix IV.5 enclosed with this Decision.

7. Tin

a) Exploration

- By 2030:

+ Completing exploration projects issued with permits (04 projects): Bu Me - Thanh Hoa; Khe Bun - Ha Tinh; La Vi - Quang Ngai; Tap La - Ninh Thuan.

+ Exploring 14 new mines in Ha Giang (1); Cao Bang (1); Tuyen Quang (4); Thai Nguyen (2); Nghe An (1); Lam Dong (3) with target reserves of about 46.030 tonnes of tin metal.

- From 2031 to 2050: Carrying out exploration for additional reserves and new exploration of 4-5 mines with target reserves of about 4.500 tonnes of tin metal.

Details about tin exploration projects are provided in Appendix II.7 enclosed with this Decision.

b) Extraction

- By 2030:

Maintaining the operation of mines issued with permits and issuing permits to new mines, issuing permits for expansion and increase in mine capacity in Ha Giang (2); Tuyen Quang (5); Cao Bang (1); Thai Nguyen (3); Thanh Hoa (1); Nghe An (5); Quang Ngai (1); Lam Dong (4); Ninh Thuan (1) with total production of about 3.280.000 tonnes of tin ore/year.

- From 2031 to 2050: Maintaining annual production of about 3.026.000 tonnes of tin ore/year. Considering issuance of permits to new projects when they have been added to the planning.

Details about tin extraction projects are provided in Appendix III.7 enclosed with this Decision.

c) Processing

By 2030: Maintaining tin production of existing tin smelting projects and failing to issue new investment permits.

From 2031 to 2050: Failing to issue new construction permits, only considering investment in expansion of existing projects when raw materials are available.

Details about tin processing projects are provided in Appendix IV.6 enclosed with this Decision.

8. Wolfram

a) Exploration

- By 2030: Completing projects issued with exploration permits, and issuing new exploration permits to 6 mine sites in Ha Giang (1); Tuyen Quang (1); Thai Nguyen (2); Lam Dong (1); Binh Thuan (1) with target reserves of about 140.100 tonnes of WO3.

- From 2031 to 2050: Carrying out new exploration if there are results of survey and assessment of minerals and geology in the period of 2021 - 2030.

Details about wolfram exploration projects are provided in Appendix II.8 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of mines issued with extraction permits and issuing extraction permits to 8 new mines in Ha Giang (1); Tuyen Quang (1); Thai Nguyen (3); Thanh Hoa (1); Lam Dong (1); Binh Thuan (1) which have been explored to assess their reserves with target production of about 5.115.000 tonnes of original ore/year.

- From 2031 to 2050: Maintaining the operation of mines issued with permits, issuing permits to new mines when there are results of exploration and these mines are added to the planning, ensuring production of about 7.390.000 tonnes of original ore/year.

Details about wolfram extraction projects are provided in Appendix III.8 enclosed with this Decision.

c) Processing

From 2021 to 2030 and from 2031 to 2050: Maintaining production of existing wolfram processing plants, failing to issue new investment permits. Only issuing permits for investment in wolfram processing plants when raw materials are available (confirmed by investors) (after exploration or import).

Details about wolfram processing projects are provided in Appendix IV.7 enclosed with this Decision.

9. Antimony

a) Exploration

- By 2030: Completing an exploration project issued with a permit in Vai Village - Tuyen Quang; issuing permits for new exploration and additional exploration in Ha Giang (1); Tuyen Quang (2); with target reserves of 25.930 tonnes of antimony metal.

- From 2031 to 2050: Carrying out new exploration when there are results of survey and assessment of minerals and geology in the period of 2021 - 2030.

Details about antimony exploration projects are provided in Appendix II.9 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of mines such as Mau Due - Ha Giang; Vai village - Tuyen Quang and investing in new mines that have been explored with target production of about 40.000 tonnes of original ore/year.

- From 2031 to 2050: Making investment in new mines and maintaining 5 mines to ensure the operation of processing plants with production of about 50.000 tonnes of original ore/year.

Details about antimony extraction projects are provided in Appendix III.9 enclosed with this Decision.

c) Processing

From 2021 to 2030 and from 2031 to 2050: Maintaining production of existing antimony smelting plants, failing to issue new investment permits. Only issuing permits for investment in antimony smelting plants when raw materials are available (confirmed by investors) (after exploration or import).

Details about antimony processing projects are provided in Appendix IV.8 enclosed with this Decision.

10. Copper

a) Exploration

- By 2030:

+ Completing exploration projects issued with permits including project on additional exploration of deep reserve of Sin Quyen - Lao Cai copper mine; project on exploration

for additional reserve of Vi Kem copper mine, Coc My commune, Bat Xat district - Lao Cai;...

+ Carrying out new exploration and in-depth exploration of 16 projects in Lao Cai (7); Yen Bai (1); Son La (2); Cao Bang (2); Thanh Hoa (1); Kon Tum (2) with target reserves of 600.000 tonnes of copper metal.

- From 2031 to 2050: Continuing to carry out in-depth exploration, expand mines that are being extracted (10 mines) and issue permits to new mines when mineralization sites are discovered and survey and assessment of geology are conducted with target production of 320.000 tonnes of copper metal.

Details about copper exploration projects are provided in Appendix II.10 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining production of mines issued with permits such as Sin Quyen, Ta Phoi, Vi Kem - Lao Cai; Khe Cam, Lang Phat - Yen Bai and recovering copper from polymetallic mines issued with permits such as Phao Mountain, Ban Phuc Nickel mine; Nickel – Copper mine in Quang Trung commune, Ha Tri - Cao Bang.

Making new investment, expanding extraction, increasing capacity, recovering copper concentrates in Lao Cai (5); Yen Bai (1); Son La (4); Dien Bien (1); Thanh Hoa (1); Cao Bang (2); Kon Tum (3). Total production will be 11.400.000 tonnes of copper ore/year.

- From 2031 to 2050: Investing in in-depth extraction of mine sites that have been explored for upgradation and investing in 5 new mine sites in Lao Cai after there are results of exploration.

Details about copper extraction projects are provided in Appendix III.10 enclosed with this Decision.

c) Processing

- By 2030: Maintaining the operation of projects issued with permits in Lao Cai, Yen Bai; Thai Nguyen; issuing investment permits to 02 new copper smelting plants in Tang Loong Industrial Park, Bao Thang district, Lao Cai province and Kon Ray district, Kon Tum province. Total processing capacity will be 110.000 tonnes of copper metal/year.

- From 2031 to 2050: Maintaining production of copper smelting plants that have been invested, failing to issue new investment permits, only issuing investment permits for expansion and increase in capacity when raw materials are available.

Details about copper processing projects are provided in Appendix IV.9 enclosed with this Decision.

11. Nickel

Enterprises issued with extraction permits shall be fully capable of synchronously making investment in processing projects in conformity with nickel metal products that use advanced technology and modern equipment, and ensure environmental protection.

a) Exploration

- By 2030: Completing projects on exploration and upgradation of Ban Phuc nickel mine; Nickel - Dong Ta Khoa - Son La. Carrying out new exploration and additional exploration and expansion of areas including Cao Bang (1); Son La (1) with target reserves of about 409.000 tonnes of metal converted to nickel.

- From 2031 to 2050: Carrying out exploration for additional reserve of 01 mine in Son La in the area that has been explored in the previous period with target reserve of about 30.000 tonnes of metal converted to nickel.

Details about nickel exploration projects are provided in Appendix II.11 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining production of Ban Phuc - Son La Nickel mine; Nickel - Copper mine in Suoi Cu - Cao Bang; Nickel - Copper mine in Ha Tri - Cao Bang; investing in 4 new extraction projects in Cao Bang (1); Son La (3) with target production of 7.200.000 tonnes of nickel ore/year.

- From 2031 to 2050: Maintaining production of mines issued with permits and issuing permits for expansion and upgradation of mine sites with expired permits. Total production will be about 13.200.000 tonnes of nickel ore/year.

Details about nickel extraction projects are provided in Appendix III.11 enclosed with this Decision.

c) Processing

- By 2030: Investing in in-depth processing projects;

- From 2031 to 2050: Maintaining the stable operation of existing processing projects, continuing to invest in expansion and increase in capacity of in-depth processing projects when raw materials are available.

Details about nickel processing projects are provided in Appendix IV.10 enclosed with this Decision.

12. Molybdenum

a) Exploration

- By 2030: Completing a molybdenum exploration project issued with a permit in Lao Cai (Kin Tchang Ho).

- From 2031 to 2050: Carrying out exploration for additional reserve of 01 mine in Lao Cai or exploring new mines when there are results of survey and assessment of minerals and geology for the period 2021 - 2030.

Details about molybdenum exploration projects are provided in Appendix II.12 enclosed with this Decision.

b) Extraction

- By 2030: Investing and extracting molybdenum mines in Kin Tchang Ho, Pa Cheo - Lao Cai.

- From 2031 to 2050: Investing in expansion of Kin Tchang Ho mine when necessary.

Details about molybdenum extraction projects are provided in Appendix III.12 enclosed with this Decision.

c) Processing

Investing in construction of a new plant to produce $(NH_4)_2MoO_4$ or smelt ferromolybdenum with a capacity of 200 tonnes/year and increasing the capacity in the period after 2030 to 400 tonnes/year.

Details about molybdenum processing projects are provided in Appendix IV.11 enclosed with this Decision.

13. Gold

a) Exploration

- By 2030:

+ Completing projects on exploration of mines in Sang Sui - Nam Suong, Pusancap - Zone I, Lai Chau province; Cam Muon, Huoi Co (Ban San), Ban Bon, Nghe An province; A Dang area, Quang Tri province; A pey B area - Thua Thien Hue province; Ma Dao area, Phu Yen province.

+ Carrying out new exploration and exploration for additional reserves of mine sites in Ha Giang (2); Tuyen Quang (3); Cao Bang (2); Bac Kan (5); Thai Nguyen (1); Lao Cai (1); Yen Bai (1); Lai Chau (3); Son La (2); Quang Tri (3); Thua Thien Hue (1); Quang Nam (9); Phu Yen (1) with target reserves of about 101 tonnes gold.

- From 2031 to 2050: Carrying out additional exploration, expansion exploration and new exploration of at least 5 new mines and mineralization sites, with target reserves of about 232 tonnes gold.

Details about gold exploration projects are provided in Appendix II.13 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining extraction to achieve the designed capacity of existing mines and making maximum recovery of gold from projects on extraction of copper mines and multi-metal mines. Making investment in new mines issued with exploration permits in the previous period and carrying out new exploration in the period of 2021 - 2030. Total production is estimated to be about 1.780 million tonnes of gold ore/year.

- From 2031 to 2050: Making new investment and expansion investment to increase the capacity of mines issued with permits (about 10 projects), mines that have been explored and making maximum recovery of gold from multi-metallic mineral extraction projects.

Details about gold extraction projects are provided in Appendix III.13 enclosed with this Decision.

c) Processing

- By 2030: Maintaining existing gold processing and refining projects with capacity of about 6.146 kg/year. Making investment in new gold refining facilities in Lai Chau, Tuyen Quang and expanding existing projects to meet the processing needs of extracting facilities.

- From 2031 to 2050: Maintaining processing facilities issued with permits, only investing in expansion and increase in the capacity of existing projects. Total production will be 6.346 kg of gold metal/year.

Details about gold processing projects are provided in Appendix IV.12 enclosed with this Decision.

14. Rare-earth elements

Enterprises issued with extraction permits shall be fully capable and invest in appropriate processing projects with total rare earth oxides, hydroxides and salts with TREO content ≥ 95%, and rare earth oxide (REO)) (as encouraged) that use advanced technology, modern equipment and ensure sustainable environmental protection.

a) Exploration

- By 2030: Completing exploration projects issued with permits at Bac Nam Xe mine, Nam Nam Xe mine in Lai Chau province. Carrying out exploration for upgradation and expansion of mines issued with extraction permits and making new investment in exploration of mines at Lai Chau (7); Lao Cai (2); Yen Bai (1).

- From 2031 to 2050: Carrying out additional exploration of rare earth mines issued with extraction permits and exploration of 1-2 new mine(s) in Lai Chau and Lao Cai.

Details about rare-earth element exploration projects are provided in Appendix II.14 enclosed with this Decision.

b) Extraction

- By 2030: Promoting the search for extraction technologies and markets in association with in-depth processing of rare earth minerals at mines issued with extraction permits such as Dong Pao - Lai Chau mine; Yen Phu - Yen Bai mine.

Making estimated investment in new extraction projects in Lai Chau (5), Lao Cai (3); Yen Bai (1).

Total production will be about 2.020.000 tonnes of original ore/year.

- From 2031 to 2050: Maintaining the operation of existing projects, investing in expansion of extraction of Dong Pao mine and investing in new 3-4 extraction projects in Lai Chau, Lao Cai if there are investors in exploration, extraction, processing in association with the product consumption market. Total production will be about 2.112.000 tonnes of original ore/year.

Details about rare-earth element extraction projects are provided in Appendix III.14 enclosed with this Decision.

c) Processing

- By 2030: Completing investment in rare-earth element processing plants in Yen Phu commune, Van Yen district, Yen Bai province.

(1) By 2030: Total rare earth oxides (TREO): Making investment in 03 new rare-earth element hydrometallurgy – processing projects in Lai Chau and Lao Cai with products that have been processed (excluding processing production of plants that have invested in rare-earth element hydrometallurgy – processing from imported materials). Total production is estimated to be 20.000 – 60.000 tonnes/year.

(2) By 2030: Rare earth oxide (REO): Making investment in new rare-earth element extraction – processing projects in Lai Chau and Lao Cai or other appropriate areas with rare earth oxide products that have been processed (excluding processing production of

plants that have invested in rare-earth element extraction – processing from imported materials). Total production is estimated to be 20.000 – 60.000 tonnes/year.

- From 2031 to 2050: According to actual situation, investing in expansion and increase in the capacity of existing projects. Focusing on in-depth processing of rare-earth metal.

(1) Total rare earth oxides (TREO): 40.000 - 80.000 tonnes/year;

(2) Rare earth oxide (REO): 40.000 - 80.000 tonnes/year;

(3) Rare-earth metal: Making investment in a rare-earth metal smelting plant with its location selected by the investor and a total capacity of 7.500-10.000 tonnes/year.

Details about rare-earth element processing projects are provided in Appendix IV.13 enclosed with this Decision.

15. Precious stone

a) Exploration

The development of investment in precious stone exploration and extraction projects for the period of 2021-2030, with a vision to 2050 shall be based on the report on survey and assessment approved by the Ministry of Natural Resources and Environment.

b) Extraction

Maintaining the operation of the project on extraction of precious stone mine in Doi Ty – Khe Met, Quy Chau in Nghe An province.

16. Apatite

a) Exploration

- By 2030: Exploring 10 new areas with target reserves of about 260 million tonnes of apatite. Prioritizing issuance of permits to in-depth exploration projects in areas issued with extraction permits to maintain stable production.

- From 2031 to 2050: Carrying out in-depth exploration of mines issued with extraction permits.

Details about apatite exploration projects are provided in Appendix II.16 enclosed with this Decision.

b) Extraction

- By 2030:

+ Maintaining production in respect to projects issued with extraction permits (13 mines), issuing extraction permits to 18 new projects with total production of 10,1 - 12, 0 million tonnes of apatite ore/year.

+ Extracting and recovering apatite III in depots (13 depots) in succession with total production of about 2.500.000 tonnes/year to provide apatite III for existing flotation plants for maintenance of the supply of materials for processing projects.

+ Extracting and recovering depleted apatite III ores (content < 10% P_2O_5) and apatite II from mine sites that have been extracted to provide them for existing flotation plants in Lao Cai province.

Maintaining the operation of existing apatite ore flotation plants and making investment in new apatite ore flotation plants under extraction projects to meet the processing needs (new apatite ore flotation plants with capacity of at least 100.000 tonnes product/year and at most 300.000 tonnes product/year).

- From 2031 to 2050: Maintaining the operation of projects issued with extraction permits and issuing extraction permits to 4-5 new projects in order to ensure production of about 16,8 million tonnes of apatite ore with a focus on apatite II.

Details about apatite extraction projects are provided in Appendix III.16 enclosed with this Decision.

17. White marble

a) Exploration

- By 2030: Completing 07 exploration projects issued with permits, and issuing new exploration permits to sites in Tuyen Quang (3); Nghe An (2).

- From 2031 to 2050: considering issuance of permits to exploration projects when necessary.

Details about white marble exploration projects are provided in Appendix II.17 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of mine sites issued with extraction permits with capacity of about 26 million tonnes of white marble (lump, granule, powder); issuing extraction permits to new projects issued with exploration permits with total production of about 13,3 million tonnes of white marble (lump, granule, powder)/year and about 2,01 million m^3 of wall tile/year.

- From 2031 to 2050: Maintaining the operation of mines issued with extraction permits, failing to issue new extraction permits.

Details about white marble extraction projects are provided in Appendix III.17 enclosed with this Decision.

c) Processing

- By 2030:

+ Maintaining white marble production of marble powder processing plants issued with permits (54 plants and capacity of about 7,2 million tonnes of white marble (lump, granule, powder)/year. + Issuing new investment permits to 06 white marble powder processing projects in Yen Bai (4), Bac Kan (1), Nghe An (2) with capacity of about 2,5 million tonnes of white marble (lump, granule, powder)/year.

+ Maintaining existing wall tile and construction stone processing plants, focusing on processing of products to serve domestic and export demands.

- From 2031 to 2050: Maintaining the operation of projects issued with permits.

Details about white marble processing projects are provided in Appendix IV.14 enclosed with this Decision.

18. Magnesite

a) Exploration

- By 2030: Completing exploration of mine sites issued with permits at Tay Kon Queng and Tay So Ro in Gia Lai province.

- From 2031 to 2050: Carrying out exploration for expansion and increase in reserves of mine sites in Tay Kon Queng and Tay So Ro in Gia Lai province with target reserves of about 10 million tonnes.

Details about magnesite exploration projects are provided in Appendix II.18 enclosed with this Decision.

b) Extraction

- By 2030: Issuing extraction permits to 02 mine sites in Tay Kon Queng and Tay So Ro in Gia Lai province.

- From 2031 to 2050: Maintaining the operation of 02 mine sites issued with extraction permits and investing in expansion and increase in capacity of these mines if possible.

Details about magnesite extraction projects are provided in Appendix III.18 enclosed with this Decision.

c) Processing

- By 2030: Investing in construction of 01 caustic calcined magnesite production plant to serve domestic demand.

- From 2031 to 2050: Maintaining production of the caustic calcined magnesite production plant issued with a permit.

Details about magnesite processing projects are provided in Appendix IV.15 enclosed with this Decision.

19. Serpentine subgroup

a) Exploration

- By 2030:

+ Exploring a new mine site in Te Thang commune, Te Loi commune, Nong Cong district, Thanh Hoa with a target reserve of about 75 million tonnes.

+ Exploring a new mine site in Village 5, Phuoc Hiep Commune, Phuoc Son District, Quang Nam Province with a target reserve of about 5,5 million tonnes.

- From 2031 to 2050: Unknown

Details about serpentine subgroup exploration projects are provided in Appendix II.19 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of projects issued with permits such as Bai Ang - Thanh Hoa; Te Thang - Thanh Hoa; Thuong Ha - Lao Cai with target reserves of about 660 thousand tonnes/year.

Issuing permits to new projects in:

- Tat Thang mine, Tat Thang commune, Thanh Son district, Phu Tho province with a capacity of 50.000 tonnes/year.

- Te Thang mine, Te Thang commune and Te Loi commune, Nong Cong district, Thanh Hoa province with maximum production of 2.000.000 tonnes/year.

- Te Thang mine, Te Thang commune, Nong Cong district, Thanh Hoa province with maximum production of 1.000.000 tonnes/year.

- Mine in village 5, Phuoc Hiep commune, Phuoc Son district, Quang Nam province, with maximum production of 300.000 tonnes/year.

- From 2031 to 2050: Maintaining projects issued with extraction permits and total production of about 3.360.000 tonnes/year).

Details about serpentine subgroup extraction projects are provided in Appendix III.19 enclosed with this Decision.

c) Processing

- By 2030: Maintaining the operation of existing serpentine subgroup mills in Bai Ang and investing in expansion or investing in 1-2 new serpentine subgroup powder grinding project(s) with total processing capacity of 2.950 to 3.950 thousand tonnes/year. After being processed, serpentine products are mainly used for the production of fused phosphate fertilizers and additives for steel, ceramic, ceramic tile and wall tile industries and other industries.

- From 2031 to 2050: Failing to issue investment permits to new projects, only investing in expansion and increase in the capacity of existing projects if necessary.

Details about serpentine subgroup processing projects are provided in Appendix IV.16 enclosed with this Decision.

20. Baryte

a) Exploration

- By 2030: Exploring at least 05 new projects with target reserves of about 2,5 million tonnes.

- From 2031 to 2050: Unknown

Details about baryte exploration projects are provided in Appendix II.20 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of projects issued with extraction permits and issuing extraction permits to 6 new mines in Lai Chau (1); Tuyen Quang (2); Cao Bang (3) with total production of about 624.000 tonnes/year.

- From 2031 to 2050: Maintaining production of projects issued with extraction permits with national total production of about 620.000 tonnes /year).

Details about baryte extraction projects are provided in Appendix III.20 enclosed with this Decision.

c) Processing

- By 2030: Maintaining the operation of existing baryte mills and investing in 3-4 new baryte powder grinding projects in Cao Bang (1); Lai Chau (1); Lang Son (1)with total capacity of about 330.000 tonnes/year.

- From 2031 to 2050: Investing in expansion and increase in the capacity of baryte powder grinding projects issued with permits with target capacity of 430.000 tonnes/year.

Details about baryte processing projects are provided in Appendix IV.17 enclosed with this Decision.

21. Graphite

a) Exploration

- By 2030: Completing exploration projects issued with permits, including An Binh - Yen Bai; Khoai Village, Ma Village, Bong 2 - Lao Cai with target reserves of about 2.5 million tonnes. Issuing a new exploration permit to 01 project in Lien Son area, Lang Thit commune, Van Yen district, Yen Bai province.

- From 2031– 2050: Carrying out exploration for additional reserves of mines in Van Yen, An Binh, Dong Cuong, Ngoi A, and Yen Thai communes, Van Yen district with target reserves of ≈ 1.3 million tonnes.

Details about graphite exploration projects are provided in Appendix II.21 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of projects issued with permits, issuing extraction permits to new mines after their reserves have been explored and reported to ensure total extraction capacity of about 1.151.000 tonnes/year.

- From 2031 to 2050: Maintaining the operation of mines issued with extraction permits with total production of about 1,15 tonnes/year).

Details about graphite extraction projects are provided in Appendix III.21 enclosed with this Decision.

c) Processing

- By 2030: Completing investment in plants issued with processing permits, including Bao Ha graphite plant; Nam Thi graphite plant in Lao Cai; investing in new 2-3 new projects with processing capacity of about 110.000 tonnes of graphite /year with a content of > 99% to serve domestic demands.

- From 2031 to 2050: Maintaining the operation of projects issued with permits with total production of about 110.000 tonnes of graphite with content > 99% to serve domestic demands.

Details about graphite processing projects are provided in Appendix IV.18 enclosed with this Decision.

22. Fluorite

Fluorite is being extracted in an independent manner at Xuan Lanh mine (Phu Yen) or as an accompanying product of another mineral extraction project such as polymetallic mine in Phao Mountain or rare earth mine.

a) Exploration

- By 2030: Carrying out new exploration in Khau Pha area, Thuong Quan commune, Ngan Son district, Bac Kan province. The production is estimated to be 50.000 tonnes.

- From 2031 to 2050: Carrying out new exploration when proposed by investors.

b) Extraction

- By 2030: Maintaining extraction projects issued with permits and recovering fluorite of extraction projects issued with permits with target reserves of about 450.000 tonnes/year.

Issuing a permit to a new extraction project in Khau Pha area, Thuong Quan commune, Ngan Son district, Bac Kan province.

- From 2031 to 2050: Maintaining production and recovering accompanying fluorite of other extraction projects, considering new investment when proposed by investors.

Details about fluorite extraction projects are provided in Appendix III.22 enclosed with this Decision.

c) Processing

From 2031 to 2030 and after 2030: Maintaining the operation of existing fluorite processing plants and investing in 1-2 new project(s) in association with rare earth

extraction and processing projects. The processing production depends on the extraction capacity of other mineral projects. Therefore, it is unknown.

Making investment in a new fluorite flotation plant in Thuong Quan commune, Ngan Son district, Bac Kan province with a capacity of about 10.000 tonnes/year.

Details about fluorite processing projects are provided in Appendix IV.19 enclosed with this Decision.

23. Bentonite

a) Exploration

- By 2030: Investing in exploration for expansion and increase in reserves of projects issued with extraction permits to ensure the operation of existing projects.

- From 2031 to 2050: Carrying out new exploration according to proposal by investors in order to meet domestic demand.

Details about bentonite exploration projects are provided in Appendix II.23 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of projects issued with extraction permits and issuing extraction permits to 4-5 new projects with target reserves of about 400.000 tonnes/year.

- From 2031 to 2050: Maintaining the operation of mines issued with extraction permits, ensuring total production of about 450.000 tonnes/year to meet domestic demand.

Details about bentonite extraction projects are provided in Appendix III.23 enclosed with this Decision.

c) Processing

- By 2030: Maintaining bentonite flotation plants in Nha Ne - Binh Thuan; Tam Bo - Lam Dong and issuing new investment permits to 3 - 4 bentonite flotation plants with target reserves of 165.000 tonnes of bentonite/year.

- From 2031 to 2050: Making new investment or promoting expansion to increase the capacity of bentonite flotation plants in order to meet the requirement for production of about 260.000 tonnes/year.

Details about bentonite processing projects are provided in Appendix IV.20 enclosed with this Decision.

24. Diatomite

a) Exploration

- By 2030: issuing permits for new exploration or exploration for expansion of mine sites issued with permits such as: Hoa Loc - Phu Yen; Dai Lao - Lam Dong with target reserves of about 25.3 million tonnes.

- From 2031 to 2050: Issuing exploration permits for expansion of the Tuy Duong - Phu Yen mine with target reserve of about 3.500.000 tonnes.

Details about diatomite exploration projects are provided in Appendix II.24 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the production of projects issued with extraction permits and issuing extraction permits to 2-3 new mines with target reserves of about 540.000 tonnes/year.

- From 2031 to 2050: Making investment in increase in extraction capacity of mines issued with permits or issuing permits to 2-3 new mines with total production of about 740.000 tonnes/year.

Details about diatomite extraction projects are provided in Appendix III.24 enclosed with this Decision.

c) Processing

Investing in expansion of existing diatomite powder grinding projects or investing in new diatomite powder grinding projects according to extraction projects.

Details about diatomite processing projects are provided in Appendix IV.21 enclosed with this Decision.

25. Talc

a) Exploration

- By 2030: Carrying out exploration for additional reserves of mines issued with extraction permits before 2020 and carrying out exploration of at least 7 new mine sites that have undergone survey and assessment in Phu Tho (2); Hoa Binh (2); Son La (2); Da Nang (1) with target reserves of about 4.3 million tonnes.

- From 2031 – 2050: Carrying out exploration of new mines that have been discovered in the process of survey and assessment of minerals and geology in the period of 2021 - 2030.

Details about talc exploration projects are provided in Appendix II.25 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the production of extraction projects issued with extraction permits, including Ta Phu - Son La mine; Thu Ngac, Long Coc, Phu Tho province; Tan Minh, Hoa Binh province.

Carrying out investment in 09 new projects of mines that have been issued with exploration permits and whose reserves are approved, including Son La (2); Phu Tho (2); Hoa Binh (4); Da Nang (1) with total capacity about 410.000 tonnes/year.

- From 2031 to 2050: Maintaining the production of projects issued with extraction permits and investing in extraction of new mines that have been added to the planning with total production of about 450.000 tonnes/year.

Details about talc extraction projects are provided in Appendix III.25 enclosed with this Decision.

c) Processing

- Investing in construction of talc mills in association with new extraction projects issued with permits in the period of 2021-2030 and after 2030.

- Maintaining 01 existing talc mill in Phu Tho and investing in construction of 04 new talc mills in Phu Tho (4); Hoa Binh (1); Son La (1) and Da Nang (1).

Details about talc processing projects are provided in Appendix IV.22 enclosed with this Decision.

26. Micas

a) Exploration and extraction

From 2021 to 2030: Investing in new exploration projects, extracting micas in Ban Mang area, Ban Ria commune, Quang Binh district and Na Chi commune, Xi Man district, Ha Giang province.

After 2030: Unknown

b) Processing

Maintaining existing projects on grinding and separating micas from kaolinite and feldspar and ensuring capacity of about 1.700 tonnes/year to provide micas for the domestic market.

Details about micas processing, extraction and exploration projects are provided in Appendices II.26; III.26 and IV.23 enclosed with this Decision.

27. Pyrite

Currently, since the domestic demand for pyrite does not exist, the pyrite has not yet been planned and it is proposed that the pyrite be transferred to the national mineral reserve.

Exploration, extraction and processing of the pyrite will be considered in each specific case when proposed by investors.

28. Quartzite

a) Exploration

- By 2030: Issuing permits for new exploration and exploration for additional reserves of 04 new mine sites in Lao Cai (2); Phu Tho (1); Thai Nguyen (1) with target reserves of about 23,8 million tonnes.

- From 2031 to 2050: Continuing to carry out exploration for expansion of mine sites issued with extraction permits or carrying out exploration of 4-5 new mines that have been discovered in the process of survey and assessment of minerals and geology for the period of 2021-2030 with target reserves of about 28.4 million tonnes.

Details about quartzite exploration projects are provided in Appendix II.28 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of mine sites issued with extraction permits, including Lai Village - Thai Nguyen; Thuc Luyen (Don Vang) - Phu Tho; Huong Phong - Thua Thien Hue and issuing extraction permits to new projects in Lao Cai (2); Thai Nguyen (1); Phu Tho (1); Ha Tinh (1) with total production of about 1,57 million tonnes/year.

- From 2031 to 2050: Issuing permits for expansion and increase in capacity of projects issued with extraction permits and issuing extraction permits to 5-10 new projects so that total production will increase to about 1,82 million tonnes/year.

Details about quartzite extraction projects are provided in Appendix III.28 enclosed with this Decision.

c) Processing

Investing in quartzite processing (grinding and flotation) according to capacity of extraction projects issued with permits in the period of 2021-2030 and after 2030 to meet demands of economic sectors.

Details about quartzite processing projects are provided in Appendix IV.24 enclosed with this Decision.

29. Quartz

a) Exploration

- By 2030: Investing in new exploration from 22 new projects with target reserves of about 11,5 million tonnes at Cao Bang (2); Lao Cai (1); Yen Bai (3); Bac Kan (7); Ha Tinh (3); Binh Dinh (3) and Phu Yen (2).

- From 2031 to 2050: Considering investment in expansion and increase in reserves or investment in new exploration from 5-10 new mine sites to maintain production, serving the demands of the economy.

Details about quartz exploration projects are provided in Appendix II.29 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of projects issued with extraction permits and issuing new extraction permits to 23 mine sites after exploration and report on reserves in Cao Bang (2); Lao Cai (2); Yen Bai (4); Bac Kan (7); Ha Tinh (3); Binh Dinh (3); Phu Yen (2) with total production of about 1.130.000 tonnes/year.

- From 2031 to 2050: Maintaining production of about 1.070.000 tonnes/year. It is possible to increase total production according to demands of the economy.

Details about quartz extraction projects are provided in Appendix III.29 enclose with this Decision.

c) Processing

Investing in quartz processing (grinding and flotation) according to capacity of extraction projects issued with permits in the period of 2021-2030 and after 2030 to meet demands of economic sectors.

Details about quartz processing projects are provided in Appendix IV.25 enclosed with this Decision.

30. Sillimanite

In Vietnam, there are 03 sillimanite mines that have been identified by geological survey, including 01 graphite mine whose reserve has been determined in Hung Nhuong - Quang Ngai and 02 mines that have not yet been explored.

From 2021 to 2030 with a vision to 2050, failing to make planning for extraction and processing of sillimanite and transfer sillimanite to national mineral reserves.

31. Sericite

Maintaining the designed capacity of sericite extraction project in Son Binh, Huong Son district, Ha Giang province under the permit issued by the Ministry of Natural Resources and Environment.

Investing in 02 new projects on extraction and flotation of sericite ore in Bac Yen district, Son La province with total investment capacity of 70.000 - 130.000 tonnes/year.

Making additional planning for new exploration and extraction project when new mines are detected and have undergone survey and assessment, and the product consumption market is available.

From 2021 to 2030 with a vision to 2050, maintaining extraction and processing of sericite of projects that have been invested before 2030 and investing in new projects if there is any new discovery.

Details about sericite extraction and processing projects are provided in Appendices III.29 and IV.26 enclosed with this Decision.

32. Vermiculite

Making additional planning for new exploration and extraction project if new mines are potential mines after survey and assessment and the product consumption market is available.

From 2021 to 2030 with a vision to 2050, making planning for extraction of vermiculite mine in Son Thuy – Tan Thuong, Son Thuy commune, Van Ban district in Lao Cai province.

Details about vermiculite extraction projects are provided in Appendix III.30 enclosed with this Decision.

33. Mineral water and hot water

a) Exploration

- By 2030: Exploring about 150 new mines (boreholes) with the production of about 56.990m^3 of mineral water/24 hours to serve the demands for mineral water and resort tourism in Ha Giang (4); Tuyen Quang (5); Lai Chau (21); Son La (1); Hoa Binh (12); Dien Bien (6); Hanoi (1); Phu Tho (6); Yen Bai (19); Bac Kan (1); Hung Yen (5); Thai Binh (6); Ninh Binh (2); Thanh Hoa (5); Nghe An (1); Ha Tinh (1); Thua Thien Hue (5); Quang Tri (1); Da Nang (2); Quang Nam (8); Binh Dinh (8); Phu Yen (4); Khanh Hoa (8); Binh Thuan (2); Kon Tum (2); Long An (4); Tien Giang (3), etc.

- 2031 - 2050: issuing exploration permits if proposed.

Details about exploration projects are provided in Appendix II.31 enclosed with this Decision.

b) Extraction

- By 2030: Maintaining the operation of 66 mine sites (boreholes) issued with extraction permits and issuing extraction permits to 166 new mines (boreholes) with total production of about 80.000 m^3 of mineral water/24 hours.

- From 2031 to 2050: Maintaining boreholes nationwide to meet the demands for mineral water and resort tourism. Considering issuance of new permits when necessary.

Details about mineral water and hot water extraction projects are provided in Appendix III.31 enclosed with this Decision.

c) Processing: Producing bottled water and extracting mineral water and hot water in order to serve recreational dipping, failing to make planning for processing projects.

III. MINERAL USE PLANNING

Exploration planning projects shall be associated with extraction planning projects and extraction projects shall be planned to supply raw materials for processing projects according to market demand.

1. Regarding metallic minerals: After extraction, original minerals shall undergo flotation to be enriched and have their components separated (in case of multi-metallic minerals) into refined ores that meet standards applicable to each processing technology. Then they can be supplied for processing projects/plants for production of metal products, alloys or intermediate products mentioned in Table 3, which can be sold domestically and exported.

- Bauxite mineral gibbsite in the Western Highlands shall be extracted and undergo flotation of refined ores to ensure supply to aluminum plants. Aluminum and hydroxide products shall be used as materials to provide for Aluminum Electrolysis Plants, and serve other domestic and export demands. Bauxite mineral diaspore in the Northern provinces shall be extracted and undergo flotation of refined ores to ensure supply to

grinding stone plants and the Ministry of Industry and Trade is assigned to be responsible for considering export under proposals of People's Committees of provinces and cities where these mines are located on the basis of the balance between domestic supply and demand.

- Regarding products processed from rare earth ores: Total rare earth oxides, hydroxides and salts with TREO content ≥ 95% and rare earth oxides (REO) shall be used to serve domestic demand with export under consideration.

2. Regarding non-metallic minerals: After being extracted and undergoing one or more stages including sorting, grinding, screening, washing and refining, etc, original minerals will become products that have been classified, enriched and ready for use. They can also be used as materials for further processing or as materials and additives for other domestic and export industries.

Mineral water and hot water shall be extracted and used to produce bottled mineral water and serve domestic nursing, medical treatment and tourism establishments and geothermal source for electricity production (if any) and other fields.

3. Regarding mineral export: extracted and processed minerals are mainly used to meet domestic demand. The export of minerals/mineral products that have been processed but have not yet become metals or alloys shall comply with guidelines, policies and laws in each specific period and the direction by competent authorities.

IV. INVESTMENT DEMAND

1. Total investment demand

The table below shows total estimated investment for projects on exploration, extraction and processing of minerals in the planning:

Table 5: Total investment for projects on exploration, extraction and processing of minerals

NO	Subjects of investment	New investment demand (billion dong)		
		From 2021 to 2030	From 2031 to 2050	Total
1	Investment in exploration	4 049	668	4 717
2	Investment in extraction	57 500	33 770	91 270
3	Investment in processing	378 751	186 496	565 247
4	Investment in formulation and announcement about the planning	181	95	275
	Total	**440 480**	**221 229**	**661 709**

Details about capital for processing, extraction and exploration of minerals are provided in Appendix V enclosed with this Decision. 2. Investment sources

- Regarding exploration: Self-arranged capital of enterprises

- Regarding extraction and processing: Self-arranged capital of enterprises, domestic and foreign commercial loans, capital mobilized through securities market, issuance of corporate bonds and other legal sources.

D. LAND USE ORIENTATION FOR DEVELOPMENT OF MINERAL INDUSTRY, INFRASTRUCTURE, ENVIRONMENTAL PROTECTION AND SCIENCE AND TECHNOLOGY

I. LAND USE ORIENTATION

Land demand for extraction of minerals is about 190.000 ha for the period of 2021-2030 and about 305.000 ha for the period of 2031-2050, and conforms to land allocation criteria under Resolution No. 39/2021/QH15 in order to implement economic development objectives.

II. INFRASTRUCTURE DEVELOPMENT ORIENTATION

1. Regarding investors

- Traffic: Investors in mineral extraction processing projects shall make planning for construction of a collector road system in order to connect with controlled–access highways and national highways at certain locations according to the needs of these projects. Locations to be connected shall be approved by competent authorities before these locations are connected.

- Water – electricity supply: Investors in mineral extraction and processing projects shall apply for use of water and electricity to competent authorities and obtain approval before executing these projects according to the needs of such projects.

2. State management

- Making synchronous investment in traffic and seaport infrastructure in order to serve the development of mineral extraction and processing in conformity with each development stage.

- Continuing to upgrade and invest in new roads and national electricity grids for remote and rural areas and concentrated industrial parks in order to serve the development of mineral projects and socio-economic development of each region and area.

III. ENVIRONMENTAL PROTECTION ORIENTATION

With objectives for green growth, circular economy development and strong shift under the brown to green strategy, the following issues shall be settled:

1. Promoting application of advanced and green technologies, economical use and salvaging of minerals; recycling technologies efficiently using tailings and overburden.

2. Collecting and thoroughly treating all kinds of waste generated in the processing of production; recycling and reusing these kinds of waste to the maximum for production and supply for other economic sectors, and gradually forming a circular economy.

3. Preventing, minimizing and overcoming incidents and environmental risks in mineral extraction and processing projects.

4. Carrying out remediation and improvement of environment of mineral mines after extraction completion towards integration between environmental remediation and improvement and the development of green projects on socio-economic development (high-tech agricultural zones, eco-tourism services, residential areas, etc.) and environmentally-friendly economic sectors.

5. Completely overcoming dust generation from production, affecting the environment and people in the process of mineral extraction and processing. Improving environmental landscape of mineral production areas so as to ensure green - clean – beautiful environment, thereby contributing to the protection of the general environment.

6. Proactively adapting to climate change, ensuring the safety of landfills, minimizing rock fall hazards, and preventing the risk of flooding; reducing greenhouse gas emissions and limiting the impact of climate change.

IV. SCIENCE AND TECHNOLOGY ORIENTATION

1. Continuing to effectively implement the second phase of the Project on technological innovation and modernization in the mining industry until 2025 approved by the Prime Minister in Decision No. 259/QD-TTg dated February 22, 2017.

2. Accelerating research, transfer, acquisition and application of advanced science and technology, technology and equipment transfer of stages, including exploration, extraction, processing of minerals, and environmental protection with regard to each group/type of minerals towards a green production model.

3. Regarding bauxite (Central Highlands), titanium, rare earth elements, chromite (Thanh Hoa), apatite (Lao Cai), titanium (Binh Thuan), nickel (Son La), copper - gold, other large-scale mineral mines/clusters such as Thach Khe iron mine, copper mine in Lao Cai province, etc. an extraction and processing complex, applying advanced technology and modern equipment shall be established.

DD. SOLUTIONS AND RESOURCES FOR PLANNING

I. SOLUTIONS FOR LAWS AND POLICIES

1. Continue to review, amend and complete the State's mechanisms, policies and laws on minerals to overcome shortcomings and limitations, and enable enterprises to invest in mineral extraction and processing projects, enhance roles and responsibilities of central and local state management authorities and enterprises.

2. Soon complete the review and assessment of the Mineral Law and issue the Mineral Law which is amended.

3. Study and amend land policies and relevant laws towards return of the area of mineral extraction land after completion of post-extraction landscape restoration or formulation of a socio-economic development project integrated with landscape restoration and environmental remediation in mineral projects in accordance with the land use planning approved by the competent authority, in order to increase the efficiency of land use according to the circular economy model in conformity with characteristics of each mineral.

4. Consider proposing and improving efficiency in investment, including cooperation with foreign partners that have experience, capital sources and market from exploration, extraction to processing.

5. Complete and amend legal policies to facilitate mineral exploration and exploitation projects in association with processing projects. Strictly control exploration and extraction in compliance with legal policies on minerals and environment, thereby ensuring labor safety.

6. Regarding bauxite, titanium, chromite, etc, issuing extraction permits when enterprises invest in in-depth processing projects directly associated with mines.

7. Regarding mineral extraction and processing: Encourage accumulation of resources from small-scale mines/mine sites to develop large enough-scale mines/mine clusters for synchronous investment in mineral exploration, extraction and processing, applying modern technology.

8. Finance: Review and promptly adjust taxes, fees and charges in a reasonable manner, ensuring the harmony of interests among the State, enterprises and people in local areas where minerals are extracted.

9. Science and technology: Prioritize scientific and technological capital in order to research and apply efficient technology for processing minerals.

10. Develop supporting polices for restructured enterprises.

11. Develop reasonable policies intended for people subject to production and residence land expropriation.

12. Resources management:

- Increase the quality of reserve and resource survey, exploration and assessment.

- Fully make statistics and public data on extraction, processing and losses of natural resources, and soon establish a database on mineral resources and share information to serve resource planning and management.

- Prioritize issue extraction permits that satisfy materials demand of projects on mineral processing that have been invested.

13. State management:

- Strengthen the cooperation between the Ministry of Natural Resources and Environment, Ministry of Industry and Trade and People' Committees of provinces in issuing permits for mineral-related activities and providing information on development of the extraction and processing issued with permits.

- Regarding some minerals, large-scale and strategic mineral mines, including bauxite, titanium, rare earth elements, nickel, copper, gold and chromite, before issuing mineral exploration and extraction permits, authorities issuing permits for mineral activities shall be responsible for collecting opinions from state management agencies in charge of planning, extraction and processing on the suitability of the planning and the supply and demand.

- Regarding mineral processing projects, investment registration authorities shall collect opinions from mineral planning management agencies on the suitability of the planning, the suitability of technology, equipment and post-processed products and the satisfaction of the requirement for mineral materials for processing prior to issuing permits. Investors in in-depth processing projects are selected in accordance with the Law on Investment, the Law on Procurement and other relevant laws and are issued with permits for extraction and exploration of mines according to the approved planning or the Resolution/Decision the Politburo, the National Assembly and the Prime Minister (if any).

- Publicly reveal coordinates of boundary of planning projects on. Enhance inspection of extraction and processing and guard of mine boundary and recently-discovered mine sites as well as national mineral reserves according to regulations of the Mineral Law and Law on Management of Public Property.

- Restructure small-scale enterprises which use limited resources, apply outdated technologies and highly cause losses of resources and environmental pollution; carry out extraction separately from the place of mineral use in order to establish large-scale enterprises for concentrated extraction and processing which apply advanced technologies for the purpose of ensuring labor safety and environmental protection by acquisition, joint venture, association or transfer of mineral permits.

II. SOLUTIONS FOR FINANCE AND INVESTMENT

1. Finance: Review and promptly adjust taxes, fees and charges in a reasonable manner, ensuring the harmony of interests among the State, enterprises and people in local areas where minerals are extracted.

2. Investment: Utilize advantages, encourage domestic enterprises that are capable to play key roles in exploration, extraction and processing of strategic minerals with large reserves. Diversify investment sources through contribution of capital, shares, joint venture and other credit capital sources.

III. SOLUTIONS FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT

1. Invest in technological innovation and use advanced equipment for extraction, flotation and processing of minerals in order to save resources, save energy, ensure labor safety and protect the environment.

2. Promote scientific research in extraction, flotation, processing and use of minerals for the purpose of maximum recovery of minerals and accompanying minerals to supply raw materials for other industries and serve economic sectors.

3. Prioritize funding sources for science and technology to conduct study on technology application for efficient processing of minerals.

4. Regarding mineral exploration and extraction, develop specific techniques for mineral exploration in the direction of the best technique and technology in Vietnam, ensuring the suitability with the actual situation of local areas and achieving efficiency in pollution prevention and control, and reduction in adverse impacts on the environment and ecosystem.

5. Regarding mineral processing and use, focus on application of advanced science and technology in the process of operation towards circular economy, green economy and low carbon development. Focus on development of scientific research and innovation in environmentally-friendly technologies in order to efficiently process mineral resources, save energy and reduce waste.

IV. SOLUTIONS FOR DISSEMINATION AND INCREASE IN AWARENESS

1. Promote dissemination of guidelines, policies and laws on minerals, and publish mineral planning.

2. Increase awareness of role and law on minerals; strengthen the public's supervision of mineral activities in local areas; publish revenues and use of revenues of mineral enterprises in a transparent manner.

3. Communication agencies shall cooperate with ministries, central authorities and People's Committees of provinces related to mineral activities, especially sensitive minerals such as bauxite, iron, etc. to promptly provide information in an objective and honest manner and prevent incitement, manipulation and distortion from reactionary organizations against guidelines of the Communist Party and the State.

V. SOLUTIONS FOR TRAINING AND INCREASE IN CAPACITY

1. Focus on investment in renovation and modernization of training and research equipment for educational institutions, specialized research institutions, key laboratories, and improvement of the capacity and quality of scientific research with support funding from the state budget and private investment.

2. Strengthen cooperation between domestic universities, scientific research institutions and laboratories, and international training and research institutions to train research students, post-graduate students, experts and skilled workers; provide high-quality training and research equipment and laboratory.

3. Enhance the leading role of research institutions and universities in order to promote scientific and technological research, environmental protection, application in mineral exploration, extraction and processing, and training in human resources for the purpose of fulfillment of the requirements for application of advanced, and environmentally friendly science and technology.

VI. SOLUTIONS FOR INTERNATIONAL COOPERATION

1. Promote scientific and technical cooperation, technology transfer in exploration, extraction, processing and use of minerals, environmental protection, labor safety and application of information technology to management and administration of minerals, monitoring, forecast, management of environment, and automatic control in order to improve efficiency, reduce losses of resources, improve labor productivity and product quality, and protect the environment.

2. Cooperate in investment in projects on mineral extraction and processing that apply high technology, use advanced and modern equipment, protect environment and ensure product consumption market. Limit cooperation, joint venture, association, sale of shares to foreign investors with regard to projects on extraction of mines and flotation of minerals.

VII. CAPITAL MOBILIZATION SOLUTIONS

Investment capital for projects on exploration, extraction and processing of minerals is partially provided by the state budget, mainly provided by enterprises with their own capital, commercial loans (mainly) on the financial market, and mobilized from other capital sources such as securities market, etc. To be specific:

1. State budget:

- Invest capital in projects on survey and assessment of mineral resource potential; carry out exploration of some toxic and radioactive minerals.

- Formulate, adjust, build and manage data on mineral planning.

- Provide financial support for scientific research and application of mineral flotation and processing technologies in order to synthetically, economically and effectively use non-renewable mineral resources in accordance with the National Science and Technology Program for renewal and modernization of mineral extraction and processing technologies approved by the Prime Minister.

2. Capital mobilization in international market: With regard to some special projects that have large scale, use modern technology, and make pilot investment in in-depth processing as a premise for synchronous production chain development and sustainable development of resources with large scale, the Government will consider supporting enterprises by providing loan guarantees in accordance with the law.

3. Mobilization of other capital sources: Mobilize capital from domestic and foreign organizations, individuals, and enterprises in compliance with regulations of the law.

VIII. SOLUTIONS FOR SUPPLY OF HUMAN RESOURCES

1. Develop a plan to recruit and train human resources in accordance with industry requirements and development progress of mineral extraction and processing projects, especially skilled technicians in charge of operation of machinery and equipment for mineral extraction and processing with advanced technology and access to new technology.

2. Focus on recruitment and training for local workers, especially workers in mountainous areas with extremely difficult and difficult socio-economic conditions.

3. Develop policies on attracting high-quality human resources and giving preferential treatment to workers, especially pit mining workers.

4. Provide material and spiritual care for workers.

5. Create connection between mines and domestic and international training institutions; run advanced training programs, bridge programs or overseas training programs to have sources of skilled and dedicated workers.

6. Regarding officials and public employees in charge of management of minerals and metallurgy, recruit and allocate people with expertise and practical experience; support and update knowledge about laws on natural resources and environment and relevant

laws. To be specific: it is necessary to strengthen allocation of officials and public employees in provinces.

Article 2. Implementation

1. Ministry of Industry and Trade

a) Be responsible for the accuracy of data, documents, diagrams, maps and database in the planning dossier, ensuring the consistency with the contents of this Decision.

b) Organize announcement about the planning in accordance with regulations and implement this Decision in association with the performance of socio-economic development tasks in accordance with the law; develop a Plan for implementation of the planning according to the criteria and arguments specified in this Decision in order to perform objectives and tasks set out in the planning; organize the assessment of the implementation of the planning in accordance with regulations of the Law on Planning.

c) Take charge and cooperate with ministries, central authorities and People's Committees of provinces and central-affiliated cities in announcing the planning, providing guidance on implementation, review, assessment, inspection, examination and supervision of the implementation of the planning, and proposing amendments to the planning when necessary in accordance with regulations of the Law on Planning and the Law on Minerals, for implementation of procedures for investment in mineral extraction and processing projects in compliance with the planning.

d) Periodically review and assess the results of the implementation of the planning; update information and propose amendments to the planning when necessary.

dd) Study formulation of regulations and submit them to competent authorities for promulgation or promulgate regulations on conditions for extraction of mines after completion of basic construction; strictly manage business, circulation of minerals, standards and regulations on the level of processing for each group/type of minerals under its competence in conformity with the actual situation; research and develop projects on basic materials for industry.

e) Organize establishment, regularly update, archive, make long-term preservation and publicly share the database in the information system and the national database on this planning.

2. Ministry of Natural Resources and Environment

a) Promote baseline survey into minerals in potential regions, including the Northwest, Northeast, North Central Region, Western Highlands and coastal areas, especially minerals distributed in deep parts. Delineate and add mineral areas that have not yet been mobilized in the planning to the list of national mineral reserves to serve local socio-economic development, and submit the list to the Prime Minister for approval.

b) Cooperate with the Ministry of Industry and Trade and relevant provincial People's Committees in issuing mineral permits in accordance with the mineral planning, ensuring that mineral extraction projects apply advanced technology, guarantee labor safety, protect environment, and are associated with in-depth processing projects.

c) Closely cooperate with the Ministry of Industry and Trade, the Ministry of Finance and the Ministry of Planning and Investment in management of mineral activities; share information and database on resources and mineral activities of enterprises and projects issued with permits.

d) Study amendments to policies and laws on land to increase socio-economic efficiency of extraction projects, including site clearance policy and post-extraction land use policy.

dd) Take charge and cooperate with local authorities in inspecting the observance of regulations on environmental protection in respect of mineral extraction and processing projects, and strictly handling projects that do not comply with regulations of the law on environmental protection according to regulations as prescribed by the law.

e) Take charge of establishment, update and sharing of the database system on mineral reserves and resources, and mineral activities of enterprises and projects issued with permits.

3. Ministry of Science and Technology

a) Take charge and cooperate with the Ministry of Industry and Trade in managing technology transfer and manufacturing equipment for mineral extraction and processing; apply advanced technology, mechanization, automatic control and equipment synchronization, thereby improving productivity and quality of extraction and processing of minerals

b) Focus on investment in research on scientific basis to complete and then promulgate a system of national technical regulations and standards, technical regulations, thereby improving the efficiency in management, exploration, extraction, processing and use of minerals.

c) Reinforce, build and develop scientific and technological potential of organizations in the field of minerals, meet the demands for research and geological baseline survey into minerals and environment, and construct a network of science and technology organizations capable of international integration in close association with education - training, and production - business. Improve the quality and efficiency in science and technology activities, promote international cooperation, acquire and apply new and modern scientific and technical advances and technologies in the world.

4. Ministry of Finance

a) Take charge and cooperate with the Ministry of Industry and Trade and the Ministry of Natural Resources and Environment in studying and proposing policies on taxes and fees in conformity with specific characteristics of extraction, processing and use of minerals; strengthen management of financial revenues, ensure correct and sufficient revenues for mineral activities in general and minerals under the planning in particular.

b) Provide capital sources for research topics and projects in service of extraction, processing and use of minerals.

5. Ministry of Construction

a) Take charge of research and formulation of projects on production of building materials and unburnt materials from waste and sludge collected during and after mineral processing, thereby promoting efficient and economical use of minerals and environmental protection.

b) Study formulation, and promulgate within its competence or request competent authorities to promulgate standards and regulations with regard to raw materials which are waste and sludge collected during and after the process of extraction and processing of minerals as raw materials for the production of building materials.

6. Relevant ministries and central authorities shall cooperate with the Ministry of Industry and Trade and the Ministry of Natural Resources and Environment in effectively implementing the planning.

7. People's Committees of provinces and central-affiliated cities engaged in mineral activities

a) Closely cooperate with the Ministry of Industry and Trade in implementation and management of the mineral planning.

b) Cooperate with the Ministry of Industry and Trade and the Ministry of Natural Resources and Environment in reviewing and assessing investment in mineral extraction and processing projects and enterprises extracting and processing minerals in their provinces; attract investment in order to promote investment in mineral processing projects on schedule and in an effective manner.

c) Strengthen inspection and supervision of mineral activities in their provinces; prevent illegal extraction and export of minerals. Handle or request competent authorities to thoroughly handle facilities extracting and processing minerals that fail to meet technical safety requirements and cause environmental pollution.

d) Promote dissemination of guidelines, policies and laws on minerals when implementing the planning in their provinces; mobilize small-scale enterprises to implement the enterprise restructuring policy.

dd) According to the scale of mines, be allowed to make self-adjustment in the demand for land use according to the local land use planning for auxiliary works of mines to serve as the basis for implementation.

e) According to local socio-economic development strategic objectives, be allowed to implement technical infrastructure projects for national and public interests, according to Article 62 of the Land Law, in mineral areas approved in this Decision on the principle of recovery and protection of mineral resources and compliance with regulations of the Mineral Law and the Law on Planning and relevant laws.

g) Cooperate in management of the planning on the principle that:

- A mechanism for cooperation in management of mineral planning between ministries - ministries, ministries – local authorities, and local authorities- neighboring local authorities shall be built.

- Regarding provinces with the same geography and socio-economic conditions, they shall formulate the same mineral policies (especially business and investment projects in an area that consists of at least 2 administrative provinces).

- Planning-managing agencies, permit-issuing agencies and tax authorities shall closely cooperate in management of mineral extraction, exploration and processing projects before, during and after issuance of permits.

- It is not permitted to hinder transport of minerals from extraction places to concentrated processing places (it is possible to transport minerals from a province having extraction mines to another province for processing. Benefit sharing policies applied to provinces having mineral resources shall be formulated.

Article 3. This Decision comes into force as of its date of signing and replaces Decisions on approval for planning and Documents and Decisions on amendments and adjustment in planning issued by competent authorities before the effective date of this Decision.

Projects that are being executed and whose applications for issuance of permits have been submitted to the Ministry of Natural Resources and Environment before the effective date of this Decision may continue to be executed according to the planning.

Article 4. Ministers, heads of ministerial agencies, heads of Governmental agencies, Chairpersons of People's Committees of provinces and central-affiliated cities and relevant organizations and individuals shall be responsible for the implementation of this Decision./.

PP. PRIME MINISTER
DEPUTY PRIME MINISTER

Tran Hong Ha