

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

EXEMPLAIRE

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N°

183

N A T O C O N F I D E N T I A L

ORIGINAL: FRENCH
22nd November 1979

DOCUMENT
AC/127-D/620

ECONOMIC COMMITTEE

CPR: IRON AND STEEL INDUSTRY - OUTPUT AND
PROGRESS OF MODERNIZATION PLANS UP TO 1985

Note by the German Delegation(1)

I. Output 1978/79

(a) Crude and rolled steel

1. The Chinese People's Republic produced 31.8 million tons of crude steel and 22.1 million tons of rolled steel in 1978 (see Annex I). This made it the world's fifth biggest steel producer, after the USSR, the United States, Japan and the Federal Republic of Germany. However, per capita output was a mere 33 kg of crude steel.

2. The big (34% and 35% more than in 1977) increase in crude and rolled steel output in 1978 provides proof of a return to more stable economic development after the domestic turmoil of the last few years. The appeal for competition between steel works made at the March 1977 "National Metallurgical Industry Conference", the replacement of the leading officials in the Ministry responsible for the metallurgical industry, the return of workers dismissed by the "band of four", the rationalization of production and administration and greater professional pride have resulted in much fuller use of the existing capacity - more than 90% in several plants. It was particularly high in the small and medium local plants, which fulfilled their annual targets faster than their bigger rivals. New production capacity came on stream for the production of crude steel at Penchi (2nd oxygen conversion steelworks) in August 1977, at Wuchang (oxygen conversion of steelworks) in November 1977 and for the production of rolled steel at Wuchang (cold rolling mill) in December 1978. Thanks to this additional capacity, the output of crude and rolled steel will rise again in 1979 though less impressively. Judging from the achievements during the first half of the year,

This document includes: 4 Annexes

(1) For the reinforced meeting on 6th and 7th December 1979

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production of crude steel will probably reach 34.0 million tons and rolled steel 24.0 million tons in 1979. This is higher than the planning targets by 32 million tons for crude steel and 23 million tons for rolled steel.

(b) Organization of crude and rolled steel production

3. The CPR produces mainly current steels as the following production pattern shows: 40% to 70% Martin-Siemens steel, 5% to 10% acid Bessemer steel and 15% to 25% oxygen-blown steel. Production of electric steel is small, between 5% and 10% of crude steel output, and concerns essentially high quality and special steels (by way of comparison, here are a few percentages for electric steel production in 1978: Federal Republic of Germany 14.4%, EEC 23.0%, Japan 21.9%, United States 23.5%, USSR 10.0%, GDR 22.8%, Bulgaria 23.9% and Romania 15.5%). The small electric steel output is explained by the chronic shortage of scrap metal in China, which is itself a reflection of the low level of industrialization. Output of special alloy steel and high alloy steel is insufficient to meet the growing national needs.

4. Rolled steel production is concentrated essentially on the manufacture of rails, girders, sections for agricultural machinery, heavy plates and sheets and welded and weldless steel tubes with a maximum diameter of 720 mm. Production capacity is insufficient for tin plate, galvanized and synthetically covered plates, small sections and precision sections. The bottle-neck for plates and cold-rolled strip steel should gradually be overcome after the installation at Wuchang in December 1978 by the Federal Republic of Germany of a cold rolling mill with a scheduled capacity of 1 million tons a year of cold-rolled strip steel, including 750,000 tons a year of vehicle bodywork plates, 150,000 tons a year of galvanized iron and 100,000 tons a year of tin plate. Since this plant has no distribution network, it is linked to the hydro-electric stations in Hupeh province. In past years, frequent dry periods have led to power stoppages and, consequently, to production losses.

(c) Technological level of the plant

5. With a few exceptions (like at Wuchang) the CPR's iron and steel industry plant is very old-fashioned. Many of the installations were built in the 40s and 50s, and some even earlier in the 30s, and have barely been modernized since. The iron and steel facilities used today (blast furnaces, Martin-Siemens furnaces, rolling mills) were mostly set up by means of Soviet technical assistance and machinery. When the Russian experts were withdrawn they often took with them the documentation and expansion blueprints. It took the CPR a long time to build steel plants on its own. However, China is a long way from the Soviet Union's technological level, and even further of course, from that of the industrialized Western countries. A measure of the technological

backwardness is that China still uses the technically simple Bessemer process for steel production, whereas in the West and other Communist countries this process is rarely used and, where it is, it accounts for less than 5% of total crude steel output. Technological out-of-dateness affects all the iron ore mines; according to Western steelmen, the iron ore enrichment facilities are like those used in the West thirty years ago.

6. The CPR is greatly interested in Western manufacturing processes particularly, oxygen-bottom blasting, vacuum melting, electro-slag remelting (ESR), continuous casting and cold rolling of steel, etc. However, Western steel experts have again remarked that the Chinese are insufficiently familiar with modern technology to be able to put it to account.

(d) Supplies of raw materials and steel products

- Raw materials

7. Insufficient data are available to enable anything more than an estimate to be made of Chinese iron ore output. In 1978 it was probably in the region of 79 million tons of crude ore (or 32 million tons of metallic ore). If this was the case, output would have been below requirements.

8. The CPR however has large iron ore deposits (some estimates put them as high as 100 milliard tons of ore, although secure deposits are apparently only about 18 milliard tons) but the low Fe content of the ore means that in most cases it has to be enriched. And there is a great shortage of enriched matter.

9. In 1978, China imported 7 million tons of iron ore mainly from Australia, North Korea, India and Brazil. The big increase in imports of this commodity in comparison with the years 1975, 1976 and 1977 (imports of between 2.4 and 2.5 million tons of iron ore a year - see Annex II) is reflected in the big expansion of raw iron output from some 25 million tons in 1977 to around 35 million tons in 1978.

10. The high raw iron output can be traced to the much fuller use of existing blast furnace capacity and to the coming on stream of China's biggest blast furnace at Anshan (annual capacity: 1.5 million tons of raw iron) in February 1978.

11. Despite the high raw iron output, the CPR imported from unknown sources 1.3 million tons of this commodity in 1978. In past years, it has always been necessary to import raw iron (see Annex II). The high level of raw iron consumption, compared with steel output, probably indicates a high proportion of foundry raw iron. Moreover, and as a result of the persistent shortage of scrap metal, raw iron plays a very big part in steel smelting. The share of scrap metal is 45% at the most, whereas in the world's major steel producing countries, it is between 60 and 70%.

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- Imports of iron and steel goods

12. The People's Republic has to provide for its iron and steel supplies through imports. The latter will probably have increased to 8 million tons of rolled products, in 1978, or more than twice what they were in 1975 (see Annex II). The imports comprise a wide range of tubes, such as distillation tubes, boiler tubes, gas pipes, water pipes, pipelines and natural gas lines, alloy tubes and welded tubes together with steel sections, girders, iron cement and wire rod. Most of the rolled steel imports comprise heavy, medium and thin plates as well as tin plate, (47% in recent years). The CPR purchases 75 to 80% of its rolled steel (mainly strip steel and plates) from Japan. The second biggest supplier is the European Community, principally the Federal Republic of Germany.

13. During the first six months of 1979, the CPR purchased 2.38 million tons of rolled steel from Japan. The contractual figure of 1.8 million tons for the second half of the year was reduced to 850,000 tons by the Chinese. No information is available on imports from other countries. According to Chinese experts, it is planned to reduce the stocks stemming from the high level of imports in 1978. Moreover, recent changes to the plan henceforth give priority to agriculture and not to the development of heavy industry, so less needs to be imported. This explains the reduction in steel imports because steel for the agriculture sector, which is poorly mechanized but uses a lot of manpower, can in most cases be produced in China.

II. Progress of modernization plans up to 1985

(a) Initial Plan

14. At the first plenary meeting of the 5th People's Congress in March 1978, the CPR announced an extensive programme going up to 1985 to accelerate the rate of development of the economy in general and heavy industry in particular. In the iron and steel sector, the programme set production of crude steel at 80 million tons in 1985 (an increase of 88.7% by comparison with 1978, or of 9.5% a year). It was planned to make a big improvement in the quality of the steel simultaneously in order to reach Western standards. In view of the very high degree to which production capacity is being used at present and the technologically out-of-date nature of the facilities, which neither in terms of quality or of range can produce the crude steel required by the metal and mechanical engineering industry, fulfilment of this target up to 1985 will require the introduction of advanced technologies (oxygen blasting, vacuum melting, continuous casting, increase in the proportion of plates in rolled steel production, etc.). At the same time, existing production capacity will have to be expanded and integrated steelworks set up. The programme also provided for the concentration of steel production in a number of large combines. Altogether 8 new steelworks, at Anshan,

Shanghai, Peking, Penchi, Wuchang, Taiyuan, Paotou and Mokanshan or Chungking (with the information available it is not possible to determine which of the two plants is concerned) are to be extended and two new coastal iron and steel complexes are to be built at Paoshan and Chinwangtao. The share of these last mentioned plants in the CPR's crude steel production will rise from some 60% in 1978 to around 80%. Annex III attempts to give a general idea, using a variety of data, of the plant capacity pattern in 1978 and 1985, while Annex IV shows the locations of the steelworks.

15. Because China can only produce a limited range of the equipment necessary to fit out the steelworks, facilities have to be imported from abroad. The CPR has therefore started talks with a series of firms in Japan, the Federal Republic of Germany, Belgium, Luxembourg, France, the United Kingdom, Austria and the United States with a view to obtaining the necessary equipment, although so far with little success (except for a contract signed with Japanese firms for the construction of a coastal steelworks at Paoshan).

(b) The revised Plan

16. The spectacular plans to increase steel production to 60 million tons between now and 1985 never had a chance of succeeding. The government very quickly realized that it was not possible to accelerate the development of a single industrial sector without simultaneously improving the infrastructure (better raw material supply, new markets, improvement of the road network, secure energy supplies, provision of housing, food and consumer goods for the labour force, etc.). What is more, the CPR apparently encountered difficulties finding the necessary short-term finance to cover the cost of importing plant. At the second plenary session of the 5th People's Congress in June 1979, the steel industry target was reduced to 45 million tons of raw iron by 1985. There will now be a phase of consolidation ending in 1981 during which priority will be given to the development of agriculture, the consumer goods industry and light industry.

17. After the plan was revised, negotiations for the import of plant marked time with a large number of projects being put back to the period 1980/1981. Annex III shows the current construction status of the steelworks referred to above. When it is remembered that the Western industrialized countries generally base themselves on a period of 5 years for the planning and building of iron and steel complexes producing between 3 and 5 million tons of crude steel a year and transforming the constituent rolled steel, a critical study of the situation would put crude steel production in 1985 at 42 million tons at the most.

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18. The revised modernization programme also requires a big improvement in the iron ore supply situation. The extension of prospection for iron ore has led to the discovery of high quality ore in the province of Hupeh and the Hengtuan mountains. Early in 1979, a contract was signed with a United States firm for the installation of an iron ore mine with a capacity of 17 million tons of enriched iron ore at Chi-Ta-Chan, near Anshan in the province of Liaoning. However it will not be possible to meet national iron ore requirements from national deposits up until 1985. The CPR is therefore seeking to sign long-term contracts for the delivery of iron ore with Australia, India and Brazil.

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CHINESE PEOPLE'S REPUBLIC: IRON AND STEEL INDUSTRY OUTPUT
(IN MILLIONS OF TONS)

	1975	1976	1977	1978	1979 Plan	Initial 1985 Plan	Revised Plan
Iron ore output (crude ore) (Fe content)	51.0*) 20.0*)	50.0*) 20.0*)	50.0*) 20.0*)	79.0*) 32.0*)			
Crude iron ore output (including foundry raw iron)	22.5*)	25.0*)	25.05**)	34.79**)			
Crude steel output	25.0*)	20.5**)	23.74**)	31.78**)	32.0**)	60.0**)	45.0**)
Rolled steel output	17.9*)	15.0*)	16.33**)	22.08**)	23.0**)		

* Estimate

** Figures taken from the Chinese press

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AC/127-D/020CHINESE PEOPLE'S REPUBLIC: IRON AND STEEL INDUSTRY IMPORTS
(IN MILLIONS OF TONS)

	1975	1976	1977	1978
Iron ore	2.4*)	2.4*)	2.5*)	7.0*)
Raw iron	0.4*)	0.3*)	0.8*)	1.3*)
Iron and steel goods of which:	3.800**)	4.480**)	6.0*)	8.0*)
Japan	2.799**)	3.455**)	4.5*)	6.1*)
EEC	0.725**)	0.701**)	1.5*)	1.9*)
Other western countries	0.150**)	0.171**)		
Communist countries	0.178**)	0.159**)		

* Estimate

** Official ECE figures given in the statistical yearbook of the Iron and Steel Industry 1978, Malseldorf

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CHINESE PEOPLE'S REPUBLIC:
CRUDE STEEL OUTPUT PATTERN 1978 AND 1985
AND PROGRESS OF MODERNIZATION

Location and type of plant	Crude steel capacity		Status of modernization projects
	1978 (in millions of tons)	Initial 1985 target (in millions of tons)	
1. Anshan, Liaoning Province: iron and steel combine	7.5	12.0	Priority modernization project; replacement of the old open hearth unit with three Chinese made oxygen converters with a capacity of 250 tons, modernization of the old rolls was planned but has been postponed; building orders to be placed with foreign firms in 1980 and as soon as possible.
2. Shanghai: iron and steel combine	4.5	10.0	Plans for a cold rolling mill and probably also for a Chinese-built oxygen steelworks. No further information; building of a cold rolling mill probably postponed.

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Location and type of plant	Crude steel capacity		Status of modernization projects
	1978 (in millions of tons)	Initial 1985 target (in millions of tons)	
3. Peking: CAPITAL iron and steel combine	1.5	5.0	Priority modernization project; second steel works now under construction; no further information available.
4. Penchi, Liaoning Province: iron and steel combine	1.5	5.0	Under construction since 1977; KONTI cold-rolled strip steel plant; modernization of the old crude steel and rolling facilities to be carried out by the Chinese themselves; modernization postponed until after 1985.
5. Wuchang, Hupeh Province: iron and steel combine	3.0	3.5	Plans to replace the old open hearth units and the Bessemer process steelworks by OBM converters (oxygen bottom blasting process); expansion of rolling mills, including construction of a 2,600 mm broad slab mill; use of existing capacity 40 to 60% through

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Location and type of plant	Crude steel capacity		Status of modernization projects
	1978 (in millions of tons)	Initial 1985 target (in millions of tons)	
6. Mokanshan, Anhwei Province or Chungking, Szechwan Province: iron and steel plant	Both 1.2	5.5	absence of independent power supply which it is planned to provide; modernization postponed. In the full list of plants scheduled for modernization the Chinese press refers to the Mokanshan and Chungking plants; no other details are available.
7. Taiyuan, Shansi Province: iron and steel combine	1.5	3.0	Plans to expand crude steel capacity (probably by means of OBM converters); modernization of the twenty-roller rolling mill. Talks on this question were resumed with a Western firm in the middle of 1979.
8. Paotou; Inner Mongolia: iron and steel combine	1.5	2.5	Replacement of the old open hearth unit by OBM converters; construction of continuous

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Location and type of plant	Crude steel capacity		Status of modernization projects
	1978 (in millions of tons)	Initial 1985 target (in millions of tons)	
9. Paoshan (near Shanghai)		0.0	casting facilities and of a KONTI tube rolling mill; no further details available; construction probably postponed. Under construction: coastal iron and steel complex using imported raw material; destined to become most modern plant in CPR; contracts signed with Japanese firms on 22nd December 1978; last slice of project with capacity of 3 million tons of crude steel due to come on stream in 1980. Interruption of building from February to mid-June 1979, work to continue after modification of payment arrangements.
10. Chinwangtao, Hupeh Province	-	8.0	Plans to build a coastal iron and steel complex in the gulf of Chihli, using imported raw materials; destined to become the 2nd

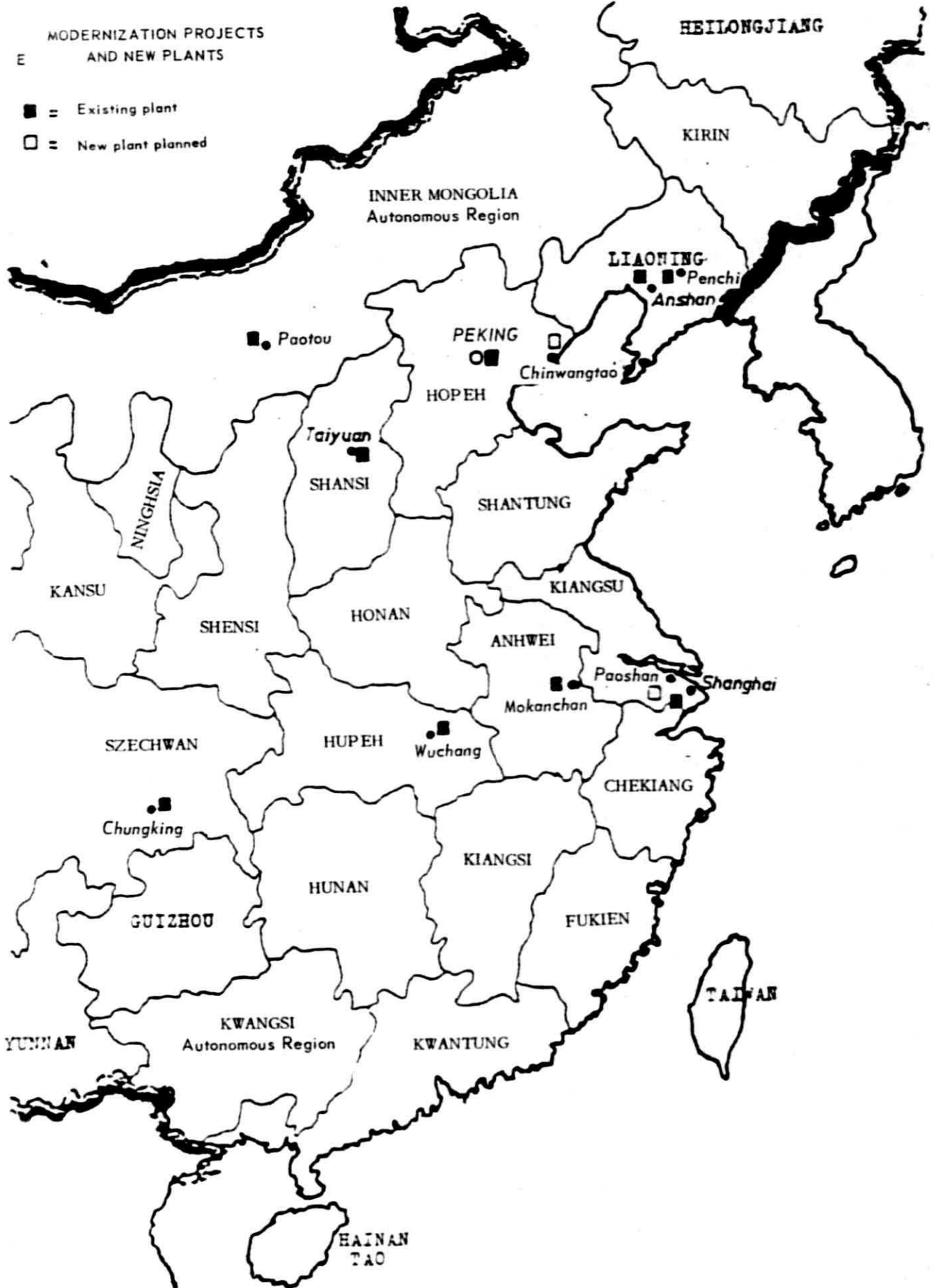
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Location and type of plant	Crude steel capacity		Status of modernization projects
	1978 (in millions of tons)	Initial 1985 target (in millions of tons)	
Crude steel capacity of the 10 plants	22.30	58.50	most modern plant in China; talks with foreign firms temporarily interrupted; orders will probably be placed in 1980 or later. No increase in output of the small and medium steelworks is expected for 1985 since they were working at near full capacity in 1978. The assumption of 80% use of the 10 plants in 1985 is based on the knowledge that certain facilities, according to the initial Plan also, will only come on stream in 1985.
Output of the 10 plants	19.00	47.22	
Capacity of small and medium plants	14.20	14.20	
Output of small and medium plants	12.78	12.78	
Total capacity	36.50	72.70	
Total output	31.78	60.00	

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