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19 July 1982

East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

No. 2295

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YUGOSLAVIA

GDR-USSR STANDARDIZATION EFFORTS FOR 1980'S OUTLINED

East Berlin STANDARDISIERUNG UND QUALITAET in German No 4, May 82 (signed to press 15 Apr 82) pp 152-153

[Article by Dr K.-H Paepke, Office for Standardization, Measurement and Quality Control: "Basic Direction of Cooperation Set for This Decade"]

[Text] ". . . It is inconceivable today that any socialist country undergoes stable development without relations with the fraternal countries and solves such problems as energy and raw materials supply, and the introduction of the newest findings of science and technology."

This statement from the report to the 26th CPSU Congress strikes the core of the socialist economic integration among the CEMA countries. For the stable economic development of the GDR, too, the further deepening and expansion of the fraternal cooperation with the USSR and the joint mastery of the new conditions of the 1980's is a prerequisite for securing a high increase in economic performance.

The decades-long joint work in the area of standardization has already borne rich fruit. Thus, on the basis of bilateral agreements or economic treaties on economic and scientific-technical cooperation, more than 900 state standards of the GDR were unified with those of the USSR on a bilateral basis. Together with the 2,350 standards which have been worked out within the CEMA, they support cooperation and commodity exchange especially in electronics, machine tools, tools, metallurgical and electrical products, as well as medical instruments. Through the standardization work of the past years, not only the retooling and follow-up tooling expenditures for electric household appliances, electric products for motor vehicles, cranes or construction machinery. They also resulted in higher quality and reliability for mutually-supplied products--for example, spark plugs, headlight inserts, measurement devices, rolling stock and medical instruments.

With the "Program of Cooperation and Specialization of Production Between the GDR and the USSR to 1990," the basic directions and areas of cooperation for the 1980's have now been staked out. For the realization appropriate agreements were or are still being concluded between the central organs responsible for cooperation and specialization and their partners. In so doing, the increase of the scientific-technical level, the quality and stability of mutual deliveries of goods, the reduction of production consumption, the better refinement of the imported raw

goods and equipment, and the concentration on the crucial points of the national economy which determine the scientific-technical progress of both countries are the things that matter. The Standardization, Measurement and Commodity Testing Office and the GOSSTANDART [State Committee for Standards of the USSR Council of Ministers], too, have agreed on the main directions of cooperation in the area of standardization and metrology to 1990 according to these cardinal points.

The foundation of the scientific-technical cooperation of both organs is the government agreement on the unification of state standards of the two countries and the government agreement on cooperation in metrology. Both sides orient their work towards the support of the measures of specialization and cooperation through the development of joint standards within the framework of the research and development tasks to be carried out or through the unification of existing standards, so that at the time of the beginning of the measures the necessary standardization work has been concluded and the cooperation or specialization objects are realized on their basis between the two countries. Practice has demonstrated: The best results of bilaterial standardization work were achieved where they were realized as a component of research and development tasks or reconstruction projects. These include, for example, such measures as joint research tasks and experimental tests in the construction of diesel engines, which resulted in the development of standards, the improvement of the mass-performance ratio of four-stroke diesel engines, and the saving of development costs. Another example is the further development of construction groups of rolling stock construction, which results in an improvement of the reliability demands and diagnosis system.

The standardization takes place pre-eminently for those types of products that are traded in significant volume between the two countries. Included in these are also the joint development and production of measuring devices for quality control, the creation of a basis for standards, and the securing of the uniformity of measurements.

As far as measuring devices are concerned, there is a strong expansion in the mutual exchange of goods because of the demands in regard to quality tests. In order to reduce the testing expenditures for the importer and exporter, the Standardization, Measurement and Commodity Testing Office has concluded bilateral agreements concerning the mutual recognition of the state control of measuring devices with the majority of CEMA countries. The economic utility lies in the furnishing of measuring devices of a high scientific-technical level, in the saving of control fees, as well as considerable costs for the introduction of qualifying tests on the part of the importer. Between the GDR and the USSR there was an increase every year in the list of state tests of measuring devices to be mutually recognized and thus the cooperation in this field for mutual benefit.

The decisions of the SED Politbureau in regard to the direction and planning of science and technology, as well as in regard to the assessment of the visit of comrade Marchuk, deputy chairman of the USSR Council of Ministers, in the GDR, proceeding from the analysis of the work up to now and the requirements of the tasks confronting us, require

--a stronger concentration of the joint standardization work on such areas which make the greatest contribution to the growth of output of the national economies of both countries,

--a strong connection of the elaboration of unified standards with joint tasks for the development of new products and processes in order to transfer the scientific-technical results immediately into production,

--the reception of characteristic values in the unified standards which correspond to the advanced international level, for the reduction of energy and materials expenditure and for the increase of quality and reliability of the products.

With the deepening of the scientific-technical cooperation required by the program of specialization and cooperation, the unification of standards of the two countries for the intermeshing of the economies, for the joint development of products and processes, for the expansion of cooperation and specialization in production and research, as well as for the increase of the reciprocal exchange of goods, receives increasing significance. Therefore it is absolutely necessary to coordinate the standardization work between the two countries on a long-term basis. Its tempo and economic effect must be substantially increased. Thus the unification of standards will orient itself pre-eminently towards standardization in industrial robot technology. That means, universally insertable building groups and building components are created which are exchangeable and rationally manufactured. The quality requirements, testing and acceptance conditions for them are set down in standards. Standards are to be worked out for microelectronics to secure the compatibility and exchangeability of building elements and building groups, in particular for microprocessors. An important complex is also comprised of standards for the numerical guidance systems for machine tools and industrial robots.

In order to be able to make uniform assessments of the quality and quantity of raw materials and synthetic materials, finished products and energy carriers, the standardization of testing devices and testing methods is being accelerated. At the same time, the mutual recognition of state tests of measuring devices is to be expanded, in connection with which the industrial ministries of both countries are included to a greater extent. Both countries regard it also as expedient to begin the development and production of measuring devices for automated technological processes on the basis of a division of labor and thus to close gaps in quality control devices and processes.

To fulfill the goal formulations of the economic strategy of our national economy with a sense of responsibility and personal involvement requires a coordinated and long-term incorporation of the powers of the GDR and the USSR in the solution of scientific-technical problems. The criterion for effectiveness is the contribution to the increase in output of the national economy of the native country, the execution of the specialized processes in research and production with the goal of attaining a higher volume and top outputs in the exchange of commodities between the two countries. A challenge to researchers, developers, design engineers, and planners.

8970
CSO: 2300/ 291

ERRATUM: The following translation, which originally appeared on pages 1-4 in JPRS 81081 of 18 June 1982, No. 2283 of this series, is being republished to correct the table on its last page.

CEMA COUNTRIES SEEN UNABLE TO MEET FIVE-YEAR PLAN GOALS

Zurich NEUE ZUERCHER ZEITUNG in German 23 Apr 82 p 15

[Article signed 'oo': "Unrealizable CEMA Five-Year Plans: Weak Economic Growth--Stagnating East-West Trade." A translation of an article on a related subject by the same author is published under the heading, "Debts to West Seen Limiting Economic Growth," in JPRS 80398, 24 Mar 82, No 2249 of this series, pp 23-25]

[Text] After the failure of the CEMA countries' five-year plans for the period from 1976 to 1980, attainment of the targets set for the period from 1981 to 1985 appears unlikely. For economic growth within CEMA declined from 2.7 percent in 1980 to a mere 1.6 percent in 1981, which is attributable above all to the extraordinary slump in Poland (-13 percent). In 1982, the CEMA economies--excluding Poland--are supposed to expand by 3.1 percent. In 1981 the investment volume of the states of the "red community"--excluding the USSR--declined or showed a stagnating trend. The development of private consumption likewise was unsatisfactory. East-West trade--calculated after adjustment for inflation--declined and the trade balance deficit of the CEMA states increased from $3.1 billion (1980) to $3.9 billion. These are the most important findings of a seminar of the Viennese Institute for Comparative Economics, which studied the development of CEMA in 1981 and the prospects for 1982.

Setbacks Everywhere

Aside from the setback in Poland, the weak economic activity in the CEMA countries is attributable to the slowed growth of the GNP in the CSSR and in Romania. The key factor in regard to the disappointing overall results in the USSR was the further production decline in the agricultural sector (-2 percent), which thus showed a drop in output for 3 years in a row. In the CSSR, the diminished expansion of the GNP from 2.9 percent in 1980 to 0.2 percent in 1981 is attributable not only to the poor results in the agricultural sector, but also to the reduced growth of industrial production (2 percent as against 3.5 percent in 1980).

In Romania, where agricultural production in 1981 showed a decline for the second year, the overall economic decline (from 2.9 to 2.1 percent) was due above all to the sharp reduction in industrial expansion (from 6.1 to 2.6 percent). The curbing of investments and of Western imports, which were enforced by the high level of indebtedness, resulted as early as 1979 and above all in 1980 in a drastic decline in industrial growth.

As regards Bulgaria, on which country data concerning the 1981 GNP are not available, the industrial and agricultural results reported suggest that the planned growth rate of 5 percent (as against 5.7 percent in 1980) has been attained. An equally sharp rise in the GNP was reported in the GDR. In Hungary, the GNP last year showed a slight increase (+1.8 percent) after a slight decline (-0.8 percent) in 1980; with agricultural production stagnating, this was attributable above all to the moderate growth in the industrial sector (2.3 percent as against -2.1 percent in 1980).

With the exception of the USSR, where the investment volume has increased by 3 percent, there has been stagnation or decline in investment activity, and the development of private consumption has been unsatisfactory on account of the poor results in the agricultural sector and the decline in consumer goods imports. In order to prevent total collapse of the supply situation, Poland has strictly regulated--since the beginning of 1981--the distribution of foodstuffs; so far, however, it has not been able to achieve any marked improvement. Romania likewise has been confronted with serious shortages. Other CEMA countries such as the USSR have not been able fully to meet demand.

By contrast, the consumer market in Hungary has been distinguished by a broad product assortment, with the income-related price level exceeding that of the other CEMA states; the development of private consumption, which in Hungary is stagnating at the 1979 level in spite of a slight recovery in comparison with 1980, is being curbed by a restrictive wage policy.

Several CEMA countries in 1981 reported a continuing rise in retail prices. Aside from the special case of Poland, where the 1981 inflation rate amounted to 25 percent, retail prices--according to official data--showed the following increases: Hungary, 4.6 percent; Romania, 3.1 percent; CSSR, 0.8 percent. As regards Bulgaria, which in 1980 registered an inflation rate of 14 percent, no data are available for 1981.

The present policy of stable retail prices, which has been made possible through increasing state subsidies, can be maintained only in the USSR and in the GDR. But even these two countries have registered price hikes: in the Soviet Union, primarily in the kolkhoz markets, and in the GDR, for choice consumer goods. However, these two categories are not covered by the consumer price index.

Energy Shortages

With the exception of Poland, which did not draw up any plan for this year, the plans for 1982 provide for approximately the same rate of economic growth (3.1 percent). In all of the CEMA countries, however, the projected GNP increases are below the targets of the current five-year plans and this goes for industrial production as well. In the CSSR and in Hungary in particular, the GNP will show only modest increases (0.5 and 1-1.5 percent, respectively). All of the CEMA states will continue in 1982 radically to restrict the investment volume so as to be able to maintain as much as possible the current consumption level. The investment volume will be absolutely reduced (CSSR, Poland, Hungary, USSR) or it will increase more slowly than the GNP (Bulgaria, GDR, Romania). As has been the case for many years, the investment activity is focused on the energy sector and on projects already started. Modernization of existing installations is another area of concentration.

In all of the CEMA states, economic growth is hampered above all by energy bottlenecks. According to unofficial reports, the USSR has in 1982 reduced its oil shipments to the satellite states by at least 10 percent; only Poland is to receive the usual volume. The situation is aggravated by the reduction of Polish coal shipments, the discontinuance of Romanian power exports (to the CSSR) and delays in the expansion of nuclear power plants. For this reason, all of the CEMA states attach great importance to energy economy. Through higher consumption norms, price hikes and stricter controls, they want to enforce efficient and economical use of these important production factors.

While the volume of intra-CEMA trade--calculated at current prices--increased in 1981 by 10 percent, the dynamism of East-West trade declined. The exports of the European CEMA states to this area increased by a mere 4 percent (1980: 23 percent) to $45.8 billion, whereas imports increased by 4.3 percent (12 percent) to $49.7 billion. In real terms, both sides registered a decline. The CEMA countries' trade balance deficit vis-a-vis the West increased from $3.1 billion (1980) to $3.9 billion in 1981. Even in nominal terms, the small CEMA states registered a decline of trade with the West, which is attributable above all to the slump in Poland: East Europe's exports to the West declined by 0.6 percent to $21.5 billion and imports decreased by as much as 5.9 percent to $24.2 billion. In Poland alone, Western imports declined by approximately 28 percent; in Romania, by 19 percent, and in Hungary, by 7 percent. But even the CSSR--a country distinguished by low indebtedness vis-a-vis the West--reduced Western imports by 4 percent.

In contrast to 1979 and 1980, the exports of the USSR increased last year much more slowly than did its imports. The marked decline (8.7 percent as against 27 percent in 1980) is attributable primarily to the reduced demand for oil and petroleum products in the West and to the stagnating oil prices. The rather sharp increase in imports (+15 percent) is a result of the crop failure, which necessitated increased imports of grain and feedstuffs. With Soviet export to the West totaling $24.3 billion, and imports, $25.5 billion, the trade balance deficit amounted to $1.2 billion. In 1980, Moscow was able to realize a slight surplus ($202.7 million) in its trade with the West. The small CEMA countries reduced their trade balance deficit from $3.3 billion in 1980 to $2.7 billion in 1981.

Foreign Trade as a Burden

The East-West trade prospects for 1982 are not very favorable. And the intra-CEMA trade, which in 1980 amounted to approximately 53 percent of the Soviet Bloc's total commodity exchange, is likewise affected by the economic slump of the various economies involved. Regarding the further intensification of "socialist integration," which is emphasized in the plans for 1982, the preconditions are rather unfavorable. The strained situation concerning the current-accounts balance of the small Eastern Bloc states vis-a-vis the West and also vis-a-vis the USSR and the increasing demand for investments in the energy sector appear to be the main factors in regard to the lack of further joint large-scale projects in the next few years. Another negative factor in regard to economic relations is the crisis in Poland. So far, Poland has not been able to contribute--through a new five-year plan--to a coordinated CEMA cooperation program. The diminished supply capacity and the necessary changes in Poland's demand situation necessitate revision of the CEMA partners' economic plans. It is not only in regard to coal and other raw materials such as sulfur or copper, but also in regard to machines and equipment--the production of which is dependent on Western supplies--that Poland does not fully meet its delivery obligations. And on account of Poland's discontinuance of investment in other projects, long-standing orders of producer goods have been canceled. Thus this year foreign trade will strain rather than boost the development of the CEMA economies.

Table. Key CEMA Economic Indicators

	Average Yearly Growth Rate in Percent						
	1976-1980	1979	1980	1981 Plan	1981 Actual	1982 Plan	1981-1985 Plan
East Europe (excl. USSR)							
GNP[1]	3.8	2.3	1.0[2]	4.6[3]	-2.0[2]	3.4[3]	3.1—3.8
Gross industrial output	5.5	4.4	2.7[5]	4.8[3]	-1.1[5]	4.4[3]	3.5—4.2
USSR							
GNP[1]	4.2	2.2	3.5	3.4[4]	3.1	3.0[4]	3.4
Gross industrial output	4.4	3.4	3.5	4.1	3.4	4.7	4.7
CEMA							
GNP[1]	4.1	2.2	2.7[2]	3.7[3]	1.6[2]	3.1[3]	3.3—3.5
Gross industrial output	4.7	3.7	3.3[5]	4.3[3]	2.1[5]	4.6[3]	4.3—4.6

1. Net material product
2. After exclusion of Poland in 1980: East Europe 3 percent, CEMA 3.4 percent;
   1981: East Europe 2.8 percent, CEMA 3 percent.
3. Excluding Poland
4. Appropriated GNP
5. After exclusion of Poland in 1980: East Europe 3.9 percent, CEMA 3.6 percent;
   1981: East Europe 3.5 percent, CEMA 3.4 percent.

CHANGES DUE TO MANAGEMENT COMPUTERIZATION DISCUSSED

Prague HOSPODARSKE NOVINY in Czech 14 May 82 p 7

[Article by Eng Emil Kotoul, Candidate for Doctor of Science, Kosire Industrial Automation Factories: "Producer and User; Automated System of Enterprise Management"]

> [Text] Effective management is no longer thinkable without sophisticated computer technology. At the Kosire Industrial Automation Factories concern enterprise and its production plants, computer technology is not only produced, but also widely used. Within the framework of this automated management system, internal enterprise management is being rationalized gradually as well.

The improvement of the management system with the help of the computer technology has its own tradition as well as its own demanding future tasks at our enterprise. In recent years, we have given priority to the building of an automated management system for our factories with a technical base of third generation computers such as the EC 1021. The existing automated management system corresponded to the technical and systemic possibilities of the computer. It has covered, with a certain degree of complexity, the requirements for the automation of managerial and informational processes in our factories, and also contributed to the rationalization of their management system.

Preconditions

From the viewpoint of an automated enterprise management system, our current approach represents a beginning phase with its typical characteristics, among which are incomplete data bases, information processing in batches, a traditional method of data collection and a relatively extensive combination of manual and automated information processing. Every enterprise, of course, must go through this phase, if it wants to create conceptually at lower organizational levels the inputs for automation at a higher managerial level, i.e., the enterprise level.

We are linking the further development of our automated management system with tasks which came about as a result of the VHJ [economic production unit]

reorganization of 1 January 1981, and in this connection with the basic expansion of our enterprise, which is now a concern enterprise. For the assurance of these tasks, it will be necessary, among other things, to create a rationally ordered system of enterprise management in which an automated management system will occupy a significant place. There is the matter, for instance, of the relatively stable allocation of managerial functions and activities among the divisions of the enterprise and of the factories. In connection with this, it will be necessary to decide in which areas of the system management will exist on the enterprise level, and in which areas on the factory level. Development is tending toward the centralization of some managerial and performance activities at the enterprise level.

All of these changes in the enterprise management system can come about only through a close mutual interaction between an automated management system and a number of developmental steps in the managerial sphere of the enterprise. The direction and tempo of development of management are dependent on the technical and systemic possibilities of a new line of computers and the applications software which has been prepared for them. Management will clearly also be influenced by pressure to rationalize administrative work and reduce the extent of the managerial and administrative staff.

The realization of these intentions presumes more advanced forms of an automated enterprise management system which we are linking with the introduction of the third and a half generation computer, the EC 1025, equipped with modern peripherals and the capacity for the semiautomatic collection and transmittal of data. Only with this technical equipment, and after mastering the first phase of the building of an automated enterprise management system, can we move on to the creation of a central data base, to real-time information processing, to the eventual hooking up of managing and managed locations to the computer, and the linking of factory satellite computing centers with the central enterprise computer.

We have already for some time been preparing the organizational, technical and methodological bases for such an automated management system, and these bases are now present in the entire managerial mechanism of the enterprise. In this connection, we first had to place the factories on about the same organizational and managerial level. The MARS application program (for small automated management system) helped us considerably in this. The MARS program is a generic one and represents for an engineering enterprise a comprehensive system which covers the automation of critical management areas.

Through the broad application of generic design solutions, and with the introduction of EC 1021 computers at three factories, we achieved significant savings in our needs for designers of automated management systems and for programmers. Our calculations indicate that it is possible to save in this manner Kcs 4-6 million on every automated management system in comparison with the use of our own designers. We are also using applications software for the development of automated enterprise management systems. This year the MARS system programs (multilevel management system) will be tested on our data systems for the EC 1025 computer.

Data

Furthermore, we have had to reach the same automation levels at the factory, operation, workshop and workplace levels of management, and thereby create the conditions for management integration with the help of unified data bases. This will make it possible in the future to hook up factories to the automated enterprise management system. In the conceptualization of this objective, we began from the fact that it is possible to reduce to algorithms almost all of the managerial and information processes of the lower elements of the internal enterprise organizational structure. This is based on primary information concerning a product and production resources, on norms and standards, on information concerning employees. For the most part it is a matter of data of a mass character.

We consider the key place in the automation of management to be activities connected with the ordering and actualization of that data which has a relatively permanent character for the enterprise. This forms the normative base for the enterprise. It serves for all calculations related to planning, budgets and documentation.

Information in the normative base concerns the technical parameters of products and of technical procedures which are the bases for establishing consumption standards for labor value added and labor content. We devote attention to input information of a normative character right in the construction offices and at technological workplaces at the stage of preparation of the test series. From these stages we use norms as the building blocks for all automated calculations.

The normative base in our enterprise has been constructed in a unified way in all factories, and is based on the same principles, yet is utilized in a decentralized fashion for factory management. There it is used to the full extent for the planning and management of production as well as for calculations and for budget-related tasks.

A quality normative base is a precondition for the broad application of automation in all areas where there is a need for the processing of aggregated data. An automated system has shown itself capable of taking over and replacing simple administrative tasks, for instance, the movement of material for documentation purposes, wage calculations, calculations of operative documentation, but also certain managerial functions, such as in the area of operative planning and management of production, the industrial distribution system, etc.

We have achieved a high level of automation in critical areas of management, such as the technical preparation for and the operative management of production, supply, marketing and work and wage accounting. These are important steps for a further stage in automation which, however, especially in view of the capacities of third and a half generation computers, cannot be accepted without a critical evaluation with a view to their final effect on the enterprise.

We have confirmed, you see, that computer centers in factories often provide users with information which is not used too much. The problem is that some information is fully usable only for decisionmaking at higher management levels and less so for the factories, which have neither the adequate capacity nor authority to make use of it.

Centralization

We have also confirmed that in certain instances processing on a computer would be more costly than the assurance of an activity by the current method. This is true, for instance, for invoicing, where if we were to automate, without basic changes, decentralized sales in factories, the cost for the preparation of a single invoice would amount, according to our calculations, to Kcs 820. This is, understandably, out of the question. Certainly, in addition to computers there exist moderately mechanized resources which are well able to carry out certain activities, and even to automate some functions, thereby also speeding them up and making them easier. Similar cases must be resolved through a change in the organizational structure of the enterprise and the organization of management. The deciding factor, however, is the final contribution to the enterprise.

Also at the enterprise level, significant importance is attached to the building of centralized, enterprise controlled and actuated normative bases which are to become the pillar for a unified data base for the enterprise. Direct access for the enterprise to primary normative information which so far has been utilized comprehensively in factory management systems will open the way to automating and rationalizing the enterprise management system as a whole. Top priority will be given to utilizing centralized data bases to increase the quality and make more precise the system for the breakdown of the plan for internal enterprise divisions.

Broader space for the utilization of normative data for standardization, for technological designing and the optimization of production scheduling is gained likewise at the enterprise level. The objective, within the framework of the enterprise, is the standardization of the formation of fixed orders of material utilization (material standards), of produced components within the framework of their unified classification systems, of production equipment, machinery and tools.

The existence of these enterprise standards must be expressed in the computer memory as a set of information. In addition, it must be evident as well during the unification of procured components and the centralization of the procurement of critical material components, in the specialization of the production of parts, the deepening of cooperative relations among factories, with the objective of greater utilization of machinery, equipment, etc.

In certain areas of management, an individual approach by factories is essential. This is true, for instance, when breaking down a plan by workplace, during organizational work and when mobilizing employees to fulfill tasks. Certain activities, however, may be rationalized at the factory only by shifting them to the enterprise.

Thus, for instance, through analysis we determined that of 15,000 material components, about 400 make up 85 percent of annual material consumption in an enterprise. A solution suggests itself: centralize the procurement of these components for the factories in the enterprise and for the other components coordinate the use of warehouse inventories at the factory level. The direct management of the procurement of selected components and the gradual utilization of enterprise materials standards has been supported by a number of measures of our supervisory VHJ. The means for handling the problem of managing procurement in conjunction with the standardizing and regulation of inventory development is a single, or unifying materials price list, the function of which is the unification of planning and of documentation throughout the entire concern.

If the requirements placed on an automated enterprise management system are to be fulfilled, the material conditions must be created for its implementation, and the professional sophistication of designers and user must be raised. We demand of them a comprehensive knowledge of enterprise management and an understanding of national economic problems. These employees often have, you see, a tendency to follow technical and systems views of problem solving, meaning that the content aspects of the concrete needs of management can escape their attention.

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CSO: 2400/279

IMPORTANCE OF FUEL AND ENERGY RATIONALIZATION VIEWED

Prague STROJIRENSTVI in Czech No 3, 1982 pp 129-133

[Article by Eng J. Fiser, ScC, director of Power Research Institute in Prague: "Rationalized Consumption of Fuel and Energy--An Important Precondition for National Economic Development"]

[Text] The complex situation with supply, conversion, transport and exploitation of energy is not idiosyncratic for the CSSR. The turbulent development in consumption of energy sources is causing serious problems to power engineers all over the world. The constantly growing consumption of energy in absolute values as well as in conversion per citizen stems from numerous objective causes which have already been adequately publicized.

Many prognoses presented in the world deal with the future growth of energy consumption in the world. All of them attempt to prove that the primary problem in supply of necessary goods for the population of a country depends on adequate amounts of power for the production of those goods.

Figure 1 illustrates the process of production of primary sources of energy as estimated by a study conducted by the Conservation Commission (WEC). The only hope for expansion of the sources of primary energy after the year 2000 concern coal and nuclear power, while the sources of crude oil and natural gas will be declining. It will be increasingly more difficult to expand mining and exploitation of coal resources because of the growing demands on mining and transportation. The increment in energy consumption must be covered primarily by nuclear power; the limited sources of uranium will sooner or later lead to the use of fast breeding reactors. It will be necessary to overcome the psychological and political barriers placed in the way of the use of nuclear power, not to mention its great demands on investments, which may become a serious drawback.

The energy situation in the CSSR resembles the world situation in many ways but is even more complicated because new sources of energy are derived from the limited domestic coal supplies. Domestic resources of crude oil and natural gas are all but nonexistent and we are practically completely dependent on imports; in relation to our existing industrial base our domestic resources of raw materials appear inadequate.

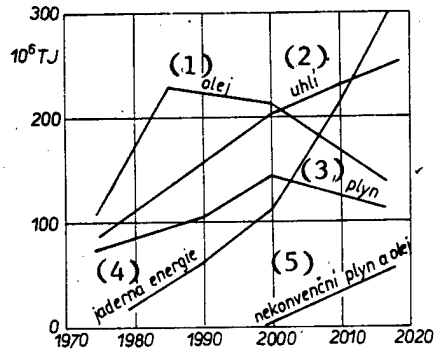

Figure 1. Annual world production of primary energy from fossil and nuclear sources according to the WEC Conservation Commission

Key: 1. Oil
2. Coal
3. Gas
4. Nuclear power
5. Unconventional gas and oil

The strategic objectives in the development of the Czechoslovak energy system have been essentially determined. The increments in energy resources are contingent on the development of nuclear engineering. Domestic fuels to supply our economy must be produced in economically most expedient volumes. High-grade energy carriers must be curtailed as sources of fuels and energy as much as possible and all types of power must be converted to the highest possible values. External circumstances, especially the skyrocketing prices of energy and raw materials, have quantified the initial proconditions for projections in the framework of the outlined strategy and for that reason, all long-range outlooks presented thus far must be regarded as potential developmental variants subject to initial conditions in the situation from which they have evolved, and thus, also as certain iterative steps leading to gradual specifications of the potential development of national economy as a whole. The time has come when the needs of power engineering on the one hand and on the other, the potential for the production of other national economic partners and last but not least, the linkage with the conditions in international trade must be most painstakingly weighed. One of the previous prognoses for the development of the Czechoslovak power system suggests, for instance, that during the 1980-2000 period our national income may increase 3 to 4.2 percent (I should like to mention for comparison that our average national increment during the 1960-1980 period amounted to approximately 4.6 percent). Of course, the values for the period of development prior to the year 2000 are not definite and further specification without doubt will modify them.

Figure 2 presents one of the elaborated variants of the primary fuel and energy resources used in the CSSR before the year 2000. Individual curves follow approximately the same direction as the corresponding curves in Figure 1, albeit for somewhat different reasons. For the control of primary sources of fuels and energy (PEZ) in the CSSR it is typical that the production of

solid fuels will not rise after 1990, unlike world projections. Until about 2000 will remain on the same level, after 2000 it will decline at first slowly, then rapidly. With its supplies limited, coal cannot be produced in volumes larger than the necessary supplies to the greatest consumers during their service life. Oil imports will stagnate in the greatest probability until the year 2000 after which it will presumably decline. Projections for imports of natural gas are not essentially different.

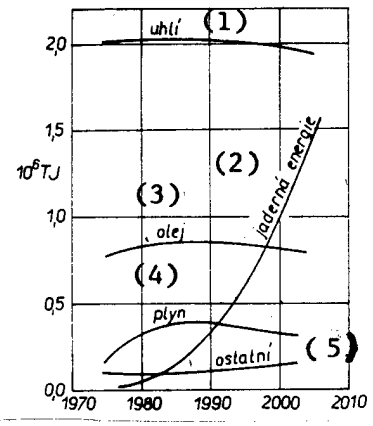

Figure 2. Total resources of fuels and energy used in the CSSR (according to sources from early 1980)

Key: 1. Coal
2. Nuclear power
3. Oil
4. Gas
5. Other

The sources of fuels and energy used in the CSSR were reviewed under the premise that the measures contained in the draft of the rationalization program for the Seventh Five-Year Plan and intended also for the subsequent period would be implemented. Although rationalized consumption of fuels and energy by itself does not guarantee abundant resources, it should be mentioned here that if the proposed rationalization measures are not implemented, Czechoslovak national economy cannot be supplied with the required volume of power, which would entail disastrous consequences. According to research data, the envisaged conservation fo fuel and energy resources has a realistic chance of success if the management on all levels and all participating authorities and organizations pay energy control undivided attention.

From the beginning of its activity the Power Research Institute (EGU) always emphasized the necessity of rational consumption of fuels; since the onset of the Sixth Five-Year Plan, in cooperation with 34 research institutes and other organizations, it intensified its expert study of specific needs and of reducing consumption of energy of selected energy-guzzling products and technologies. It focused primarily on the production sphere whose consumption of energy has a decisive effect on total consumption of primary sources of energy. Of course, it did not neglect the nonproduction sphere which consumes a major share of heat.

The results of research in the production sphere of our national economy point to two basic types of rationalization measures:

--to reduce specific consumption in the production by the application of the achievements of research in the area of technological development,

--to reduce specific consumption in the production by structural changes in national economy.

The share of both effects on total relative conservation of primary sources of energy in the period from 1970 to 1980-1990 was determined by separating the effect of the technological development and the effect of the branch structure on the consumption of energy (Table I).

Table I

	1980/1970	1990/1980
Period	10^3 TU	10^3 TU
Savings based on the technological development	464.90	411.61
Savings based on changes in branch structure	15.82	274.01
Total savings	480.72	685.62

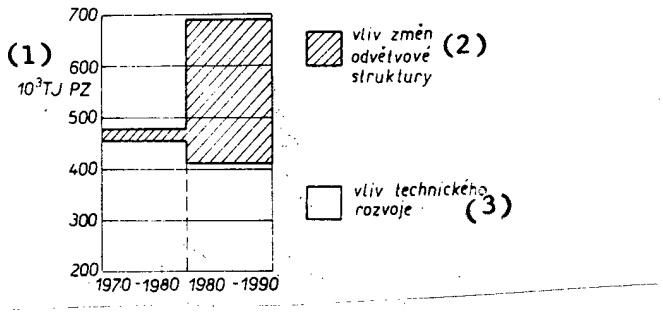

Figure 3. Summary relative savings of primary sources of energy

Key: 1. 10^3 TU primary sources
2. Effect of changes in branch structure
3. Effect of technological development

This development is presented in a graphic form in Figure 3. From the above-mentioned review it appears that during the 1970-1980 period 96.7 percent of the conserved energy converted to primary sources of energy stemmed from technological development programs, while the effect of the changes in branch structures remained negligible. However, during the 1980-1990 period the effect of branch structures will become more pronounced and account for almost 40 percent of total relative savings, while the share of the technological development in conserved energy will decline relatively as well as absolutely. Structural changes will become an increasingly more distinctive factor of the rationalization program.

Naturally, rationalized fuel consumption must be viewed according to several criteria, not only from the standpoint of conservation of sources of fuels and energy. In addition to lower specific consumption of energy, a relevant criterion is the investment required for the program and the ensuing payback on capital. As regards reconstruction of facilities, physical wear and tear of the equipment to be remodeled and its remaining service life, the potential guarantee of investments and other criteria must be considered.

Primary sources of energy must be conserved by means of implementation of several programs whose viability was assessed first of all from the technological point of view and then with regards to their economic parameters. In terms of investment guarantees thus far their availability has not been analyzed in detail, however, it is axiomatic that further development of the program cannot avoid dealing with that particular aspect.

Herebelow we present a selection of some of the most important sectors of our production where conservation must become especially intensive. It does not list all rationalization programs, only an outline of some of the more noteworthy proposals which are of particular importance in terms of lower energy requirements.

Electric Power Generation

--Higher efficiency of operation of high-pressure heaters (VTO).

Although recycled heating of water feeding electric power stations reduces specific fuel consumption in power engineering, the operation of the VTO in all large condensation power stations is unsatisfactory. If the VTO would operate reliably and continuously in half of the blocs of 110 MW and 200 MW units, about 4,300 TU in primary fuels would be conserved.

--A higher share of combined generation of electric power and heat. In our conditions the production of electric power in thermal plants demonstrates currently specific consumption of fuels on the average 37 percent lower than its generation in 110 MW units. The projected increments in thermal plants and conversion of condensation systems to heat generation are expected to save approximately 12,500 TU of primary resources before 1990.

--Reconstruction of power engineering units

This follows the program planned already for the Seventh Five-Year Plan which will continue in the next period with the objective of achieving the planned parameters.

--Liquidation of obsolete production equipment

It is estimated that in this system about 380 MW of facilities with less than 50 MW capacity will be eliminated in 1985 and another 300 MW during the Eighth Five-Year Plan. Their production will drop from 1140 GWh in 1985 to about 200 GWh in 1990. Actual savings will depend on actual exploitation of those facilities, on their condition and on actual conditions of the electrification

system in a given period. If all rationalization programs now under consideration are implemented and all thermal power stations in the CSSR generate electric power, then the result would be the following development of specific fuel consumption in electric power engineering related to primary sources of energy (Table II).

Table II

Year	1970	1975	1980	1985	1990
Specific fuel consumption for generation of electric power in primary sources 10^3 TUPS/kWh	12,274	11,585	11,237	10,979	10,557

Production of Pig Iron

The following are the principal factors which determine energy requirements in the production of pig iron:

1. Metallic contents of the blast-furnace charge and its homogenization;

2. The usable capacity of blast furnaces;

3. The counterpressure in the throat;

4. The temperature and the oxygen-enriched blast;

5. The type of power charge;

6. Mechanization of operations in blast furnaces;

7. Automatic computerized control of blast furnaces.

Blast furnaces are about 90 percent energy-efficient, from which it follows that it would be difficult to introduce additional efficient rationalization measures in power engineering. In the CSSR we have begun liquidation of outdated low-capacity furnaces and modernization of those adaptable to more efficient operation.

The rationalization measures under consideration should promote this development of specific consumption related to primary sources of energy (Table III).

Table III

Year	1970	1975	1980	1985	1990
Charge TUPS/t	0.0250	0.0229	0.0214	0.0203	0.0190
Consumption of TUPS/t in operation	0.0063	0.0060	0.0054	0.0053	0.0050
Total TUPS/t	0.03]3	0.0289	0.0268	0.0356	0.0240

Generation of Heat

All ministries have jointly studied the options for rationalization measures in generation of heat on the basis of concepts concerning heat consumed in individual branches and its development. Public facilities will generate more heat (from the current one fifth to about one fourth of total heat produced in 1990), however, this will not affect total specific consumption of fuels for heat generation because specific consumption in public and industrial facilities are almost identical.

The share of heat produced in thermal systems in combined heat-and-power generation will be significant. In addition, the effect of reconstructed old facilities and of newly built or expanded facilities with lower specific consumption will be in evidence. The power station in Melnik which was partially converted to heat generation and some expanded thermal plants, such as those in Opatovice, Otrokovice, Plzen and elsewhere, may serve as examples. Nevertheless, the quality of solid fuels will produce some negative effects, but on the other hand, the organization of extensive centralized heat supply systems will be beneficial because the expanded facilities will more than compensate for the effect of heat lost in transfer and distribution, if the operations are improved by more advanced control systems. The use of certain regenerative types of energy and of unconventional sources of energy will mean further contribution.

If implemented, the measures under consideration for heat generation will result in the following development of specific consumption of primary sources of energy in the production of 1 TU (Table IV).

Table IV

Year	1970	1975	1980	1985	1990
TUPS/U	1,457	1,386	1,373	1,343	1,320

Production of Ammonia from Natural Gas

Ample opportunities for conservation of energy in the Eighth Five-Year Plan may be anticipated from the new, more sophisticated production units installed in one of the industrial establishments in Slovakia under the title of Ammonia I. Several potential models are currently under consideration. One of the variants involves replacing the existing unit with a new one which would more than double the output and which has more advanced production technology; it is presumed that one production unit will be built for the production of urea. In terms of necessary public outlays, the relatively high one-time investments will be paid back within 3.8 to 2.7 years depending on the type of the design.

The envisaged development of specific fuel consumption in primary sources of energy for 1 ton of the product in the planned production establishment of the Ministry of Fuels of the SSR appears in Table V.

Table V

Year	1970	1975	1980	1985	1990
TUPS/t	0.0634	0.0626	0.0687	0.0680	0.0577

The indicators presented above apply to a single plant in the CSSR and not to all ammonia-producing plants. Total specific consumption of primary resources for the production of ammonia, including the compressed type, is estimated at approximately 57 GUPS/t in 1990.

Production of Aluminum Oxide

The currently applied technological method of production of aluminum oxide, Al_2O_3, in the CSSR consumes considerable energy. For that reason an oxide-producing plant is scheduled for reconstruction which will proceed in two stages. After the reconstruction its consumption of energy will drop to about 42.5 percent of the current consumption, which represents significant savings in the planned production.

The development of consumption of primary energy sources per unit of production is presented in Table VI.

Table VI

Year	1970	1975	1980	1985	1990
TUPS/t	0.0691	0.0641	0.0583	0.0516	0.0167

Production of Technically Pure Aluminum

The production of Al_2O_3 is narrowly linked with the production of technically pure aluminum. At present aluminum is produced by two-stage electrolysis of Al_2O_3 in a continuous process under the effect of additives and direct current in rectangular steel tubs. It uses a type of electrolyzers that make it impossible to cover individual tubs, which causes considerable waste of heat, tars dust and fluorine in various chemical forms and affects unfavorably not only the immediate area of the operation but also the near and even more distant environment of the plant. It should be mentioned that the production of anode materials for Soederberg electrodes has very untoward effect on hygienic conditions.

The program for reconstruction which is therefore under consideration should save the maximum possible savings of electric power and considerably improve hygienic conditions. Electrolyzers will be enclosed and the polutants exhausted more efficiently, which will improve the environment of the plant.

The results of the scheduled reconstruction will be reflected in specific consumption of primary sources of energy per unit of production (Table VII).

Table VII

Year	1970	1975	1980	1985	1990
TUPS/t	0.2016	0.1194	0.02070	0.1990	0.1647

I offered these examples to illustrate the options for the rationalization program in energy conservation in industrial production for the near future. However, it is not possible to present here every program under consideration for the period before 1990.

Rationalization programs will involve also the nonproduction sphere of our national economy. The development of centralized heat supply systems (SCZT) deserves special attention because heat supply consumes about 40 percent of total consumed primary sources of energy; about 20 percent of their total consumption is used to generate heat supply which is transferred by pipeline from thermal and heating plants and from boiler rooms to consumers, in other words, by centralized heat supply systems. A major share of energy consumed in the nonproduction sphere is used to heat and prepare hot service water. The following potential structure of heating systems for housing was prepared on the basis of projections (Table VIII).

Table VIII

	1975	1980	1985	1990	2000
Solid fuels	73	63	56	47	30
Liquid fuels	6	7	6	6	4
Gaseous fuels	7	13	18	23	26
Centralized heat supply systems	12	15	17	19	28
Electric power	2	2	3	4.5	10.5
Nonconventional sources	-	-	-	0.5	1.5

It is therefore envisaged that heat supplied from centralized heat supply systems will gain in importance mainly due to the limited resources of fossil fuels and their steadily deteriorating quality. Only large central thermal plants can burn such fuels economically and with minimum effect on the environment. Thermal capacities will be concentrated in large central facilities and therefore, large central heat supply system must be established to transfer heat economically over long distances. Several different sources of heat will function side by side in interconnected concentric thermal networks which will be gradually established. In due time the limited resources of our domestic fossil fuels will necessitate the use of nuclear fuel to generate heat. Nuclear power plants and nuclear thermal and heating plants will supply heat. The so called nonconventional sources of energy which will become auxiliary factors in the CSSR fuel and energy balance, particularly in genera-

tion of heat and preparation of hot service water, will involve in the conditions of our state primarily the solar and geothermic energy, the secondary sources of power and last but not least, the recycled energy recovered from waste air and water. Such supplemental sources will not be of major importance in the overall fuel and energy balance. It is estimated that in 1990 their contribution will amount to $29.3.10^3$ TU and in the year 2000 about 120.10^3 TU, or less than 3 percent of total consumption of primary sources of energy at the end of this century. Heat recycling of the "air-air" type appears highly efficient. It may be introduced by simply adding a recycling heat exchanger to the existing air technology in facilities. Energy thus obtained is at least 60 times cheaper than solar or geothermic energy. Our national economy still has relatively extensive untapped sources of energy. I should like to point out as an example the Ostrava-Karvina district which is losing more that 360,000 cubic m/min of upcast blast escaping at 14 to 18°C from the coal mines into the atmosphere. If we would take the advantage of the 5.5°C thermal differential from the escaping blast, we would gain over 31,000 MWh of heat per month. We may not even realize the specific amount and volume of the sources of energy wasted on the territory of our state which should be used efficiently and profitably to the best advantage. It may be therefore advisable to survey the entire territory of our state from the air by the infrared or other method over appropriate intervals of time (individual seasons, workdays and holidays, etc.) in order to identify locations suitable for comprehensive utilization of wasted energy and its further programming in detail.

In view of the changed situation in our country and abroad our entire national economy is facing the fact that the type of extensive management prevalent until very recently is no longer possible. We must seek and find methods and programs that will create and utilize more national income and advantageous indicators for our people's living standard even though we shall have fewer resources at our disposal and they will require more intensive processing.

The same applies to the fuel and energy base at our disposal. We must continue processing available resources to better advantage and consequently, reduce their consumption in the production and nonproduction spheres to an absolute minimum and utilize them so as to achieve desirable final economic results. From the above it follows that if we make good use of the technical skills of our people we may accomplish satisfactory achievements with rationalization programs. Naturally, this is predicated on rationalized consumption of materials and energy which must become the concern of all working people on every level of work and management and in every sector of national economy.

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FUTURE IMPORTANCE OF SMALL ELECTRIC POWER STATIONS VIEWED

Prague TRIBUNA in Czech No 19, 1982, p 12

[Article by Rostislav Valasek "Small Hydroelectric Power Stations--Program for the Future"]

> [Text] Though there may be some questions concerning the operation, reconstruction and even construction of new small hydroelectric power stations, none of them is a "to be or not to be" question. Actually, small hydroelectric power stations do nothing more than fulfill the demand that domestic sources of energy be exploited as efficiently as possible.

In 1980, we consumed in the CSSR almost 370,000 GWh of electric power. In addition, in the late 1970's the theoretical hydraulic power potential of our rivers represented more than 28,500 GWh annually and the technologically usable potential almost 12,000 GWh. Obviously, this is far from negligible. Of course, in reality in 1979 we exploited no more than 32.8 percent of this potential of our rivers, which represented 3,672 GWh of electric power.

In other words, the amount of unexploited hydraulic power leaving the territory of our state annually corresponds to 5.1 million tons in conversion to lignite for power engineering; it may be obtained from sources with a capacity over 10 MW, with an additional 1.8 million tons in sources with a capacity of 0.2-10 MW and at least 826,000 tons in sources with a capacity under 0.2 MW.

Every single kWh of electricity generated by harnessing the hydraulic power potential equals energy produced by burning 1 kg of power coal in steam power stations.

Nevertheless, despite the indisputable advantages of hydroelectric sources, in 1965-1979 the rate of progress in our country's hydraulic engineering declined 8 percent, while, for example, in the GDR it increased 63 percent, in Poland 162 percent, in the USSR 108 percent, in Belgium 84 percent and in France 48 percent during the same period.

At present, when we are reducing the consumption of high-grade fuels precisely in power engineering, when despite our country's focus on domestic resources the construction of thermal power stations is winding down and the increment

in power generation will come predominantly from nuclear energy, the emphasis is again on hydraulic power. While it is true that the cascades on the Vltava and Vah rivers have become synonymous with hydraulic power, it is no less true that we lack the hydraulic engineering potential of other countries, since most of our rivers have their springs in our country and most of the hydraulic power on our territory is dispersed in small streams.

Needed Stations Must Not Be Eliminated!

In view of the fact that the exploitation of our rivers for power engineering has not reached a desirable level, the presidium of the CSSR Government approved toward the end of 1979 the Principles for Intensive Exploitation of the Hydraulic Power Potential of River Streams in the CSSR for Electric Power Generation in Small Hydroelectric Power Stations.

We discussed the general principles as well as certain problems connected with the operation of small hydroelectric power stations with Eng Frantisek Pazout, a member of the bureau of the presidium of the CSSR Government, who informed us that the presidium of the CSSR Government in its Decision No 304/1979 assigned, among other things, the following tasks:

--to ensure continuous operation and regular maintenance of all existing small hydroelectric power stations and to prevent their liquidation;

--to rebuild, remodel and modernize the technological equipment and buildings of the obsolescent small hydroelectric power stations, including appropriate water works--dams, weirs, river beds, canals, etc.;

--to survey dams and weirs thus far unused for power engineering, to determine whether they may be furnished with equipment for power generation;

--to reassess the potential for restoration of the already abolished hydroelectric power stations.

Furthermore, the demand was emphasized that already during the planning stage of new weirs or dams to be constructed on our rivers for purposes of water economy, incorporation of small power sources should be always considered, if that is feasible for power engineering. Further development and construction of facilitites for small hydroelectric power stations must be adapted also to specific conditions of the river streams and maximum conservation, reliability, minimum investment outlays and brief construction schedule must be taken into consideration when developing suitable models of technological equipment for small hydroelectric power stations.

Two years later we may say with satisfaction that the demand to exploit small sources of hydraulic power as much as possible has met with a very favorable response and many of the "forsaken" power stations are already producing electric power. Work is now under way to put still more power stations into operation. The construction of new, more efficient small hydroelectric power stations is now in the planning stage or already under way (see Table).

Cataloguing for the Second Half-Time

All hydraulic works suitable for power generation were supposed to be catalogued in 1980-1981. Although such cataloguing is of fundamental importance, only the Federal Ministry of Fuels and Energy [FMPE] and the national ministries of forest and water economy and the ministries of industry have fulfilled their tasks. The kraj national committees prepared their listing most unsatisfactorily and some failed to attend to it at all. At the same time, one of the preconditions for a comprehensive solution of the problems of small hydroelectric power stations will be met only if we obtain accurate reviews of potential exploitation of hydraulic energy, the condition and usability of the existing machinery in both the liquidated and operating sources.

By its decision of November 1981 the CSSR Government assigned responsible authorities the task of completing the cataloguing of small sources of hydraulic power and their technical facilities, particularly the still usable ones, and to submit their reports to the FMPE before 30 June 1982 so that they can be presented for the action of the advisory bureau organized by that ministry. Only complete listing will enable us to reach some conclusion about the type of technological equipment available in existing sources and about their location.

From the cataloguing completed thus far, we learned that of the 955 localities already surveyed on our territory 230 are now operating at 159 MW total capacity.

The programs approved for the construction of new small hydroelectric power stations--in other words, for the construction of small hydroelectric power stations with less than 10-MW capacity--is focused on those locations where the sources of electric power will constitute a part of relatively extensive multipurpose works already completed or now under construction, such as dams, weirs rendering rivers navigable, or water-supply systems for nuclear power plants, etc. In addition, opportunities are being created to promote the interest of organizations and individual citizens in the implementation of rationalization programs for exploitation of microsources of hydraulic energy.

During the current five-year plan the construction of new, more efficient small hydroelectric power stations should add 15.96 MW of installed capacity and generate 71.1 GWh of electricity per year.

The construction program for the Eighth Five-Year Plan includes 28 support programs on the Vltava, Labe, Morava, Ohre, Dyje, Odra, Hron and other rivers, which involves total installed capacity of 62.35 MW in small, 1 to 3 turbine hydroelectric power stations, with an annual capacity equal to 271.43 GWh.

Microsources of Hydraulic Power

Small hydroelectric power stations with capacity under 200 kW offer additional opportunities for the exploitation of the power-generating potential of our rivers. Such sources are abundant all over our territory. From them we may gain an additional 171 MW or more of installed capacity. Under the current conditions, water works and construction units are partially equipped for operation of such stations in many localities where they may be restored mostly by self-help and without major investments.

Extensive deliveries of small turbines and generators are needed to put microsources of hydraulic power into operation. If we want to specify their potential volume, the results of previous inventories of such works may serve as illustration: 14,882 small sources of energy were operating in our country.

Naturally, this is not a question of the volume as much as of the most efficient solution as regards the concept of works and economical production of technical equipment. Before June 1982 the ministries of metallurgy and heavy engineering and the ministries of electrical engineering in cooperation with the FMPE will submit a report on auxiliary development of unified series of technological equipment, including automatic units, and a report on provisions for the production and delivery of such equipment for the program of reconstruction, general overhaul, restoration or new construction of small hydroelectric power stations.

An advanced concept of DC elbow turbine for low heads with capacity from 0.5 to 10 MW which has been already completed in the planning department of the CKD [Ceskomoravska Kolben Danek] N. P. in Blansko has attracted interest even abroad. Of course, new, nonconventional solutions have also been proposed, among others, by engineers of the CVUT [Czech Military Institute of Technology] who had tested a prototype of propeller pump. With no adjustments it achieved 89 percent efficiency of turbine operations in conversion of hydraulic power, which is an unqualified success. Pumps manufactured in our country and suitable for this purpose have capacities from 30 to 110 kW; their price range is from Kcs 50,000 to 300,000.

Higher Purchase Prices, Lower Charges

Principles of economic incentives for operators of small hydroelectric power stations and for potential interested parties are valid as of the beginning of 1982.

--The new price list of the FMPE which is now in force adapted the price of electric power purchased from hydraulic sources at Kcs 0.32 per kWh supplied to the network in the daytime, and at Kcs 0.09 per kWh supplied from 10 pm to 6 am. The average per kWh cost for electricity produced in such sources as, for example, those under the jurisdiction of the FMPE is in the range from Kcs 0.11 to 0.14 and should not exceed the ceiling of Kcs 0.24 even in the least favorable case.

Last year the ministries of forestry and water management of the CSR and SSR reduced by 80 to 95 percent the rental fees of water works serving small

hydroelectric power stations of the FMPE, which facilitated their further operation and development within that ministry because that fee is not charged outside the ministry.

--Since the beginning of 1982 the Czechoslovak State Bank grants state, cooperative or public organizations preferential credit up to the full amount of the costs of construction or reconstruction of hydraulic power sources. If such works are constructed in conjunction with reclamation projects, the credit, which amounts to 3 percent in agricultural and commercial organizations, is cut to 1 percent.

--If a citizen decides to build a small hydroelectric power station, the Czechoslovak State Savings Bank grants him a loan to construct such a microsource at a credit rate of 2.7 percent. Such loans are made without collateral and the savings bank pays invoices and bills of supplier organizations.

The above-mentioned measures follow a single purpose: to provide incentives to former operators or new parties interested in the construction of small hydroelectric power stations.

Many steps have already been taken but numerous unresolved and unanswered questions still abound. The meeting of the presidium of the CSSR Government on 12 November 1981 reemphasized the demand that the cataloguing of sources of hydraulic power and of capacities installed in them be completed. In this conjunction the Ministry for Technological and Investment Development prepared in January 1982 a simplified questionaire for completion of the cataloguing project (the preceding questionnaire was excessively laborious). It includes enforcement of expeditious permit and approval procedures for small hydroelectric power stations which are now under construction, which are being remodeled or about to begin operation. The proceedings for a permit to operate a 5-kW source should not be as tedious and complicated as for a nuclear power plant.

Even with the adoption of the decisions of the presidium of the CSSR Government, considerable shortcomings in the sector of planning of small hydroelectric power works in the CSR led to the construction of large weirs which do not utilize their potential for power generation. This must not be repeated.

The growing interest in the exploitation of small hydroelectric power stations indicates that we can be good managers. Although operations in small hydroelectric power stations have the character of untraditional and auxiliary sources, it is indisputable that they help rationalize the consumption of fuels and energy. The problem is to provide such opportunities and preconditions for the construction, restoration and operation of small hydroelectric power stations that would give us the best advantage of the power-generating potantial of our rivers.

INDUSTRIAL PROBLEMS, SOLUTIONS ASSESSED

Industrial Concentration Problem

Warsaw ZARZADZANIE in Polish No 7, Jul 80 pp 7-10

[Article by Andrzej Cylwik: "Problem of the Concentration of Polish Industry; the Concentration of Production"]

[Text] During the latter half of the 20th Century, the concentration of industry has become common, a feature of the economic development of the capitalist and socialist countries. At the present time many Polish scientists are inclined to view this process as the objective law of scientific and technical progress. We can see this merely from the following statements: "The concentration of industry is undoubtedly correct because of how generally it occurs and because of the economic results";[1] "Production concentration and its closely related processes of integration of production activity and specialization are becoming increasingly objective in nature, and in certain subsectors of industry this concentration is even somewhat forced on industry by the current development of science and technology";[2] "The process of concentration is historical in nature and is an unavoidable phenomenon determined by overall economic growth."[3]

The process of concentration of industry has been going on in the Polish economy for more than 20 years now.[4] Changes in this realm have been great and have been manifested, among other things, in the following:

Decline in the number of state enterprises, which dropped between 1960 and 1975 from 3,514 to 2,554,

Increase on the magnitude of a dozen and some times in the value of the production created by a single enterprise,

Rise in the mean employment in a factory (for example, the mean in 1960 was 418 employees, but in 1977 the mean was 1,043 employees).

Current trends in the development of industry and long-range aspirations show that the concentration process will continue. This makes it advisable to analyze in retrospect the previous achievements and to attempt to establish the laws of development for the concentration process, as well as to assess its results, especially as to whether it turned into the called-for process of integrating the industrial units.

The process of concentration is defined and classified in various ways. In this analysis the division proposed by J. Goscinski will be used.[6] He makes a distinction between three major sorts of concentration:

Production concentration taken to be:

-- an increase in the quantity of production created in various plants,

-- a decline in the number of places in which a given product is produced,

-- the creation of new, combined places of production, in which it becomes possible to install larger pieces of equipment and to use more modern methods of production;

Capital concentration, or the process of the fusion or joint designation and use of collected funds without basic changes in the authority of the economic organizations participating in this venture;

Administrative concentration, which is a form of forced grouping of industrial units, accompanied by important changes in the realm of the autonomy of the combined units.

Only the first and third sorts of industrial concentration have had practical significance in Polish economics. It is true that capital concentration existed in the form of combining funds for joint research or investment ventures, but despite the many postulates up until now it has not been possible formally to create voluntary industrial associations.[7]

In the real course of economic development we are most often dealing with the simultaneous appearance of the phenomenon of production and administrative concentration, but owing to the lucid nature of the analysis, they will be presented separately. Let us start with the concentration of production and look at the benefits of it, the most important being what is called the effect of large-scale production, or the decline in mean production costs per unit of the product as the size of production increases.

The basic problem analyzed by numerous scientists is the scope of the general application of the principle about the existence of the effect of large-scale production and the related problem of the optimum size of factories. Research conducted in the developed capitalist countries analyzing many years of change in the extent of concentration clearly shows the practical existence of an optimum enterprise size, depending on the subsector of industry. J.C. Allen examined the structural changes in British industry from 1900 to 1960 and found, for example, that in the textile industry, the decided majority of the enterprises employed from 100 to 399 people, but in the steel industry the major development took place in enterprises numbering more than 1,000 employees.[8]

M. Bottcher[9] gives an interesting view concerning the process of concentration in a socialist economy. In his opinion, the increase in the sizes of enterprises should be related to a certain change in the structure of production. The production structure should be "adapted" to the size of the industrial unit, so as to help it to achieve the greatest labor productivity. On the other hand, if there is no possibility of changing the structure of production, then there is undoubtedly a limit on (optimum) size for the enterprise (plant), and if this size is exceeded, production costs will increase. To support his statements, Bottcher includes examples of phenomena which occurred in the 1960's in the GDR economy, where greater effectiveness occurred in certain subsectors of industry in enterprises of less than average size (for the given subsector) than in other enterprises.

T.B. Kozlowski summarizes the comprehensive review which his book gives of the opinions and research results obtained on the subject of the effects of large-scale production and says that each subsector or branch of industry has its own specific characteristics, which make it possible to obtain greater or lesser benefits from using highly productive equipment. There are branches in which the possibilities of designing and installing highly productive equipment are very great and those in which there are only limited possibilities in this area."[10]

The above points have also been confirmed in the research conducted at the end of the 1950's and the beginning of the 1960's in Polish and Soviet industry. On the basis of the results of this research, L. Pasieczny[11] singled out four industrial groups with a specific impact of production concentration on the rise in labor productivity. Here they are:

Industries in which increases in the size of plants cause an uninterrupted (although paced at different rates) increase in labor productivity. This rule applies to the power, chemical, metallurgical, building materials, and timber industries;

Sectors of industry in which the increase in the size of the plants brings about a rise in labor productivity but only up to a certain point. This law applied to the chemical, metallurgical, engineering, textile, and clothing industries.

Sectors of industry in which growth of plant size gives no regular change (increase) in labor productivity, but the largest plants (in the given subsector) nonetheless feature the greatest productivity. This law applied to the building machine and fuel industries.

Industries in which there is no regular relationship between increased plant size and an increase in labor productivity. This law applied to the rubber industry and the food industry.

It is L. Pasieczny's view that owing to technical production factors, the concentration of production can be best utilized in the case of apparatus processes (power industry, chemical industry, metallurgy) and

and the production of large-scale goods (aircraft, ships). It also gives the causes for the inadequate effectiveness of the process of production concentration in the Polish economy, mainly listing errors in the organization of the production process, errors in the preparation and execution of the investment process, excessive production concentration in certain subsectors of industry as expressed in unjustifiable exceeding of the plant size optimum (for the given subsector), and technical and technological backwardness of local industry.

Some of these errors were also committed during the latter half of the 1970's, as we can see from the results of the analysis conducted by M. Lissowska[12]. She confirmed the occurrence of two harmful phenomena:

Exceeding the optimum size of enterprises (plants). For example, in the electrical engineering industry the greatest productivity per employee was achieved in enterprises employing 2,000-5,000 persons, but in the metal industry the optimum size of enterprises from the viewpoint of maximum labor productivity ran between 1,000 and 2,000 employees. Meanwhile, in both of these industries there was an increase of several percentage points in the share of the larger enterprises, above the optimum employment level.

The adverse impact of concentration on the productivity of fixed assets. M. Lissowska discovered the major causes of this phenomenon to be "inadequacies in the organization of production and failure to make rational enough use of equipment, whether as the result of delays in bringing new plants up to full production capacity or as the result of stoppages or permanent failure to use equipment found to be surplus."[13]

Summing up the results of her analyses, she stated: "...in only a few subsectors we can see the continual, decided occurrence of the effects of a large scale up to the largest plants according to both ways of measuring concentration (the number of employees and the value of fixed assets -- author's addition). This applies only to thermal and electric power and to the textile industry."[14] In the other subsectors of industry there was a clear range of optimum plant size, and when this size was exceeded work productivity suffered; in certain cases the limit of optimum splant size was relatively low, for example, 201-500 employees in the fuel industry.

M. Lissowska also made a comparative analysis of the development of production concentration in Poland and in England and the United States. It turned out -- and this may cause a certain amount of consternation -- that the mean number of persons employed in a factory in Poland, except in the food industry, the automotive industry, and the clothing industry, was higher than in England or the United States. Hence there arises the question: Why, despite the high level of production concentration, is this process less effective in our country than in certain advanced industrialized countries? It would seem that the cause for this state of affairs is to be found in the majority of instances outside the process of concentration. This has been pointed out by L.

Pásieczny and M. Lissowska, who have pointed out numerous shortcomings in the organization of production.

This fact has also been confirmed by the results of research conducted at the beginning of the 1970's in the Polish knitwear, hosiery, and chemical industries.[15] The authors of this research emphasized the impact of poor production organization on the reduced effectiveness of the concentration process. The occurrence of this phenomenon was related to the application of outmoded production technology and engineering, difficulties in managing a large number of employees and in resolving complicated problems of decision-making, and disruptions in industrial units (for example, periodic shortages and outages of raw materials).

T.B. Kozlowski states right out that the primary role in the genesis of economic limits on enterprise size is played by organizational factors. In this connection he calls for the gradual development of factory size, which may create the opportunity for combatting sooner the problems associated with inadequate employee training and the absence of management routines and may serve as an incentive to the more effective implementation of the later stages of development. There is much to show that under Polish socioeconomic conditions, when many plants are springing up on previously unindustrialized land and many of them are employing a great many people without industrial experience, this view is correct and worth broader application.

In my opinion, however, this does not exhaust the list of problems concerning limits on the effectiveness of the process of production concentration. An equally or perhaps even more important matter is inadequate specialization and coproduction and inconsistency in the structure of Polish industry. Data on this subject are very rarely published. The discussion launched in 1975 by the editors of PRZEGLAD ORGANIZACI threw some light on the phenomena which were occurring. It was evident from the information[16] provided at that time that mass production in Polish industry amounted to only 7 percent, while the figures were 28 percent for France and 35 percent for the United States. In similar fashion, large-series production in Poland amounted to 15 percent, in France to 30 percent, and in the United States to 24 percent.

The low level of specialization and coproduction were also proved by the fact that in the Polish engineering industry 90 percent of the enterprises produced spare parts independently, with only a few industrial units fully availing themselves of centrally produced structural components (this ratio was just the reverse in U.S. industry). The phenomenon of relatively meager development of specialization and coproduction is characteristic not only of the Polish economy but also of some other CEMA countries. It is closely related to periodic disruptions and economic tensions, which encourage autarky. We should also point out certain inefficiencies in the system of industrial management. For example, in the research which H. Sadownik conducted in 1971, he found that branch coordination in Polish industry functioned almost exclusively in a formal sense. This was the result of the lack of the ability to execute resolutions and branchwide

agreements, or to mount effective control and exact the sanctions which had been provided for.[17]

On the other hand, the lack of consistency in the structure of Polish industry, the next important reason for the decline in the effectiveness of production concentration, appeared as underdevelopment of small-scale industry, which for many years had worse management conditions than the larger industrial units (key industry). This adverse trend was not reversed until 1979, and gradual improvement is to be anticipated. We can best get some sort of idea about the importance of proper cooperation between large and small firms by the example of the expansion of Japanese industry. One of the experts on this problem, Norio Yanagihara, says: "by regulating the coproduction tasks assigned to the small and medium-size firms, the large corporations can achieve the most beneficial level of utilizing their own production capacities."[18]

Finally, the next reason for the inadequate effectiveness of production concentration is to be found in the inadequacies and inconsistencies of the process of administering the concentration of industrial units. This problem should be given far more attention, because it is upon its course that such important, anticipated effects of the concentration process as the greater competitiveness of large economic organizations on international markets, greater possibilities for using the achievements of science and technology, and the relative decline in the costs of managing production depend. This problem will be presented more comprehensively in the next article.

FOOTNOTES

1. Z. Szeloch. "Organizacyjne problemy tworzenia i funkcjonowania kombinatow przemyslowych" [Organizational Problems of the Establishment and Operation of Industrial Complexes]. Wyd UMCS [Marie Curie-Sklodowska University Press], Lublin, 1976.

2. J. Kortan. "Doskonalenia procesu laczenia przedsiebiorstw" [Upgrading the Process of Amalgamating Enterprises], EKONOMIKA I ORGANIZACJA PRACY [Economics and Organization of Work], May 1978.

3. J. Goscinski. "Modele i funkcje duzych organizacji gospodarczych. Referat na konferencje naukowa" [Models and functions of large economic organizations; paper at scientific conference], Lodz, 1973.

4. It practically begun in 1958; initially, especially in the years 1950-1955, even a counter tendency appeared, in the concern about the misconceived "branch purity," and some enterprises were divided up into individual plants.

5. Information based on ROCZNIKI STATYSTYCZNE PRZEMYSLU [Statistical Annals of Industry] for 1973, 1976, 1978.

6. Viz J. Goscinski, op cit.

7. Viz H. Mrela."Rodzaje zrzeszen" [Types of Associations] ZARZADZANIE [Management], 1974, No 8; A. Jedraszczyk, E.W. Murawski. "Koncern i zrzeszenie" [The Concern and the Association], ZARZADZANIE, 1975, Nos 2-3.

8. G.C. Callen. "Struktura przemyslu brytyskiego, analiza przemian ekonomicznych" [Structure of British Industry; Analysis of Economic Changes], Warsaw, PWE [Polish Economic Press], 1962.

9. Viz M. Bottcher. "Die optimale Betriebsgrosse -- Scheinproblem oder Mittel okonomischer Diagnose?" DIE WIRTSCHAFT, 1966, No 48, pp 10-12.

10. T.B. Kozlowski. "Optimalne wielkosci przedsiebiorstw przemyslowych" [Optimum Size of Industrial Enterprises], Warsaw, PWE, 1973, p42.

11. L. Pasieczny. "Koncentracja, specjalizacja i wspolpraca produkcyjna" [Production Concentration, Specialization, and Cooperation] in joint work: "Ekonomika przemyslu" [The Economics of Industry]. Warsaw, PWE, 1966.

12. M. Lissowska. "Zmiany stopnia koncentracji przemyslu w latach 1966-1970" [Changes in the Extent of Industrial Concentration in 1966-1970], GOSPODARKA PLANOWA 1979, No 11.

13. M. Lissowska. "Wplyw wielko ci zakladu na wydajnosc pracy w przemysle" [Impact of Plant Size on Labor Productivity in Industry], GOSPODARKA PLANOWA, 1973, No 9, p 606.

14. M. Lissowska. "Wplyw wielko ci..." op cit

15. A detailed description of the scope, methods, and results of the research was given in: S. Niewiadomski. "Ocena efektow gospodarczych koncentracji produkcji na przykladzie przemyslu dziewiarskiego i ponczoszniczego" [Assessment of the economic effects of production concentration using the example of the hosiery and knitwear industry] in "Funkcje i struktura przedsiebiorstw -- ewolucja i integracja" [Functions and Structure of Enterprises; Evolution and Integration], Warsaw, PWE, 1976; T.B. Kozlowski, op cit.

16. "Aktualne problemy organizacyjne jednostek inicjujacych" [Current Organizational Problems of Initiating Units], PRZEGLAD ORGANIZACJI 1975, Nos 8-9.

17. H. Sadownik. "Problemy zarzadzania zjednoczeniem przemyslowym" [Problems of Managing the Industrial Association]. Warsaw, CODKK, 1972.

18. N. Yanagihara. "Strategia i struktura japonskich organizacji przemyslowych" [Strategy and Structure of Japanese Industrial Organizations], ZARZADZANIE, 1974, Nos 10-11.

Technology Import Substitute Solution

Krakow ECHO KRAKOWA in Polish 27 May 82 pp 1,2

[Article: Lenin Iron and Steel Works Saved Thirty Million Dollars"]

> [Text] What do you do when the foreign-exchange coffers are empty and you cannot move to produce a thing without certain components which used to be imported? This was the problem which the Lenin Iron and Steel Works faced. Krakow mill employees are not waiting for the gods or the bankers to smile on them. They have worked out a special program to replace imports with their own newly introduced technology. There is a list of 37 undertakings the execution of which will make it possible to save about 30 million dollars.

Specialists from the Refactory Materials Plant of the HiL [Lenin Iron and Steel Works] developed the technology and began their own production of special megnesite products used in the linings of mixers used to hold the liquid pig iron. A ton of similar products formerly imported from Austria costs more than 500 dollars. Their production in our country, even though foreign raw material is used, brings an annual savings of 19 million zlotys. The antiimport program calls for beginning production on a total of ten types of refractory materials.

The so-called pellets previously bought from Brazil were eliminated from the charge of the great furnaces and were replaced with Polish and Soviet sinter.

In coproduction with Zygmunt Iron and Steel Works, certain parts are made which are needed for the American, Japanese, and West German rolling-mill equipment in the complex.

The Sheetmetal Cold-rolling Mill has to its credit great achievements in its actions to limit foreign-exchange expenditures. Here they found native substitutes for the emulsion oils, chemicals used in "washing" sheet metal, cast-iron shot for the machining of rollers, and so on, all of which they used to buy for hard currency.

The iron and steel works also helps others starting up production of rolled products which used to be imported for the needs of the automotive industry, the electrical engineering and tele-engineering industry, the farm machine industry, and the printing industry. For example, sheet metal which is smoother, as is necessary for the components of automatic telephone exchanges, is already being produced.

There are also problems. In its desire for some domestic partner to begin making things it needs, HiL must independently arrange for the necessary raw materials, look for coproducers, and often provide for

its own transportation. I recalled the cast-iron shot. They make it at the Metallurgical Plants in Trzebinia. Kambud in Krzeszowice provides a partly finished product. HiL trucks transport them on the route from Trzebinia to Krzeszowice and Krakow.

Information is miserable. HiL recently received a telex from the automobile factory concerning the possibility of replacing imported oil in the process of conserving auto chassis sheet with domestically-produced Korferol WD-5 oil. Meanwhile, the complex has been using this item with success for several years aleady.

In the case of the detergents used in the cold-rolling mill, the right hand did not know what the left hand was doing. It was by accident in the course of talks on a completely different subject that it was learned that the chemicals were being sought by the Institute for Heavy Organic Synthesis.

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STATUS, SIGNIFICANCE OF FISHING INDUSTRY PROBED

General Prospects

Warsaw RZECZPOSPOLITA in Polish 27-28 Feb 82 p 5

[Article by Zbigniew Wyczesany: "Can We Afford Fish from the Pacific?"; passages enclosed in slantlines printed in boldface]

[Text] Report on the Status of Fishing. Meat or Fish? How Much, What Kind, and At What Cost?

/Over the course of the past thirty years for the second time the following problem has arisen: what should we invest in, meat or fish? Just as during the 1960's, when the economy had limited possibilities for investment, it is a matter of weighing current decisions, but, above all, of clearly outlining a long-range strategy in the area of food economy./

The result of a change in views was then a compromise--it was necessary to develop grain products and, on a parallel basis, fishing, especially deep-sea fishing. Moreover, the latter promised lower costs for obtaining protein products as well as providing the market with an increase in valuable consumer products which would be a complete substitute for meat and its processed products.

To Catch or To Buy?

Times have changed. We have to go farther and farther for fish. Limitations on fishing have increased. The direct costs of fishing have grown enormously. At present the prices of ships are very high, even though they are being built by Polish shipyards. There have been manifold increases in fuel prices. Foreign-exchange expenses for the fleet (the purchase of fuel and material provisions, port duty-fees, etc.) are being maintained at a high level.

/Hence, doubts have been expressed in certain circles as to whether, in general, it is worthwhile to engage in deep-sea fishing, which is such a great burden on the economy. A report which has recently been developed by a group of experts on the status of fishing provides an answer to this question.

The report on the status of fishing comprehends its role in the national economy and in the country's food complex, points out the consequences of the economic changes brought about by the taking possession of the seas by the maritime states, informs us about the results of searching out new fishing locations, and presents capital ratios, cost estimates, including foreign-exchange intensiveness, as well as comparisons between the costs of meat products and those of fish during the years 1977-1980./

Based on a thoroughgoing analysis, conclusions have been formulated in the matter of developing fishing in the short-term and long-term future.

Status of Possession

What is the disposition of Polish fishing today?

At present the fishing fleet is composed of 101 trawler-factory ships with a combined capacity of more than 200,000 GRT [gross registered tons]. The average age for this fleet amounts to 12 years. The status of the auxiliary fleet is 10 ships with a combined capacity of 71,000 GRT; these are indeed ships which are newer than the fishing fleet, but their suitability for transport--among other things, from the viewpoint of the increasingly greater distances of the fishing locations from Poland--covers scarcely 40--50 percent of the needs.

In 1981 the value of the fishing fleet and the auxiliary fleet amounted to approximately 15 billion zlotys. Furthermore, the value of the shoreline property was about 3 billion zlotys (docking facilities, workshops for repairing refrigeration units, supply warehouses, etc.). The fishing fleet has become obsolete to a considerable extent, but, at the same time, it has not yet reached the stage where it has to be refurbished or replaced.

In 1970 the fishing fleet was operating relatively close by (the average distance of the fishing sites from our country was 2700 nautical miles), i.e., principally in the Atlantic and in African waters.

In 1980 we were catching fish in eight regions of the world, already including the Pacific to a considerable extent. The average distance of the fishing sites from Poland amounted to 6660 nautical miles.

/This geographic change has brought about a change in the structure of the kinds of fish being caught. Ten years ago the following four kinds of fish were dominant: codling, herring, mackerel, and flatfish. At present the proportion of these very kinds of fish in global, deep-sea fishing amounts to scarcely 1.5 percent. More than 80 percent of all fish catches today are made up of kinds of fish which were practically unknown in Poland ten years ago./

Hake and [mintaj] have won recognition for themselves in home cooking, and they are tasty. The situation is not so good with other kinds of fish which are less valuable and more difficult to process technically.

A Broken Agreement

Under conditions which have been worsening since the very early 1970's at fishing sites (the process of taking possession of the seas and the establishment of 200-mile-limit economic zones), many fishing sites which had heretofore been exploited by our fleet became inaccessible. We concluded a series of agreements with the maritime states on the right to fish in their zones, with the United States, among others.

As recently as November representatives of the U.S. Embassy in Warsaw confirmed the stability of our presence in waters within the jurisdiction of the United States. In April of the current year we had to sign an extension of an inter-governmental agreement within the framework of which we had the right to catch about 250,000 tons of fish annually, which would have been much less than half the amount caught in long-distance, deep-sea fishing.

As a result of President R. Reagan's brutal decision, the fishing fleet which was operating there (28 ships) was compelled to leave the waters which were located within the U.S. zone. After a two-month interruption, which caused a dislocation of the fleet, the first information came in about the undertaking of fishing in new zones in the Pacific and the Atlantic. This has created chances of catching at least as many fish this year as in 1981.

We have at our disposal a staff of experienced deep-sea fishermen, and we have attained a high rank in oceanographic research and in ascertaining the status of stocks in various parts of the world. We have concluded agreements with several states, including, among others, Canada, Norway, and France, on fishing within their economic zones.

We can continue to obtain considerable quantities of fish from areas which are generally accessible as well as from waters which are covered by international conventions. We are conducting negotiations with a number of African and South American states regarding the purchase of fishing licenses or regulating fishing on the basis of sharing or cooperation. Fishing on the open oceans [high seas] beyond the continental shelfs is an open matter.

Real Prospects

/Experts assert that we could obtain as much as one million tons of fish annually from the ocean waters immediately around us. Realistic possibilities have been estimated more modestly. Let us bear in mind that the report estimates them at 500,000 tons of fish annually in the fish catch./

This would allow us to export enough fish to cover the increased foreign-exchange costs for the fleet, to produce fish meal in amounts of 60,000 tons, as well as to provide the domestic market with fish and fish products amounting to 190--200,000 tons (in commercial terms). Let's add to that fish from the Baltic Sea (a catch amounting to 170--180,000 tons annually), which in analogous commercial terms would amount to about 100,000 tons.

Question: how much does this cost? At present it is still impossible for us to carry out a complete economic calculation. The prices of the new ships are not known, nor do we know how much the costs of fuel and material supplies will rise. It has been computed that before 1990 we will have to lay out approximately 17 billion zlotys for renovating the fishing fleet, modernizing and rebuilding the auxiliary fleet, as well as developing the shoreline installations (mainly the refrigeration units).

/The comparisons which have been conducted with the shaping up of the costs of animal products under present conditions do not run counter to similar calculations which were carried out some 22 years ago. Ocean fish in the course of things are a relatively cheaper product than meat. And such is the foundation and the final conclusion of the report on the status of deep-sea fishing and the prospects for its development./

Inland Fishing

Warsaw GOSPODARKA RYBNA in Polish No 1, Apr 82 pp 3, 4

[Article by Professor dr hab. Jan Szczerbowski, Olsztyn Inland-Water Fishing Institute: "Prospects for Inland-Water Fishing"]

[Text] Poland's rapidly occurring socio-economic changes compel us to outline the conditions for the further operation of inland-water fishing. This is connected not only with the ultimate purpose of increasing the quantity of fish supplied to the market but equally with the role which it must perform as a component part of the comprehensive hydro economy. For the reservoirs which are used for producing fish are often also reservoirs of water for communal purposes, agriculture, and industry. In large number they are the direct receivers of a constantly increasing amount of pollutants. Fishing, which includes various means of catching fish, among others, sports fishing, will have an increasingly vital importance within the natural attaining of consumer centers and the recreations which are inextricably linked with them.

Discussion of the topic of fishing's role as well as its importance within the prospects for operating the entire national economy assumes, therefore, especially now, a great importance, and it touches increasingly wider circles. A symptom of this is the large amount of works, among others, "An Evaluation of the Status and Prospects for the Operation of the Inland-Water Fishing Economy," which have been completed by a group of staff members at the Inland-Water Fishing Institute.

In the introduction to this work it is asserted that during the period from 1957 to 1977 evidence has shown that fish production along with material connected with fishing increased from 13,100 to about 34,000 tons, with an average annual growth of 800 tons, which amounts to a growth rate of 3.42 percent. This is a growth more rapid than for agriculture as a whole and also more rapid than in meat production, wherein this indicator reached 3.17 percent. However, in the last three years (1978--1980) production has undergone a decrease (Table]). Fish caught by anglers have attained a high supplementary position in consumption. It is reckoned that they amount to approximately 30,000 tons. Total consumption, therefore, fluctuates within

limits of 50,000 tons. Registered production from 1 ha. of pond surface during the years 1970--1979 fluctuated from 340 to 606 kg of consumable fish, in the case of lakes it amounted to about 32 kg, while in rivers and dam-type reservoirs it fluctuates around 10 kg per ha. The officially documented effects places the productivity of the waters in Poland among the highest places among the countries which lie in an analogous climatic zone. However, these values are much lower than those set forth in the plan for development in the last five-year plan.

TABLE 1. Production of Fresh-Water Fish during the Years 1970 and 1975--1980

(in thousands of tons)

Years	1970	1975	1976	1977	1978	1979	1980
Total Production	21.5	30.7	32.1	34.0	26.0	27.5	26.7
Consumable Fish	17.8	23.4	23.7	26.5	21.0	19.5	18.7
Fish-Stocking Material	3.7	7.3	8.4	7.5	5.0	8.0	8.0

In 1980, according to the government program, 32,000 tons of fish were supposed to be caught from ponds, as compared to an amount of 14,000 tons extracted in 1975. Such a rapid growth of production was stipulated, among other things, by the need to construct or reconstruct about 20,000 ha of ponds (of which 6,500 ha have remained incomplete) and the supplementary construction of industrial-type breeding facilities for fish-stocking material, based on heated water, construction of a number of fish hatcheries, plants for industrial-type fodders, as well as facilities for production and social purposes. Up to the present time many enterprises have not begun to be implemented but continue to perform at a low percentage.

A retardation in the development of production also ensued as a result of the reorganization of the terrain administration division as well as the liquidation of the Association of State Fish Farms and the inclusion of fishing within the operational sphere of the viovodship organizations. An additional hindrance was the clearly marked increase in production costs, while the sale price of fish remained changed for many years.

The production of lake and river fish was maintained at a similar level only thanks to the very intensive economic measures which were undertaken, including fish stocking of well-known types for economical prices. It should be pointed out that the attainment of economic effects from lakes as well as the high level of fish catches by anglers indicate that their productivity fluctuates around 60 kg. per ha. This value goes beyond the limits of the natural production suitabilities for this type of reservoir, which, perhaps, testifies to the extensive fertilization of the waters brought about by pollutants. It is reckoned that of the total surface of lakes in Poland, amounting to about 302,000 ha., there are 240,000 ha. which are utilized for fish production; moreover, the water which is designated as pure accounts for only 30 percent of the lakes, while a further 16 percent of the surface is no longer suitable for fish production.

The catastrophic status of the purity of the overwhelming part of the rivers as well as the dam-type reservoirs decidedly limits their use in the sphere of commercial fishing production. Only the middle and lower courses of the Wisla and Odra are exploited for commercial fishing. In 1980 approximately 362 tons of fish were caught. In recent years a well-marked tendency has been observed toward a decline in commercial fishing activity as well as production effects. It must be reckoned that further worsening of the state of purity of the river waters will completely eliminate commercial fishing from them. However, rivers and dam-type reservoirs are becoming interesting areas which are used by anglers; they obtain there several thousand tons of fish during the course of a single year.

As presented in an abbreviated form, the present status of the effects of fishing operations should provide us with an outline of its possibilities for work in the future. Depending on the methods adopted and the forms of conducting the fishing economy, its effects may fluctuate within the parameters of the two variants given below:

Years	1980	1981	1985	1990	20000
		(in thousands of tons)			
Variant I	18.7	20.0	20.2	21.7	24.7
Variant II		20.0	24.3	30.0	41.5

It should be pointed out here that the development of production can ensue only in the sphere of pond fishing. Catches of lake fish will fluctuate within limits of about 8-9,000 tons. We must point out with particular emphasis, however, that the maintenance of total production at the level which has been maintained up to the present depends, among other things, on the following conditions:

--introduction of rational foundations enabling the multi-faceted use of water supplies,

--decrease in the level of water pollution,

--central coordination of fishing activity as a whole,

--modernization of legal regulations,

--improvement in the technical condition of ponds, the production center for fish-stocking material, and production facilities,

--improvement in social facilities,

--correction of deficiencies in supplying means of production and especially fodder.

If these conditions are not fulfilled, then after 1985 we must reckon on a well-marked decline in production.

Development of production in accordance with Variant I up to a level of 24,700 tons in the year 2000, as compared with a yield of 20,000 tons in 1981, will require the following additional measures:

--undertaking of investment outlays connected with modernizing and repairing 1000 ha of ponds,

--assuring approximately 60,000 tons of fodder, including 20,000 tons of pellets.

Development of production in accordance with Variant II requires the following:

--undertaking of investment outlays connected with modernizing and repairing 1750 ha of ponds annually,

--building up at least three or four fish hatcheries,

--building up three or four centers for commercial-type breeding material for hatching young carp, with a production capacity of 300-600 tons each,

--making it possible to purchase 100,000 tons of fodder, including 42,000 tons of fodder pellets, which is connected with the ultimate purpose of building a new plant with a production capacity of 15,000 tons annually.

Baltic Sea Fishing

Warsaw RZECZPOSPOLITA in Polish 8 Mar 82 p 1

[Article by WYCZ: "Fish Harvest on the Baltic: Deliveries to Market to be Increased in March; passages enclosed in slantlines printed in boldface]

[Text] /Good news has come in from the Coast: anchovies, codlings, and herring are pouring onto the nets. It is a fish harvest on the Baltic. This creates real chances of improving the supply of salt-water fish to the market. In March of this year it is predicted that more than 21,000 tons of fish and fish products will be delivered to the commercial network, including considerable quantities of fresh fish from the present Baltic catches. For purposes of comparison: in January of this year such deliveries amounted to 13,500 tons./

From January to April, often under difficult weather conditions, fishermen obtain 60 percent of the entire annual quantities of anchovies, and codlings, as well as 25 percent of the herring. The catches of these fish are, however, limited, and our fishermen within the framework of the Convention for the Preservation of the Live Resources of the Baltic Sea and Straits have the right to catch within the Polish zone during the course of a year, among others, from 60,000 to 80,000 tons of codlings, from 55,000 to 65,000 tons of herring, and from 15,000 to 40,000 tons of anchovies. Violation of these amount limits could threaten the Baltic catch and decrease the catch in ensuing years.

A fundamental matter is the complete management of the fish which are caught. For example, social disapproval greeted the decision to send to the State

Fish Farms for fodder purposes 32 tons of anchovies, as if it could not be managed differently at that time.

/On the eastern coast the local directors of fishing enterprises decided to create a coordinating council, the goal of which is to endeavor to create conditions for the untroubled collection of fish from fishermen, the freezing of fish for purposes of later processing, and the justification of transporting fresh fish to consumers in the inland parts of the country./

Following the pattern of the last few years, the deep-sea fishing enterprises "Odra" in Swinoujscie and "Dalmor" in Gdynia extended aid to Baltic fishing. Several large trawler-factory-ships take fish off from cutters at sea and provide processing connected with freezing. At the same time fishing refrigeration units and storehouses receive prior to freezing considerable quantities of fish for purposes of processing and current delivery to the market.

The processing enterprises are signaling a shortage of cans for canned fish. This could threaten a decrease in the production of canned goods. Conversations have been held with the GDR in the matter of exchanging cans for finished products, but this is only a temporary solution. Fishing ought to receive cans from the country's metallurgical industry.

Maritime Office Director Comments

Koszalin GLOS POMORZA in Polish 1 Apr 82 pp 1, 2

[Interview with Director General Marian Fila in the Office of Maritime Economy [UGM] by Henryk Borucinski: "The Baltic Is Our Great Storehouse"; date and place not specified; passages enclosed in slantlines printed in boldface]

[Text] /Seasons abundant in fish manifest themselves cyclically in the Baltic. At such times the press writes about a "crop disaster" and the "unutilized possibilities" of Baltic fishing.

At present signals are coming in from the Coast that the Baltic has produced an exceptionally abundant "crop" of anchovies. Fresh anchovies, as something new, have begun to show up in the retail shops of Central Fishing. At the same time opinions have been formulated that the fishermen are idly observing enormous schools of anchovies without being able to catch them because of badly established limits on fish catches./

With these doubts a PAP reporter addressed the director general of the Office of Maritime Economy [UGM], Marian Fila, who in the UGM is responsible for the sector of maritime fishing.

[Question] /Mr. Director, do we have a regular "crop disaster" with regard to fish?/

[Answer] We have a crop but not a disaster. I say this because at present we have succeeded in managing the entirety of the fish caught in the Baltic, despite the fact that, already at the beginning of the year, if it is a matter of anchovies, we have profited from the greater size of the limits placed upon us.

[Question] /The fishermen are questioning the size of those limits. For example, the fishing enterprises from the Koszalin Coast assert that they could increase their catch by close to half again as much. But they are not allowed to. And there is a lack of meat in the country./

[Answer] Poland ratified the Gdansk Convention on the preservation of the Baltic's biological stocks. We strictly warn and will continue to strictly warn that our Baltic fishermen not violate the quota of catches designated for us by the Baltic Commission. This type of policy is in the interest of the Baltic countries. But the Baltic was already being over-used in the past. We have observed for several years the free growth of the fishing stocks, which has brought about a situation whereby the limitation upon the catch performs its own role. We want the Baltic Sea to be our great storehouse.

[Question] /But in view of a fish crop above all expectations, in this case, of anchovies, is there no possibility of adjusting the limits?/

[Answer] There have been some disputes and exaggerations over this unusual crop. According to research conducted by the Maritime Fishing institute, the flock of anchovies from the years 1980-91 is quite weak, and there is no basis for increasing the limit. The best anchovies are fish which are three years old. If we increased the catch during the current year, we would be obtaining small fish, and in the ensuing years the flock of anchovies would be reduced, and, as a consequence, there would likewise be a reduction in the status of the codling stocks, because the codling live on anchovies.

Likewise exaggerated are the reports about the fishermen inactively observing the flock of anchovies. The Baltic fishermen work hard and have attained a good level of productivity.

[Question] /But what limits has the Baltic Committee designated for Poland during the current year?/

[Answer] On herring 64,500 tons, on codling 95,000 tons, and on anchovies 12,500 tons. A combined limit has been designated, amounting to 172,000 of those three kinds of fish which have been limited. Let us recall that flatfish and fresh-water fish which go out into the Baltic are not limited. Thanks to negotiations with Sweden, we have increased our combined limit to 174,400 tons for this year. For we yielded to them 600 tons of codling in exchange for 3,000 tons of herring.

[Question] /Fresh anchovies have begun appearing in the Central Fishing retail stores./

[Answer] The customers are not yet used to this form of anchovies. Everyone is familiar with "anchovies in oil" or smoked by weight.

[Question] /Hasn't this led to a waste of anchovies?/

[Answer] I have already mentioned that we are treating the Baltic as a handy storehouse, and we are trying to see to it that the entirety of the Baltic

catches are managed effectively. In order to profit fully from a good fishing run, we have directed to the Baltic 10 large factory ships belonging to deep-sea fishing enterprises. Their task is to cooperate with the Baltic cutters [fishing boars]. They take off from them the fish which have been caught and freeze them or prepare them in a preliminary fashion.

[Question] /But sending fresh anochovies to the retail stores bears witness to the fact that the processing industry is not keeping pace. After all, anchovies are not the best fish for frying./

[Answer] Indeed, but for years we have had shortages of cans, seasonings, oil, tomato sauce, and processing capacities. We have no signals, however, from Central Fishing that fresh anchovies have gone to waste. They have been bought not only for frying but for grinding and for marinating.

A chronically recurring weak point of the fishing industry is a shortage of boxes. To a large extent, boxes are made or repaired independently in the fishing or processing enterprises.

The central maritime supply office announced a need for 112 tons of nails, but only 3 tons were delivered.

[Question] Which of the fishing firms are the most active on the Baltic?

[Answer] In this matter too there are differences depending on which region the fish are appearing in. On 3 March the best results were obtained by "Szkuner" from Wladyslawowo--8,694 tons; ranking next were two enterprises from /Ustka: "Korab"--8,444 tons and "Barka"--6,462 tons, then came "Kuter" from Darlowo--5,996 tons and "Koga" from Hel--5,317 tons./ Fishermen associated in collectives caught 6,899 tons, while individual fishermen caught 4,022 tons. Nor are there any limitations on fish in these quantities.

[Question] /What was delivered to the market from this? Or, to put it another way, why are there no fish to be seen in the market?/

[Answer] In February 7,894 tons of fish and fish products came onto the market from Baltic catches. As a whole, however, the supply of fish to the market underwent a worsening, for because of the American restrictions the deep-sea fishing catches declined. In February of last year deliveries of fish and fish products amounted to 23,453 tons, but in February of this year the amount was only 17,867 tons. Within the total deficit of foodstuff shortages in the stores such an amount of fish is the proverbial drop in the ocean of needs. But also from this point of view the Baltic is an object of our particular interest, and we are trying not to allow even the least waste of fish which have been caught.

Deep-Sea Fishing

Szczecin KURIER SZCZECINSKI in Polish 1 Apr 82 pp 1, 2

[Article: "To Be or Not To Be: Deep-Sea Fishing"; passages enclosed in slantlines printed in boldface]

[Text] /GDANSK PAP. Two facts about the contradictory pronouncement designating the present position of Polish deep-sea fishing. On the one hand, it is

catching too much, and this raises its economic reason for being, while, on the other hand, it provides such a quantity of protein, which we cannot do without--at least not for a brief time period--and which nothing can replace./

For the long-term goal purely economic factors have certainly been decided. Then there ensues deep-sea fishing, which will provide abundant supplies, but there is not much time to adapt ourselves to the new conditions. Many surrounding factors are against it: the reduction in the accessibility of shelf-type fishing sites, especially as a result of the American restrictions, the rise in fuel costs, and the age which the fishing fleet has already attained. The trump cards are presented, as it were, less convincingly: tradition, knowledge and capacity, as well as highly skilled, professional personnel. That is not enough. What we need are more and more specific "trump cards." The key sector in these searchings is science and technology, and specifically the Maritime Fishing Institute [MIR].

When decisions made by President Reagan were detrimental to our fishing fleet near the Pacific coast of the United States, the fleet set out for the open waters of the Northeast Pacific. But the trawler-factory-ships did not proceed "in the dark." Two years ago this region was penetrated by the MIR's research ship "Profesor Bogucki." During the period of adjustment the places where the ostrobok [?] are concentrated were defined, and the catching methods appropriate for overcoming the difficulties were shown by time. Soviet ships have advised that the situation there on the whole is good.

In the open ocean the most abundant fishing sites are located equally in outflows and in zones where the ocean currents mingle. Such places were found by our research ships in the Atlantic as well. Today we are catching not only fish there but ever-increasing amounts of squid.

Squid, like kril a few years ago, have recently become a center of interest at the MIR. Could it be that the scientists have been subject to a passing fad? The known reserves located beyond the zones already possessed are estimated at millions of tons of annual catches of these cephalopods. Commercial catches are still barely in their infancy, and, therefore, there exists considerable room for technical and economic progress. Soviet scientists are of this same opinion. The news has resounded somewhat prematurely that Polish and Soviet researchers have recently recognized as the most important subject of mutual cooperative work the design of automated lines for processing squid. The fact of the matter is that squid in its natural state does not bring about wide interest in the market, although the meat of this cephalopod is highly valued for its nutritional qualities and taste, and there is a discouraging amount of labor intensity in preparing the raw material.

Automatic units must take this over. In the Middle Atlantic region the fleet must be furnished with better equipment than it has been up to now, equipment suitable for carrying out a great many tasks. Serving as a prototype of such a multi-task unit is MIR's research ship "Wieczno," which has just left on its second run to the mid-Atlantic in order to research the problems of catching

not only squid but also tuna, edible sharks, marlin, and other large pelagic fish. Catching all these animals has one trait in common: it takes place with the aid of fishing hooks rather than trawling nets, and for this reason it is less energy-intensive.

In the opinion of a great many scientific experts, Antarctica should become a successive region of lasting interest to Polish fishing. This problem is very controversial because economic views speak out against sending ships out to such distant fishing sites.

Herring Catch

Poznan GAZETA POZNANSKA in Polish 6 Apr 82 p 1

[Article: "The Fishing Season Moves On"]

[Text] On the Baltic the harvest of herring has begun. The first few "trial" catches of fishermen from the Szczecin Coast have indicated that there will be plenty of herring this year. There are many fish and very splendid ones. If the warm weather holds, the boats will return in the next few days from the fishing sites filled to the gunwales. However, is not the situation being repeated from the past few years, when there was a shortage of ice for freezing the fish and of boxes for packing them? Fishermen are likewise worried whether the prices which have been established for a kilogram of herring will be adequate to cover the costs and the effort which have been invested in catching them. For up to now there are no price-lists which clearly define how much can be earned on these fish. Whether or not the supply to the market of herring, which are so sought after, is subject to correction depends on a positive solution of these problems.

Falkland Conflict, Other Problems

Warsaw RZECZPOSPOLITA in Polish 22 Apr 82 p 4

[Article by WYCZ: "Maritime Economy Earns Enough To Pay for Itself: Basic Functions of the Office [of Maritime Economy]. Results in 1982. Dispute over the Falklands as An Important Threat To Our Fish Catches. Herring 'Harvests' in the Baltic"; passages enclosed in slantlines printed in boldface]

[Text] /(C). The far-ranging panorama of maritime matters and problems--from the office's organizational structure, the sphere of activity and competence, through the complicated question of economic reform, the fish harvests in the Baltic, and the consequences for our foodstuff market resulting from the conflict over the Falklands, the conditions of functioning within the new system of navigation and ports, and to the matter of maritime training and about the vanture of the "Dar Pomorza"--all these were brought up at a press conference held in the Office of Maritime Economy by its director, Minister Jerzy Korzonek, as well as the under-secretary of state, Ryszard Bialas./

The office chief stated the following among other things: We have been in existence for 10 months, and from the very earliest period all of our activity has been subordinated to the new systems principles. We do not have a division into branch departments, nor does the office perform functions proper to subordinate enterprises and supervisory institutions. Each one must earn enough to pay for itself. We do not have any cell-type compartmentalization which would continue even in a vestigial form the distributive-command system.

The most important task for this office is the creation of conditions for developing the maritime economy with consideration being given to the full independence and self-financing of the enterprises relative to the social and economic needs of the state as well as the formation of over-all principles of maritime policy.

In general, it is not easy. Navigation, ports, fishing, facilities for repairing the fleet, protection of the maritime environment--each of these sectors of the maritime economy has its own troubles. With respect to global results, however, this past year has been a profitable one. Let's bear in mind that the maritime economy, like the economy as a whole, had about 6 percent better financial results htan in the year 1980, even though trans-shipments in ports were approximately 40 percent lower, and fish catches were about 20 percent lower. In the final analysis, the good results attained by the merchant fleet were of preponderant importance here.

/A declining trend has, unfortunately, makred deep-sea fishing. In 1982 this does not look as if it will improve. As a result of the brutal controls imposed by President Reagan, we have been compelled to seek out new fishing sites. At present about 40 fishing ships are located in the Falkland region, and, as predicted, they were to have caught about 230,000 tons of fish here. The conflict over the Falklands has indirectly affected Poland as well.

We cannot catch more than 200,000 tons from the Baltic, because this amount more or less coincides with our stipulated quantity in accordance with international agreements./ Meanwhile, precisely on the Baltic, after a mass winter run of anchovies, on 15 April of this year there began to appear abundant banks of large Baltic herring. Daily trans-shipments have reached amounts of 1300-1400 tons. Because these herring have been afflicted with a parasite [a nematode] they are not directly suitable for consumption. In accordance with the recommendations of the sanitation-epidemiological services, they must be subjected to a process of deep freezing or a powerful salinization for at least 6 weeks. Eight factory-ships have been directed to the Baltic; they take fish off from the cutters; the loading facilities have likewise been put in a state of complete readiness. Nothing can be wasted.

We will address the remaining problems which were raised during the conference at the Office of Maritime Economy in separate publications.

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SECTORS INVOLVED IN FULFILLMENT OF ENERGY PROGRAM

Mineral Resources

Bucharest ERA SOCIALISTA in Romanian No 8, 20 Apr 82 pp 608

[Article by Gheorghe Codreanu, state secretary in the State Planning Committee]

> [Text] Recent decisions of the party's Central Committee Plenum and of the RCP CC Executive Political Committee have brought to the forefront of attention the problems of speeding up the fulfillment of Romania's energy program with a view to reaching the strategic goal of the greatest national importance--achieving Romania's energy independence by the end of this decade. The indications and tasks formulated on these occasions by Comrade Nicolae Ceausescu firmly orient the communists' efforts and those of all the people toward broad utilization of the entire energy potential we have available at a more sustained rate and toward managing all forms of energy with maximum care and a high spirit of saving from everyone. And it is a duty with profound patriotic meaning to take decisive action for the purpose of having exemplary fulfillment of the tasks and measures established by the party leaders.

Faster Increase in Mineral Energy Resources

As we know, the energy sources which have supplied civilization until the 40's when Enrico Fermi put the first nuclear reactor into operation have been vegetable or mineral (coal, crude oil, gases and so forth). One must make the clarification that there is a basic difference between the two classic types of energy raw materials, in the sense that the vegetable sources regenerate in 50-60 years, while the mineral ones can be considered nonregenerative, bearing in mind how long it takes for them to form--many millions of years--which means that the exploitation of them is limited in time.

During the development of society and, in particular, of industry, a larger and larger energy consumption was required, which could not be satisfied by vegetable resources. So man was forced to turn to mineral resources in order to produce the energy he needed. In the case of coal, the total quantity consumed from the time it began to be exploited until 1940 is approximately equal to what was consumed in just three decades from this date, that is, until 1970. World

stat stics show that in recent decades, fuel consumption doubled in intervals of 20-25 years, which required a rapid diversification of energy sources in order to cope with this growth rate of consumption. Naturally, the sources most easily exploited were the ones sought, ones with advantageous conditions for transport and ones which efficiently adapts to the varied forms of consumption. In this century we have reached the point where the fuel with the greatest development would be crude oil and gases, whose consumed quantity doubled from one decade to another.

Under these circumstances the question is justifiably posed: what are the reserves and their prospects for the future? The answer is absolutely necessary in order to be able to direct efforts toward those resources which provide the consumption which society needs for the longest possible time.

Current fossil fuel consumption (crude oil and coal) represent nearly 80 percent of total primary energy used in the world, while, taken separately, crude oil and gases hold more than 60 percent of this consumption. Retaining current consumptions, a maximum exploitation period of 50-60 years can be counted on for the crude oil and gas reserves as they are estimated. And this is with the condition of usubstantially increasing the investment effort both for exploitation of reserves in the zones which are accessible with difficulty and awell as for substantially increasing the recovery factor for crude oil from active deposits. These are the reasons which require man to head for other combustible substances capable of providing a greater prospect and growth in economic independence, together with the economic and political unfavorable circumstances which made crude oil prices rise artificially.

The reserves of coal, whose exploitation began long before that of crude oil, have reached a rather advanced degree of knowledge; the ones certain of being exploited can satisfy consumption at a growth triple the current one for a minimum 130 years.

Knowledge of the reserves of fossil fuels is a very important problem, bearing in mind that in the next two-three decades theystill will be the base for primary energy sources. For that reason many specialized studies are being worked out for modernization both of the extraction techniques as well as those for use in the industrial area. With regard to the crude oil reserves, their geographic distribution shows that in the current period and probably for a number of years to come the states which hold big reserves (particularly the OPEC countries) will be able to keep control over crude oil prices as a result of the fact that replacement of this type of fuel requires reorientation of the economy, with very big implications for technologies and change in the installations and production on other bases, with other costs and other productivity. One may say that the evolution of crude oil prices will be affected very much by the evolution of reserves and the rate for replacing it with other fuels which would provide sources of primary energy for a longer period.

Knowledge of the mineral raw material resources Romania has available has permanently been in the attention of the party and state leadership, since without knowing their prospects one cannot work out the strategy for overall national economic development in a substantiated way. It should be pointed out that the

special importance given to energy problems in Romania did not proceed from an accidental phenomenon, but it was brought out even before the 1973 oil crisis. This general attention, directed in particular toward counteracting the negative effect of the oil crisis, meant that Romania would be among the first countries where the problems of production, consumption and emphatic saving of energy were legislated before the end of 1973.

In foreseeing and approaching these problems, the special merit of Comrade Nicolae Ceausescu should be noted; he was deeply concerned with working out and consistently applying an effective energy policy as an integral part of the national strategy for economic and social development. The paths to be followed were made specific in the 12th party congress directives and in the program-directive specially dedicated to energy, which draws precise tasks for all sectors of activity with a view to achieving Romania's energy independence by 1990 due to the development of our own sources.

The decision of the recent RCP Central Committee plenum sharply brings to the center of attention the speed-up of actions at all levels to carry out the energy program by 1990. In this framework, tasks of special importance belong to geological research which, by intensifying its activity, must make widely known the potential of mineral resources underground, must increase the degree to which the national economy's needs are covered with geological reserves of raw materials. Proceeding from this, the extraction industry should work out and generalize techniques which insure a rise in the degree of extraction and utilization of all useful elements from the deposits in operation. At the same time, the ministries, and other central organs, together with centrals and enterprises, are called on to actively be concerned with new energy sources, with intensifying research for utilization of geothermal, solar, wind and wave energy as well as with using hydrogen, synthetic fuels and household waste for energy purposes and with the subterranean gasification of coal and the production and utilization of biogas and the discovery and utilizationof other new energy sources.

The Romanian state has allocated large amounts for development of the mineral raw material base, which in the last three decades have totaled more than 83 billion lei, of which more than 50 billion have been for crude oil and gases and more than 4 billion for coal and combustible shale. Despite this, whereas the situation may be considered satisfactory with regard to knowledge of structures bearing combustible mineral substances, the degree of providing exploitable industrial reserves for some substances is slow. That is why it is necessary to raise the rate of knowledge of exploitable reserves for crude oil, gases, pitcoal and even lignite and brown coal in order to insure the production established at the 1990 level.

The known potential of coal and combustible shale at the level of reserves on balance covers the production forecast for 1990 for a period of more than 30 years, a period not considered to be satisfactory. For that reason, the RCP CC plenum established as the task for geological activity the increase in the volume of known reserves for lignite and brown coal for covering production for a 100-year period.

An important problem facing researchers in the area of geology is of investigating all Romania's geographic regions and of knowing the reserves for each zone in view of the development of explorations in as many counties as possible and thus reducing transportation distances from the mine to the electric power or thermal power central. At this time, the distribution of the known potential of solid combustible substances is as follows:

Geographic Zone	Potential Equal to Thousands of Tons of Conventional Fuel	Proportion of total (%)
Total Romania, of which:	2,347.6	100
Banat	227.9	9.6
Valea Jiului	296.3	12.5
Oltenia	1,464.2	62.4
Muntenia	239.3	10.4
Moldavia	5.8	.2
Transylvania-East	31.9	1.4
Transylvania-West	82.2	3.5

This extremely uniform distribution by zones of the reserves of Romania's potential requires transporting a very large volume of coal from Oltenia, especially to Moldavia and the other zones with low reserves for the purpose of providing thermal energy for industry as well as for heating homes. This translates into large expenses. Of course, not all regions have similar conditions for promoting reserves; yet, as is also seen in the table, there are coal-bearing formations in nearly all Romania's zones, however with more difficult research and exploration conditions. Intensification of research will create opportunities for supplying the locations with coal with much greater efficiency if extraction would continue to develop in a restricted number of counties.

Fulfillment of the geological research program and of utilization of coal and combustible shale resources means that in this five-year plan the projects should be directed toward knowing the coal layers situated at greater depths than those from the perimeters currently being exploited even if the exploitation conditions are more difficult and require adoption of new utilization techniques. Geological research cannot be limited just to "showing" the existence of coal layers; it must bring the geological conditions and mining conditions in which they are found and, together with the research and design institutes for coal extraction, it should establish the technical conditions for exploitation and utilization. That is why the percentage of mining projects in total volume of geological projects should rise very much, while research activity must be combined more harmoniously and more closely with the activity of designing the mines and pits. During the extraction, the exploitation units in turn are required to continue geological research on one hand for increasing the degree of knowledge of the reserves and, on the other, for a detailed knowledge of the way that rocks behave, the way waters circulate in the zone which is being exploited and the variation of coal layers and taking the necessary measures in time for the good flow of production activity.

In light of these demands, we see that geological research must be intensified substantially in order to be able to carry out and overfulfill the task of the reserves from the balance group forecast in this five-year plan, with the majority of these reserves to enter into operation by the end of 1985. Also, together with homologation of the reserves of a new deposit in the balance group, it is necessary to move immediately to drawing up the investment documents and for all technical-economic indicators to be subject to proval for utilization to conform with current legislation.

Proceeding from the real opportunities which Romania has for providing primary energy resources for the future, it has been forecast that coal production should increase from 44 million tons in 1982 to 87 million in 1985. In the current five-year plan the operation of deposits of bituminous shale will begin, reaching a production of 10 million tons by 1985, which will be used totally for the production of electric power. According to estimates, by intensifying the activity of geological research in all regions of Romania, the fund of coal reserves will substantially exceed consumption, increasing 425 million tons in this five-year plan compared with a consumption of 348 million tons. Geological and technological research projects will be concluded and 13 new mines for pit coal and 22 mines for lignite and brown coal will be turned over for introduction into economic circulation.

Romania is among those countries in which the industrial production of crude oil started way b fore World War I and continued at a high level in the period between the two wars and developed considerably between 1950-1975.

The geological research done until now is rather advanced in the case of se imentary structures down to a depth of 3,500 meters, where most of the existing deposits in operation are known. Bearing in mind the very broad area of the use of crude oil and products derived from it both in industry as a raw material as well as for energy purposes, Romania is making sustained efforts to increase the degree of knowledge of the potential of operational reserves for the purpose of providing the production tasks established (15 million tons by 1985) for as long a period as possible.

The party leadership established that the main goals in geological research activity in the area of hydrocarbons are to extend projects to depths of more than 4,000 meters and to intensify research on the continental shelf of the Black Sea and to continue drilling to extend the productive zones. In these ways, the volume of reserves brought out in this five-year plan must increase around 60 percent compared with the achievements in the preceding five-year plan.

Fulfillment of these tasks requires decisive measures from the Ministry of Petroleum and subordinate units to increase the efficiency of research projects, to reduce the nonproductive time in drilling activity by at least 40 percent by 1985 compared with 1980 and to substantially increase working speeds at the deep wells, mainly due to extending new techniques and optimizing the drilling process and using fluids with superior characteristics. A problem of special importance is the improvement in the operation techniques and application of new procedures which insure a final recovery factor from the reserves of 40 percent compared with the 32 percent achieved in 1980.

Special attention involves geological research to bring out new accumulations of gas both in the Transylvania basin, where the majority of deposits in operation are known, as well as outside the Carpathains, where the percentage of reserves which are to be brought out in the current five-year plan is 50 percent of the total, compared with the 30 percent achieved in the last five-year plan.

In general one should say that the substantial improvement in drilling and extraction activity in all respects in the area of hydrocarbons requires special measures from other ministries, too, in order to adapt the equipment to the new working conditions, to increase the range of equipment in the supply of this sector and to provide materials from the metallurgical and chemical sector according to the specific nature of the environment at the depth at which work is being done.

With the potential of mineral energy resources which Romania has available, it can carry out important quantitative and qualitative changes in the energy balance so that it provides for fulfillment of the program established, whose goal is the energy independence of Romania by 1990.

Role of Technology

Bucharest ERA SOCIALISTA in Romanian No 8, 20 Apr 82 pp 8-11

[Article by Dr Eng Mario Duma of the Central Institute for Energy Research]

[Text] The March RCP CC Plenum decision on carrying out the program for energy production in the 1981-1985 five-year plan and development of Romania's energy base by 1990 devotes a separate chapter to increasing the role of scientific research and of new technologies in this regard. But the problems of technical progress go through the entire decision because, truly, accomplishing all the directions of action forecast is indissolubly a condition of the contributions which science and technology should make, explicitly or implicitly.

Basically, what are the data on the energy problem in Romania's specific conditions?

In its direct form, the energy problem lies in the need to provide a balance between energy consumption and "production" of it. We consume much more energy than we produce. So we import. But, as we know, the prices of raw materials in general and those of oil in particular have seen considerable increases throughout the last decade, affecting the entire economic balance at the world and national level and requiring a readaptation and general reorganization of structures, of technologies, of mechanisms and of criteria and indicators of development.

Recently, as a result of a certain relaxation on the internal market of oil, having as a result a certain fall in oil prices, optimistic views have appeared---the energy crisis has passed, oil is abundant, we can return to "normal," that is, to an energetics based intensely on oil. Without arguing further the premature nature of such evaluations, we feel that this is neither the time or the place to predict how matters will develop. Two hypotheses can be kept in mind for a probnosis: either the current relaxation is a passing phenomenon and the rising course of oil prices will return, or the relaxation is a long-term one. But, in any case,

even in the most optimistic versions, one must bear in mind that the current relaxation on the hydrocarbon market and even a continued reduction in oil prices will not bring back what it cost even at the 1972 level or even near that.

In the period of the start of the world oil crisis, although independent of it, through the net exporting of energy, Romania became a net and massive importer. This situation must be remedied, regardless of the fluctuation in oil prices, because only with such a condition can Romania's future energy independence be insured.

Strictly limiting ourselves to the area of energy and attached technologies, the imperatives resulting from the current situation are that we should consume less energy to achieve the same values, that we should produce more energy and that we should use energy that we produce better and more efficiently.

Despite the quantitative appearance of the problem, energy--through its role in the development process and its omnipresence and total involvement in social and economic activities--reflects the deep qualitative aspects and, in order to solve it as a problem, requires structured qualitative progress throughout the technological and economic structure.

Reduction in Energy Consumption

As was stressed at the RCP CC Political Executive Committee on 9 April, the most important source of energy is the saving of it.

In this connection, one must distinguish many aspects. We have not reached the stage where we can put the problem of consuming less energy in an absolute way under conditions of a sustained economic growth. But it is clear that we also should seek for the growth rate of energy consumption to be less than the rate of economic growth and for a unit of national income achieved to consume less energy and also for the reduction in energy consumption not to cause social and economic harm and not affect the normal operation of production units and quality of the habitat.

We feel it is necessary for four paths to be pointed out, ones by which we can reach this goal.

The first is in avoiding waste and the losses caused by negligence and poor management. It is an immediately accessible, cheap and, by this, all the more efficient way. But, at the same time, its finite, limited, exhaustible nature must be kept in mind as well as the need to stay within limits in order not to exceed the bounds beyond which material or social damages could be caused. Pushed beyond the optimum point, social-economic processes become vulnerable and unstable. Of course, in most cases, the reserve for avoiding waste is open and fully justifies efforts to utilize it.

The second way is to promote technical progress in the energy-consuming processes, particularly in the energy-intensive technologies and products and those which consume energy-intensive materials. And here it is possible to apply the method of "small steps," that is, modernizations, improvements, gradual optimizations which reduce in time the level of specificconsumption of energy and of the

energy-intensive materials. Of course, a large number of "small steps" can produce a lot. But the basic solution to the problem will come from the technologies conceived on new principles, ones which take the place of current technologies in the branches and processes which are big energy-consumers and also the energy-intensive products. In this regard much is expected from the basic research in physics, chemistry and biology. New catalysts and new methods for stimulating chemical reactions and separators of physical components are awaited, others than the change in phase by temperature, combustion, electrolization and so forth, which require a lot of energy.

Also, some of these "new" principles are actually known and returning to them not only would save energy but also would bring an increase in quality and efficiency. For example, in agriculture, the use of natural fertilizers and reestablishing crop rotation, reestablishing vegetable-animal ecosystems which provide natural fertiliz tion of the soil in association with new biotechnologies would permit saving large quantities of chemical fertilizers and energy-intensive pesticides, at the same time avoiding the gradual destruction of soil quality.

The third way to save is "recovery of the energy utilized in the consumption sectors (heat of gases, liquids, semi-manufactured and manufactured items, warm air and water used technologically, material waste with energy value), including by the broad use of pumps and heat recovery receptables," as is mentioned in the decision of the RCP CC plenum. These types of reserves are very great, particularly for certain categories of processes such as, for example, those in metallurgy (due to the high temperatures with which they operate). It also is necessary to provide the elements for installation and standardized equipment on industrial bases, proceeding from a study of the specific local possibilities for optimum recovery of heat as well as local use of recovered energy, which is a separate technical problem which sometimes is more difficult to solve than the recovery itself.

Sometimes the solution to the problem lies in combining or associating varied technological processes which would mutually (or unidirectionally) use the recoverable energy. So it is a problem of technological concept at the level of the structure of investments and technological flows. The classic example for this idea also is from the iron and steel area: cast iron is produced in blast furnaces, it is cast and cooled, then heated but in order to be placed in the steel ovens, it is cast and cooled and then again heated in deep ovens for rolling. For several decades the technological procedure for continuous casting of the metal has been known, a procedure in which all these phases follow directly, taking the hot material from one to another without cooling and intermediary heating. Of course, the procedure involves deep reutilizations, the need for synchronizations which are hard to achieve as well as other difficulties, but it illustrates a long-range principle in the concept of the integrated utilization of energy, that is, through systems of "total energy," as such procedures started to be called.

Basically, thermification (the combined production of electric energy and heat)--so widespread in our energetics and which is the exclusive principle of building the electric power centrals in Romania in the future--is another example of the integrated use of energy and intrinsic recovery of it.

Finally, the fourth way to reduce energy consumption per unit of national income lies in modifying the overall industrial structure in favor of the branches and products with a high degree of processing and low energy consumption, a way whose importance was emphasized in the Directives of the 12th party congress. Yet, we see from the statistical data that the guidelines established and the decisions adopted in this regard are being applied insufficiently. The recent legal regulations for taking fixed capital out of operation and removal of certain material goods from the administration of the social state units do not provide for, at least they do not explicitly provide for, the case of moral usage and removing technological installations with high energy consumption from use. Also, some installations which should have been removed as a result of unjustifiably high energy consumption continue to be given plan tasks in the practice of production planning and utilization of production capacities.

Returning to the problems of structure, one can show that shifting a single percentage of the total volume of industrial production from an energy-intensive branch--for example, chemistry or metallurgy--toward a branch with low specific consumption of energy--including sector B--can reduce total energy consumption of industry by several percentage points. However, this requires a particular increase in the quality and competitiveness of nonenergy-intensive products and, so, their technical level and degree of science incorporated.

Generally, it is possible to bring the share which each way could have in the saving of energy and in the rise of the energy intensiveness of the national income--reducing waste and losses, technical progress, recovery, structural changes in the economy. It would be particularly useful if analyses for the specific conditions of Romania could be made in the research of energy economics and the industrial economics. Given the current large share of the energy-intensive branches in the structure of industry and of it in the national income and in total energy consumption, given the large share of energy-intensive products in export, the firmer application of directives on the structural changes mentioned could have favorable results for reducing energy consumption per unit of national income.

Really, we have a specific energy consumption per unit of national income which is much greater than that of the industrialized capitalist countries or the other socialist countries and even that of the developing countries. The difference no longer can be considered as coming just from waste following intense measures for saving introduced in recent years. The studies made show that the indicators of energy-intensiveness characteristic of our economy exceed that of other countri much more than is seen by comparing certain specific consumption for certain products or certain specific technologies. The conclusion required is that action must be taken in all ways, primarily through radical change in the energy-intensive processes by introducing technical progress as well as by the quantitative and qualitative reorganization of the structure of branches and products and for the reduction of the energy intensiveness of the economy as a whole.

Increase in Energy Production

Providing primary energy resources above all is linked with the development of methods, techniques, apparatus and equipment for exploring geological structures

and for discovering some new useful deposits and new reserves at the level of knowledge and preparation which would permit the move to exploitation, to production.

In turn, the new deposits discovered until now generally are found at greater and greater depths and under more and more difficult natural geological conditions (for example, inclined layers and thin layers, deposits at the bottom of the sea, crude oil of high viscosity, unfavorable composition and so forth). For that reason, they need new technologies and equipment in order to provide extraction at an appropriate level of economic efficiency and sometimes even for the technical achievement of the utilization of the deposits concerned. The plenum decision points out that "the industrial coal reserves which are useable with the methods being used now lead to a degree of provision of more than 30 years at the level of 1990 consumption," with the degree of provision of 100 years thus requiring new technological methods for utilization.

But from this one should not understand for 30 years we are being "provided" with coal,without there being a need for technical progress. The fact that the reserves are useable does not mean that equipment with high performance is not necessary, appropriate for the diversity and difficulty of geological conditions and, at the same time, answering the continually greater demands for efficiency which they insure.

We know the special efforts and measures adopted to supplement the labor force needed for coal extraction. This is at the current and immediate future level of production. But how is the situation seen in relationship with the considerable increases in production in 1985-1990? Labor productivity which is provided by the technologies and extraction equipment is not only a parameter of efficiency but a bottleneck, a condition of development and of solving the energy problem. So what we need is for a new generation of mining technologies and equipment to be conceived and built now, which would permit carrying out the necessary jobs under conditions of the severe limitation of the labor force for providing services. This same thing is also valid for mining projects required by building hydroenergy construction--excavation, digging the galleries and so forth. With highly productive equipment we could build hydroelectric power set ups not only at a faster rate but also with a higher degree of utilization of the hydroelectric power potential in certain basins, by building hydroelectric power centrals with greater drops in level, thus, in greater power on the same rivers, with the same losses of water.

A second aspect is that of the energy intensiveness belonging to fuel extraction. The fuel branch in 1980 consumed around 11 percent of Romania's total energy production--in the form of direct energy consumption alone (without, for example, also counting the energy included in building the extraction and drilling equipment and in obtaining metal from the equipment and so forth). Together with the worsening geological conditions, our own energy consumption can rise up to the unacceptable limits if new technologies and new types of equipment do not compensate for this trend, at least in part.

In the end, from the total quantity of energy in the deposit, we actually can extract more or less--with the remainder remaining lost, not extracted--depending

on the extraction methods. Among other things, it is a question of the technologies needed to utilize the pit coal reserves tied up in the protective pillars and to increase the final factor of recovery of crude oil deposits (for example, steam injection into the deposit), with the technologies themselves often energy-intensive.

The same problem, of our own energy intensiveness, is crucial in promoting new sources of energy. The high energy consumption included in the materials belonging to the equipment concerned meansthat an intense program for proliferating them should itself be a "net consumer" of energy at the level of the economy for a prolonged period.* So the faster possible reduction of our own energy intensiveness, increase in the energy efficiency of the equipment and promotion of nonenergy-intensive,renewable sources become priorities of scientific research.

Currently the electric power produced in the nuclear power centrals in some countries is a solution contributing to the solution of the energy problem. In Romania, the geographic assymetry of placement of the energy resource of coal and shale, discovered and in operation in the southwest, also where there are big Danube hydroelectric power resources set up, justify the locations established for the nuclear power centrals: Dobrogea, Moldavia, Transylvania.

The RCP CC plenum decision provides for scientific research " irst, building of the projects from the special programs for nuclear materials, moderators, nuclear fuels and equipment for the nuclear portion and the classic portion, on schedule and at the level of quality appropriate." Implicitly this also means doing research on the overall operation of the installations in time and their future operation in full safety and efficiency and research which would specify the technical conditions for materials and equipment. Prior experience of Romania's electric power requires this. We must take into account that the 300-MW blocks from the Isalnita central delivered in 1960 by prestigious suppliers also caused some difficulties in operation at the beginning. From this experience, but especially from the big difficulties avoided and as yet not solved forever at the Rovinari and Turceni centrals, we believe three very important conclusions are required: a) energy scientific research must precede and prepare the design and building of projects; b)a type of spacing of building is needed so that at least a year is provided for between the entry of the first energy block into operation and the actual start into manufacture and building of the following blocks of the same type in order to correct any defects or technical shortcomings established for the first aggregate in time; c) local providing of social conditions to recruit and stabilize labor force with necessary qualifications which should precede and then keep up with the energy investment.

Utilization of Energy With Maximum Efficiency

Basically, in order to consume the available energy as efficiently as possible, it is necessary to insure the highest possible output for conversion of the various forms of energy from one into the other (refining, processing, combustion),

* Through exact calculations this was demonstrated for the case of solar energy by Dr Eng Costin Motoiu of the Faculty of Energetics of the Political Institute in Bucharest.

to use high-performance energy-receiving equipment and--in extension from the technical toward the economic--to obtain valuable and competitive products with the energy consumed, including through the chemification of superior fuels. The connection with technical progress, thus, is clear, even without giving examples which would be strictly specialized.

A well-known international trend is the increase in degree of electrification of energetics, that is, a rise in the percentage of electric energy in total energy consumed. This trend is explained by the versatility of utilizing electric energy, by its obligatory nature for certainsituations (electric motors, lighting, electronics, telecommunications), by the superior qualities obtained with the aid of electric technologies (electric steel, electrolytic aluminium and so forth) and by the greater opportunities for automation and improvement in working conditions for the users.

The world energy crisis has emphazized this trend of the electrification of energetics for many reasons: the use of inferior coal can be done advantageously only through the conversion into electric power in the big centrals located in zones where the land needed for storing the ash can be allocated and where measures for environmental protection can be taken. Also it is economical not to transport a fuel with lower caloric power per unit of weight great distances. Also, nuclear power is converted advantageously into electric power only in the very big units, while hydraulic power can be used on a broad scale by conversion into electric power. (Yet, some of the new energy sources are utilized advantageously through conversion directly into heat and chemical energy and not into electric power).

From this viewpoint, one finds that the percentage of electric power in the total energy consumption in Romania is around one-fourth, comparable with the situation in most other socialist countries; but in the industrialized capitalist countries the percentage is somewhat greater--generally, one-third. The countries which are very rich in hydroelect ic energy resources reach or exceed one-half. As a result, the concern with increasing the percentage of electric power in the future, as established by the decision of the RCP CC plenum, answers a current trend of technical progress, including as an important means of saving crude oil that is imported and the superior utilization of hydrocarbons.

Also, the combined production of electric power and heat in the electric power thermification centrals is an important way to increase efficiency in the utilization of energy resources. From this viewpoint of the percentage of thermification, Romania is in the forefront.

Yet one should mention several general coordinates of the "maneuvering range"in this direction and several bottlenecks of a qualitative nature which cause basic problems for energy strategy, including for scientific research and technological engineering.

A first problem which rises refers to the supply of the industrial processes with heat, heating of areas in building, supplying warm household water and the food preparation. In the zones near the electric thermification centrals and for many industrial processes as well as for heating and supply with warm water, the

heat produced in the central is used. Heat cannot yet be transmitted economically great distances with the solutions existing today. So the problem remains open, the problem of covering consumption in the case of non-thermificated zones as well as those for food preparation and the operation of industrial furnaces. Currently, this consumption is provided by hydrocarbons (natural gases, petroleum) partly through electric power and partly with the aid of firewood and coal. The introduction of electricity requires a corresponding rise in the peak power in the national electrical power system, making the electric network an appropriate size and, in particular, an appropriate structure for the balance of fuel to produce electric power.

Providing heat in small locations through the electric thermification centrals leads to the installations of small thermoelectric energy blocks (unified power), having as a result the worsening of output, labor productivity and specific investment. Also, local supply of the electric thermification centrals or thermoelectric power centrals with lignite, besides the disadvantages connected with transporting the lignite and those which are involved in pollution and the need to combat it. For rural locations and isolated settlements there actually is no complete substitution solution. On the other hand, some of the new sources--for example, solar energy--have the inconvenience of being unavailable precisely when there is a need for more heat, that is, winter, while the seasonal stocking of heat does not seem to be achievable in this decade.

A second difficult problem is transportation. Except for the transportation itself, which can be electrified, all the rest--motor, naval and air transport--remains a tributary of liquid or gas fuel in the foreseeable stage of technology.

A third problem is that of the industrial installations--including the electric power centrals--conceived to operate on gas or black oil. Many of them, having been built relatively recently, are in good condition and include considerable investments not yet amortized.

Precisely in order to solve such problems a number of countries now are orienting their scientific research efforts on a priority basis toward achieving liquid or gas substitute fuels-- the so-called synthetics--either through processing of coal, including inferior coal and shale, or by other means (alcohol from the biomass with rapid growth, methanol and so forth) obtained at the industrial scale. According to a 1980 document of the United Nations Economic Commission for Europe, the new technologies of this type allow fuel to be obtained at a price which is just 50-100 percent more than that of natural liquified gas or coal and comparable with the price of petroleum.

For the future, following the solution of the problem of synthetic fuel in Romania--which, as we have showed, is being researched intensely at the world level--priorities for using it could be established depending on the quantities obtained. In any case, the investment efforts needed to produce synthetic fuel should be compared with the investment savings achieved by supplying liquid or gas fuels for the existing equipment and installations, with minimum reconversion.

We want to dwell on one last problem of scientific strategy--and not just scientific--in the area of energy.

Generally a great diversity of possible solutions existsfor a great diversity of energy problems. In order to solve any problem we need an effort of conception and investment. Each ton of conventional fuel produced in addition or saved, as well as any really new and efficient technological solution, requires an allocation of human and financial resources. Nothing is obtained without human and material efforts.

In relation to Romania's size and our economic potential, the election of certain priority directions of research and concentration of efforts in such directions are posed in a much more critical way than in the countries which have big reserves available. But, in these countries, too, priority directions for research are being s lected without trying to approach all the possible solutions.

The criterion of energy efficiency, of the achievable energy contribution is decisive for such a selection of priorities and orientation of efforts toward them. Of course, if forces and resources are concentrated on few research directions, the risk of failure also exists: precisely in some of these directions it is possible for the anticipated efficiency not to be obtained. But, if forces and resources are not concentrated, the certainty appears that, actually, the significant efficiency will not be obtained in any direction, thus increasing the gap compared with the peak world achievements. Of course, the version of "on all fronts" does not involve the decision-making responsibility of selection. Yet it involves the responsibility "of not being selected."

Precisely for that reason we feel that a solution to the many problems dependent on the future insuring of Romania's energy independence is a condition of the way in which human and financial resources we have avilable in research are concentrated--on the basis of prospective well-based analyses--on certain goals of maximum energy contribution.

Agricultural Production

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[Article by Dr Eng N. Brasoveanu]

[Text] Agriculture, along with silviculture, is the single branch of the economy which has a net energy production, contributes to the convervation and improvement of the environment and represents the main source for feeding the population and providing raw materials for light and food industry. At the level of foreign relations, a developed agriculture reduces or even cancels food dependency on countries abroad and provides the necessary surplus for the import required by gradual industrialization and achievement of the balance of agricultural products from within the country, contributing to economic and political independence.

One of the great paradoxes of the modern world lies in the fact that more and more grains from the countries with advanced industry are being imported to feed the world's population, with the developing countries adding credits to cover their food needs for industrialization. And the "green weapon," agricultural production, is being used by the exporting countries as a means of political pressure.

Clearly, in these conditions the problem is not posed of the dichotomy between the agriculture-industry concept, with the dogmatic alternative of industry or agriculture being accepted, but rather merely types and solutions of industrialization and modernization of less energy-intensive agriculture are required and a better proportioning of the sizes of these two main branches in order to insure the harmonious,balanced development of industry and agriculture. Any historical measure for economic development against the background of joint growth and mutually intensifying growth of the two basic sectors shows that the countries with a developed economy on our continent were first "the granaries of Europe" before being "workshops of the world."

The place and role of agriculture within the national economy bring to the forefront the problem of the type of agriculture and alternations of the process of economic growth and solutions to intensify and modernize agriculture which answer the more and more pressing demands for agricultural products under conditions of population growth and reduction in the labor force for agriculture. At the same time , they would integrate the current instructions for saving raw materials and energy, given the negative balance on the world level. Whereas in recent decades more and more an increasingly overloaded and sophisticated model was imposed for modernization and intensification of agriculture on the basis of an industrialization policy at dimensions and rates which many times were suffocating, what has been pointed out in the somber picture of the resources of raw materials and energy at the world level in recent years led to a radical reconsideration of economic policies on the models for economic growth, development rates for industry and agriculture, types, sizes and structures for modernization and intensification of agricultural production. The imperatives for raising efficiency begin to be conditions decisively of economic growth. Thus, in the quarter - century since 1945-1970, a picture has been given us of a spectacular quantitative development, following a decade of profound reflection, in the 1980-2000 period a superior qualitative evolution is forecast, with the decisive role which in the past belonged to raw materials being taken over by ashy material and efficient technologies.

The historically determined fact pointed out in this optionis that as long as natural energy sources predominated, per hectare production was small, however the conversion ratio between energy invested and what was achieved was large. Together with the introduction of new energy sources intended to intensify natural fertility, vegetable production increased, while the conversion ratio for energy use fell. From here we have the urgent need to practice an intensive agriculture so that the energy investment is as efficient as possible. This means that solar energy, the single way to insure a ratio agreeable for bioconversion must be used at a high level , which in the end is carried out in obtaining large quantities of production per unit of energy invested.

In this framework, under conditions of moving from the extensive to the intensive phase of the economy, the new agrarian revolution in Romania above all aims at a revolution in the development and intensification of agriculture, with the qualitative problems of investment efficiency and judicious use of natural and human resources moving to the forefront. This means a review of the range of species and types of plans, of species and breeds of animals, it means a new size for the proportion of energy-intensive and energy-extensive crops, it means a reconsideration of the big energy-consuming technologies and expensive types of agriculture.

A New Strategy for Intensification of Agricultural Production

In the process of the economic growth of agriculture, together with acceleration of the process which modernized sturctures of the national economy as a whole, agricultural space has the tendency to continually diminish. Also contributing to this process is the diversification of the functions of agricultural territory. From its main end of providing agricultural food goods to the new qualities which gives agriculture a greater functionality--industrial, by implanting industries in the rural environment; touristic, by developing rural tourism; residential, since it is the residence of a portion of urban workers; recreational-cultural, by establishment of regional and national parks and nature conservation. In the process of agricultural growth, land improvement projects become more and more necessary; either they increase the land's production potential as in the case or irrigation, or they bring back into agricultural circulation areas of land which had become inappropriate for agriculture--goals fulfilled by digging projects, drainage, combatting of soil erosion and correcting of waterways.

A considerable intensification for agricultural lands is given by circulating resources, of which fertilizers and water are particularly distinguished. They insure economic efficiency in a shorter period and with lower financial contributions than fixed capital, bringing high economical nature and rapid rotation of funds invested. In this regard, the studies on evolution of the agriculture of the developed countries accredit the idea that the rise in volume of fixed capital has lost its prior significance, with the decisive element being technical progress and optimum combination of the factors of production, providing a differentiated correlation by territory and crops and mainly between the most important economic resources in agriculture--fertilizers and water.

Against this background, the soils of high biological capacity explain the spectacular results in the so-called "green revolution," marked by tripled grain production. Only these increases were possible due to the creation of types of grain and rice capable of fully utilizing large quantities of chemical fertilizer. Without chemical fertilizer the soils of the types mentioned did not prove to be more productive than the old soils. Thus, the entire structure of the "green revolution" miracle collapsed under conditions of massive requirements for chemical fertilizer required by the most productive varieties, however they are fertilizers which require large quantities of energy to produce them. What is more, the vegetable biological material with the greatest biological potential, very rapacious in the lack of chemical fertilizers, extracts its nutritional substances from the organic substance in the soil, thus "charging" the land to the account of future generations.

For that reason, many developing countries were forced to reject the plans for economic growth planned on this basis, given the impossibility of supporting such overwhelming costs. So the use of "natural nitrogen" is taking on greater and greater importance in the world with the more pronounced introduction of leguminous grain crops--particularly soy--and perennial fodder crops--leguminous (clover, lucerne, trefoil)and perennialgraminaceae. Also, a reconsideration of stable waste in all its forms, so disconsidered in Romanian agriculture for a long time, is a problem being posed more and more intensely. Use of residual water, of liquid stable waste from the industrial animal-raising complexes and of compost would reduce fertilization cost a lot.

In the same framework of improving biological material it is felt necessary to improve the ratio between caloric contribution and protein contribution to the new varieties. In this regard, we know that satisfying the need for calories is much easier to achieve than the need for protein. Hunger in the world is more for protein than calories. With a century of efforts and achievements we have not succeeded in affecting the quality of proteins and quantity of digestive protein, but changes have been produced in the protein content of the main crops which continue to remain around 75 percent for rice, 9 percent for corn, 12 percent for wheat. Of course, in this direction the field of research is still open broadly, with some recent achievements being revealing.

Regarding the same problem of protein contribution of food resources, we mention that improvement in the food system requires greater participation from the animal proteins. But for one calorie in the form of protein and lipids from meat or eggs, 7 and 4 calories of vegetable origin, respectively, are consumed, marking a lower efficiency of conversion of energy from one area to another. For that reason the problem is posed of the direct use of protein from soy, for example, avoiding their travel through the animal's organism. What is more, in order to quantitatively and qualitatively increase vegetable production, the attempt is being made to move from the crosses between varieties of the same species to crosses between species, knowing that in this case there is a superior heterozise. Until then, the most complete utilization as possible of all fodder resources, particularly the less expensive ones, that is, hayfields and pastures, waste from food industry, from secondary products from grains and leguminous crops and some food and technical crops and double crops would reduce the cost of products of animal iorigin.

In order for the increase in agricultural production, brought by the process of intensification, not to lead to a more expensive cost of living, the problem is posed of a model of an agricultural food system which would appease both the demand's of today's society, requesting, stocking, preserving and processing of agricultural products, but also the need for providing a satisfactory management of the family budget. This kind of end, aimed in particular at reducing the cost and share of expenses for food, is not possible under the condition of the agricultural food system in the world's developed countries, where the transformation, transport, commercialization and preparation of foods absorb a quantity of energy which is triple that of the quantity needed to produce agricultural raw materials. The food industries in the particular countries have come to occupy fourth place in energy consumption, after the metallurgical industry, chemical production and petroleum refinery industries. For example, it is significant that the energy utilized to conserve food products in cans--the manufacture of packaging and sterilization--much exceeds the food energy of the product canned.

The higher and higher specific consumption for obtaining each additional unit of production requires that the intensification processes be based on the concept of total use of all the economic resources which agriculture has available, on utilization of existing reserves, but reserves which are not utilized enough, such as organic fertilizer, green fertilizers, practicing of crop rotation with a justifiable share from the technical and economic viewpoint, of grain leguminous crops and perennial fodder crops and based on superior utilization of the natural conditions through use of techniques and combinations of adequate economic means--

means and measures which lead to an increase in production without requiring high energy consumption and big expenses incurred by exclusive application of the modern factors of intensification.

Mechanization and Chemification Are Not a Goal in Themselves

Whereas at the startof the process of the cooperativization of agriculture and mechanization of production processes, along with increasing the number of animals and production constructions, a decisive goal was to carry out investments with a view to intensifying and modernizing agriculture in the following stage, after generalization of socialist relations in the rural world, chemification became the priority direction. In recent decades, the most important share of the effort of social labor was represented by land improvement projects. For these projects as a whole the need is brought out of regulating the water factor, the characteristic of all hydroimprovement projects--irrigation, drainage, digs--as well as of combatting soil erosion, since regulating of high floods and evacuating excess water at the same time have an anti-erosion effect, that is, improvement of soil acidity.

The unified approach to the problems of land improvement projects, however, does not exclude priorities. It is precisely taking into consideration these factors which insures great economic efficiency in the use of energy resources. Among these priorities I want to first stress the improvement in the balance of humus and keeping it in the soil. From this viewpoint there is special importance in extending projects to set up sloping, including enforesting of agricutural lands which have been powerfully destroyed, with these projects affecting all the other projects by reducing the solid and liquid output drained, with the result being conservation of the land, an end with broad economic and social effects.

Let us not forget that each year millions of tons of soil go into the Black Sea, an inestimable value which no longer can be recovered in any form. Due to the lag of some water management projects, irrigation projects cannot join with the contribution of other hydroimprovement projects on the basis of agropedologic research, which reduce the efficiency of the irrigation a lot. That is why it is necessary to carry out drainage projects in the zones affected by humidity faster and in greater dimensions, with a view to blocking surface leakage and regulation and digging of interior rivers with the purpose of avoiding worsening of the hydroenergy balance of the particular zones and destruction of the ground with high phreatic contribution. In this context, Comrade Nicolae Ceausescu requested that priority be given to the projects to eliminate excess humidity, with the beneficiaries being urged to carry out the maintenance and care of the projects to correct the water factor, since a disfunction of great portions in the entire sewer system is installed, a fact which brings a substantial reduction in the effect of the particular improvement projects and rise in expenses and energy consumption for correcting these defects. I feel that it is significant that expenses of up to 700,000 lei/hectare have been reached to bring back into agricultural circulation some nonproductive lands, with a very large consumption of fossile fuels, without still obtaining an optimum soil in all respects.

One also may state that the inadequate structure of crops in an irrigated system, characterized by excessive crowding of the technical and food crops--

making some crops like sugar beets and soy too big to detriment of the plateau lands of Transylvania and Moldavia, where they had the tradition and conditions for obtaining economical products, and making the corn crop too small, which many times does not exceed the proportion of arable land considerably in the non-irrigated systems--leads to economic results which are inappropriate for the effort of social work intended for irrigation projects. We also mention that reduction of electric energy consumption intended for irrigation in the peak periods of this activity at the level of an irrigated system results in savings in this way of around several hundred thousands, which is insignificant compared with losses in the millions for agricultural production due to restrictions on obtaining water. This denotes an inadequate management of energy sources which in the end brings large losses for the national economy as a whole.

The contribution of land improvement projects is different in intensity. While irrigation shows its effects immediately, water management projects--accumulations, regularizations of river beds, deviations and so forth as well as digs--do not produce immediate effects and are difficult to give a value to. However, eliminating the losses caused by flooding, they have great economic and social importance. Their complete effect in the projects to combat soil erosion is seen 6-8 years after the work is done, but they have a decisive role in lessening and gradually avoiding the erosion process. Eliminating excess water requires lower investments than irrigation, so they are more efficient, but irrigation brings the biggest economic effects. So we see that in evaluating economic efficiency it is not at all suitable to look for just the immediate result. Precisely such a view meant that many land improvement projects were delayed, which negatively affected soil fertility, emphasizing the process of destruction of extended areas. Precisely for that reason, together with interest in those hydroimprovement projects which have immediate effects and efficiency, the same attention also should be given to those improvement projects which have a more remote and reduced contribution during a nearer stage, but contribute decisively to the timely intensification of the land's production capacity, savings and giving to future generations a land with high production values. The economics of land improvement projects always should be analyzed within the framework of the past-present-future relationship, at the level of immediate and more distant economic effects, and not just with regard to economic efficiency as well as social-political efficiency.

The use of the main factors of technical progress at the optimum dimensions and structures is an important way to improve the relationship between effort and economic effect in the process of the modernization and intensification of agriculutre.

In this framework, under conditions of reducing the labor force working in agriculture, the options of the decision-making factors more and more are heading in the direction of extending mechanization, of including the totality of links of production techniques in the mechanization process. Although this option has a decisive role in increasing labor productivity and production and for reducing expenses, its being carried out is limited by the incomplete stage at which the system of agricultural machinery is. The stage we are referring to even now, as an effect of a policy of mechanization of agriculture from the first two decades of the period of cooperativization and following this period, also drags on now, a stage characterized by the action of "tractorization," that is, preponderant supply with tractors, to the detriment of the stock of mechniery needed to form

the particular aggregates. Such a situation has economic and social implications, since it brings surpluses of tractor and labor force for the agricultural year as a whole and, at the same time, large peaks of requests for mechanization and other energy resources (human and animal) in certain stages of the year, particularly in the September-October period of harvesting of the late crops, with negative effects with regard to creating some big gaps between the biological harvest and the economic harvest stored.

A study on production costs at various levels of mechanization records that in the version with the highest level of mechanization, as a result of reduction in consumption of the labor force and force of animal traction and corresponding rise in the volume of mechanized projects, although the total number of energy units used--expressed in horsepower--actually doubled, the cost of energy consumption fell compared with the least mechanized version from 899 to 595 lei/hectare and from 7.43 to 2.53 HP. These figures plead for diversifying the stock of agricultural machinery and for completing it with all the necessary aggregates. Only the need for applying complex mechanization and the mechanized operation of all agricultural projects as much as possible do not mean loading a large volume of mechanized projects for the sake of mechanization. The need for saving energy and raw materials requires application of the mechanization technologies at the level of minimum work, presupposing the forecast of strictly necessary projects within an agricultural year. In this regard it is planned for the introduction of certain technologies with the most economical aggregates in agricultural practice to have as an effect in 1981-1990 reduction in fuel of 8.5 percent for the agricultural projects carried out by tractor, 19 percent for harvesting with grain combines, 7 percent for corn and 12 percent for fodder.

Reducing to the minimum the energy consumption used requires a reconsideration of the use of work animals under certain unsuitable conditions for mechanization activity; these are on lands with small stocks, on very high slopes for internal transporting, large distances and so forth.

Fertilization activity represents the most important component in the process of the intensification and modernization of agriculture. The thing is for fertilization not to be done unilaterally, with the stress being placed in chemical fertilizers. Especially since these fertilizers require a high energy consumption--50 percent of total energy consumption in vegetable production. Given this, it becomes urgent to reconsider the role and place of organic fertilizers,which no chemical fertilizer can equal. Of the approximately 25 million tons of organic fertilizer estimated by specialists in the Ministry of Agriculture and the Food Industry, equalling 300,000 tons of active nitrogen, phosphorous and potassium substance, only 12-14 million tons are used. Using these reserves, too, the entire need for nutritional substances is not insured within the fertilization process, clearing requiring the contribution of chemical fertilizers to complete them.

With regard to the interrelationship between the production structures and the strategy of intensification of agriculture, one notes that in the last three decades the trend was formed to move from circular agriculture, within which the connection between vegetable and animal production is carried out by fodder balance and balance of waste--contribution to fertilization of thesoil--to

the type of linear agriculture, in which system animal production in the industrial animal-raising complexes is broken from vegetable production, with the concentrated fodder being brought from outside these enterprises and the leadership factors not being concerned with the fertilization of the land they have available on the basis of the waste. What is more, about 20 years ago it was planned more and more intensely to reject crop rotations with the motivation that chemical fertilizers would compensate for the effect of crop rotation. Which was also carried out to a large extent. Of course, big productions were obtained, but to the detriment of the soil structure and quality of production. The experiments made bring out that compared with single crops, a rotation of 4 years brings a rise in production (expressed in grain units) of 14 percent,with the net income rising better than 2.7 times. Longer rotations permit cultivation of technical crops in greater proportions, which through the level of production and prices contributes to the increase in net per hectare income. Such an agricultural system permits an intensive agriculture to be practiced, diminishing the big requests for chemical fertilizers, herbicides and pesticides. Against the background of the interrelationship of the structure of intensification-types of intensification, we have the need for generalizing certain systems of specific agriculture, zonal ones, which would include different types of crop rotations in relationship with the ecological conditions but also with a social order appropriate production technology.

Through the prism of the need for the continued intensification of agriculture, under conditions of the scarcity of energy and raw material resources in the world, more and more the biological concept of agriculture is being brought up to date, whose structural background is including some ameliorative crops and fertilization mainly with organic fertilizer. Within this agricultural system, at the level of the same net income, just one-third of the energy used by chemified agriculture is consumed. The problem being posed refers to the fact that by exclusively practicing such an agricultural system we cannot cope with the increasingly greater demands for agricultural products at the level of a population which is increasing at very fast rates, since rejecting chemical fertilizers would reduce current grain production in half. With this, a mixed type of agriculture--with a biological foundation but also with a broad opening toward intensive, modern and utilized rationally in a managerial spirit--appears timely and answers the current social and economic commands between the apologists for modernization of agriculture with no discernment, one which promotes superchemified agriculture despite the higher and higher cost of the products and deterioriation of the environments and between the supporters of a strictly biological agriculture, without any contribution of intensification, which forgets that we cannot cope with the demographic-food balance with chemical fertilizers and other modernization factors.

8071
CSO: 2700/295

REPUBLIC OBLIGATIONS TO FEDERAL FUND FOR UNDEVELOPED REGIONS

Belgrade SLUZBENI LIST SFRJ in Serbo-Croatian No 31, 4 Jun 82 p 911

[Excerpt] The following annual and monthly advance payments into the Federal Fund for Granting Credits for the Faster Development of Economically-Underdeveloped Republics and Autonomous Provinces have been established (in thousands of dinars) for 1982:

1 Republike odnosno autonomne pokrajine	2 Godišnja akontacija stalnih sredstava Fonda	3 Sredstva po osnovi obveznog zajma (50%)	
		4 godišnja obveza	5 mjesečna obveza
1	2	3	4
6 SR Bosna i Hercegovina	5,578.300	2,789.100	232.425
7 SR Crna Gora	957.500	478.700	39.892
8 SR Hrvatska	11,847.600	5,923.800	493.650
9 SR Makedonija	2,347.900	1,173.900	97.825
10 SR Slovenija	6,936.500	3,468.300	289.025
11 SR Srbija izvan teritorija socijalističkih autonomnih pokrajina	11,641.100	5,820.600	485.050
12 SAP Kosovo	926.400	463.200	38.600
13 SAP Vojvodina	4,423.100	2,211.600	184.300
14 UKUPNO:	44,658.400	22,329.200	1,860.767

Key:

1. Republics or Autonomous Provinces
2. Annual advanced payments of permanent funds into the Fund
3. Funds on the basis of obligatory loan (50%)
4. Annual obligation
5. Monthly obligation
6. SR (Socialist Republic of) Bosnia-Hercegovina
7. SR (Socialist Republic of) Montenegro
8. SR (Socialist Republic of) Croatia
9. SR (Socialist Republic of) Macedonia
10. SR (Socialist Republic of) Slovenia
11. SR (Socialist Republic of) Serbia
12. SAP (Socialist Autonomous Province of) Kosovo
13. SAP (Socialist Autonomous Province of) Vojvodina
14. Total

CSO: 2800/418

TRADE UNION MEETING CITES FAILURES IN POOLING LABOR, FUNDS

Belgrade BORBA in Serbo-Croatian 26 Jun 82 p 5

[Excerpt] The central theme of the 25 June meeting of the governing council of the SSJ (Trade Union Federation of Yugoslavia) was the pooling of labor and resources in earning income and in developing the under-developed republics and Kosovo, and the building of a unified Yugoslav market. Trade union and other analyses of this problem show that we are lagging considerably behind in associating labor and funds, that we have not yet, in all areas, perceived the problems involved in this process, and income-linking by OOURs (basic organizations of associated labor) with those [OOURs] in undeveloped areas is still inadequate.

Of the total revenue accrued in 1980 only 10.74 percent was based on joint revenue [programs]; in 1981 this percentage was 11.31. This result is even worse if one considers the fact that two-thirds of the funds pooled are associated on the basis of law, not on a free basis. The situation is similar in regard to exchange of labor; in 1980 1.87 percent of income was earned on the basis of labor exchange; in 1981 this percentage was 1.78. In 1981 joint [jointly-earned] income accounted for 0.19 percent of total revenue; in 1981 it accounted for 0.16 percent.

Alija Avdic, member of the SSJ Presidium, said in his report on this that 80 percent of pooled funds are linked to investment programs initiated by collectives in the economically developed parts of the country. This indicates that the attitudes and policy in regard to regional development through associating of labor and funds, as envisioned in the 5-year plan, have not been attained.

In the judgment of the SSJ governing council, many self-management agreements which regulate these matters are inadequate. A survey made in 1980 in 20,000 basic organizations shows that 94 percent of these [OOURs?] pooled funds within their republic or province, while only 6 percent pooled funds outside their borders. Thus, also the policy of investment is enclosed within opstina, republic, and provincial boundaries.

Also evident are tendencies toward weakening of [domestic] trade trends, fragmenting and encapsulation of the market, and toward monopoly.

Because of inadequate linking therefore, the entire reproduction structure is not developing as desired in the spirit of the Law on Associated Labor. Many facts show that it is not only a question of resistance to associating but also other conditions including the inadequate material position of producers. Available income is declining from year to year. In 1974 the share of producers in distribution of the social product was 72 percent, while in 1981 it was 67 percent. In the same period the income available to them declined from 67 to 63.3 percent of total income. Thus their rate of capital accumulation and reproductive ability also declined.

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ANALYSIS SHOWS INTER-REPUBLIC TRADE CONTINUES TO DECLINE

Belgrade BORBA in Serbo-Croatian 24 Jun 82 p 4

[Excerpt] The unified Yugoslav market is not functioning, but this is not because of the lack of a new special law to coordinate relations in this field. This is the judgment of the Federal Executive Council which believes that if the existing laws were consistently applied, they could effectively regulate relations on a unified Yugoslav market. It is well-known that relations in this field are not in order. Inter-republic commodity trade has been only symbolic for a long time. This is indicated also in an extensive analysis of the unified Yugoslav market which will soon be the subject of discussion by delegates in the SFRY Assembly. The analysis shows that more than two-thirds of all goods and services "move" only within the boundaries of our federal units [republics and provinces].

Some republics and provinces frequently produce considerably more goods than they need, but nevertheless this "surplus" rarely crosses their own "border."

In the last 10 years Bosnia-Hercegovina has reduced its purchases of goods and services from other republics and provinces by 11 percent, Montenegro by 22 percent, Croatia from 27.4 percent to 18.5 percent, Macedonia from 36.2 percent to 29.1 percent, Slovenia from 23.9 percent to 20.2 percent, Serbia from 32.6 to 20.4 percent, Kosovo from 53.7 to 44.4 percent, and Vojvodina from 30.8 to 26.3 percent.

In regard to exports of goods and services, Bosnia-Hercegovina, for instance, delivers to other republics 28.9 percent of its total production, Montenegro 28.1 percent, Croatian 27.7 percent, Slovenia 36.5 percent, Serbia 30.8 percent, Kosovo 37.1 percent, and Vojvodina 34.7 percent. All percentages show a reduction of about 10 percent compared to those of 10 years ago, except for Macedonia which increased its deliveries to other republics by 1.9 percent.

Many facts which this very useful analysis has shown were known and discussions have been held many times about them in delegate committees of the SFRY Assembly. Now, however, extensive material with tables and percentages has been compiled which also offers certain political recommendations. The question is, however, how much strength delegate assemblies, or associated labor, will find to break down and overcome republic and provincial borders in a short time.

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BRIEFS

SOCIALIZED WORK ORGANIZATIONS--As of the end of 1981 there were 20,939 basic organizations of associated labor (OOURs), or about 1,700 more than 3 years earlier, according to the Federal Bureau for Statistics. There were also 13,888 work organizations without OOURs; this is a reduction from 14,269; and 4,451 work organizations with OOURs (in 1978 there were 3,812). There were 404 complex organizations of associated labor compared to 286 [in 1978] and 5,246 organizations of associated labor (OURs) compared to 4,173 [in 1978]. In agriculture there were 774 basic organizations of private farmers cooperating with cooperatives (compared to 266) and 264 basic cooperative organizations (compared to 261). The number of internal banks remained unchanged at 167. There were 10 associated banks. The number of artisan cooperatives increased from 293 to 389, while the number of [artisan] contract organizations of associated labor increased from 59 to 123. In 1978 there were 6,837 SIZs (self-management interest communities), and 8,054 at the end of 1981. The largest number of OOURs is in industry and mining (6,053), agriculture and fishing (1,252), transportation and communications (1,457), construction (1,611), and commerce (2,293). [Excerpt] [Belgrade EKONOMSKA POLITIKA in Serbo-Croatian 31 May 82 p 29]

CSO: 2800/418

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