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MAJOR STATISTICAL INDICATORS OF INDUSTRIAL ACTIVITY<sup>1/</sup>  
(Report by the Secretary-General)

I. Introduction

1. The Commission during its twelfth session "considered it desirable to undertake a systematic review and study of the major uses to which industrial statistics are and might be put. It was thought that the study should deal with the types of primary data required and the derived index numbers, ratios and frequency distributions which show important relationships between the various elements of industrial outputs and inputs. Among the measures studied should be methods of estimating changes in the relationship of industrial output to input of materials, energy, labour and capital. The study should also deal with the way in which the various items of primary data and the inquiries through which these items are gathered and might be related to one another in order to form an effective and efficient system of industrial statistics. The Commission noted that the various international documents on industrial statistics and on basic statistical series for the use of the developing countries in programmes of economic and social development included valuable information and suggestions on these subjects. However, the material was scattered through various documents and was primarily of summary character. It was agreed that the study should relate to the more general requirements for, and uses of, industrial statistics" (E/3633, para. 29).

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<sup>1/</sup> The scope of industry in this paper, includes mining, manufacturing, electricity and gas (ISIC groups 1, 2, 3, 51). Construction statistics are excluded and dealt with in a separate paper, which is before the Commission (E/CN.3/305).

2. The Commission, on the basis of the above considerations, requested the Secretary-General:

"To undertake a systematic investigation of the major general uses of, and requirements for, industrial statistics, including the types of primary data required and the derived index numbers, ratios and frequency distributions which show important relationships between the various elements of industrial output and input, as well as the useful relationships between the various industrial inquiries through which the data are gathered" (resolution 3 (XII)).

3. International recommendations made so far on industrial statistics are set out in the following publications:

- (i) Index Numbers of Industrial Production (1950), Studies in Methods, Series F, No. 1
- (ii) International Standards in Basic Industrial Statistics, Statistical Papers, Series M, No. 17, Rev.1
- (iii) International Recommendations on the 1963 World Programme of Basic Industrial Statistics, Statistical Papers, Series M, No. 17, Rev.1, Add.1
- (iv) International Standard Industrial Classification of all Economic Activities, Statistical Papers, Series M, No. 4, Rev.1
- (v) Indexes to the International Standard Industrial Classification of all Economic Activities, Statistical Papers, Series M, No. 4, Rev.1, Add.1
- (vi) Statistical Series for the Use of Less Developed Countries in Programmes of Economic and Social Development, Statistical Papers, Series M, No. 31 (Chapters III, IV and VI).

In addition to these above-mentioned publications reference should be made to the provisional issue (published in 1953) of Industrial Censuses and Related Enquiries, Studies in Methods, Series F, No. 4, Vol. I and Vol. II and further to the International Labour Office publication The International Standardisation of Labour Statistics, Studies and Reports, New Series, No. 53.

4. These recommendations deal with the most important primary data and do not treat problems of derived figures (except those of index numbers of industrial production) and in addition, there remains considerable scope for a more elaborate system of primary data. This paper attempts a fairly comprehensive description

of the major indicators in industrial statistics including both primary data and derived figures. The description starts with a fairly brief survey of the major uses of, and the requirements for, industrial statistics (Section II) and then presents a list of the major statistical indicators of industrial activity in tabular form with some methodological remarks concerning formulas, components, frequencies, etc. (Section III). It is primarily an attempt to bring together and complete suggestions scattered through various earlier documents but does not contain detailed recommendations either on the calculation, or on the various uses, of these indicators since this would require a more extensive treatment of the whole subject of industrial statistics. What is intended here is to give a rough but comprehensive framework for industrial statistics which may help developing countries to design their programme of industrial statistics for primary data and the processing of these data into derived figures, indexes, distributions, numbers and ratios, etc. Other countries may find the paper useful in reviewing their system of industrial statistics.

5. The uses, requirements and indicators dealt with in this paper are selected as being of general importance; they may, of course, be supplemented for specific countries and circumstances and judgements may differ as to whether some basic uses, requirements or indicators have been omitted, while others of less significance have been included. On the other hand the selection is not to be considered as a minimum recommendation. It comprises some indicators, whose experimental uses may be few so far and, moreover, the divergences of needs and uses of industrial statistics among countries of different economic systems and levels does not permit the recommendation of a minimum set of indicators. Consequently the list of indicators presented in Section III may be selected and supplemented by each country according to its specific conditions and needs.

## II. Major uses of, and requirements for, industrial statistics

6. Industrial statistics give information about the industrial sector of the economy and permit analysis of its different parts. Industrial statistics also provide data for national accounting and other statistics covering the whole economy. According to the character of these analyses and utilization of data the major uses of industrial statistics may be classified roughly into three groups:

- (i) practical uses of industrial statistics by industrial enterprises, governmental and other organizations for business planning and socio-economic decisions;
- (ii) statistical uses of industrial statistics to compile national accounts, commodity balances, input-output tables and other comprehensive statistics on the economy as a whole (or in connexion with other branches of the economy);
- (iii) scientific-theoretical uses of industrial statistics by various branches of the social (and sometimes natural) sciences.

7. This kind of classification is, of course, extremely arbitrary but it is useful for the purposes of the following discussion. It might be noted that the so-called statistical uses are, in the final analysis, determined by practical requirements (and to a lesser extent by scientific-theoretical requirements), regarding national accounts and other comprehensive statistics on the economy as a whole. In turn, most, if not all, of the data collected to serve statistical and practical uses can be used in the scientific-theoretical sphere. However, it is likely that data derived from the first two uses (practical and statistical) will not be considered fully satisfactory or sufficient for rigorous academic purposes. It is also likely that the kind of additional data required for scientific-theoretical use will not be considered suitable as part of a regular statistical programme and will probably be handled through special inquiries.

8. The extent to which these above-mentioned uses and the items of data they normally require affect the statistics compiled by the individual industrial unit is of interest. Apart from the kind of data which are needed for financial accounting purposes, each industrial unit needs, and ought to organize, an additional system of economic statistics for its own purposes. This should, however, be built up bearing in mind the requirements of the national system of industrial and economic statistics. (In turn these national systems may reflect the international recommendations.) In most cases, the national statistical system requires the provision of data which are also useful to the individual industrial units, but it involves adhering to more rigorous definitions and possibly to different groupings and more detailed breakdowns. In addition, in some cases, it may be necessary to request some data in a form which would not otherwise be used by the industrial unit.

9. It may be useful after the above general remarks to give a brief survey of the uses (and their requirements) mentioned above and classified under the three headings mentioned in paragraph 6: (i) the practical, (ii) the statistical, (iii) the scientific-theoretical.

(i) The practical uses

10. The major practical use of industrial statistics is to enable the controllers of the economic units concerned to make correct or at least reasonable decisions. Economic (or business) decisions are of course motivated and influenced by many factors in addition to the purely economic; these include the psychological, the sociological, the political, etc. Nevertheless, in most situations the dominant factors are the economic ones and a correct or reasonable decision would involve a course of action which is (i) feasible, (ii) consistent with the general policy and function of the given economic unit and (iii) efficient. Information is thus needed to illuminate which appears feasible, consistent and efficient and to illustrate the conditions and consequences, advantages and disadvantages of alternative courses of action. (The presentation of information in statistical form offers a number of advantages in that it is more objective, utilizes precise units of measurement, and enables comparisons to be made in a meaningful way.) It is, of course, obvious that the need for industrial statistics to aid decision making increases rapidly as the size, complexity and interdependence of industrial activity grows.

11. To some extent the basic items of data of industrial statistics (e.g. output of individual commodities, number of operatives, quantity of electricity consumed) are valuable and directly practicable indicators. Usually, however, it is necessary to utilize the basic data to compile more easily applicable indicators. This processing of the basic data includes many of the commonly known statistical techniques from simple groupings and aggregations through to complicated index number calculations. Inasmuch as information is required concerning the interrelationships and interdependencies of industrial activity, it is necessary to compute such derived figures as distributions, frequencies, rates, ratios, etc. To evaluate the actual present level of industrial activity in relationship to possible future trends and changes, time series and comparisons with other enterprises and countries and, in the case of planning, with plan figures or targets, are also necessary.

12. The decision making may involve actual situations or may concern the formulation of a plan. It may refer to current production; the volume and variety of output; future production; factors of production and their more efficient combination; the introduction of improved or new products and technologies; investment in new machines, equipment or entire factories or enterprises. In addition the decisions may be made and their circumstances and consequences evaluated by managers of individual establishments or enterprises, by private or government institutions controlling groups of enterprises or by governmental agencies controlling whole branches of industry or even responsible for the development of the whole of the industrial sector and the entire economy. Thus there is a great variety not only in the nature of the decisions but also in the character and functions of the persons or institutions making those decisions. Consequently one can expect a variation in the kind of data needed to fulfil these varying circumstances and differing requirements.

13. It would, however, be difficult to outline the kind of data required and the uses under headings indicating the specific type of decision being made or the particular kind of decision-maker involved. It is of course true that any kind of classification of uses of, and requirements for, data will be fairly arbitrary because in actual fact each decision is likely to involve not only a few items of data, but a whole set of data characterizing the total economic environment and context within which the decision is made. Nevertheless some kind of general outline is attempted and is shown in Section III.

(ii) The statistical uses

14. The statistical uses form the second broad group of uses of industrial statistics. The major function of data put to these uses is to present as clearly as possible an over-all picture of the present situation and the past trends of the whole economy. This over-all picture is needed by both centrally planned and market economies and by both developed and developing countries for policy-making purposes. An over-all picture is essential to government economic policy whether it is intended only to influence the business cycle and the economic activity of private enterprises by fiscal, monetary and tariff policy or whether it is intended to plan and manage the whole economy and its development. It is also important

that a comprehensive picture of the economy be available to the individual enterprises and organizations, whether public or private, within the economy. This is valid both in countries which formulate and use national development plans and in countries where numerous separate economic units need to come to conclusions concerning future trends and developments. It is also generally considered both a necessity and a duty for a Government to provide its citizens with the economic facts which have assisted in the formulation of economic policy and so create a basis for informed public discussion, criticism and appreciation.

15. National accounts tables showing the source of the expenditure on the national product, the distribution of national income and the financing and composition of capital formation are the kind of minimum framework necessary to understand the situation concerning savings and investment, employment and wages and salaries, etc. Input-output and related tables and commodity (products, material and energy) balances are also valuable tools which can enhance the ability to understand and manipulate the economy. In all these pictures of the economy, industry is usually an extremely important element and, if not important in absolute terms, is at least a highly dynamic element. It is an important source for the generation of national income and for both the production of investment goods and their consumption. A majority of the sectors in input-output tables are usually industrial, the other branches of the economy generally being presented in more highly aggregated forms. The industrial sector also figures prominently in the majority of commodity balances either as a producer or as a consumer.

(iii) The scientific-theoretical uses

16. The kind of data available as a result of the two above-mentioned uses offers much material for economic research and academic study. Since industry is not only an important sector of the economy but also an important area of human life it is studied by many academic disciplines. Industrial statistics are widely used in the construction and testing of economic theories and econometric models, in studies of economic and general history, in sociology and economic geography, etc. These investigations may have particular statistical requirements for data not otherwise available, e.g. long time series for economic history. However, it would not seem profitable to deal with these uses and requirements in this context.

III. A list of major statistical indicators

17. In the annex, a list of major statistical indicators of industrial activity is given. This list includes 136 items classified under six headings.

1. Production
2. Resources (factors) of production: Labour
3. Resources (factors) of production: Natural Resources and Fixed Assets
4. Resources (factors) of production: Material and Energy Used
5. Efficiency
6. Other Characteristics of the Industrial Sector and its Role in the Economy

In listing, priority is given to derived figures although main primary data which are also used as independent indicators are included. In addition, priority is given to indicators required on a macroeconomic level but some major indicators which are usually used only by enterprises are also listed. Against each item, valid international recommendations, some methodological remarks concerning their calculation (and sometimes their uses too) and a tentative recommendation on frequency are also shown. With respect to international recommendations only those which particularly concern industrial statistics are mentioned. Of course, as industrial statistics are a part of general economic statistics other recommendations of a more general character may have an impact on the indicators mentioned. In this connexion, reference should be made to all recommendations of the International Labour Office.

18. As already mentioned in Section I of this paper, this list of indicators cannot be considered as a minimum set of recommendations for each country. This list can be selected from and supplemented by each country according to its particular conditions and needs.

19. In order to avoid an unnecessary increase in the length of this list many of the derived figures characterizing internal relationships and distributions which may be calculated from the included indicators but which are not of special importance are not listed separately. Further, in nearly all cases a breakdown of data by branches, by geographic areas and production units is also very useful but is not separately listed. Concerning index numbers of changes over time, weighting alternatives are not separately noted. Obviously Laspeyres and Paasche



weighted and unweighted formulas and their various combinations may be calculated according to circumstance. The use of weighted (standardized) formulas is mentioned only in cases where it has a distinctive significance.

20. Some of the indicators can, of course, be used for the purpose of international comparison. However, this area of use has been omitted from this paper. In the first place it was considered more important to emphasize the uses and requirements within a national framework. In the second place international organizations are already compiling and publishing the simpler international comparisons while the more sophisticated techniques of international comparison involve complex problems which require detailed special study.

#### IV. Conclusions

21. The Commission will wish to review the list of indicators given in Section III of the paper. Further, to consider its suitability for publication as a guide for countries undertaking work in this field. Certain of the indicators require, for their compilation, the collection of items of basic data which have not so far been dealt with in the international recommendations. The Commission may wish therefore to request that further study should be undertaken to define the scope, coverage and content of the additional items of basic data required for the most important derived figures.

ANNEX  
MAJOR INDICATORS OF INDUSTRIAL ACTIVITY

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English  
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N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks	
			Current	Annual	Infrequent			
<b>1. Production</b>								
1 1	Output of individual products	In one or more physical units or/and in value terms.	+	+	(+)	In connection with a list of selected products some recommendations have been made by the Conference of European Statisticians WG 13/15.	It is recommended that self consumption by the statistical units of intermediate products should also be included. (This also applies to the indicators under No's 1 6, 1 7. Exact definitions of products and units are needed within each country. In cases where quality classes can be meaningfully identified the output of major individual products could be broken down and classified on this basis. The quantity and share of rejected products may also be noted.	
1 2	Stocks of major individual products	"	(+)	+				The level of stocks relative to output and sales may be examined as well.
1 3	Sales (shipments) of major individual products	"	(+)	+				Sales related to output and stocks may be examined as well (Output (1 1) and Stocks (1 2) with adjustment for intermediate products used inside the statistical unit gives sales (1.3).)
1 4	Sales of major individual products by groups of customers	"		+				The grouping of customers - 1) on a microeconomic level according to the needs of the enterprises; 2) on a macroeconomic level according to the main channels of total consumption, 3) for input-output tables according to the aggregation of the tables
1 5	Unfulfilled orders received by major individual products	"	+					A breakdown into domestic and foreign orders may also be used.
1 6	Rate of growth of output of major individual products	Based on data in physical units or/and in value terms	+	+				
1 7	Output per capita by major individual products	Based on data in physical units		+	(+)			Total output divided by number of inhabitants (population)
1 8	Value of gross output	See International Recommendations		+				International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev 1 and Series M, No 17, Rev 1, Add 1
1 9	Value added or value of net output	"		+				"
1 10	Index number of industrial production	See International Recommendations	+	+				Index Numbers of Industrial Production, Series F, No 1
1.11	Average rate of growth of industrial production per annum			+				Geometric mean of index numbers concerning several consecutive periods of time. The average rates may be calculated for various periods and compared by periods and branches and (internationally as well.
1 12	Total value of stocks of finished goods produced	See International Recommendations		+		International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev 1, and Series M, No 17, Rev 1, Add 1	See remark under 1.2.	
1 13	Total value of work in process	"		+		"		
1 14	Total value of sales		(+)	+		"	See remark under 1.3	
1 15	Total value of sales by groups of customers			+			See remarks as to the appropriate grouping under 1 4	
1 16	Total value of unfulfilled orders received		+				A breakdown into domestic and foreign orders may be used.	
<b>2 Resources (factors) of production</b>								
<b>Labour</b> <sup>1/</sup>								
2 1	Number of persons engaged	At a given date during the period and/or average over the period		+	(+)	International Recommendations in Basic Industrial Statistics, Series M, No 17, Rev 1, and Series M, No 17, Rev. 1, Add 1.		
1/ Also refer to the publication The International Standardisation of Labour Statistics ILO Statistics and Reports, New Series No 53								

No	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
2.2	Number of persons engaged by status groups	At a given date during the period and/or average over the period.		+	(+)	International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev. 1 and Series M, No. 17, Rev. 1, Add. 1.	Usual status groups working proprietors, unpaid family workers, homeworkers, employees.
2.3	Number of employees by functional groups.	"	+	(+)		"	Usual functional groups operatives, supervisory personnel, etc.
2.4	Number of employees by major occupations.	And/or number of persons engaged. At a given date during the period.		(+)	+		Occupations according to special skill and qualification acquired, e.g. electrician, mining engineer, turner, foundryman, etc.
2.5	Number of scientists and engineers.	Technicians also could be included. Number of persons employed and/or engaged. At a given date during the period.		+			The data may be related to the total number of employees or persons engaged. Exact definitions of the categories scientists and engineers are needed within each country.
2.6	Index number of industrial employment	Separately for operatives, for operatives and for total number of persons engaged. At a given date during the period.	(Operatives and employees only.)	+	(persons engaged)		The index numbers may be used on absolute figures from 2.1 and 2.3, or on figures obtained using sampling methods. Labour turnover rates may also be noted.
2.7	Number of employees as to whether nationals or aliens.	And/or number of operatives. At a given date during the period.		+	(+)		
2.8	Number of employees by sex	"		+			
2.9	Number of employees by age groups.	"			+		
2.10	Number of employees by type of school (educational institution) last attended	"			+		
2.11	Number of operatives by skill.			+	(+)		The usual grouping is skilled, semi-skilled and unskilled. Exact definitions of these categories are needed in each country.
2.12	Man-hours worked.	For operatives and for employees, also by major occupations.	+	+		International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev. 1, and Series M, No. 17, Rev. 1, Add. 1.	
2.13	Operative man-hours worked by normal time and over-time.		(+)	+			
2.14	Operative man-hours worked by wage-systems				+		A possible breakdown is payments by the hour, by the day, by the week or piece-work.
2.15	Operative man-days worked.	Data also by shifts.		+			An appearance during the day at the place of work, regardless of the time actually worked, will count as a man-day worked.
2.16	Average operative man-hours worked per day			+			Based on items 2.12 and 2.15 or on sampling methods. In addition sampling methods may be used to investigate also the causes of time wasted.
2.17	Average man-hours worked per week	Man-hours of operatives and/or employees.	(+)	+			Mostly calculated on basis of direct inquiries using sampling methods.
2.18	Average man-hours worked per year.	Man-hours of operatives and/or employees.		+			Based on items 2.12 and 2.3 or on sampling methods.
2.19	Total wages and salaries paid.	See International Recommendations	+	(+)		"	
2.20	Total wages and salaries paid, by functional groups	"	+	(+)		"	See item 2.3. If it is feasible it might also be useful to obtain a breakdown of wages and salaries corresponding to the breakdown of numbers of persons (items 2.4, 2.5, 2.7 - 2.11) by major occupations, by qualifications and schooling, by skill, by sex, by age and by nationality. This breakdown will facilitate the calculation of average earnings dealt with in items 2.21 - 2.27. Alternatively the data can be obtained by sampling methods.
2.21	Average earnings by functional groups.	Per week or month and per year	+	+			Based on items 2.20 and 2.3 or by using sampling techniques. Minimum and average wage rates may also be noted.
2.22	Average earnings per year by functional groups and as to whether nationals or aliens			+			Primary data obtainable from corresponding breakdown of items 2.20 and 2.3 or by using item 2.21 and sampling techniques.

N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
2.23	Average earnings per year by functional groups and sex			+			Primary data obtainable from corresponding breakdown of items 2.20 and 2.3 or by using item 2.21 and sampling techniques
2.24	Average earnings per year of operatives by skill and sex			+	(+)		"
2.25	Average earnings per year by major occupations and sex.			+			"
2.26	Average earnings per year by major occupations and age groups				+		"
2.27	Average earnings per year by functional groups and last school (educational institution) attended.				+		"
2.28	Distribution of number of employees by functional groups, skill and sex according to the average earnings per year			+			Similar distribution figures may be calculated by breakdown of items 2.22, 2.25, 2.26, 2.27 and 2.29
2.29	Average earnings per man-hour worked by functional groups and major occupations.			+			Based on items 2.21, 2.26 and 2.18 and/or data obtained by sampling methods
2.30	Index number of average earnings at current prices by functional groups	Average earnings per man-hour worked and/or per week or month and/or per year	+	(+)			Based on items 2.21 and 2.29. Similar index numbers of changes over time may be calculated based on items 2.22 - 2.27. Indexes based on weighted and un-weighted formulas should be calculated
2.31	Index number of real average earnings by functional groups		(+)	+			Index numbers of nominal average earnings (2.31) divided by index numbers of consumer's prices. Similar index numbers may be calculated also on items 2.22 - 2.27. Indexes based on weighted and un-weighted formulas should be calculated
3 Resources (factors) of production							
Natural resources and fixed assets.							
3.1	Confirmed reserves of major mineral products.	In physical units.		+	(+)		
3.2	Number of most important machines and equipment	"		+	(+)		One important group of key-machinery (power equipment) will be dealt with separately under items 3.10 and 3.11.
3.3	Distribution of major machines and equipment by technical characteristics.	Distribution of the number and/or the capacity of major machines and equipment			+		Degrees of automation are among the most important technical characteristics.
3.4	Capacity of major machines and equipment	In physical or sometimes in value units of output		+	(+)	International Recommendations in Basic Industrial Statistics, Series M No. 17, Rev 1.	Capacity is expressed as the maximum potential output per year and is calculated generally by multiplying the maximum potential calendar time (8760 hours per year) by the maximum potential output per machine hour. Alternatively instead of using the theoretical maximum potential time and hourly production, capacity may be calculated by multiplying the standard working time per year by the standard output per machine hour. This alternative also applies to items 3.6, 3.8 and 3.9.
3.5	Actual machine-hours worked by major machines and equipment.		+	(+)			This data may be gathered using sampling methods.
3.6	Extensive utilization of major machines and equipment (ratio of actual to maximum potential hours worked)		+	(+)	(+)		This data also may be gathered using sampling methods, which can also be used to investigate the causes of time wasted (work stoppages.)
3.7	Actual hourly output per machine of major machines and equipment	Mostly in physical units, sometimes in value units.	+	(+)			The data may be gathered using sampling methods
3.8	Intensive utilization of major machines and equipment (ratio of actual to maximum potential output per machine hour)		+	(+)	(+)		"

No	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
3.9	(Integrated) utilisation of capacity of major machines and equipments			+			Actual output per year related to maximum potential output per year, according to the capacity calculations (3.4). See remarks under 3.4 and 3.6. This indicator is the product of the indicator of the extensive (3.6) and the intensive (3.8) utilisation of the capacity.
3.10	Number and total capacity of power equipment installed	See International Recommendations.		+	(+)	International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev. 1, and Series M, No. 17, Rev. 1, Add. 1.	
3.11	Number and capacity of prime movers, electric motors and generators installed	"		+	(+)	"	Further breakdown by types and size of capacity may also be recommended. Indicators mentioned under items 3.2 - 3.9 can be calculated for these types of machinery as well.
3.12	Number of working places available for operatives in the first shift.	Either the number of working places available for all operatives or only the number of places available for working directly with the machines.		+	(+)		The number of working places must be calculated on basis of detailed definitions.
3.13	Utilisation of available working places			+	(+)		Utilisation is expressed as the ratio of the total number of operatives actually employed on all shifts related to the number of working places available on the first shift multiplied by the number of shifts possible. Alternatively the utilisation of places available for working directly with the machines can be measured. This indicator is to be considered as a rough measure of capacity utilisation.
3.14	Gross additions to fixed assets.	See International Recommendations.		+	(+)	International Recommendations in Basic Industrial Statistics, Series M, No. 17, Rev. 1, and Series M, No. 17, Rev. 1, Add. 1.	This indicator may also be calculated for major types of machinery in physical units. If adequate data are available on depreciation, net additions to fixed assets can also be calculated. Distribution of gross additions to fixed assets by branches, by geographic areas, by size and other characteristics of the enterprises may be investigated as well.
3.15	Total value of fixed assets.	Gross value and, if available, value net of depreciation as well. Also by major groups of fixed assets.		+	(+)		The collection of meaningful data on this item is extremely difficult. The valuation problems with respect to purchase price as against replacement price, and to depreciation are well known. Indirect calculations and estimations are often used. The major groups of fixed assets may be power equipment, transport equipment, buildings, improvements to land, other construction and land.
3.16	Depreciation of fixed assets	Total and also by major groups of fixed assets.		+			The collection of meaningful data is extremely difficult. Indirect calculations and estimations are often used.
3.17	Ratio of gross and net value of fixed assets	Total and also by major groups of fixed assets			+		Only if adequate data exists on the net value of fixed assets. This indicator is considered a rough guide to the obsolescence of the total stock of fixed assets.
3.18	Index number of volume of fixed assets			+	(+)		Based on data from item 3.15, if available, with the elimination of price changes.

N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
	<b>4 Resources (factors) of Production</b>						
	<b>Material and energy used</b>						
4.1	Quantity and value of individually important materials and fuels used	In physical units and/or in value terms		+		International Recommendations in Basic Industrial Statistics, Series M, No 17, Rev 1, and Series M, No 17, Rev 1, Add. 1.	In order to supplement foreign trade statistics it may be desirable to separate imported and domestic materials and fuels used
4.2	Quantity of electricity consumed	In physical units	+	(+)		"	It will usually be necessary to collect the details of electricity purchased, electricity self-generated and electricity sold
4.3	Quantity of electricity consumed by type of use	"		+			The breakdown of uses can be for 1) electric motors, 2) lighting, 3) other (technological use)
4.4	Quantity of total energy (fuels and electricity) consumed	Expressed in a fuel (coal) equivalent		+			
4.5	Distribution of total energy consumed, by types of energy	"		+			Coal, coke, wood, refined oil fuels, manufactured gas, natural gas, hydro-electricity, other electricity, other fuels (if electricity is imported it might be shown separately)
4.6	Total cost of materials and fuels used and purchased electricity consumed	In value terms		+	(+)	"	For input-output tables more detailed data are needed according to the sectors of the tables; for calculation of costs by individual products See also remarks under 4.1
4.7	Stock of individually important materials and fuels	In physical units and/or in value terms	(+)	+			
4.8	Total value of stocks of materials and fuels	In value terms.		+	(+)	"	"
	<b>5 Efficiency</b>						
5.1	Labour input per unit of output of major individual products.	Labour input measured by man-hours worked by operatives or/and by employees, output in physical units.		+	(+)	Some guidance concerning the calculation of labour productivity measurements was given by a joint meeting of the Conference of European Statisticians and ILO See Conf Eur Stats./WG 21/2, and Conf. Eur Stats /WG.21/5	5.1 and 5.2 are reciprocals of each other and are equally usual In many cases, as production is not usually homogenous, it will be difficult to isolate the labour input of individual products.
5.2	Output of major individual products per unit of labour input.	Labour input measured by man-hours and/or man-years worked (average number) of operatives or/and employees, output in physical units		+	(+)	"	"
5.3	Labour input per unit of value of output.	Labour input measured by man-hours and/or man-years worked (average number) of operatives or/and employees or persons engaged, output measured by value added or value of gross output, or contribution to GDP, etc.		+	(+)	"	5.3 and 5.4 are reciprocals of each other and are equally usual.
5.4	Value of output per unit of labour inputs.	"		+	(+)	"	"
5.5	Index numbers of labour productivity.	" Most usual types value added (or value of gross output) per man-hour worked by operatives and per operative and per employee.	+	(+)			Index numbers of labour productivity are calculated either 1) on the basis of index numbers of production and index numbers of employment (labour input) or 2) sometimes directly on the basis of data under items 5.3 or 5.4 or 3) more seldom (using the appropriate weighting system and sampling methods) on the basis of data under items 5.1 or 5.2 In addition as indexes based on these techniques are much influenced by structural changes calculation of standardized index numbers are highly recommended.
5.6	Average rate of increase of labour productivity per annum	See under item 5.5		+	(+)	"	Geometric mean of index numbers of labour productivity (5.5) concerning several consecutive periods of time. The average rates may be calculated for various periods and compared by periods and branches (and internationally as well).

No	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
5.7	Increase in output attributable to gains in labour productivity.	See under 5.5		+			Based on data 5.5, and 1.11. A simple method of calculation $\frac{I_{LP} - 100}{(I_{LP}-100) + (I_L-100)} \times 100$ $I_{LP}$ = Index number of labour productivity, $I_L$ = Index number of labour input (i.e. employment) More sophisticated methods of calculation are also available and are frequently used.
5.8	Share of total wages and salaries in the value of output	Value of output can be measured according to several gross or net concepts		+			
5.9	Capital/labour ratio (technical equipment of labour).	Capital can be measured by the total value of fixed assets or/and of machinery only. Labour can be measured by either the total number of operatives (or employees) or, preferably, only those employed on the first shift. Based on average or at given date of period figures.		+	(+)		For measuring changes over time capital must be expressed in constant prices and standardized index numbers are preferable
5.10	Capacity of installed power equipment per operative	This can also be based on the capacity of electric motors only. The number of operatives (or employees) can be the total number or, preferably, only those employed on the first shift. Based on average or at given date of period figures.		+	(+)		May be considered as a rough approximative measure of the capital/output ratio (technical equipment of labour). Since expressed in physical units, this indicator is more suitable for comparisons over time (and international comparisons) than item 5.9. If index numbers are used calculation of the standardized form is recommended.
5.11	Quantity of electricity consumed per man-hour worked by operatives	Total electricity consumed and/or consumed by electric motors only, alternatively total energy consumed. Labour input can also be measured in man-years and for employees (persons engaged)		+			See the remarks under item 5.10 (except the last one)
5.12	Capital/output ratio (Average capital/output ratio)	Capital total capital, gross value of fixed assets and/or of machinery only. Output value data according to several gross or net concepts		+	(-)		Reciprocal figures (output/capital ratios) are also usual. See remarks under item 3.15. For investigation of changes over time standardized index number formulas should be used
5.13	Incremental capital/output ratio (Marginal capital/output ratio)	Gross additions to fixed assets (see item 3.14) related to the increase in value added (or gross or net value of production)		+	(+)		This alternative is more often available than item 5.12 and therefore more frequently used. It is however less reliable being more subject to fluctuations and being influenced by the time lags involved before much investment is fully productive
5.14	Share of depreciation of fixed assets in the value of gross output			+			Meaningful data on the depreciation of fixed assets (item 3.16) are often not available
5.15	Profit/capital ratio	Capital measured by gross value of fixed assets or/and by total capital (i.e. including stocks and financial reserves)		+			Data to calculate this indicator often not available
5.16	Quantity of major individual materials and fuels used per unit of output of major individual products.	Mostly in physical units sometimes in value terms.		+			The reciprocal of this indicator is also used

N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
5 17	Quantity of major individual materials and fuels used per unit value of gross output			+			
5 18	Quantity of electricity consumed per unit of value of production	And/or quantity of total energy consumed, expressed in fuel equivalents Related to gross or net value of production or to value added.		+			
5 19	Share of total cost of materials, fuels used and purchased electricity consumed in the value of gross output			+			
5.20	Total cost of production			+	(+)		This is frequently not available from the data collected in industrial censuses and surveys.
5 21	Share of total cost of production in the value of gross output			+	(+)		By analysing changes over time the influence of price changes and structural changes should also be taken into account
5.22	Share of profit in the total value of gross output			+	(+)		This item is equal to 100 minus item 5.21. See remarks under 5.21. If the data are available, this indicator may also be calculated for major individual products )
5 23	Structure of costs of production	Several classifications of costs used in budgeting and costing procedures are applicable. Most usual breakdown wages and salaries, cost of materials, fuels, electricity; depreciation, taxes, other expenses		+	(+)		
5 24	Total cost of production per unit of output of major individual products			+	(+)		Generally used only on a micro-economic level. If influence of price changes can be eliminated comparisons over time in real terms may also be made.
5 25	Producer's prices by major products	With or without taxes (market prices)	(+)	+			Producer's prices must be collected according to the concepts applied to the valuation of production. These are required for the calculation of item 5.26.
5 26	Producer's price index number	"	(+)	+			
5.27	Purchaser's prices by major materials and fuels used, electricity consumed			+			Purchaser's prices must be collected according to the concepts applied to the valuation of inputs of material, fuels and electricity used. These are required for the calculation of item 5.28
5 28	Purchaser's price index number of materials and fuels used, electricity consumed.			+			
5.29	Rate of turnover of stocks of materials and fuels.	For major individual items in physical units and for the total in value terms		+			Materials and fuels used in the given period divided by the average stock (e.g. the mean of the stocks at the beginning and end of the period) of materials and fuels
5.30	Rate of turnover of stocks of finished goods	"		+			Sales of finished goods in the given period divided by the average stock (e.g. the mean of the stocks at the beginning and end of the period) of finished goods
5 31	Rate of turnover of working capital.			+			Value of gross output divided by the value of working capital (includes value of stocks of materials, fuels, work in process and finished goods and cash in hand)



N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
5.32	Total expenditures on industrial research and development.			(+)	+		Adequate definition and collection of the primary data needed is often hardly practicable. Breakdown of these data by sources, uses, branches etc. may be useful. The data can be related to value added.
5.33	Persons engaged on industrial research and development			(+)	+		Adequate definition and collection of the primary data needed is often hardly practicable. Breakdown of these data by branches etc. may be useful. The data can be related to total persons engaged.
5.34	Share of products of higher quality in the total output of the given products.	Mostly in physical units, sometimes in value terms.		(+)	+		This is possible only when the quality of the product can be adequately classified.
5.35	Share of output of products produced by technologies of higher efficiency in total output	"		(+)	+		This is possible only when the given technologies can be adequately classified and compared, and output by each given technology can be identified.
5.36	Distribution of major machines and equipment by age.	In physical or value terms. Age measured by years of production or installation.			+		Considered a rough indicator of technical level of machinery
5.37	Degree of mechanization and automation of labour.	Concerning single processes of production and/or the total production activity.		(+)	+		Measured by share of mechanized (automated) labour input in total labour input. A precise definition of mechanized and automated labour is needed. Use of sampling methods may be recommended
5.38	Degree of mechanisation and automation of production.	"		(+)	+		Measured by the share of mechanized or automated output in total output. A precise definition of mechanized and automatized production is needed
5.39	Number of patents issued during the period			+			As the significance of each individual patent can not be taken into account by adequate weighting, this indicator can be considered to be only a very rough guide to technical progress.
<b>6. Other characteristics of the industrial sector<sup>2/</sup> and its role in the economy.</b>							
6.1	Share of industry in the GDP (or national income) of the whole economy.	With and without mining.		+	(+)		Changes over time of this share may be examined both in current and in constant prices. (International comparisons may be highly influenced by different relative prices within each economy).
6.2	Share of industry in the number of persons engaged in the whole economy	" Also share related to the total labour force.		+	(+)		Comparable both over time and internationally. Highly influenced by relative level of labour productivity
6.3	Share of industrial exports in the total exports of the economy.	With and without mining.		+	(+)		See remarks under 6.1
6.4	Share of industrial labour in total labour incorporated into the goods and services exported by the economy.	"			+		In order to indicate the contribution of industry to exports this item is preferable to item 6.3. It can be calculated with the help of labour inputs per unit of output and the inverse matrix of an input-output table.
6.5	Distribution of value added (or net value of production) in industry by types of ownership and forms of operation.	A breakdown according to the main branches of the industry may also be recommended.		+	(+)		This and the following indicators characterising the structure of the industry from several points of view can be combined with each other in many ways, only some of those will be mentioned under the following items
6.6	Distribution of number of persons engaged in industry by types of ownership and forms of operation.	"		+	(+)		

<sup>2/</sup> As mentioned in the introduction to this table construction (ISIC division 4) has not been included.

N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
6.7	Distribution of value added (or net value of production) in industry by geographic areas.	With and without mining. A breakdown according to the main branches of the industry may be recommended too.			†		
6.8	Distribution of number of persons engaged in industry by geographic areas	"		†			Changes over time based on this indicator may be evaluated as well.
6.9	Distribution of number of industrial establishments by geographic areas.	"			†		"
6.10	Distribution of value added in industry by branches	Distribution of gross and/or net value of production may also be examined.		†			By comparisons over time (and international comparisons) changes (differences) of relative prices must be taken into account.
6.11	Distribution of number of persons engaged in industry by branches.	Distribution of employees and/or operatives may also be examined.		†			Can be easily compared both over time (and internationally) but the comparisons are highly influenced by the relative level of labour productivity
6.12	Distribution of value of fixed assets by branches.				+		
6.13	Distribution of gross additions to fixed assets by branches			†			
6.14	Distribution of value added (or net value of production) in industry by size-classes of establishments.	The size-classes of establishments measured by value added and/or by number of persons engaged and/or by installed capacity of power equipment.		(+)	+		This indicator characterises the concentration of production. For the same purpose the share of 3, 5, etc. largest establishments in the branch total may also be observed. Sometimes size-classes of enterprises are used.
6.15	Distribution of number of persons engaged in industry by size-classes of establishments.	"		(+)	+		"
6.16	Distribution of number of industrial establishments by size-classes of establishments.	"		(+)	+		"
6.17	Distribution of fixed assets of industry by size-classes of establishments.	"			+		"
6.18	Distribution of capacity installed of power equipment of industry by size-classes of establishments.	"			+		"
6.19	Level of labour productivity by size-classes of establishments.	Labour productivity measured according to indicators 5.1 - 5.4			+		If labour productivity figures may be considered reliable indicators of efficiency, these figures may be used to evaluate the impact of concentration on efficiency.
6.20	Number of factories producing the same products.				+		An approximative indicator of specialisation. The concepts of "same product" and "different type of product" require an exact definition, which is extremely difficult.
6.21	Number of types of products produced by the same factories				+		"
6.22	Share of total output in each branch of industry, which consists of products properly classified to that branch.				+		This is applicable where the establishment (or enterprise or local unit) is the statistical unit utilised. Usually the output of these units is not homogeneous and contains secondary products which do not properly belong to the branch of industry to which the establishment, by virtue of its main product, is classified. This measure then gives some indication of the degree to which establishments specialise in the production of their main product

N <sup>o</sup>	Name of Indicator	Alternative Types of Measurement and Units	Recommended Frequency			International Recommendations	Remarks
			Current	Annual	Infrequent		
6.23	Share, of total output of a given product, which is produced by establishments engaged mainly in its manufacture.				+		This is also applicable where the establishment (or enterprise or local unit) is the statistical unit utilised. Usually a part of the total output of a given product is manufactured in establishments in which it is the chief product and part is manufactured in establishments in which it is a secondary product. This measure is an indication of the degree to which a given product is manufactured by establishments specialising in that product.

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