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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

THIRD CONSULTATION ON THE PETROCHEMICAL INDUSTRY

Vienna, Austria, 2–6 December 1985

REPORT

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Explanatory notes

APLA	Asociación Petroquímica Latinoamericana
ASEAN	Association of South-East Asian Nations
CEPIC	Conseil européen des fédérations de l'industrie chimique
CMEA	Council for Mutual Economic Assistance
GATT	General Agreement on Tariffs and Trade
OAPEC	Organization of Arab Petroleum Exporting Countries
OPEC	Organization of Petroleum Exporting Countries
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme

PREFACE

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru, in March 1975, recommended that UNIDO should include among its activities a system of continuing consultations between developed and developing countries with the object of raising the share of developing countries in world industrial output through increased international co-operation. 1/ The General Assembly, at its seventh special session in September 1975, endorsed the recommendation and requested UNIDO to implement it under the guidance of the Industrial Development Board.

In May 1980, the Industrial Development Board decided to establish the System of Consultations on a permanent basis, and in May 1982 it adopted the rules of procedure 2/ according to which the System of Consultations was to operate, including its principles, objectives and characteristics, notably:

(a) The System of Consultations should be an instrument through which UNIDO would serve as a forum for developed and developing countries in their contacts and consultations directed towards the industrialization of developing countries; 3/

(b) Consultations would also permit negotiations among interested parties at their request, at the same time as or after consultations; 4/

(c) Participants of each member country should include officials of Governments as well as representatives of industry, labour, consumer groups and others, as deemed appropriate by each Government; 5/

(d) Final reports of the Consultations should include such conclusions and recommendations as were agreed upon by consensus by the participants; the reports should also include other significant views expressed during the discussions. 6/

The First Consultation on the Petrochemical Industry was convened at Mexico City, in March 1979, 7/ and the Second Consultation on the Petrochemical

1/ Report of the Second General Conference of the United Nations Industrial Development Organization (ID/CONF.3/31), chap. IV, "The Lima Declaration and Plan of Action on Industrial Development and Co-operation", para. 66.

2/ See Draft rules of procedure for the System of Consultations (ID/E/258), annex.

3/ Official Records of the General Assembly, Thirty-fifth Session, Supplement No. 16 (A/35/16), vol. II, para. 151(a).

4/ Ibid., para. 151(b).

5/ Ibid., para. 152.

6/ Ibid., Thirty-second Session, Supplement No. 16 (A/32/16), para. 163.

7/ Report of the First Consultation Meeting on the Petrochemical Industry, Mexico City, 12-16 March 1979 (ID/227).

Industry was held at Istanbul, in June 1981. 8/ The Industrial Development Board, at its sixteenth session in May 1982, 9/ took note of the conclusions and recommendations of the Second Consultation and decided at its seventeenth session in May 1983 that a consultation on the petrochemicals sector should be held during the biennium 1984-1985. 10/

Twenty-six Consultations have been convened since 1977 covering the following industries and topics: capital goods, agricultural machinery, iron and steel, fertilizers, petrochemicals, pharmaceuticals, leather and leather products, vegetable oils and fats, food-processing, industrial financing, training of industrial manpower, wood and wood products and building materials.

8/ Report of the Second Consultation on the Petrochemical Industry, Istanbul, Turkey, 22-26 June 1981 (ID/273).

9/ Report of the Industrial Development Board on the work of its sixteenth session (Official Records of the General Assembly, Thirty-seventh Session, Supplement No. 16 (A/37/16)).

10/ Report of the Industrial Development Board on the work of its seventeenth session (Official Records of the General Assembly, Thirty-eighth Session, Supplement No. 16 (A/38/16)).

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INTRODUCTION

1. The Third Consultation on the Petrochemical Industry was held at Vienna from 2 to 6 December 1985. The Third Consultation was attended by 143 participants from 56 countries and 18 international and other organizations (see annex I).

Background to the Third Consultation

2. The First Consultation on the Petrochemical Industry recommended action by Governments of both industrialized and developing countries in the area of the marketing of petrochemicals produced in developing countries. UNIDO was requested to study long-term agreements for the sale of petrochemicals as a means of assisting the orderly flow of petrochemicals into existing and future markets. The Consultation also considered some of the essential elements of licensing agreements and recommended that UNIDO prepare a model form of contract and a set of guidelines for consideration at the Second Consultation. 1/

3. The Second Consultation on the Petrochemical Industry recommended that UNIDO should, inter alia, revise the first draft of the model form of agreement for the licensing of patents and know-how in the petrochemical industry and include a more extensive integral commentary on the text including, where necessary, alternative texts; thereafter, convene a meeting of experts to review the new draft with a view to preparing a revision expressing both views, with a balanced presentation of the views.

4. The Second Consultation also requested UNIDO to examine various forms of long-term arrangements for the development of the petrochemical industry in the developing countries and to update the existing general guidelines for joint ventures. In co-operation with the parties concerned, UNIDO was also asked to develop a programme of co-operation among developing countries, both those with and those without petrochemical feedstocks, to promote the development of the petrochemical industry in those countries. 2/

Preparations for the Third Consultation

5. In accordance with a recommendation made by the participants in the Second Consultation, the Secretariat of UNIDO prepared the "Second draft of UNIDO model form of agreement for the licensing of patents and know-how in the petrochemical industry, including annexures, an integrated commentary and alternative texts of some clauses" (UNIDO/PC.50) and convened a meeting of international experts to review it. Their suggestions have been reflected in an updated version of the model form of agreement. 3/

1/ Report of the First Consultation Meeting on the Petrochemical Industry, Mexico City, 12-16 March 1979 (ID/227).

2/ Report of the Second Consultation on the Petrochemical Industry, Istanbul, Turkey, 22-26 June 1981 (ID/273).

3/ "UNIDO model form of agreement for the licensing of patents and know-how in the petrochemical industry, including annexures, an integrated commentary and alternative texts of some clauses" (UNIDO/PC.50/Rev.1).

6. In order to help developing countries in identifying investment opportunities in the petrochemical sector and in improving the transparency of the market, UNIDO initiated the preparation of a supply/demand data base. Through direct contacts with companies and governmental organizations in the developing countries as well as with companies, professional associations and other sources of data in the developed countries, projections of medium-term demand for the most important petrochemical products are also available on the data base. The data base facilitates the projection of long-term demand for some 25 basic, intermediate and end-products of the petrochemical industry that are widely used and/or produced in developing countries.

7. In addition to joint venture arrangements, the UNIDO Secretariat examined other forms of long-term arrangements, including those covering financing; training; marketing and trade; feedstocks and the supply of raw materials; technology and its development; co-operation between countries and companies concerning their policies for the replacement and expansion of capacities for selected petrochemical products; and barter arrangements, including compensation agreements.

8. An OPEC/UNIDO/OPEC Fund for International Development Seminar on Co-operation among Developing Countries in Petrochemical Industries was organized at Vienna, from 7 to 9 March 1983, to discuss co-operation between developing countries with hydrocarbon resources or with no hydrocarbon resources. The Seminar examined studies, prepared by the co-sponsoring organizations, entitled "Opportunities for co-operation among developing countries for the establishment of petrochemical industries"; "The development of petrochemical industries in developing countries" and "The availability of natural gas in developing countries for petrochemical industries"; and recommended that an examination should be made of existing arrangements for co-operation in various regions with a view to formulating guidelines for such co-operation. The Seminar also recommended that a directory of technological capabilities in developing countries, a directory of the export potential for petrochemicals and a world-wide investment opportunity study should be prepared.

9. The participants emphasized the need for active co-operation among developing countries in research and development activities, and established an advisory panel of experts to assist the co-sponsoring organizations in the implementation of the recommendations of the Seminar. The Advisory Panel on Petrochemicals held three meetings. An Expert Group Meeting on International Co-operation on Petrochemicals was also convened in 1984, which brought together members of the panel and representatives of the petrochemical industry in developed countries to discuss North-South co-operation. That meeting identified areas for North-South co-operation at the company, corporate and international levels in the fields of marketing; raw materials; basic petrochemicals; intermediates and end-products; plant operation; maintenance and spare parts; technical services; training and manpower development; safety; environmental protection; technology; and government policies.

10. A background document ^{4/} was prepared, reviewing past and current global trends of development in the petrochemical industry. The study encompassed several documents prepared by the Secretariat of UNIDO on world supply and demand, cost evaluation of petrochemical production, research and development trends, world trade and co-operation trends.

^{4/} "The petrochemical industry in the developing countries: prospects and strategies", Sectoral Studies Series No. 20, vol. I (UNIDO/IS.572).

11. In accordance with the recommendation of the Second Consultation to study long-term arrangements for the development of the petrochemical industry, the Secretariat prepared a study 5/ on the basis of a direct survey of existing joint venture arrangements in countries of the ASEAN region, of Latin America, the Middle East and Western Europe; in the Nordic countries; and in the United States of America.

12. In the light of the work undertaken by the UNIDO Secretariat and the activities summarized above, the Secretariat envisaged that the Third Consultation would consider the establishment and development of an efficient mechanism, on a permanent basis, for the maintenance and development of a UNIDO data base for the petrochemical industry, including the creation of a working group with an appropriate composition and mandate to achieve its objectives; and examine the different forms and mechanisms for long-term arrangements that could help developing countries and their petrochemical companies to establish mutually beneficial relations while safeguarding the healthy development of the industry.

13. For those reasons participants in the Third Consultation were requested to consider:

Issue 1: Long-term arrangements for the development of the petrochemical industry in developing countries

New Issues

14. The studies undertaken by the Secretariat clearly indicated that, in addition to the issues emerging from the First and Second Consultations, two other vital areas warranted special attention. Those were, first, the need to increase the use of petrochemical products in an integrated and rational manner in achieving the development goals of developing countries and, secondly, to upgrade the capability of developing countries in the operation, use and development of petrochemicals through intensified research and development activities. In order to achieve those two objectives, the UNIDO Secretariat selected the following issues for consideration at the Third Consultation.

Issue 2: The development of downstream petrochemical industries in developing countries

Issue 3: Research and development in the petrochemical industry in developing countries

5/ "Survey and analysis of joint venture arrangements in the petrochemical industry" (ID/WG.448/4).

AGREED CONCLUSIONS AND RECOMMENDATIONS

Issue 1: Long-term arrangements for the development
of the petrochemical industry in developing countries

Conclusions

15. The following conclusions were reached:

1. The Working Group concludes that a data bank is important for promoting the development of the petrochemical industry in developing countries and for co-operation both between developed and developing countries and among developing countries. UNIDO efforts in this field should be continued, interacting with and drawing full benefits from similar activities in other United Nations agencies and international organizations.
2. The Working Group recognizes that international trade plays an important role in the development of the petrochemical industry in the developing countries and needs the general application of common commercial rules as favourable as possible. In this context the existence of tariff and non-tariff barriers can, among other things, restrict trade in petrochemical products. Therefore, the Working Group considers that the tariff and non-tariff barriers which inhibit the future growth of the petrochemical industry in general should be phased out within the proper frameworks.
3. The process of restructuring the petrochemical industry is governed by such factors as the rapid growth of demand for petrochemicals in developing countries as a whole, the availability of raw materials, the social implications for population and labour concerns, and changing economic conditions. Taking into account the above-mentioned factors, restructuring can be facilitated by long-term co-operative arrangements. The Working Group also recognizes that since the restructuring process provides benefits, it should be encouraged by removing obstacles and adopting measures to accelerate its market-associated development.
4. The Working Group concludes that the concept of joint ventures retains its fundamental validity and presents a viable mechanism for international co-operation in order to accommodate the needs and contributions of the partners. It also recognizes that the building up of confidence between potential partners and a clear understanding of their needs and objectives are matters of great importance for the formation of joint ventures.
5. The Working Group recognizes the crucial role of individual government policies in creating an environment conducive to the successful implementation of long-term arrangements for the petrochemical industry, such as market protection for emerging industries and incentives for industrial development.
6. In addition, the Working Group emphasizes the need to adopt and implement the best prevailing practices regarding environmental protection and safety matters and internationally accepted practices regarding labour-related matters.

7. The Working Group recognizes that the effective transfer of technology includes not only the provision of satisfactory engineering design and related equipment, but also the means of building up the capacity to assimilate transferred technology locally and of developing the ability to improve on the products and the process, as well as the basis for establishing good production practices, including proper safety and environmental protection measures. The Working Group also recognizes that substantial progress has been made in removing restrictive clauses within transfer of technology agreements and that in general such agreements no longer contain unduly restrictive clauses.
8. The Working Group recognizes the importance of developing a local capability for participating in plant design and undertaking construction, as well as the need to review technical standards and specifications used in the design of petrochemical plants in order to maximize the contribution of the domestic capital goods industry without relaxing safety, environmental factor requirements and operational efficiency.
9. The Working Group reiterates the importance both for the companies involved and the Governments concerned of securing adequate safeguards and sufficient guarantees relating to the design and operation of plant and equipment with due consideration being given to developing country conditions.

Recommendations

16. The Working Group recommends that UNIDO should, within its mandate:
 1. Continue its efforts to improve further the petrochemical data base and in addition circulate among Member States a list of relevant publications available from other national, regional and international organizations and agencies;
 2. Bring to the attention of the appropriate international organizations, such as GATT and UNCTAD, the issue of tariff and non-tariff barriers, which affect the international trade in petrochemicals and consequently detrimentally affect the further development of the petrochemical industry;
 3. Consider, inter alia, convening an expert group meeting to examine the problems and benefits associated with the process of restructuring in the petrochemical industry, and communicate the findings to Member States and to other interested parties for their consideration;
 4. Make a special effort, in co-operation with other appropriate organizations, on matters directly related to safety and environmental protection and labour relations in the petrochemical industry and in developing new forms of co-operation between developed and developing countries and among developing countries;
 5. Extend its activities in encouraging individual government authorities and others in initiating and/or consolidating confidence-building measures among potential partners through the organization of workshops, seminars, meetings and training programmes.

Issue 2: The development of downstream petrochemical industries
in developing countries

Conclusions

17. The following conclusions were reached:

1. It is an important objective for developing countries to develop downstream petrochemical industries. Through their use for construction, clothing and food, the products of these industries provide for important basic needs of a growing population. The development of downstream industries also serves to alleviate balance-of-payments problems, contributes to an increase in employment, promotes a balanced development between different regions of a country and strengthens technological capabilities;
2. The development of diversified downstream industries can contribute to the strengthening of the industrial structure and to bringing about considerable productivity increases in industries using their products, and in agriculture;
3. The development of downstream industries is also a suitable way for many developing countries to upgrade and find markets for the products of the basic petrochemical industry and thereby to achieve an improved utilization of national resources;
4. Developing countries should give appropriate priority to the strengthening of downstream industries in their development plans. They should also assess the extent to which technical assistance is required from external resources;
5. In the establishment of downstream petrochemical industries, countries will have to consider the necessary conditions for success and viability:
 - (a) Assessment of markets and appropriate capacities;
 - (b) Involvement of entrepreneurs and local authorities;
 - (c) Assistance in training;
 - (d) Promotion of applications;
 - (e) Technical legislation etc.

Recommendations

18. The Working Group recommends that the developing countries should take action as appropriate:

1. To review and analyse the existing and potential markets for the products of the downstream petrochemical industries to respond to the rapid growth of demand, taking into account the social implications and changing economic conditions;
2. To elaborate a long-term integrated strategy for the development of the domestic downstream petrochemical industries, taking into account the overall development strategy, the existing production structure,

the development of a basic petrochemical industry in general, and the needs of the agricultural, construction and textile sectors in particular;

3. To provide the necessary support for the establishment and/or expansion of downstream petrochemical industries. Such support might include the following:

- (a) Technical assistance by government authorities;
- (b) Financial incentives;
- (c) Assistance with infrastructure;
- (d) Manufacture of processing machinery and equipment, including tools and moulds;
- (e) The involvement of petrochemical companies and other relevant expertise, where they exist, in the selection and development of products and processes and in the training of personnel.

19. The Working Group further recommends that the developing and industrialized countries should take action, as appropriate, in the field of international co-operation:

1. To promote economic and technical co-operation among developing countries in the downstream petrochemical industries, and in particular:
 - (a) To promote regional co-operation among developing countries to provide larger markets;
 - (b) To facilitate the development and/or extension of linkages between upstream and downstream petrochemical industries;
 - (c) To pool resources particularly in the exchange of information.
2. To foster co-operation between industrialized and developing countries in establishing downstream petrochemical industries, and in particular:
 - (a) To promote enterprise-to-enterprise co-operation;
 - (b) To make use of experts available under favourable conditions to assist developing countries;
 - (c) To consider bilateral co-operation to establish and support the development of national technical development centres.

20. The Working Group also recommends that UNIDO should, within its mandate, take action:

1. To review the experience gained in the plastic development centres existing in developing countries with a view to exploring the possible extension of their contribution to the general development of downstream petrochemical industries in other developing countries;

2. To prepare a study assessing and analysing the present status of and future prospects for the petrochemical downstream industries in developing countries with emphasis on the application of plastics in agriculture;
3. To sponsor forums for, in particular, small-scale companies from industrialized and/or developing countries for the exchange of industrial experience that might lead to different forms of commercial or technical co-operation agreements. These meetings could lead to a survey of enterprises prepared to propose co-operation for downstream petrochemical industries.

Issue 3: Research and development in the petrochemical industry
in developing countries

Conclusions

21. The following conclusions were reached on issue 3:
 1. Research and development continues to play an important role in the long-term planning, everyday operations and in the technological development of all aspects of the petrochemical industry;
 2. Current priorities of developing countries are related to the acquisition, development and assimilation of manufacturing technologies and to market and process development;
 3. Greater use of enterprise-to-enterprise co-operation at national, regional and international levels would assist in maximizing the value of the resources available for research purposes.

Recommendations

22. The Working Group recommends that developing countries should, as appropriate:
 1. Elaborate national policies for research and development applied to the petrochemical industry and its downstream applications and ensure that research and development in these areas obtain the necessary support and resources;
 2. Aim at an optimal use of resources through, inter alia, the promotion of co-operation between industry, the sphere of academic research and education, and national research institutes;
 3. Encourage co-operation between enterprises and all operators concerned (including laboratories, universities etc.) at the national, regional and international levels as follows:
 - (a) At the national level:
 - (i) Networks could be created for the exchange of information and expertise between research units engaged in similar or related activities;

(b) At the regional and international levels:

- (i) Additional possibilities could be explored for regional co-operation between enterprises and research centres in different countries with a view to pooling resources to solve common problems and to exchanging technical information, expertise, training etc.;
- (ii) Co-operation should also be encouraged between licensor and licensee particularly by including the training of personnel in process design and engineering;
- (iii) Joint research should be fostered between developing and industrialized countries for elaborating new processes and new products, including possible joint licensing agreements with third parties.

23. The Working Group recommends further that UNIDO should, within its mandate, take action:

1. To provide assistance in the elaboration of national research and development policies for the petrochemical and downstream industries, upon request from the countries concerned;
2. To extend the existing training programme to the field of industrial research in all related sectors of the petrochemical industry.

I. ORGANIZATION OF THE CONSULTATION

Opening of the Consultation

Statement by the Director-General of UNIDO

24. The Third Consultation was opened by the Director-General of UNIDO. Stating that the Third Consultation was the first to be held under the aegis of an independent UNIDO, the Director-General said that, barring the issues of food and shelter, petrochemicals touched intimately the daily lives of people. Recalling the reasons for the current difficulties encountered by the sector - the sharp increase in energy prices, market saturation, the emergence of new capacities - the Director-General pointed out that the difficulties would endure for some time to come unless the international community made a determined and collective effort to find common solutions.

25. The two previous Consultations had emphasized the imperative need for long-term arrangements between producers and consumers for an orderly global development. Given the sensitivity of the petrochemical sector to the global economic situation, to the energy crisis, to recession and to the external debt burden, the invitation to the participants of the Third Consultation to take up that theme again was not untimely.

26. The Second Consultation had warned the international community of the dangers facing the industry and had invited it to consider its restructuring in a stable and rational manner. The measures taken had had a positive impact but more needed to be done to resolve the issue of orderly marketing.

27. Solutions to the problems would have to give due consideration to the legitimate aspirations of those developing countries with access to low-cost feedstocks and energy resources to utilize their comparative advantage and thereby upgrade the economic value of their natural resources. Actions to remove market restrictions, allow free access to international markets of products according to their competitiveness, as well as specialization between countries and companies on the basis of mutual advantage, were also mentioned by the Director-General as being worthy of consideration. Advancing the efforts of developing countries, through intensified South-South and North-South co-operation, to promote the use of the products of the downstream petrochemical processing industries, and assisting, on the basis of international co-operation, the promotion of research and development in the petrochemical industry were further points for consideration.

Statement by the Secretary-General of the Ministry of Foreign Affairs, Austria

28. The Secretary-General of the Ministry of Foreign Affairs welcomed the participants on behalf of the Government of Austria and said that his country attached great significance to the work of UNIDO. Within the framework of the newly independent UNIDO, he believed that the System of Consultations would play an even larger role, giving greater focus to practical and well-defined issues.

29. The petrochemical industry sector was one in which Austria could make a meaningful contribution; the petrochemical industry was an important branch of the country's oil production.

30. Despite the economic recession of the 1980s, market opportunities in the developing countries were still promising and, therefore, a greater degree of

internationalization of petrochemical production seemed likely to predominate in the future.

Statement by the Head of the Negotiations Branch of UNIDO

31. The Head of the Negotiations Branch said that the issue of long-term arrangements for the development of the petrochemicals industry in developing countries was the crux of the Consultation's deliberations. He invited the participants to consider the nature and feasibility of long-term arrangements for the world supply of and demand for petrochemicals, joint venture arrangements, co-operation between and among the countries of the South and co-operation on a universal basis.

32. Turning to the second issue, downstream petrochemical industries in developing countries, he said that the difficulties of the developing countries arose basically from the small and fragmented nature of the downstream industry, and were further compounded by the complexity and fast-evolving nature of the relevant technology. In his opinion, that area would lend itself to international co-operation. It was essential, therefore, that the Consultation suggest practical and feasible means by which the developing countries might be able to overcome the constraints in the development and the integration of downstream processing industries.

33. The third issue, research and development, was basic to self-sufficiency, independence and financial viability and concerned both developed and developing countries. Those activities were, however, costly, and needed a high level of technological and organizational capabilities and infrastructure, and very advanced scientific knowledge and skills. Recognizing the imperative of viable research and development programmes, the Secretariat had suggested certain ways, mainly through shared activities, of implementing research and development programmes in developing countries.

Election of officers

34. The following officers were elected:

- | | |
|----------------|--|
| Chairman: | Gordon D. Wilson (United Kingdom of Great Britain and Northern Ireland), Licensing Manager, ICI Petrochemicals and Plastics Division |
| Rapporteur: | S. Chowdhary (India), Chief Manager (Polymers), Indian Petrochemicals Corporation Ltd. |
| Vice-Chairmen: | Olu Akani (Nigeria), Project Co-ordinator, Nigerian National Petroleum Corporation |
| | Francisco J. Barnés (México), Secretario Técnico, Comisión Petroquímica, Secretaria de Energía, Minas e Industria Paraestatal |
| | Bogdan Janicki (Poland), Director, Ciech-Technochem |
| | Bernhard Schleppinghoff (Federal Republic of Germany), Manager (Research and Development), EC-Erdölchemie GmbH |

Adoption of the agenda

35. The Consultation adopted the following agenda:

1. Opening of the Consultation
2. Election of the Chairman, Vice-Chairmen and Rapporteur
3. Adoption of the agenda and organization of work
4. Presentation of the issues by the Secretariat
5. Discussion of the issues

Issue 1: Long-term arrangements for the development of the petrochemical industry in developing countries

Issue 2: The development of downstream petrochemical industries in developing countries

Issue 3: Research and development in the petrochemical industry in developing countries

6. Other matters
7. Conclusions and recommendations for further action
8. Adoption of the report of the meeting

Establishment of a programme of work and working groups

36. The Consultation adopted the programme of work shown in annex II below.

37. The Consultation established two working groups to discuss the issues and to propose conclusions and recommendations for consideration at the plenary session:

Working Group 1 to consider issue 1: Long-term arrangements for the development of the petrochemical industry in developing countries

Working Group 2 to consider issues 2 and 3: The development of downstream petrochemical industries in developing countries (issue 2); research and development in the petrochemical industry in developing countries (issue 3)

38. Francisco J. Barnés (México), Secretario Técnico, Comisión Petroquímica, Secretaría de Energía, Minas e Industria Paraestatal was elected Chairman of Working Group 1.

39. Bernard Carrere (France), Service des études économiques, Union des industries chimiques, was elected Chairman of Working Group 2.

Documentation

40. Documents issued prior to the Consultation are listed in annex III below.

Adoption of the report

41. The report of the Third Consultation was adopted by consensus at the final plenary on 6 December 1985.

II. REPORT OF THE PLENARY SESSIONS

Summary of the discussion

42. One participant, after congratulating the Secretariat on its follow-up activities to the Second Consultation and the well-prepared documentation for the Third Consultation, recalled the conclusion of the Second Consultation that indicated that the establishment of petrochemical plants in locations where feedstock and energy resources were available would have economic attractions.

43. Some participants emphasized that UNIDO could only implement recommendations within its available resources, taking into account the priorities of the work programme established by the policy-making organs of the Organization.

III. REPORT OF THE WORKING GROUP ON ISSUE 1:
LONG-TERM ARRANGEMENTS FOR THE DEVELOPMENT OF THE
PETROCHEMICAL INDUSTRY IN DEVELOPING COUNTRIES 6/

44. In opening the session, the Chairman of the Working Group underlined the desirability of arriving at specific and practicable recommendations that would promote international co-operation in the petrochemical industry.

Market conditions

45. On the issue of markets and market development, it was felt that intimate knowledge of the potential demand of not only the domestic but also regional and other export markets was a prerequisite for the development of the industry. The valuable experience gained in that respect in Latin America demonstrated the feasibility of a regional approach, which was greatly facilitated by a comprehensive exchange of market and related information. The Secretariat pointed out that the directory of developing countries' technological capabilities in the petrochemical sector (UNIDC/PC.125) covered many relevant aspects conducive to regional co-operation.

46. On the current efforts being undertaken by the Secretariat to create a data base on the petrochemical industry, the participants strongly endorsed that work. They stressed the need for its continuation and further expansion to include, among other things, information and data analysis showing new trends, identification of local needs, installed and projected capacities, in order to furnish the basis for a realistic view of the situation in its different and various components. It would be useful to indicate the possibilities of implementing petrochemical projects in developing countries, particularly projects of mutual interest to two or more countries, of maximizing comparative advantages, and of opening markets in developing countries in order to allow the establishment of world-scale production capacity.

47. Thus the data base would play an active role in facilitating the implementation of plans to develop the petrochemical industry in developing countries and in South-South co-operation.

48. The need for close co-operation between the international organizations and agencies concerned was particularly important and urgent in order to avoid duplication.

49. UNIDO could, in connection with the establishment of the petrochemical data base, consider supporting the training of the responsible decision-makers in the fields of marketing, organization, management and safety.

50. The linking of the development of a petrochemical data base with executive training would maximize its effective utilization by aiding Member States in the execution of their long-term marketing plans, particularly in terms of helping them to decide what products should be produced, at what prices, in which quantities and in what forms.

51. With respect to trade and related issues, particularly tariff and non-tariff barriers, the representatives of GATF and UNCTAD noted that their organizations were extensively involved in researching those issues. The Secretariat agreed that in respect of those issues, inter-agency co-operation worked well, as was evident in a number of background and reference papers, ^{1/} the preparation of which had benefited considerably from the expertise of those two organizations.

52. Many participants considered that the erection of obstacles to free trade in petrochemical products hampered the prospects for the expansion of the industry in developing countries. That was particularly true in cases where limited domestic requirements for the products would preclude the establishment of cost-efficient, world-scale-sized plants, and would lead to a dependence on exports, at least for an initial period. The representative of OPEC stated that access to major markets was crucial to developing countries, above all for the generation of foreign exchange to service foreign debt and for the recovery of investment on plant. Another participant proposed that, in order to counteract the current limitations of world trade in petrochemicals, a 10 per cent share of the petrochemical requirements of the industrialized countries should be earmarked for duty-exempt imports from the developing countries. Similarly, at least half of the petrochemical imports of the developing countries should originate in other developing countries and should also be exempt from duty. Other participants expressed reservations as to the practicability of setting arbitrary targets unrelated to the realities of the market-place and its various constraints.

53. The crucial nature of exports from new projects in some developing countries was emphasized by some participants. The participants recognized that international trade played an important role in a sector like the petrochemical industry. Projects were implemented because of changes in comparative advantages, particularly those that fostered the future growth of the petrochemical industry in developing countries. That meant that the use and application of common commercial rules, which had been discussed and organized by the largest number of countries, seemed to be a fundamental need. The Governments in developed and developing countries should resist protectionist pressures and reduce existing tariffs and non-tariff barriers. Various frameworks, such as a new multilateral trade negotiation as well as preferential and regional frameworks, could provide useful opportunities for achieving further trade liberalization in the petrochemical sector. Furthermore, it would be useful to start such negotiations soon.

54. Some participants drew attention to the fact that international co-operation in the industry depended, as elsewhere, on the sharing of tangible economic benefits among business partners.

Long-term arrangements

55. A representative of the Secretariat pointed out that the survey and analysis of joint venture arrangements represented an extension and fundamental reworking of the general guidelines submitted to the Second Consultation. Although the concept of joint venture arrangements had evolved considerably in recent years, generating many new forms, it still retained its

^{1/} UNIDO/IS.572/Add.1 and UNIDO/IS.573.

fundamental validity as a major vehicle for international co-operation in the petrochemical industry. The background document on that subject 8/ was based entirely on information and insights gained through direct contact with public authorities and business partners of existing joint venture companies, as well as through extensive regional surveys in both developing and developed countries.

56. The participants agreed that joint venture arrangements represented a viable mechanism for matching the needs and contributions of the parties in a mutually beneficial manner. In that context, reference was made to the emerging pattern of many joint venture agreements, in which such factors as raw material and energy availability, combined with established export markets, were considered crucial for the commercial viability of world-scale petrochemical plants in countries with limited domestic markets. Some participants contrasted capital-intensive joint ventures in basic commodities with less costly downstream processing operations that integrated well into domestic economies, and stressed that it would be desirable to start with those downstream operations that could be well integrated into domestic economies.

57. In that connection, participants from some developing countries with extensive petrochemical industries said that relevant experience in developing appropriate technology to meet their own specific requirements could be made available to other interested developing countries.

58. Some participants maintained that industrialization was mandatory for economic advancement and that the petrochemical industry, in view of its interlinkage with other sectors, could constitute the core of such efforts. The narrowly defined business criterion of commercial viability was insufficient; social costs and social benefits should also be taken into account. In addition, apart from the possibility of gaining access to world markets, the overriding motivation of the developing countries in participating in international joint ventures was the acquisition of technology and its local assimilation.

Restructuring

59. Despite the fact that petrochemical growth rates in the developing countries had been higher than those in developed countries in recent years, participants noted that the share of production of developing countries in absolute terms had remained modest and that solutions were required.

60. Many participants reported on current restructuring in the industry, which had involved rationalization in the form of shut-downs, idle plants, streamlining and product specialization. The Secretariat reminded the participants that the process of restructuring itself offered many opportunities for international co-operation, some of which had been identified in a UNIDO document. 9/

61. Regarding overcapacity and the resultant problems, most participants insisted that that issue could not be solved by developing countries refraining from establishing additional plants. One participant pointed out that the

8/ "Survey and analysis of joint venture arrangements in the petrochemical industry" (ID/WG.448/4).

9/ "World changes in the structure of the petrochemical industry, 1980-1983" (UNIDO/PC.123).

situation had already improved significantly and that the rising standard of living in many countries would bring about a greater demand for petrochemical products.

62. Some participants proposed that production and consumption could be balanced by closing down older plants for a while. They urged both developed and developing countries to minimize their oil and gas consumption and keep those valuable resources for future and better use. In the meantime, greater efforts in research and development should be made to find new and better products and/or to improve the specifications of existing products.

63. Several participants suggested that UNIDO could provide a valuable service by preparing a definitive and comprehensive analysis of the state of the industry, and its future prospects, that would enable decisions to be taken on a sound and rational basis to the benefit of the industry and, in the final analysis, the consumer.

Long-term arrangements

64. The representative of APLA stressed that in any long-term arrangement there should be a clear and genuine complementarity of interests, with each partner contributing his specific comparative advantage. On the issue of the policy measures for long-term arrangements, many participants agreed that an appropriate government framework was essential. Some participants were of the opinion that the role of government in developed market economies could not be compared with that obtaining in developing countries, where it was generally wider. Participants generally agreed on the crucial role that government policies could play in attracting foreign partners for joint ventures or other arrangements. Furthermore, newcomers paid a financial penalty for entering the international market that could take the form of lower prices and, consequently, adversely affect all producers.

65. The representative of UNEP urged participants to pay due attention, in discussing policy measures, to the necessity for environmental protection, since prevention of environmental damage was always less costly than its subsequent remedy.

66. The discussion then turned to the examination of some aspects of contractual obligations in the broader context of technology transfer agreements. Several participants noted that, with some exceptions, licensors did not impose many restrictions on the marketing of products manufactured through the use of their processing technology.

67. Participants also considered that the duration of mechanical guarantees and warranties conventionally offered by suppliers was not satisfactory, given the traditionally longer construction time that obtained in developing countries. Such provisions should be expanded to accommodate the specific requirements of the developing countries at the contract negotiation stage.

68. Some participants from developing countries stressed the need for the development of indigenous technologies to place developing country petrochemical industries on a sound footing. Another factor judged important by many participants was access to improvements in technology and the assimilation of that technology.

69. Some participants requested UNIDO to survey and analyse the problems faced by the developing countries in the construction and operation of petrochemical complexes in such a manner that similar problems could be avoided by other countries.

70. One participant suggested that independent engineering companies should be employed directly by owners to provide overall project management for planning and operation, on behalf of operators in developing countries, and to extend support to operators in advanced site engineering, not only in respect of detailed engineering design on site, but also as regards maintenance and inspection services.

71. Another participant noted that the best way to avoid problems connected with equipment and machinery was to involve the technical personnel of the complex concerned from the outset, starting with the project design and engineering phase.

72. Some participants underlined the necessity of integrating the manufacture of equipment and machinery required by the petrochemical complexes into the capital goods industry of the country. Such a linkage had proven extremely beneficial to a number of developing countries in reducing the cost of projects. Aspects of safety were also discussed, and the attention of the meeting was drawn to a recent report that had been prepared by CEPIC.

Regional co-operation

73. The representative of APLA gave a brief description of the achievements made possible by regional co-operation through his organization and concluded that similar results could be obtained in other regions.

74. The representative of OAPEC stated that in the Arab region a large number of joint projects in the petrochemical, fertilizer, pharmaceutical and other sectors had been conceived, some of which had been implemented largely on the basis of economic viability, technical competence and the availability of manpower in the region.

75. One participant remarked that his country's regional co-operation schemes mainly involved a neighbouring country. The pragmatic approach employed in that respect was to optimize the resources of both countries, notably raw materials, market size, capital resources, which had allowed more flexibility and synchronization in their industrial policies. Countries of the ASEAN region were also, to some extent, co-ordinating their policies in the petrochemical industry through a joint committee, which, however, had not yet led to a comprehensive and integrated approach, given the fact that the industry of the region had been established relatively recently.

76. On the issue of customs unions, the representative of GATT remarked that since customs union agreements usually embraced all products, some conflict of interest might arise between the petrochemical sector and the general requirements of such agreements. The meeting concurred that, in any event, the success of customs unions depended to a large extent on the political will of the participating countries.

77. The representative of UNCTAD reminded the participants that a recent ministerial conference of developing countries had approved the launching of a scheme to elaborate a generalized system of tariff preferences, covering products traded amongst developing countries, including some petrochemical derivatives. That scheme, when implemented, would have some repercussions on the current pattern of global trade.

78. Some participants, in response to the case made in favour of importing products, rather than producing them locally, maintained that the utilization of locally available raw materials and other resources, economic development,

the creation of an industrial base, employment opportunities, foreign exchange and strategic considerations etc. clearly demonstrated the advantages of national production. Those factors far outweighed any short-term advantage to be gained by importing petrochemicals. Some participants maintained further that, in any case, developing countries would have to import a whole range of other items, which they could not possibly hope to produce themselves.

79. One participant emphasized the desirability of effective trade union participation at the Consultations. The labour movement, in general, was sympathetic to the efforts being undertaken by the developing countries for their economic emancipation. However, the current rationalization of the petrochemical industry in the industrialized countries had produced redundancies and a permanent loss of jobs with all the accompanying social hardships. He called for some understanding of those problems.

IV. REPORT OF THE WORKING GROUP ON ISSUE 2:
THE DEVELOPMENT OF DOWNSTREAM PETROCHEMICAL INDUSTRIES
IN DEVELOPING COUNTRIES 10/

80. Participants discussed initially the term "downstream petrochemical industries", which had been defined in a UNIDO document as being the processing of end-product petrochemicals. Plastics, rubber and synthetic fibre processing constituted the main body of petrochemical products (about 70 per cent of the total production of the petrochemical industry). 11/

81. Several participants discussed the role of the downstream industries. It was agreed that downstream industries played an important role in national economies. Some participants emphasized that their products met essential needs in such sectors as food, shelter and clothing; other participants emphasized the rates of growth of demand, which were very high in developing countries. Participants also mentioned that the products of downstream industries could be used as an alternative to metals, natural fibres etc.; that the manufacturing technology was relatively simple and that the products could be manufactured in smaller-scale units, using imported or locally produced polymers.

82. Many participants stressed the importance of the utilization of plastics in agriculture, called plasticulture. They pointed out that from greenhouses and irrigation to crop protection to product packaging, depending on the particular country, downstream products played an ever-increasing role and that, in many countries, agriculture accounted for up to 20-25 per cent of the total consumption of plastics. Those participants stressed that potential advantages in that field were particularly attractive to developing countries that relied heavily on their agricultural production.

83. Participants from several regions reported on the development, actual status and future development plans of the downstream industries.

84. Many participants discussed the constraints on the development of downstream industries. Some participants stressed that the full backward integration of polymer production was necessary for the economic operation of downstream industries; others suggested that a lack of investment capital was the major obstacle, while others said that besides a lack of sufficient capital, a lack of human resources, skills and equipment could be limiting factors. A few participants mentioned that emergency rather than preventive maintenance was characteristic of the industry in developing countries and that developing countries had to rely upon foreign expertise during major repairs.

85. Two participants pointed out that product application research was a prior condition for the successful marketing of products. Several participants stressed the importance of market research and market development

10/ ID/WG.448/3.

11/ "The petrochemical industry in developing countries: prospects and strategies", Sectoral Studies Series, No. 29, vol. I (UNIDO/IS.572), pp. ix-xii and 13-15.

in the selection of specific products for local manufacture in a given region since the properties of the product should meet the expectations of the customers. One participant stressed the necessity of having an adequate distribution network. Another participant said that in marketing and market research, the co-ordination of petrochemical, product manufacturing and downstream industries was necessary.

86. One participant said that manufacturing technologies should also be studied in detail, and that a strategic forecast should be made of the potential impact of technological advances on the production structure.

87. One participant pointed out the significance of new developments, such as single-cell protein from methanol, in the light of the preoccupations of the developing countries.

88. Several participants discussed the role of training in the downstream processing industries. They said that manpower training was essential for providing pools of skilled workers for production facilities and that that objective could be achieved by on-the-job training for six to eight months. One participant considered that the most important training and educational task lay in the managerial and organizational field. Many participants discussed the possibility of using the services of experienced and knowledgeable experts made available in the industrialized countries under favourable conditions (e.g. early retirement).

89. Many participants underlined the need for policy co-ordination in support of downstream industries. One participant described the model used in his country, which included assistance in product selection, advice on how to obtain government support, a guaranteed supply of raw materials, incentives for training etc. Other participants stressed the necessity for co-ordinating upstream and downstream integration.

90. The necessity for and possibility of co-operation among developing countries were emphasized and several examples were presented of such co-operation at the regional level as well as between individual local organizations. Some participants stressed the importance of co-operation in the organization of downstream petrochemical industries to meet the specific demands of the industry.

91. Several participants reported on the significant role played by manufacturers of plastics in the establishment of a plastic processing industry in a developing country.

92. A representative of the UNIDO Secretariat gave information on the activities of UNIDO in the creation of application centres for plastics, their achievements and the possibilities they offered for developing countries.

V. REPORT OF THE WORKING GROUP ON ISSUE 3:
RESEARCH AND DEVELOPMENT IN THE PETROCHEMICAL INDUSTRY
IN DEVELOPING COUNTRIES 12/

93. Participants described petrochemical research and development as an activity directed towards the development of new products, new processes and new applications; as an essential tool for the selection, assimilation and improvement of technologies; as a method to improve and stabilize the quality of products; and also as a necessity for the solution of the technical problems of downstream petrochemical industries.
94. Many participants reviewed the organization and achievements of research and development in petrochemicals in their country and offered assistance to interested developing countries.
95. Some participants of developing countries reported that important new processes had emerged from research and development in their countries, some of which could also be licensed out to third parties.
96. Several participants pointed out that the main directions of research and development in petrochemicals should include a better utilization of local resources, including organic feedstocks and co-products/by-products and the adaptation of processes to local conditions.
97. Many participants suggested that process design engineering should be integrated into, or closely connected to, research and development organizations for the successful implementation of research results in commercial-scale production.
98. Several participants analysed the constraints that hampered the utilization of research and development resources in developing countries. They included the lack of recognition of the need for research, the lack of research facilities and management capacity, the shortage of skilled manpower and brain-drain.
99. Many participants stressed the need to improve co-operation in research and development between companies, central institutes and universities. Such co-operation should be based on mutual recognition and support of mutual objectives and needs.
100. Many participants described successful examples of bilateral, regional and multilateral co-operation, particularly in the exchange of information between professionals both in an organized as well as an informal manner.
101. A representative of the Secretariat reported on the activities of UNIDO in the fields of economic co-operation between developing countries (ECDC) and technical co-operation between developing countries (TCDC).
102. Participants acknowledged the role of UNIDO in the establishment of national research and development centres and requested that those activities be extended in future.

Annex I

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Annex II

PROGRAMME OF WORK

Monday 8:30 - 10:00 Registration at the Vienna International Centre
2 December

Plenary

10:00 - 13:30 Opening session; election of officers; adoption of the agenda; formation of working groups

Working group 1

Working group 2

Discussion of issue 1 a/ Discussion of issue 2 b/

14:30 - 16:00 Market conditions:
capacities; produc-
tion; consumption;
demand projections

Viability of the down-
stream petrochemical
industry and its impact
on the national economy

16:30 - 18:00 Viability of produc-
tion in developing
countries

Marketing and market
development

Product development and
adaptation

Co-operation in the down-
stream petrochemical
industry

Tuesday 9:30 - 10:30 Long-term arrangements
3 December

Conclusions and recommen-
dations

Discussion of issue 3 c/

11:00 - 12:45 Other forms of long-
term arrangements

Research and development
in the petrochemical
industry in developing
countries

Role and place of research
and development in the
petrochemical industry

Actual situation of
research and development in
petrochemicals in develop-
ing countries

14:30 - 16:00 Policy measures
required for long-term
arrangements in devel-
oping countries

New trends in research and
development in petrochemi-
cals and their impact on
future strategies

Policies and legis-
lation of developed
countries/companies

Organization of research
and development in petro-
chemicals

	16:30 - 18:00	Policies and legislation of corporate co-operation	Resumed discussion, policy measures
Wednesday 4 December	9:00 - 10:30	Regional co-operation	Resumed discussion Co-operation in petrochemical research and development
	11:00 - 12:45	Resumed discussion	South-South and regional co-operation
	14:30 - 15:30	Conclusions and recommendations	Action required in research and development
	15:45 - 16:00	Resumed discussion	
	16:00 - 18:30	Regional co-operation	Conclusions and recommendations
Thursday 5 December	9:00 - 10:30	Discussion and adoption of the conclusions and recommendations of Working Group 1	Discussion of conclusions and recommendations of Working Group 2 on issue 2 Discussion of conclusions and recommendations of Working Group 2 on issue 3
	11:00 - 12:30	Discussion and adoption of conclusions and recommendations	Adoption of conclusions and recommendations of Working Group 2
	14:00 -	Visit to Petrochemie Danubia, Schwechat	
Plenary			
Friday 6 December	9:00 - 11:00	Discussion of the report of the Third Consultation	
	11:30 - 13:00	Adoption of the report and closing session	

a/ ID/WG.448/2.

b/ ID/WG.448/3.

c/ ID/WG.448/1.

Annex III

LIST OF DOCUMENTS

Issue papers

Issue 1: Long-term arrangements for the development of the petrochemical industry in developing countries	ID/WG.448/2	A/C/E/F/R/S
Issue 2: The development of downstream petrochemical industries in developing countries	ID/WG.448/3	A/C/E/F/R/S
Issue 3: Research and development in the petrochemical industry in developing countries	ID/WG.448/1	A/C/E/F/R/S

Background documents

Survey and analysis of joint venture arrangements in the petrochemical industry	ID/WG.448/4	E/F/S
Approaches to contractual agreements aimed at access to technology and to its improvements in the petrochemical industry with illustrative examples	ID/WG.448/5	E/F/S
The petrochemical industry in the developing countries: prospects and strategies Sectoral Studies Series No. 20, vol. I	UNIDO/IS.572	E
The petrochemical industry: the sector in figures, vol. II	UNIDO/IS.572/Add.1	E

Information documents

Report of the First Consultation on the Petrochemical Industry, Mexico City, 12-16 March 1979	ID/227	E/F/S
Report of the Second Consultation on the Petrochemical Industry, Istanbul, 22-26 June 1981	ID/273	E/F/S
UNIDO model form of agreement for the licensing of patents and know-how in the petrochemical industry, including annexures, an integrated commentary and alternative texts of some clauses	UNIDO/PC.50/Rev.1	E
Report. First Meeting of the Advisory Panel on Petrochemicals, Vienna, 3-4 October 1983	UNIDO/PC.82	E
Report. Second Meeting of the Advisory Panel on Petrochemicals, Vienna, 17-18 September 1984	Panel paper	E
Report. Third Meeting of the Advisory Panel on Petrochemicals, Vienna, 3-5 June 1985	Panel paper	E
World changes in the structure of the petrochemical industry 1980-1983	UNIDO/PC.123	E
Report. Expert Group Meeting on International Co-operation on Petrochemicals, Vienna, 19-21 September 1984	UNIDO/PC.124	E
Developing countries' technological capabilities in petrochemicals	UNIDO/PC.125	E/F/S
Current world situation in petrochemicals	UNIDO/PC.126	E/F/S

International trade and the marketing of petrochemicals	UNIDO/PC.128	E/F/S
Emerging petrochemicals technology: implications for developing countries	UNIDO/IS.350	E
Opportunities for co-operation among the developing countries for the establishment of the petrochemical industry, Sectoral Working Paper Series No. 1	UNIDO/IS.376	E
World demand for petrochemical products and the emergence of new producers from the hydrocarbon rich developing countries, Sectoral Studies Series No. 9	UNIDO/IS.427	E
The development of chemical and petrochemical industries in the European CMEA countries, Sectoral Working Paper Series No. 23	UNIDO/IS.486	E
Environmental study of the petrochemicals industry, Sectoral Working Paper Series No. 36	UNIDO/IS.568	E
Tariff and non-tariff measures in the world trade of petrochemical products (prepared by the UNCTAD secretariat for UNIDO), Sectoral Working Paper Series No. 37	UNIDO/IS.573	E
New trends in petrochemical research and development, Sectoral Working Paper Series No. 38	UNIDO/IS.576	E
Environmental considerations relating to the petrochemicals industry, Sectoral Working Paper Series No. 40	UNIDO/IS.580	E
Opportunities for co-operation among developing countries for the establishment of petrochemical industries (Seminar paper) Paper prepared by UNIDO and the OPEC Fund for the OPEC/UNIDO/OPEC Fund for International Development Seminar on Co-operation among Developing Countries in Petrochemical Industries, Vienna, 7-9 March 1983		E
The development of petrochemical industries in developing countries (Seminar paper) Paper prepared by UNIDO for the OPEC/UNIDO/OPEC Fund for International Development Seminar on Co-operation among Developing Countries in Petrochemical Industries, Vienna, 7-9 March 1983		E

