

*Leave of Absence*

*Tuesday, January 26, 2010*

**SENATE**

*Tuesday, January 26, 2010*

The Senate met at 1.30 p.m.

**PRAYERS**

[MR. PRESIDENT *in the Chair*]

**LEAVE OF ABSENCE**

**Mr. President:** Hon. Senators, I have granted leave of absence to Sen. Michael Annisette and Sen. Annette Nicholson-Alfred who are both out of the country.

**SENATORS' APPOINTMENT**

**Mr. President:** Hon. Senators, I have received the following correspondence from His Excellency the President, Prof. George Maxwell Richards, T.C., C.M.T., Ph.D.:

“THE CONSTITUTION OF THE REPUBLIC OF TRINIDAD AND TOBAGO

By His Excellency Professor GEORGE MAXWELL RICHARDS, T.C., C.M.T., Ph.D., President and Commander-in-Chief of the Republic of Trinidad and Tobago.

/s/ G. Richards  
President.

TO: MRS. PARVATEE ANMOLSINGH-MAHABIR

WHEREAS Senator Michael Annisette is incapable of performing his duties as a Senator by reason of his absence from Trinidad and Tobago:

NOW, THEREFORE, I, GEORGE MAXWELL RICHARDS, President as aforesaid, in exercise of the power vested in me by section 40(2)(c) and section 44 of the Constitution of the Republic of Trinidad and Tobago, do hereby appoint you, PARVATEE ANMOLSINGH-MAHABIR, to be temporarily a member of the Senate, with effect from 25<sup>th</sup> January, 2010 and continuing during the absence from Trinidad and Tobago of the said Senator Michael Annisette.

Given under my Hand and the Seal of the President of the Republic of Trinidad and Tobago at the Office of the President, St. Ann's, this 22<sup>nd</sup> day of January, 2010.”

*Senators' Appointment*  
[MR. PRESIDENT]

*Tuesday, January 26, 2010*

“THE CONSTITUTION OF THE REPUBLIC OF TRINIDAD AND TOBAGO

By His Excellency Professor GEORGE MAXWELL  
RICHARDS, T.C., C.M.T., Ph.D., President and  
Commander-in-Chief of the Republic of  
Trinidad and Tobago.

/s/ G. Richards  
President.

TO: PROFESSOR DAVID PICOU

WHEREAS Senator Annette Alfred is incapable of performing her duties as a Senator by reason of her absence from Trinidad and Tobago:

NOW, THEREFORE, I, GEORGE MAXWELL RICHARDS, President as aforesaid, in exercise of the power vested in me by section 40(2)(c) and section 44 of the Constitution of the Republic of Trinidad and Tobago, do hereby appoint you, DAVID PICOU, to be temporarily a member of the Senate, with effect from 22<sup>nd</sup> January, 2010 and continuing during the absence from Trinidad and Tobago of the said Senator Annette Alfred.

Given under my Hand and the Seal of the  
President of the Republic of Trinidad  
and Tobago at the Office of the  
President, St. Ann's, this 14<sup>th</sup> day of  
January, 2010.”

#### OATH OF ALLEGIANCE

*Senators Parvatee Anmolsingh-Mahabir and Prof. David Picou took and subscribed the Oath of Allegiance as required by law.*

#### CIVIL AVIATION (AMDT.) BILL

Bill to amend the Civil Aviation Act, Chap. 49:03, brought from the House of Representatives [*The Minister of Works and Transport*]; read the first time.

#### PAPERS LAID

1. Third report of the Auditor General of the Republic of Trinidad and Tobago on the financial statements of the Public Transport Service Corporation for the year ended December 31, 1996. [*The Minister of Trade and Industry and Minister in the Ministry of Finance (Sen. The Hon. Mariano Browne)*]

2. Third report of the Auditor General of the Republic of Trinidad and Tobago on the financial statements of the Public Transport Service Corporation for the year ended December 31, 1997. [*Sen. The Hon. M. Browne*]
3. Third report of the Auditor General of the Republic of Trinidad and Tobago on the financial statements of the Public Transport Service Corporation for the year ended December 31, 1998. [*Sen. The Hon. M. Browne*]

#### **PETROTRIN PENSIONS BILL**

Bill to restructure the pension arrangements of the Petroleum Company of Trinidad and Tobago Limited [*The Minister of Trade and Industry and Minister in the Ministry of Finance*]; read the first time.

#### **INCLUSION OF RENEWABLE ENERGY (GOVERNMENT BUILDINGS)**

**Sen. Dr. Adesh Nanan:** Mr. President I beg to move the following Motion standing in my name:

*Whereas* Trinidad and Tobago economy is built on the revenue from oil and gas and whereas the said oil and gas revenues are finite resources;

*Be it resolved* that the Government take immediate steps to include the use of renewable energy in the planning process for Government buildings.

Mr. President, I always start my contribution with the UNC Manifesto under the distinguished leadership of the former Prime Minister, the hon. Basdeo Panday and Leader of the Opposition. The United National Congress manifesto 2000, on page 52 deals with oil and gas manufacturing:

"We will continue to optimize this country's strength in petroleum, gas and gas based industries."

And on page 53 it states:

"Recent offshore finds indicate that there are real prospects for a gas boom, as well as for increased production of oil.

Two trillion cubic feet of gas was found just off the South East coast of Trinidad.

This is a significant find which opens up the possibilities for collaboration with our nearest neighbour country which is a member of OPEC and a significant player in both the oil and the gas industry.

*Renewable Energy (Gov't Buildings)*  
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An estimated 3.1 trillion cubic feet of gas and an estimated 90 million barrels of liquids comprising crude oil and condensate have also been discovered.

In addition to these discoveries by BP Trinidad and Tobago Limited there have also been other gas discoveries by EOG Resources and Broken Hill Petroleum.

Currently proven national reserves are estimated at 25 trillion cubic feet of gas.

The energy experts indicate that another 75 trillion cubic feet of gas remain to be accessed in Trinidad and Tobago's jurisdiction.

Because of our natural gas, we have been able to become the world's number one exporter of ammonia, and recently, of methanol...

Indeed, through collaboration with BP Trinidad and Tobago and the other major stakeholders in the oil and gas industry, the UNC will manage an energy policy that takes advantage of current favourable prices for oil and gas. This policy will take into account the fact that oil is a depleting asset, which, in the context of a greening consciousness, will come to be regarded less and less as a desirable source of energy.

Natural gas is today considered a clean fuel and therefore the opportunity exists for us to capitalize on our huge reserves.

At the same time, we need to take into account that new renewable sources of energy in the future, such as solar energy, fuel cells and hydrogen will eventually reduce the demand for natural gas"

Mr. President, I was shocked to read in the newspaper, the *Trinidad Guardian* business section, at page 19:

"Chamber predicts surge in oil, gas exploration."

And the Chamber President, Charles Percy, was lamenting the fact and I quote:

"Percy said the root of the problem is in the process of obtaining a Certificate of Environmental Clearance (CEC). He told stakeholders the delays chip away at his memberships' ability to compete.

'While we endorse the objectives behind the CEC process, we have to question the extent to which the current system will be able to meet the objectives of the environmental management act, without simultaneously hurting our competitiveness and turning away business from our shores', Percy said."

He called for intervention.

*Renewable Energy (Gov't Buildings)*

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“We urge the Government to undertake this reform process as quickly as possible.”

And then Minister Enill replied:

"Meanwhile, the Minister of Energy and Energy Industries, Conrad Enill, responded to the statement by Percy claiming that delays are due to the long process required to obtain a CEC.

Enill said the Government is making an effort to change the process to bring it in line with what is considered relevant in the industry, so that companies can maintain their business competitiveness."

In preparing for this Motion, I happened to go to the *Jamaica Gleaner* dated Friday, August 17, 2007 and in this particular report there was a similar situation with respect to this CEC.

**1.45 p.m.**

In this particular article, under “Standard guidelines”:

“Petro Canada's Senior Vice-President, Operations and Technology, Gordon Carrick, called for clearer criteria and standard guidelines for Certificate of Environmental Clearance...from the state-agency, Environmental Management Authority which would help in their planning.

‘Often rig commitment must be made in advance of CEC so the operator needs confidence in the CEC award process,’ said Carrick.”

This article is dated August 17, 2007. We are hearing the South Chamber President lamenting the same tardiness in the Certificate of Environmental Clearance from 2007 to 2010 and Minister Enill replies that the Government is making an effort to change the process to bring it in line with what is considered relevant in the industry.

Also, in this article based on the Chamber of Industry and Commerce predicting oil and gas exploration and Government releasing gas tax strategy:

“Government has completed the review of the fiscal system for the energy sector and is awaiting a response from stakeholders, says Energy Minister, Conrad Enill.”

I was shocked to learn that this same article dated August 17, 2007 in the *Jamaica Gleaner*:

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“Multinational energy companies operating in Trinidad and Tobago see gas resources available in the country over several decades, but have asked Government to re-consider their tax regime that is posing a major deterrent for high-cost exploration particularly in the deep water and ultra deep water, which may hold new hydrocarbon reserves.

President of BHP Billiton, Trinidad and Tobago, Vincent Pereira, said his company did not participate in the government's recent ultra deep water bid round because of the prohibitive fiscal regime which does not consider the high risks and huge costs that companies undertake in frontier acreage.”

What was surprising was that in this same article:

“Prime Minister Patrick Manning said government recognises that the sustenance of the energy sector depends on the availability of the raw resource.

‘Our reserve numbers have decreased somewhat, but we have planned for that. It is for that reason that I have personally given my strongest support towards increasing upstream activity in the local hydrocarbon sector that will increase our reserve base,’ he told the conference.”

We are in a situation now because of the tardiness of the Government in exploration of our natural gas resources. We have missed the boat because in this particular round when there was an opportunity for bidding to take place we were, in terms of nations with natural gas reserves, high on the list. So investors were looking at us favourably in terms of natural gas; but since we have failed at this particular round, we are now at a very low level in terms of our ability to attract investment in our reserves.

Even further, in the same *Business Guardian*:

“Riley: Don’t depend on high gas prices

T&T has to begin looking at other sources of revenue because the energy sector will not be able to sustain the country forever, says BPTT’s Chief Executive, Rupert Riley.”

He went on to say:

“...oil and gas are wasting assets as we use them up”—and as the Motion says, in terms of finite resources.

He also went on to say:

“Oil consumption is turning the corner raising some optimism for price movements as demand increases. On the other hand gas prices for some time will remain fairly soft. There is a huge surplus of gas in the market,’ he said.

‘The emergence of quite a large amount of Liquefied Natural Gas...has removed the unique advantage that we have enjoyed for so long of being the first in the market. We now have to seek other ways of being competitive in a world of much heavier gas on gas competition.’”

If you look at the Ryder Scott report in terms of the proved possible and probable reserves, January 2007, 30 tcf, our exploration gas reserves was 37.1 tcf. In 2005, the Ryder Scott report pointed to 32 tcf in terms of our exploration gas reserves and we are now up to 37.1, an increase of over 5.

The point is, in terms of our depleting resource of natural gas, we are in a position now that we have the gas, but if you look at the amount of gas being utilized in our plants within the country, you will see that a large amount of gas is required.

I ask the Minister of Energy and Energy Resources—when I prepared for this Motion, I saw a certain number of things that Petrotrin had to do in terms of 3D seismic in terms of this particular issue. BHP Billiton Trinidad and Tobago produces 30,000 barrels of oil per day. The company is currently working on its phase II gas project which involves the development and sale of gas from the Greater Angostura Field. First gas production is expected in 2010. I am sure that the Government will bring us up to date on this particular project.

The article also talks about the cost of upfront investment required for deepwater development. The investment cannot sustain the very slow payback over time that occurs with the current high tax regime. Suggestions were made for a more progressive tax rate that is lower for deepwater projects and incentives for the full capital investment and not limited to the exploration components.

I started the Motion in terms of what was available in 1999 in terms of our resources of oil, gas and revenues. I want to go to that particular area. In 1999, 65 per cent of our gas was being used to produce ammonia and methanol and in 2000 we were the world's largest exporter of methanol and ammonia.

In 1999, we had 605 million barrels; possible reserves of 2.6 billion barrels; gas reserves at 22.9 billion cubic feet. We had a projection of 51 years at current rates of extraction; relatively small amounts of gas at that time were exported. We have a projection now of 773 billion cubic metres over a period of 24 years.

I also ask the Minister of Energy and Energy Industries, in terms of the Canadian Superior Bounty, that is 60 miles off our coast, that was supposed to have a 2.6 trillion cubic feet of gas and produce 200 million cubic feet of the clean burning fuel per day, is that well coming on stream?

In terms of our renewable energy and its potential, the importance of renewable energy can be considered on three fronts: increasing diversity of supply; assisting in the protection of the environment; and paving the way for an efficient customer-friendly market.

If we look at the environmental influence, in terms of measureable facts and figures, carbon dioxide levels are up since the Industrial Revolution; the ten warmest years have occurred since 1990; the oceans are warming and sea levels are rising; polar ice caps are melting at an ever-increasing rate and consumers need to be concerned in terms of efficiency and turning to alternative sources of energy.

If you consider public buildings and renewable energy and the various mechanisms to utilize renewable energy, we can go back to the UNC manifesto in terms of solar energy, fuel cells and hydrogen will eventually reduce the demand for natural gas.

If we look at the possibility of the utilization of renewable energy, it is interesting. I make reference to the piezoelectric effect. This is new technology that is coming into use at creating renewable energy. This deals with minute fibres, nano fibres, embedded in material. These fibres are coated with zinc oxide. The way the renewable energy operates, is that you have millions of tiny bristles similar to two microscopic bottle brushes rubbing against each other and this mechanical motion converts mechanical motion into electrical energy. This particular effect, the piezoelectric effect, can be utilized to provide energy and in buildings also in terms of utilizing renewable energy. That is one way.

There is another renewable energy source, which is the atmosphere. Research is going on with respect to fuel cells and the creation of electricity using fuel cells, hydrogen and air from the atmosphere; clean fuel so to speak.

**2.00 p.m.**

The way this particular fuel cell operates is that it takes hydrogen and oxygen and creates an electric current where a lot of heat is produced and it can be utilized in government buildings. What is important here is, in terms of the transmission of energy from the generating source to various commercial



buildings, because of the distance that the energy has to travel, it would be better to have it close to the buildings so that the generators could be part of the building structure. You can have the piezoelectric effect.

We have seen in this country, large buildings gone up over a period of time. We are not sure if any of these buildings are utilizing renewable energy sources. A simple thing of designing glass pane in such a way that the light comes through, will also provide ambient light for the buildings, but it can actually produce electrical energy as it passes through tinted glass. In terms of the design of the building, that is one area that we could look forward to, in terms of actually utilizing solar energy to create electrical energy for the building, with respect to actually getting an electricity supply as well as the production of hot water for the building. That is one of the ways of actually utilizing renewable energy in commercial buildings.

In terms of government buildings, we have not seen the introduction of renewable energy into the planning process. Not only is this with respect to the stained glass for utilizing renewable energy and fuel cells, we could actually have the utilization of wind power and solar power, or what is called photovoltaic in these particular buildings. It is all about reducing the amount of energy demand and reducing the greenhouse effect, so that we would not continue to damage the ozone layer and emit greenhouse gases. These are efficient mechanisms and there is very little pollution involved.

Mr. President, I need to explain a little about solar power and its use in government buildings, because besides having the stained glass or impregnated glass for trapping the sunlight and producing electrical energy for the building, you can also have wind turbines. If these buildings are located in windy areas, we can have wind turbines which actually go from kinetic energy from the wind into electrical energy. These wind turbines can be part of the building construction, in terms of design, to facilitate the reduction of reliance on power from other sources. The wind turbines can be designed in such a way that they will operate at a very, very low, almost frictionless mechanism. Very little wind would be required at that time, to actually trigger these turbines. Once the turbines start to move, they can move in what we call perpetual motion; almost frictionless. If we continue, in terms of that particular wind turbine that produces energy, and if we look at solar energy and solar conversion, we will see when you utilize solar energy, you have a direct current being produced. That direct current can be stored in a battery. For this direct current to be utilized in operating equipment, it has to be converted to an alternating current, which requires an inverter. That is

where the price would tend to escalate with this particular usage of solar power. This inverter could convert the direct current into an alternating current that can be utilized for minor equipment function or operation in the building. It is called the green revolution, which is the new term that is being utilized.

To extrapolate a little further, in terms of government buildings, what is happening now in some countries is that they are using what is called net meters. The electric company could accept a feedback into the system. If you are producing electricity and you can actually produce more than is required, there is a feedback into the system and there are net meters that would measure the electricity going out and you would get a rebate.

Even further than that, there are tax incentives that are being given for the design of buildings in such a way that they will reduce the amount of energy requirements. These tax incentives are being given, in terms of how the buildings are being designed to utilize renewable energy. It is something the Government could consider, in terms of looking at that particular area; not only for building codes, but with respect to the actual construction of buildings in the future. We have spent a lot of money on tall buildings, with, very little or no use of renewable energy.

In terms of the design, we can also design in such a way that some of those tall buildings would have plants at various levels and those plants would provide shade to the buildings. That would actually reduce the amount of sunlight coming into the buildings. That is another mechanism. It can be extended further away from the municipalities to the rural communities, where local government bodies operate, especially in the area where there are landfill operations. A signal can be sent where a particular landfill can be operated via renewable energy. It would send a message to the community that the Government recognizes that oil and gas are finite resources and that at some point in time, we need the renewable energy component.

If we look at the situation, with respect to our finite resources, there are some questions that must be asked, in terms of the actual number of our resources. Again, I was a little surprised to learn that bpTT would be spending over US \$1 billion over the next five years. That was from 2007; a five-year period, in terms of their exploration. The average well cost is over US \$50 million. The question has to be asked, in terms of our oil and gas; finite resources; revenue from oil and gas; the actual exploration of our reserves and the amount of expenditure required; the situation that the Government is in now, and in terms of a cash flow situation which we have heard about from the Prime Minister: Will

there be any further development in this particular field? The Government needs to inform the population, not only by little snippets in conferences, about the reduced exploration that has been going on over the last five-year period and what is the actual projection, in terms of getting more of our reserves to come on board. In terms of the revenue from oil and gas and the low or soft gas prices, oil revenues are not at the level of what it was before. We are having a situation where we should really consider, because of the amount of—

Let us look at the schools or even the hospitals. If you can move these hospitals and the schools to operate on renewable energy sources, then we could utilize the money they have been spending on electricity bills. That particular cost can be moved to assist in other areas of the education or health sector.

We seriously need to consider the immediate use of renewable energy in not only the new buildings that are coming on board, but also our existing structures, because from time to time there are renovations taking place in schools, health centres and other government buildings such as fire and police stations, where renewable energy can be utilized in these particular buildings, because of the new design. Not only can it be an incentive, with respect to the Government moving in that direction but if you look at the housing situation in our country, in terms of the number of houses built over the last few years, we could see if the Government had in its planning, the use of renewable energy. We would have had a considerable reduction, in terms of the utilization of electricity from our generating plant.

I am sure that the Minister of Energy and Energy Industries would respond and say that is a small amount of energy that is required to run these facilities, but that is not the aim and objective of the Motion. The aim and objective of the Motion is to inform the Government that any little step towards the utilization of renewable energy—in fact, they are building fuel stations in Korea that will be pumping hydrogen into cars. The world is moving away from these finite resources of oil and gas.

If our reserves are being projected—what is interesting is that the amount of gas that is being required for these energy projects that are coming on stream, it is draining our sources, in terms of—if we do not have any great exploration, we can have a problem in this country. We could very well have a situation where we have too much gas. We cannot sell our gas right now because the price—I would think that the Government needs to reconsider the gas policy, with respect to the markets that are available with these low prices. It is a balancing act, with respect to whether we sell or keep our gas and wait for the price to go up.

In the meantime, while there is that situation of uncertainty in the international market, we need to seriously consider utilizing the available technology. We are not in this alone, because there are many countries that are way ahead of us, in terms of the use of renewable energy for government buildings. In fact, they have gone even further. The next highlights you would see, if you go on the Internet, would be that Abu Dhabi is moving towards a totally renewable energy city, where the entire city would be powered by renewable energy. That is the kind of projection that we want to see.

**2.15 p.m.**

If you look at the United States Energy Policy Act of 2005 you would see that there are new tax incentives for improving the energy efficiency of commercial buildings. There is a tax deduction for expenses incurred for energy efficient buildings and that would be passed on to the building owner. I am sure that any amendment to this Energy Policy Act would put more emphasis on renewable energy.

There is another area called smart choices about energy in Government buildings and this can set a very powerful and public example of energy efficiency and environmental stewardship, because every dollar saved on energy cost means more Government funds for other projects.

In terms of performance, you could go up to about 50 per cent cutting cost from renewable energy sources. I would have thought that when the architects were designing the National Academy for the Performing Arts, in terms of air conditioning, I am not aware—they could correct me if I am wrong—that they have looked at a new air condition unit that runs on very low power, about 50 per cent less power, that is available. It is a new air conditioning unit on the market and I thought a modern building like that, they would have considered utilizing that particular air condition unit.

**Sen. Browne:** How do you know that?

**Sen. Dr. A. Nanan:** Well, I do not know. That is why you could correct me if you did use it.

Mr. President, that is an option that was available to the Government with respect to these particular buildings that were constructed recently and the use of this particular type of air condition units. I think I wrote down the name here because it is an interesting piece of information that the Government—it is called

the “coolerado” and what is interesting about this coolerado is a specific thermodynamic process that is being utilized. It was discovered way back in the 1880s and it is now being utilized in terms of energy transfer.

When I was reading about this particular air condition unit and how it operates, it is interesting that it works with the same principle or a similar principle as the human body in terms of the response. Because if you are in a hot environment and a certain amount of heat is being transferred into the body the body will provide a mechanism to get rid of the heat, that is via exhaled air or via what we call perspiration or sweat. It is in this particular process, the evaporation of sweat from the skin, that produces the cooling effect and it is that same thermodynamic principle of the evaporation process of water leaving the surface of the skin.

I am sure that many chemists in here would recognize that water has a high heat of vaporization and this high heat of vaporization is what causes this particular situation to develop. So this particular coolerado utilizes this thermodynamic principle and it is because of this thermodynamic principle and the use of that that power consumption is much less in this particular air condition unit. If you are utilizing this particular air condition unit for commercial buildings we can see the savings in terms of what will take place and it will send a signal to the public that, yes, the Government is serious about the situation with energy, not only in terms of the environment but in terms of the long term future of our finite resources of oil and gas. That is one area in terms of the reduction in energy requirements.

There is another new system being utilized and that is the use of computers in buildings. Again, the situation is developing where computers would be able to switch lights on and off in various parts of a building so you do not have the lights on at all times in buildings. It would be computerized in such a way that at a particular time you would have only these particular lights on, so you will have a reduction in the amount of energy requirement for that particular building. So all those are part of the green revolution in terms of commercial buildings and the utilization in commercial buildings.

If we look at the situation with installation of this equipment—because you can extrapolate from government buildings to commercial buildings and homes—in terms of the price structure, to actually put some of these in a home was about US \$10,000 per kilowatt, but with respect to the thrust in renewable energy these prices are coming down considerably, up to about US \$60 per kilowatt generation. So we are seeing a facilitation of the use of renewable energy in buildings as well as, not only government buildings but also homes.

I spoke earlier about net metering and it is very ironical that a large number of houses in Germany have solar panels. If you look at the climatic situation of Germany—I am sure you have been to Germany, Mr. President, and I do not know if you have seen the sun in Germany, because a number of times in Germany it is very cold, clammy and rainy, and still they have put up their solar panels and they are utilizing solar energy. Here in the Caribbean we have a greater opportunity of our geographical location to utilize solar energy in terms of the larger amount of solar energy available during the day. So it is another opportunity for the Government to consider, not only with respect to the use of solar energy for lighting but there is the other area of utilizing in government buildings the use of solar energy for hot water systems.

Many would recall that in Barbados there is a lot of solar powered water heaters—and I am not campaigning for any solar water heater company, I am just making an observation that probably in this particular country we need to look again at the use of solar water heaters, especially in our new design of buildings.

In other countries they are building solar powered generators. In fact, in many African countries they are now building a lot of solar powered generators to generate electricity. So, we are seeing the use of solar power, not only in minuscule amounts like it was before, but it is being widespread. In Europe they have what they call wind farms, where they have a number of turbines in one particular area and they are generating large amount of electricity. If you drive through some parts of Europe for miles and miles you would only be seeing wind turbines. So it is another area that the Government could look at in term of their commercial buildings, and probably in the Ministry of Planning, Housing and the Environment under Town and Country Planning Division they could probably look at the use of renewable energy in terms of how they approach the approval of plans for buildings in this country.

If you go on the Internet, there are a number of software programmes that are available now to tell you how to design a building to utilize renewable energy and to reduce energy. In fact, when I was looking through I saw in the Olympics in Vancouver, Canada they are now going to monitor the amount of energy consumption used on a daily basis in that particular area. That is how the world is getting so conscious about the use of energy and these resources. There is also an area in terms of the manifesto that pointed to, not only the use of natural gas for that particular—I left out a part, because of our natural gas we have been able to become the world's number one exporter of ammonia and recently of methanol.

And I talked about the Government's thrust in utilizing our natural gas resources and the requirements in terms of the amount of gas that would be required in the next few years because of our projects. If we look at the projections we have to ask the question, 13 wells are planned for drilling during 2007/2008 while 16 more exploration wells at a cost of US \$565—I presume that is million—will begin from 2008 by companies that were selected for energy blocks in the 2006 competitive bid round. So it is the 2006 competitive bid round that the people were pouring scorn on in terms of the Government's tardiness; in fact, in some quarters it is being said that because of the Government's greed we lost out on that particular bidding round in 2006.

There are 13 wells planned for drilling and the Government has to respond as to if these actually took place with respect to the 13 wells, and there are 16 more exploration wells and the Government needs to come clean with respect to these exploration wells and if anything happened at all in this particular sector?

Mr. President, in this document it says:

“Permanent Secretary in the Ministry of Energy Leroy Mayers, said in 2008 and beyond, the Ministry plans to conduct 3D surveys in the north coast marine area and electronic surveys in the deep Atlantic.

‘This is to improve the data that we have, so that when we go out for our next bid round, hopefully towards the middle or towards the end of 2008, we can provide the companies with improved data which will ensure that they can make better judgement in terms of the blocks we present to them’...

The Ministry will conduct study on heavy oil as well as audits on potential acreage. The Energy Ministry also plans to commission an energy data hub by October which among others, will enable secure electronic transfer of the country's high-value petroleum information and create online collaboration and knowledge-sharing between the ministry and upstream producers.”

Mr. President, if you go to many of the sites—because I want you to check with respect to this particular statement and the country's high value petroleum information—you cannot obtain that information unless you pay a fee. There is a heavy fee with respect to getting the report on this particular situation of our petroleum information. So I cannot verify if this particular statement is correct. So the Minister, who is responsible, will have to give an explanation or clarification on this particular statement about transfer of the country's high value petroleum information.

**2.30 p.m.**

Mr. President, in 2007, the Petrotrin company saw a positive oil and gas reserve picture. We looked at the future and knew that in the exploration and production, we are going to expend probably US \$1.2 billion over the next five years, consisting mainly of exploration seismic work, developing drilling, as the Executive Chairman, Malcolm Jones said. I have to ask the question: Did Petrotrin expend, or are they projecting this particular expenditure over the next five years, from 2007, for exploration, seismic work and developing drilling because of the situation with Petrotrin in terms of their cash flow? Would this particular US \$1.2 billion not be utilized at all in terms of exploration, seismic work and development drilling? This is an important precursor for any competitive bidding round. Now, the reserves are undoubtedly there, but they need more incentive to encourage exploration. We do share the view that there is a lot of gas out there to be found.

Mr. President, in this Motion, I pointed to the fact that we have oil and gas as finite resources, but I wanted to show in terms of these finite resources what is happening. Yes, they are finite, but although they are finite, they are still available. But what has been demonstrated from 2007 to now, is the poor exploration plan, or in terms of the strategy of the Government in terms of the gas exploration, it is because of that situation from 2007 to now, that we are in this particular situation, where we have to go cap in hand to beg investors to come into Trinidad and Tobago. I am sure what we could have gained in the advantage in 2008, we will now have to lower the petroleum taxes for more investment in this particular sector. So we are going to be at a disadvantage in the next bidding round.

Mr. President, the state-owned national oil company concluded negotiations with BHP Billiton, EOG Resources and BG Trinidad and Tobago, for the supply of 560 million standard cubic feet of gas per day beginning in 2009, which will be used for a new domestic gas-based project. The question has to be asked—this was stated in 2007—with respect to the resources, 560 million standard cubic feet of gas per day. Now, when I looked at some of the projections in 2005, in terms of the amount of gas, 24 years is the period from 2005 in terms of our resource and the activity at the time, and countries that had less gas were having a larger—in terms of their—period over which they can utilize the resources. This particular article was written in 2007, with a request of 560 million standard cubic feet of gas per day.



The Minister of Energy and Energy Industries needs to tell the country with respect to this particular negotiation, if negotiations were concluded—this is what the article says—if the requirement now is for a supply of 560 million standard cubic feet of gas; if that is part of the projection of the smelters, the Essar Steel Plant and the Propylene Plant; and if in 2009 to 2010, this particular requirement has to be met. If they are not finding any more gas in terms of the projection of 24 years, we will see that figure falling. I am sure when it was made in 2007, and the Ryder Scott Report, if this amount of gas is required per day with these new projects, it will be a definite reduction in terms of the number of years that we will have our natural gas.

In fact, in 2007:

"...Government announced a decline of over three trillion cubic feet in its natural gas reserves over the last two years.

An audit by Houston-based Ryder Scott showed that the 3P (Proved, Possible and Probable) were estimated at 30 tcf in January 2007."

The article goes on to say—I said that earlier, but I want to reinforce that point:

"Government is also pinning its hope on the estimated 37.1 tcf in exploration gas..."

This is the question that had to be asked, this exploration for gas reserves. If we look back in terms of the profile, we are now in a situation where according to the Chairman, Robert Riley, the situation with our oil and gas is that we do not have reserves that are easy to access.

**Sen. Jeremie SC:** Could you state what article you just read?

**Sen. Dr. A. Nanan:** 2000. With our gas reserves, Mr. President, there is a high cost of drilling where our reserves are located now—off the offshore—and when they drill from that particular well, the high cost of drilling is due to very high pressure in deep water. There is an unusual situation on our continental shelf, that we have the possibility of mud volcanoes and methane gas emanating from these particular mud volcanoes. So when they are drilling, they have to go a little bit to the side and it is very costly in this particular exercise of drilling in deep water.

So, Mr. President, because of the situation of expensive drilling and the Government's tardiness in getting the exploration plan in place, our oil and gas revenues are down, and our oil and gas revenues will continue to be down because we are not favoured any more in terms of our natural gas. We are low

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down on the totem pole in terms of being attractive and the Government has to take steps immediately to put in place during the planning process, the use of renewable energy because our resources are going to be depleted at a very rapid rate with what the projections are, with respect to these plans that are coming on stream.

So utilizing renewable energy in all the designs for our buildings, whether it be the solar component, the wind component—even in some countries you could use the hydroelectric power. I am calling on the Government to immediately take steps to put renewable energy into the planning for government buildings

I beg to move, Mr. President. [*Desk thumping*]

**Sen. Mark:** Mr. President, I beg to second the Motion and reserve my right to speak.

**Mr. President:** The Motion has been seconded by Sen. Mark.

*Question proposed.*

**Sen. Dana Seetahal SC:** Mr. President, this is not something that I would usually have contributed to, but having regard to the events in the last two days in this country, I come here with renewed energy as a citizen of Trinidad and Tobago and as a woman, and in the situation where the statement or the saying "10 to one is murder", has new meaning in this country.

Having said that, the Motion before us, which is, essentially that Trinidad and Tobago is built on revenue from oil and gas, these are finite resources and we need to take steps to include renewable energy in the planning process it is my respectful view, and I mean no disrespect to the mover of the Motion, that in this country not many people are familiar with the concept of renewable energy. So it would have been useful to define what renewable energy means, lest many people think it is just renewed energy as I used it just now in the context of physical energy.

According to Wikipedia, the free encyclopedia:

"Renewable energy is energy generated from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are...(naturally replenished)."

So that is really what renewable energy means, naturally replenished sources of energy. One might argue for example, that oil in particular, is naturally replenished, but that would take hundreds and thousands of years. So we are

talking about within a lifetime energy, that is naturally replenished. It is said that in 2006, 18 per cent of global energy consumption came from such renewable energy. So it seems that we are moving on.

Now, Mr. President, my personal contact with renewable energy came, I would say, when I was at the University of the West Indies. I would not talk about how long ago that was, but a graduate student in the Faculty of Engineering asked me to read his master's dissertation on solar energy. It was really for the drafting, not for the content. But in reading it naturally, I grasped some points and then it came home to me how useful solar energy could be in a tropical climate. That same student eventually had his project utilized; I believe heated swimming pools in Jamaica. So it was something practical that I saw.

Mr. President, the concept of renewable energy for someone who is not in the field of energy like my colleague, Sen. Ali, it is a sort of romantic concept. You remember windmills and Don Quixote, that kind of thing? Remember those little windmills when you are growing up that you made with a little cedar? So the whole concept of that energy and the generation of it, if you did geography you would know about hydroelectric power and talk about hydroelectric power stations in countries that had big rivers and so on. So it is something that seems to have a lot to do with nature, and if you are talking about going back to nature or going to nature, then the concept of renewable energy is a very real one. So it is with me.

Now, people do not think about it, but we have always had renewable energy. When you see movies with cavemen and they are lighting wood, that is a form of energy and that is renewable, because you have trees that grow within your lifetime and you use that wood, again. So this is seen actually as one of the most utilized form of renewable energy today, and it is said, again according to Wikipedia, that 13 per cent of the renewable energy comes from wood and 3 per cent from hydroelectric power.

There are other renewals such as the wind, solar energy, geothermal energy, biomass and that is really most of them. Waves, I believe, are another form of renewable energy.

#### **2.45 p.m.**

Mr. President, many countries in the world use these forms of renewable energy. Wind power, for instance, provides 19 per cent of Denmark's electricity, that is one-fifth, from wind power alone. If you go to Denmark and those Scandinavian countries, you would see giant wind farms or some things looking

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like giant windmills. How it is done, according to what I have read, is that the air flows from the wind are used to run massive wind turbines and in that way provide energy.

I am doing this, not for those of my Senator colleagues, like my colleague on the left, or the Minister of Energy and Energy Resources, who would already know these things, but for members of the public who are or should be interested in renewable energy. They may not even be aware that they know about it already.

Hydroelectric power—those big dams that you hear about or see in other countries, some of which we have here in the Caribbean, they constitute means of harnessing water which can be used and is used for energy. Small rivers provide hydroelectric power; streams, waterfalls, all these things which we take for granted. I recall when I was doing geography we would talk about what countries had hydroelectric power installations. I see Sen. Dr. Saith looking at me; all these are things which he knows of.

**Sen. Dr. Saith:** I am listening.

**Sen. D. Seetahal SC:** He looks as if he is really interested in contributing, because he probably has this at his fingertips.

But for the rest of us, solar energy is derived from the sun through solar radiation, from what I have read. In the US, in particular, you have a lot of power stations that utilize the sun, but Kenya is ahead of the rest of the developing world in its use of solar energy. It is said that the largest number of solar powered stations per capita is in Kenya. There are currently three World Bank projects for the utilization of solar energy in the developing world.

Mr. President, what I found interesting was the concept of biofuel, which actually suggests a sort of contradiction in terms. You have sugar cane which you would expect has something to do with agriculture and not energy. We in Trinidad and Tobago tend to think of agriculture and energy as two conflicting things; but sugar cane is used in Brazil for the last 40 years or so to provide or support their ethanol fuel programme. Today there are 35,000 gas stations in that country which has, at least, one ethanol pumping station. So you can go to a gas station and get ethanol fuel in Brazil, 35,000 gas stations.

In the US, ethanol is blended in their fuel; this happens in a lot of different places. So ethanol fuel is something that has been a source of energy in many countries and, in particular, as I said, Brazil. So you have bioalcohol, bio-diesel, bio-ethanol; all of these things I learnt, which sounds so kind of incongruous.

Geothermal energy is the fifth type of renewal energy that is not commonly used yet. This is something that could occur if you bore, I understand, some two miles into the earth's crust and you bring up some of that energy and heat; you can use this as a form of energy.

In the United States the geysers are supposed to produce, according to what I have here, one of the largest sources of biothermal energy. Think about it; there is geothermal energy; you have the geysers in California and they have used that. This is a natural spring that goes high up into the air and they have utilized this in the United States to create a power field about 72 miles. As a result of that process, whatever they do, I do not understand it, they have been able to generate energy in that state from something that is natural. Imagine that; of course you could argue coal and oil in their various levels are natural, but these things take hundreds of years. But you have this geyser coming up and you can use it and it would still be there, so that is the point of renewable energy; it is not going to be finite and finished, like how we say that we have oil and gas until 2015 as other countries that are running out; we do not have to worry too much about it.

Those are the main forms of renewable energy. Why should the Government of Trinidad and Tobago include this in their planning processes? It is obvious; if we can utilize those resources, those forms of energy, and they would still be there, then it must be beneficial to us economically. Of course, we do not want the rest of the world to utilize it too early, because we have relied on the cost and value of the export market to be able to sustain ourselves. So if the United States and other major countries were to depend on these renewable forms of energy, then it would be to our disadvantage. That is not true, because ultimately our energy sources, our gas, our oil, would finish. In our lifetime probably, it would be reduced significantly. We really, therefore, must plan for when that time comes, and we must plan for it, not only by seeking to utilize the other forms of renewable energy, but by diversification otherwise.

This brings me to something that we have heard over and over in this Parliament, and especially from that side in recent years, about these mega farms. If our energy resources are to be depleted, as this Motion presupposes, then one must have diversification. The Government of the day has said in its budgets in 2007 and 2008 that there would be 10 mega farms in Trinidad and Tobago that would feed us. I heard about one-half of a megafarm in the last two years. I would like to hear, when someone responds, and hopefully it would be the Minister of Agriculture, Land and Marine Industries, the Minister of Energy and Energy Industries, where we are with those farms, because we need to provide for when we do not have all the money to fund the resources.

Another use of renewable energy, not only to us in Trinidad and Tobago but the rest of the world, is the benefit to the environment in this time of climate change. Our Government itself has said, through the Prime Minister, that it is concerned with climate change. I do not see the Minister of Energy and Energy Industries here, but I would imagine that a caring government, or any government, concerned with the environment and the effects of climate change, must want to access renewable energy.

I take it that the fact the Government is so interested in what I am saying, as demonstrated by the conversation which has resulted in their comments about this renewable energy and agriculture, I see from the other side because a question was asked about who said so. So I hope that what I have said has generated that interest so some response would be forthcoming, not only about the megafarms, but whether the Government is looking ahead and planning to save our environment, one, by accessing renewable energy and, two, by saving our economy, factoring that into its planning process.

Thank you, Mr. President.

**Sen. Dr. Jennifer Kernahan:** Thank you, Mr. President, for the opportunity to contribute to this Motion by my colleague Sen. Dr. Nanan.

First of all, I would like to congratulate the mover of the Motion, Sen. Dr. Nanan, because this is clearly an important issue in our country today, as was evidenced by the fact that even Sen. Seetahal SC felt compelled to contribute.

Sen. Seetahal SC at the end of her contribution said that she hoped that the Government had plans and policies in place to develop the whole issue of renewable energy, because it is such an important issue. I would advise Sen. Seetahal SC not to hold her breath. [*Crosstalk*]

There is a clear and cogent reason for this call by Sen. Dr. Nanan for the issue of renewable energy to be actively promoted and supported by the Government of Trinidad and Tobago. During his presentation he made reference to several technologies that are being used by different countries in the world. He referred to it as the green revolution; other countries have recognized this.

The clear rationale for renewable energy is basically three-fold: one, that it is clean energy which reduces the pollution that scars the cities and countrysides of especially more developed countries, like China. We all know the horrible effects of the accelerated industrial development over the past few years that took place in China which has led to cities being practically unliveable, the smog, smoke and respiratory diseases that have resulted from that and the failing health of the

population. The issue of clean energy is very much on the front burner in all countries of the world, especially the developed countries which have suffered so dreadfully from dirty industrialization.

The second clear rationale for the development of clean technology, the green revolution renewable resources, energy resources, is the fact that they are sustainable; that is a simple concept, the fact that it is renewable, it is sustainable. It does not contribute to the build-up of climate change and the greenhouse gases that affect climate change.

In the third place, the rationale for the call for the development and support of renewable energy by this Government is the fact that it provides energy security. Energy security is one of the major issues on the world stage today, because everybody, all the developed countries are looking for a way to be energy secure, not to have to depend on oil, gas and fossil fuels which are largely imported into their countries from other countries. The US is a leading, vocal promoter of energy security, because they were once net exporters of fossil fuels, oil and gas, and since the 1970s they have become the net importer of oil and gas into their country, and they are very concerned about this. It is a question of clean energy, sustainable development and energy security.

These are three major, huge issues for any country, large or small and, I would imagine, more so with small vulnerable economies like ours. Clearly this is an idea that sells itself; it is inconceivable that this Government seems to be dragging its feet on the whole question of a rational and serious approach to the institution of renewable energy.

In fact, an article in the *Express* of Wednesday, July 22, 2009, the headline says:

“T&T lagging behind Caricom on cleaner energy”

We are lagging behind even Caricom countries.

"For years now there has been a kind of romanticism about the importance of moving towards the use of renewable energy in Trinidad and Tobago."

### **3.00 p.m.**

Mr. President, that is so true, people talk about it, it is fashionable to speak about it maybe at the cocktail parties and so forth, but nothing has come in reality to deal with the situation of actually implementing this policy across the board in Trinidad and Tobago.

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I continue to quote:

"The voices became louder in the wake of the 2007 Ryder Scott study which suggested that the natural gas reserves to production ratio was down to 12 years.

Trinidad and Tobago lags behind its Caricom partners with respect to the use and penetration of RET.

Evidence abounds on the growth of RET (renewable energy technology) usage throughout the region.

Barbados has become world famous for its use of solar water heaters (SWH).

In 2002, there were more than 35,000 water heaters installed in Barbados, making it the third highest ranked country in the world on a per capita basis."

Where are we when we look at these issues?

"Jamaica is making its mark in wind driven power generation, from the Wigton windfarm project, commissioned in 2004."

Mr. President, we are in 2010 and this Government, in spite of paying lip service to renewable energy generation and development has done very little.

I continue to quote:

"Wigton Windfarm Ltd supplies the Jamaica power company with an average of 7 MW of power.

In Grenada, the use of commercial solar power systems is expanding. Grensol, a supplier of commercial and domestic solar power systems boasts that it has installed more than 30 systems across Grenada. It has also brokered an agreement with Grenlec, the power company, to facilitate the sale of excess power back to the grid.

Tiny Nevis is harnessing its geothermal potential.

Next year, St. Kitts/Nevis expects to commission a ten-megawatt geothermal power plant which would satisfy fully the island's power demand."

This was written in 2009, but this year I believe it was brought forward because when I was in St. Kitts this year, they were about to commission their 10-megawatt geothermal power plant.

"St. Kitts is expected to come on line within two years as capacity expands to 40 MW.



As a result St. Kitts hopes to be supplying power to a wider network of islands over the next five to ten years."

So a small island like St. Kitts is not only going to be fully energy secure, but is going to be fully providing their island with its own renewable and secure energy. It is also going to be providing other islands with energy which would serve as an important source of renewable income. Can you imagine not having to worry because this is a renewable project and you have an income coming in from which generations would benefit?

Mr. President, there are challenges which were mentioned in this article because of the economics of the situation.

"With heavily subsidized domestic prices for both hydrocarbon fuels and electricity, there has been no economic incentive for the use of RETs.

As it seeks to promote RETs, the Government is likely to find itself in a dilemma.

It must choose between providing a competing subsidy for the use of solar or other RE or increasing the prices on electricity and hydrocarbon fuels so as to enhance the commercial attractiveness of RETs."

So I suppose this is what the Minister would address when he gets up to speak in this debate; the whole question of economics and whether or not we would try to subsidize renewable energy sources which would encourage the private sector development and so forth, or whether or not he is going to impose higher prices on the cost of electricity.

I would advise the Minister to do the former because this is more people friendly; it is more sustainable and not as negative. It would not have the sort of negative impact on the cost of everything in the country and the inflation that is already raging out of control in this country. So the Minister and the Government has to be very clear on what its policy would be with respect to subsidizing and promoting the use of renewable energy resources.

It is interesting that the article went on to say and I quote:

"Thus far, Government has failed to demonstrate that there is the political will to move away from liquid fuels."

It went on to talk about the sad story of CNG because it said:

"While the use of CNG, as a cleaner environmentally friendly fuel, has been touted now for nearly 25 years, there is to my knowledge, not a single PTSC

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bus or Government vehicle that is powered by CNG. Ironically, perhaps the single example of Government directly demonstrating commitment to use CNG was back in 1985 when the then Prime Minister, then Minister of Energy, drove a CNG-powered vehicle after the first CNG pilot station was commissioned."

You know, we understand why all this happened; PNM is all hype and "ol' talk" and a lot of grand gestures, but nothing behind it, no follow-through, because it is easy to go with the flow. It is easy to stay with the status quo because we have oil and gas now, and it is easy to spend the income from the oil and gas, the summits and high living, and because this Government does not think about succeeding generations and what they will do when the oil and gas run out as the Ryder Scott Report says that we have 12 years. Of course, they are saying do not bother with the report, it is not important; we will find gas and oil because God is a Trinidadian.

This article went on to say:

"For example, in Israel, the world's highest per capita user of solar water heaters, Government mandated the installation of SWH in all Government-owned buildings, it then legislated SWH within its building codes."

Can you imagine that, Mr. President, the kinds of savings and development that we can envisage with that sort of resolve to deal with the issue of renewable energy resources in the way that other countries are doing? You mandate it into your building codes, into your government and public offices and buildings and you lead by example and then the private sector, and private persons will fall in when they realize that the Government is serious.

If the Government goes around every Monday morning, raises the issue, drops it and talks about it now, then forgets it for another 25 years, we can seriously have this debate when my granddaughter is perhaps a Member of this Parliament in the future. [*Desk thumping*]

Mr. President, the issue of renewable energy has occupied the more developed countries which are concerned, as I said before, on their dependency on fossil fuels from outside sources meaning us, because we have to be concerned too as they are moving very quickly. The major countries to which we export are moving very quickly to be self-sufficient and energy secure and we are depending on our oil, gas, ammonia, and methanol because we feel we will always be here and always have the resources, and that is not so at all.

Energy security is a major issue for Europe and the US and I would like to quote from a document, "Electricity from Renewable Energy Sources Encouraging green electricity in Europe". This is a document produced by the Commission's Directorate-General for Energy and Transport in Europe. The heading of this article says:

"A Directive to encourage Cleaner Electricity". We are not talking about a suggestion, we are not talking about a hope, and we are not talking about a wish or something airy-fairy. They have put in place European Union legislation directive to encourage cleaner energy while we are dragging our feet in this small country with 12 years left of gas and oil.

"The development of renewable energy sources is a central aim of European Union energy policy—reflecting the clear benefits that clean, sustainable and secure energy supplies will bring to current and future generations of Europeans..."

Therefore, they are looking at how their future generations would survive, something this Government is not doing at all. They are looking at renewable energy:

"because they are renewable and do not contribute to the build up of greenhouse gases that cause climate change. Secure—because they are sourced within Europe, not imported, and thus they reduce our dependency on events elsewhere in the world that we cannot control."

So clearly they are in a damage control mode, they have depended on oil and gas and other sources of energy from outside Europe for a number of years and they have said enough is enough.

This article went on to say just knowing of the benefits is not enough and:

"It should not be forgotten that no energy source, whether carbon-based, petroleum-based or nuclear, has ever been developed without the determined support of the public authorities. Therefore, actively promoting renewable energy sources for electricity generation is the aim of the RES-E directive."

Which means the renewable energy sources for the generation of energy directive. So they are clear, they understand the problem, they understand what their constraints are and they are doing that. This is not in one country, it is not a directive in one country of Europe, this is a European Union directive, all the countries of Europe are bound by this directive.

This article goes on to show that this directive was put forward in 2001, and I quote:

"Since the adoption of the RES-E directive in 2001, implementation of its provisions has progressed. A comprehensive EU regulatory framework is in place and Member States have adopted national targets for green electricity consumption and are working towards them."

This is what the developed countries are doing. What we are doing here? Trying to build smelter plants? A technology and a concept that is over 100 years old. People have gone past that, they do not want those kinds of dirty industrialization in their country; they are looking at renewable energy, clean, sustainable and secure energy and so forth. That is what Europe has bound all members of the European Union to do and they have bound them to national targets which are monitored and they must meet their national targets and a certain percentage of their energy requirement must come from renewable energy.

It continues:

"Europe leads the world in the technology of renewable energy and plays an important role in understanding and building the appropriate institutional support structures to promote a sustainable market for green electricity."

Mr. President, we know this Government has a relationship with the European Union, we have a representative of the European Union here and they have signed the EPA agreement recently. Why not take advantage of the relationship with Europe and the fact that it is the world's leading experts in the technology of renewable energy, ask for help to get the projects that are necessary going in our country because we have to think not only in the short term but in the long.

At the end of the document it says:

"Since the RES-E directive was adopted in 2001, its provisions on targets and support measures have set the framework conditions for real advances in the production and supply of green electricity. The recent assessment shows the progress made so far—in wind power in particular. More importantly it shows us where the problems are and where we must take action in support of Europe's renewable energy strategy and sustainable development goals."

That is our problem, we do not have any strategy, and we do not have any sustainable development goals. This Government is just rolling along with this happy-go-lucky, whatever happens happens as long as they eat and drink today and have good salaries and a good lifestyle, they do not care what happens to our grandchildren and great, great grandchildren when the oil and gas is finished.

That is our problem; no long-term vision. They are talking about Vision 2020. Where is that in terms of concrete, realizable terms of instituting renewable energy resources in this country with all the big buildings they are putting up? They like to talk a big talk, but they do not walk the walk and that is the problem this country has with them and which this country will deal with them at the next available opportunity.

**3.15 p.m.**

I looked at what is happening in the United States. This is not cutting edge technology. Much of this is fairly old technology. People have set their parameters. The document, "Renewable energy in the United States" gave certain information. In the United States more than 11.1 per cent of the domestically produced energy is renewable energy. Hydroelectric is the largest producer of renewable power in the United States. They are making serious inroads into renewable energy. This document says:

"Several solar thermal power stations have also been built. The largest of these solar thermal power stations is the SEGS group of plants in the Mojave Desert with a total generating capacity of 354 MW, making the system the largest solar plant of any kind in the world."

I think that the second largest would be in China where the Chinese have realized the problems of their environmental degradation and pollution. They are making serious attempts to correct that by building solar plants.

"The largest photovoltaic power plant in North America is the 25 MW Desoto Next Generation Solar Energy Center in Florida."

They are dealing with the issue of renewable fuels for transportation. It says:

"...most cars on the road today in the US can run on blends of up to 10 % ethanol, and motor vehicle manufacturers already produce vehicles designed to run on much higher ethanol blends."

They are looking to the future. They are looking to phase out the dependency of our little bit of oil and gas going to the United States. They have converted huge farms into the production of corn for ethanol production. The motor vehicle manufacturers are designing cars that would run on higher ethanol blends. It also says:

"The development of renewable energy and energy efficiency marks 'a new era of energy exploration' in the United States, according to President Barack Obama. In a joint address to the Congress on February 24, 2009, President Obama called for doubling renewable energy within the next three years."

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If they say that 11 per cent of their domestically produced energy is renewable, in the next few years their plan is to have over 33 per cent of renewable energy domestically produced in the United States. What is the plan of Trinidad and Tobago with respect to dealing with that?

They have done extensive research on the issue. They have produced volumes of reports according to this document, "Outlook On Renewable Energy In America". I want to share with my colleagues the public policy principles that they have come up with, with respect to the need for renewable energy.

To make the transition to the renewable energy future that is outlined in the scenario, the report argues that the energy policy of the United States needs to build on a range of principles which include:

1. Building a comprehensive national renewable energy strategy that addresses a full range of technological and market issues;
2. creating energy policies that address both the challenges of oil dependence and global warming in an integrated way; and
3. recognizing that energy efficiency and renewable energy work together.

This is something that we do not recognize. We do not recognize that energy efficiency and renewable energy work together. You cannot talk about renewable energy and yet you are wasting energy by your actions as a government and not taking into account the fact that we need to conserve energy, as well as build the basis for renewable energy.

Sen. Dr. Nanan spoke about the huge building with much glass that this Government constructed. It is the National Cultural Centre. I shudder to think about the amount of gas that we use to cool that building. After the design is such that you use much glass which tends to heat the building, you have to use all this gas to produce air conditioning to cool it. I do not know if this Government knows whether it is going back, forward, up or down.

In the scenario where you have 12 years left of gas and oil—if God is not a Trinidadian, heaven help us—you are blindly going forward and putting up structures that do not take into account the fact of finding the gas in the future to cool these buildings. We would become net importers of gas very shortly. I suspect that Members of Congress in the United States also cackled when other persons would have told them that they would be a net importer of gas by the late '70s. The detractors would have cackled also but it came to pass. They are net importers of oil and gas now. I do not expect anything different from our so-

called caring Government that cackles at these ideas, when I ask from where we will get the gas. We would become net importers of gas and oil if we continue along the path that we are continuing, without any thought to the future and the use of renewable energy resources.

The public policy principles must provide long term incentives for renewable power investments, modernizing our transmission and distribution systems and invest it in the next generation of biofuel facilities infrastructure. They are not only talking about the present biofuel infrastructure, but also another generation. They are looking far ahead, 50, 100 years down the road. We are happy that we have 12 years. We do not have to bother about that. Who is worried about that? That is the limit of the vision of this caring Government.

It says that they need to “accelerate national R&D research and development programmes to return the US to global leadership.”

Everybody knows that that is important. Where are our universities, technical institutes and R&D research that would inform about where we need to go and the technologies that are available that we can implement to carry us into this millennium in which we are? I suspect that the mindset and thinking of this Government as promoted in a quote from the Minister of Energy and Energy Industries has set the stage for this bleak scenario with respect to where we are with renewable energy.

I quote from an article in the *Newsday* dated Saturday May 23, 2009, Energy Fuels Prosperity by Clint Chan Tack. It gives you a little insight as to the thinking of this Government and the Minister of Energy and Energy Industries as to why we are where we are today. Nowhere. It says:

“Energy Minister Conrad Enill is confident the energy sector will guide the country through turbulent economic times....

Despite the crisis, Enill yesterday said the energy prospects over the next 100 years looked bright and Tobago will become ‘more fully integrated’ into the industry once the National Gas Company establishes a gas supply to the new Cove Industrial Estate.

...Enill said the petroleum industry has flourished because Trinidad and Tobago has been a pioneer at every stage of its development....

Now as the world stands on ‘cusp of change’ because of the crisis, Enill declared a new generation of energy pioneers is being ‘called to duty’ to turn opportunity into possibility. ‘Globally, all of the forecasts for energy

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consumption continue to point to carbon-based fuels continuing to play a dominant role in the energy mix for several decades going forward,' he stated."

This is the mystery that we have unravelled here today. Why this Government has done very little to promote the issue or renewable energy resources. Government policy as enunciated by the Minister of Energy and Energy Industries says that globally, all forecasts for energy consumption continue to pour into carbon based fuel and play a dominant role in the energy mix for the next several decades going forward. We are satisfied. "We happy, we cool." We have carbon based fuel. We do not have to worry about renewable energy, policy plans and generations of technology like the Europeans and Americans are worrying. Why worry? Be happy. We have gas and oil here. That is the Government's mindset. To rub salt into the wound he went on to say:

"With this in mind, the minister said there are several emerging energy industries that will build on the energy platform already in place to further strengthen the economy. One of these is the new Alutrint aluminium complex being constructed in La Brea.

'We expect Alutrint to have an even more profound impact on the lives of our people and the world as we move 'forward,'"

Could it be that they have to get tested for cancer every two years? Is that the impact you are talking about? That is a profound impact. I will not say that it is a positive impact. It is a very negative impact. It also says:

"...Enill was also confident that Government's plans to launch a domestic plastics industry 'will rise above the challenges posed by current economic global conditions.'"

This gives a little insight as to Government's thinking. They have no qualms about developing energy industries based on depleting resource. They see a bright future into the next 100 years for these energy based industries as plastics. Apparently, they have no intention of being serious about renewable energy because they are quite satisfied that we would always have gas and oil to export and support the plastics industry, ammonia and methanol and everything else that it has going.

Other citizens do not agree. That is the problem with our Constitution and so-called democracy. We do not have a say. Whatever they say goes and there is no way to deal with them under five years and five years are too long a time to deal



with a government as errant as this Government is. All we can do is talk, write letters and ask questions, but with very little response or hope that these questions, queries and concerns about our generation and future generations are being heard or taken into consideration by the Government.

I heard some very important questions being asked on the question of energy and its use with respect to the aluminium smelter about which the Minister spoke. This is a letter that was sent to the *Newsday* on Thursday May 21, 2009, by Gary Aboud, Secretary, Terrence Beddoe, President of Fishermen and Friends of the Sea. They asked a number of pertinent questions with respect to the aluminium smelter that the Minister spoke about and a plant which uses our depleting oil and gas resources. The question that this article starts with is a letter to the Prime Minister. It says:

“Mr. Prime Minister,

What is more important, aluminium or water?

Our Government previously confirmed a US \$300 million loan from China, and equity from Sural of US \$125 million. It was 60 percent debt, 40 percent equity. Now Sural has backed off, and the Chinese are lending the full value. Now it is all debt.

Mr. Manning, you promised us that there would be a private sector partner who have technical capacity for downstream industries, and that the product would enter the market in finished products, that there would be expertise. The Cabinet even passed the Fiscal Incentives (Alutrint Ltd) Order, 2008 which approved downstream products for a ‘minimum manufacturing process’..., which states that after the liquid aluminium is molded into ingot, ‘the ingot is then transferred to downstream facilities to be processed to wire, rods or cable’.

Now with Sural pulled out, there is no expertise to manufacture aluminum, far less the down-stream products. If the new 100 percent debt-owned facility is to produce only ingots, then will it be financially viable, and if it produces ‘downstream’ products without expertise, will it be profitable?”

These are valid questions that the citizens are asking and there is no response. Nobody sees it necessary to deal with the concerns of the citizens. That gas and oil are ours. It is our collective heritage.

**3.30 p.m.**

It is also the heritage of our children and great-grandchildren and these are valid questions we have to ask on their behalf also. The article goes on to say:

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“There needs to be debate and transparency in a democracy.

For instance, why has Alutrint lost its private sector taker?”

It states here:

“The State has used its monopoly to silence people, to move and displace people, to make room for the smelter.”

It says that Alutrint:

“...has gas at 40 percent of market value, according to the Minister of Energy in 2006. It has a ten-year tax holiday, unlike loyal citizens. It has exemptions from Customs Duty and Value Added Tax.

Any private sector firm would jump on Alutrint and none have. Why?”

So this citizen is asking about a Sural issue and the cost of gas to Sural and the tax holidays and so on, and since Sural has pulled out, why no private sector firm has come in. Clearly, the answer is not available because, as the writer has said, we have not done a cost benefit analysis; we do not know what the costs are and what the benefits of Alutrint are. And with such a large loan and with such grave impact, why have we not commissioned a cost benefit analysis?

The writer went on to speak about the risk to the water table 12 inches below the proposed plant. There are dangerous geological instabilities, and the whole issue of private sector firms not wanting to take that risk that Sural has pulled out of; that they have to check their employees for cancer annually and residents every two years.

[MR. VICE-PRESIDENT *in the Chair*]

The writer came to the conclusion that:

“It’s not worth it, for the money, or to the impact on the companies’ reputation, even with 60 percent easy financing.

So if the expert investors are not interested, why are we, without expertise, doing it on our own? Is Alutrint not Ispat all over again?”

These are valid questions that people have asked with respect to the use of our energy resources—

**Hon. Senator:** By whom?

**Sen. Dr. J. Kernahan:** By citizens of this country; that is “whom”. The citizens who elected you to government to govern this country on their behalf in a fully transparent manner and open and accountable to the citizens. What do you mean “by whom”? So what? You are not accountable to anybody; you are just

there, you could do what you want? You see, Mr. Vice-President, this is the attitude and I am happy that the Minister asked this question: "By whom?" You know? Like if somebody from Mars came down and asked this question. That is the attitude. That is why we are in the mess we are in now. We have not started any serious programmes of renewable energy resources and we are wasting our oil and gas resources on these huge mega plants, methanol and so on, that will cause the exploitation of the available gas and oil and we will have to import gas and oil to run these plants in the future. According to my grandmother, I might not be here but the ants will come and tell me.

I know the Minister will get up to talk about—as he did the last time that this issue came up—a "Pilot Project on the Use of Renewable Energy Technologies in Trinidad and Tobago - Introduction of Solar Water Heating Systems in the Tourism (Host Home) Sector." [*Interruption*] I am doing it based on experience. The last time we spoke about the lack of any provisions or pilot programmes or policies on renewable energy, the Minister was quite happy to get up and talk about this pilot project that is apparently, supposedly, purportedly, taking place in the country, in conjunction with the UN.

The cost of the project, based on a document I have here: UN Development Programme - Trinidad and Tobago - Port of Spain states:

"Budget as of January 16, 2006"

The total cost of the project is TT \$343,349 and US \$54,848. This is the agreement for the project and it was signed by Sen. The Hon. Dr. Lenny Saith, Minister of Energy and Energy Industries for and on behalf of the Government of the Republic of Trinidad and Tobago, on January 27, 2006.

We are in 2010 now. The Government needs to be reminded four years later, and it would be lovely for the Minister of Energy and Energy Industries, when he gets up to speak, to tell us what has come out of this pilot project; what they have learnt with respect to the pilot project and what has been, most importantly, implemented by the Government based on the outcome of this pilot project.

In the first part of this document, the "Situation Analysis", it acknowledged certain important issues here that the Government, in reality, refused to acknowledge. It says and I quote:

"The hydrocarbon sector continues to be the main driver of the economy contributing in 2004 to 34% of GDP..."

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And they quoted their sources:

"and 85% of total exports (Source: Annual Economic Survey 2004, Central Bank of Trinidad and Tobago)."

It goes on to say and I quote:

"There is recognition, however, that these resources are ultimately finite resources."

And this is the crux of the debate before us today brought by Sen. Dr. Nanan, that these are finite resources and we must be careful as to how we deal with it and we must make provision for alternative sources of energy.

I go on to quote:

"From an economic perspective, the relatively abundant oil and natural gas reserves, coupled with the relative cheapness of hydrocarbon-generated electricity, constitutes a major barrier to the promotion and adoption of more costly renewable energy technologies in Trinidad and Tobago. Hydrocarbon-based energy sources account for nearly 100% of electricity generation in the country."

[MR. PRESIDENT *in the Chair*]

An abysmal place to be, when the world is racing ahead with geothermal, wind, solar, and so on. In the Caribbean we have seen where we are lagging behind St. Kitts-Nevis, Barbados; we are still at the point where we are 100% dependent on hydrocarbon-based energy sources for electricity generation. This Government should collectively bow their heads in shame and collectively, maybe, resign too. That would be nice.

It says here, and I quote:

"From an environmental perspective, the universal use of hydrocarbon resources for energy production is a major source of atmospheric pollution and global climate change."

You know, we have all this "ol' talk" about, we are interested in climate change; the problems of climate change and we want to do our part to decrease climate change and so on, locally. The Minister of Planning, Housing and the Environment was supposed to have gone to the conference in Copenhagen and, of course, they would have given all the nice, pretty speeches, and so on, that they gave all over the world, but we still have 100% generation of electricity by hydrocarbon-based energy sources, under all the pretty speeches and the posturing.

What I loved in this "Situation Analysis" was this next sentence:

"The Government of the Republic of Trinidad and Tobago's policy is geared towards the promotion and adoption of renewable energy as an alternative to the hydrocarbon-based energy sources in accordance with the provisions of the UN Framework Convention on Climate Change (UNFCCC) which the GORTT ratified on 24 June, 1994."

Could you imagine that since 1994 we ratified the UN Framework Convention on Climate Change at the Kyoto Protocol, and so on, which bound all countries to decrease energy emissions and global warming gases by, I think it was, 12 per cent by 2012 and this Government is still 100% dependent on hydrocarbon sources to generate electricity and to do everything else, fuels and so on, for cars and vehicles?

That is the sort of posturing that this Government always does, because they were in the company of the UNDP representatives, Mr. James Hepple, Director of the Tourism Development Company and Dr. Inyang Ebong-Harstrup, Resident Representative of the UNDP. So they are in the company of all these illustrious persons and they strut out the usual "ol' talk", the posturing and the usual promises, and so on. It has nothing to do with reality.

I love the objectives of this agreement they signed and I want the Minister—

**Mr. President:** The speaking time of the hon. Senator has expired.

*Motion made,* That the hon. Senator's speaking time be extended by 15 minutes. [*Sen. Dr. A. Nanan*]

*Question put and agreed to.*

**Sen. Dr. J. Kernahan:** Thank you. Mr. President.

So after admitting that they have signed the UN Framework Convention on Climate Change, 1994, over, what, 16 years ago, the Government says that they have these lofty objectives that are so nice on paper but very little in terms of reality. Some of the objectives that they have with respect to the project were:

"- reduce operating costs through medium to long-term savings on electricity costs and maintenance and replacement of electrical heaters;"

I think Sen. Dr. Nanan spoke to that, that you must have that objective to save on electricity costs. It is an important objective and it must be done in reality, not just on paper. Another objective:

"-reduce the use of fossil fuel in the production of electricity for water heating by promoting the use of solar energy systems;"

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But where have we seen in all the government houses that the Minister of Planning, Housing and the Environment likes to boast about that the Government has built over the last few years—I saw her on television just now talking about the thousands of houses that the Government has built over the last few years. After having signed the Kyoto Protocol and the Convention on Climate Change over 16 years ago; where are the solar panels in all those Government buildings and the houses that the Government has built—the thousands that they claim to have built?

It says here, another objective is:

- "- increase environmental conservation in the bed and breakfast industry;
- utilize the improved environmental conservation measures as a marketing tool; and
- document the costs and benefits of installation and operation of solar water heating systems."

So they went on to say what they expect as the outcomes of the project:

- "-Reductions of emissions associated with the use of fossil fuel for electricity generation."

Which I expect the Minister to document for us this afternoon:

- "(a) lower energy costs"

I would expect the Minister to document for us based on that pilot project what were the projected lower energy costs of such a project; what are the lower maintenance costs that they would have observed:

- "(c) Improved marketability of properties.
  - Increased knowledge of cost/benefit analysis and appropriate technology.
  - Increased growth of 'green tourism' in Tobago."

So those were the expected outcomes of the project that they spent over TT \$343,000 to promote and, therefore, this project was started in 2006 and the end year was supposed to be 2006. It was supposed to be a one-year project four years ago.

So I would fully expect the Minister to be able to come and put on the Table a proper and transparent report, based on the money that we have spent to implement this project and what have been the outcomes of the project as listed in

their document. This is not a jokey thing; this is a serious thing because this is about our future; this is about our present and our future, our children, our ability to survive in an increasingly hostile atmosphere in the world.

So I would very much like the Minister to respond very seriously to the Opposition and to the Senator who has raised this very important Motion with respect to what has become of the UN Development Pilot Project on the Use of Renewable Energy Technologies in Trinidad and Tobago - Introduction of Solar Water Heating Systems in the Tourism (Host Home) Sector. This was supposed to have been completed in 2006.

When I saw the document, I tried to look for the results that would have been posted on the Internet by the ministry and I saw here, the project name: Pilot Project on the Use of Renewable Energy Technologies in Trinidad and Tobago - Introduction of Solar Water Heating Systems; Trinidad and Tobago; the location. I saw a repeat of the objectives and so on; I saw who were the persons involved in the project: Tobago Bed and Breakfast Association and the Trinidad Host Home Association.

### **3.45 p.m.**

I saw the status marked completed and I saw the associated agencies—the Minister of Energy and Energy Industries, Government of Trinidad and Tobago. It says clearly that this is for public information and that this was a project with the UN in conjunction with the Ministry of Energy and Energy Industries. It is a project completed in the year 2006. I saw a lot of other things, but not the outcomes mentioned in the original document. It says here: "Policy Impact". I do not know if this is meant to enlighten us; but it did not enlighten me.

Under Policy Impact, on what is purportedly a report on this project, it says:

“The proposed Pilot Solar Water Heating Project in Trinidad and Tobago is being implemented mainly to provide the Government of the Republic of Trinidad and Tobago with first hand information and knowledge on system performance and efficiencies to be obtained from this solar energy application. The information will influence the formulation of a national renewable energy policy and programme for the country.”

This gives us some indication of what is supposed to be brought to the Table today by the Ministry of Energy and Energy Industries with respect to this pilot project because out of this we are supposed to get first-hand information and system performance and efficiencies; and another outcome should be a national renewable energy policy and programme for the country.

It looks like we are heading somewhere. Let us see if the Minister will step up to the plate and give us the information we require on the advancement made in Trinidad and Tobago with respect to a national policy on renewable energy and the actual implementation on a wider scale, especially in government projects and so on.

I saw a document from the Department of Chemistry, UWI, St. Augustine, by O. Headley, called Applications of Solar Energy in Trinidad. It was interesting that they mentioned certain facts. He mentioned the Barbados issue. He said that the solar water heating industry in Barbados has a turnover of US \$2 million per year and that there was some indication that manufacturing in Trinidad and Tobago is now economically feasible. Certainly, if the Trinidad and Tobago Electricity Commission raises the cost of electricity, through its economic production cost, solar water heaters would be competitive with traditional electrical water heaters.

We have seen gradual increases in electricity costs in this country because of the fact that it is subsidized and the Government has a clear policy on reducing subsidies of these fuels; yet they are not making any move to provide cheaper, reliable alternatives which smaller countries have been able to implement. We are talking about a US \$200 million turnover a year in the solar water heating industry in Barbados. This is ridiculous, especially as the Professor has said that the solar water heater is really an old idea, the original design having been patented by William Bailey of California in 1909.

Some elements of the private enterprise have been looking at this issue. Based on an article here in the *Trinidad Express*, dated Monday, January 05, 2009, Driven by Solar Energy, by Carolyn Kisson of the South Bureau, it says that:

“Quietly solar energy has been making inroads in Trinidad.

Several companies have started cutting electrical costs by installing solar powered energy.

Solar lights have been installed on several Trinmar offshore OIL platforms. Arnold Corneal, the corporate communications manager at State-owned energy firm Petrotrin, parent company of Trinmar, confirmed the use of solar powered lights...”

Some company called Solar Power Concepts Limited is supplying these lights, encouraging customers to use these lights which are really cost cutting and energy efficient.



Another company, Piranha Technology Asset Management Limited, recently installed a solar powered bin, which compacts garbage before it overflows on to the sidewalk, on Harris Promenade, at a cost of \$42,000. It says here that solar energy is high on the agenda of developing and developed countries in their quest for less expensive, sustainable and green sources of power as quoted by Mr. Dopson, an entrepreneur from private enterprise.

We, the UNC, as the Senator who moved the Motion pointed out, are very well aware of the issues. We had been planning for these issues. We had policies in place for them; but eight years later, after 2002, we still have a 100 per cent generation of electricity by fossil fuels. We have thousands of houses built by the Government with no solar panels. None of them make use of renewable energy technology. This Government has not yet caught on to the whole question of the green revolution. It is still in the backward days of the smelter industries that they are hell-bent on implementing in this country.

This is really a government with no vision; no caring for the people of Trinidad and Tobago and its generations. This is a backward Government and I am sure that the electorate will know what to do with it come 2012.

Thank you.

**The Minister of Energy and Energy Industries (Sen. The Hon. Conrad Enill):** Thank you, Mr. President. The Motion as raised by Sen. Dr. Nanan states:

*Whereas* the Trinidad and Tobago economy is built on the revenue from oil and gas and whereas the said oil and gas are finite resources;

*Be it resolved* that the Government take immediate steps to include the use of renewable energy in the planning process for Government buildings..

At the outset, if this Motion had said:

*Be it resolved* that the Government take immediate steps to include the use of renewable energy in the planning process;

I would have supported it. I would have sat down and we would have gone home. But during the course of the debate, various speakers created distortions to which I must respond before I talk to the renewable energy agenda, which is something that the Government has been working on for some time now.

In his contribution at the Summit, there was a lot of discussion about the policy position of his administration or his party as it relates to hydrocarbon use and the business of exploration and development of the energy sector. The

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Senator made reference to the Ryder Scott Report. He drew some conclusions from it and then he talked about a number of things, so let me try to put some of them into context as we talk about this particular issue. Additionally, I thank him for the opportunity to discuss these issues because it is not very often that we are able so to do.

Over the last two years, the world as we know it went through a series of convulsions, the least of which being the question or the dynamics within the hydrocarbon sector. You will recall that in about September 2008, we had a financial situation in which the major economies of the world found themselves in situations where governments basically had to bail them out.

That came right before prices of oil and gas that nobody envisioned. What, therefore, happened in the case of Trinidad and Tobago was that we had set out to review our fiscal provisions for the explorations of oil and gas at a time when revenue was extremely high. We were talking about US \$100 a barrel oil and US \$8, US \$9, US \$10 for gas; Henry Hub.

There was also a cost of exploration that replicated the characteristics of a high environment. In other words, the capital cost of exploration was extremely high. When the events occurred with the financial market and prices disappeared, the cost of production did not because there were sufficient inventories and volumes around that caused that to occur. The companies then said unless you could have gotten a price of about US \$70, no exploration activity would take place because the cost of exploration was too high.

The business of gas and oil is not a short-term business. If we give out a block today, we are in fact looking at revenues eight years down the road. It takes about eight years, so that all the benefits we have today in revenue terms are decisions we made eight years ago. Trinidad and Tobago today, when we look at the geography and the geology, we see that—land and shallow—we know where all the easy explorations are. We have looked at it and we know exactly where it is.

In fact, today, simply on the basis of our current resources, as at January 01, 2010, the natural gas reserves of Trinidad and Tobago support a number of gas-based industries. We support four electrical power generation plants; four plants that manufacture LNG; 11 plants that manufacture ammonia; seven plants that manufacture methanol; and four plants that manufacture direct reduced iron.

So, it is not only about oil and gas; it is also about petrochemicals. In looking at this suite of power plants or products, we also know that in order to complete this, two others are required. One is the one at which we are looking with aluminium smelter and the other is the creation of a plastics industry. All of these use gas.

In the context, therefore, of looking at the Ryder Scott Report that everybody talks about and at situations in which we have more gas than we have use for, the Government took the view that we have to look once again at its gas allocation policy and decide in the medium to short term how to use it to get the best value. That exercise was completed and the Government basically set out a priority listing on how to use that gas.

**4.00 p.m.**

If you would permit me, let me just say what that priority is, because while we have that particular priority, we have some other priorities, as they relate to exploration activity.

The first priority that the Government has, insofar as its gas is concerned, is to allocate gas for the new approved projects, including Alutrint, ESSAR Steel and gas to propylene.

The next priority deals with existing plants and their future needs for a defined period. In other words, to keep them running, they need gas and we are dealing with that.

The third priority we have is basically for the bottlenecking of the current LNG trains. This is intended to provide additional revenue.

Right now, we have a situation in which there is gas produced, but there is no place for it, because some of the projects we have are a little bit behind, and therefore, what the Government has to do is to pay for it. This offers us the best alternative in the short term to monetize that.

The fourth, of course, deals with the ammonia and related downstream facilities, which must be part of any proposal. In other words, when you are coming with a proposal, it is not simply to deal with ammonia and those products, you have to talk about downturn activities. As it relates to gas, gas allocation and gas utilization, that is the current position.

The Ministry, in the next two to three months, will also be putting out some blocks in the shallow area. That will take care of things that we currently know, with companies that are prepared to get involved in the activity, once the fiscals are right.

When we look at all of that, we also recognize that the deep acreage in Trinidad and Tobago has some of the similar characteristics to what we have seen in Brazil, Nigeria and some formations in Ghana. We are currently negotiating with the major companies, because they have said to us that they would like to

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participate in the exploration activity. But there is a decision that we have to make and it is that decision that is currently being looked at. The decision that we have to make is whether or not, in terms of our current resources, LNG is the preferred vehicle of the future. One has to look at that, in the context of what is taking place globally with unconventional gas that has exploded on the biggest market; the United States market.

I talk here now about shale gas. Therefore, once that decision is made—and the information that we have so far suggests that is for the foreseeable future—LNG is going to be required, simply because when we look at what is happening with the Brie countries and what is happening with China and India, we have seen that as we speak now, they have already recovered and they are back into expansion mode.

In Ghana for example—I use Ghana because we have had some recent conversations with them—the demand for gas and oil from that province is such that it cannot be fulfilled. The demand that they have, just cannot be fulfilled at this point in time. There are those who said, correctly so, that there was a significant amount of product coming on the market from Qatar, Russia, Yemen and a number of countries, in spite of that coming on the market. All of that has already been allocated and as we speak now, there is still a situation where there is demand but there is no supply. So that, those who talk about the business and talk about it in very, very emotional terms, need to understand what the facts are. The fact is, as it relates to the Trinidad and Tobago business, as it relates to the way in which we have gone about this and as it relates to our cost of producing that commodity, we still have an advantage. The advantage we have is that we are the largest producer in the Atlantic Basin and, therefore, we have the advantage of being what you call a swing producer. What that basically says is that we have the ability, from time to time, to move our gas in other jurisdictions and get better than Henry Hub prices. But, that is for another debate.

The debate that we are talking about today has to do with renewable energy. Mr. President, I am sure that we said this before, but let me say it again. It was in October 2008, that the Cabinet established a Renewable Energy Committee, under the chairmanship of the Ministry of Energy and Energy Industries, basically to formulate the renewable energy policy Green Paper and promote renewable energy development and usage in Trinidad and Tobago. Renewable energy is one of those industries that have to be put within a context, because a lot of the policies we have had, up until now, do not support the economics of renewable energy. In fact, if you were simply to try and do it on your own, the economics do not support it.

Two things have changed that have caused us to really look at it. One of course, is this whole climate issue. The issue of climate and the effects of greenhouse gases have put into perspective globally, this question of renewable energy. Because what countries must now do is slow their rate of exploration or their rate of using fossil fuels and find a way in which they can protect the environment. The energy policy forward, even in Trinidad and Tobago, is basically development; but environmental sustainability. That creates a whole new different discussion about what we do and how we do it. There are lots of things we have done in Trinidad and Tobago that support that.

The last one, or the one that we are currently looking at is the use of CNG as a replacement in the transportation subsector, because as we speak now, Trinidad and Tobago has a natural advantage. Let me make this point differently. All of those who criticize Trinidad and Tobago as a small island state for not getting on the bandwagon as quickly as possible and doing all those things, really need to understand, globally, what we are talking about.

There is a discussion also about measuring this in per capita terms. Let me give you some information about what is happening in the world. There is an organization called the Carbon Monitoring for Action Group and they basically have prepared a report. What that report says is that between Asia, North America and Europe, that accounts for 10.8 billion tonnes of carbon emissions and the rest of the world, 700 million tonnes. In simple terms, those countries, Asia, North America and Europe, account for 10.7 billion tonnes and the rest of the world 700 million tonnes.

In addition, these countries—[*Interruption*] Asia, 5.7; North America, 3.9 and Europe 1.8; so Asia is the biggest. This is the other piece of it; the use of coal has proven to be one of the greatest contributors to global carbon emissions. Trinidad and Tobago, however, produces 99 per cent of its electricity from natural gas and zero per cent from coal. By comparison, the US produces 49 per cent of its electricity from coal; the United Kingdom, 33 per cent; India, over 70 per cent and China, over 75 per cent. I am saying this to say that the argument about measuring this on a per capita basis and then creating the situation that Trinidad and Tobago is barred or Trinidad and Tobago is not where it needs to be, is something that one has to look at within the context of the facts.

While that is so, the Government has been working with the United States, through its Department of Energy, and what we are seeking to do is to develop a renewable energy research centre and a framework for partnership, under the Energy and Climate Partnership of the Americas. This was first announced at the

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Fifth Summit of the Americas and we are in the process of putting this together. When we put this together, the centre will also be networked with similar centres currently established in Chile, Peru and Colombia and what this is seeking to do really is to develop a methodology to use the knowledge that the United States has and really to build into Trinidad and Tobago as an energy-producing country, a renewable energy centre, that allows us to do some of the things that you have talked about, housing, photovoltaic, wind energy and all of that. All of those are things that are currently on the table. In fact, in this particular centre, we should have all the elements in place, maybe by April of this year. So, in real terms, therefore, we have in fact been looking at this particular matter.

Let me talk to this particular committee that we have set up and how they are composed and what was their mandate. The mandate of the committee is as follows:

1. Review the energy balance of Trinidad and Tobago and conduct a current state assessment of renewable energy applications and research activities into photovoltaic solar power, solar thermal energy, wind energy, wave energy and biofuels, including biomass, biogas, bio-diesel and bioethanol.
2. Using appropriate criteria relevant to Trinidad and Tobago.
3. Identify feasible and practical renewable energy technologies in various sectors, including transportation, industry, manufacturing, commercial and residential.
4. Set realizable targets and timeframes for renewable energy usage in the energy mix.
5. Make recommendations, with respect to the level of incentives, tax relief, infrastructure support, grants, price subsidies, et cetera, required to promote the use of renewable energy technologies in each sector.
6. Identify opportunities to linkages between energy-based industrial plants to be established and the production of renewable energy components.
7. Identify mechanisms and strategies for financing renewable energy projects by local and international agencies, including carbon trading schemes.
8. Identify legislation and regulation that would be necessary for the exploitation, development and use of renewable energy.

This committee was set up and this was the mandate. It had as its members persons from the—let me give you the positions.

Chairman	Director of Energy Research and Planning, Ministry of Energy and Energy Industries
Members	Professor of Energy Systems and Vice-Provost Postgraduate Studies, Research and Development, University of Trinidad and Tobago Lecturer/Department of Physics, UWI and Chairman of the Solar Committee of the Caribbean

There is a committee in the Caribbean looking at this and we are members of that.

Director of Trade Facilitation, Ministry of Trade  
and Industry

Senior Engineer, Generation Interface, T&TEC

Senior Economist, Research, Planning and  
Technical Services Division, Ministry of Science,  
Technology and Tertiary Education

Team Leader, Business Development National  
Energy Corporation

Senior Economic Policy Analyst, Ministry of Public  
Utilities and Environmental Economist

And, of course, the Secretariat is the Ministry of Energy and Energy Industries.

#### **4.15 p.m.**

Additionally, the ministry is authorized to engage professional services as required to undertake this work. That was in 2008.

On September 10, 2009 the committee reported, and basically provided a status report which said as follows: That the committee had in fact gone ahead and done its work and there was a timetable by which the Policy Green Paper on Renewable Energy would be made available to the public for comment.

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I have a copy of the draft policy in which it discusses, among other things, the rationale for renewable energy in Trinidad and Tobago; our existing energy policy content; the question of using renewable energy for power generation, strategies and approaches for moving forward with renewable energy; setting renewable energy targets; legislation and regulation incentives for renewable energy, and of course education, training, research and development financing; regional programmes and the relationship with the various players with the policy as it relates to the climate change policy.

The draft document therefore was developed, and it is intended very shortly, for this particular document to be laid in the Parliament as a Green Paper and then to have wider public consultations on this particular issue. So to take the view that we are somehow in darkest Africa and this is a matter that we are unaware of and this is a matter that we are unfamiliar with, that is not so. So our policy position is very clear.

We believe that renewable energy is something that we must do because it has two components to it. One, the question of reducing the whole climate issue and the climate issue is a real one. We have also looked at the question of our exploration activity; we have looked at the question of what we are doing about increasing our supply and increasing our activity and we have indicated a design application, strategies and plans for renewable energy.

Sen. Dr. Nanan talked about the energy hub. The energy hub is a tool that we use in the Ministry of Energy and Energy Industries in which the ministry, basically, authorizes companies to proceed with certain projects on the basis of data that is available to the ministry, so instead of companies having to bring all of the paper work and so on, they simply load it into the system; engineers at the ministry look at it and either approve it or not; it is up; it is running; it is working and it has been for a little while now.

The question of ethanol and the question of large farms: Now, this is the discussion that we hear from time to time and I think we should spend five minutes on this simply to make this point. When we examine this issue from the perspective of history we will see that oil is a depleting asset and corn is a depleting asset. When you took agriculture and placed it as an alternative for fuel, what you were in fact doing was reducing the supply of food and converting it into energy. We saw that in the policy in the US sometime ago and the spillover, of course, was that the cost of food started to move in a particular direction.



I think that they have reversed that particular trend as we speak but once you take agricultural type products and use them for energy then that is no longer available to you for food. The consequence of that is that you have less food available and corn was a big example. So when you look at it from ethanol production—the other thing about it is that some time we looked at ethanol in the Trinidad and Tobago context and we looked at the sugar cane and the problem that we had there had to do with content, sucrose quality and what was required and the economics of making it work did not meet the requirement. I do not know if we have additional technology but we have looked at this for a particular point in time but that was the issue.

The matter with the large farm and megafarms: The Minister of Agriculture, Land and Marine Resources will answer that.

**Sen. Seetahal SC:** You could answer it.

**Sen. The Hon. C. Enill:** He will answer that.

Sen. Dr. Kernahan talked about the question of the aluminium smelter and the fact that the Government has basically not been able to get a partner when Sural moved out. That is not so. The largest company in Brazil—Votorantim—is on board. The projects, basically, have three of the best people, people who would bring the technology and the expertise to the table. We are working through the shareholders agreement and the project agreement right now to make sure we have some control over that, and therefore that will continue in the manner in which we had set out. Insofar—

**Sen. Dr. Kernahan:** And the cost benefit?

**Sen. The Hon. C. Enill:** The cost benefit analysis when we looked at it, it made sense in this sense, but put it differently, if it did not make sense, the private sector was not going to basically take equity participation, and I think we intend to divest that to 60 per cent. Who knows? *[Interruption]*

Yes, but your country cannot progress unless you put the policies in place to facilitate that kind of activity, but that is a different discussion.

Insofar as CNG is concerned, I think that the numbers that I saw as it relates to the number of vehicles that we have—we have about 2,000 right now—and we are going to be making a decision very shortly to upgrade the eight stations that we have. We have about eight stations right now dispensing CNG and we intend to bring those up to a level in which the current 2,000 vehicles that we have will get a better level of service.

So, Mr. President, I am extremely happy that this Motion has come for us to talk to it a bit. It is a Motion that talks about two things: the question of oil and gas resources in Trinidad and Tobago, its use and the future. I think we have demonstrated that we have a strategy for short term and we also have a strategy for medium and longer term, and we also have a rationale for the current resources that we have found and for those in which we are going to be involved, and that the renewable energy agenda is very much in train; there are full-time people looking at this; there is a lot of work going on in a number of areas as they relate to bringing this particular area of Government policy on board, but we are also doing it in conjunction with the challenges we face within the context of the climate change issue, which is looming as a big issue that the globe has to deal with.

**Sen. Dr. Kernahan:** The pilot project?

**Sen. The Hon. C. Enill:** The pilot projects—the one with T&TEC, as I understand it—those projects are still at the same stage. I think one had to do with the tourism sector. We would be discussing very shortly another pilot project between the UNDP and ourselves and what it seeks to do is to bring some of that into community centres. All the things you talked about—

**Sen. Dr. Kernahan:** Thank you for giving way. What do you mean by it is still at the same stage? In 2006 a pilot project with the UNDP was started with respect to tourism and renewable energy and it was supposed to be completed in 2006 and a report generated, that is what we are asking about.

**Sen. The Hon. C. Enill:** Well, to the best of my knowledge, that has occurred and the project continues as is. There has not been any additional activity on it and the report is leading to another project.

**Sen. Dr. Kernahan:** Could we get a copy of that report?

**Sen. The Hon. C. Enill:** Yes, I think it is a project that UNDP had, and therefore I think there is no difficulty in making that project available.

**Sen. Dr. Nanan:** I made a remark about 500 million cubic feet of gas per day that will be required for these projects in 2010, is that still on?

**Sen. The Hon. C. Enill:** The requirement for gas for all the projects that we have amounts to, in aggregate, 20.1 trillion cubic feet and what we have accommodated within that are all the projects that we talked about; the new ones as well as the existing ones.

We also have companies, and we talked about some of them that have identified additional uncommitted gas. So you have bpTT for example, BG excluded the Manatee field, EOG, BHP Billiton and Petro Canada, that group has something like 7.7 tcf, and of course, within that as well we have the Loran Manatee which is the piece with Venezuela that we are negotiating agreements with. Once those are in fact in place, we would release some other 2.7 tcf in a tcf field.

So the point I am making is that we are in control of this issue. We have commitments that we are catering for. We are with the industry in trying to understand what is required in order to find the resource. We know what decisions we have to make to attract them and we are doing just that, therefore as it relates to our medium term and short-term prospects for gas and the utilization of gas in all the areas that we have talked about, we really are very comfortable with where we are. As it relates to the future, we have sufficient information to suggest to us that once the projects are economic and that is what we are working through now, that Trinidad and Tobago will continue for the foreseeable future to be able to produce gas.

I mean, if we saw what is happening with Venezuela and we saw what is happening around the world, there is exploration taking place now and the types of finds that we are seeing are very large and we believe that in looking at the Trinidad and Tobago geology—and our geoscientists did a study sometime ago in which they looked at our acreage and acreages in Nigeria, Brazil and a number of other countries, and they looked and saw the same formation, therefore on that basis we expect that we can get the results. The only issue is where it is at, it is basically in deep.

**Sen. Dr. Nanan:** You made a remark about Petrotrin is US \$1 billion being utilized over that five-year period with respect to seismic activity. Was that conducted by Petrotrin? Because that report was 2007.

**Sen. The Hon. C. Enill:** I am not sure about that particular one but the Petrotrin Work Programme that I have seen right now basically is supporting 3D seismic. Because what we want to determine is where else you have opportunities for drilling wells, and that is the programme that we are engaged in and that is a programme that is beginning, I think, in February and it is intended to finish in December of this year.

I think, Mr. President, that I have dealt with some of the issues that were raised. The ones related to agriculture I would leave for my colleague the Minister of Agriculture, Land and Marine Resources at some point in time. I just wish to

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conclude by indicating that we really have no fundamental difficulty with this particular Motion. It is not really only about government buildings. That is just a part of the policy. It is wider than that and we would really have no difficulty in supporting this at the end of the period.

**ADJOURNMENT**

**The Minister of Energy and Energy Industries (Sen. The Hon. Conrad Enill):** Mr. President, I beg to move that this Senate do now adjourn to Tuesday, February 02, 2010 at 1.30 p.m., where we propose to deal with the Supreme Court of Judicature (Amdt.) Bill, 2010 and the Evidence (Amdt.) Bill, 2010.

*Question put and agreed to.*

*Senate adjourned accordingly.*

*Adjourned at 4.31 p.m.*