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THE ENERGY CHALLENGE*

*Enrique V. Iglesias***

THE DEBATE ON STYLES OF DEVELOPMENT

The subject of styles of development is not foreign to us, nor has it only recently become one of CEPAL's concerns; it has been one for some time. Originally serving as an analytical category to dispel the anxiety of economists over the social failure or inefficiency of growth processes, it later acquired elements developed in the expanded international discussion of the various dimensions of development. The debate on development has thus been forced to follow the pronouncements of scientists which were publicized at a very opportune moment indeed by the work of the Club of Rome, through which the discussion on the meaning for humanity of the depletion of natural resources or the appearance of physical restrictions on the process of economic growth was brought up at the international level. These facts implied not only a scientific, but also an economic, social and political challenge, and at those levels the need to examine the styles of development which exert irrational pressure on natural resources and challenge physical restrictions was raised and discussed.

But the scientific questioning of development styles is not the only approach to them. Other discussions, from different vantage points, provide new angles from which to analyse in various ways the predominant style of development and to search for alternative styles.

I have just mentioned one of these approaches: the social angle. In discussing the social efficiency of growth, we condemn the inability of the reigning style of development to solve the social problems of Latin America and of the developing world in general.

Another angle from which both the economic and the social efficiency of styles of development in underdeveloped countries have been challenged vigorously is that of the "population problem"; that is, the explosive growth of the population and of urbanization, with all the concomitant problems that these phenomena have entailed.

The subject of technology functions in the same way. Conservationists, who have been concerned with this subject for many decades, have always drawn attention to the consequences that development styles based on the massive incorporation of modern technologies into backward societies could have as a potential source of aggression against their cultural patterns, leading consequently to the alienation of man from society and nature.

Another angle from which development styles in the developing world are being discussed is that of the autonomy of development, a subject which was not only raised at the ideological level in theories about imperialism and other related approaches, but has also been expressed in the political sphere through the process of decolonization and the explosion of the Third World onto the international scene. In the light of this concern, autonomy of development is another angle from which the particular characteristics of a certain development style can be evaluated.

But irrespective of the angle from which one views it—society, technology, culture or autonomy of development—the debate on development styles is extremely important in that it allows development to be appreciated fully and brings out the whole range and complexity of the subject. Even more importantly, it highlights the essentially political aspect of development

*The ideas presented in this article were formulated during a mission on co-operation in the field of energy with which the author was entrusted by the Secretary-General of the United Nations. They were presented at the CEPAL/UNEP Regional Seminar on Styles of Development and Environment in Latin America, held at CEPAL headquarters, Santiago, from 19 to 23 November 1979.

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processes. In reading the inspired reports prepared at the Founex and Cocoyoc meetings or by the Dag Hammarskjöld Foundation, in which alternative styles of development are discussed, one feels that they all have one basic limitation: although all are brilliant in diagnosing the problem and analysing the various aspects of its possible solutions, none has stated that basic political definitions are at the root of it. The crux of the matter is whether social organization (and the basic political forces which uphold it) can truly bring about the changes which must be introduced in development styles in order to achieve the goals which these documents propose. It is precisely in the political capacity to achieve these transformations that the greatest challenge lies.

It is in this context that I wish to turn now to the subject of energy, which has recently concerned me personally, and which is another of the angles from which the styles of development currently predominating in the world can be examined.

THE ENERGY PROBLEM: GENERAL CONCERNS

To begin, I wish to clarify some of the remarks made previously. Firstly, I am not an expert on energy, and therefore I shall merely attempt to convey the impressions of one who examines the problem from the economic point of view. Second, I shall attempt to approach the problem by identifying the main challenges to be faced by developing countries in the years to come, and to consider the options these societies may have, with special regard to the Latin American countries.

The influence of energy on the prevailing style of development has already been pointed out by Osvaldo Sunkel.¹ There is no doubt that the type of energy which mankind has preferred to use in past years has set its stamp, in one way or another, on both the development style and the lifestyle of all the countries in the world. Under this style, economic development was stimulated mainly by technological achievements, which in turn depended closely on the energy base available. It was the development of these new technologies which facilitated the unprecedented flowering of the productive forces of humanity.

Obviously, this development style and the technological change which sustained it were made possible by the provision of a new type of energy, hydrocarbons, which for many decades was characterized by its relative abundance, the flexibility with which it could be used in various patterns of technology and, especially, its low cost.

This development style based on the introduction of new and cheap forms of energy facilitated the attainment by today's societies (or at least by their élites) of the levels of well-being which they currently enjoy. One quarter of humanity was thus able to reach unprecedented levels of living with extremely "sophisticated" technological advances based, of course, on the provision of cheap energy.

Clearly, the developing countries were influenced by a development style and type of technology based on these abundant and cheap sources of energy. And this life style gradually penetrated with particular virulence into certain groups of our societies, since the imitation of more opulent societies made us susceptible to all the forms of consumerism they had developed. In this way, Western civilization, or at the least its external trappings, penetrated to all corners of the earth, the every community and culture, and included all societies under identical rules of production and consumption which could thereafter no longer survive without the energy base which had sustained them for a number of decades.

In 1973 came the "energy crisis", which had two important effects. The first was that, through an intelligent association of the petroleum-producing countries, the above-mentioned cycle based on cheap energy was brought to an end. The industrialized world had developed over the

¹See his report "Los estilos de desarrollo y el medio ambiente en el proceso histórico reciente de América Latina", presented at the regional Seminar mentioned earlier.

past thirty years through the continuous extraction, at greatly reduced cost, of a resource located mainly in the developing countries (the Arab countries produce 70% of the world's supply of hydrocarbons). The second effect of this crisis was to reveal for the first time the danger that the growth of hydrocarbon reserves would fall behind the growth rate of consumption of that resource and that during the next decade it would be difficult to maintain the world energy balance if the current growth rate of consumption continued. Indeed, if that rate is maintained in future years we will be in grave danger of facing an international fuel shortage and at some point before the end of the century the production curve could start to decrease. This situation raised a very serious quandary for a civilization which had drastically transformed its energy balance, was depending less and less on coal, and was nourishing its rapid expansion mainly on hydrocarbons. This was what was called the energy crisis.

All the consequences of this crisis, and not merely its impact on balance-of-payment positions, must be considered. It is undoubtedly one of the most complex and dramatic crises of the century, and should be approached from various angles.

Firstly, we are facing a *technical* problem, because essentially we must determine what humanity's options are when faced with the possible exhaustion of a source which is the mainstay of the current energy balance.

It is an *economic* problem, because whatever energy options the future may bring us, the price of the various sources of energy will be much higher than at present, since substitute sources of petroleum cost much more than the traditional sources on which humanity has based its development in the last few years.

It is a *political* problem because, for the first time, the developing world is reversing the traditional relations of dependency and is working together to obtain a higher price for one of its basic products through an exceptional demonstration of political organization which has allowed the Third World to react intelligently and to place North-South relations, also for the first time, on an interdependent rather than dependent basis.

It is also a *psychological* problem because, as I see it, either by the force of events or the will of the participants, one of the most formidable international information machines has been created and is forming images in the public mind which may distort the reality of the facts. Through these images, it is sought to attribute the responsibility for the current international economic crisis solely to the petroleum-exporting countries, which can only be explained as the result of an unfortunate distortion of international public opinion which fuels passions and makes any form of constructive international dialogue much more difficult.

Finally, it contributes to the generation of broader political problems, for we cannot ignore that behind the subject of petroleum lie political problems which transcend it. It is well known that petroleum has often been used as a weapon to achieve other political objectives, and that petroleum strategies are directly involved in the whole political crisis in the Middle East.

At all events, the balance of forces in the world has been changed, thus giving this discussion an entirely new character and making the question extremely complex. For it is not a purely technical problem; rather, it is at once an economic, political, psychological and information problem.

In spite of the numerous aspects of the energy crisis, I feel that its most important trait is the uncertainty which it has created on a world scale. It is precisely this uncertainty that makes an international dialogue essential, and the separate groups of countries must be brought together to discuss their respective interests and search for ways to co-operate for their mutual benefit.

FACTS AND UNCERTAINTIES OF THE ENERGY PROBLEM

Among this vast range of uncertainties, there are some facts which deserve special attention.

The first fact is that the production of hydrocarbons is approaching economic limits which could mean that in the next decade and until the end of this century, there will be a severe

imbalance between supply and demand, with serious danger of temporary shortages and tremendous vulnerability to any type of international conflict. The political crisis in Iran has recently shown the extent to which we are treading an extremely narrow path between supply and demand, with severe fluctuations which could lead to permanent tension in the world markets during the coming years.

Second, the cost of energy resources will continue to rise throughout this period, and will approach the cost of replacing them. Naturally, the cost increase may take various forms and will not always continue at the same rate: it might be very rapid for the next two or three years, and then proceed slower and more gradually. But one fact which the entire world accepts is that energy costs will continue to rise in real terms. Up until three years ago, it was believed that the main goal in increasing prices would be to keep pace with the rate of inflation, but now I think that costs will continue to increase in real terms also. Some people contend that a real annual increase of 3 to 5% can be expected for the next decade; combined with the world inflation rate and the fluctuations in the most important currencies, this could lead to heavy increases in the world petroleum bill. This hypothesis presupposes that petroleum prices will double in nominal terms every few years and is certainly far from being the most pessimistic projection, if the recent behaviour of prices is taken into account.

Third, if the prices of energy resources climb faster than world inflation does, petroleum gluts and financial surpluses will become a common phenomenon in the future, especially in some countries. This will mean that international money markets will be influenced by surpluses of historically unprecedented magnitude which will play an important role in the world economy, depending upon what recycling machinery is adopted, either through the traditional methods of the past or through new ones which might be developed through international co-operation.

Fourth, increased prices will lead to conservationist policies, even though their results will not be immediately apparent. At best one can say that technology has shown that with appropriate policies, normal consumption levels can be reduced by 20 to 30% in future years. This reduction, although extremely important, will not solve the fundamental problems, however.

Fifth, everyone agrees that the developing world's ability to decrease its consumption of energy is greatly inferior to that of the developed world. Developing countries need much more energy than they are currently consuming, and will probably have to increase their rates of energy consumption much faster than their growth rates, which must be increased in the future if the developing world is to solve its economic and social problems. In other words, these countries cannot significantly contain or restrict their energy consumption without hampering their development processes. In the developed countries, on the other hand, the margin for reduction of energy consumption is much wider since, because of the degree of development achieved by their economies, their consumption of energy can increase more slowly than the product does.

Sixth, although there are other extremely important sources of energy, among which coal and nuclear energy are especially promising, it will take some time before they can be effectively utilized. Any investment in the nuclear field takes ten to fifteen years to start giving its fruits, and other foreseeable options, such as the liquefaction of coal, will also require fifteen years to affect the market supply. There are extremely promising possibilities in the area of renewable resources, but their effects are also difficult to forecast, at least in terms of commercial exploitation. In other words, there is no reason why petroleum should cease to be fundamental to the world provision of energy in the future, and consequently hydrocarbons will continue to make up over 50% of the world energy balance.

These are the facts which are generally accepted. Now let us consider the controversial matters.

No one knows exactly what the world's real capacity for hydrocarbon production is, in spite of the fact that there are said to be extensive as yet untapped deposits. Apparently, there are resources in many regions, including Latin America, but the economic and technical difficulties of exploiting them are still unknown. These resources would facilitate surmounting the

limitations which the world is facing in the provision of energy products, but would not allow the present share of hydrocarbons in the total supply to be maintained.

We know that there are extensive resources in the world for use in the generation of atomic energy, but this is a field fraught with great uncertainty because of plant security, the advantages and disadvantages of the different technological options, the disposal of radioactive wastes and other related problems. In this field, we again confront not only an economic problem but also a technical, political and psychological one, as indicated by the great variety of opinions currently held on the subject in different countries.

The other great uncertainty involves the application of energy policies. The North does not agree as to what is the best way to handle this matter. There are two schools of thought: those who feel that the market will solve these problems and that prices should therefore be allowed to act as the main regulator, and those who demand more and more insistently that voluntary or interventionist measures should be adopted, including even rationing, as the President of the United States has proposed: a heresy that is hard to accept for those who worship the power of the market.

LONG-TERM PROSPECTS

Having said this, and without going into further detail, the problem seems to present itself in two phases: the long-term challenges, and those which we must face in the transitional period.

Looking at the long term, and assuming that my interpretation of what the technical experts say is correct, we can be fairly safe in taking a historically optimistic view. I think that mankind has begun and will greatly increase an unprecedented effort to acquire new technologies. Certainly, the twenty-first century will have a more solid energy base than the twentieth does, and it is very possible that we will then have solutions that are currently unavailable — firstly, because the technological progress and magnitude of investments currently being contemplated both in the public and private sectors are enormous, and second, because I feel that discoveries are being made, such as nuclear fusion and others, which will facilitate using renewable sources of energy that may have virtually unlimited possibilities. Therefore, it is perhaps not rash to toy with the hypothesis that the options which will be available to humanity in the future will be much better than we can currently anticipate. But this is a hypothesis that can be tested only when the twenty-first century arrives.

Another field in which important experiments are being carried out, especially in the Soviet Union, is the generation of hydroelectric power and its transmission over long distances. Man will soon be able to transmit electrical energy very efficiently over thousands of kilometers; he must merely await the dissemination of these technologies and the procurement of the investments necessary to put them into practice.

The progress being made in the technology of coal transformation is another promising fact, as is solar energy, which is developing in the same direction.

With regard to renewable sources of energy, the Brazilian "green energy" experiment is full of promise and one of the most outstanding options that I have seen. Brazil is using agricultural and forestry products or wastes to generate new forms of energy which could become a major substitute for current liquid fuels.

Nor must we forget the progress being made in social organization. The public is developing greater sensitivity to the need for conservation policies, and this will mean that in fields such as transport and urban organization, society will opt for technologies based on alternative energy solutions or, in the industrial sector, new, energy-saving techniques.

I feel that all these elements justify some historical optimism, based on the group of alternatives which will allow us to confront the energy problem on a long-term basis.

THE TRANSITIONAL STAGE

However, the energy problem is much more difficult during the transitional period. Let us consider the facts of this matter.

First of all, as just stated, there is no doubt that during this period the consumption of hydrocarbons will continue to be basic for the functioning of society. All the possible options will bear fruit only in the long term, with a few exceptions such as, perhaps, "green energy".

Second, prices will continue to increase, and increase they must. I think that a major error of recent years has been to have allowed prices to decrease in real terms after 1973. The world must become accustomed to the idea that with a scarce and non-renewable resource like petroleum, the only solution is to increase its price until it reaches that of other substitute forms of energy. If we agree that the price of these other forms of energy is higher than the current price of hydrocarbons, there is no reason, either economic or technical, to believe that prices should not continue to rise systematically. The question of how they should rise, at what pace and under what types of international agreements, is another matter.

Third, the importance of a less-discussed but perhaps more important subject should be stressed: the investments that will be required during the transitional period until a new type of world energy balance is reached.

Currently, the world has three major reference costs. There is the reference cost of light petroleum (Saudi petroleum), the extraction of which requires investments fluctuating around US\$ 2,000 per barrel of daily production (in 1978 dollars). In addition to this type of petroleum, which constitutes the bulk of the world's production, we have petroleum from those countries that must pay intermediate costs ranging from US\$ 6,000 to 8,000 per barrel. Finally, there is a small minority of cases, including that of Alaska and the countries which must extract fuels from submarine areas, which require investments already totalling US\$ 20,000 per barrel.

The share of these different sources in the world provision of hydrocarbons is changing significantly. The most expensive sources of petroleum will continue progressively to replace the most inexpensive ones. Simultaneously, producers will have to take account of the investments, generally higher, required to exploit new sources of the resource, which will determine the price for replacing the resources currently being exploited. All of the above will strongly influence the cost structure of this product, and consequently basic costs will shift. According to some reliable estimates, the petroleum whose extraction currently costs some US\$ 2,000 must generate resources to cover investments of approximately US\$ 6,000 per barrel, while petroleum which currently costs US\$ 8,000 must finance investments of US\$ 14,000, and it will also be necessary to obtain petroleum through the third type of extraction, which will entail investments of approximately US\$ 30,000 to US\$ 35,000 per barrel. In other words, a production of 250,000 barrels per day, which in a country like Saudi Arabia currently requires an investment of US\$ 500 million, will in ten years require investments of approximately US\$ 5,000 million, both for new sources of energy and conventional ones.

This implies a spectacular change in the world's demand for hydrocarbon investment resources, which will be accompanied by similar changes in other fields. There is general agreement that the investment effort which mankind will have to make to confront the energy challenge in the future will assume spectacular proportions. Whatever hypothesis on the world energy balance is assumed, mankind will have to multiply by five or six the sums currently allocated to developing the sector. This is an extremely important fact which must be kept in mind when analysing the future of Latin America.

Simultaneously, another phenomenon exists: the persistence and growth of huge financial flows. Last year, all the countries in the world combined paid a petroleum bill of approximately US\$ 240,000 million, of which OPEC received US\$ 210,000 million. Of this amount, US\$ 50,000 million went to the Euromoney market and the rest was spent on imports, primarily from the industrialized world, which is by far the greatest beneficiary of these surpluses because it

capitalized intelligently on their growth. Of the US\$ 50,000 million channelled through various forms of international recycling, the major part went to the Euromoney market, which naturally provided financing amounting to a much higher figure and received a significant portion of the financial surpluses obtained by the OPEC countries. Ultimately, the international private banking system was the main provider of the financial resources used to balance the deficit in the external accounts of the various countries of the world, especially the developing countries. Last year, these financial requirements came to US\$ 8,000 million in the case of Mexico, US\$ 6,000 million in Brazil, US\$ 3,500 million in South Korea and China, US\$ 2,000 million in Argentina and Taiwan, etc.

This extraordinary state of international liquidity is currently one of the main problems of the world economy because of the uncertainty that it creates, but at the same time it has come to be the main source of financing for many countries in the world. The member countries of OPEC will continue to contribute a substantial portion of these resources, especially since some of them will have a permanent surplus because within their own frontiers they are unable productively to absorb investments of the size which their petroleum income makes possible.

This means that throughout the transitional period, balance-of-payments crises will be the order of the day for many countries. It is impossible really to predict what forms these crises will take, or what should be done to manage them, because the prices of other products are changing along with petroleum prices. Furthermore, the prices of food and other commodities, manufactured goods, and especially capital goods are also increasing. The developing countries have reacted differently to these situations: some, such as Brazil, India and Yugoslavia, which have large deficits, have launched ambitious policies for expanding their production and exports of manufactures. Others are exporting their manpower to the Persian Gulf and are receiving impressive sums from remittances made by their emigrants, which often exceed the yield of their exports. Both groups of countries are beginning to build their own defences, but other countries are in a completely hopeless situation because they have no manufactured goods, lack the conditions necessary to send their workers abroad and also lack access to international money markets. Thus, very different situations exist in the world and make this subject a multifaceted one at the international level.

At all events, today there is a very clear feeling that the new investment drive in the world will mainly benefit the developed countries, which are capable of developing new technologies and spearhead industries and using them to penetrate international markets.

The developing countries, in my view, fall into three categories. On the one hand there are the largest countries, which also have large solutions and are a category in themselves, such as Brazil, India, Yugoslavia, and to a large extent the countries of Western Asia and ASEAN, whose economies operate on the basis of schemes which have been successful so far. Certainly, these countries are not likely to become a general model, although they have brought their own solutions to the question, for instance increased exports and access to international money markets. At the other end are the smallest countries, the poorest of the world, whose consumption of energy is extremely low and will continue to be so in future years. These are in a sense the most helpless of all, although the rate of their development process does not create excessively high energy requirements and they may continue, at least in some sectors, to use non-commercial sources of energy. Finally, an intermediate group of countries, including the Latin American countries in general, are the worst off of all, because they have a development style imported from the industrialized countries, with an accelerated rate of urbanization and industrialization, an automobile-based civilization that has penetrated into their most remote areas, and cultural imitations of every kind, but without the ability to defend themselves which the larger countries have.

This explains why the initial reactions to this difficult international situation came from some Latin American countries which have experienced the consequences of the energy crisis more acutely than other developing countries. These reactions were provoked mainly by the public

sectors and by those social groups which felt most heavily the weight of the adjustment measures required during the above-mentioned transitional period. As if that were not enough, this all took place within an international climate strongly affected by inflation and the stagnation of the industrialized economies. The growth prospects of the Organization for Economic Co-operation and Development (OECD) are bleak and disturbing, and because of the perplexity regarding the evolution of the world economy, solutions are uncertain or are constantly overtaken by events.

In sum, no machinery to confront these phenomena is in sight. The only solution put forward so far seems to be a slightly naive revival of neo-monetarism: an attempt to overcome the Keynesian rules of the 1930s which have been shown to be efficient in weathering the financial storm, but incapable of rebuilding the real economies of the countries of a world in crisis while simultaneously controlling inflation. They are excellent strategies for achieving deflation, but ineffective for promoting the ordinary and stable growth of the central economies.

Because of this, it is a source of great satisfaction to note that new trends which stress the structural adjustment of supply are now appearing. These theories, which seem novel in the United States, are well known here in CEPAL, where they were adopted many decades ago. But we live in a world of great complexity which is re-applying older formulas that do not give the desired results and is heading uncertainly towards the search for new solutions.

We must prepare ourselves to face a decade which is dominated by a difficult economic situation and throughout which inflation and stagnation will probably continue to coexist. This will mean a much more serious situation than that of 1973, because it must not be forgotten that in that year the economic situation was comfortable: our countries had a relatively low level of debt and a much better ability to react.

WHAT CAN WE DO?

We must now face the obvious question, and here I shall argue for an equally obvious theory: firstly, out of moral conviction, second on account of my personal beliefs, and third, because I am an official of the United Nations, which believes absolutely in dialogue. This position may seem overly idealistic in a world where not everyone is in favour of dialogue and where, on the contrary, there seem to be forces working in favour of chaos, which would mean a gloomy future for humanity. Unfortunately, if the current systems persist we may not be far from chaos, and perhaps some irrational forces may be thinking that this is the only option at present. For this reason, common sense and the vision of great political leaders must prevail against what could become a real holocaust, if a true international dialogue is not established.

I believe, then, that dialogue is absolutely essential and, furthermore, that it is possible, because for the first time we have conditions that will allow the various sectors involved in the matters being discussed to seat themselves at a single table, bringing to it a range of interests which can be reconciled through negotiation.

What the developed countries want today is an orderly evolution of the world economy and international prices: in other words, they are interested in the possibility of restructuring the world economy on a joint basis. What the OPEC countries want is that the world should respect their right to defend the value of their natural resources, so that they can gain the technological resources required to develop their economies and can guarantee their supply of food. The non-oil-exporting developing countries, for their part, want to acquire the elements necessary to survive the current crisis and to be able to promote the development which we all desire. All of these interests could be reconciled in a well-organized dialogue.

In order to make this dialogue possible, however, I believe that the international community must first accept certain *principles* and second, certain *attitudes*, which are primarily political.

Some of these principles, which I see as basic and upon which any international dialogue must be founded (a dialogue which must take place within the framework of the United Nations), are the following.

Firstly, we must recognize that there are no alternatives to a global dialogue. Here we must weigh the specialized interests of the industrialized countries, which wish only to discuss the question of energy, against those of the developing countries which contend and rightly so, that the dialogue should be global. I believe that at this point further discussion becomes academic: there really is no way to avoid a global dialogue, since if we sit down at a table to discuss only energy problems, we cannot complete the discussion without also considering world inflation, the functioning of money markets and the prospects for economic growth. In other words, the dialogue will immediately take on global dimensions.

The second principle is that during the transitional period, the countries which can make the greatest contribution towards the orderly development of the process are those which currently consume the greatest energy resources: the developed countries. It is useless for the developing world to save on electric light bulbs if the United States, which continues to consume one-third of the world's energy, fails to reply with clear and resolute conservationist actions. In other words, a decisive contribution to an energy conservation strategy can only be made by the industrialized countries, and above all the United States. I think that if we agree on this matter, the international dialogue will have a much better chance of success.

Third, as we have said, we must accept the fact that the cost of fuel will continue to rise, since this is the only way to ensure that the world will awaken from the unreal, irresponsible dream in which it has slumbered for the past thirty years, during which it based its entire development process on the provision of an inordinately cheap source of energy.

The fourth principle is that there can be no dialogue unless certain global responsibilities which are incumbent upon humanity as a whole are accepted. The first responsibility involves the world balance-of-payments position. It is senseless to insist that only the OPEC countries, in the case of the Third World, can solve this problem, when it is clear that in reality it can only be solved through the commitment of the entire international community. The subject of investments is likewise a global one and represents a challenge which, in my view, could be much more important than the problem of the balance-of-payments positions. The world must accept that energy investment implies a responsibility for the entire international community. It is debatable, to say the very least, whether Algeria or Venezuela should invest their petroleum surpluses in the development of new sources of hydrocarbons when this petroleum will be consumed by Europe or the United States. In the final analysis, this investment is the joint responsibility of the major consumers. This is a new idea in the international community, but we must continue to develop it. On the other hand, if the developing countries can increase their energy investments while simultaneously sustaining their development, the demand on world energy markets will decrease, thus facilitating orderly market development and decreasing the pressure on scarce resources. This will be in the interests of the industrialized countries, which are responsible for 90% of the world demand for hydrocarbons.

Furthermore, the investments which will be required in the petroleum sector are so large that unless the principle of world responsibility for them is accepted, the petroleum-producing countries and the developing countries will have to contribute beyond their means, for the effort will compete strongly with their global investment needs. This is a fundamental matter for Latin America, and I will return to it later.

The third global responsibility involves technology, and here we face one of the greatest challenges. According to the statements made during the recent Vienna conference, the international community must accept that technological progress is, by definition, the common heritage of mankind. The technological efforts being made at present must be expanded and transferred, especially to the developing countries.

I believe that the responsibility for managing the international money system is also global, and that the world is facing an extremely serious problem, to which the OPEC countries must react with financial discipline in the management of surpluses if the system is to continue to support world economic development. This is probably the most crucial problem for the

international community at present. The possibility of an international financial crisis implies collective responsibility on the part of all the countries of the world, and they must make an effort to consider the problem seriously within the framework of the International Monetary Fund and the United Nations, which must play an important role in the future management of this process. It would be highly inadvisable for this to be left to the vicissitudes of struggles among financial groups or the special interests which are behind them.

Finally, there is a fifth principle, the recognition of the need to develop "South-South" co-operation, which I have intentionally left until last because here we find that international public opinion is somewhat at a loss to know what to think. Let us not deceive ourselves: the problems of the Third World will not be solved solely through South-South co-operation; the developing countries cannot solve their problems alone. Nevertheless, this co-operation front is a fundamental aspect of the Third World's self-defence and assertion of its own identity, and the developing countries must remain united to sustain any negotiating strategy with the industrialized nations. However, we must not assume that the solution of the energy problems affecting the Third World can be left to this type of co-operation alone.

All of the above calls for the establishment of negotiating procedures or machinery. And I must note with satisfaction here that, in principle, this mechanism has already been drawn up in the General Assembly. The solution of current North-South problems depends to a large extent on the rounds of global negotiations which are being completed within that body.

I said a moment ago that in order for the dialogue to take place, certain political attitudes must be developed. The international dialogue is truly a political process and can only be developed by defining our political attitudes. We face an international crisis of major proportions, and only political decisions equal to the crisis will allow us to solve it. We must keep in mind that these decisions will have to be adopted in a climate of generalized mistrust caused by economic uncertainty, political differences and the very novelty of the problems with which the world is faced. And it is disturbing that at present there is no clear sense of progress towards a political commitment on which to base the dialogue and build a new system of international co-operation.

MEASURES AT THE NATIONAL LEVEL

I wish now to refer briefly to what must be done at the national level, with special regard to the Latin American countries. This is a subject on which CEPAL must work quickly. We must consider the elements that will make up the development strategy for the 1980s, and define the actions to be taken on the internal front.

Firstly, we must recognize the differences between Latin American countries, because there is no doubt that between Mexico and Brazil on the one hand and Uruguay and Costa Rica on the other there are striking disparities. Accordingly, the countries face very different situations and problems. But there are also common denominators, and I wish to point out three or four of those which I feel are important. The need to take action to adjust to the increased price of energy, international inflation and the protectionism of the industrialized countries are examples of these common needs, whose cost might increase dangerously as a consequence of the stagnation of the central economies.

A second common element is the need to face up to the serious problems of the balance of payments, an area where, as I have already pointed out, the international community must assume its share of responsibility, but where solutions must also be sought both on the national and the regional level.

A third important element is the need for countries to adopt stringent conservation policies —on the basis of some promising experiments which have been carried out in the industrial sector, in transport, urban development and rural organization— and, if necessary, to institute the rationing of energy consumption.

Fourthly, there is the need to diversify energy sources according to the situation and

capability of each country. Thus, for example, Nicaragua must continue to develop geothermal energy and Uruguay, hydroelectric energy, while Brazil should emphasize green energy. In short, each country should try to find its own energy balance on the basis of its natural resources.

A fifth and extremely important consideration is that of investments. Whatever the capabilities of each country in this field, huge investments will be required to develop them. Energy objectives can therefore be expected to compete with other economic development objectives from the point of view of the assignment of the resources available for investment. Indeed, the demand for investment will be formidable, and will pose a serious challenge to development programming in the coming years.

This leads us to give a warning that the development of the energy sector may involve intense competition with the social and economic development requirements of our countries in the next years. Nor should we forget that energy investments have long lead times before they bear fruit. It is therefore highly probable that the solution of the energy problems will generate and sustain regressive trends affecting the social structure which will be much stronger in the upcoming decade than during the 1970s.

But we must not become discouraged about the impact that such a group of measures could have, especially if we recall the as yet unutilized energy potential in Latin America. For example, this region has one of the largest potentials in the world for the production of hydroelectric energy: 30% greater than that of the Soviet Union, double that of the United States and Canada combined, and four times that of Europe. The importance of this fact can be seen when we consider that at present only 15% of the potential just mentioned is being exploited.

MEASURES AT THE REGIONAL LEVEL

We must now consider what measures could be adopted in Latin America as a whole —an extremely delicate subject concerning which I wish merely to sketch out some thoughts.

This region of the world which has tried out all possible co-operation efforts, could well set itself novel goals in this field. In this connexion, it is very encouraging to note that the Latin American Energy Organization (OLADE) is acquiring its own momentum, as shown by its recent meeting in Costa Rica, where the Latin American countries united to consider this subject at the highest level. There is no doubt that OLADE will be called upon to play an extremely important role in the next decade. It is equally encouraging to see that Venezuela has offered to represent the interests of Latin America within OPEC in order to achieve better co-operation from that organization: this is an extremely important political development.

But we must also move towards new frontiers. I believe that the search for new forms of regional co-operation in this field should be greatly intensified in the next few years. Both the Latin American Economic System (SELA) and CEPAL must carry out extremely important functions in this connexion. Why should not Latin America consider developing an energy co-operation programme that would allow us to achieve security of supply in the event of world upheavals or conflicts? Why should not we envisage a programme of technological co-operation with the participation of UNDP, a body which is making extremely important contributions to that field? Why should not we consider achieving greater co-operation in the field of investments, which must become a fundamental element in the development of the energy sector, by deliberately using the energy investments that must be made to stimulate the internal development of countries: a policy in which the Inter-American Development Bank (IDB) could play an important role? Why should we not search for better co-operation with regard to markets, using the advantages of geographical proximity and commercial complementarity and formulating appropriate agreements and machinery? I believe that these are extremely important subjects regarding which an optimistic attitude must be maintained in an area of the world like our

own which has tried all possible forms of co-operation. At the same time, however, they are subjects which pose an important political challenge.

In sum, I believe that we are entering a period that will be characterized by an awakening responsibility regarding these matters. Humanity, and especially the industrialized countries, is leaving behind a long period of blindness and irresponsibility concerning the subject. It will be difficult for history to explain how man could have lived through this period without becoming aware that the great industrial centres were expanding through the extraction of energy resources, especially from the Third World, at inordinately low prices and with imminent prospects of their exhaustion. It will be difficult to explain why a gradual process of adjusting prices was not undertaken earlier, and why serious policies for long-term substitution were not applied. I believe that this awakening responsibility on the part of all the countries in the world as regards energy must be accompanied by an effort to clarify the ideas for the man in the street: a task in which the United Nations must play an important role, since public opinion on this subject has been greatly distorted for many decades.

This awakening responsibility on the part of the international community will present new challenges to planning; it will be necessary to reduce current uncertainties. The decisions which may be adopted in the next few years will affect the future of humanity for two or three decades. The Latin American countries possess all the elements required to understand the importance of planning in this field: let us not forget that Latin America learned to plan because of energy. Nevertheless, our countries will require support to perfect this process, and here the CEPAL system must make a major contribution. The socialist experience in the energy field must also be reviewed and examined, for in many respects the socialist countries are much better prepared to face the energy challenge than is the capitalist world.

Simultaneously, however, the current crisis will create new opportunities for stimulating our economies; the industrialized world is already fully aware of this and believes that the energy transition will mean a "Schumpeterian" period, marked by impressive development of its productive forces. Unfortunately, this view is mainly confined to the countries of the North. To what extent can the investments required for the development of energy resources be used to stimulate the growth of the developing countries? And, simultaneously, to what extent must this growth be based on styles and policies that differ from those of the past if the problems posed by the energy crisis are to be reduced to manageable dimensions?

As I have already stated, the priority given to energy development could also have socially regressive consequences, because it will inevitably involve a far-reaching reorientation of investments. In order to reconcile energy objectives with social development goals, we must carefully weigh the energy options which arise in the light of their impact on employment, where appropriate technologies must be adopted, agricultural development and food production, and other elements that will strongly affect the social development of our countries.

What does seem obvious is that energy factors must weigh much more heavily in the planning process than they have in the past. I fully agree with what was said to me by a Minister in the Indian Government: "We who studied at Oxford and Cambridge came to India, and before making an economic decision we thought of its impact on the balance of payments. Today, however, before making an economic decision we think of its impact on the energy balance". This applies equally to Latin America, where we must begin to see things in the same light.

I am convinced that the weight of energy factors and other factors which are taking on growing importance in the world today will determine the changes to be made in the next decades, and many of those changes will originate in the North. I am aware that these changes will generate strong resistance, and that those who currently benefit from the advantages of the current style will be ready to make superhuman efforts to maintain it, or to transfer its negative consequences to other social sectors. Nevertheless, I also believe that it will be very difficult to stifle the anxieties of the vast majority of mankind, which currently is so gravely affected by the

consequences of this style. For this reason, I am convinced that it will inevitably be changed. This is an essentially political task, wherein it is necessary more than ever to appeal for a degree of social voluntarism. The market has shown clearly that it is incapable of effecting lasting solutions. For that reason, these solutions are not yet in sight. CEPAL must be aware of these problems, and I hope that the contribution it can make to solving them will transform it into a kind of critical conscience of Latin American development.