TELECOMMUNICATIONS

Interested Donors
AsDB, WB, UNDP, Japan, France, Italy, USA

Concerned Government units
Ministry of National Development
Department of Telecommunications

Government and donor concluded:

1. Over 90% of telecommunication equipment in the country is supplied by the USSR. Most of these are old, with 80% installed more than 20 years ago and are now outdated. There are serious problems in obtaining spareparts to keep systems operational.

2. All agree on the importance of having an adequate and efficient telecommunication system in the country, given the relative isolation of many of the more remote provinces. Improved communication with the outside world is vital.

3. The telecommunications situation needs to be restructured and a short-erm investment programme has to be elaborated to allow for an early start of the modernization process of the sector. The country has a sufficient number of qualified technicians, though some training may be necessary to acquaint them with modern equipment and technology.

4. AsDB will carry out a sector review and assist in the preparation of a master plan. Japan has already made funds available for 2 telecommunications project in two phases. For the first phase Yen 900 million is available, Yen 800 million is foreseen for a second phase to start in 1992.

5. A French commercial firm (ALCATEL) has signed a FFr115 million contract with the Mongolian authorities, under which equipment will be supplied to modernize the telephone system in Ulaanbaatar and a new telephone exchange is to be installed.

6. Other donors present are interested in receiving AsDB's sector study on the basis of which they could decide on a possible participation in technical assistance or capital investments in this sector.

ENERGY

Interested donors:
WB, AsDB, ESCAP, USA, Japan, Denmark, France

Concerned Government Units:
Ministry of National Development
Ministry of Energy

Covernment and interested donors concluded in an ad hoc group:

1. The sector can benefit from two different, simultaneous thrusts: a) a master plan plan for the sector is to be developed in order to provide an overview of required actions; b) several projects must be implemented before the plan is complete in order to provide an adequate energy supply.

2. Partial studies have already taken place under donor financing from which the global study can benefit. The Unites States has funded a feasibility study for the upgrading of the Ulaanbaatar power plants, and Japan is undertaking a survey mission for the renovation of power plant No. 4, which it intends to follow up with investment for the actual renovation of the plant.

3. The Covernment is interested in exploring alternative sources of energy. In this respect, UNDP has already been financing a project looking at ' ', solar and biogas energy. Denmark showed a particular interest in responding to this Government need, and UNDP promised to send Denmark the reports produced by the above-mentioned project. Denmark would like to fund that part of the overall sector study relating to alternative sources of energy. In addition, the AsDB would fund a study on hydropower, followed by investment in the area if warranted.

4. France noted that it would not invest in the sector until its profitability had been established. In this respect, it was noted by the donors that efficiency and price issues had to be addressed. In this respect, the AsDB announced that it would fund a comprehensive energy audit.

5. The World Bank proposed to fund the overall sector survey. It was agreed by the donors that close coordination would be sought in carrying out the survey. The World Bank will provide copies of the Terms of Reference for the mission to all interested donors and invite comments and/or participation.

TRANSPORT

Interested donors:
AsDB, World Bank, Japan, France, ESCAP

Government units:
Mongolian Airlines (MIAT)
Railway
State Transport Department
Ministry of National Development

The World Bank pointed and others agreed that the transport sector is among the most important areas for critical action now to resolve trade problems, diversify trade and generate foreign exchange. Bottlenecks exist in the short term, and longer term renovation and expansion is required.

1. Air

(a) AsDB is taking the lead with the high priority expansion and development of more adequate airport facilities in Ulaanbaatar. TOR are ready and TA is to begin soon. Government indicated it would like existing alternative airfields in Ulaanbaatar looked into an option.

(b) In the next phase, Government is concerned about modernizing and enlarging its fleet, improving internal airports and raising standards.

(c) The airline is expected to be privatized and some form of joint venture was considered desirable.

(d) France has some interest and will coordinate.

2. Railroad

(a) Japan is lead agency and will do a sector study of route development and improvement focussed on access to internal commercial interests such as natural resources, and secondly, access to the sea. A rail cargo terminal near the Chinese border will also be studied for follow-up investment.

(b) Government would also like, in a next phase, to modernize and expand its own rolling stock including locomotives. However, the urgent need for tank lorry cars for petroleum products can now be met from critical import funds provided by the World Bank or other donors. Presumably other critical needs to keep the economy functioning can be met if they are put forth for donor consideration.

(c) Other donors may have an interest (e.g. France) in follow up.

3. Road

AsDB will also do a masterplan of the road system, building on the prior USSR study. Four roads are being considered.

4. Overall planning

(a) The group noted that a coordinated intermodal plan is essential. This requires Government and donor efforts.

The World Bank is going to finance an economic study about long term options for access to the sea. Japan is assisting China and Mongolia help to develop access by rail through China.

ESCAP has a programme of significance: Asia regional highway project and TransAsian railway project are important considerations to assure Mongolia's access. ESCAP also offers training on planning.

(b) Ports are also an essential factor. Initiatives are underway to develop Tuman River area -- which Mongolia strongly supports as the shortest access to the sea of Japan. UNDP, ESCAP and potentially AsDB are involved. This too needs coordination.

3. INFORMATION TO BE USED AT THE MEETING ON MINERALS AND RAW MATERIALS OF MONGOLIA

INFORMATION TO BE USED AT THE MEETING

ON MINERALS AND RAW MATERIALS OF MONGOLIA

1. A coking coal deposit at Tavantolgoi is located 15 km to the south of Tsogt-Tsotsii somon (district) of Ömnögobi aimag (province), 100 km to the east of Dalandzadgad city, 430 km from the Choir railway station.

Exploration-assessment works have assessed the volume of the total coal reserves as 5 billion tns. A part of this deposit at Tsanhi is considered as the most appropriate for initial exploitation. 300.3 million tns out of the estimated resource of 412.3 million tns of the $A+B+C_1+C_2$ categories at this part are coking coal.

A technological study of coal-coking and -dressing has been carried out. Deep water reserves of the lake Balgasyn Ulaan (75 km from the deposit) and water reserves of the river Ongiin (210 km from the deposit) have been estimated as well.

2. A copper-molybdenum deposit at Tsagaan Suvraga is located in Mandakh somon of Dornogobi aimag, 220 km to the west of the Sainshand railway station.

The ore reserves of the $B+C_1+C_2$ categories are 240.0 million tns, including 1280.85 thousand tns of copper and 43.62 thousand tns of molybdenum. The contents of copper and molybdenum in the ore are 0.53% and 0.018% accordingly. Non-commercial ore reserves are 77.5 million tns, including 197.67 thousand tns of copper and 7.05 thousand tns of molybdenum.

Besides there have also been discovered side contents of rhenium-0.39 gr/tn (119.68 tns of estimated reserves), selenium-8.3 (2547.02 tns), tellurium-2.8 (3927.93 tns), gold-0.084 (25.77 tns), silver-2.64 gr/tn (810.14 tns).

An ore-dressing technology has been studied.

Also in the area of the deposit water reserves have been discovered, enough to provide the needs of enterprizes and factories to be built there in future.

3. A tungsten-molybdenum deposit at Undur Tsagaan is located in Khentii aimag, 30 km to the east of the center of Ömnödelgher somon and 80 km to the north-west of Undurkhan city.

Preliminary exploration of this deposit has estimated 141 million tns of ore reserves of C_1+C_2 categories, including 175.1 thousand tns of three-oxide of wolfram, 26.2 thousand tns of molybdenum, 43.9 thousand tns of beryl oxide, 13.0 thousand tns of bismuth. The ore is base, containing 0.124% of three-oxide

of wolfram, molybdenum - 0.019%, beryl oxide - 0.031%, bismuth - 0.008%.

An openpit exploitation of the deposit is preferable. A brown-coal mine is operating 45 km from the deposit and 200 km from it an electric power station of high capacity based on the Baganuur coal deposit is planned to be built.

Three km from this deposit a silver-polymetal deposit of Mungon Undur is located. Preliminary explorations are now underway there. 12.6 million tns of ore estimated by exploration-assessment works contain 125.4 thousand tns of lead, 81.1 thousand tns of zinc, 946 tns of silver. The average content of lead is 0.99%, zinc-0.64%, silver-74.8 gr/tn.

4. A polymetal deposit at Ulaan is located 120 km from Choibalsan city and 13 km to the west of "Erdes" village. The village "Erdes" is connected to a transmission line and Bayantumen-Solovyovskaya railroad.

A detailed exploration of the deposit has been finished. The commercial ore reserves available for an openpit mining have been assessed as 39.2 million tns of ore of the B+C +C categories, including 782.4 thousand tns of zinc, 43 .3 thousand tns of lead, 2062 tns of silver, 8159 kg of gold, 4310 tns of cadmium, 28.9 tns of copper, 275 tns of selenium, 278 tns of tellurium. The non-commercial reserves of the ore available for an openpit mining are 7.2 million tns, containing 31.9 thousand tns of zinc, 32.6 thousand tns of lead and 101 tns of silver. The non-commercial reserves not available for an openpit mining are 28.8 tns of the $B+C_1+C_2$ categories, including 511.8 thousand tns of zinc, 283.2 thousand tns of lead, 1254 tns of silver.

In the result of exploration-assessment works that had been conducted at polymetall deposit in Mukhar, which is 1,5 km from the Ulaan deposit, it was established that it contained 62 thousand tns of lead,332 thousand tns of zinc, 110 tns of silver of the category C_2 .

Dressing technologies for different types of ore have been studied.

5. A polymetal deposit at Tsav is located in 125 km to the north-east of Choibalsan city. It is in 3 km to a railroad and in 17 km to the nearest railway station. There is a polymetall deposit at Ulaan in 90 km to the west of this deposit.

In the result of exploration-assessment works conducted in 1983-1986 it had been estimated that the deposit contained 4.7 million tns of ore of the category C_2-P_1 including 1.6 thousand tns of denominated lead. The ore also contains such side-elements as cadmium (0.021%) and gold (0.07-2.24 g/t). Preliminary exploration of some ore bodies started in 1987.

According to the preliminary calculations this deposit contains 7 million

tns of ore including 330 thousand tns of lead, 280 thousand tns of zinc, 3500 tns of copper, 1185 tns of silver, 2,5 tns of gold. The deposit is suitable for an underground mining.

6. A silver deposit at Asgat is located 180 km to the north-east from the center of Bayan-Ulgii aimag, not far from the Mongolian-Soviet border. The nearest railway junction is the Biisk station in the territory of the Soviet Union. The deposit is at 3000-3800 metres above the sea-level.

Preliminary exploration is now being conducted at the deposit. Approximate calculations have assessed the ore reserves as 24.8 million tns of the $C_2+P_1+P_2$ categories including 7125 tns of silver, 1356 thousand tns of bismuth, 92.4 thousand tns of antimony, 163 thousand tns of copper.

Several similar ore zones have been discovered at the ore field of the deposit.

7. A deposit of rare earth metals in the Lugiin river area is located in Dornogobi aimag, 60 km to the south-west of Khatan Bulag somon.

The ore reserves for the C_1+C_2 categories have been assessed as 369 thousand tns containing 11.0 thousand tns of rare earth elements' oxides (combinations). The average content of these elements is 3.2%. In the result of a detailed analysis of deep and other ore bodies it has been determined that the reserves of the ore are possible to be increased up to 500-600 thousand tns.

A technological study has proved that a relatively high concentrate of rare earth elements could be educed.

8. A deposit of rare earth metals at Mushgia Hudag is located 100 km to the north-east of Dalanzadgad city (Ömnögobi aimag) and 30 km to the south of Mandal Ovoo somon. According to the present calculations this deposit is the biggest among the other deposits found in the area.

In the result of the exploration-assessment works of the deposit it has been calculated that probable reserve of ore is around 30 million tns of the category $C+P_1$. The total average content of rare metals in the ore is 1,5% and the reserve makes up 200-250 thousand tns.

9. A wolfram-molybdenum deposit at Yughdzer is located in Erdenetsagaan somon (Sukhbaatar aimag), to the south-east of Baruun-Urt city and 285 km from Choibalsan city.

Lodes of this deposit have been used. A preliminary exploration conducted in the underground part of the deposit have assessed the ore reserve as 21.6 mi-

llion tns of the category C_1+C_2. The ore is base. The content of the three-oxide of wolfram is 0.197% and the reserve is 42.5 thousand tns. The molybdenum content is 0.056% and the reserve is 12.13 thousand tns. Besides the ore also contains beryl (4.1 thousand tns) and bismuth (5.14 thousand tns).

The ore dressing is ascertained to be quite difficult. In the deposit area there had been discovered several other ore deposits, which haven't been fully studied yet.

10. A salt deposit at Shuden Uul is located in Davst somon of Uvs aimag, 137 km from the city Ulaangom and 1180 km from Erdenet city. The transmission line connecting Ulaangom city with the energy and power network of the Soviet city Krasnoyarsk goes through the deposit area, as well as the Ulaangom-Kyzyl (USSR) autoroad. The Khar Tarvagatai and Nuurst Hotgor coal deposits are also located there.

The saline deposit area is considerably large. A detailed exploration of it's western part has been carried out and the reserves have been assessed up to the 50 meters depth. The reserves include 1624.4 thousand tns of the B category and 1905.1 thousand tns of the C category. Besides there is a big volume of non-commercial reserves there.

4．モンゴル人民共和国産業発展技術刷新事業方針案に反映された組織構築、協力方策の形　（和訳）

モンゴル人民共和国産業発展技術刷新事業方針案に反映された組織構築、協力方策の形

日　本

協力国、建設組織名	所　在　地	生　産　能　力	建設期間	資本投資額		第一期にされる建設組織方策（＋）
				総　額 100万トグリグ	そのうち自由貨幣 100万米ドル	
A	1	2	3	4	5	6
		Ⅱａ／科学技術部門基本方針				
		ａ／重点工場				
1．ゴビ研究センター	バヤンホンゴル		1991 - 1995	10	—	
		ｂ／中小工場				
1．飼料リジン調製工場	ズーンハラー		1992 - 1994	59.7	7.0	
2．Ｂ型肝炎ワクチン工場	ウラーンバータル		1991 - 1992	5.8	0.4	
3．パン酵母工場	〃		1991 - 1993	17.1	1.0	
		Ⅱｂ／基礎技術				
		ａ／重点工場				
1．超音波技術設備組立工場	ウラーンバータル	製品５～８種製造	1995	65.1	8.7	＋
	合　　計			157.7	17.1	

A	1	2	3	4	5	6
			Ⅱｃ／情報通信 ａ／重点工場			
1．アジアサット衛星通信受信局	100ソム	それぞれ電話2回線減衰伝送回線つき	1992 - 1993	76.8	8.0	+
2．四アイマクに音声技術によるＲＲ（無線受信）局建設／基礎設備	ウブス、サブハン、アルハンガイ、ホブスガル	975km	1992 - 1995	64.8	8.0	+
3．人工衛星「インテルサット」システムによる国際通信開設複合体	ウラーンバータル	國際電話120回線テレビ1回線、減衰伝送回線つき	1992 - 1993	53.7	7.0	+
			ｂ／技術刷新			
1．アナログ・システムＲＲ局を音声通信局に切替え						
－　第1期	ウブ・ブルガンー	9局	1992 - 1995	16.1	1.9	
－　第2期	ダシンチレン全方向	77局	1996 - 2000	111.0	13.1	
2．ラジオ・テレビ局設備刷新	ウランバータル		1991 - 1994	260.1	30.3	
3．ウランバータル市音声システム無線電話局建設	ウランバータル市市場間	330 ユーザ	1996 - 2000	9.3	1.0	

A	1	2	3	4	5	6
4．ウランバータル市移動無線電話局建設	ウランバータル	900 ユーザ	1993 - 1994	31.2	4.0	
		c／中小工場				
1．金線工場	ウランバータル	年産 5,000-1,000kg	1992 - 1994	21.3	3.0	
2．太陽電池工場	ウランバータル	年産 2,000システム	1991 - 1993	36.5	5.0	
3．情報コンピュータ技術工場	ウランバータル	テレビ 5.0～8.0万台 コンピュータ 1.0万台 ＡＴＳ 100台	1991 - 1995	42.6	6.0	
	合　計			722.4	87.3	
		Ⅱｄ／測定規則、標準化 ａ／重点工場				
1．電流標準（原器）作成	〃	計量器 950台試験	1997	1.08	0.167	
2．電気抵抗標準作成	〃	計量器 700台試験	1996	2.24	0.316	

A	1	2	3	4	5	6
3．圧力標準作成	〃	計量器 1,050台試験	1998	2.080	0.292	
4．液体体積使用標準作成	〃	計量器 600台試験		3.94	0.521	
5．シリコン技術実験センター	ウラーンバータル		1993 - 1996	3.0	0.4	
6．電気技術試験所	〃		1992 - 1995	2.2	0.3	
		b／技術刷新				
1．測定計器工場の重量製造作業場技術刷新	ウラーンバータル	製品 400万個製造	1992	1.2	0.2	+
	合　　計			15.7	2.2	
		Ⅳ　エネルギー a／重点工場				
1．バガノール発電所	ウラーンバータル／バガヌール	600MW	1991 - 1996	5,041.0	717.2	
2．ブレンゲ水力発電所	ブルガン	200MW	1991 - 1995	51.1	7.2	
	合　　計			5,092.1	717.2	

A	1	2	3	4	5	6
		V 石 炭				
		b／技術刷新				
1．アドゥーンチュルー露天炭鉱	ドルノド	—	1991 - 1993	107.1	8.4	+
2．バガノール炭鉱	ウラーンバータル	—	1992 - 1995	331.4	30.0	+
3．多数のノタグの炭鉱	—	—	1991 - 1995	212.5	16.7	+
4．主要炭鉱の建設トラスト		--	1991 - 1995	31.8	2.5	+
		c／中小工場				
1．活性炭工場（煤煙浄化）	ウラーンバータル	年産 2,000t	1992 - 1995	11.2	0.5	+
2．スズ工場	〃（ナライフ）	年産 300t	1991	18.4	1.2	+
3．トモルトルゴイ鉄鉱山	ダルハン	年産 100万t	1992 - 1995	198.7	13.9	+
	合 計			961.4	73.2	

A	1	2	3	4	5	6
			VI 地 質 b／技術刷新			
1．地質学研究センター	ウラーンバータル	—	1991 - 1995	23.4	3.3	+
	合　　計			23.4	3.3	
			VII 鉱 山 a／重点工場			
1．銅製錬工場	エルデネット	年間銅6万t溶練、純銅3万t、銅鈹3万t生産	1992 - 1995	2,772.55	390.5	+
2．トモルティーン・オボル亜鉛選鉱工場	スーフバータル	年間鉱石30万t処理、精鉱5.77万t生産	1990 - 1993	324.5	32.7	+
	合　　計			3,097.05	423.2	

A	1	2	3	4	5	6
		Ⅷ 農 業 c／中小工場				
1．バガ・オボル・トラクター工場	ダルハン	トラクタ 500～1,000 台	1991 - 1995	90.0	15.0	＋
	合 計			90.0	15.0	
		Ⅸ 羊毛、縫製 b／技術刷新				
1．子供服第一工場	ウラーンバータル	250 万着	1995	24.8	3.5	
2．子供服第二工場／韓国	ウラーンバータル	100 万着	1993	5.7	0.8	
3．メリヤス第二工場	ウラーンバータル	20 万着	1994	40.0	7.0	
4．「フラン」縫製工場	ウラーンバータル	10 万着	1995	12.7	1.8	
		c／中小工場				
1．剛毛紡績織布工場	ウラーンバータル	300 t、52.5万m	1993	52.8	6.2	
2．衣服用プラスチック金属部品工場	ウラーンバータル	315 万	1993	1.7	0.2	
3．長毛工場	バヤン・ホンゴル	1,730 t	1994	35.0	4.5	
4．婦人衛生用品工場	ウラーンバータル	6,000 万	1993	3.6	0.5	
	合 計			176.3	30.5	

A	1	2	3	4	5	6
			ＸＩ　金属加工			
			ａ／重点工場			
1．無色金属（鉄・鋼）工場	ダルハン	10万ｔ	1990 - 1993	600.0	65.9	＋
2．工具鋼工場	ダルハン	1万ｔ	1993 - 1994	50.0	6.0	＋
3．ジーゼル・エンジン工場	ダルハン	3万基	1992 - 1993	152.0	20.0	＋
4．電動機工場	ウラーンバータル	15万台	1993 - 1994	160.0	20.0	＋
5．家庭用電気器具工場	ウラーンバータル	16万台	1993 - 1994	50.0	8.5	
			ｂ／技術刷新			
1．AZUN機械エンジン工場	ウラーンバータル	150～200 基	1992 - 1994	55.0	6.0	
			ｃ／中小工場			
1．「モンゴル・メタル」協同組合						
－　ねじ、ボルト	ウラーンバータル	200　ｔ	1992	6.5	0.3	
－　釘	ウラーンバータル	2,500　ｔ	1991	8.0	0.4	
－　鉄線	ダルハン	6,700　ｔ	1993	11.3	0.7	
2．SUU 「セザズ」店	ウラーンバータル	420 万ﾄｹﾞﾙｸﾞ	1992	5.5	0.46	＋
	合　　計			1,098.3	128.3	

A	1	2	3	4	5	6
			XIII 木 材 b／技術刷新			
1．生活用紙工場増設	ウラーンバータル	3,000 t	1992 - 1994	11.7	1.5	
	合　　計			11.7	1.5	
			XV 製 紙 a／重点工場			
1．衛生紙工場	ウラーンバータル	1,000 t	1991	6.0	0.8	
	合　　計			6.0	0.8	
			XVI 道路運輸 c／中小工場			
1．ガクノール電極工場	ウラーンバータル	15 t	1991 - 1995	8.5	1.2	
2．乗用車及び小型トラック組立	ウラーンバータル	1,000 台	1997 - 2000	24.8	3.5	
	合　　計			33.3	4.7	

A	1	2	3	4	5	6
			XⅧ　文化芸術			
			b／技術刷新			
1．歴史文化記念物保存修理設備	ウラーンバータル オボルハンガイ	－	1991 - 2006	226.5	15.0	
2．民族の姿を描く「オルジェイ」映画館の技術刷新	ウラーンバータル	－	1991 - 1995	35.0	5.0	
			c／中小工場			
1．ラジオ組立工場	ウラーンバータル	30,000台	1991	14.2	2.0	
	合　　計			276.2	22.0	

5. Proposals for exploring the possibility of constructing mining and metallurgic enterprise in the eastern region of the MPR

Proposals for exploring the possibility of constructing mining and metallurgic enterprise in the eastern region of the MPR

1. Base of raw materials

Lead-zinc deposit of Ulaan is situated on the territory of Eastern aimak (province), 120 kms to north of city of Choibalsan.

Main industrial components of ore are zinc, lead, silver, and accompanying components are uranium, copper, cadmium, selenium, tellurium, fluorite, sulfid sulphur.

Besides polymetall resources and certain accompanying components there are 275 tonnes resources of selenium, 278 tonnes tellurium, 587,5 thousand tonnes fluorite in open cast mine.

Detailed research work till the level of+705 m has been commenced in the deposit of Ulaan. (p.3)

Polymetall deposit of Tsav is situated on the territory of Eastern aimak, on 115 kms to north-east of Choibalsan, on 2,5 kms to east of railway line Borei-Choibalsan and on 8 kms to south of the passing track Suujiin Undur on this railway line.

In the deposit of Tsav preparate exploration work by drilling bore-holes is underway and 180 metres deep shaft has been made, which is connected with horizontal excavation.

As a result of commenced work by January 1, 1989 (specification work commenced by September 15, 1989) lead, zinc, copper, silver, gold and conventional lead resource of category C_2 and P_1 was estimated. Preparative exploration work is planned to end in 1991, detailed exploration - in 1994 and estimation of resources in 1996.(p.3)

Results of proccessing test

Proccessing test of ore of the "Ulaan" deposit was made by 2 technological schemes: by selection scheme and by collective selection scheme of proccessing. After comparing the technological indices of the above-named schemes the collective-selection technological scheme was recommended for proccessing, which provides the possibility of producing following items:

- Lead concentrate with 60% lead, 220.5 gr/tn silver and 3.82 gr/tn gold;
- Zinc concentrate with 40% zinc and 0.2% cadmium;
- Pyrites concentrate with 38% pyrites.

Proccessing test of ore of Tsav deposit was not done till nowadays, but taking into consideration the similarity of substancials and mineralogical composition of the ore with ores of Ulaan deposit we can accept the scheme of proccessing of ore of Ulaan deposit for the proccessing of Tsav deposit ore.

Test for metallurgic proccessing of concentrate was not done.

II. Considerations for constructing mining and metallurgic factory

We propose to explore the possibility of constructing mining and metallurgic factory on the basis of polymetallic deposit of Tsav and Ulaan.

Composition of mining and metallurgic factory:

- Open cast mine in the deposit of Ulaan with mining capacity of 2000 thousand tonnes lead and zinc ore per year;
- Underground mine in the deposit of Tsav with mining capacity of 400 thousand tonnes lead-zinc ore per year;
- Proccessing factory with capacity of proccessing 2400 thousand tonnes lead-zinc ore per year, accompanied with subsidiary farm. The factory will be situated near Ulaan deposit Ore from Ulaan deposit will be transported by open cast mine transport, ore from Tsav deposit will be transported by train from the distance of 160 kms;

– Lead and zinc metallurgic factories for proccessing all zinc and lead concentrates from ore proccessing factory. The factory will be situated near the proccessing factory.

While defining the capacity of zinc factory one should take into account the proccessing of 60 thousand tonnes zinc concentrate per year from other factories (30 thousand tonnes zinc concentrate).

Items of metallurgic factories – pig zinc, purified lead, metallic cadmium, sulphuric acid are generally for export).

Further more, the question of constructing an enterprises for further proccessing of metalls and producing items, such as, lead accumulators and other goods of high demand in internal and external markets, can be elaborated.

Accounted geological resource of Ulaan deposit
(in open cast mine, depth level 705 m
by April 1, 1986)

Category of resource	Content of metalls						Resource of metalls				
	ore resource (th.tn)	Lead %	Zinc %	Silver gr/tn	Gold gr/tn	cadmium %	Lead th.tn	Zinc th.tn	Silver tn	Gold tn	cad.tn
B+C1+C2	394	1.1	1.2	0,9	0,106	0.01	434	757	2003	7322	3944

Accounted geological resource of deposit of Tsav
(by September 15, 1989)

C2+P1	70954	5.36	3.95	167.03	0.349		380.1	280.00	1185,15	2,475

6．銅製錬所建設の技術的経済的な根拠にかんする資料（和訳）

銅製錬所建設の技術的経済的な根拠にかんする資料

1．銅製錬所の生産能力は、電気銅年間100,000トン以上でなければならない。

2．生産物一覧

2．1　電気銅

2．2　二つの場合を予想した亜硫酸ガスの利用産物

－　硫酸

－　元素硫黄

2．3　金

2．4　銀

3．銅精鉱の化学的成分の詳細は付録1参照。

4．溶剤の評価（二つの場合を検討）

4．1　ケース1.「モイツォグ・エルス」産のガラス用硅砂

含有率：酸化珪素　－　83　%

酸化アルミニウム　－　7.8%

酸化第二鉄　－　2.2%

K_2O+Na_2O　－　4.0%

4．2　ケース2. ブムイト産の金鉱石

含有率：酸化珪素　－　90.0%

金　－　10 g/t

酸化カルシウム含有の石灰岩　－　53.34%

5．燃料の詳細

主要な工業用燃料として石炭を採用する。

石炭の評価：　灰　分　－　21.0%

水　分　－　0.6%

揮発物分　－　27.6%

硫　黄　－　0.6%

リ　ン　－　0.053%

発熱量　－　5,000～6,000kcal/kg

6．電　力

周波数　－　50Hz

電力供給は、ウランバートルーダルハンーエルデネットーエルデネット火力発電所間の高圧線(220kw) によっておこなわれる。

7．工業用水

水　質　：　ｐＨ　－ 7.2

カルシウムとマグネシウムにかんする硬度

ＭＧｅ物質量／リットル　－ 3.78

平均水温　－ 8～10℃

8．輸送条件

8．1　精鉱の輸送は３kmの距離をコンベアー輸送あるいはスラリーパイプ流送による。

8．2　石炭の輸送は鉄道輸送による。

9．製錬所建設地：　エルデネット市、「エルデネット」企業の生産用地内

10．生産物の販売

10．1　電気銅10,000ｔは、国内の銅線材およびコイルの生産のために使用される。

10．2　残りの電気銅は輸出される。

10．3　リン酸およびリン肥料の生産のために硫酸の利用が検討されている。

10．4　元素硫黄を生産する場合には、主要な硫黄塊は輸出される。

11．製錬所職員の教育と研修は、技術と設備が買い付けられる国々でおこなうことが見込まれる。

粗鉱品位は、切羽が深くなるにつれて、次のような基本的理由によって低下していく。

－　銅硫化鉱物の鉱化作用の低下に伴って、岩石硬度が高くなる。

－　黄銅鉱の含有比率の低下による銅含有量の低下、硫化鉄鉱で富化された区域の出現。

これらの変化は、黄銅鉱をベースにした現在の浮選法では、精鉱品位の低下をもたらす。

－　石膏、硬石膏、粘土質鉱物のような、Ｍｏ浮選を阻害する鉱物の出現、これは高品質のモリブデン精鉱を得ることを困難にする。

銅の生産は第一に、世界市場における銅の需要によって、第二にコンビナートの製錬所の始動時期によって規定される。

切羽の深化によって鉱石における黄鉄鉱の割合が増大するとともに、銅精鉱の質は、2010年代には20～22％にまで低下する（表２）。

銅精鉱の品位を維持することはできないが、原鉱の性状に対応して銅精鉱の品位を最高レベルを維持する手段はある。

- 優先浮選用選鉱剤の使用。
- 効率の高い浮選機の適用。
- フローシートの改善。

選鉱工場では、バルク浮選の回路に、精選系統を導入したフローシートを適用する。最後の清掃浮選の尾鉱は最終廃棄産物である。

Ｃｕ－Ｍｏ－ＦｅＳ$_2$ バルク精鉱の精選は次のようにしておこなわれる。バルク精鉱を予め濃縮する。その後濃縮したバルク精鉱に石灰を添加し、85～90℃の温度で蒸気処理し、蒸気処理したバルク精鉱を水で洗浄する。その後、最初にモリブデン鉱をその他の硫化物から浮選する。それからモリブデン浮選の尾鉱は石灰を添加し硫化鉄鉱を抑制して銅鉱をプロスとして採取する。

将来、製錬所が稼働する時期には、選鉱工場の機械や技術は、選鉱原鉱の鉱物学的組成組織などの変化とともに変化するだろう。

現在、選鉱工場における銅の実収率は81.7％で、次の浮遊選鉱試薬を使用している（石灰、硫化ソーダ、ブチル・ザンセート、アエロフロート、Ｔ－80油、灯油、および水ガラス）。

選鉱工場の技術的な緊急課題は、次のとおりである。

- 選鉱工場の再建
- 生産性の高いアナライザーを適用した、質の高い地質・技術的地図の作成
- 改良された、効率の高い浮遊選鉱試薬の探求

1992年から2000年にかけての合弁企業「エルデネット」における銅精鉱中の銅の生産量は、次の表で示される。

（単位：ton）

	年							
	1992	1993	1994	1995	1996	1997	1999	2000
銅精鉱中の銅量	124,000	124,000	124,000	124,000	123,000	122,000	121,000	120,000

1979年から1991年にかけて、生産された銅精鉱のほぼ80～95％が貿易協定によってソ連に輸出された。その他、わが国の銅精鉱の主要な輸出国は、日本、中国、フィンランド、チェコスロバキア、ドイツである。

銅精鉱と銅加工産業の生産物の新しい販売市場には、韓国、台湾、フィリピン、インドネシア、イランなどが挙げられる。

ソ連と中国の領土内における銅精鉱の通過輸送には大きな費用が必要で、輸送の際に大きな損失が生まれる。このことから、銅精鉱の製錬及び加工が必要となる。

1992年から、他の国々の市場で電気銅を販売することを目的に、ソ連の銅製錬所にたいして、ベースとなるソ連の銅精鉱に加えて当国から銅精鉱の供給がおこなわれる予定である。1992年には、外国市場で40,000トン以上の電気銅を販売する計画である。

1992年から1993年にかけては、10,000トンの銅製品の生産能力をもつ、電気銅から電気工業用のワイヤーを製造する生産ラインの設立が予定されている。

生産される銅精鉱の予想される化学的成分
1992年～2005年

年	成分含有量 %										
	Cu	Mo	Fe	Pb	Zn	Bi	Co	Sb	As	S[1]	CaO
1992	29	0.08-0.15	21-26	0.02-0.05	0.2-0.3	0.005-0.006	0.01-0.03	0.05-0.08	0.2-0.4	32-35	0.4-0.9
1995	27	0.10	23	0.05	0.28	0.005	0.01	0.05	0.28	34	0.5
2000	25	0.10	25	0.05	0.28	0.005	0.01	0.05	0.27	33	0.6
2005	22	0.10	26	0.05	0.27	0.005	0.01	0.05	0.19	32	0.7

年	成分含有量 %									
	MgO	Al_2O_3	SiO_2	Au	Ag	Re	Se	Te	Ni	Hg
1992	0.3-1.0	3.0-3.5	5-8	0.2-0.3	60-85	1.5	60-75	5-8	10-100	1未満
1995	0.5	3.0	8.5	0.25	65	1.3	60	7	35	〃
2000	0.5	3.0	10.5	0.27	65	1.2	59	7	35	〃
2005	0.5	3.0	12.0	0.26	63	1.2	56	8	35	〃

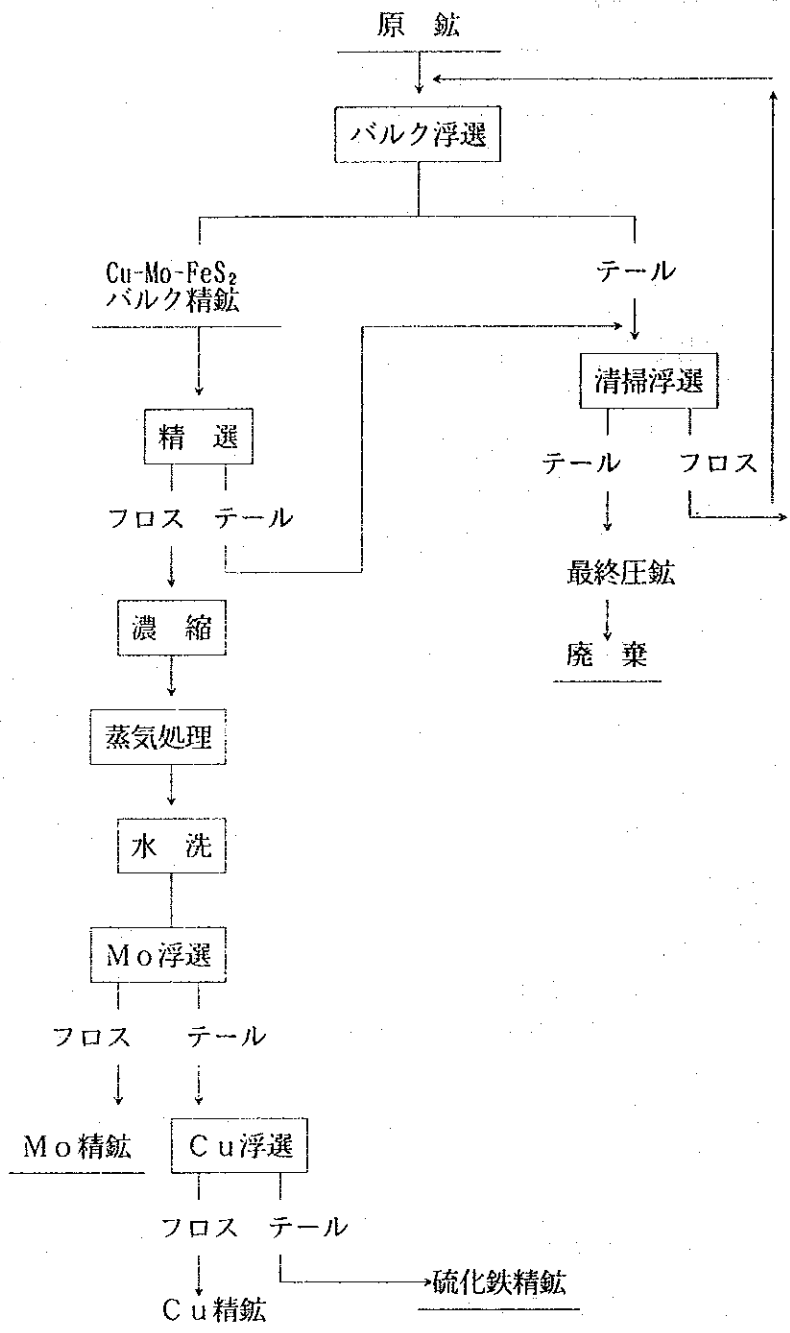
注 1) 水分の含有量は10%未満。
2) 1992年における銅精鉱の予想される成分含有量は、1990年から1991年にかけての工場の活動資料にもとづいており、それ以降は、処理鉱石の鉱物学的成分にもとづいている。

表2　採鉱・選鉱コンビナート「エルデネット」が年間2,150万トンおよび2,500万トンの鉱石を処理する際の概算的な技術的指標

年	1992	1995	2000	2005	2010
鉱石処理量（100万トン）	19.6	21.8～18.5	25.0～21.5	25.0～21.5	25.0～21.5
原鉱品位（Cu%）	0.8	0.7～0.76	0.59～0.62	0.544～0.57	0.502～0.52
精鉱品位（Cu%）	30.0	27.0～29.0	24.0～25.0	22.5～23.5	21.2～21.8
銅精鉱量（トン）	408,385	443,528～382,168	496,771～432,827	489,239～426,057	483,648～420,532

〔参　考〕

日本側で想定したモンゴル側提案の選鉱フローシート



7. Regulations of NDM of MPR (1 March 1991)

REGULATIONS OF NDM OF MPR

(1 March 1991)

One. General Principle

1. NDM of MPR is a state administrative control organisation that works out national policy on state social and economic development strategy, on guidelines, and on science and technology progress.

2. The task of NDM is to establish relevant structure, equitable relations for satisfying the social and economic development pace of the country; to work out and implement the national short term and strategic development policy on the basis of national scientific and technological policy.

3. In its activity the NDM will follow the MPR constitution, government law and other laws and decrees and these regulations and guidelines.

4. The NDM is headed by the Minister nominated by the Small Khural [parliament] and he will be fully responsible before the government of MPR for the implementation of the task and functions.

5. Ther will be a Minister's council with the responsibilities to discuss the issues related to the ministry's task and implementation of its functions. The council is headed by the Minister. The staff and the regulations of the council will be approved by the Minister's order.

6. The ND Minister will issue an order on the issues within his rights in line with the laws of MPR and will provide its implementation. The relevant organisations and people are obliged to fulfil ND Minister's order.

7. The Government of MPR will approve monthly salary fund of NDM and nominate the first deputy minister and deputy ministers. The Ministry will use the seal, stamp and official printing paper made by fixed rules.

Two. Responsibilities and Rights of NDM

8. NDM is responsible for the following (functions):

(a) work out short and strategic policy on the basis of studying and concluding the social and economic development of the country; work out a development model adjusted to the ecological peculiarity; to determine the key industrial, social and economic questions;

(b) work out guideline measures for implementation of government policy on social and economic development;

(c) work out social and economic annual development directions, state targets and task;

(d) to work out unified balance on national income, manpower, labour resources, finance, payment and essential materials and raw materials and monitor it;

(e) coordinate economic development balanced relationship, state of balance and structure, sectoral development policy and task;

(f) develop the science and technology priority trends, critical sectors and industries consistent to the country's development requirements, to pursue investment and sectoral constructive policy by ways of properly distributing the capital for creating the capacity which can give its effect in short space of time;

(g) to promote equiitable integrated regional social and economic development taking account of the proper allocation of labour forces;

(h) to determine the government policy on demography and society on the basis of defining the material and spiritual needs of the population, and their living standards and the level of daily life and cultural environment; work out the policies for resolving the acute issues consequently;

(i) work out policy on economic stability of the country, financial and essential materials and raw material stock (reserves);

(j) work out development policy and strategy on science and national technology that is consistent with social and economic policy; to organise the implementation measures;

(k) to work out integrated programme, projects and national targets on key scientific and technological issues; to pursue the policy of choosing them in a competitive way, financing and investing;

(l) evaluation of new techniques and technology; organise and monitor quality guarantee work for output, to pursue the unified policy of standardisation and metrology;

(m) to work out and introduce economically proper (relevant) mechanism for introducing science and technological achievements into the industry, to enhance technical level and output quality;

(n) work out the unified policy on social informatics and electronization (information technology), coordinate and implement the work to provide with state information sectoral structure, national informatics fund and network;

(o) to pursue the policy of choosing the technological standardisation and technical and programming tools;

(p) work out policy on acquiring and monitoring industrial progressive technology;

(q) choose innovations, trade marks, output samples; protection of rights, purchasing and selling patent license, know-how, abroad and domestically;

(r) cooperate with UN and international specialised organisations, work out and implement projects and programmes; this task should be considered and consistent (adjusted) to the country's development policy;

(s) to work out the issue and effective use of foreign loans and aid for development of priority sectors and industries together with relevant organisations (ministries); monitor the implementation.

9. NDM has the following rights:

(a) give allowance of financing scientific and technologic integrated programme, projects, national targets;

(b) approve economic standard and limits in working out the social and economic development strategy, perspective and national targets;

(c) to obtain, from relevant organisations, information, material and estimates that are required within its rights;

(d) to involve organisations of people on the basis of preliminary agreement in defining the short term and perspective directions of the country's development;

(e) to initiate economic motivation of public and cooperative organisations and individuals who are introducing high technic, technology that is significant for social and economic development of the country;

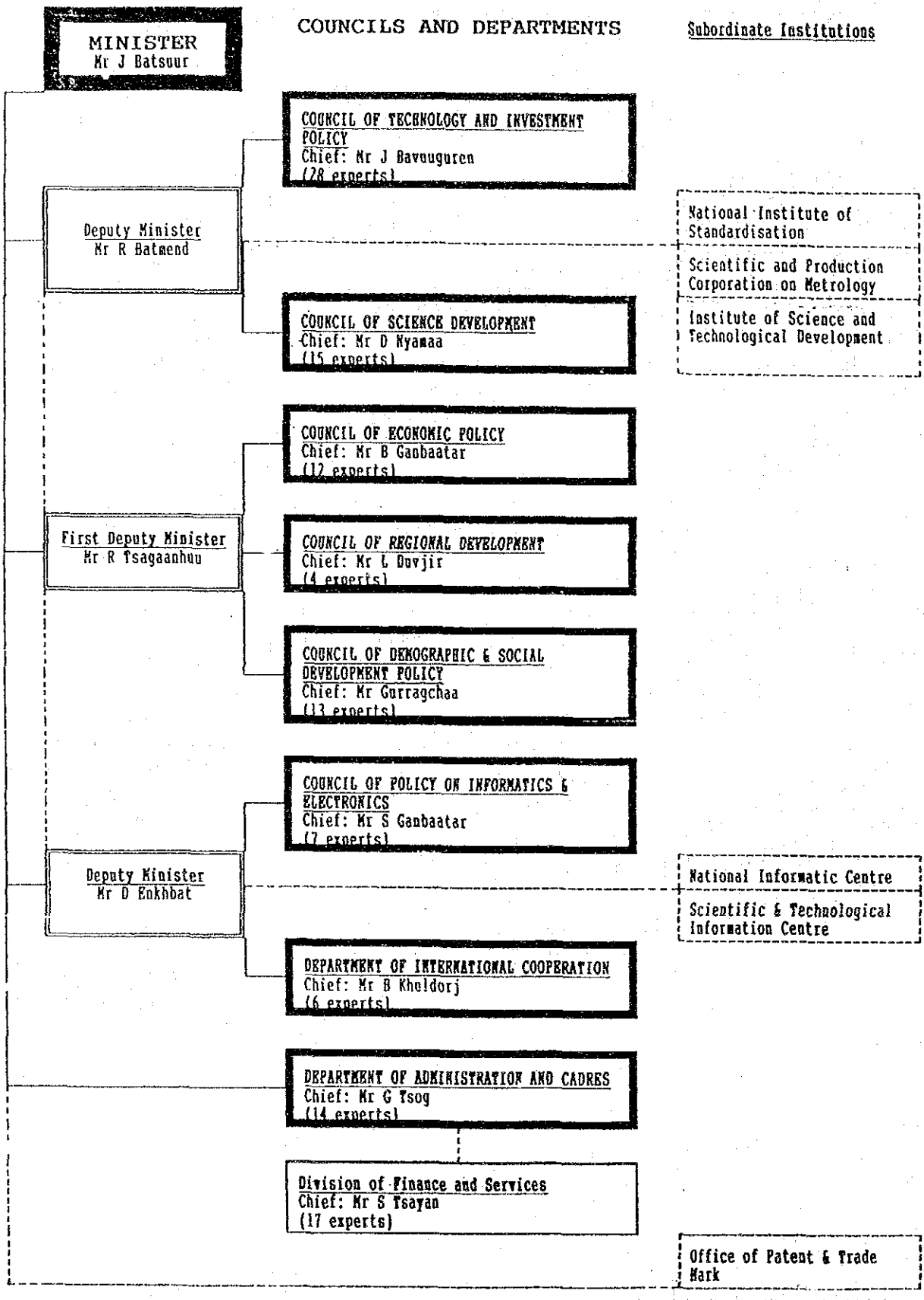
(f) give quality guarantee to the output and service approval of state standard; to certify state laboratories; monitor and certify innovations, discoveries, trade marks, output samples; make relevant organisations patent domestic innovations;

(g) within its activity frames have relations and cooperate with other countries and international organisations in line with proper regulations;

(h) approve the ministerial staff organisational structure, structural unit, and member organisations;

(i) have all other rights given by the MPR legislations.

ORGANISATION OF THE MINISTRY OF NATIONAL DEVELOPMENT



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