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## ENERGY POLICY IN THE WESTERN HEMISPHERE

David L. Pumphrey
U.S. Department of Energy

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Commentary
by:

Joel Darmstadter
Resources for the Future

Chris Flavin
Worldwatch Institute

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## *Preface*

In July 1988, President Reagan signed an extension of the Energy Policy and Conservation Act directing the Secretary of Energy to conduct a study on "how best to enhance cooperation between the United States and other countries of the Western Hemisphere with respect to energy policy, including stable supplies of, and stable prices for, energy." In October 1990, the "The Report on the Western Hemisphere Energy Cooperation Study," prepared with the help of eleven government agencies, was completed by the Office of International Affairs of the Division of Energy Assessments.

On January 15, 1991, the DOE released the report to the public at an afternoon seminar held by the Latin American Program. This working paper is an edited transcript of the three presentations and the subsequent discussion session.

The report is the first attempt by the Department to establish a comprehensive energy policy for the hemisphere, although it is distinct from the DOE's formulation of a national energy strategy. David Pumphrey discusses the origin of the study and its implications for policymakers. Two energy specialists, Joel Darmstadter and Chris Flavin, address the strengths and weaknesses of the findings.

Events in recent months -- particularly the Persian Gulf War and the move toward increased hemispheric economic cooperation -- demonstrate the potential value of such a comprehensive review of energy policy. In fact, Pumphrey notes that the DOE is developing an energy component for the Enterprise for the Americas Initiative. Among the measures the report advocates are improved contacts among energy officials throughout the region, the provision of greater assistance in the identification of opportunities for the utilization of U.S. energy technologies, and increased cooperation among aid and lending organizations to ensure that their programs are consistent with environment and development goals.

We expect that you will find this working paper worthwhile. Copies of the report can be obtained by calling the Department of Energy at (202) 586-6140.

# ENERGY POLICY IN THE WESTERN HEMISPHERE

DAVID L. PUMPHREY

Director, Energy Assessments Division
Office of International Affairs

U.S. Department of Energy

The original directive for the "Report on the Western Hemisphere Energy Cooperation Study" was contained in the 1988 extension of the Energy Policy and Conservation Act. An amendment to that act directed the Department of Energy (DOE), in cooperation with the departments of State and Commerce, to conduct a study on "How best to enhance cooperation between the United States and other countries of the Western Hemisphere with respect to energy policy, including stable supplies of and stable prices for energy. On completion of the study, the Secretary of Energy shall propose a comprehensive international energy policy for the United States designed to enhance cooperation between the United States and the other countries of the Western Hemisphere."

Our first task was to try to find out what the drafters of the amendment intended and the scope of issues they wanted addressed. The amendment was initiated by the late Congressman Mickey Leland from Houston, Texas. Therefore, we first began meeting with his staff and then with Leland himself to get a feel for how to put some boundaries on a project that basically covered all energy and the impacts of all energy use, both economic and environmental. We decided that the best approach was to begin the process of understanding the concerns and the issues that

were facing all of the countries involved, to identify the types of cooperation currently in place--both in the more narrowly defined energy area, perhaps under the purview of the DOE, and in a broader foreign aid or lending context that other areas of the department were involved in. We could then find the common ground that we could use to identify new cooperative activities.

We tried to contact different interest groups throughout the hemisphere that were involved in the energy field. We began with energy officials in the various countries and regional energy organizations. We canvassed the U.S. government about the energy implications of its different departments, including those who are coauthors of the report, and the multilateral lending institutions.

We then asked four of DOE's national laboratories to study certain topics, including oil use, oil production, oil investment rules, the refining industry, natural gas supply and demand, and electricity. A special study was made of renewable energy sources and the prospects for renewables. We commissioned the laboratories to also catalog the types of cooperation that were currently in use and to evaluate what was happening with them. Oak Ridge National Laboratory then collected the various studies and developed a discussion paper, which became the report; it highlighted the different issues that came out of these studies and pulled them together in one document.

The report was circulated to energy ministries and organizations throughout the hemisphere. We cosponsored a conference with the U.S.

Trade and Development Program focusing on the oil sector in particular. We brought to Houston, Texas, oil officials from nine Latin American countries with significant oil sectors to discuss policies and the directions and modes of cooperation that they envisioned for the future.

This study was being made during a time of radical change throughout the world. Our contacts in Latin America, who feared that they were being overshadowed by what was happening in Eastern Europe and the Soviet Union, came to realize that we were ready to listen to them. There are now democracies in almost all the countries of the region, although the situation shifts back and forth on the margin. Many countries are beginning to attack their economic problems by moving away from state domination of the economy toward free market policies and privatization. In addition, President Bush announced his Enterprise for the Americas Initiative, which deals with debt, investment, and trade. Sound energy policies have a direct relationship to the success of such an initiative.

The report included a special chapter on Canada, with whom our energy relationship is well developed. We cooperate in a number of areas, in terms of policy consultations, nuclear nonproliferation consultations, research and development cooperation, and environmental cooperation--or confrontation, as it has been at times in the past. However, the focus here will be on Latin America--Central and South America.

For the United States, the paramount issue is energy security. The events in the Persian Gulf reinforced the need for diversification of oil

supplies. One of our main interests is how to make more oil available in the world market and thereby reduce the vulnerability to disruptions in the Middle East. The most likely avenue is to develop and influence greater productive capacity. Mexico and Venezuela are major producers with a significant capacity to expand, but there are also a number of other countries with potential. The question is how that expansion can take place. This hemisphere is heavily dependent on oil, much more so than most of the developed world. About 60 percent of the commercial energy is oil-based. Obviously, increased conservation and more efficient use of alternative fuels could free up oil into the marketplace. A related area is emergency preparedness--how to avoid panic buying in the marketplace in the event of international disruptions; how to develop more effective energy emergency systems; and how to increase the reliability of productive systems throughout the Western Hemisphere.

The environment, of course, is another large issue for the United States. How do we introduce cleaner technologies and reduce emissions, especially of greenhouse gases and chlorofluorocarbons? An area of growing importance to the department is increasing commercial opportunities for U.S.-based energy industries and technologies. Some industries, especially in the renewables or efficiency areas, may need international markets to be introduced. Others, such as oil and gas services, are facing declining markets in the United States and need more active participation in the international market. How do we find ways to identify opportunities, and, perhaps, reduce barriers? Finally, at least three countries in the region that have been developing nuclear industries are not part of the nuclear nonproliferation system. How do we lead them

into that system of controls and also create opportunities for the transfer of nuclear technology for peaceful use, especially technology related to safety?

The concerns in Latin America reflected its nonhomogeneous makeup. There are small island nations with little in the way of indigenous resources, and major countries that are well endowed with a variety of energy resources. Some are major world suppliers and others are major importers. Finding a comprehensive policy approach for all these countries was difficult; but throughout the region, the overwhelming energy-related objective is how to establish efficient, flexible energy systems that will generate sustainable economic growth. Energy supply reliability has been a major problem in Latin America. Argentina, for example, has had severe electricity outages, which has led to the development of a sort of second electricity system provided by small diesel generators.

Debt and energy are closely allied in Latin America. A return to economic growth will require a sound and efficient energy system. The key issue, then, is how the region can finance the development of an energy infrastructure without increased investment. Debt problems have made financing major projects difficult and expensive. Some countries in the region have found that it has been impossible to attract new capital. An estimated 20 percent of the current Latin American debt has been linked to energy projects. The heavy emphasis in the past on large projects, especially large hydroelectric projects to take advantage of the water

resource potential throughout the region, has had an enormous cost in terms of capital expenditures.

Protecting the environment was also a concern expressed by many of the energy and environment planners throughout the region, as was the need for new technologies and for emergency preparedness.

With this catalog of issues in a broad sense, we began to look at current cooperative efforts. The DOE interacts with only a few countries on a policy basis. We have regular bilateral discussions with Mexico and Venezuela, in particular, to keep each other informed of what is happening in the policy environment, to try to explain that environment, and to explain the benefits of different policy developments. We have had two programs to promote the introduction of new technologies in the areas of clean coal and renewable energy. They are designed also to provide a basis for U.S. technologies in the region. We are beginning an export assistance programs focused on the oil and gas services sector to help them identify new markets. We also have ongoing research and development cooperation. One major activity is a study with Mexico to identify the approaches, policies, and technologies that can be used to improve air quality in Mexico City.

We have agreements with Venezuela in the area of heavy oil recovery. Our research and development activities have been structured around what we can learn from our efforts, not on simply providing assistance to the country. With its vast resources of heavy oil and tar sands, Venezuela provides us with a place to test new technologies that

might be applicable in the United States. We have also participated in some science and technology agreements with other countries, most recently Brazil.

As for other government agencies, the Agency for International Development (AID) has had a major program in Central America focusing on renewable energy and geothermal and other sources of energy, as well as on the development of an energy policy base to promote new and better energy policies. The U.S. Trade and Development Program has funded a number of feasibility studies for energy projects, looking specifically at refineries and other types of large-scale plants. The Export-Import Bank has put a limited amount of loan guarantee money toward energy projects, and the Environmental Protection Agency has worked out some arrangements on energy efficiency with Brazil. The multilateral banks have played a major role in the region and have lent significant sums to the energy sector. Large parts of the World Bank and Inter-American Development Bank programs are put toward energy projects, usually for electric power projects--either new large dams or transportation and distribution systems. There is not much going toward the fossil fuel area, but there has been a growing interest in some of the renewable technologies. Finally, there are some technical assistance programs through the United Nations that are looking at specific projects.

The study showed that although there was cooperation in energy activities between U.S. agencies and countries within the region, there was little internal coordination, no sense that the best kinds of projects were being focused on or that priorities were being established among them. So

there was a great deal of interest in maintaining these contacts and building cooperation, especially in the areas of conservation and efficiency, at a more intense level.

One major conclusion we came to is that energy resource allocation would benefit from continuing the process of removing government controls on the economies of the region. Privatization is a critical part of developing efficient energy markets. The state oil companies were somewhat taken aback by this. But privatization can be either the actual selling of public enterprises, or it can be the process of companies moving towards operating like private companies rather than like social agencies of the state.

Technology transfer is a critical element, clearly, for the countries in Latin America. More open markets as a result of privatization will provide opportunities for the U.S. companies that are selling energy technologies. The issue is not a question of aid or of educating energy experts in the region--by and large, the people we have dealt with in the energy sphere have been professionals--it is rather a question of making information and technology available. The best way to do this is through the private sector. The government can play a role in providing information, but in the United States, at least, the private sector has to be the main source.

The congressional report directed us to come up with a set of recommendations on how best to proceed, how to identify new opportunities for cooperation to achieve these potential benefits--without spending more money. With that caveat, we came up with what I have

been told is an unremarkable set of recommendations (although anyone who has passed through the interagency process in Washington knows that it is remarkable for any set of recommendations to be acted upon). The first involved establishing closer and better contacts with energy officials throughout the region, moving forward from countries such as Brazil and Argentina to others that have the potential for conservation, renewable energy, and other energy sources. We want to expand our network of bilateral consultations to identify opportunities for joint projects and promote cooperation in new areas. One example is a project we undertook with Mexico to encourage more efficient electricity trade and to identify opportunities for cross-border electricity exchanges or trade.

An area that has not been tapped at all by us is to work with the regional energy organizations. The language that accompanied the congressional mandate called on us to consider creating a type of international energy agency for the region. We found little support for creating a new multilateral organization, but we also found that there are regional organizations with which we can begin to work. The Organization for Latin American Energy and Development (OLADAY) has membership representing all of the countries of Latin America and the Caribbean and focuses on developing regional energy policies and producing data bases. We hope to establish a working relationship with OLADAY to start the process of transferring what we have learned, both within the United States and the International Energy Agency, in an effort to affect the energy policy process. The Latin American State Oil Companies Association (ARPEL) is examining technical oil issues. I would like the DOE to join the organization in an observer status and begin the process of serving as a

conduit for information from U.S. oil companies. We have also contacted the Regional Electrical Integration Commission (CIER), a regional electricity organization. We believe that we could bring to the organization considerable experience in the process of independent power and in other areas with which the U.S. and Canada have experimented.

We also recommended that we start providing greater assistance in the identification of opportunities for the utilization of U.S. energy technologies. The clean coal technology program and the renewable energy program have been working for a number of years to identify opportunities. A new office within the department is responsible for coordinating these activities to make them more effective.

The final recommendation was to begin working with the aid and lending organizations that operate out of Washington, D.C., and that have such a major influence on the direction of the energy sectors. The idea would be to ensure that environment, development, and energy policy goals are consistent, to avoid funding energy projects by one bank for reasons that may be inconsistent with what other banks or aid organizations are doing. The people who approve lending for projects should have a common understanding of what the problems are. We are beginning to work on this idea, but it is difficult to get these groups to coordinate with each other.

Although we did not discuss it in the report, we are working towards developing an energy component for the Enterprise for the Americas Initiative. As we move on the issues of investment and trade, we have to

examine what are the energy aspects of those activities, how energy affects investment and trade, and what areas we should be focusing on as we implement the initiative.

JOEL DARMSTADTER
Senior Fellow, Energy and Natural Resources Division
Resources for the Future

On the issue of energy cooperation, it is helpful to move beyond that murky term "cooperation" and recognize that what sometimes purports to be cooperation can also mask insularity and economic retrogression. For example, nothing seems more admirable than the overall economic benefits of cooperation within the European Community, as long as the effects of its farm policy on world agriculture is brushed aside. And parenthetically, the cynic would be tempted to observe that it was Venezuela that spearheaded the formation in 1960 of a cooperative venture that was called the Organization of Petroleum Exporting Countries (OPEC), which in itself was a reaction to the then prevailing cooperative arrangement under the tutelage of the major oil companies, the "seven sisters." So one has to be careful sometimes of where cooperation leads us.

There are clearly many examples of actual and prospective cooperation, and the DOE report elaborates on these. Their benefits are indisputable: a liberalized and more certain investment climate and support for commercial development of energy resources--resources in which the region or countries within the region may have a particular comparative advantage, such as geothermal in Central America, biomass in the tropics, and solar energy in a large number of countries. Another benefit would be the expanded availability and sharing of energy data and information, the geographic diversification of energy supply in the context of greater energy security, perhaps agreements to augment emergency

stocks of oil, and, last but not least, the promotion of greater energy efficiency.

On the other hand, we should head off any steps toward and dispel any illusions concerning preferential energy supply arrangements. It is not quite clear what the DOE report has in mind in proposing areas of cooperation. The report states its goal of enhanced cooperation "in order to encourage stable prices and supply levels for the region" (my emphasis). What, presumably, the report does not have in mind is, let us say, some engineered arrangement, maybe with Venezuela or with Mexico, that would give the United States privileged access to their oil during world oil market disruptions. It would not behoove the United States, under its IEA membership obligations, to do what Charles DeGaulle tried to do in 1973 in his effort to carve out an independent political line with the Persian Gulf producers. In any case, neither Venezuela nor Mexico would want to deny themselves the proceeds of a rising oil market because of some prior arrangement, and it is for this reason that such an arrangement would probably never be fashioned.

The DOE report also discusses (but David Pumphrey did not) an oil leasing option. An earlier DOE report on alternative financing methods for the Strategic Petroleum Reserve issued to Congress in February of last year is good; I am impressed at how complicated this issue can be. The feasibility of the leasing arrangement may depend on, among other factors, the availability of leased oil from countries that have substantial excess production capacity (I do not know whether Mexico and/or Venezuela, as

opposed to Saudi Arabia and perhaps other Persian Gulf producers, would meet that criterion). But it is an idea well worth studying.

The report puts considerable and legitimate stress on the economic benefits of having the energy transaction in the hemisphere mediated by free-market forces, rather than unduly governed by interventionist, regulatory, or restrictive processes. The report also seems to spotlight the United States as the place where the benefits of a free energy environment or marketplace are most conspicuously evident. I agree with the broad tenor of that argument, but in the interest of both humility and fact, I do want to note a few lapses, even in this country, from that laissez-faire code.

We protect domestic sugar growers with import restrictions, which then, of course, exposes us to the demand for a bigger Caribbean Basin foreign aid initiative for sugar producers in the Caribbean, such as Barbados. We restricted imports of Brazilian ethanol at the time when Brazil had an exportable surplus of the product. I am not sure that those restrictions were occasioned by the fact that Brazil's ethanol production subsidy, which was considerable, was greater than ours, which is also very considerable (the United States supports ethanol production at about twenty or twenty-five dollars per barrel of oil equivalent). We barred the export of Alaskan oil to Japan even though it would represent a cost-minimizing strategy because of lower transport costs. We notoriously underprice electricity from federal dams in the United States. It is Congress--and Congress acting along regional rather than partisan lines--that is sometimes responsible for these distortions, for these imperfections

or deviations from true market processes. This prevents changing these policies.

The United States-Canada Free Trade Agreement (FTA) is prominently cited in the DOE report. The implications of the FTA for energy are that it has the effect of outlawing price discrimination in the energy trade. But authority remains vested on the U.S. side in the Federal Energy Regulatory Commission, as it relates to electricity and natural gas imports, and on the Canadian side in the International Energy Board.

But, these caveats aside, the distorting effect of a gross intrusion by the government into energy markets can be formidable. Let me cite one example: the policy of the Venezuelan government (under the kind of political pressure that I would not be cavalier enough to dismiss as unimportant). That policy is to set the domestic retail price of premium leaded gasoline at about twenty or twenty-five cents per gallon (the policy of current Venezuelan President Carlos Andrés Pérez indicates that the price level will be increased). This populist pricing policy utterly fails to account for the environmental stress caused by the automobile; it will not be long before Caracas assumes the character of a Mexico City or Bangkok. The price of gasoline in the United States, about $1.30 per gallon, may also not account for the environmental stress; but twenty-five cents is surely unlikely to do the job.

There is, therefore, an environmental consequence of that misguided policy. The economic consequence of that pricing policy is such that the level is set at about one-half or certainly no more than two-thirds of the

world price of petroleum products. Thus, Venezuela has, at least until recently, forfeited hundreds of millions of dollars that would otherwise be obtainable through the proceeds of foregone exports. There is a real dilemma here. Automotive transport is one of the most cherished items in the incremental budget of households in the Third World. Even in the countries of Eastern Europe, which are hard pressed in terms of standard of living, the demand for automotive transportation increases by 8 to 12 percent per year. In Korea and Thailand, two newly industrial countries, it increases by 15 to 20 percent per year.

In economic jargon, the income elasticity of demand for automotive services is extremely high in all developing countries. One ironic consequence of this phenomenon, and not just in Caracas, is apparently to dilute the very rise in well-being that is supposed to be occurring as a result of the economic development that allows the purchase of more cars. I have nothing profound to add to this expression of melancholia, except for the observation that we among the haves of the world should be careful in prescribing for the have-nots a developmental future that we have been singularly unable to resist or to cope with ourselves.

CHRIS FLAVIN
Vice President for Research
Worldwatch Institute

The DOE report would have been more useful and effective if it had attempted to target some high priority areas of potential cooperation, rather than paint with such a broad brush. Working in a government agency and under a congressional mandate does not allow the same sort of flexibility as at a private research organization; nevertheless, targeting the issues in a more precise way would have been more useful.

First, there is the potential for going too far in trying to wall off the Western Hemisphere. From the point of view of the United States, and potentially from the point of view of the other North and South American countries, there is danger in thinking of ourselves as somehow separate. One sees this tendency often on the part of the media and the public, particularly in the immediate reaction to a crisis in the Persian Gulf. There has been a naive sense that somehow we can be dependent on Venezuelan oil, for example, and thereby protect ourselves in some way from being dependent on Persian Gulf oil. This is not a realistic strategy for the United States to pursue. Efforts to become dependent on or to enhance production of Venezuelan oil could diminish efforts to reduce overall dependence on oil and overall consumption of oil in the Untied States--efforts that would in the long run tend to be much more effective and productive from the nation's standpoint.

A point that many people have lost sight of in the midst of the current crisis is that when market prices of oil shoot upward, it is not just the oil from Saudi Arabia or even just the oil from Venezuela that reflects the increase. It is the oil coming out of Alaska and Texas as well. In terms of the macroeconomic effect on the economy and in terms of the immediate short-term consequences of producing a recession, to be able to say that a barrel of oil has Venezuela or Alaska written on it, as opposed to Saudi Arabia or some other Middle Eastern country, is not much protection.

There is a natural tendency on the part of Congress and the administration to view the Western Hemisphere as a region that can somehow be insulated from dangerous economic and political conditions overseas. The reference to Venezuela as having been a founding member of OPEC is certainly a useful reminder as we ponder the conditions of the current oil market. It is also dangerous to go too far in thinking that we have to cooperate technically with Latin American countries as a substitute for cooperation with Asian or European countries. I would argue for more technical cooperation across the board. In the state-of-the-art technologies that we need to develop, we are more likely to see technological gains, from a narrow U.S. point of view, working with Japanese or European companies and governments than with Latin American countries.

That is not to say that there are not opportunities for successful cooperation with Latin American countries in this regard, because there are. But to get the most technological bang for the buck, from the U.S. standpoint, we should be aware that Japanese companies have made enormous progress in recent years with efficiency technologies and with a

whole range of other technologies. Precisely because of some of the market imperfections and economic impediments in the region, there has been less progress in this regard in Latin America. Even where there has been at least apparent rapid progress, such as with the Brazilian ethanol program, questions can still be raised. Those who have looked in detail at Brazil's ethanol program would question how technologically sophisticated it really is and how applicable it is to a U.S.-based ethanol industry.

To target efforts at cooperation within the Americas, there must be a vision. Obviously, the authors of this study were in a difficult situation, given that a national energy strategy was being prepared here in Washington, D.C., at the same time they were working on the report. The vision, therefore, was not yet in place. Unfortunately, at least as I read the tea leaves, we may not see that vision supplied in the near future. Extraordinary politics with regard to the Persian Gulf situation appear to have taken over. We are unlikely to see more than a policy here and a policy there, as opposed to a guiding vision of where the country is headed, of how to measure progress, and of the ideas that Admiral James D. Watkins, the Secretary of Energy, originally had with regard to national energy strategy.

The problems run right through this administration and through the politics of energy generally in this country. But in the absence of such a vision, there are some benchmarks that would have been a useful focus in the context of both our national energy strategy and in terms of guiding a report on international cooperation of this sort.

There is the need to begin treating markets in the energy sector much more seriously than we have and to work hard to open up to the free winds of the market some areas that have not been successfully opened so far. We have to go beyond ideas like decontrol of oil and natural gas prices and begin looking at how to make the electric power industry more competitive, something which has begun to happen only in parts of this country. Unfettered reliance on market forces alone is not going to provide the vision and probably is ultimately not going to provide an energy strategy that serves the needs of either the country or the world at large.

There is the need for strategies to reduce dependence on oil. It makes sense to have a national goal of limiting consumption of oil--whether that means slowing the growth rate of consumption, particularly in developing countries, or actually cutting the amount used, which is feasible in a country like the United States. The United States can have a goal of that sort in place and use it to guide policies without grossly violating economic principles. In fact, in many cases one can use economic incentives to move in that direction.

I would argue for going beyond simply having nonsubsidized oil prices and toward having rather high taxes on oil products. It would be dangerous for the United States, in terms of comparing itself with the rest of the world, to look at average gasoline prices in the Western Hemisphere and reason that it should be in the middle in terms of prices. Our gasoline prices are now between a third and a half what they are in most of our industrial competitors. So they have a much greater incentive to conserve,

to drive less, to purchase efficient cars--and for manufacturers to develop new, more efficient technologies. More realistic pricing, and, in this case, a tax in order to accomplish that pricing level, is almost certainly required.

That approach generally could also be recommended to other Western Hemisphere countries. We are fooling ourselves if we believe that we can somehow wall ourselves off from a dangerous international oil situation, especially given the almost inevitable trends shaping up in the 1990s and beyond toward increasing dependence on Persian Gulf oil for any oil importing nation.

A national vision of energy policy should include a carbon dioxide-limited energy strategy. This is controversial within this administration, and to some extent around the world, but it is worth noting that a growing number of countries are at least beginning to develop such strategies. We may even have a formal international commitment and protocols, with everyone attempting to limit carbon dioxide output in some way.

This country is some distance from actually making that commitment, but it is important to begin thinking about what it would mean. For example, coal consumption must be cut because coal is a high producer of carbon dioxide per unit of energy. We have had an energy policy to encourage combustion of coal (with the exception of limitations on sulfur and so on as it pertains to acid rain). It might also mean that we would need to begin thinking about whether we can afford to develop all of the oil shale and tar sands that are available in parts of North America. These are some of the dirtiest of the fossil fuels, not only from the

conventional pollutant standpoint, but also from the standpoint of carbon dioxide emissions.

Scientists now tell us that to stabilize the concentration of carbon dioxide in the atmosphere we must eventually cut carbon dioxide emissions by 60 to 80 percent of current levels. It is hard to imagine moving onto a path of increasing use of coal and tar sand and shale oil that could, over the next fifty years or so, easily double or triple total worldwide carbon dioxide emissions. So a move toward a carbon dioxide-limited energy policy would certainly mean taxes on fossil fuels, probably based on carbon emissions. It would mean accelerated efforts to improve energy efficiency, and a real commitment to develop nonfossil energy systems, presumably some combination of renewable energy or nuclear power.

Of the points that have been discussed in the DOE report, some of the required areas for cooperation are a heavier commitment to energy efficiency and to renewable energy technologies. Unfortunately, in both of those areas, the United States has less to bring to the table technologically than we would have if we had continued with the sorts of research and development programs that were begun in the early 1980s. We are not, therefore, starting from a particular position of strength today in urging Latin American countries to cooperate with us and to make enormous technological progress.

We have made progress over these ten years, but we are not the leading center of excellence in these technologies. And so there is a

fundamental need to step up U.S. research and development and commercialization of this whole range of technologies. And in that context, there is an enormous opportunity to cooperate not only with Latin American countries, but with countries around the world. Because these areas of technology have been neglected to some extent for some time, there is the potential to begin a process of highly rapid technological advancement if that commitment is made.

In terms of policy reforms to encourage other nations to implement, particularly Latin America, there are some programs that are worth pointing to in the Agency for International Development. These programs are useful in promoting more competitive, independent approaches to power use, in encouraging the private sector to get more involved, and in moving toward a decentralization of power systems. Many of the electric power industries of Latin America are in serious economic and managerial crisis now. In many cases, the approach of building massive power projects and providing rapid electrification has gone out of control, and some smaller scale opportunities have been neglected. Institutional reforms are almost certainly in order.

This is an area as well where the United States, at the national level at least, lacks a commitment of its own to move forward with the kinds of reforms that are needed. Certainly the U.S. system is in better shape overall than most of those in Latin America. But we have a long way to go to create more independent power sectors in many parts of our country. As we begin to learn those lessons and move forward, much can be shared with other countries, including the countries of Latin America.

## DISCUSSION

DAVID PUMPHREY: In speaking to the point about insularity, the DOE was asked why it was doing a study on Western Hemisphere cooperation. The short answer was we were not asked to look at other countries. We tried to be careful about the concept of a fence around the Western Hemisphere. The people who had started generating the ideas had been advocating a pan-American energy alliance or something similar; that meant perhaps a hemisphere-wide oil tariff, a tariff to make the hemisphere oil self-sufficient, if not energy self-sufficient, and cut itself off from the rest of the world. The department and our international office have tried to convince policy makers in the administration and on Capitol Hill to drop that idea. We cannot do it for the United States alone; we are part of an integrated world market. We want to avoid the idea that we could somehow develop a hemispheric strategy. This report is part of an overall international policy as well as an overall energy policy (of course, there can be some debate as to where that energy policy stands). We are in total agreement on not creating a policy that applies only to this hemisphere.

RICHARD NUCCIO (Inter-American Dialogue): I am perplexed by what the speakers mean by market prices. I heard at some points that international market forces would set prices. I heard at other points that we do not allow international or national market forces to set prices in significant areas of U.S. energy production or distribution, and that that was regretted. But then I also heard that we need to fix gasoline prices at the right level by taxing them.

If we allow gasoline prices to be set by market forces, then they are exactly where they should be, and I would agree that that is a terrible place. It is bad for the United States that the prices are at the level that they are. But that is where the "market" is setting them, and I assume this is because it is an imperfect market. The market did not factor in the $30 billion per year that we have to spend to protect Saudi Arabia and liberate Kuwait. And it will never factor in those kinds of things. The market is not factoring in the possibility of a one- to three-degree temperature rise by 2040. And it will not.

So I do not know what you mean by market forces, unless you would like them to be a rough guide to how to make policy decisions, not how to set prices. We seem to be in an unpleasant kettle of fish precisely because we reversed nonmarket forces at the end of the Carter administration and went to a more market-driven system. This new system has increased our oil consumption, which has brought Cadillacs back into vogue and encouraged people to buy four-wheel drive vehicles and so on, and has diminished what edge we had in alternative and renewable energy supplies.

I was in Venezuela shortly after the Iraqi invasion of Kuwait. A minister of energy, who was in office after the creation of OPEC and after the 1973 oil embargo, said that in the mid-1970s the Venezuelans proposed to the United States a hemispheric energy plan. Given recent events in Kuwait, Venezuela would now be supplying about 70 percent of hemispheric energy needs if the recommendations they had made at that time had been accepted. Do you think there are more options available to

the DOE now than there would be if we were 70 percent energy sufficient in the Western Hemisphere and if we did not have the dependence on Middle East oil that we do?

Part of that proposal from the Venezuelans was, in fact, the kind of linkage that I thought the commentators were against. But it was implied by Pumphrey's suggestion of fitting energy into the Enterprise for the Americas Initiative; namely, the Venezuelans were looking for prices for their oil that would allow them to pursue an industrial model of substituting other kinds of trade and export activities for oil production. They were looking for access to markets in the United States for manufactured goods, textiles, and other kinds of resources.

Again, at the same time, the panelists appear to be arguing that we do not want to say that the United States has a particular interest in seeing countries which are linked to us by trade, migration, environmental, and a whole series of other concerns in a better position economically, socially, and politically. They appear to be saying that it is not in our interest to link together energy, trade, environment, and markets in a package that trades off some things and promotes a common interest within a hemispheric context. In short, I thought I heard the idea of integrating energy into the Enterprise for the Americas Initiative and making tradeoffs among the components being criticized when, in fact, they should be promoted.

Such a plan does not necessarily need to be exclusionary. I think there will be some kind of informal trading bloc within the Western

Hemisphere competing with Eastern Europe and Africa, and with Japan and Asia. The real question is whether we do that in a coordinated way or whether we allow it to develop informally. And, as the world trading system expands and gets more diverse and complex, we may even someday decide that it is good for improving world trade to have some coordination and some agreement-making on subregional levels within a broader GATT-expanded kind of trading system.

DAVID PUMPHREY: In the terms in which I am speaking, market pricing is more akin to international market pricing. The market does not work as smoothly for fuels that do not have an international market. For oil, there is an international market price that is fairly well established for everyone. On a competitive basis, natural gas can be linked to oil, although not perfectly. There is a small international market for gas. Although it is changing, electricity has been historically much more closely related to a cost-of-production concept. And the subsidization of electricity prices has been a major issue throughout the hemisphere.

With respect to electricity, it is important to ensure that costs are covered in the most efficient fashion, that there is no cross-subsidization among sectors. Mexico has always maintained special rates for electricity going into agriculture, which is far below either the cost of providing it or the cost that is incurred by other users. I cannot say that the United States is blameless on this account. We have a history of doing this, and we still do it in some areas. The electricity market will change, hopefully, as we see the beginning of an independent power concept and perhaps more of a market concept, which is a bit more difficult.

On the linkage to the EAI, it is more the reverse of what you were describing. Energy often has been ruled outside the discussions on trade and investment throughout the hemisphere. We think it is important that it be included within the context of those discussions--investment in particular, but also trade, with regard to any trade barriers or special tariffs.

In terms of a hemispheric energy plan, we often hear this argument from the Venezuelans; in fact, there is some hint that a former Venezuelan administration had a hand in generating the push toward this study. There is a wish to tie up "secure markets," which obviously means some kind of preferential pricing regime. I am not certain that our distribution of imports would be much different now than it would have been with some kind of hemispheric energy plan. Our dependence on the Middle East for the United States alone is relatively small, much smaller than Japan's and Europe's. The point is that our dependence on the Middle East is interesting, but in some ways not relevant to the impact of a supply disruption. A supply disruption results from the price increase that is transmitted throughout the system. The main reason we try to avoid using and focusing on this idea of U.S. dependency is that we could be one percent independent, but not insulated from the economic effects of a disruption.

JOEL DARMSTADTER: I detected a slightly mischievous and needling note in that question. I think the questioner heard perfectly well what was being said. Clearly, compared to ten or twenty years ago, there is a

reasonably competitive world oil market today. When prices go up the day after the invasion, everybody concludes that there is a conspiracy and that it is still "Big Oil" that controls prices; but when grapefruit prices go up after a freeze, nobody says that there is a conspiracy of citrus producers. The big oil companies, being powerful, visible, and wealthy, bear the burden and the onus of the Rockefeller cartel image and so on.

We are somewhere near a fairly competitive world oil market. If that is the case, then the market price for gasoline is probably at about ninety cents a gallon (without tax). When the Venezuelans put in the safety net or subsidize gasoline at thirty cents, that is clearly below the market; and when the Europeans and the Japanese price gasoline at the pump at four dollars per gallon, that is substantially above the market.

Having said that, it becomes a sort of value judgment as to which is the right policy. The Europeans are closer to what my values would dictate. But keep in mind that in Europe, hefty gasoline prices go back as many as forty years and were never inspired as an energy saving device. They were occasioned by balance of payments and revenue requirements of governments. The fact that gasoline in Italy costs four dollars per gallon has had the unwitting but now mercifully beneficial effect of keeping people from consuming more gasoline.

Nuccio's example exposes the difficulty of defining the right price that would embody these external effects. He asked rhetorically if the price reflects an increase in temperature by the middle of the next century. The answer is clearly it does not. But would he be willing to give

us the surcharge to reflect that rise, and countless other external effects that would need to be included? Where everybody would agree is that Nuccio has defined a price that would not only reflect the conventional market price in a competitive environment but also all of these other long-term effects. But, in practice, this would introduce countless questions. What rate of discount do you apply, for example, to the cost of global warming to future generations thrice removed?

The DOE, as an extension but not as a component of the national energy strategy, which is presumably about to be released, has commissioned a major study that is going to look at the entirety of the fuel cycle for all energy forms, beginning with extraction, through distribution to consumption. The idea is to try to come much closer than anybody has succeeded in doing so far to isolating environmental consequences, so as to at least begin to approach directionally the ideal of defining energy prices that truly reflect broadly the external damage that energy inflicts and perpetuates on society.

CHRIS FLAVIN: The term "markets" covers many things. It is one thing to talk about whether energy markets--whatever the price--are working efficiently, whether there are limitations on who can enter the market, and whether there are quotas and interferences of various kinds. It is another question to talk about prices being distorted in various ways through subsidies or taxes.

Given anything as complex as the global energy market, we cannot try to have central planning for policy, and we cannot, in particular,

separate individual, regional, or national markets. However, there is a useful role for the tax system to play in attempting to get a better "right" price that reflects the broader cost. Everybody would agree that the raw market price of crude oil based on the cost of producing it in Saudi Arabia does not reflect some of the most basic costs that we are concerned with in the world today. Rectifying this problem is something that a growing number of people would agree with, even many people who would call themselves free marketeers.

TOM HORRIGAN (Latin American and Caribbean Bureau, Agency for International Development): The Agency for International Development (AID) has done work in Latin America on promoting energy efficiency. Given the limited funds that we have, would any of the speakers today like to point out areas of opportunity for investment by donor agencies in the Latin American energy sector, or in specific areas of the energy sector?

CHRIS FLAVIN: If I could target a single area that has been neglected in terms of investment in most countries, it is improved efficiency on the end-use side. If one looks at the course of energy policy and the interferences in the market by governments over the past century, the effort has been essentially to build up supply sources, power systems--all of the technologies. In most countries, we are now near the end of the process of building up an energy infrastructure that basically supplies most people with commercial forms of energy. There obviously are some Latin American countries that are still engaged in that process, but it is quite far along. Today, the area for greatest technological opportunity and possibility for change and for effective results in reducing oil dependence,

reducing pollution, and increasing economic competitiveness is improved energy efficiency.

Latin America needs to begin doing what is increasingly being done in many countries: fairly elaborate end-use studies of where the energy is being used; what the technologies are; what the potentials for replacing it are; how to accelerate introduction of new technologies; how to prime the domestic market pump for these technologies; to what extent domestic manufacturing is needed; and to what extent imports should be encouraged.

We could accomplish quite a bit in most countries if, in terms of international cooperation, we eliminated much of what is being done on the supply side and put it on the end-use side. I would not necessarily argue for something quite that drastic, but we could go a long way in that direction--over time. AID has obviously been supportive of that. And there appears to be increasing sympathy at the World Bank for the notion of moving in that direction.

DAVID PUMPHREY: The move toward efficiency, especially in the electricity sector, such as smaller scale methods to achieve electrification, is probably important. Although there was a great focus in our department on petroleum, many of the issues involved electricity, how to meet the electricity needs of the region, especially in the areas where AID would be most actively involved--the smaller countries, the countries without the indigenous resources that could make them self-sufficient. Efficiency and some kind of diversified electrical system is probably key.

JOEL DARMSTADTER: I do not know how much work AID is currently doing in issues relating to deforestation. But I would be interested in a major effort to think through the prospects for a policy or initiatives that couple forestation in tropical countries in dedicated areas with the capacity to produce electric power. Such an effort would address the carbon dioxide problem in two ways: through the absorptive, fertilization effect of sopping up the carbon dioxide; and possibly displacing some fossil fuel that would otherwise need to be burned to generate electricity from the old forest, the photosynthetic efficiency of which has diminished over the life cycle.

If it can be demonstrated to the satisfaction of the Brazilians or the Peruvians that it is inherently to their economic disadvantage to cut down forests to develop unproductive grazing lands, then it seems to me that one might have the ingredients of a policy that would be economically beneficial to the country. It would provide for a new source of energy, and it might address the problem of the greenhouse effect. Are there cooperative programs already in the Amazonian region that would address these possibilities?

TOM HORRIGAN: We are beginning a $900 million project that addresses global climate change in Brazil and Mexico. Energy efficiency and reforestation, or reducing deforestation, are key elements of that project.