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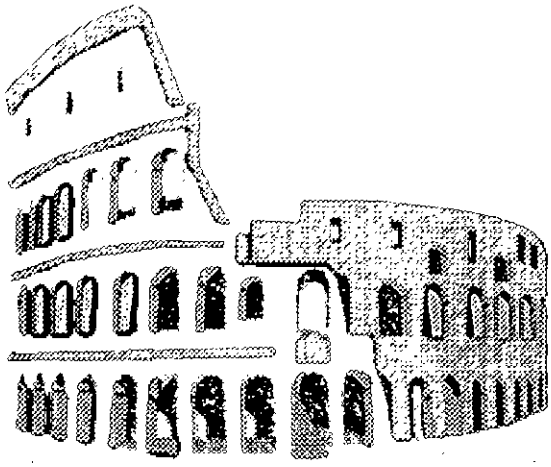

# ECONOMISTS' GROUP MEETING

## "Development and Cooperation"

## October 1-4, 1995

1) PROGRAMME

2) PARTICIPANTS

3) GUEST SPEAKERS

4) MEDITERRANEAN SECURITY, POLITICAL, ECONOMIC AND CULTURAL FACTORS

5) LATIN AMERICAN DOWNSTREAM AND WORLD OIL OUTLOOK

6) THE CASE OF THE ITALIAN CHEMICAL INDUSTRY

7) DOW CORNING CORPORATION: A JOINT VENTURES JOINT VENTURES.

8) COOPERATION OF JAPANESE CHEMICAL COMPANIES WITH FOREIGN COMPANIES

9) FUTURE OF THE ECONOMISTS' GROUP

ECONOMISTS' GROUP

ROMA 95

# DEVELOPMENT AND COOPERATION

Savoy Hotel - Via Ludovisi, 15 Roma

**CONFERENCE PROGRAM**

**Sunday, 1 October**

17.00 Registration
18.00 Economists' Group meeting
19.00 Cocktails
20.00 Dinner at the Hotel

**Monday, October the 2nd**

*Morning session: Macroeconomic and industrial outlook in OECD and major world areas*

9.00 "Italy's macroeconomic and financial prospects in the framework of the EU": C.A Bollino - General Director, ISPE (Ministero del Bilancio)
9.20 "Industrial structure in Italy: potentials and constraints": G. Galli - Director, Centre for Economic Studies, Confindustria
9.40 Discussion
10.15 Coffee-break
10.30 "Economic and industrial development in major areas": D. H. Meldrum for the Economists' Group and Panel with N. Filippello (North America), R. Freeman (Europe), K. Joshida.
11.30 Discussion
12.30. Lunch.

*13.30 Lunch speech: "The chemical industry in the framework of global developments":* M. Colitti President of EniChem.

*Afternoon session: "Oil producing countries and market conditions"*

14.30 "Religion, politics and institutional development in N. Africa and the Middle East":
R. Aliboni - Director, Istituto Affari Internazionali;
15.00 Discussion
15.45 Coffee-break
16.00 "The oil market scenario": D. Tantillo - Director, Planning Division, Agip S.p.A
16.30 "Latin America Downstream and World Oil Outlook": T. Eck - Chief Economist, Amoco
16.50 Discussion
17.30 End of the session
18.00 Visit to the Cappella Sistina
21.00 Dinner at Hotel Eden, via Ludovisi 49

**Tuesday October the 3rd**

*Morning session: "Restructuring and growth: the role of intra-industry agreements"*

9.00 "Opening remarks on the issues of competitiveness and cooperation among companies": J. Wyatt, Parpinelli
9.45 "Case studies in Europe": R. Freeman - Chief Economist, ICI; W. Bruehl Chief Economist: " Hoechst Group: New Start 1994"- Hoechst. L. Tigini, EniChem: "The Case of the Italian Chemical Industry"
10.30 Coffee break
10.45 "Case studies in the U.S, and in Asia": J. D. Walter - Corp. Economist, Dow Corning; K Nakajima - Business Research Dept, Mitsubishi Kasei Corp.
11.45 General Discussion
13.00 Lunch

*Afternoon session: The Economist's Group: key issues for new membership*

14.30 Opening remarks by President H. Out
14.45 Discussion and conclusions
16.00 Election of a new Vice-President; date and place of the 1996 Conference
16.30 End of the Conference
18.00 Tour through the centre of Rome
21.00 Dinner at George's Restaurant, via Marche 7.

**Wednesday October the 4th**

8.30 Guided tour through the Via Appia Antica on the way to IAFE S.p.A., Eni Management School, in Castelgandolfo

10.30 Coffee at IAFE S.p.A.
11.00 Meeting with Dr. Paolo Vitali, Head of Managerial Development in ENI who will illustrate the issue related to: "Strategic Reassessment and Organisational Development in the future of the Eni Group"

12.15 Lunch

13.15 Return to the Hotel

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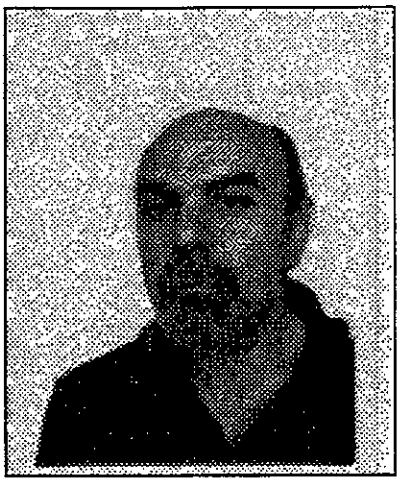


ROBERTO ALIBONI

Curriculum vitae

Since 1987, Roberto Aliboni has been Director of Studies at the Italian Insitute of International Affairs in Rome, an institute he helped to found and establish in the sixties as a direct collaborator of Altiero Spinelli. He is the editor of L'Italia nella politica inernazionale (the IAI's yearbook on Italy's foreign affairs). From 1979 to 1986, he was the Director of the Institute.

Form 1972 to 1979, he taught intrnational Economics at the Universities of Naples and Perugia and held research position in various institutes dealing with internaonal and security affairs.

Mr. Aliboni has initiated and been the director of many international research projects involving international institutes and experts and funded by international foundations (the Ford Foundation, the Volkswagen Stiftung, etc.). The last such project on "The role and prospects of Southern Europe security in a changing european environment" was carried out in 1989-1990.

In 1994, he conceived and succesfully initiated the Mediterranean Study Commission (MeSCO), the network of Mediterranean institutes dealing with international and security affairs.

Publications

*The Red Sea region*, Croom helm, London & Syracuse University Press, Syracuse, 1985 • *European security and out of Nato area crises*, The international spectator, 2, April-June 1988, Rome • *The Mediterranean scenario: economy and security in the Region South of the EC*, The international spectator ,2, April-June 1990, Rome • *Regional security and European security*, in F. Cerruti -R. Ragionieri, Rethinking European security, Taylor & Francis, New York, London 1990 •

*The Mediterranean dimension,* in W. Wallace The dinamics of European integration, Francis Pinter Pub., London & New York 1990 • *European security across the Mediterranean,* WEU Institute for Security Studies, Chaillot Papers, 2, March 1991 Paris • *Southern European security perceptions and problems,* in R. Aliboni, Southern European security in the 1990's, Pinter Publishers, London & New York 1992 • Southern Europe and the United States: the community approach, in J. W. Holmes, Maelstrom, The World Peace Foundation, Cambridge, Massachussets 1995 • *Institutionalizing Mediterranean relations: complementary and competition,* Internationale politk und gesellschaft, N° 3 1995 Bonn•

Curriculum
vitae

JOHN F. WYATT

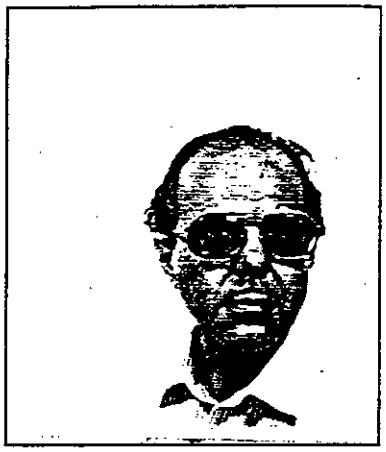
Dr. Wyatt graduated in Business Administration in Liverpool, and attained a Msc, and a PhD in Theoretical Chemistry at the University of Manchester.

Dr. Wyatt is Managing Director of Parpinelli TECNON.
He has been with the TECNON Consulting Group since 1978, initially responsible for the Group's polymers consulting activites before moving into petrochemicals and subsequently assuming re sponsibily for the companies total operations.

He has directed many TECNON assignments undertaking feasibily studies, evaluation of marketing strategy, business planning and competitive position analysis covering many sectors of the petrochemical industry.

Prior to joining the TECNON Group, he spent fourteen years with Ciba-Geigy in the United Kingdom and Switzerland.

Dr. Wyatt is internationally known trhoughout the industry and is currently President of EMCRA, a professional association representing the business research and strategic planning sector.



Curriculum
vitae

DOMENICO TANTILLO

Dr. Tantillo was born in Rome in 1941; he graduated in Law from University of Rome in 1965.

After an initial period of working in a special Credit Institute, he later moved to join the ENI Group, where for many years he was Manager of the Department for Energy and Economic Studies. Later he moved to the Corporate Planning Department where he was in charge of problems related to the Strategic Portfolio.

In 1981 he was engaged on business Development for ENOXY (the Occidental-EniChimica joint venture) until the agreement concluded.

Since 1988 he has been with AGIP S.p.A. as Vice-President in charge of Corporate Planning where he has had particular responsibilty for preparation of the Strategic Plan and for coordination of the Investment Progam and Strategic monitoring.

CARLO ANDREA BOLLINO

Curriculum vitae

Dr. Bollino was born in Rome in 1954; in 1977 he graduated in Economics at the Bocconi University in Milan.

He is Professor in Econometrics at the Luiss University in Rome.

He has been a lecturer in Economics at the University of Pennsylvania where he attained a Phd in Economics in 1983 and worked as a Director at the LINK Project under the guidence of Prof. L. R. Klein.

On his return to Italy in 1983 and up to 1989, he worked in the Economic Studies Department of the Bank of Italy and was Professor in Economics at the University of Campobasso and Sassari. Before becoming General Director of ISPE he was the Head of the Energy and Economics Studies Department in ENI.

Since 1990 ha has been a member of the Italian Society for Statistics, of the Italian Association of Energy Economists and of the Scientific Committee of the Luiss University.

Publications

*Ill circolo virtuoso. Commercio e flussi finanziari in un'Europa allargata*, Il Mulino, 1993 • *Un triennio virtuoso*, Note di Ricerca ENI, 1992 • *Riflessioni sul dilemma etico*, Spazio Impresa, 1991• *Sull'indicizzazione delle retribuzioni*, Spazio Impresa, 1991 • *Lo scenario economico di fronte alla crisi del Golfo*, Energia, 1990

GIAMPAOLO GALLI

Curriculum vitae

Dr. Galli was born in Milan in 1951; he graduated in 1975, in Economics at the Bocconi University in Milan.

He obtained a Phd from the Department of Economics at the M.I.T. in 1979 and did research work with Prof. R. Solow and F. Modigliani.

From 1979 to March 1995 he worked at the Resarch Department of the Bank of Italy. Between 1979 and 1982 he was in charge of the Money Market Division. He also contributed to the setup of the macroeconometric model of the Bank. From 1988 to 1991 he was in charge of the Forecasting Committee. From 1991 to March 1995 he directed the International Economics Department; in this period he was a member of the Monetary Committee of the European Union, of the Economic Policy Committe of OECD, of the G-10 Committee of Alternates and of the Scientific Committee of Ente Einaudi.

He taught Econometrics and Monetary Economics at the Bocconi University in Milan, and at the La Sapienza University in Rome.

At present he is Director of Economic Research in Confindustria and member of the LUISS University Scientific Committee and of the Technical Committee of the Ministry of Industry.

Publications

*On the difference between tax and spending policies in models with finite horizons* (with W. H. Branson), NBER Working Paper N° 2557, April 1988 • *Fiscal responsibility, monetary policies and the exchange rates,* (with R. S. Masera) in Value and capital, fifty years later, L. McKenzie-s: Zamagni, IEA, Mac Millan, 1990

• *Finance and development: the case of Southern Italy,* (with R. Faini and C. Giannini) in Finance and development: issues and experience, A. Giovannini, Cambridge University Press, 1993 •

• *Concerted interventions and the dollar*, (with P. Catte and S. Rebecchini) in The international monetary system: review of the past, outlook for the future, Cambridge University Press, 1994 • *Microstructure of foreign exchange markets* (with J. Frankel and A. Giovannini) forthcoming by Chicago University Press.

Curriculum
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MARCELLO COLITTI

Dr. Colitti was born in Reggio Emilia in 1932, in 1954 he took Law's degree at the University of Parma.

He joined Eni as a Junior Economist in the Economic Studies Department in 1956; was appointed Head of the Public Relations Department in 1967; Manager of the Economic Studies in 1971, and Director of Planning in 1976.
In 1980 he was appointed Vice Chairman of AGIP S.p.A. and served in this capacity until September 1983. Between 1982 and 1983 he served as Chairman of the Industrial Advisory Board of the I.E.A., Paris. From September 1983 to June 1995 he was Chairman of Enichem Polimeri.

As founding member of the Oxford Energy Policy Club since 1983, he has extensively published and lectured on oil and economics.

In June 1985 he became Energy Advisory to the Chairman of ENI and in January 1986 he was appointed Chaiman of Ecofuel S.p.A.
From 1991 to 1995 he served as Chairman of the Observatoire Méditerranéen de l'Energie (O.M.E.).

Since June 1993 ha has been Chairman of EniChem S.p.A., the Chemical Company of ENI Group.

In 1993 he was appointed Vice President of Federchimica, and member of the Junta of Confindustria.

In 1995 he was also named President of Polimeri Europa S.r.L., a Europe-based joint venture with Union Carbide.

Publications

*La politica petrolifera italiana*, with L. Bruni, Giuffré, 1967 • *Le grandi imprese e lo Stato*, Einaudi, 1971 • *Gli Stati Uniti alla deriva*, Buffetti, 1975 • *Energia e sviluppo in Italia - La vicenda di Enrico Mattei*, De Donato 1979 • *Size and distribution of known and undiscovered petroleum resources in the world, with an estimate of future exploration*, in OPEC Review, N°3 Autumn 1981 • *Managing the oil supply*, in OPEC Review, Fall 1986 •

# MEDITERRANEAN SECURITY: POLITICAL, ECONOMIC AND CULTURAL FACTORS[1]

by **Roberto Aliboni, Director of Studies**
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With the end of the Cold War, the importance of military factors affecting Europen security in the areas beyond the Mediterranean (i.e. North Africa and the Middle East) has taken a back seat with respect to non-military considerations.

This paper aims to identify the cultural, political and economic factors affecting European security in the Mediterranean area, and will consider some policy implications.

***Cultural Factors*** influence European security in that they may prompt fundamental ideological antagonisms which in turn give rise to an environment that is hostile and potentially aggressive toward Europe and, more broadly speaking, the West (and the other way round).

(1) Since the Second World War, Western Europe has developed a "rationalist" political culture which has led to the strengthening and enlargement of its democratic political institutions, a strong emphasis on the respect for human and civil rights, and the primacy of international solidarity with respect to nationalist concerns. In the area surrounding Western Europe, however, the end of the Cold War has been accompanied by the re-emergence or reinforcement of "romantic" trends dominated by ethnic, religious, or national values which generally lead to an adversarial identity.

Unless they are managed with appropriate cooperation policies, these developments may have a negative impact on the cohesion and political regime of Western Europe.

(2) Western Europe--and the West as a whole--is considered the primary antagonist of the identity sought in Mediterranean areas. The nationalist position is that of traditional Third Worldism, that is, the West prevents or impedes the spread of modernity (by preventing or limiting the spread of economic, technological and scientific development). According to Islamists, on the other hand, modernity may only be reached within the framework of indigenous values and not through

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[1]This paper is an updated and revised version of a presentation prepared for the international seminar on "The Southern Dimension of European Security: The Mediterranean Area and the European Security Identity", organized in Rome, 5-6 March 1993, by the Western European Union Institute for Security Studies, Paris, in collaboration with the Istituto Affari Internazionali, Rome, and the Centre for Military and Strategic Studies (CeMiSS), Rome and then published in Fred Tanner (ed.), *Arms Control, Confidence-building and Security Cooperation in the Mediterranean, north Africa and the Middle East* ( Malta: Mediterranean Academy of Diplomatic Studies 1994).

assimilation of Western culture: modernization through imitation of the West is a trap which can only lead to subordination.

Islamists are more radical in their rejection of the West and Western Europe than are nationalists. The latter perceive themselves to be on the fringe of what are essentially shared cultural values; their goal is to assume a more central position a culture that is perceived as universal. Islamists, however, reject Western culture as universal and perceive their development as being necessarily in opposition to the West.

The rise of radical Islamism (though there are also major moderate or less radical movements) has intensified longstanding anti-Western sentiments in the regions south of the Mediterranean. The security implications of this trend include fundamental tension which hinders dialogue between Western and Euriopen countries and those of the Southern Mediterranean area.

(3) There has been an increase in immigration from the Mediterranean area (and from Eastern Europe) to Western Europe. Immigrants often form ethnic communities which resist integration into the European host culture. As this is occurring in a period of significant demographic fragility in Europe (where the growth rate is virtually zero in a rapidly aging population), immigration is strongly perceived as a threat, and has led to intolerance and racism. This has contributed to the implementation of restrictive legislation on immigrants and refugees, which is in sharp contrast to the "rationalist", democratic nature of European society and exacerbates the fundamental tension referred to earlier. Also, it is a not negligible factors in hindering the implementation of freedom of circulation in the European Union.

(4) These elements of tension are amplified by the mass media, particularly because of the one-way flow of messages (images transmitted are almost exclusively Western--and these are compounded by those of Western tourists). On one hand, mass media send "European" images across the Mediterranean, giving rise to distortions, conflicts, imitations, and anomie (e.g. French, Italian and Spanish coverage of the Gulf War which was received in the Maghreb); on the other, mass media bring Europeans "European" views of the Southern Mediterranean, particularly of the Islamist movements, which are generally stereotypical and negative, fuelling hostility and mistrust toward the region.

In conclusion, the tension felt by the South with respect to the North is mutual. From a European point of view, the pressures of current cultural trends are putting democratic institutions to the test, and creating a perceived threat to the European way of life.

***Political factors*** also contribute to hostility toward the West.

(1) Western Europe, as an integral part of the West, is allied with the so-called moderate Arab regimes (i.e. those which are cooperative at the international level). This is less of an issue than it had been during the Cold war when such rivalries contributed to the East-West confrontation. What is more relevant today is that opposition groups (Islamist and others) within Arab countries see the West abd Western Europe as supporting what are usually authoritarian and repressive

regimes.

"Democracy" is an important ingredient of European policies toward the countries south of the Mediterranean and democratization is strongly put forward by the Europeans as a condition for cooperation and aid. However, from the point of view of the Arab regimes, European conditionality is fitted out with the necessity to prevent cooperation from turninig into intrusion or from being perceived as an intrusion domestically. Intrusion is refused not only by Islamists but also by several secular opposition groups, which believe that democracy is to be attained through an internal debate aimed at enlarging and strengthening the civil society (i.e. including Islamists). Inability to prevent intrusion or its perception can turn European cooperation into a factor of domestic instability.

Cooperation policy has therefore to walk on a tight rope: it is demanded as a factor of stability, but if used as a leverage to introduce democratic trends into southern Mediterranean societies, it may turn into a destabilizing factor.

(2) The West and Western Europe are involved in the two major crises under way to the south of the Mediterranean: the Arab-Israeli crisis and the Iraqi crisis. Their involvement is a source of a hostility toward the West which will persist as long as the crises remain unresolved and even afterward, as the resolution will favour some groups at the expense of others. Developments in both the UN managememt of the Iraqi crisis and the US/multilateral management of the Arab Israeli negotiations have proved more difficult than expected. Even if Western management will succeed, Europeans have to be aware of the fact that other difficult and long-lasting challenges to be dealt with will emerge.

(3) The lack of international cooperation between the European and Arab worlds constitutes a negative political factor in trans-Mediterranean relations. The Cold War made such cooperation difficult; the end of the Cold War should encourage Western Europe, and particularly the European Union, to develop a policy of cooperation with the Arab world, and to avoid being confined to a marginal role of indirect support or of involvement at the sub-regional level (Maghreb). Such a European initiative, even if it will involve security, would not necessarily be a "duplication" within the Atlantic framework.

A significant impediment to the establishment of inter-regional cooperation between the European Union and the Arab world is the asymmetric level of institutionalization and cohesion of the two sides; the absence of a solid and articulated inter-Arab cooperation weakens the prospects for a successful policy of inter-regional cooperation.

***Economic Factors*** affect European security at least in two main ways:

(1) The marked income disparity among most countries in the area and economic/social underdevelopment fuel opposition (particularly Islamist) to Arab regimes, thus increasing instability. International and bilateral cooperation has recently made more effort to address these problems, launching major adjustment and restructuring programmes. The programme of economic cooperation established by the European Community in 1990 (the renewed Mediterranean policy), despite an increase in funding, provides a modest effort, considering

European interests in this region. The Euro-Mediterranean Partnership the European Union has prepared in 1995 for it to be discussed at the ministerial November 1995 conference in Bercelona seems more promising.

In any case, the EC has to play a greater and more autonomous role in supporting programmes and projects aimed at increasing employment in the short-medium term--an objective which is less important to the restructuring and adjustment programmes supported by the IMF and the World Bank.

(2) International economic cooperation, however, is limited by the severe disintegration and fragmentation of the regional economies and by the lack of cooperation between States with extremely unequal demographic and income distributions. The Arab-Israeli conflict constitutes a fundamental disruption of relations between the countries of the region.

This state of disintegration is a destabilizing factor and threat to West European interests. It results in market fluctuations and trade restrictions, weak infrastructures, threats to oil and other energy supplies, and the lack of mobility of goods and people (which contributes to migrations to Western Europe).

Progress in the current Arab-Israeli negotiations (end of the boycott, border openings, etc.), the implementation of some forms of Middle Eastern Regional Cooperation and the revival of the Arab Maghreb Union would have a very positive effect on international cooperation because it would restore market continuity. In any case, intra-regional cooperation and integration must also be increased. As in the political arena, increased regional integration is necessary in the economic field if international cooperation is to be successful.

Rome, 28th August 1995

***References***


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"Latin American Downstream and World Oil Outlook"

T. R. Eck Presentation
Economists' Group Rome 1995 Conference

## GDP And Population Growth
## Central And South America

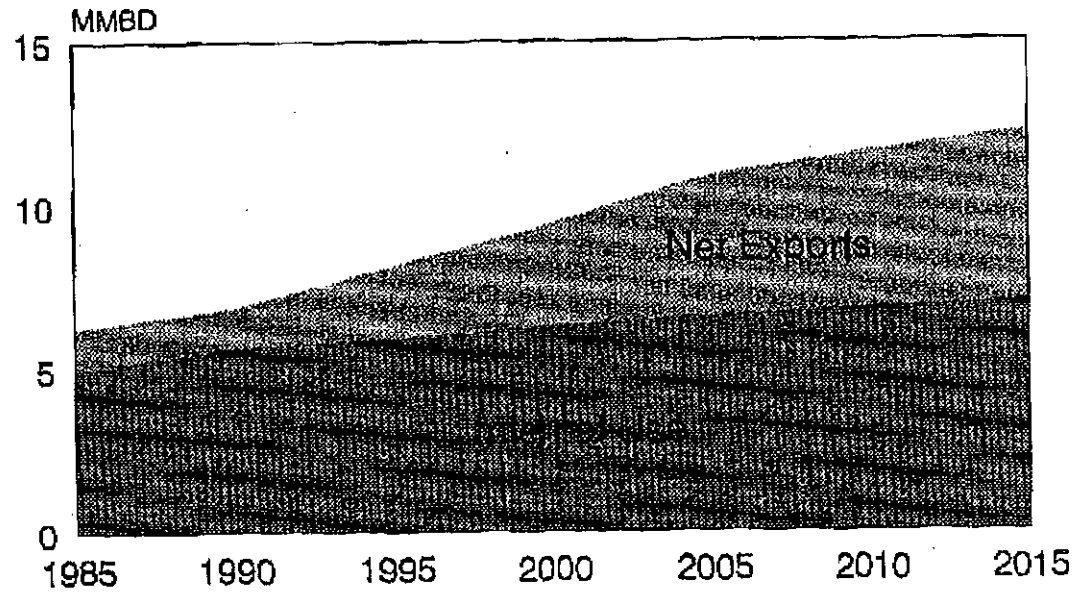
| | | | | Growth | |
|---|---|---|---|---|---|
| | 1992 | 2000 | 2010 | 92-00 | 00-10 |
| GDP, 1987 $ Bil | 435 | 575 | 843 | 3.6 | 3.9 |
| Population, MM | 371 | 446 | 550 | 2.3 | 2.1 |

## Primary Energy Demand, Central And South America

| | Million B/D Oil Equivalent | | |
|---|---|---|---|
| | 1992 | 2000 | 2010 |
| Oil | 3.4 | 4.3 | 5.7 |
| Gas | 1.1 | 1.4 | 2.2 |
| Solid Fuels | 0.4 | 0.5 | 0.7 |
| Nuclear | - | 0.1 | 0.1 |
| Hydro & Other | 0.7 | 0.9 | 1.2 |
| Total | 5.6 | 7.2 | 9.9 |

Source: International Energy Agency

# Latin America: Crude Oil



# Crude Oil Resources: 1994

| | Billion Barrels | | Ratio, Reserves to Production |
|---|---|---|---|
| | Reserves | Production | |
| Venezuela | 65 | 0.9 | 72 |
| Mexico | 51 | 1.0 | 51 |
| Other | 13 | 0.9 | 14 |
| Total Latin America | 129 | 2.8 | 46 |
| Memo: USA | 23 | 2.4 | 10 |

## Increases In Crude Oil Reserves: 1995 Vs 1985

| | Billion Barrels |
|---|---|
| Columbia | +2.8 |
| Mexico | +2.2 |
| Brazil | +1.8 |
| Ecuador | +0.6 |

# Well Completion Trends: 1994 Vs. 1990

| | Net Change |
|---|---|
| Venezuela | +365 |
| Argentina | +294 |
| Ecuador | +30 |
| Brazil | -11 |
| Mexico | -43 |
| Columbia | -81 |
| Other Latin America | -59 |
| TOTAL | +495 |

# Natural Gas Resources, 1993 - 94

| | TCF Reserves | TCF Production | Ratio, Reserves to Production |
|---|---|---|---|
| Venezuela | 130 | 0.8 | 162 |
| Mexico | 70 | 1.3 | 54 |
| Argentina | 18 | 0.6 | 30 |
| Other | 41 | 0.8 | 51 |
| Total Latin America | 259 | 3.5 | 74 |
| Memo: USA | 165 | 19 | 9 |

# Policies On Private Investment In Oil

| | |
|---|---|
| Argentina | Extensive Privatization |
| Bolivia | Privatization Underway |
| Brazil | Plans Meeting Heavy Opposition from Labor |
| Peru | Plans on Hold |
| Venezuela | Marginal Fields, Offshore, Heavy Oil |
| Mexico | PEMEX Largely Intact. Some Moves in Petrochemicals, Marketing, Gas Distribution |

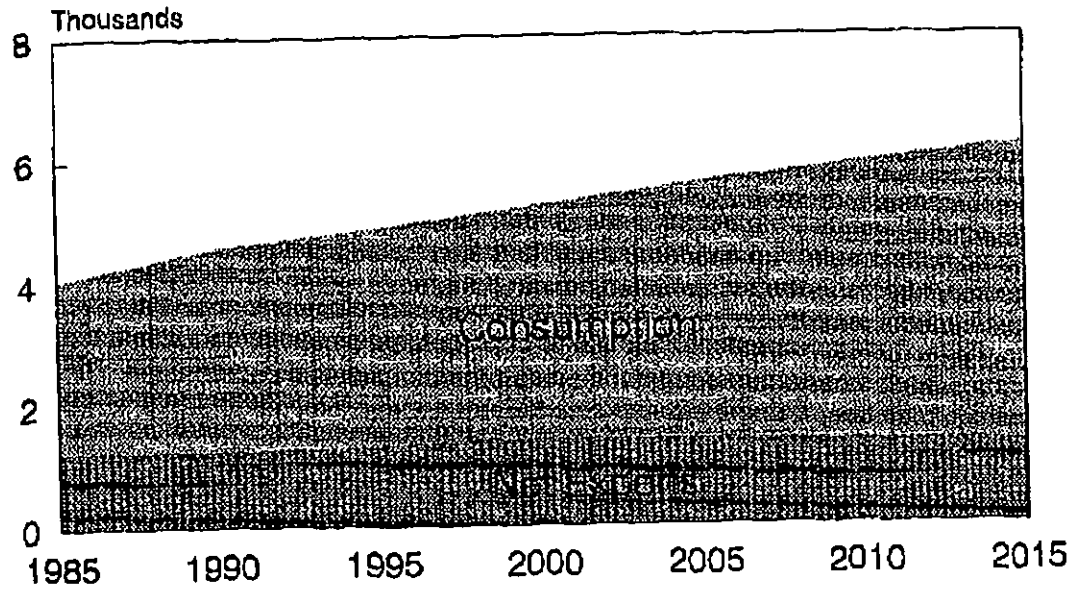
# Oil And Gas Outlook For Latin America

- Long Term Market Potential Good
- Excellent Natural Resource Base
- Large External Capital Requirements for Projects and Supporting Infrastructure
- Privatization Moving Slowly
- Fiscal Demands Often Unrealistic

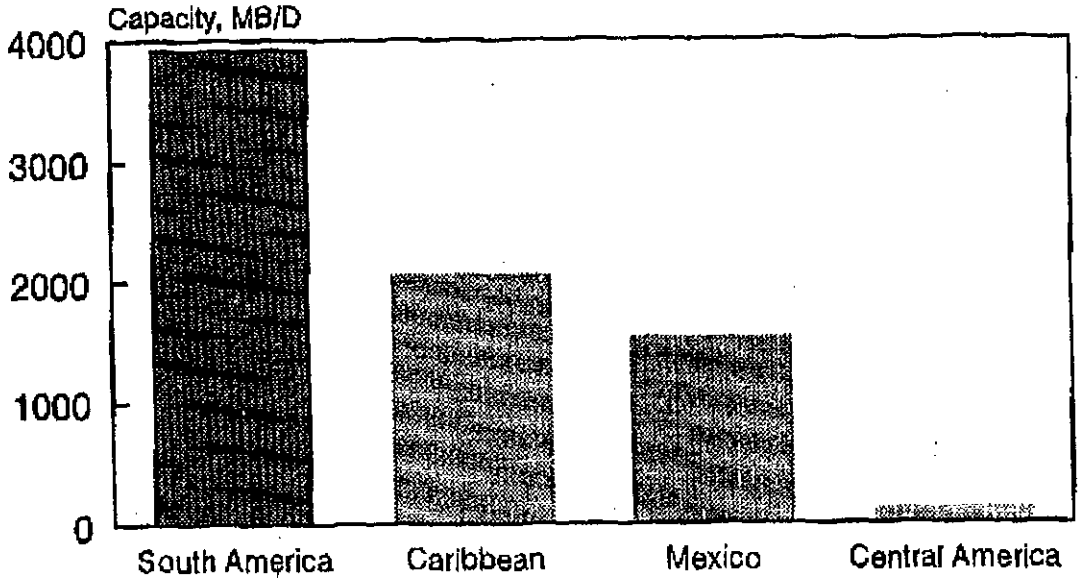
## Latin America: Refined Product Demand

| | Annual Growth Rate, 1995 - 2005 |
|---|---|
| Gasoline | 2.3 |
| Distillate/Gas Oil | 2.0 |
| Kero/Jet/Naphtha | 1.5 |
| Residual Fuel Oil | -0.8 |
| TOTAL | 1.4 |

# Latin America: Refined Products



# Refinery Capacities, January 1, 1995



## PDVSA Plans More Crude, Refining Capacity

- Wants to Increase Crude Production to 5 MMB/D by 2005.
- Capacity to be Increased to 5.5 MMB/D.
- Plans to Expand Refining Capacity to 3 MMB/D (Including Foreign Refineries).
- Current Refining Capacity (Including Foreign) 2.4 MMB/D.

# Venezuela's Orinoco Projects

| Project | Heavy Oil MB/D | Synthetic Crude MB/D | Cost $ Bil. |
|---|---|---|---|
| Maraven, Conoco | 130 | 112 | 1.7 |
| Maraven, Total | 180 | 150 | 2.9 |
| Corpoven, Arco * | 165 | 210 | 3.5 |
| Lagoven, Mobil * | 130 | 112 | 1.7 |

* Proposed

## Nova Group Plans Gas Pipeline To Supply Chile

- 290 Mile Pipeline from Argentina's Neuquen Basin to Santiago and Southern Chile
- First Deliveries Expected 1997
- Sufficient Contracts with Shippers Negotiated to Fill Line

# Bolivian Petroleum Industry Privatization

- One Option is to Sell Present State - Owned Company, YPFB
  - Sell as One Company or Split into Upstream / Downstream
- Bolivia Prefers Forming Five New Companies, Dividing YPFB Assets
  - Exploration
  - Production
  - Refining
  - Marketing
  - Transportation
- Invite Foreign Participation in Capitalization of New Companies

# Bolivia - Brazil Gas Pipeline

- $2 Billion, 3700 KM Pipeline
  - Completion Planned 1996

- Joint Venturers
  - Bolivian Government
  - Brazilian Government
  - YPFB (Bolivian State Oil Company)
  - Petrobras
  - Enron Corporation
  - British Gas, Tenneco, BHP Group

- Resources
  - 3.7 TCF Gas Reserves in Bolivia

Brazil's Power Generation Capacities
Gigawatts, Gross

| | 1992 | 2010 |
|---|---|---|
| Oil | 5 | 4 |
| Gas | - | 5 |
| Coal | 1 | 4 |
| Nuclear | 1 | 2 |
| Hydro & Other | 49 | 78 |
| Total | 56 | 93 |

Source: International Energy Agency

Mexico's Power Generation Capacities
Gigawatts, Gross

| | 1992 | 2010 |
|---|---|---|
| Oil | 13 | 14 |
| Gas | 4 | 20 |
| Coal | 1 | 5 |
| Nuclear | 1 | 1 |
| Hydro & Other | 9 | 17 |
| Total | 28 | 57 |

Source: International Energy Agency

Power Generation Capacities In Other Latin America
Gigawatts, Gross

| | 1992 | 2010 |
|---|---|---|
| Oil | 19 | 33 |
| Gas | 14 | 36 |
| Coal | 3 | 9 |
| Nuclear | 1 | 2 |
| Hydro & Other | 44 | 76 |
| Total | 81 | 156 |

Source: International Energy Agency

**Economists' Group**

**Tuesday October the 3rd**

**ROMA '95**

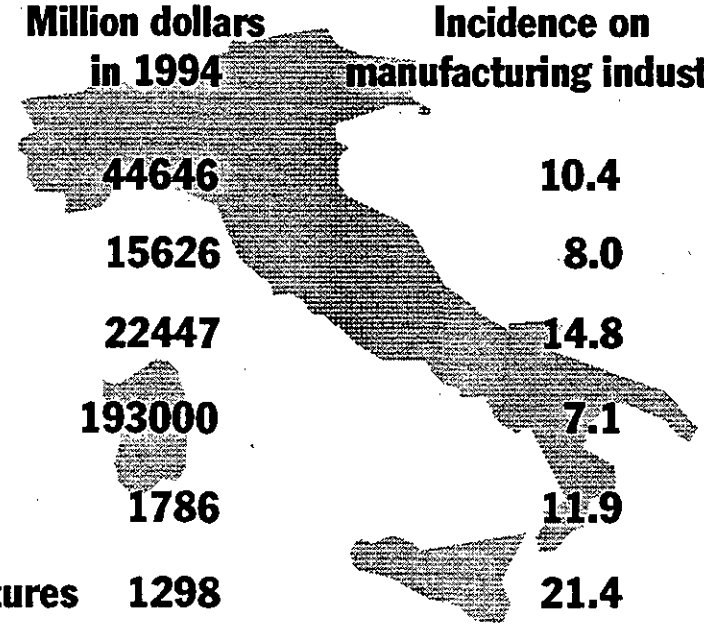
# The case of the Italian chemical industry

**Intervention of Luciano Tigini**

**In cooperation with Federchimica**

## ITALIAN CHEMICAL INDUSTRY

| | Million dollars in 1994 | Incidence on manufacturing industry |
|---|---|---|
| Turnover | 44646 | 10.4 |
| Export | 15626 | 8.0 |
| Import | 22447 | 14.8 |
| Employees | 193000 | 7.1 |
| Investments | 1786 | 11.9 |
| R&D expenditures | 1298 | 21.4 |



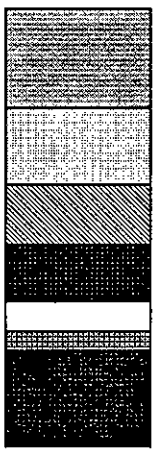
## The chemical industry is one of the most important sectors even in Italy

- It is ranked third in the turnover classification by sector
- If we exclude pharmaceuticals, figures relating turnover, decline to 33837 million dollars whereas those relating R&D expenditures fall to 372
- Employees have declined by 11.1% with respect to 1990

## ITALY IS THE THIRD BIG MARKET IN EUROPE

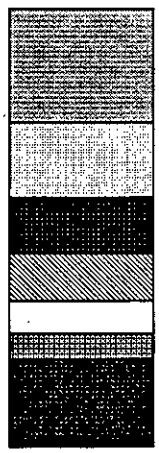
### Consumption 1994

| | |
|---|---|
| Germany | 22.6% |
| France | 17.5% |
| Italy | 13.9% |
| Great Britain | 12.9% |
| Belgium | 6.7% |
| Nederland | 4.5% |
| Other European countries | 22.0% |



### Turnover 1994

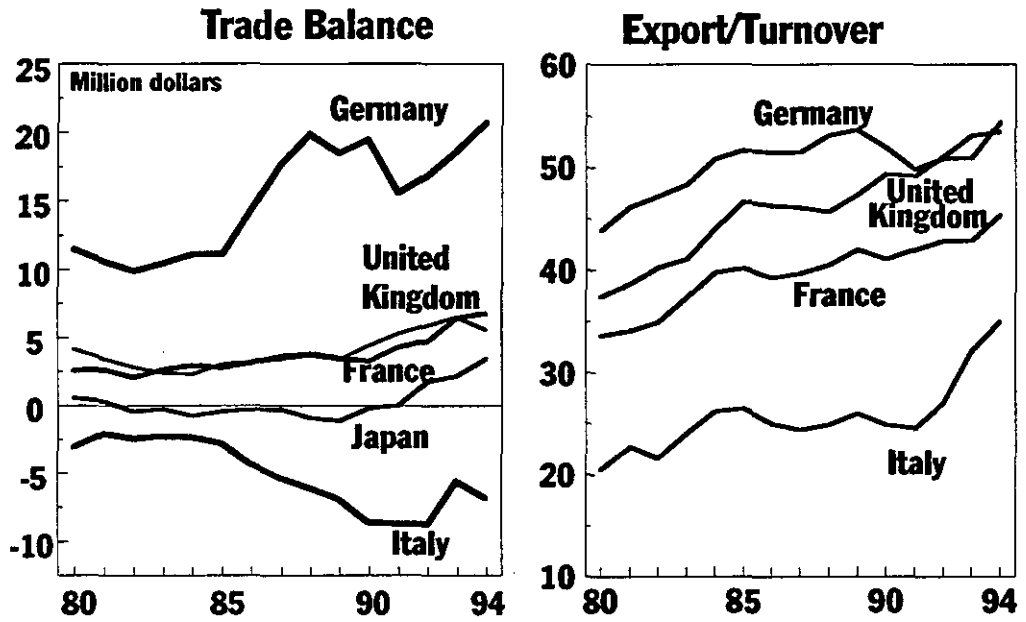
| | |
|---|---|
| Germany | 25.9% |
| France | 17.2% |
| Great Britain | 12.8% |
| Italy | 10.7% |
| Belgium | 7.5% |
| Nederland | 5.8% |
| Other European countries | 20.2% |



## Italy is the third market in Europe

- It is a very big market thanks to the dimension of the industrial structure and of the specific user sectors: textile, engineering, metal, and plastic products, furniture, food industry, etc.
- For many multinationals it is often the second market in Europe
- It is only fourth with respect to production and that is why it accounts for a large deficit in trade balance

## THE CHEMICAL TRADE BALANCE




**Italy is the only big industrial country with a large deficit in the chemical industry**

**The Italian chemical deficit**

- **is the second, after energy products, biggest deficit in Italy, whose national trade balance is largely positive**
- **has beginning to grow since the 80s and now it has a structural nature**

**Whereas imports/consumption ratio is quite similar to other countries, the export quota is much lower than other nations**

**Deficit is largely determined by**

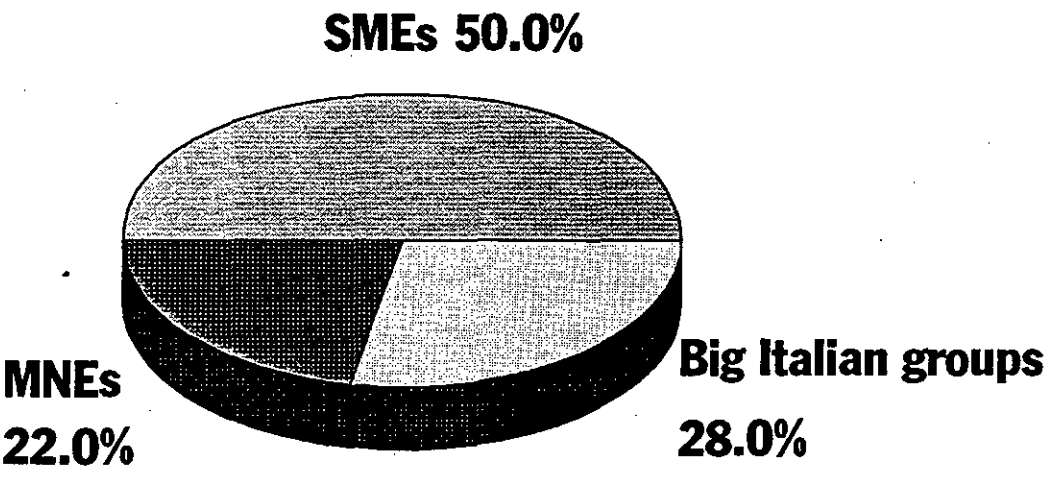
- **relative low innovation activities**
- **structural problems of big companies**
- **low production activity of multinationals**
- **dimensional constraints of SMEs**

## THE DISTRIBUTION OF EMPLOYMENT


## Italian distribution of chemical employees

- does not follow the big plant location
  - such as those of basic chemicals - which is rather dispersed
- is largely concentrated in Lombardy,
  which accounts for the 44% of chemical employment
  and where one can find a great number of SMEs

## THE 3 OPERATORS IN THE ITALIAN CHEMICAL INDUSTRY




Based on value production data of chemicals excluded pharmaceuticals

**There are 3 kinds of operators within the Italian chemical industry and they are all important to understand the structural aspects of the sector**

- the number of the big Italian companies is quite low;
  only EniChem, Montedison and Snia can be considered big
- SMEs, which are a great many,
  are certainly not a marginal component of the chemical industry

## RANK OF THE BIG ITALIAN CHEMICAL COMPANIES AMONG EUROPEAN COMPANIES IN 1993

| | | |
|---|---|---|
| 1. Hoechst | 12. Shell | 23. BP |
| 2. Bayer | 13. Akzo | 24. DSM |
| 3. BASF | 14. Elf Atochem | 25. Unilever |
| 4. Ciba Geigy | 15. Solvay | 26. Total |
| 5. Rhone Poulenc | 16. Zeneca | 27. Schering |
| 6. ICI | 17. EniChem | 28. Degussa |
| 7. Elf Group | 18. Huls | 29. Courtaulds |
| 8. Akzo Nobel | 19. Air Liquide | 30. EMC |
| 9. Merck & Co | 20. BOC | 31. Petrofina |
| 10. Sandoz | 21. Henkel | 32. Montecatini |
| 11. Roche | 22. Norsk Hydro | 33. Rutgerswerke |
| | | 40. Snia BPD |

Source: ECN Chemscope, December '94

## The big Italian chemicals companies

- are substantially only three, being the fourth ranked very far in this classification
- are very few among the first 100 chemical companies in Italy, which are for the most part multinationals
- may be considered only two, since Montedison and Snia has become a single company which in this classification may be ranked among the first 20 companies

If we consider European standards for a medium company (with a turnover from 400 to 1000 millions of Ecu), there are no medium-sized companies in Italy

## THE RESTRUCTURING OF THE BIG ITALIAN COMPANIES

**ENICHEM**

shutting down of company's plants and site closures
dismission of non-core business
fixed cost and employees reductions
focus on petrolchemicals (plastics and intermediates)
joint-venture with Union Carbide in PE (Polimeri Europa)

**MONTEDISON**

cost rationalization
focus on fine chemicals and specialties
joint-venture with Shell in PP (Montell)

**SNIA**

fixed costs reductions
focus on bio-engineering and fibers
2 joint ventures with Rhone-Poulenc, 1 with Courtaulds in fibers

## The three big Italian companies

- have been strongly affected by the crisis
  to which they have opposed a drastic and positive reaction
- are now in a better position than 5/6 years ago

They reacted to the crisis

- by reducing their fixed costs
- by re-engineering their structure
  with both internal and external operations
- by focusing on core business

## "PASSIVE" INTERNATIONALIZATION

➡ **Enterprises with foreign participation in Italy at the 1/1/1994**

| | Total | with majority control |
|---|---|---|
| Chemicals MNEs | 214 | 191 |
| Pharmaceuticals MNEs | 101 | 95 |
| Total chemicals MNEs | 315 | 286 |
| Total industrial MNEs | 1474 | 1256 |

➡ **Predominance of a commercial presence**

**By far, internationalization has been almost "passive" in Italy**

- Chemical multinationals represent the 21% of total industrial enterprises with foreign participation in Italy
- The significant number of multinationals, there were 286 with majority control in 1993, is the result of the numerous acquisitions of the 80s
- Their entry in Italy aimed at the acquisition of market shares more than at the realization of greenfield investments
- By acquiring profitable and dynamic firms of limited dimension, foreign MNEs have "substituted" domestic medium companies
- At present, only 34% of MNEs turnover is produced in Italy

## HOW MNEs EVALUATE THE "ITALIAN SYSTEM" ACCORDING TO A RECENT SURVEY OF FEDERCHIMICA

### POSITIVE JUDGEMENTS

**Quality of human resources**

- Creativity as a professional skill
- Initiative capacity
- Flexibility
- Capacity to work under pressure

### NEGATIVE JUDGEMENTS

**Bureaucracy and "red tapes"**

**Little transparency and great uncertainty of relations with the Public Administration**

**Logistic problems with infrastructures and public services**

## The "Italian system" through the experience of multinationals according to a survey of Federchimica

**The human factor is considered as a strenght point of Italian system thanks to**

- the capacity to manage complex situations
- the flexibility to find the solution in any way
- the creativity to innovate and focus on applied technologies

**Relations with the Public Administration represent the major constraint to the presence of MNEs because of**

- the fragmentation of decisional power
- the inefficiency of public services
- the uncertainty of legislative and administrative system

## GROWING OPPORTUNITIES FOR MNEs

- High quality of Italian work force
- Dynamic industrial relations
- Devaluation with stable inflation
- Effective wage control

**Growing convenience of a production presence**

## The recent Lira devaluation has sorted a double effect on multinationals

**MNEs with a significant production presence:**

- increased exports significantly
- often become the preferred supplier of their group for specific products
- exploit their entire production capacity

**MNEs with a sole commercial presence:**

- had to reduce sales
- had to face hard drops in margins
- had to re-evaluate their presence in the market

**MANY SIGNALS FOR A STRONGER PRODUCTIVE PRESENCE**

## POPULATION OF CHEMICAL ENTERPRISES AN INTERNATIONAL COMPARISON

| Employees | ITALY | | U.K. | | FRANCE | | GERMANY | |
|---|---|---|---|---|---|---|---|---|
| | N. of firms | % of employees | N. of firms | % of employees | N. of firms | % of employees | N. of firms | % of employees |
| from 20 to 99 | 832 | 16% | 634 | 11% | 671 | 11% | 655 | 5% |
| from 100 to 499 | 313 | 30% | 293 | 24% | 329 | 27% | 395 | 14% |
| more than 499 | 75 | 54% | 112 | 65% | 124 | 62% | 156 | 81% |
| TOTAL | 1220 | | 1039 | | 1124 | | 1206 | |

## Italian SMEs

- The widespread diffusion of chemical SMEs is not only an Italian feature but it is in Italy that they are dominant (46% of employment in companies with less than 500 employees)
- Italian SMEs are concentrated in chemical specialties
- They are particularly numerous in
  - paints and varnishes
  - fine and specialty auxiliaries
  - pharmaceutical raw materials
  - cosmetics
  - plastic transformation
- In a sector such as paints and varnishes they account for 80% of the employees of the sector

## THE REASONS FOR SUCH A MASSIVE PRESENCE OF CHEMICAL SMEs

There are *general* reasons connected with the features of the "Italian system"

- *Large availabiliy of entrepreneurship*
- *Creativity of human resources*
- *Characteristics of the industrial system*
- *Convenience to remain small from a fiscal point of view*

and there are more *specific* reasons strongly related to the characteristics of the chemical market

- *Great number and small average dimension of users: often 10 times in number than in foreign markets*
- *Strong need for customization*

## USERS DETERMINE THE SUCCESS OF CHEMICAL SMEs

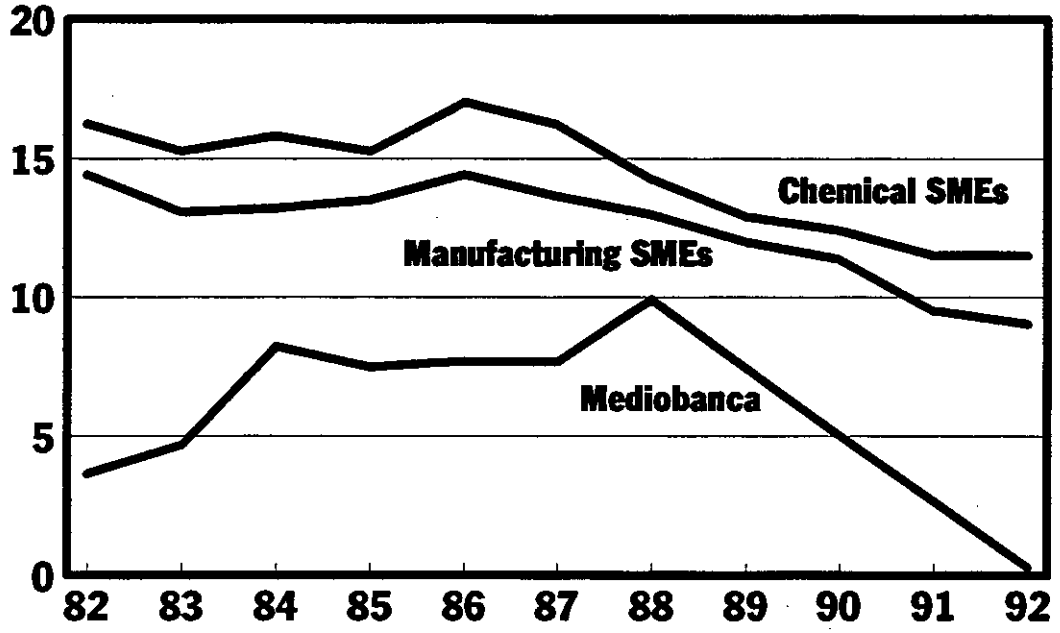
- MNEs have difficulties in relating with the high number of final users
- MNEs prefer selling their intermediates and fine chamicals to SMEs specialized in chemical auxiliaries and specialties
- SMEs possess the flexibility to meet the customization requirement of the market

**THERE ARE NUMEROUS DOMESTIC MARKET NICHES WHERE A GREAT NUMBER OF CHEMICAL SMEs FINDS ITS IDEAL PLACING**

## A CASE OF EXCELLENCE: PHARMACEUTICAL RAW MATERIALS

- It accounts for about 130 companies which produce in Italy though they are MNEs
- It is characterized by strong relations with external research institutes and profitable process innovation
- It exports 80% of the turnover
- its competitive advantage is built on **FLEXIBILITY**

## THE TREND OF THE RETURN ON INVESTMENT




## The performance of chemical SMEs

- Their profitability has been higher than manufacturing SMEs and firmly better than the ones of Mediobanca index, the institute representing the big companies, both Italian and MNEs
- Contrary to the generalized tendency, employment in SMEs tends to increase and in the last years they have never reduced their employees

## DIFFERENT CONSTRAINTS FOR DIFFERENT ORIENTATIONS THE RESULTS OF A SURVEY OF FEDERCHIMICA

**WEAK EXPORTERS**

- Commercial network 77%
- Assistance network 47%

**BIG EXPORTERS**

- Investments in innovation 46%
- Licences and patents 44%
- Production capacity 41%

**FIRMS WHICH DO NOT EXPORT**

- Managerial and organizational capacities 55%
- Language and cultural difficulties 46%

## SMEs and internationalization

- The last economic cycle induced many SMEs to export
- Their exports increased more than the average of the sector
- They have to start a real internationalization process

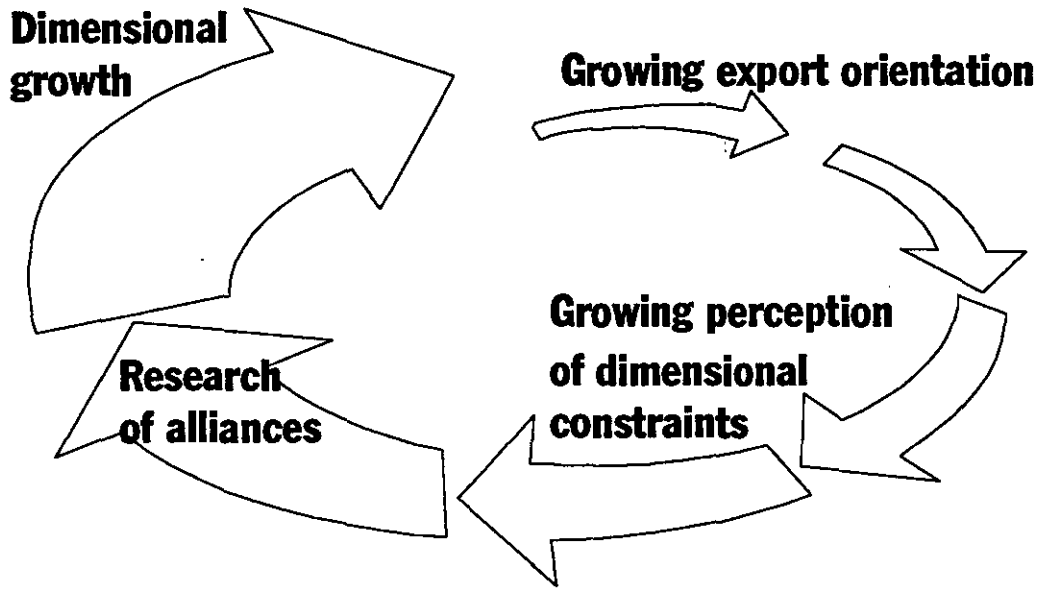
## MEDIUM TERM PROSPECTS
## THE RESULTS OF A SURVEY OF FEDERCHIMICA

| | | For the company it will be of strategic importance | |
|---|---|---|---|
| Export/ Turnover | | Export orientation | Internationalization |
| 20% | Paints and varnishes | 62% | 71% |
| 30% | Fine chemicals and auxiliaries | 79% | 54% |
| 80% | Pharmaceutical raw materials | 94% | 61% |

Medium term prospects

- We are assisting to a progressive orientation
  towards internationalization of a growing number of companies
- Only four years ago, internationalization was a determinant factor
  for the sector and the market in general
  but not a fundamental factor for the company's strategies
- Today exports and internationalization are viewed as important factor
  for the sector but they are even more strategic for the single company

## THE VIRTUOUS CIRCLE OF INTERNATIONALIZATION




## The virtuous circle of internationalization

- Technical service, as basic key factor to success, requires for a structured presence abroad
- Direct competition with foreign companies stresses the dimensional constraint and the need to invest in innovation
- The process of external growth has opened many companies towards agreements and joint-ventures with foreign and/or Italian companies, thereby stimulating additional openings towards foreign markets
- A virtuous circle has been created that should help to overcome the excessive fragmentation of a part of the Italian chemical supply

## BIG COMPANIES AND SMEs

- to use the Italian market as test for new products
- to adopt an aggressive and innovative approach to the market

**Not only a commercial relation but a real partnership**

# DOW CORNING CORPORATION

## Case Study

## A Joint Venture's Joint Ventures

Presented to

The Economists' Group

Rome, Italy

October 3, 1995

John D. Walter
(517) 496-4925

# DOW CORNING

## Why the Joint Venture?

1. Pooling of technical expertise
   - Corning had the chemistry
   - Dow Chemical had the chemical engineering
2. Increasing pressure from the military for more product
3. Growing perception during the early '40s that silicone chemistry held huge untapped potential

# DOW CORNING CORPORATION

## Long Term Results

- Dynamic 52 Year History
- Over 8,300 Employees in 1995
- Over 5,000 Products
- 45,000 Customers
- $2.5 Billion Sales
  - 16% Average C.G.R.
  - 60% Outside of U.S.
- $145 Million Adjusted PAT - 1994
- $174 Million R&D Spending - 1994
  - 8% of Sales
- 6113 Active Worldwide Patents

# Dow Corning Corporation
# Manufacturing Sites and Regional Headquarters

# KEY CUSTOMER INDUSTRIES

- Aerospace
- Automotive
- Chemicals/Petrochemicals
- Construction
- Consumer Products
- Electrical/Electronics
- Food Processing
- Industrial Maintenance & Production
- Medical Products
- Paints & Coatings
- Personal, Household & Automotive Care
- Pharmaceuticals
- Plastics
- Pressure-Sensitive Adhesives
- Textiles & Leather

# DOW CORNING'S
# History of Joint Ventures

| Year | J.V. Name | Partner | Location |
|---|---|---|---|
| 1948 | SISS* | St. Gobain | France |
| 1950 | Midland Silicones | Albright & Wilson | UK |
| 1962 | Fuji Polymer (45%) | Brown McFarlane | Japan |
| 1966 | Toray Silicones | Toyo Rayon | Japan |
| 1967 | Shin-Etsu Handotai (45%) | Shin-Etsu Chemical | Japan |
| 1980 | Silinor | Ipiranga | Brazil |
| 1983 | Lucky-DC Silicones | Lucky Goldstar | S. Korea |
| 1992 | Universal Silicones (40%) | JJ Gandhi Group | India |

* Societe Industrielle Des Silicones et Des Produits Chimiques Du Silicium

# SISS* - 1948
# & Midland Silicones - 1950

**Purpose** : Increased Participation in European Markets

**Results**: Both Highly Successful

Rapid Growth in European Sales & Manufacturing

Bought 100% of Midland Silicones in 1969

Sold SISS Shares in 1970

**Reasons for Dissolution**:

Dow Corning Sought Direct Control

Needed One Basic Site in EC

Rhone-Poulenc Acquired St. Gobain (Chemicals)

* Societe Industrielle Des Silicones et Des Produits Chimiques Du Silicium

# Fiji Polymer - 1962
# & Toray Silicones - 1966

**Purpose** : Participation in the Japanese Silicone Market

Entry Restricted

**Results**: Both Highly Successful

Phenomenal Sales Growth/Basic Manufacturing Base

Purchased 100% of Fuji Polymer in 1973

Purchased Majority Position in Toray Silicones in 1978

## Reasons for Dissolution of Fuji Polymer JV:

Consolidation of Dow Corning Position

Ownership Restrictions Lifted

# Lucky - Dow Corning Silicones - 1983

**Partner:** Lucky Goldstar

**Purpose :** Gain a Manufacturing Base in the South Korean Market

Understand the Korean Market

**Results:** Extremely Rapid Growth

Acquired Additional 40% in 1992

Acquired Remaining 10% in 1995

**Reasons for Dissolution:**

Company's Identity Well Established

Chaebols Restructured

# Cooperation of Japanese Chemical Companies with Foreign Chemical Companies

***"Restructuring and Growth : the role of intra-industry agreements"***

***--------Mitsubishi Chemical Corporation--------***

# Press-released Divestitures, Alliances and Mergers in Japan

( from Japanese "Economist", July 17,1995 )

| | | |
|---|---|---|
| 1993/3 | TOSOH to DIK | Agrochemicals |
| 1993/6 | Sumitomo to MKC | Magneto Optical Discs |
| 1993/11 | TOSOH to DIK | Pigments |
| 1993/10 | MGC and MKC | Engineering Plastics J/V |
| 1993/12 | MKC/MPC | Merger |
| 1994/5-7 | Showa Denko/Asahi Chemical | Swapping: PS to PP |
| 1994/8 | Sumitomo/Nihon Zeon/Tokuyama | PVC J/V |
| 1995/2 | Showa Denko/Nippon Petroleum | PP and PE J/V |
| 1995/9 | TOSOH/Mitsui Toatsu/DENKA | PVC J/V |

## Mitsubishi Kasei Corporation's Case

1) Our first partner in Japan: the Monsanto Company

J/V Mitsubishi Monsanto Kasei Company ( Jan./1952)

A motive in the case:

Rapid Introduction of Poly Vinyl Chloride Business

Present status:

Direct business relation is going to be finished

Main reason:

Monsanto Company's stategic decision;

Not profitable by bald reengineering

What we have learnt from cooperation:

Long-range cooperation by "Charter"

Drastic decision by Monsanto management

**2) Present situation of our overseas businesses: 39 sites:**

**11 in America,**

**4 in Brazil and Singapore,**

**3 in Thailand and Indonesia,**

**2 in Germany, Korea and Taiwan,**

**1 in Canada, Mexico, England, Netherlands, Italy, Ireland, Hong Kong, and Australia.**

**3) Main partners:**

**Allied-Signal, Bakrie & Brothers, Ciquine, Exxon, Hoechst, Monsanto, Rohne-Poulenc, SABIC, SamNam, SamYang, Shell, Verbatim**

4) Business types: Core business ( technology-oriented or market-oriented)

5) Future plans: Asia and America regions

Petrochemical intermediates business

Compounding business

TPA and PET relating business

Pharmaceutical business

Information Storage Products Business

6) Policy:

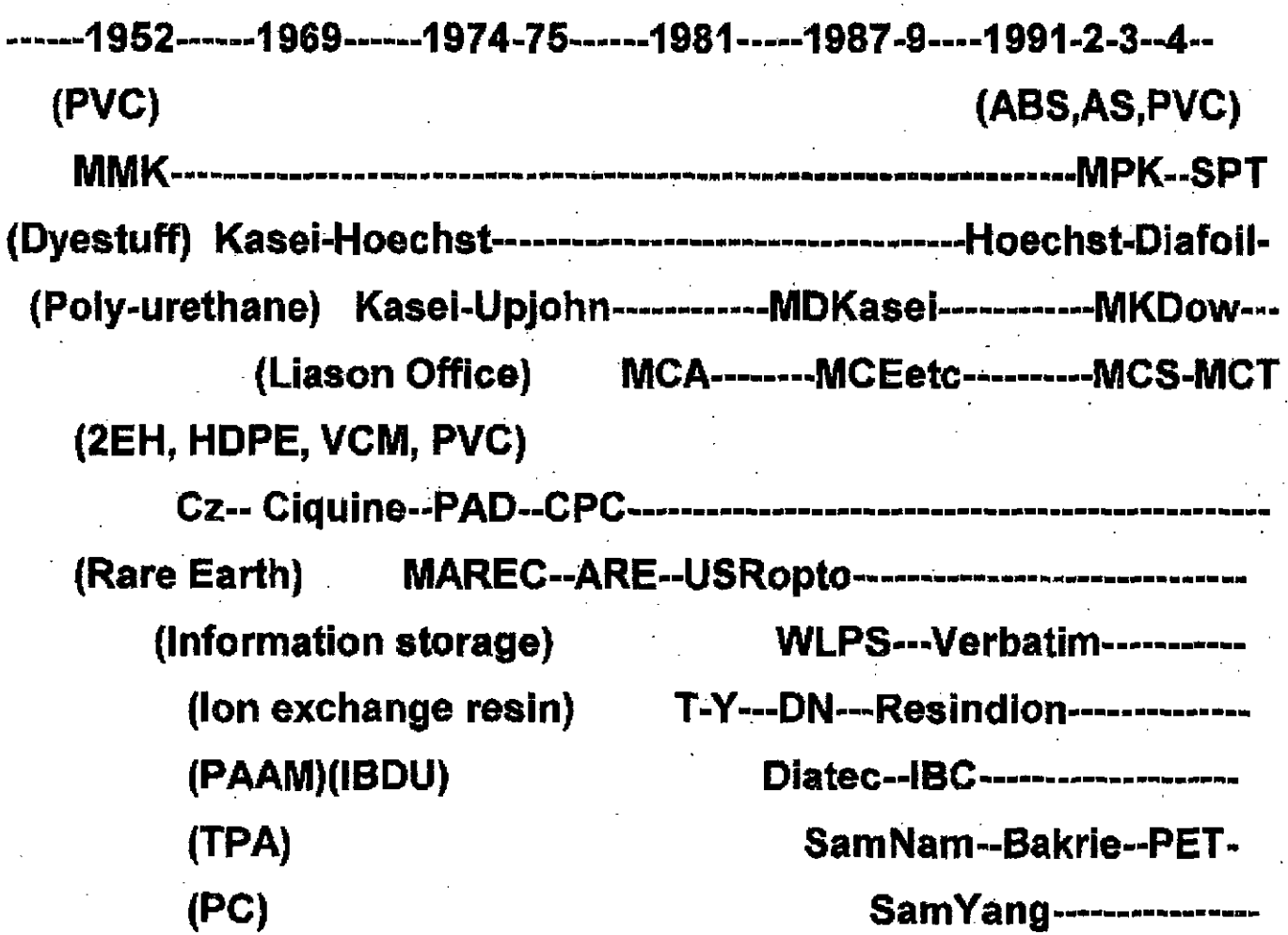
Licensing policy will be getting much more severe.

Brushup of our core technology will be emphasized.

Investment will be focused on Asian market including India.

Flexible alliance with competitive partners will be important.

## Ongoing Collaboration (1995/3E)



**Mitsubishi Petrochemical (1956/4)**

1956-60-----69------1974-75----1980----1985---88-1991-2-3--4--

Shell(petrochemicals)----------

Yuka-Badische (EPS)----------/ /

Chi-Mei (investment:ABS,AS,PS)-- -- -- -- -- -- ----------

(HDPE,EG) SPDC--SHARQ----------

(EG) JSEG----EGS----------

(SM-PO) Seraya

(Liason Office) -----MPL-----MPCA---

(PP compounding) MytexPolymers--------

# Future of the Economists' Group

## (1) Functions of EG Members ?

- Economist
- Chief Economist
- Strategic Planner
- Public Affairs Manager
- Marketing Manager
- Business Analyst
- Controller
- Other

ECONOMISTS' GROUP
ROMA 95

## Future of the Economists' Group

### (2) Competences of EG Members ?

- General Management
- Corporate Planning
- Macro-Economic Analyses & Forecasting
- Country Analyses & Reporting
- Competitor Analyses
- Down-Stream Industry Analyses
- Risk Analyses/Risk Management
- Security Analyses

## Future of the Economists' Group

## (2) Competences of EG Members ? (Cont'd)

- Shareholder Value Analyses
- Corporate Finance
- Corporate Fiscality
- Foreign Currency Exposure Analyses
- Acquisition & Mergers
- Speech Writing
- Other

## Future of the Economists' Group

### (3) Relevant Sectors for EG Membership ?

- Chemicals & Agro-Chemicals
- Pharmaceuticals
- Upstream Industries
  (not only mineral oil & refining)

ECONOMISTS' GROUP
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## Future of the Economists' Group

### (3) Relevant Sectors for EG Membership ? (Cont'd)

- **Downstream Industries (important outlets)**

  * Man-Made Fibers & Textiles
  * Plastic Processing
  * Packaging
  * Engineering & Construction
  * Motor Vehicle Manufacturing
  * Electric & Electronic Appliances
  * Other

## Future of the Economists' Group

### (4) Other Organisations Acceptable for EG Membership ?

- Associations of the Chemical Industry
- Academia/Universities
- Government Organisations
- Non-Governmental Organisations (NGO's)
- Other

**N.B. EG Membership is a Personal Membership**

ECONOMISTS' GROUP
ROMA 95

## Future of the Economists' Group

## (5) New Countries for EG Membership ?

- Central & Eastern Europe
- Arab Gulf States (GCC)
- Latin America
- East Asia
  (in particular China & India)

## Future of the Economists' Group

(6) Should the EG be independent and exclusively chemical ? Co-operation (e.g. joint sessions) with other professional groups ?
Likely positive effects:

- Widen our Scope
- Reveal Fresh Ideas
- Establish Cross-Sectorial Networks
- Develop New Areas of Interest for Future Conferences

E.G. Joint Sessions

## Future of the Economists' Group

### (7) Areas of Interest to Pay More Attention to ?

- Social Developments & Structure
- Political Mega-Trends
- Re-alocation of Production Facilities (Determining Factors)
- Chemical Industry's Image in Society

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## Future of the Economists' Group

### (7) Areas of Interest to Pay More Attention to ?

- Social Developments & Structure
- Political Mega-Trends
- Re-alocation of Production Facilities (Determining Factors)
- Chemical Industry's Image in Society

# ECONOMISTS' GROUP

# R O M A 1995

## DEVELOPMENT AND COOPERATION

Savoy Hotel - Rome
October 1-4, 1995

## THE CHEMICAL INDUSTRY IN THE FRAMEWORK OF GLOBAL DEVELOPMENTS

*by*

*Marcello Colitti*

Forgive me if, confronted by such a gathering of distinguished scientists, I, not having any title to scientific distinction, will start this speech by talking about matters like production, about which scientists do not discuss anymore, perhaps because of having being bored with them in the previous decade.

**Let's talk about production**

As an economic function, production used to be considered primary and fundamental, and now seems to be increasingly confined to the attic, together with anything that smack of physical as compared with telematic and immaterial.

I mean production of goods, and not of services. I am still one of those people who, perhaps because of their limited time for reading modern economic textbooks, remain tied up to notions of physical production, value added and such things, while their younger counterparts talk about informations, software and services as the hub of a modernised economy. They quote the acres and acres of abandoned industrial sites in the USA or in Europe -the famous, or infamous, rustbelts- to prove how the economy has moved from material to immaterial production, and to show how the production of goods becomes increasing not only no more chic, but coarse and positively embarrassing for sophisticated people. Production of goods is for underdeveloped countries, who believe - oh, illusion- that this is the right road to reduce the economic gap separating them from the richer countries they try to

imitate. And in fact, while they are busy building the next huge factory, the very rich countries shut down one, and concentrate on pop culture, software, communication, and finance.

Perhaps I am too old to jump on that bandwagon. I am still convinced that material production is the basis for any economic welfare, and that among economic concepts, value added remains a key one. I am always asking myself whether a village could really survive where everybody lives neither sowing and reaping, nor extracting and transforming the earth's riches but simply washing each other's clothes. The rustbelts, which are not exclusive of very rich countries, do point to a great change, which has in fact happened first of all inside the industrial sector itself.

**The development of industry within this century**

Within this century, industry has changed rapidly, from heavy to light, large to small, complex to simple, slow to fast. The great change has happened under our very eyes, that is, in less than a lifetime; and it has originated not because of electronics, but beacuse of the substitution of coal with oil. When coal was king coal, the main energy giver, in form of steam, heat and light, steel was the main material for any manufacturing production. Coal and iron ore were the two sources of steel, and had to be mined, and transformed, or simply cleaned, before used. Coal had to become coke, and upon that transformation a lot of activities depended, among them the chemical industry, which took the gas coming from coal

transformation, and obtained from it a range of products, like methanol, ammonia, aromatics, etc. used for fertilizers, explosives, solvents, dyestuffs , etc.

Coal and iron were costly to transport, and industry was therefore located near the mines, in what are the rustbelts of today. Countries without coal could not compete: in Italy, for example, coal prices were about five times higher than in England. By the way, that was the worst moment of Italy, a country which had kept important industries, for example textiles, metalworking, tanning and many other, none of which could compete with a coal-based production. Italy was therefore inexorably relegated to the backwater by its lack of coal, and entered in a phase of economic decadence which lasted until our times.

The industry of today is based on a much simpler cycle: oil gives energy, and gas from the same well goes into a cracker to produce the basic intermediates for the manufacturing products, which are polymer-based. To provide sophisticated energy sources, is refined, and one of the resulting products, virgin naphtha, is used for cracking if wet gas is not available. The new system operates with liquids and gases, and not with solids: so the equipment to contain, transport, and transform them is smaller and lighter than before. Oil made the thermoelectric power stations became smaller and less costly than they had been with coal; eventually, natural gas is making them small and light enough to be located inside the cities. Oil and its close brother, natural gas, pollute much less than coal.

The final products of the oil age, the polymers, are much lighter and flexible than steel, and are shaped into manufactured products more easily and with machines that are smaller, simpler and easier to automate. Chemical industry has become the main producer of materials for manufacturing. Modern industry need not be bigger, or, better, it needs to be big only in the upstream plants.

This change has drastically reduced the importance of location. Oil and gas are transported everywhere, and even the advantage of being a producing country is not really related to the saving of transport cost, but to the much more substantial advantage of getting at least part of the oil rent. Cheap transport has given the oil economy an extraordinary tendency to become global: chemical industry has diffused itself over the globe, and it is rapidly spreading in new countries which jump the coal age to go directly to the oil and electronics one.

The most outstanding case of industrial development through petrochemicals is Saudi Arabia. Saudi Arabian Basic Industries Corporation - SABIC - was created to utilize domestic feedstocks, and especially ethane sold in the Kingdom at a very competitive price ($0.50 per million BTU). SABIC developed mainly through Joint Ventures with international companies and now produces 17 million tons of chemical products, ranking among the big players. Mexico, Venezuela, Qatar and many other countries did the same, with varied results.

**The timing and the size of the new industry**

The birth of the new industry is difficult to time exactly. These phenomena happen with a gradual build-up, followed by a flare-up and a period of very fast growth. Perhaps I will show my Eurocentric approach if I say that the new industry was really born after the end of World War two. The period, say, from 1945 to 1960 was inaugurated by the passing in American and English hands of the technical breakthroughs the Germans had obtained with carbochemicals, some of which they had had the time to put into practice, and many they had not. A technological explosion ensued, coming from the application of abundant money and cheap gas and liquids to what had been devised on the basis of costly and clumsy coal and a more restricted economy.

Oil industry became the mother of the petrochemical industry, and the two got tied to each other for ever in the age which they have shaped.

I am afraid that at this point some numbers are inevitable, and I must now run the risk of ruining your digestion with some factual data.

Feedstocks. In 1994, 138.3 million tons of oil products, equivalent to about five per cent of the crude oil refined in the world, were utilized by the petrochemical industry. They included 104.6 million tons of virgin naphtha, 20.0 million tons of light and heavy gasoil and an estimated 13.7 million tons of propane and butane. To these must be added 31.6 million tons which came directly from oil wells rather than refineries, that is 21.3 million tons of ethane and an estimated 10.3 million tons of

LPGs. In 1994, the petrochemical industry purchased from the oil producers a total of 169.9 million tons of feedstock, of which 61.6% was virgin naphtha, 14.1% butane and propane, 12.5% ethane, and 11.8% gasoil.

Investments. To create such a big market for some of its products, the oil industry invested huge resources in the technological and productive development of petrochemicals. How much of the total capital extant in petrochemicals came from the oil companies is difficult to say. The total net fixed assets of the world petrochemical industry in 1994 have been estimated at 160-180 billion dollars. Probably 60%-70% of that came from the oil companies. This would put the capital - that is, the net fixed assets - invested over time by the oil industry in its "offshoot" at 100-120 billion dollars.

Integration

It is clear from the figures, as well as from common knowledge, that petrochemicals are strictly integrated with the oil industry, which has taken the driving seat of a very large industry which in 1994 produced world-wide 65.4 million tons of ethylene, 36 mt of propylene, 46.4 mt of aromatics, 89 mt of plastics, 16.7 of fibres, 7.4 of synthetic rubbers, etc. It is a truly global industry, with production all over the world, and currently developing at a great rate outside the most industrialized area of the world.

The oil industry has contributed substantially to petrochemicals which take the oil out of the energy domain and put it into materials and hardware, products which

have changed our everyday lives even more than the application of oil and gas to our energy needs.

Of course, integration has also unwanted effects. In the troughs of the economic cycle the petrochemical industry suffers heavy losses, a large part of which did end up by being paid for out of the oil industry's profits. In 1993, for example, large companies like ICI, Shell Chemical or Enichem lost from ten to six per cent of their sales, while Basf or Bayer lost between four and two per cent of sales.

The absolute level of the losses has been, to say the least, staggering.

**The consequences of the new industry**

Petrochemical companies do not usually sell finished products on the final market. For example, they sell their plastics to the manufacturers of the goods - car parts, bottles, pipes, boxes, toys etc. - that are actually sold on the market. These manufacturers are usually small, with low fixed costs, and very flexible.

The new industry has therefore taken the shape of a network of small, highly automated factories, competing with each other and serving each other; which has in turn created a new society where enterprising individuals enjoy a the new vertical mobility and become entrepreneurs. This has changed, before anybody could notice, the social structure, giving the manual worker a possible way of escape from its condition of subordination, and opening at the same time the door for his passage to the great undifferentiated cauldron of what we call "middle class" although it is

not in the middle of anything, and it is not, strictu sensu, a class in the same meaning than was given to that word in the preceding social structure.

This is the society in which we live to day, in which the value added produced by every single industrial worker has grown so much that the problem has moved from how to produce wealth to how to share the wealth with people who are not needed in the actual productive activity. But I will leave that to the professional economists, who are well represented here.

**Characterization of the industry**

In these last decades, the pervasiveness of the chemical products in every economical activity inextricably linked the industry with the overall economy. Hence it's no surprise that the peak of economical cycle corresponds with the highest performances of chemical industry-see 1989/1990- or that at the bottom, the petrochemical companies are the ones with the poorest results.

Petrochemical industry normally anticipates both the growing and the sliding down part of each cycle. At the bottom petrochemicals face staggering structural problems - dispersion of the sites, plants too small, high fixed costs, fragmentation of supply, weak financial structure.

In the recent crisis, petrochemical companies were loosing a lot of money and decided to run for cover in a number of ways; short term and, more important, structural policies were applied to the emergency.

The first priority was to stop loosing money and to go back to financial sanity.

As the industry has no control on its variable costs, that is, on Virgin Naphtha in Europe, and ethane in the US, fierce programs for the reduction of fixed costs were launched and implemented and debt repayment were practised on a very large scale.

For example Enichem reduced its fixed costs from 29,6% on turnover in 1993 to the 17,6% in 1995, and the financial debt, which was more than 8350 billion lire at the end of 1993, will be less than 2450 billion at the end of this year; the debt-equity ratio will slide from 3.4 of 1993 to 0.4 of 1995.

Moreover, many companies found that they were competing on an excessive number of lines, in many of which their position was too vulnerable, with no hope of becoming cost leader.

Two facts were unanimously recognised: first, only the cost leader will resist the next successive negative phases of the cycle; second, nobody, no matter how big, can become cost leader in all its product lines.

So, concentration became the name of the game, and many companies exited from businesses where they felt they could not aspire to primacy; many, for example Enichem, dedicated the resources thus obtained to debt reduction.

Mind you, the jury is still out in this matter. How do you conciliate the advantages of integration with those of specialization? Is it possible to grow only in one product, perhaps the one in which you are technologically stronger, without supporting that action by preparing and adequate integrated supply of the necessary feedstocks?

One could say that integration is the bane of petrochemicals because it compels the companies to grow on a very wide front, and therefore requires heavy investments; or, on the contrary, that integration is the only way to grow. A single-product development, one could say, would expose the company doing it to the risk of being strangled by the scarcity, and therefore by very high prices, of the feedstocks.

One could object that if intra-sectoral transactions were performed at market prices, the integrated and the non-integrated line of development would basically be the same. However, it is not only a matter of transfer prices: it is also a matter of the actual availability of a feedstock. If a company intends to increase strongly its utilisation of a certain feedstock, it has to make sure that the supply will be there: and there is no better way of doing that than doing that than making the necessary investments.

We all know that the Stock Exchanges of this world prefer single product companies, whose results are clearly connected to the demand and prices of well known products: but the structure of the industry seems to be putting a limit to their development.

**Alliances, Joint-Ventures and new capacities**

The years of the slump brought with them a number of negotiations for Joint Ventures, some between American companies that believe in the European market and European ones who believe in American technology. Some other Joint Ventures were instead due to the need to find a home for some shipwrecked companies.

Big alliances have been formed in the last two years having the objective to develop single businesses: five of them were between American and European companies, three between two American companies but there were none between European companies. Instead, European companies made among themselves rationalisation agreements (two) and "rescue" agreements (three).

Producers seem to be steeling themselves to resist the obvious temptation to invest in ethylene and its derivatives, which in many cases was not resisted in previous booms. Perhaps, the European petrochemicals producers' psychological attitude seems to be more that of the swimmer saved at the last minute from drowning than that of the general who sees in front of him a great plain waiting to be conquered. Up to now, the capital investments plans seem to be related to debottlenecking of the existing plants rather than to new investment

An additional reason for this feeling is that the oil and petrochemical companies of the oil producing countries see their function as the utilisation of domestic raw materials for internal economic development; and the better and more direct feedstock for ethylene, ethane, has in practice no other use that as a cracker feedstock. Ethylene production is therefore a sort of inevitable decision, and polyethylene follows suit. Although some of these countries (Saudi Arabia, Venezuela, to quote only two) have strongly developed their petrochemical industry, in some cases even to the limit of direct availability of raw

materials, they do not seem intentioned to reduce their commitment. In fact, there are signs of the opposite.

**The challenges**

**- The market**

Demand for the main petrochemical products increases roughly at the same speed that GDP, which in any recent five-years period never grew more than 2-3% per annum. Of course, new product substitute for old ones, new technologies open up new frontiers, but the basic reality is of a "mature" industry. The structure of supply is hopelessly out of tune with reality. Each product has too many producers, many of them with volumes too small to be really cost-competitive, and to allow them to get beyond the role of the regional producer, that is, to implement an effective strategy for the whole European market.

The challenge of reshaping the European market to adapt it to its "mature" condition demand is on, and perhaps the current favourable market development will help those who willingly accept it. The contrary can be said about the market in the Far East. There we have high rate of growth of demand, low local production capacities: the area is therefore seen as suitable for massive, basic investment. The international petrochemical companies are taking to that like ducks to water, and there is no scarcity of projects. Apart from China, which, alone boasts about a hundred projects, the

countries of the area are implementing, with or without partners, seventy more. A caveat is perhaps necessary: the Far East market is still heavily influenced by political choices, as the recent massive, albeit, hopefully, temporary, slow-down of demand in China demonstrates. There may be plenty of opportunities, but the going could very well be quite rough for some time yet.

**- The environment**

I put the environmental and technological challenges together, because they are related one to the other - the only possible answer to ecological problems is better technologies - and because they are both the most difficult problem and the only guarantee of survival. The world sees now a strengthening of the ecological movements, some of which now behave like international powers, with an important difference as compared with the other powers that be: no visible political internal or external control is exercised upon them. They are not responsible to electors, shareholders, or to State's power. Some American expert are already talking of "parastates" organisations which move freely across the globe, with very little control, no visible democratic system for internal consensus, no accounting of the money they gather and use. In the case of ecologist's organisations, public opinion is obviously supporting them, but this support seems to originate also in a very skilful manipulation of information technology, which often than not blurs the merit of the matter, and puts every problem on an emotional basis.

Having said that, I must add that it would in any case be not only silly, but also useless, to resist to the obvious trend towards better environmental protection. Petrochemical industry permanently ensconced on the hot seat, has only technology to resort to. The development of new, more environment friendly, products and processes is not only the main road to create new investments opportunities: it seems to me to be the only way to survival of the industry.

In this respect, there are also many new opportunities offered to the petrochemical industry. An example may suffice, which also illustrate the idea that ecological constraints can sometimes be translated into opportunities. The oil companies are under growing pressure to take the aromatics out of gasolines. They seem to have resisted, quoting increasing costs. Perhaps they could have a new look at the matter, and calculate how much new feedstock would be flowing into aromatics processing systems of their petrochemical sisters to produce intermediates which by the way, seem nowadays to be in short supply.

At the present, Europe consumes about 150 millions tons of gasoline whose average content in Aromatics and Benzene is respectively of 37% and 2,4% against the "new and greener" values of 25% and 1% which, sooner or later, Europe will certainly require. The refining industry will have to find something to make good the octane number lost with the Aromatics reductions, but the products are already there, and well

tested. A big amount of Benzene and Aromatics will be free for petrochemical utilisation (18 millions tons of Aromatics and 2.2 millions of Benzene).