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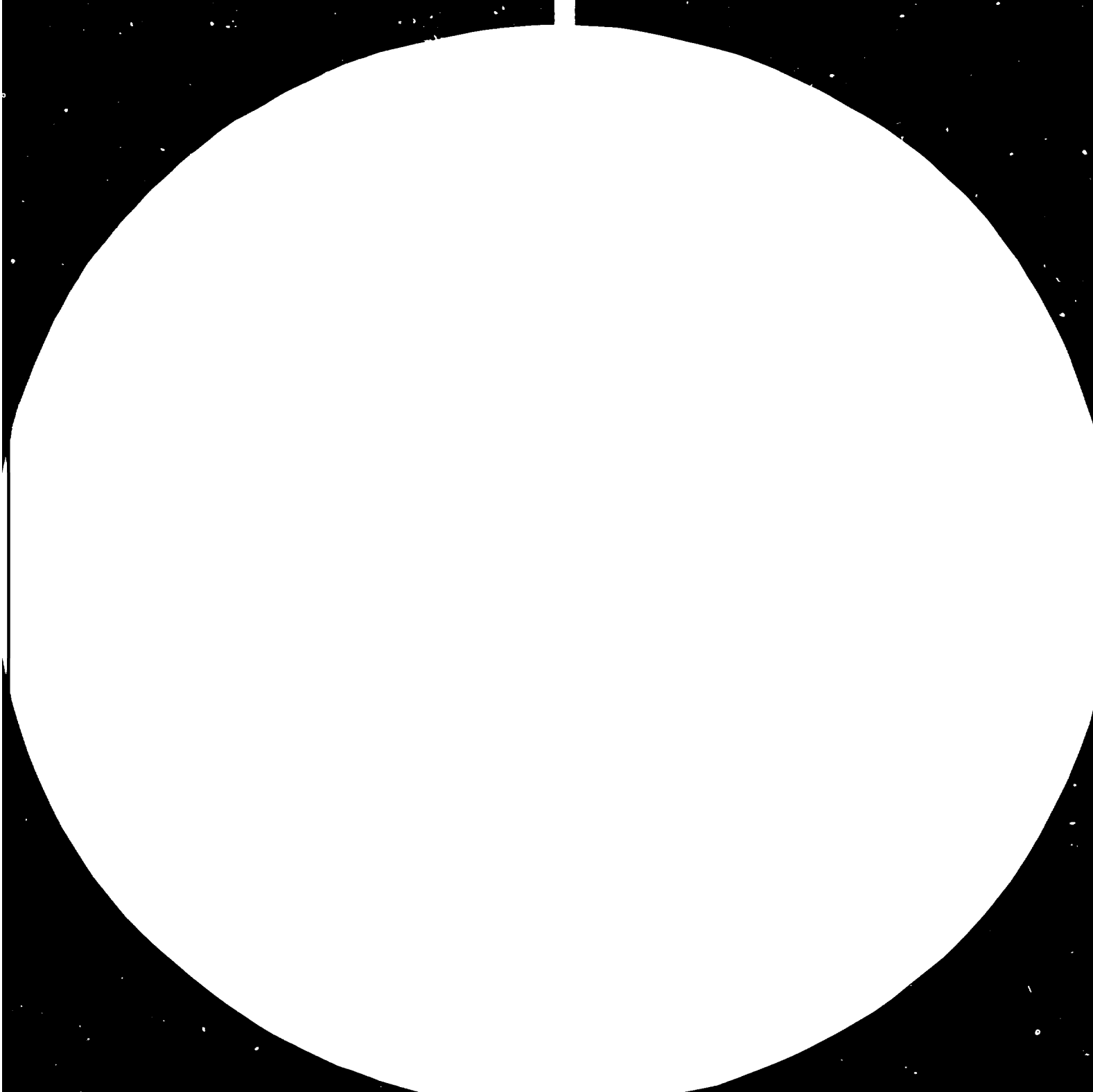
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THE NORMATIVE SCENARIO

Effects and conditions of realization \*

\* This document has been translated from an unedited original.

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1. The Small Expert Group has considered with particular attention the "normative" scenario contained in the document "Proposals for the scenarios" (UNIDO/IS.213/Add.1, 11 March 1981).

It will be recalled that this scenario has been developed as follows. From global scenarios socio-political hypotheses have been derived that are conducive to the growth of the iron and steel industry in the developing countries: political movement towards North-South collegial management, a new balance in North-South relations, and a converging evolution of the iron and steel industries of the South. These "socio-political" hypotheses represented the "dimensions" of the "normative" scenario, with which six hypotheses specific to the steel industry were associated.

H<sub>1</sub>. There is an increase in the demand for iron and steel products in the developing countries, but this demand follows the strong trend in the industrialized countries towards improved quality standards. In the context of the industrialization of the developing countries, closer links with the projects of "downstream" industries are reflected in a demand for increasing quantities of high-grade steel, some of which must be imported.

H<sub>2</sub>. This hypothesis regarding new steel markets which may open up as a result of the requirements of the infrastructure needed for new energy sources has been explored in greater depth since the first version of the "Proposals for the scenarios" issued in March 1981. The "Study of markets for the iron and steel sector created by the development and diversification of energy production" (ID/WG.356/1) suggests that the impact of the new energy sources on steel markets will remain slight (at least during the period under consideration), this being particularly true as regards the steel production of the developing countries. This hypothesis will thus be dropped in the final version of the scenarios.

H<sub>3</sub>. The interplay of relative prices generally produces a double-squeeze effect which works to the detriment of the steel sector, causing negative economic transfers. It will be corrected in this hypothesis.

The negative transfers are brought about from upstream through the price of energy and capital goods. In the case of certain mineral-rich countries, the transfers are positive because of the relative prices of ore and steel products. Downstream, the transfers work to the profit of the metalworking and engineering industries, including the capital goods industry.

It will require a series of internal and international corrections to bring relative prices into alignment. These corrections concern the relationship between the prices of steel products in developing countries and the prices of metal products. The latter are usually depressed. Quite frequently, and not only in the developing world, domestic prices of steel products are higher than the prices on export markets. In this case, measures must be taken to ensure that national downstream industries are not overly penalized by the balancing process.

In the face of this general phenomenon of the double squeeze in relative prices, different developing countries are differently positioned with regard to the possible lines of action open to them.

In the case of countries with petroleum and mineral resources, energy and ore prices are constraints which are at least partially controlled, permitting, in principle, the setting of internal prices decoupled from, or independent of, international prices. The situation is not the same for developing countries not similarly endowed. In addition, a very small group of developing countries has a capital goods industry with the capability of supplying steelmaking equipment. For steel industry newcomers the price of equipment is an external constraint. The pressure brought to bear by downstream industries depends on the corporative power of the engineering industries, a factor which is not insignificant in the most advanced of the developing countries, but is virtually non-existent in the least developed, where this sector is extremely rudimentary if it exists at all.

The problem of relative prices and unfavourable terms of trade are not factors which must necessarily have an inhibiting effect on growth. It has been seen in certain countries (France, Austria,

the United States of America) and at certain periods that those branches of the economy with a rapidly increasing productivity are generally those for which the terms of trade were unfavourable. Increased productivity appears to be the response to adverse economic conditions and to be encouraged by such conditions. Japanese steelmaking is a case in point. However, this does not apply to countries which lack the capacity to make this kind of response or which, because of structural weaknesses, cannot withstand overly adverse conditions to begin with.

H<sub>4</sub>. The normative scenario also implies a reversal of the generally deteriorating trend in financing conditions for the developing countries. The paper "Iron and steel projects versus indebtedness, savings, exports and credit-worthiness" (ID/WG.356/4) indicates a considerable range of variation in the behaviour of developing countries with respect to indebtedness and in their ability to obtain credits. For example, the countries which have steel investment projects of less than 250,000 tonnes (mini-steelworks) are also those where financing appears to involve the largest element of risk in terms of classical investment criteria.

The situation is more favourable for groups of countries having projects of between 250,000 and 800,000 tonnes and above, but there are marked differences from country to country within these groups. The financial data suggest that there is a potential trend towards diverging steel industry growth in the developing countries. If the aim is rather to move towards a convergence, or at least to prevent the differences that already exist from widening, this trend must be turned around. This requires both the establishment of the appropriate financial mechanisms and a greater attractiveness of steel projects in the form of the hope, if not the guarantee, of a reasonable return. Here the financing hypothesis is linked to some extent to the one that follows.

H<sub>5</sub>. Thanks to a voluntarist policy, developing countries may have the capacity for assimilating the steel plant techniques and organizational methods required for their projects.



The studies which have been prepared in the mean time have not only fully confirmed the importance of this basic hypothesis, but have in addition developed its essential points in greater detail. <sup>1/</sup>

For example, it appears that, apart from a few outstanding successes (which are exceptional), the commencement of production at a satisfactory rate generally founders, among other problems having to do with links to the surrounding infrastructure and supply difficulties, on the inadequacy of training vis-à-vis the complexity of the installations to be managed. Analysis shows that problems in ensuring an efficient operational mesh between the various sections of the plant - from the delivery of the pig to the steel, from the steel to the continuous-casting operations, etc. - represent the major obstacle to good steelmill operation. As far as possible, therefore, these weak links should be eliminated.

This last observation is to be seen in the light of the fact that more than 70 per cent of the new planned capacity concerns production units of more than one million tonnes' capacity. Experience shows the difficulty of mastering mills of this size, whereas economies of scale appear to become fully effective only at around 5 million tonnes. These projects compound, as it were, the disadvantages of inadequate size as far as economies of scale are concerned with the difficulty of achieving effective management.

One of the conditions for a normative scenario is therefore to re-think and simplify the organization of steel enterprises. The order of things must be reversed. A technical logic, intrinsic and apparently implacable, has thus far governed the design of steelmills, a logic in which the human agent had little or no place. The task of training was accordingly to prepare people for the jobs to be done. Training has been largely unable to perform this function completely; the objective has generally been found to be impossible to achieve. The issue seems to be less the pedagogical aspects of training (although here too serious problems persist) than the objective itself.

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<sup>1/</sup> The reader is referred to the complementary paper to Dossiers V and VI, "Difficulties of achieving full production in iron and steel plants in the developing countries" (working document).

What is needed now would seem to be to adapt the design of enterprises to the human resources, taking advantage of the degrees of freedom that technological advances allow. This does not appear to be impossible, and we shall return to this subject later on.

H<sub>6</sub>. The revision of the projects identified (see Dossier I in "The dossiers", UNIDO/IS.213, Rev.2, 15 December 1981) calls for no change in the previous formulation of the hypothesis that some developing countries will enter the iron and steel industry or will increase their production capacities by using the direct reduction process and by reducing the size of plants.

It will be recalled that 40 projects, representing some 40 per cent of the capacity of the 125 projects analysed, involve the use of direct reduction and that 90 per cent of these projects are located in countries with petroleum or gas resources.

The mini-steelworks projects are numerous (43 projects surveyed), but their weight in the new planned capacities is small (4 million tonnes out of 116 million).

The management of these mini-steel mills appears to be simpler not merely because of their smaller size, but also because of the production routes selected. For example, the management of the route using an electric furnace fed with scrap or products with continuous casting is less critical than, in a modern mill, the route "blast-furnace, oxygen converter, continuous casting", where perfect operational synchronization is required while the metal is in the liquid stage, and especially at the "oxygen converter - continuous casting" interface.

Moreover, the direct reduction process requires less investment, which relieves the pressure of the financial constraint.

An additional point to remember is that a combination of these hypotheses and a combination of them and of the environmental macro-economic and socio-political hypotheses will establish a configuration of the scenarios. These combinations will influence the resultants.

The resultants are thus the final expression of the scenarios. Two have been adopted:

$R_1$  = An increase in investment projects in developing countries;

$R_2$  = Progress in the diversification of iron and steel production in the developing countries. This variant of  $R_1$  involves only those developing countries that already have an advanced iron and steel industry base.

2. The positions adopted by the Small Working Group make it necessary to specify the precise content of the "normative" scenario. The normative scenario is that in which the resultant  $R_1$  tends towards the implementation of the projects announced by the developing countries - that is, the installation of a new capacity of 116 million tonnes.

Furthermore, the attempt to quantify the scenarios placed the emphasis on the use of installed capacities as the fundamental variable.<sup>2/</sup> The aim is not to install production capacities ... but to produce steels of given qualities.

Let us take the example of an integrated factory with an annual output of 1 million tonnes of flat products. The cost of the investment would be something like 2 billion dollars. If production making full use of the installed capacity is achieved five years after the decision to build, then on the basis of an average sale price of 400 dollars per tonne for the products manufactured, production by the fifteenth year will be 10 million tonnes, which represents a market value of 4 billion dollars. If, as often happens in the iron and steel industries of the developing countries, entry into full production entailing full use of the installed capacity takes 10 years, production during that period will only be 5 million tonnes and the market value will be 2 billion dollars.

The difference to be made up between these two cases represents the value of the investment.

This illustrates what is at stake in achieving a correct entry into full production. The entry into full production is subordinate to project design, training and industrial know-how, activities which are closely dependent on the quality of the co-operation between the parties.

A normative scenario should therefore aim to achieve not one but three objectives. The first (resultant  $R_1$ ) would be to implement projects of the order of 116 million tonnes of new capacity and to diversify production (resultant  $R_2$ ).

<sup>2/</sup> See in particular para. 107 of "Proposals for the scenarios", UNIDO/IS.213/Add.1, 11 March 1981.

The second objective would be to construct plants which operate using installed capacity in the most efficient way, which are profitable and which do not merely swallow up money (resultant  $R_3$ ).

In other words, the normative scenario should not only take into account the extensive aspect of the growth of the iron and steel industry in the developing countries but its intensive aspects also.

The third objective would be to ensure that there is a certain degree of convergence in the growth of the iron and steel industry in the developing countries, which implies the implementation of the projects in the 25 countries which have recently acquired an iron and steel industry and also to avoid divergent development and the accentuation of differences between developing countries.

3. The definitive content of the scenarios will be determined on the basis of the discussions of the Working Group Meeting at Estoril, Portugal, from 3 to 5 February 1982, after the Meeting.

The work undertaken since the original formulation of the scenarios (document UNCTAD/IS.213/Add.1, 11 March 1981) indicates the need for the following corrections and additions:

(a) The present trend in the iron and steel industry and the deepening recession in certain developing countries, and particularly in Latin America, suggest that the trend scenario envisaged is drifting towards the crisis scenario (see the note "Crisis and trends in the restructuring of the iron and steel industry: Implications for the scenarios", UNCTAD, ID/WG.363/3). The gap between the trend and the normative has widened. Consequently, the negative trend should be reversed in this case and activities between now and the end of the decade should be stepped up accordingly.

(b) The planners and especially those in UNCTAD <sup>3/</sup> anticipate a decline in the world economy and consider that the rectification of the growth rate in the developing countries is an essential prerequisite if major catastrophes are to be avoided (see above note "Crisis and trends in the restructuring of the iron and steel industry"). The normative growth rate of the demand for steel envisaged in the 1990 scenarios (9 per cent), seems consistent with the general growth rate of the economy

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<sup>3/</sup> UNCTAD, Trade and Development Report, 1981.

in the developing countries envisaged by UNCTAD (6 per cent). There is therefore no reason at present to revise this figure other than to make allowances for regional variations.

(c) Massive efforts have been made in all the industrialized countries to achieve energy savings in the heavy consumer sectors such as the iron and steel industry. <sup>4/</sup> The drop in the volume of steel used in the manufacture of cars, for example, is a strong trend. Since the first oil shock of 1973, steel consumption in France, for instance, has dropped by 3 per cent per year and it is anticipated that this rate will remain at 2.5 per cent per year for at least a decade. As explained in the "dossiers" <sup>5/</sup> this drop in quantity is accompanied by an improvement in quality. Over-all the production capacity of the developed market economy countries - and probably the European socialist countries too - will scarcely change, but the quality will certainly change.

It would be unrealistic to think that the developing countries will remain on the fringe of world development. The iron and steel economy of the third world is not an isolated oasis; it has upstream links with the manufacturers of equipment and downstream links with the metalworking industries producing consumer durables and capital goods. The new industrial patterns will therefore also apply to the iron and steel industry in the developing countries. The first version of the scenarios probably underestimated the importance of this trend. It has an effect particularly on the technology of flat products (sheet metal in particular). It poses the dilemma, according to current technological logic, of "staying in the race", which is the option chosen by some developing countries (Brazil, for example), or of seeing the distance from the advanced industrialized countries grow larger. Or the attempt to define new technological standards for the iron and steel industry should, if possible, combine technological developments with the development of the available human resources. The impact of the variables - training of human resources and design and implementation of projects for the commissioning of new plants - should thus be stressed in the normative scenario.

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<sup>4/</sup> See the documentation of the Economic Commission for Europe's Seminar on the Energy Situation in the Iron and Steel Industry, Vienna, Austria, 7-11 September 1981.

<sup>5/</sup> See Dossier IV, "Technology and research", section C, "Towards the mass production of high-grade steels".

(d) The supply of iron ore has given rise to concern about the future owing to the fact that the exploitation of new mines has slowed down or ceased altogether. An analysis of this question is summarized in the document entitled "Problems and prospects in regard to supplies of iron ore", an informal supplementary note to Dossier II, "Raw materials and energy".

It follows from the above that, whereas some risk of shortages cannot be ruled out, there are also mechanisms for adapting supply; it also follows that, despite the delayed response between demand and supply, there is no prospect of genuinely serious situations arising. Consequently, it is not presently envisaged to add the possibility of a shortfall in the supply of iron ore to the hypotheses constituting the scenarios. But the fact that the adjustment of supply and demand for ore in the case of the normative scenario would require investments in the mining sector which would have to be added to the financing requirements of the iron and steel sector should not be lost sight of.

4. The balance sheet of the normative scenario would be as follows:

(a) Production

The world capacity of the iron and steel industry is now probably of the order of 900 million tonnes.

The installed capacity in the developing countries is of the order of 70 million tonnes, to which should probably be added 50 million tonnes in China; that represents approximately 7.7 per cent of world capacity excluding China and 13.3 per cent including China. According to the projects analysed, it should almost treble during the decade.

In 1990, if one takes the hypothesis that the restructuring of the iron and steel industry in the industrial countries will not be reflected in significant increases in global capacity, the normative scenario would mean that installed production capacity in developing countries would represent 13 per cent of world capacity, which would then be approximately 1 billion tonnes, and more than 20 per cent taking into account the projects in China and the Democratic People's Republic of Korea.

With a production capacity of 180 million tonnes, the developing countries - not including China - would have a potential in the iron and steel industry slightly greater than that of Japan and the

United States and less than that of EEC and the USSR. If China were included, the potential of the developing countries would exceed that of EEC and the USSR.

(b) The demand/ production balance

The revisions made to "Dossier I" of the projects since the drafting of the "Proposals for the scenarios" are minimal from the point of view of the production capacities envisaged (less than 2 million tonnes difference). As, on the other hand, the logic of a normative scenario leads us to maintain the previous hypotheses of high demand growth rates, the resultant demand/supply balance is not altered (see table 10, page 59, of the "Proposals for the scenarios").

The figures, slightly corrected, are as follows:

	(million tonnes)					
	Demand	1990 production capacity	Produc-	Produc-	Demand/supply balance	
			tion level 70%	tion level 85%	P.L. 70%	P.L. 85%
6.5% growth rate hypothesis	163.6	182	127.4	154.7	-36.2	-8.91
9% growth rate hypothesis	210.9	182	127.4	154.7	-83.5	-56.2

It will be recalled that the 9 per cent demand growth rate for iron and steel is consistent with the growth rate of the economy considered in the UNCTAD normative scenario. Therefore, adopting this hypothesis, that would mean that, on the basis of their demand, the developing countries would require net imports to meet slightly less than 40 per cent of their needs if their installations operated at a production level of 70 per cent, and slightly over 25 per cent with a production level of 85 per cent.

With a 70 per cent production level, that would mean doubling the present volume of imports, which are of the order of 40 million tonnes. With the same production level but with only a 6 per cent demand growth rate, the present volume of imports would be maintained.

(c) The balance sheet for the labour force employed  
in the developed and developing countries

Input-output tables may serve as a point of departure for calculating the labour equivalences in trade in physical goods. The

first methodology for such calculations was prepared in the USSR <sup>6/</sup> and later developed in France. Thus it was possible in the case of the three basic scenarios considered, the "crisis", "trend" and "normative" scenarios, to calculate first the quantities of labour contained in the capital goods required to set up a production capacity of 116 million tonnes and also the quantities of labour necessary for iron and steel production. The hypothesis taken was that some developing countries could produce some of their capital goods: Brazil, India and the Republic of Korea up to 70 per cent, Mexico 40 per cent, Argentina, Venezuela and Chile 30 per cent, the other Latin American countries 20 per cent and the other Asian and African countries 10 per cent of the necessary capital goods and studies. These hypotheses are on the optimistic side. Nevertheless, the gross gain in employment in the industrial countries would, in the normative scenario, amount to 2,740,000 man/years during the period under consideration, which would correspond approximately to the creation of 300,000 permanent jobs, if the investments were staggered over 10 years.

If one calculates the corresponding gross loss of employment in the industrial countries that can be attributed to iron and steel production by the new installations in the developing countries, one arrives in the normative scenario at an estimate of 592,000 man/years.

This calculation means that investment in the iron and steel industry in the developing countries would be a net creator of jobs, gains and losses being in the relationship 4 to 1.

Several remarks are needed on this point. There is a lack of clarity about the idea of employment "losses". Employment losses would arise if, for example, the entire additional iron and steel production of the developing countries were to be exported to the industrial countries and substituted for local production. This is obviously out of the question, if only because of the developing countries' over-all deficit in 1990.

The employment losses take the form of reduced expansion rather than a genuine loss, and correspond to the labour input that would be needed in the iron and steel industries of the industrial countries if they

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<sup>6/</sup> M. Lidelman, "First intersectoral balance of labour expenditure in the national economy of the USSR", Viestnik Statistiki, 1962, No. 10



were to export to the developing countries the same amount of iron and steel products as the developing countries intend to manufacture themselves.

There would also be a loss of employment if the additional iron and steel production of the developing countries replaced imports. This question will be taken up again later in more detail, but at this stage it may be noted that the normative scenario does not call for the replacement of imports but rather for the maintenance or even increase of the level of imports.

Moreover, there would be a time-lag between the creation of new jobs in the investment goods sector of the industrial countries and the notional employment losses due to reduced expansion of exports of iron and steel products. The creation of employment would occur during the ten-year period, especially in 1982-1987, whereas the related iron and steel production would arise at the end of the period.

There is an ever-increasing need for the social dimension to be considered in the relationship between developed and developing countries, or, more simply, in the North-South discussion.

Thus, the development of the iron and steel industries of the South would on balance benefit employment in the North. This conclusion is of great importance for public opinion in the industrial countries, especially among the trade union organizations. The dominant picture is still that of the industrialization of the South causing redundancy in the North and must be changed. It is true, however, that the benefits for employment do not apply to the same sectors and that the industrial countries do not have the same capacity to respond to the demand for the supply of the required capital equipment. Seen from this point of view, the industrialization of the South is a causative agent of movements and inter-sector transfers of skills within the developed countries and of differences in their respective situations. In any case, these basic questions cannot be evaded. The workers involved are also actors in a normative scenario.

Similarly, the alternatives of the normative scenario and its effects on employment in the developing countries cannot be tacitly passed over.

The following table (p. 14) summarizes these alternatives. It is based on the productivity divergences noted in the plants of developing countries (see the document entitled: "Difficulties of achieving full production in

Table      Estimates of manpower required for the iron and steel projects studied in the "dossiers"

Number of projects	Description	Calculation basis for determining manpower	Capacity (millions t/yr)	Manpower estimated	
				H1 low	H2 high
29	Micro-plants, presumed non-integrated, of less than 100,000 t/yr	A little over 300 employees per plant	1.7	10 000	10 000
44	Mini-plants of 100,000 to 500,000 t/yr	H1 1,500 employees per plant (equivalent to 0.0050 man/t) H2 1,000 employees per plant (equivalent to 0.0033 man/t)	13.2	44 000	66 000
20	Medium plants, 500,000 to 1 million t/yr	Average estimates of H1 0.0200 man/t H2 0.0025 man/t	16.1	40 250	322 000
32	Plants over 1 million t/yr	Average estimates of H1 0.0200 man/t H2 0.0050 man/t	85.0	425 000	1 760 000
125	-	Equivalent on average to H1 close to 0.0200 man/t H2 0.0045 man/t	116.0	519 250	2 158 000

iron and steel plants in the developing countries"). It exhibits considerable "spread" in the estimates of manpower requirements depending on whether low or high labour productivity is assumed, and results in employment creation figures ranging from 2,150,000 down to 520,000 employees. In view of the specific weight within the 125 projects of those exceeding a million tonnes, it is in that group of projects that the difference in employment estimates is greatest (1,750,000 jobs at low productivity and 425,000 at high productivity). Between these two extremes, those solutions should be sought that are most apt to harmonize the objectives of profitability, increased employment, improved wages and optimum economic surplus.

On that point too several remarks are called for. The alternative that maximizes employment minimizes productivity. It is doubtful that this approach of relative over-employment or concealed unemployment, even at low wage-levels, can yield an economic surplus. It is also doubtful that it would create a good environment for training the surplus manpower, or that deficit iron and steel plants could act as the driving force for industrialization. It therefore seems preferable to work towards more productive enterprises, even with a smaller labour force, provided that the economic surplus can be re-invested in productive employment. But that is another question.

In short, the approach adopted here is an attempt to formulate in more direct and concrete terms the problems of the international division of labour within a new international economic order. It goes beyond the problems at the enterprise level to those at the society level and implies reasoned choices in which entrepreneurs, workers and governments participate.

5. The year 1990 has been set as the target date for the scenarios. As it is now 1982, eight years remain for achieving the normative scenario. As soon as this is regarded, not as a mere pipe-dream or academic construction, but as an objective to be reached, it is useful to plot its course and identify the constraints in terms of time.

The analysis of "Dossier I" shows that half the planned production capacity is being installed or is for immediate installation (project phase III). Accordingly 58 million tonnes of new capacity are essentially outside the scope of future negotiations, though the balance of the financing still has to be negotiated. This has been estimated at \$20,000 million out of the \$80,000 million required.

It remains to finance the other half of the planned capacity, plus the probable shortfall on the first half, or about \$100,000 million. How can this sum be raised and applied to iron and steel investments?

It is also important to note that decisions on large projects (1 million tonnes and above) to go into production by 1990 must be taken in 1982-1983, or at the latest in 1985. Thus projects listed as being at stage I (general concept and pre-feasibility study) and stage II (project under study and negotiation) must be decided on by 1985. Any delay will retard the implementation of the normative scenario beyond 1990 to the extent of the delay.

The international community would thus have three or four years available for putting active policies into effect.

This period and the remaining eight years of the decennium seem enough to carry out a growth policy for mini-plants, but the time is very short for the large projects. The problem becomes complicated if the need to determine and transfer new standards for the iron and steel industry is taken into account. Even supposing that the international community is fully aware of this need, and that the advanced industrial countries make a radical change of course in that direction, the new standards could hardly be out in less than five or six years. It is therefore extremely probable, if not certain, that projects conceived in the period 1982-1985 will incorporate very little of these standards. There is thus a great danger that the developing countries will be faced, on a larger scale, with the same management and quality problems with regard to labour, infrastructure

and supplies as those which have in most cases not been resolved in the course of operating the same type of plant. In the absence of enterprises of a new type, therefore, consequences must be drawn at the negotiations level to the effect that the industrial transfers must permit the performance of the enterprises to be subsequently improved.

6. International co-operation is absolutely essential for the implementation of the normative scenario. The analysis has demonstrated that, however desirable co-operation between developing countries may be, a scenario based entirely on generalized "South-South" co-operation would be unrealistic and would lead to results inferior to those foreseen in the projects (see "Proposals for the scenarios", para. 88). The key to the normative scenario is surely "North-South" co-operation.

The officers and the Small Working Group have undertaken a preliminary selection of the negotiable items (see records of the meeting of 6-7 August 1981 and of the Third Meeting of the Small Working Group, 3-4 December 1981). It will be recalled that an examination of the "dossiers" led to the identification of 23 negotiation items. The selection carried out classified these under six headings: (a) Costs and financing; (b) Labour and the development of human resources; (c) technology and research; (d) raw materials and energy; (e) the new industrial arrangements; and (f) special action for the 25 countries that are newcomers to the iron and steel industry.

It became apparent during the third meeting of the Small Working Group that it was not so much the list of negotiable items that was important as the enumeration of those items that shape the character of the various negotiations.

To move forward on these lines, the secretariat has therefore made some attempt to find a pattern in the negotiations, or more modestly to find an approach which will help to classify the various implied parameters.

The shape of the negotiations is perceived in three dimensions.

- The first dimension is represented by the type of negotiation. On the basis of the iron and steel projects of the developing countries, there would seem to be three types of negotiation:

1. Inter-sectoral negotiation

The iron and steel project - in the case in point, one or more large projects - is a part (perhaps a major part, perhaps not) of a broader area of negotiation. What is at stake for the foreign partners may include, for instance, access to sources of energy and raw materials in the host country or, in general, entry to its market.

The counterparts to the finance and technology transfer inputs may be outside the iron and steel sector.

2. Negotiation of a large iron and steel project

This is the classic situation in which the negotiations concern only the project itself. The partner or partners contribute all or part of the financing, equipment, technology and technical assistance, which are combined in various proportions with local contributions of raw materials, energy, human resources, investment goods and counterpart financing.

Exports of iron and steel products may serve as a partial or total means of payment. The destination of any exports may, incidentally, be subject to agreements to shift competition to a third area.

3. Negotiations on a mini-steelworks

Although this case does not seem a priori to be different from the preceding one, it is nevertheless desirable to consider it separately, as its scope is more restricted, production is almost exclusively intended for the domestic market, less finance is involved and construction periods are shorter.

4. Negotiations on steelworks based on direct reduction

This category of negotiations may intersect the three previous ones. However, in this case also, it would be desirable to ascertain the relevant procedures. There are two reasons for this. The first is that the process involves 40 per cent of the projected production capacity. The second is that, in 90 per cent of the cases it involves petroleum exporting countries with natural gas at their disposal, and on the other hand a restricted oligopoly of industrial companies from the developed countries that possess the technical processes.

As an illustration, on the base of "Dossier I", it can be estimated that the following developing countries are concerned - or could be:

Negotiations of type I (excluding petroleum exporting countries)

North Africa and the Middle East

Mauritania (iron ore)

Morocco, Tunisia and Jordan (phosphate rock)

Africa south of the Sahara

Togo (rich phosphates)

Zimbabwe (chromium and other strategic metals)

Zambia (copper)

Zaire (copper, cobalt and vast hydroelectric resources)

Senegal and the Ivory Coast (iron ore)

Latin America

Argentina (ores, agricultural wealth, "the food weapon", land)

Cuba (nickel)

Paraguay (hydroelectric resources)

Bolivia (tin and iron ore)

Colombia (coking coal, the only deposits in Latin America)

Chile and Peru (copper and iron)

Asia

India (high quality iron)

Afghanistan (natural gas)

The Philippines (copper).

Negotiations of type II (according to size of projects)

Mexico, India, Brazil, Republic of Korea, other countries in Asia, Iran, Nigeria, Venezuela, Argentina, Indonesia, Cuba, Iraq, Pakistan, Thailand, Algeria, Libya, Syria, the Philippines, Saudi Arabia and Egypt.

Negotiations of type III

One should distinguish between two categories of countries, those that already have an iron and steel industry and intend to expand it by constructing mini-steelworks, and those that are the genuine newcomers.

Thus, Argentina, Colombia, Peru, Mexico, Brazil, India, Bangladesh, Indonesia, Thailand, the Republic of Korea, other Asian countries, and Jordan already have an iron and steel industry, which should create conditions favourable to the assimilation of the mini-steelworks technology.

On the other hand, Honduras, Nicaragua, Paraguay, Bolivia, Cameroon, the Central African Republic, the People's Republic of the Congo, Gabon, Ghana, the Ivory Coast, Liberia, Senegal, Zambia, Tanzania, Zaire, Togo, Bahrain, Oman, the People's Democratic Republic of Yemen, Morocco and Saudi Arabia would be newcomers. The preponderance of African countries will be noted. It will also be recalled that the estimated cost of investments for the 160 mini-steelworks projected represents only 4 billion dollars.

Negotiations of type IV (according to size of projects)

Mexico, Iran, Venezuela, Indonesia, Algeria, Iraq, Thailand, India, Egypt, Libya, Algeria, Malaysia, Saudi Arabia, Argentina, Brazil, Trinidad, Liberia, Pakistan, Bangladesh, Peru, Ecuador, Abu Dhabi, Qatar, Kenya, Oman and Burma. (Out of a total of 40 projects representing 49 million tonnes, 25 projects of more than 500,000 tonnes each account for 43 million tonnes).

- The second dimension is represented by the logic of the links between the items negotiable.

In the industrial sphere, the elements of negotiations are not separate but interdependent. The parties involved have inputs that are in balance or out of balance. And, unless negotiations are carried out in a spirit of international solidarity or on a basis of gifts, the more the contributions are out of balance, the greater the counterpart contributions. By the nature of things, an industrial transfer always implies a total or partial imbalance and therefore implies the expression of a relationship of forces, the explicit recognition of which is the resultant industrial co-operation.

The orientation of production towards the domestic market or exports, financing, financing procedures and costs, the proportion of equipment imported, the use of local and imported raw materials, energy sources, the training of local manpower and the importing of foreign assistance, research and development activities together constitute a whole whose parts are inter-related. Each negotiation is, in a sense, specific, since each partner country has specific contributions. However, according to the different types of negotiations referred to above, the relationship between the various elements and their relative importance probably vary.



If the Working Group agrees, the Secretariat proposes to explore this question in greater depth for the Third Consultation Meeting on the Iron and Steel Industry. Taking a global viewpoint, that is to say, considering iron and steel projects in the developing countries as a whole, some elements of global bargaining between the industrial countries and the developing countries can be illustrated.

The labour element incorporated in trade in capital goods and iron and steel products has been referred to above. It will merely be recalled that the position seems to be favourable to the developed countries.

One of the most sensitive questions is doubtless related to the competitive potential of the developing countries. In this context it will be emphasized that investment projects are essentially turned towards domestic markets. Thus, only the following projects entail production intended for export:

Production of sponge iron: Liberia, Qatar, Bahrain, Abu Dhabi, Indonesia, Trinidad, up to 3.3 million tonnes;

Semi-finished products: Brazil (Tubarão) 1.5 million tonnes, India, possibly Vizakapatnam, first phase, 1.6 million tonnes by means of a buy-back agreement.

Out of the 116 million tonnes projected, a total of 6.4 million tonnes of production capacity is export-oriented.

It can also be demonstrated that, during the 1970s, the growth of iron and steel production in the developing countries was compatible with an increase in the exports of the developed countries to the developing countries. (See UNIDO "The crisis and trends in restructuring the iron and steel industry - Implications for scenarios - ID/WG.363/3, paragraph 3.1.).

Tunisia is a striking example of a country in which iron and steel production shows strong growth and demand even stronger growth; thus after a period in which imports fall, they will later increase. This case is fairly representative of the general situation implied in the normative scenario.

- The third dimension, which defines the configuration of the negotiations, is the interfaces of the relations between the actors and their respective strategies.

The interfaces may be represented by a triangle whose three faces are constituted by the buyer (the receiver), the seller or sellers (the transmitter or transmitters) and the sources of finance.

The buyers are Governments of developing countries or private enterprises.

The sellers comprise four groups: the process-engineering firms, the equipment suppliers, the steel fabricators or a combination of these groups (consortium combinations).

The sources of finance are the international development banks, the export credit banks and the commercial banks.

The parties combine according to their strengths, interests and respective strategies. The latter may be a function of the general industrial situation. Thus, for example, companies which lose money through the sale of steel products may be interested in selling their technology and, when they manufacture it, their equipment.

The configuration of the negotiations is the result of the combination of their three dimensions: the types, the elements and the parties.

Thus, a major project and, even more so, an intersectoral project will be the complex result of the association of most of the above parties and will embrace practically all the elements of negotiation. For example, manpower training can be carried out by the designer in charge of building the plant, the "sister" iron and steel company or companies being involved to only a small extent, or else it can be entrusted to a specialized training firm.

In the case of a direct reduction project, the process-engineering firm and the transmitter iron and steel producing enterprise may be one and the same and may produce part of the equipment and carry out the function of credit supplier, with or without the involvement of commercial banks. The "sister" company may also take charge directly of manpower training.

In the case of mini-steelworks, the lower level of financing which has to be mobilized should, a priori, make it possible to simplify the financial backing of the projects.

It is therefore proposed that the Working Group should discuss the associations which appear the most favourable to the implementation of the normative scenario.

Although this is a question which remains open, the Secretariat have the impression that in general, and above all as regards the major projects, success implies a greater degree of commitment on the part of the "sister" iron and steel concerns in the developed countries - and in some cases of high-performance enterprises in the developing countries - extending, in some cases, to the creation of mixed enterprises. But the great variety of situations certainly calls for a large degree of flexibility in the solutions.

7. Approximately half of the projected production capacity has still to be negotiated, or negotiations have still to be concluded.

The negotiations which remain to be carried out concern:

"Major projects" representing more than 44 million tonnes production capacity in the following countries: Mexico, Republic of Korea, other Asia, India, Nigeria, Argentina, Cuba, Thailand, Brazil, Venezuela, Philippines, Syria, Colombia and Chile;

Direct reduction projects representing 6.7 million tonnes in the following countries: Pakistan, Bangladesh, India, Ecuador, Argentina, Brazil, Liberia, Egypt, Bahrain, Qatar, Abu Dhabi, Oman and Iraq;

Mini-steelworks projects representing 1.7 million tonnes in the following countries: Bangladesh, Burma, Indonesia, Honduras, Nicaragua, Bolivia, Peru, Central African Republic, Congo, Gabon, Ghana, Senegal, Togo, Zaire, Tanzania, Morocco, Bahrain, Oman, Jordan, Syria and Democratic Yemen.

Along with these negotiations, there are those relating to the projects with a production capacity intermediate between 250,000 and 1 million tonnes, representing 5.1 million tonnes. These concern the following countries: Singapore, Philippines, Viet Nam, Republic of Korea, other Asia, Venezuela, Brazil, Ghana, Kenya, Liberia, Tanzania and Jordan.

It should be emphasized that efforts to obtain financing will probably take place in conditions which are new in relation to those of past years. The American, European and Japanese iron and steel projects will probably generate competition on the financial markets with the projects in the developing countries (see the analysis of the crisis and trends in the restructuring of the iron and steel industry, document cited, section 3.3.). The former will probably be regarded by financiers as representing less of a risk.

In the light of this, it seems that the implementation of the normative scenario requires, firstly, an intensified dialogue between iron and steel interests and, secondly an extension of this dialogue to include the other actors involved - producers of capital goods, workers' organizations, international financial institutions, major commercial banks and of course the Governments concerned.

