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Item 10 (b) of the provisional agenda

## **PROPOSAL ON CLEANER OR LESS GREENHOUSE GAS-EMITTING ENERGY**

### **Submissions from Parties**

#### **Note by the secretariat**

1. At its fifteenth session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) requested the secretariat to organize a workshop under the guidance of its Chairman on the topic of cleaner or less greenhouse gas-emitting energy, if possible prior to its sixteenth session, and to prepare a report on the workshop. The SBSTA invited Parties to submit views on the structure and scope of the workshop by 15 February 2002, for compilation by the secretariat into a miscellaneous document (see document FCCC/SBSTA/2001/8).
2. The secretariat has received nine such submissions.\* In accordance with the procedure for miscellaneous documents, these submissions are reproduced in the language in which they were received and without formal editing.

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\* In order to make these submissions available on electronic systems, including the World Wide Web, these submissions have been electronically imported. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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PAPER NO. 1: AUSTRALIA

**AUSTRALIAN SUBMISSION ON STRUCTURE AND SCOPE OF  
PROPOSED WORKSHOP ON CLEANER OR LESS GREENHOUSE GAS EMITTING ENERGY**

At the sixth Conference of the Parties (COP6 (bis)), the Conference of the Parties (COP) “recognized that cleaner or less greenhouse-gas-emitting energy, emphasizing renewables, hydro, geothermal and natural gas, can promote global environmental benefits to meet the objectives of the Convention and the Kyoto Protocol and optimize the uptake of cleaner or less greenhouse-gas-emitting energy” and accepted an offer by the Canadian Government to host an informal meeting to discuss this issue. A meeting was subsequently held in Calgary, Canada, 2 to 5 October 2001 which was attended by experts from 34 countries, including Australia.

At its fifteenth session in Marrakesh, 29 October to 6 November 2001, the Subsidiary Body for Scientific and Technical Advice (SBSTA) received a report by Canada on the outcomes of the informal meeting. In its conclusions, the SBSTA requested the secretariat to organise a workshop under the guidance of its Chairman on the topic of cleaner or less greenhouse gas emitting energy, if possible prior to its sixteenth session (“Item X. Other Matters” FCCC/SBSTA/2001/8). The SBSTA also accepted an offer by the Government of Canada to host the workshop and has invited submissions from Parties on the structure and scope of the proposed workshop.

Australia believes that an increased uptake of less greenhouse gas intensive energy represents an important element in the development of sustainable and least cost approaches to the reduction of global greenhouse gas emissions. Australia is concerned at the possibility that the implementation of the Kyoto Protocol may provide a disincentive to a greater global trade in less greenhouse gas emitting energy and supports further discussion to identify the scope of, and possible approaches to address, any such impediments. Australia therefore supports the proposal to hold a workshop and welcomes the offer by the Canadian Government to host the meeting.

**Introduction**

Energy demand over the coming decades is projected to expand, particularly in developing countries where it is anticipated that more rapid industrialisation and rise in general economic well being will provide a significant impetus to greater use of energy.

Under the framework of the Kyoto Protocol, Parties included in Annex B have agreed specific emission reduction commitments and it is expected that greater use of cleaner energy will play an important role in meeting these commitments and those of the UNFCCC more broadly.

Benefits of a shift towards greater use of cleaner energy will accrue to all parties, including developing countries and represents an opportunity for all parties to contribute to lower global emissions and the objective of the UNFCCC.

Australia believes that it is important that global efforts under the Kyoto Protocol are optimised so as to most effectively contribute towards meeting the objective of the UNFCCC.

In this regard, Australia noted that a key conclusion from the Calgary meeting was the possibility for the trade in cleaner or less greenhouse gas emitting energy to suffer potential disincentives due to the implementation of the Kyoto Protocol, particularly trade between Annex B and non Annex B and Annex B and non Parties to the Protocol. Australia also noted from the meeting that disincentives could also exist in the form of barriers to trade and/or subsidies and that potential benefits could accrue through the removal of such disincentives.

Australia believes that such actions, if they could be identified, would clearly be consistent with the provisions in Article 2.1 (a)(v) and Article 2.3 of the Kyoto Protocol.

### **Structure and Scope of Proposed Workshop**

#### **Structure**

Australia considers that the SBSTA workshop should be held over two or three days prior to the sixteenth meeting of the SBSTA, 3 to 14 June 2002. In addition, Australia believes that the workshop should:

- Be aimed at an expert level;
- Be open to all Parties;
- Invite participation from other organisations that have expertise in cleaner energy issues (e.g. the IEA or IEA/OECD Annex I Experts Group). Should Parties agree, this could usefully include participation of relevant industry and stakeholder representatives.

Australia found that the informal nature of the October 2001 meeting in Calgary assisted in promoting discussion of issues and the sharing of information and would encourage, to the extent possible, a similar approach be adopted for the SBSTA workshop.

#### **Scope**

Australia believes that a useful starting point for the workshop would be to further explore the key issues identified at the Calgary meeting. Specifically:

- The development of a clearer understanding of the global trade in cleaner or less greenhouse gas emitting energy and of the energy related supply and demand characteristics of Parties who trade in cleaner or less greenhouse gas emitting energy;
- What impediments to such trade could stem from the implementation of the Kyoto Protocol?
- How could global emission reductions from an increased use of cleaner energy be measured and accounted for?
- What incentives or actions may be possible to address possible barriers or disincentives?

#### **Conclusion**

While Australia currently has not determined its views on how the promotion of cleaner energy should be achieved within the framework of the Kyoto Protocol, it believes that the issue remains an important component of a longer term sustainable least cost approach to meeting the objectives of the UNFCCC. Moreover, Australia considers that additional benefits, environmental and economic, would accrue to Parties

through greater global trade in cleaner energy and the removal of subsidies for the production and/or consumption of energy.

Australia therefore supports the continuing investigation of this issue by SBSTA and welcomes the opportunity to participate in the cleaner energy workshop before SBSTA 16 in June 2002.

PAPER NO. 2: CANADA

**STRUCTURE AND SCOPE OF THE WORKSHOP ON CLEANER  
OR LESS GHG-EMITTING ENERGY**

Submission of the Government of Canada  
February 2002

The second part of the sixth Conference of the Parties (CoP 6 (bis)) “recognized that cleaner or less greenhouse gas-emitting energy, emphasizing renewables, hydro, geothermal and natural gas, can promote global environmental benefits to meet the objectives of the Convention and the Kyoto Protocol and optimize the uptake of cleaner or less greenhouse gas-emitting energy”.

The Government of Canada convened an informal meeting on the above-mentioned issue, on which it reported to the Subsidiary Body for Scientific and Technological Advice (SBSTA) at its fifteenth session in Marrakech, 29 October – 6 November 2001. In its report to the seventh Conference of the Parties (CoP 7), the SBSTA requested the secretariat to organize a workshop under the guidance of its Chairman on the topic of cleaner or less greenhouse gas (GHG)-emitting energy (FCCC/SBSTA/2001/8). CoP 7 then adopted the report of the SBSTA.

In Canada’s view, the issue of cleaner or less GHG-emitting energy and the role it plays in working to meet the objective of the Convention and the Protocol are of utmost importance. The negotiations on policies and measures may provide a framework within which to analyze and discuss ways and means to promote the domestic production and use of cleaner or less GHG-emitting energy; however, the effect of cleaner or less GHG-emitting energy trade on global emissions reductions and the goal of stabilization of GHG concentrations in the atmosphere has never been fully analyzed within the United Nations Framework Convention on Climate Change (UNFCCC) process.

Canada welcomes this opportunity to provide its views on the structure and scope of the forthcoming workshop.

**Introduction**

The objective of the UNFCCC is to stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. As part of the movement toward achieving this objective, a transition in the global energy profile from more GHG-emitting energy to less GHG-emitting energy must take place.

The commitment to address the global challenge of climate change is equally serious for all Parties. The Kyoto Protocol is an agreement whereby Parties have stated their intention to undertake an international commitment to address the important objective of the Convention. 38 developed country parties included, in Annex B of the Kyoto Protocol, have taken on specific numeric targets to address the challenge of the Convention. Each Party included in Annex B, as part of its national reduction strategy, will try to reduce reliance on GHG emissions-intensive energy sources in addition and increase reliance on cleaner or less GHG-emitting energy sources.

The UNFCCC provides a common objective of stabilizing GHG concentrations and, in seeking to meet this objective, contain GHG emissions. As all Parties formulate and implement national and, where appropriate, regional programs containing measures to mitigate climate change, they will need to address the issue of GHG concentrations in energy produced and exported.

Canada wants to ensure that the Kyoto Protocol optimally drives all Parties towards attainment of the Convention's objective. It is Canada's belief that *all* actions that work toward securing a successful transition to a cleaner or less GHG-emitting global economy and ultimately to the achievement of that objective should be encouraged. One of these actions would be to facilitate trade in cleaner or less GHG-emitting energy.

As an important first step, Canada believes that the upcoming workshop should focus on cleaner or less GHG-emitting energy trade and, more specifically, on the methodological questions identified by the informal meeting held in Calgary, Alberta in October 2001.

### **Informal Meeting on Cleaner Energy**

Canada held an informal meeting on the subject of cleaner or less-greenhouse-gas-emitting energy in Calgary, Alberta from October 3<sup>rd</sup> to 5<sup>th</sup>, 2001. The agenda for this meeting benefited from the input of an informal international advisory group. Experts from 34 countries attended.

The central conclusions of the Calgary meeting may be summarized as follows:

- First, cleaner or less GHG-emitting energy does indeed promote global environmental benefits and should be optimized;
- Second, the optimal uptake of cleaner or less GHG-emitting energy depends not only on domestic emission reduction strategies, but also on international trade;
- Third, within the context of the Kyoto Protocol, trade in cleaner or less GHG-emitting energy could encounter significant barriers that could limit emission reduction opportunities and could even lead to increased emissions;
- Finally, there is a need to work with developing countries to optimize the transition to and the uptake of cleaner or less GHG-emitting energy.

The informal meeting in Calgary also generated several methodological questions in relation to cleaner or less GHG-emitting energy:

- What are the characteristics of cleaner or less GHG-emitting energy trade and what are the characteristics of Parties that trade in such energy?
- What are the global environmental benefits generated by cleaner or less GHG-emitting energy trade and how can they be measured?
- What are the barriers and disincentives to cleaner or less GHG-emitting energy trade and could they be further amplified by the entry into force of the Kyoto Protocol?

- What actions could be undertaken to remove or attenuate these barriers and disincentives, particularly in the context of the Kyoto Protocol? Can they be transformed into stimuli to increase cleaner or less GHG-emitting energy trade?

### **Structure and Objectives**

Canada believes that the methodological questions identified above are substantive and could have a serious impact on the efforts that Parties will have to make to meet their commitments under the Kyoto Protocol. Canada therefore suggests that these questions provide an outline for the structure and scope of the upcoming workshop, that the workshop aim to exchange information on these questions and provide answers to them.

It is Canada's hope that Parties will present their views, analytical work and experiences relating to these questions.

Specifically, the workshop should aim to:

- Contribute to the availability, effectiveness, transparency and comparability of information regarding international patterns of trade in cleaner or less GHG-emitting energy, the creation of global environmental benefits and removal of barriers to both;
- Develop, and exchange information on, methodologies to measure global environmental benefits flowing from trade in cleaner or less GHG-emitting energy that are comparable across Annex B Parties, non-Annex B Parties and non-Parties to the Protocol;
- Contribute to the availability, effectiveness, transparency and comparability of information that underpins the incentive structure to trade in cleaner or less GHG emitting energy;
- Facilitate the identification of barriers to trade in cleaner or less greenhouse-gas-emitting energy and options for their removal; and
- Identify incentives to optimize the uptake of cleaner energy and reduce any unintended effects from the Protocol that would discourage trade in cleaner energy.

The workshop should take place over a two to three day period and:

- Be open to all Parties to the UNFCCC; with financial assistance to strengthen the participation of non-Annex I Parties;
- Be held at the expert level;
- Encourage co-operation and participation of other organizations that are already undertaking work within this field (for example, the International Energy Agency).

### **Scope**

Each of the methodological questions identified by the Calgary informal meeting provides an opportunity for Parties to exchange views on a series of related questions, as follows.



**What are the characteristics of cleaner or less-greenhouse-gas-emitting energy trade and what are the characteristics of Parties that trade in such energy?**

What is cleaner or less GHG-emitting energy trade? In Canada's view, it is trade in energy that results in fewer GHG emissions (measured on a full life-cycle basis) per unit of energy produced than alternative energy sources. Trade in such energy can produce global environmental benefits.

In Bonn, the Conference of the Parties, (FCCC/CP/2001/CRP.13), "recognized that cleaner or less greenhouse gas-emitting energy, emphasizing renewables, hydro, geothermal and natural gas, can promote global environmental benefits to meet the objectives of the Convention and the Kyoto Protocol and optimize the uptake of cleaner or less greenhouse gas-emitting energy".

Canada is of the view that the types of energy emphasized above fulfill the above-mentioned criteria for cleaner or less GHG-emitting energy trade.

The informal meeting in Calgary began the process of highlighting or defining the characteristics of Parties who trade in such energy in terms of their relation to the Kyoto Protocol. The informal meeting identified trade in cleaner or less GHG-emitting energy as potentially taking place between the following categories of Parties and non-Parties to the Kyoto Protocol:

- Annex B Party – Annex B Party
- Annex B Party – Non-Annex B Party
- Annex B Party – Non-Party
- Non-Annex B Party – Non-Annex B Party
- Non-Annex B Party – Non-Party
- Non-Party – Non-Party

In Canada's view, the workshop should examine patterns of trade in cleaner or less GHG-emitting energy between these groups of Parties and non-Parties to the Protocol, in order to ensure that all such trade can be facilitated. In particular, which patterns are stimulated by the fact of being Party to the Protocol and which are discouraged?

Canada recognizes that it may also be desirable to examine other characteristics of Parties who trade in cleaner or less GHG-emitting energy, in order to identify additional ways in which such trade can be encouraged.

**What are the global environmental benefits generated by cleaner or less-greenhouse-gas-emitting energy trade and how can they be measured?**

In Canada's view, a global environmental benefit is created when trade in cleaner or less GHG-emitting energy enables an importing country to avoid emissions, thus resulting in lower emissions than would otherwise be the case. When the avoided emissions in the importing country, less the emissions incurred in the production and transportation of the energy in the exporting country, are greater than zero a global environmental benefit is produced.

It is straightforward to measure the emissions associated with the production and transportation of exported energy. Some Parties are already doing so in their national inventories. In addition, some Parties, such as

Canada, have begun to report separately the emissions associated with the production and transportation of exported energy.

In Canada's view, avoided emissions and thus global environmental benefits are measurable and verifiable. The guidelines and standards developed for the use of baselines, elaborated in the texts of the Marrakesh Accords on Articles 6 and 12 of the Kyoto Protocol, provide a useful starting point from which to do so. The workshop should agree to a methodological process for the measurement and verification of avoided emissions, particularly at the national level.

**What are the barriers and disincentives to cleaner or less-greenhouse-gas-emitting energy trade and could they be further amplified by the entry into force of the Kyoto Protocol?**

The informal meeting in Calgary elaborated a number of potential incentives that may be faced by different categories of countries, under a number of potential energy trade scenarios in which these countries may be engaged. A brief overview of these incentives is outlined here.

**Incentives Faced by Importing Countries**

*Annex B:* These Parties will be motivated to choose the least GHG-intensive source of energy available, in terms of emissions when combusted, in order to help meet their own domestic targets. This could include imported natural gas to generate electricity (rather than domestically produced coal, for example). It could also include imports of electricity from the grid, which is emissions-free from an end-use perspective, irrespective of how it has been generated (these Parties may have no economic incentive to choose the least GHG-intensive from a production standpoint).

*Non-Annex B:* These Parties have the option of being indifferent to the emissions intensity of energy sources, since they do not face targets, and may choose between them on the basis of cost alone.

*Non-Parties:* These countries have the option of being indifferent to the emissions intensity of energy sources, since they do not face targets, and may choose between them on the basis of cost alone.

**Incentives Faced by Exporting Countries**

*Annex B:* These Parties must count in their inventory all emissions associated with the production and transportation of exported energy. This could provide an incentive to export energy that is low in emissions when produced, but not necessarily when used. Could also face incentive to export low-combustion-GHG energy, if shipping to a Party motivated to purchase such energy. However, this could also provide a disincentive to continuing to produce and export cleaner or less GHG-emitting energy if exporters are not able to pass on emissions-related costs faced domestically to purchasers who have no incentive to pay a higher price and options to buy elsewhere.

*Non-Annex B:* These Parties are not responsible for the emissions associated with the production and transportation of imported energy. They may face no economic incentive to address the GHG content of their energy imports.

*Non-Party*: These countries are not responsible for the emissions associated with the production and transportation of imported energy. They may face no economic incentive to address the GHG content of their energy imports.

Detailed trade scenarios in which the Kyoto Protocol was in force were presented at the informal meeting in Calgary. In a number of these scenarios barriers and disincentives to sustainable trade in cleaner or less GHG-emitting energy were found that could result in higher global emissions, contrary to the objective of the Convention. The workshop should examine the incentives facing countries and further investigate the barriers and disincentives to trade in cleaner or less GHG-emitting energy that may arise from entry into force of the Kyoto Protocol.

**What actions could be undertaken to remove or attenuate these barriers and disincentives, particularly in the context of the Kyoto Protocol? What incentives could increase cleaner or less greenhouse-gas-emitting energy trade?**

Canada views trade in cleaner or less GHG-emitting energy as a necessary component of the transition to a global energy profile that is less GHG-intensive. Therefore, if the Kyoto Protocol erects barriers or disincentives to trade in cleaner or less GHG-emitting energy that would facilitate that transition, such barriers or disincentives should be removed. Finally, the workshop should examine how such barriers and disincentives can be transformed into stimuli for the generation of global environmental benefits.

### **Conclusion**

It is Canada's belief that the removal of barriers and disincentives to the use and trade in cleaner or less GHG-emitting energy can be accomplished within the framework of the Kyoto Protocol. The policy options for doing so should be explored, examined and developed in the forthcoming workshop. Canada welcomes the opportunity to share analyses and experience with other Parties and to work together to find ways to further facilitate the transition to a less GHG-emitting global economy – a necessary component in the achievement of the objective of the Convention – a goal equally important to all Parties.

PAPER NO. 3: CHINA

Submission from China  
on the Structure and Scope of the Workshop on  
“cleaner or less greenhouse gas emitting energy”

China welcomes the conclusion proposed by the chairman of SBSTA that requested the secretariat to organize a workshop on the topic as above, noting that an informal meeting has been held in Canada last October. China considers that:

1. The workshop should be open to the participation of all parties and should be carried out on an expert level. Financial support should be made available for the participation of Non-annex I parties.
2. The miscellaneous document of the submission from parties should be distributed to all parties when the compiling work finished. Based on the submissions, the Secretariat of UNFCCC should prepare a draft Terms of reference of this workshop, which should be discussed and adopted at the beginning of the workshop.
3. The issue of cleaner energy is far broader than “export ” or “trade”. The scope of the workshop should include not only “export” or “trade”, but also production, transportation and use of energy.
4. The ways to promote the technology transfer from developed countries to developing countries in the area of cleaner energy should also be addressed in the workshop.
5. The workshop may invite some participants from developed countries to make presentations on domestic policies and measures that could promote the use of cleaner energy.
6. All methodological issues concerning the cleaner energy to be discussed in the workshop should not go beyond the framework of the Kyoto Protocol.

PAPER NO. 4: COLOMBIA

**REF: Comentarios Gobierno de Colombia FCCC/SBSTA/L.19**

Por medio de la presente me permito hacer los comentarios del Gobierno de Colombia al documento FCCC/SBSTA/2001/L.19.

Se recomienda a la Secretaria de la UNFCCC que en el taller que se propone realizar en el tema de energía que emite menos GEI, se traten algunos de los temas identificados por los asistentes a la reunión informal del Canadá en Octubre de 2001, entre los cuales están:

- Características de los países que comercian energéticamente (países anexo B, países no Anexo B, países que no son parte de la Convención).
- Mecanismos para manejar y prevenir los desincentivos del uso de energías más limpias, incluyendo temas como provisiones para países que no son parte del Protocolo o de la UNFCCC, reglas de contabilidad o dispensaciones especiales.
- Medidas para incentivar el uso de energías más limpias como son los precios verdes, sistemas de tasas, análisis de ciclo de vida (incluyendo impactos sociales y económicos), subsidios de corta duración e incremento de la concientización, de manera que se mantenga el comercio de energías más limpias para aumentar los beneficios globales ambientales.
- Mecanismos para internalizar las externalidades ambientales en los precios de los energéticos con el fin de viabilizar las energías más limpias que reduzcan las emisiones de los GEI.

PAPER NO. 5: IRAN

**Proposal by  
The Islamic Republic of Iran  
for the workshop on  
Cleaner or Less GHG-Emitting Energy**

**Objectives:**

- \* Identifying the most available, accessible and affordable source/s of clean energy (i.e. natural gas and the renewables), and its role in meeting the Kyoto Protocol targets, sustained economic growth (particularly of the developing countries) and international market growth;
- \* Examination and identification of the obstacles to the production and use of the most available, accessible and affordable source/s of clean energy;
- \* Encouraging further production of clean energy source/s through transfer of affordable clean energy technologies to the developing countries at preferential or affordable rates;
- \* Encouraging wider use of available and affordable source/s of clean energy at the national, regional and international level according to the international market mechanisms and the Kyoto Protocol guidelines;

**Structure:**

- \* Strengthening the capacity of developing country Parties identified in Article 4, paragraphs 8 and 9 of the Convention, for inter alia, improving efficiency in activities relating to cleaner fossil fuels, taking into consideration the need to improve the environmental efficiency of these activities;
- \* Promotion of investment in developing countries, in development, production, distribution and transport of less greenhouse gas-emitting, environmentally sound, energy sources, particularly natural gas;
- \* Cooperation in the field of research, development and use of, renewable energy, including solar and wind energy, in developing country Parties;
- \* Cooperation in the development, diffusion and transfer of less greenhouse gas-emitting advanced fossil-fuel technologies, and/or technologies relating to fossil fuels that capture and store greenhouse gases, and encouraging their wider use as a win-win approach for both the environment and the development, enjoying a good level of practicability; and facilitating the participation of the developing country parties and other Parties not included in Annex I in this effort;

15 February 2002  
The Government of Japan

**Japan's views on the structure and scope of a workshop  
regarding "cleaner or less greenhouse gas-emitting energy"**

**Introduction**

Japan considers that "cleaner or less greenhouse gas-emitting energy" should be encouraged to use widely in order to contribute to reduce global greenhouse gas emissions. Japan welcomes the opportunity to submit views on the structure and scope of a workshop regarding "cleaner or less greenhouse gas-emitting energy".

Japan appreciates the hosting of the informal meeting by the Government of Canada, and believes that "cleaner or less greenhouse gas-emitting energy" is an important topic to further discuss. Japan also welcomes the offer of the Government of Canada to host a workshop on this issue, and would like to present the following comments.

**1. Scope of the workshop**

- Sharing information and exchanging views on methods to promote utilization of "cleaner or less greenhouse gas-emitting energy"
- Discussing global environmental benefits from "cleaner or less greenhouse gas-emitting energy"
- Discussing barriers to introduction and trade of "cleaner or less greenhouse gas-emitting energy"
- Discussing broadly "cleaner or less greenhouse gas-emitting energy" including trade, products, etc.

Japan believes that the workshop should focus on the above matters because it is still premature to discuss methodological issues regarding "cleaner or less greenhouse gas-emitting energy".

**2. Structure of the workshop**

In order to facilitate the understanding of "cleaner or less greenhouse gas-emitting energy", the workshop should provide an opportunity to exchange views, technological knowledge and information. As the first step, it is necessary to accumulate the expertise in this field. Therefore, the workshop should be held at the expert level and participants should include experts from international organizations, private sectors and so on.

Results of the discussion should be compiled in a report and disseminated to the Parties and related organizations.

**Major Environmental, Economic and  
Methodological Considerations to Promote the  
Utilization of Natural Gas as a Cleaner or Less –  
Greenhouse Gas Emitting Energy Source for the  
Twenty-first Century**

A paper for submittal to the proposed  
SBSTA Workshop on Cleaner  
or Less – Greenhouse Emitting Energy  
to be held in Canada

**THE NATIONAL TEAM FOR  
CLIMATE CHANGE  
THE STATE OF QATAR**

**Ministry of Energy and Industry  
P.O. Box 47, Doha, The State of Qatar**



## 1. Introduction

The Subsidiary Body for Scientific and Technological Advice (SBSTA) of the United Nations Framework Convention on Climate Change (UNFCCC) has requested, in its Fifteenth Session held in Marrakesh (Oct. 29 to Nov. 6, 2001), the secretariat to organize a workshop on cleaner or less-greenhouse gas-emitting energy to be hosted by Canada in May, 2002.

Views from the concerned parties are to be compiled by the secretariat and discussed at length in the workshop, thus initiating a negotiation process on this issue which is vital to several countries.

The subject of cleaner or less-greenhouse-gas emitting energy has been discussed in Calgary, Canada in October 3 - 5, 2001. The Calgary meeting generated numerous methodological questions in relation to cleaner or less-GHG-emitting energy trade, namely:

- 1) What are the characteristics of cleaner or less GHG-emitting energy trade and what are the characteristics of Parties that trade in such energy?
- 2) What are the global environmental benefits generated by cleaner or less GHG-emitting energy trade and how can we measure them?
- 3) What are the barriers and disincentives to cleaner or less GHG-emitting energy trade and could they be further amplified by the entry into force of the Kyoto Protocol.
- 4) What actions could be undertaken to remove or attenuate these barriers and disincentives, particularly in the context of the Kyoto Protocol?
- 5) Finally, what incentives could increase cleaner and less GHG-emitting energy trade?

This paper is an initiative by the State of Qatar to the workshop. It contains our views, analytical work and experience relating to the topic, particularly considerations required for the promotion of natural gas as cleaner or less greenhouse energy source. The major issues discussed in the paper are as follows:

- The economic and environmental benefits of natural gas utilization and its importance as an essential component for global energy decarbonization strategies.
- A brief description of The State of Qatar's experience in international trade in natural gas and the domestic environmental implications regarding GHG emissions from the prospective of a developing country engaged in exporting natural gas on a global scale.

- Identify methodological issues related to the subject for further discussions and elaborations.

Throughout this paper, the term “cleaner or less GHG emitting energy” will be referred to as natural gas.

## **2. Future Scenario of Global Energy Demand and the Role of Natural Gas**

- In the reference case projections for the International Energy Outlook 2001 (IEO 2001), world energy consumption is projected to increase by 59% over a 21-year forecast (1999 – 2020). Much of the growth in the worldwide energy is expected in the developing countries.
- Fossil Fuels (oil, gas and coal) will account for 90% of the world's primary energy mix by 2020.
- International trade in energy will increase sharply.
- Natural gas is the fastest growing energy component of primary world energy consumption. Over the IEO 2001 forecast period, gas use is projected to nearly double.
- The natural gas share of total energy consumption is projected to increase from 23% to 28% in 2020.
- Natural gas is expected to account for the largest increment in electricity generation increasing by almost 300% from 2664 TWh in 2000 to 8243 TWh in 2020. It will contribute about 30% of the total global electricity generation compared to 17% in 2000 (IPCC TAR 2001). Combined-cycle gas turbines (CCGT) offer some of the highest commercially available efficiencies (60 – 70%) for power and heat generations. However, coal will remain the major source for electricity generation in 2020 contributing 38%, a value similar to its share in 2000. Oil, nuclear, hydro and renewable energy shares of electricity generation will remain small accounting for 7%, 8%, 15% and approximately 1% of the total production, respectively.
- Gas use in the developing countries is projected to grow at a faster rate than any other fuel category in the IOE 2001 reference case, an average of 5.2% per year compared to 3.7% per year for oil and 3.1% for coal.

### **3. Natural Gas and Climate Change: Environmental and Economic Benefits**

Due to the unique chemical characteristics of natural gas as opposed to other fossil fuels, its utilization allows significant reductions of GHG emissions, thus helping member countries to the Kyoto Protocol to achieve their national emission targets. Its use also has wider economic and social environmental benefits including positive effects related to human health and welfare.

The UN Intergovernmental Panel on Climate Change (IPCC) manuals for National Greenhouse Inventory & Good practices (1996, 2000); and EPA compilation of Emission Factors (1998), EMEP/CORINAIR Emission Inventory Guide books (1996) include compilation of emission factors from fossil fuel combustion by various anthropogenic sources. A study of the literature is essential in order to determine the magnitude of relative emissions by various fossil fuels and the potential emission reductions for various economic sectors if coal and oil fuels were replaced by natural gas. Table 1 provides a comparison of the average emission coefficients for natural gas, coal and oil for various anthropogenic sources of GHGs and criteria pollutants. It is obvious from the Table that the relative emission reduction potentials of natural gas are significant. It is essential, however, that the emission reduction possibilities for various sectors be based on realistic energy demand scenarios and that the extent and impact of the reduction must be looked at closely, particularly with regard to the benefits to annex-B countries' commitment under the Kyoto Protocol, and also the co-benefits to human health and welfare.

In terms of GHG emission reduction potentials, the saving in CO<sub>2</sub> emission from fuel combustion for natural gas compared to coal or oil amounts to 40% and 30% respectively. Reductions in CH<sub>4</sub> emissions ranging between 50% for the manufacturing and construction industries, and commercial / institutional sectors and 98% for the residential, agricultural, forestry and fishing industry are also possible if natural gas were substituted for coal in these sectors (Table 1). In comparison to oil, reduction potentials of approximately 50% are feasible for all sectors except in the manufacturing and construction industries where CH<sub>4</sub> emission appears to increase. In the case of N<sub>2</sub>O emissions, larger reduction opportunities are available for all sectors analyzed (Table 1). These potentials are approximately 80% in the case of natural gas substitution for oil and up to 90% for coal.

The reduction potentials of criteria pollutant emissions for natural gas fuel relative to coal and oil are shown in Table 1. The estimates were based on the assumption that medium sulphur content fuel oil (3% S) and coal (1.5% S, 11.5% ash) were used (Table 1). The data show that the relative reduction potentials of toxic pollutant emissions for natural gas in comparison to coal or oil are highly significant. A reduction potential of up to 50% in NO<sub>x</sub> emissions from all sectors switching from coal to natural gas and between 25 – 50% for those switching from oil, is feasible. Emissions of filterable particulate matter (PM) due to fossil fuel combustion were estimated for the energy and manufacturing construction industries only. The results suggest that reductions of more than 90% are possible if fuel switching to natural gas is achieved. Moreover, the results show that such switching would result in almost complete elimination of SO<sub>2</sub> emissions due to fuel combustion. Lastly, fuel switching to natural gas would significantly reduce NMVOC emissions by at least 75% relative to coal, however, in the case of switching from oil, emissions are of the same order of magnitude. It is quite likely that the reductions in NMVOC and NO<sub>x</sub> emissions warranted by natural gas use in place of coal or oil would certainly result in reduced photochemical oxidants formation in the atmosphere.

In order to fully explore the environmental impact of fossil fuel characteristics and energy mix in terms of GHG and toxic pollutant emissions, we now examine a realistic scenario, published by the IPCC (IPCC TAR 2001, IEA, 1998), for global electricity production in 2020. Using the aggregate emission factors developed in Table 1 and IPCC forecast of energy mix, technology development and global power demand, the likely GHG and toxic pollutant emissions were estimated (Tables 2 and 3). It is clear from the results that natural gas would provide a sizable share of the global future demand of electricity, generated at a significantly higher conversion efficiency, compared to coal and oil. Moreover, the CO<sub>2</sub> emissions per energy unit delivered, in case of natural gas, would be approximately 60% to 130% lower compared to oil and coal respectively (Table 2). In terms of criteria pollutant emissions, the projections in Table 3 clearly show that natural gas utilization in future electricity production would allow significant reductions in SO<sub>2</sub>, PM, NO<sub>x</sub> and NMVOC emissions. This would eliminate millions of tonnes of toxic pollutants, which otherwise would have been emitted into the atmosphere if coal or fuel oil were used instead.

In addition to the climate change mitigation potentials there are substantial co-benefits (ancillary benefits) resulting from increased utilization of natural gas. The co-benefits are broad in spectrum and include benefits to human health due to reduced exposure to criteria and hazardous air pollutants, and decreased negative impacts on materials and crops. Nevertheless, the economic benefits to human health and welfare remain to be determined accurately. They require accounting and assuming an

economic value for the price of alternative fuels (coal and oil) and the non-climate external costs (cost of pollution) in addition to the cost of climate change mitigation. The human health externalities include cost of morbidity and mortality, cost of hospitalization and lost working hours etc.

The current energy related fiscal measures and policies in both Annex 1 and non-Annex 1 countries are distorted and consequently do not clearly reflect the large economic benefits resulting from natural gas utilization. Progressive phasing out of market imperfections e.g. subsidies, fiscal incentives, tax and duty exemptions in all GHG emitting sectors is imperative.

The IPCC estimated that the benefits from reduced air pollution (by converting to natural gas) in USA and Europe could offset between 30% and 100% of the abatement cost.

**Table 1. Estimates of Average Greenhouse Gas and Criteria Pollutant Emissions due to Combustion of Fossil Fuels by Various Anthropogenic Sources and Relative Emission Reductions Warranted by Natural Gas Fuel\***

	CO <sub>2</sub> (t/TJ)			CH <sub>4</sub> (kg/TJ)			N <sub>2</sub> O (kg/TJ)			NO <sub>x</sub> (kg/TJ)			Filterable PM (kg/TJ)			NMVOC (kg/TJ)			SO <sub>2</sub> (kg/TJ)		
	Coal	Oil	NG	Coal	Oil	NG	Coal	Oil	NG	Coal	Oil	NG	Coal	Oil	NG	Coal	Oil	NG	Coal	Oil	NG
Energy Industry	98.3	77.0	56.1	1	3	1	1.4	0.6	0.1	300	200	150	164	99	3.0	5	5	5	1045	1359	0.25
NG Emission Reduction	-43%	-27%	-	0%	-67%	-	-93%	-83%	-	-50%	-25%	-	-98%	-97%	-	0%	0%	-	-100%	-100%	-
Manufacturing Ind. & Const.	-	-	-	10	2	5	1.4	0.6	0.1	300	200	150	-	29	3.0	20	5	5	1045	1359	0.25
NG Emission Reduction	-	-	-	-50%	+150%	-	-93%	-83%	-	-50%	-25%	-	-	-90%	-	-75%	0%	-	-100%	-100%	-
Commercial /Institutional	-	-	-	10	10	5	1.4	0.6	0.1	100	100	50	-	-	-	200	5	5	1045	1359	0.25
NG Emission Reduction	-	-	-	-50%	-50%	-	-93%	-83%	-	-50%	-50%	-	-	-	-	-98%	0%	-	-100%	-100%	-
Residential Sector	-	-	-	300	10	5	1.4	0.6	0.1	100	100	50	-	-	-	200	5	5	1045	1220	0.25
NG Emission Reduction	-	-	-	-98%	-50%	-	-93%	-83%	-	-50%	-50%	-	-	-	-	-98%	0%	-	-100%	-100%	-
Agriculture/ Forestry/ Fishing (Stationary)	-	-	-	300	10	5	1.4	0.6	0.1	100	100	50	-	-	-	200	5	5	-	-	-
NG Emission Reduction	-	-	-	-98%	-50%	-	-93%	-83%	-	-50%	-50%	-	-	-	-	-98%	0%	-	-	-	-

\* Average Coal S Content = 1.5 (medium), Fuel oil 3% (medium). Coal ash content 11.5 (IPCC, 1996, EPA 1998).

**Table 2. Projected Global Electricity Production, Fuel Consumption, CO<sub>2</sub> Emission and Estimates of Conversion Efficiencies and Emissions per Energy Produced in 2020**

	Natural Gas	Coal	Oil
Electricity Generation <sup>(1)</sup> (TWh).....	8,243	10,296	1,941
Fuel Consumption <sup>(1)</sup> (EJ).....	62	106	18
CO <sub>2</sub> Emissions <sup>(1)</sup> (MtC).....	946	2,723	350
Conversion Efficiency (KWh/GJ).....	133	97	108
Conversion Efficiency Relative to Natural Gas	100%	73%	81%
CO <sub>2</sub> Emissions per KWh (gC/KWh) .....	115	264	180
Emissions Relative to Natural Gas.....	100%	230%	157%

<sup>(1)</sup> IPCC TAR (2001)

**Table 3. Projected Global Emissions (Uncontrolled) of Criteria Pollutants due to Electricity Production in 2020 \***

POLLUTANT	NG	COAL	OIL
Total SO <sub>2</sub> Emissions (Kt SO <sub>2</sub> ).....	15.5	110,770	24,460
gSO <sub>2</sub> /KWh.....	2 x 10 <sup>-3</sup>	10.8	12.6
Total Filterable PM (Kt PM) .....	186	17,380	1,780
gPM/KWh.....	22 x 10 <sup>-3</sup>	1.7	1.0
Total NO <sub>x</sub> Emissions (Kt NO <sub>2</sub> ) .....	9,300	31,800	3,600
gNO <sub>2</sub> /KWh .....	1.0	3.1	1.9
Total NMVOC Emissions (Kt NMVOC) .....	310	530	90
gNMVOC/KWh ....	37 x 10 <sup>-3</sup>	51 x 10 <sup>-3</sup>	46 x 10 <sup>-3</sup>

\*Based on EFs, Fuel Consumption Statistics and assumptions in Table 1.

## 4. Natural Gas and Global LNG Trade

Natural gas provides a competitive advantage to some countries. Large proven reserves are present in countries like Russia, Iran, Canada and Qatar. Natural gas has two modes of transport: pipeline in regional markets and liquefied natural gas (LNG) by ships for global markets.

The data in Tables 4 and 5 show the global pipeline, LNG trades and major proved reserves. The following conclusions can be made:

- The regional trade of natural gas by pipeline and LNG exports is very small and amounts to about 5% of the total global fossil fuel consumption. It constitutes about 21.5% of the total natural gas consumed annually.
- Currently the European Union is the largest beneficiary from pipeline trade of natural gas produced mainly by the Russian Federation, Algeria and other Northern European countries.
- Based on volume of export Indonesia, followed by Algeria, Malaysia, Qatar, Australia and Brunei are the major global exporters of LNG. The major beneficiaries are Japan (50%), followed by South Korea and Taiwan.
- Approximately 80% of the total natural gas produced is consumed locally by the producer countries. The major countries in this category are: USA, Russia, Europe and the Middle Eastern countries.
- The major reserves of natural gas are in Russia (38%), followed by Iran (15%) and Qatar (10%).
- Annex B and non-annex B countries of Kyoto Protocol are engaged in international trade of natural gas. Table 5 shows the present annex B vs. non-annex B countries in KP with respect to their position in the natural gas trade (exporters vs. importers).



**Table 4. Global Trade of Natural Gas and LNG Relative to Overall Consumption and Proved Reserves in Major Exporting Countries (Yr 2000)\***

Export / Import	Billion m <sup>3</sup>	(%) of Total	Proved Reserves Trillion m <sup>3</sup> 2000	Share of Total Reserve (%)
Global Annual Consumption of Natural gas (+LNG) 2000	2405	<u>100%</u>	150	-
Global Fossil Fuel Consumption in 1998 (EJ)	318.5	-	-	-
Global share of Natural Gas (%)	26.5% (Coal 29%, Oil 44.5%)			
Global share of Pipeline Trade	4.2% (16% of global NG consumption)			
Global share of LNG Trade	1.5% (5.5% of global NG consumption)			
<b>Global Pipeline Export</b>	<b>389</b>	<b>100%</b>		
Exporter: Canada Importers: USA	101.7	(26%)	1.73	1%
Exporter: Europe Importers: Europe	106.7	(27%)	5.22	3%
Exporter: Russia Importers: Europe	130.3	(33%)	56.7	38%
Exporter: Algeria Importers: Europe	35.3	(9%)	4.5	3%
<b>Global LNG Trade</b>	<b>137</b>	<b>100%</b>		
Exporter: Indonesia Importers: Japan, S.Korea, Taiwan	35.7	(26%)	2.05	1%
Exporter: Algeria Importers: Europe	26.0	(19%)	-	-
Exporter: Malaysia Importers: Japan, S.Korea & Taiwan	21.0	(15%)	2.3	1%
Exporter: Qatar Importers: Japan, S.Korea, USA & Spain	14.04	(10%)	14.4	10%
Exporter: Australia Importers: Japan, S.Korea	10.11	(7%)	1.3	1%
Exporter: Brunei Importers: Japan, S.Korea	8.8	(6%)	0.4	-
Other Traders (Nigeria, Oman, Trinidad & USA)	5.6 7.6	(4%) (5.5%)	0.4 -	- -
USA	-	-	4.7	2%
Iran	-	-	23.0	15%
Saudi Arabia	-	-	6.0	4%
U.A.E	-	-	6.0	4%

**Table 5. Major Natural Gas Traders**

<u>EXPORTERS OF NATURAL GAS</u>		<u>IMPORTERS OF NATURAL GAS</u>	
		<b>Annex B parties</b>	<b>Non-annex B parties</b>
<b>Annex B countries</b>	Canada →	USA (non KP party)	
	Russian Federation →	EU	
	EU →	EU	
	Australia →	Japan	S. Korea
<b>Non-annex B parties</b>	Algeria →	EU	
	Indonesia →	Japan	S. Korea, Taiwan
	Malaysia →	Japan	S. Korea, Taiwan
	Qatar →	Japan EU USA	S. Korea, India Kuwait, UAE
	Brunai →	Japan	S. Korea

## 5. Qatar's Experience in Natural Gas Trade

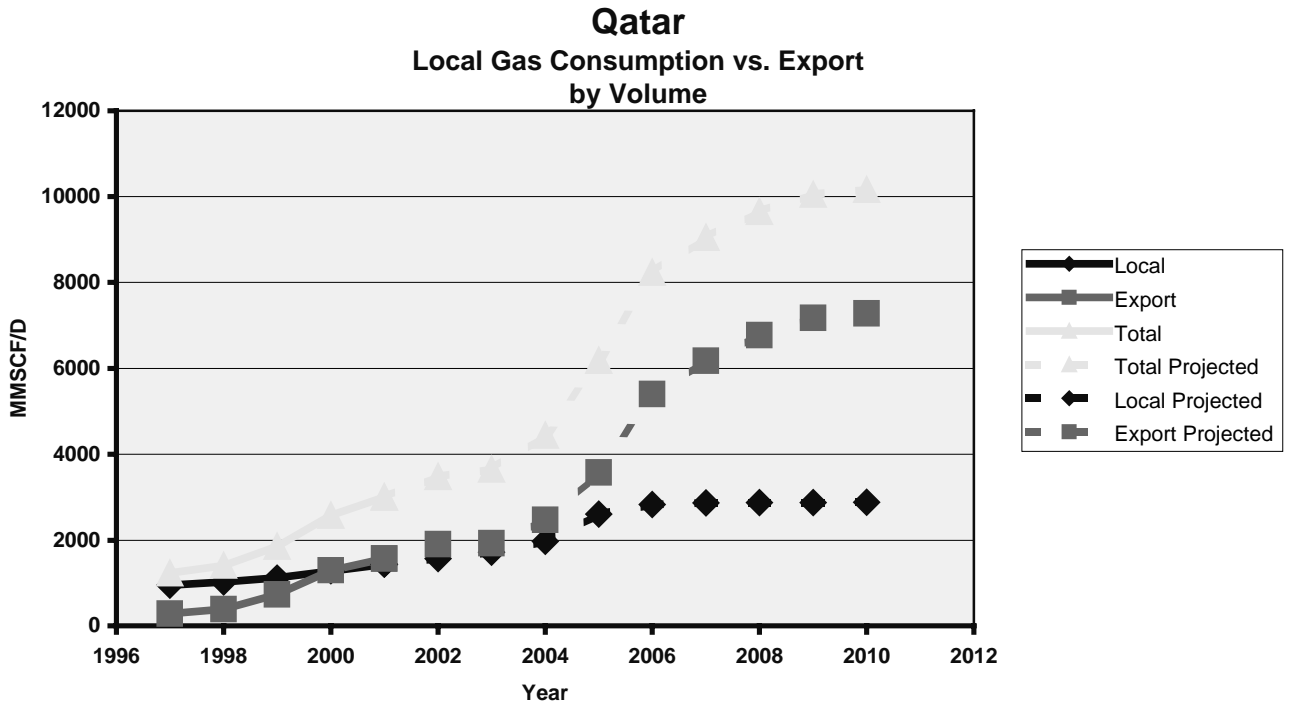
Qatar is a developing country with a comparative advantage to supply global markets with cleaner or less GHG emitting energy source (i.e. natural gas). The North Field, being the largest non-associate gas field in the world, can be tapped to contribute to the solution of the climate change issue, and improve human health and welfare conditions.

Qatar is an exporter of natural gas, primarily as LNG. Lean gas production and consumption are integrated with local, regional and global markets. Table 6 and Graph (1) provide data on Qatari local consumption versus export of natural gas. Exports are projected to grow from 23% to 72% of total gas production from 2002 to 2010.

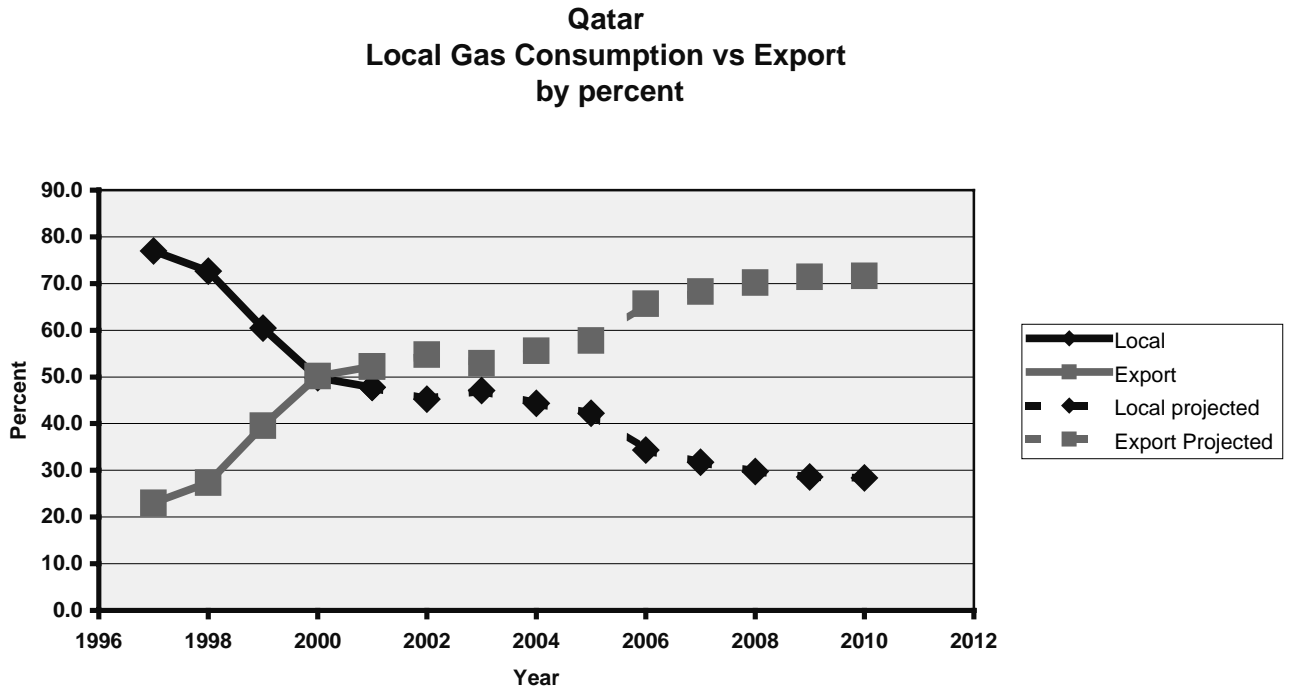
**Table 6. Qatar's Historical Production/Consumption and Export of Natural Gas (MMSCF/D)**

Year	Total Production	Total Local Consumption	% Local Consumption	Total Export	% Export
1997	1231	947	77.0	284	23.0
1998	1409	1024	72.7	385	27.3
1999	1854	1120	60.4	733	39.6
2000	2577	1284	49.8	1293	50.2
2001	3004	1435	47.8	1569	52.2
2002	3482	1575	45.2	1906	54.8
2003	3649	1719	47.1	1930	52.9
2004	4441	1971	44.4	2470	55.6
2005	6185	2609	42.2	3575	57.8
2006	8229	2828	34.4	5401	65.6
2007	9041	2867	31.7	6174	68.3
2008	9647	2873	29.8	6774	70.2
2009	10047	2873	28.6	7174	71.4
2010	10157	2883	28.4	7274	71.6

Graph (1)



Graph (2)



Pipelines are the mode of transport for natural gas export to regional markets (UAE, Kuwait, Bahrain) while trading with global markets is accomplished through LNG carriers. Trade partners are Annex B countries: Japan, EU, USA, non-annex B countries: S. Korea, India, UAE, Kuwait & others.

Qatar's natural gas trade has the following features:

- 1) Qatar is a developing export-orientated country trading in a cleaner energy with both annex I and non-annex I countries of the convention and the Protocol.
- 2) Exported natural gas is consumed in electricity generation sector.
- 3) An increase in natural gas export will increase GHG emissions in Qatar while importing countries will achieve significant reduction in their GHG and toxic air pollutant emissions. However, a shift of fossil fuel to natural gas will result in both a net reduction of the overall global GHGs emission and improved human health and welfare conditions. CO<sub>2</sub> emission per capita is expected to increase in Qatar due to international gas trade.
- 4) The majority of the natural gas contracts are long term (20 – 25 years duration). Medium term contracts and spot market dealings are emerging.
- 5) The pricing formula of natural gas is indexed to oil and global market conditions, i.e. GHG emissions and criteria pollutants are not accounted for in these formulas. This in part is due to the policies and measures in developed countries which are inadequate to reflect the relative benignity of natural gas compared to coal and oil.
- 6) Qatar belongs to parties to the convention identified in Paragraph 4.8 of the convention: "Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products." The Kyoto Protocol provides for special consideration for these countries, particularly with regard to the response measures from annex I parties. Among the issues to be considered are funding, insurance and transfer of technology (3.14 of the Kyoto Protocol).

## 6. A Methodological Note

The ultimate objective of the UN Framework Convention on Climate Change (UNFCCC) is the stabilization of GHG concentrations in the atmosphere at a level that would prevent projected dangerous anthropogenic interference with the climate system. It follows, therefore, actions and measures that lead to reductions of GHG emissions should be encouraged. A viable measure in this regard would be to enhance the production, trade and utilization of natural gas, as energy source on a global scale. Due to its unique chemical characteristics, natural gas utilization for energy, allows significant reductions of GHG emissions, thus helping member countries to the Kyoto Protocol to achieve their national emission targets. Moreover, its increased use will have wider economic and social environmental benefits which are in line with the principles of sustainable development e.g. improved human health and welfare.

Natural gas has been recognized in Kyoto Protocol negotiations as part of the solution to stabilize GHG in the atmosphere. The Marrakesh Accords contains decisions supporting promotion of natural gas. Implementation of articles 4.8 and 4.9 of the convention and articles 3.2 and 3.14 of the Kyoto Protocol has the following Paragraphs:

*Paragraph (31):* “Encourages Annex II Parties to promote investment in, and to support and cooperate with, developing country Parties in the development, production, distribution and transport of indigenous, less greenhouse gas-emitting, environmentally sound, energy sources, including natural gas, according to the national circumstances of each of these Parties;”

*Paragraph (29):* “Encourages Parties to cooperate in the development, diffusion and transfer of less greenhouse gas-emitting advanced fossil-fuel technologies, and/or technologies relating to fossil fuels, that capture and store greenhouse gases, and requests Annex II Parties to facilitate the participation of the least developed countries and other non-Annex I Parties in this effort.”

The IPCC Assessment Reports have recommended increased use of natural gas over other fossil fuels as a way to reduce greenhouse gas emissions.

Natural gas will play a critical role as a bridge between fossil fuels and carbon-free energy sources in the future.

Reducing global emissions will require a combination of actions including the shifting of primary energy mix toward less-carbon intensive sources measured on a full cycle basis. Table 7 shows CO<sub>2</sub> emissions from producing and burning a quad or 1 EJ of fossil fuel:

**Table 7. Carbon Dioxide Emissions from Producing and Burning (one) EJ of Fossil Fuel\***

	Fuel Used EJ	CO <sub>2</sub> (Mt)
<b>Natural Gas</b>	0.074	4.3
Extraction/Processing	0.034	2.0
Pipeline Transport		6.3
Subtotal	1.000	58.3
CO <sub>2</sub> released when fuel burned		64.6
Total		
<b>Oil</b>	0.035	2.9
Extraction	0.027	2.2
Transport (crude)	0.054	4.5
Refining (to diesel)	0.026	2.1
Transport (refined)		11.7
Subtotal		82.7
CO <sub>2</sub> released when fuel burned	1.000	94.4
Total		
<b>Coal</b>	0.015	1.2
Surface mining	0.026	2.7
Processing	0.026	2.1
Transport		6.0
Subtotal	1.000	102.0
CO <sub>2</sub> released when fuel burned		108.0
Total		

\* (SEI, 1990)

Three points worth noting:

1. Natural gas is the lowest CO<sub>2</sub> emitting fossil fuel on a full cycle basis, 32% less than oil and 41% less than coal.
2. Natural gas is the highest CO<sub>2</sub> emitting fuel at the extraction/processing state [4.3 MT natural gas vs. 2.9 MT for oil and 3.9 MT for coal].
3. CO<sub>2</sub> emissions associated with natural gas are primarily released when fuel burns. (10% at production and 90% at consumption.) In addition to CO<sub>2</sub>, Methane releases due to venting, flaring and fugitive emissions and leaks adds to the GHG emissions at the production side. As a rule of thumb, one may say (15 – 20%) of GHG emissions arise from production, processing and transport to consumers, while emission from consumption makes up the remaining percentage (80 – 85%). Emissions at the production stage of natural gas vary with composition of gas, sweet or sour gas, position in lifetime of production of the pool, and technology used.

The expanded use of natural gas will benefit all the stakeholders of the natural gas chain, producers and consumers, in achieving global environmental objectives. Legally, under a voluntary assent voting rule, global environmental regulation instruments like the Kyoto Protocol must follow a “Beneficiaries Pay Principle” rather than conventional doctrine of “Pollution Pay Principle” associated with the local environmental regulations (Wiener, 1999). Accordingly cleaner or less GHG emitting energy sources must be recognized and given a special consideration. With respect to international trade, GHG emissions for natural gas exporters will increase while those for natural gas consumers will decrease. The net impact is a significant global GHG decrease.

Many developed countries would fail to achieve their emission target reductions solely on the basis of domestically implemented policies and measures. On the other hand, developing countries need methods to promote the use of cleaner energy in order to satisfy growing demand and improve environmental conditions (electricity CO<sub>2</sub> emission in developing countries).



In view of the above, we urge the global community to consider the following proposal:

Initiation of a credit-based mechanism within the Kyoto Protocol regime for natural gas producers to offset the GHG savings of gas consumers due to international trade.

We may here suggest the following principle on this credit-based mechanism:

**A calculated method should be required to distribute credit between producers and consumers of natural gas, based on emission reductions attributed to fuel switching resulting from increased international trade.**

In this proposal the credit would be defined as the savings, or net gain, of GHG from using natural gas in place of an alternative fuel, for which gas will substitute over the life cycle of both fuels on an annual basis. These savings could be divided between both producer and consumer of natural gas on a percentage basis of GHG emissions (i.e. 15% to producer and 85% to consumers). A credit system has to be implemented within the flexibility mechanism of the Kyoto Protocol. This principle could also be expanded to reflect the ancillary benefits due to health impacts. Such a methodology will require a special accounting rule to capture GHG emissions, and credits for reductions, based upon emission inventories in specific countries involved with the international trade of natural gas.

Further elaborations on this methodology is needed in the upcoming workshop.

## **7. Conclusions**

- 1) Natural gas has the potential to play a central role in the quest to stabilize GHG in the atmosphere. It has been recognized as a cleaner fuel in the Marrakesh Accord.
- 2) International trade in natural gas should be given a special consideration with respect to the rules of the Kyoto Protocol, as the negative impacts to producers of natural gas will be significant if no new methodology is adopted.
- 3) Natural gas infrastructure projects must be considered as a “clean“ development mechanism, as the result will increase natural gas consumption in developing countries.

- 4) A new formula must be recognized and promoted in order to realize an economic value for the superior environmental qualities of natural gas (internalize cost).
- 5) Qatar is a developing country grouped with the countries defined in Paragraph 4.8 of the Climate Change convention and 3.14 of The Kyoto Protocol. It will be the largest LNG exporter in the next few years. Paradoxically, GHG emissions will increase significantly in Qatar as we supply cleaner fuel to international markets.

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PAPER NO. 8: SPAIN

(ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES, AND BULGARY, CROATIA, CYPRUS, CZECH REPUBLIC, ESTONIA, LATVIA, LITHUANIA, POLAND, ROMANIA, SLOVAKIA, SLOVENIA)



**SUBMISSION BY SPAIN ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES , AND BULGARY, CROATIA, CYPRUS, CZECH REPUBLIC, ESTONIA, LATVIA, LITHUANIA, POLAND, ROMANIA, SLOVAKIA, SLOVENIA**

**BRUSSELS, 18 FEBRUARY 2002**

**UNFCCC WORKSHOP ON CLEANER OR LESS GHG-EMITTING ENERGY**

Spain, on behalf of the European Community and its Member States, and Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, welcome the opportunity to submit their views on the objectives and scope, structure and timing of a future UNFCCC workshop on “cleaner or less GHG-emitting energy”, as requested by SBSTA at its 15th session.

**Introduction**

At the 2nd part of the 6th session of the Conference of the Parties, Canada offered to host an informal meeting on cleaner or less GHG-emitting energy trade. The COP took note of this offer and invited the Government of Canada to report on the outcome of such meeting in the next SBSTA session.

The SBSTA at its 15th session took note of the report by the Government of Canada on the outcome of the “Cleaner Energy Meeting”, held at Calgary from 2 to 5 October 2001, and requested the UNFCCC Secretariat to organize a workshop on this subject under the guidance of the SBSTA Chairman. The SBSTA accepted the offer of Canada to host such a workshop.

## **EU views on the objectives and scope of the workshop**

The underlying principle of the ‘IPCC Guidelines for National Greenhouse Gas Inventories’, adopted by the COP at its 3rd session as the methodologies for estimating anthropogenic emissions by sources and removals by sinks, is that greenhouse gas emissions shall be allocated to the Party where they arise. The same principle is reflected in Annex B of the Kyoto Protocol. There are many products that primarily go for export and emissions associated with producing them are to be accounted in the national inventory of the exporting country.

The EU and other Parties mentioned above are convinced that sound energy policies are key in reducing greenhouse gas emissions. However, we would like to emphasize that the proposal on “cleaner or less GHG-emitting energy” has to be reviewed under the agreed framework of the Kyoto Protocol and the Marrakech Accords.

The EU and other Parties mentioned above see the need to broaden the scope of the pro-posed workshop and to highlight the importance of the numerous issues raised at the in-formal meeting organized by Canada in October 2001 on cleaner energy. We believe that the UNFCCC workshop should seek to address any issues related to cleaner energy within the framework of the Kyoto Protocol and the Marrakech Accords. It should therefore be entitled “UNFCCC workshop on methodological issues raised by the promotion of cleaner energy in the framework of the Kyoto Protocol” and it should explore in more detail the nature of the issue, the energy sources and economic benefit, and its wider implications for Parties to the UN Framework Convention on Climate Change and the Kyoto Protocol. In particular, it should focus on the methodological issues and the specific instruments in relation to the promotion of cleaner energy.

Therefore, we consider that the workshop should address, inter alia, the following topics:

1. Promotion of cleaner or less GHG-emitting energy in the context of the implementation of the Kyoto Protocol through:
  - (a) the implementation of policies and measures, including ‘best experiences’ to promote the uptake of cleaner energy:
    - (i) life cycle analysis, including social and economic impacts;
    - (ii) internalisation of external costs and benefits;
    - (iii) progressive reduction or phasing out of counterproductive market imperfections, such as fiscal incentives, tax and duty exemptions, and subsidies to fossil fuels;
    - (iv) implementation of ‘green pricing’, ‘green certificates’ and environmentally sound taxation systems;
    - (v) assessment of ancillary benefits;
    - (vi) public awareness-raising by education and information campaigns.
  - (b) the implementation of project-based mechanisms of the Kyoto Protocol ;
2. The legal, political and other implications of the Canadian proposal on cleaner energy need to be addressed in order to:
  - (a) ensure the compatibility with the reporting and accounting rules established under the UN Framework Convention on Climate Change and the Kyoto Protocol;
  - (b) consider the potential links with the treatment of other export activities, e.g. of environmentally sound products;
3. Actual and potential future role of different methods to produce cleaner energy:
  - (a) renewable energy production, such as:
    - (i) hydropower,
    - (ii) wind energy,

- (iii) solar energy,
- (iv) biomass,
- (v) tidal energy,
- (vi) geothermal energy;
- (b) cleaner and more efficient energy production, such as:
  - (i) co-generation,
  - (ii) fuel cell technology,
  - (iii) combined cycle.

### **Structure**

The EU and other Parties mentioned above stress the need to have a geographically and technically well-balanced discussion through the participation of both experts in cleaner energy and government representatives involved in the climate change process.

The workshop should be organised within the following framework:

- (i) The workshop should last 2/3 days.
- (ii) Sessions would comprise one(two) keynote speech(es) and several presentations followed by a discussion period.
- (iii) Be carried out at an expert level.
- (iv) Participation should be limited to invitations based on nominations by the SBSTA Chairman:
  - Parties;
  - universities and researchers;
  - international organizations such as the International Energy Agency, the Organization for Economic Cooperation and Development, the Intergovernmental Panel on Climate Change, and the Energy charter secretariat;
  - private sector, stakeholders and non-governmental organizations should be invited to make presentations on their views, analytical work and/or experiences on the above mentioned topics.

### **Timing**

The SBSTA at its 16th session should consider the terms of reference of the workshop based on the views provided by Parties.

PAPER NO. 9: UZBEKISTAN

**VIEWS FROM REPUBLIC OF UZBEKISTAN**

**" The proposals on cleaner or less greenhouse gas-emitting energy "**

**(Item 7 of Summary table of upcoming deadlines for the submission of views by Parties)**

Uzbekistan supports necessity of holding of this meeting and proposes to involve to more active participation of developing countries and transition economy countries.

Participants from these countries can present their reports about successful experience of use in these countries of cleaner energy and renewed sources of energy, such as hydraulic power, solar and wind energy, geo-thermal energy, biogas and wastes, and also about those sources and connected to them technologies, which have reached or are close to achievement of a application stage in industry.

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