13 June 1997

# THE LISBON DECLARATION ON CO2 REDUCTIONS

**Submission of the Insulation Industry to the Conference of Contracting Parties of the UN International Framework Convention on Climate Change. Kyoto, December 1997**

Since the Second Assessment Report of the International Panel on Climate Change (IPPC) there can no longer be any real doubt about the impact of greenhouse gas emissions on the global environment. The greenhouse effect, in particular from $CO_2$ emissions, requires urgent action. Space heating and cooling of buildings in both Western Europe and North America are major contributors to $CO_2$ emissions.

One of the most efficient and quickly achievable means of cutting $CO_2$ emissions is to reduce energy use. In the residential and commercial building sector, the most effective energy saving can be accomplished through the use of a readily available energy efficiency technology - thermal insulation. Thermal insulation simply reduces the transfer of heat (and cold) through building structures or envelopes. Thermal insulation not only reduces energy use and therefore $CO_2$ emissions (see tables hereafter) but in addition the right insulation products also provide thermal comfort, acoustic insulation and fire protection. The same benefits hold true for the industrial/manufacturing sector.

The following tables give an indication of the massive use of energy for space heating and of its corollary, i.e. the massive potential for savings.

Table 1 summarises the energy savings already realised in the United States.

| | | ENERGY USE (Million GJ[1] & Quadrillion Btu) | | | |
|---|---|---|---|---|---|
| | | No insulation | Baseline (existing) | Savings | % Savings |
| **Residential** | **GJ** | 21,532 | 10,550 | 10,982 | 51% |
| | **Btu** | 20.41 | 10.00 | 10.41 | 51% |
| **Commercial** | **GJ** | 8,662 | 7,069 | 1,593 | 18% |
| | **Btu** | 8.21 | 6.70 | 1.51 | 18% |
| **Residential & Commercial** | **GJ** | 30,194 | 17,619 | 12,575 | 42% |
| | **Btu** | 28.62 | 16.70 | 11.91 | 42% |

(Source: "Green and Competitive: Energy, Environmental, and Economic Benefits of Fiberglas and Mineral Wool Insulation Products" by Energy Conservation Management, Inc., et al, June 1996.)

[1] Millions of Giga Joules, $10^{15}$ J.

Table 2 illustrates the potential for reducing carbon dioxide emissions ($CO_2$) if all American homes were to be insulated to the Council of American Building Official's 1992 Model Energy Code, a recognised minimum energy efficiency code in the United States.

| | | CARBON DIOXIDE Million Tonnes & Billion Pounds | |
|---|---|---|---|
| | | Existing | Additional Potential |
| Residential | Million Tonnes | 612 | 113 |
| | Billion Pounds | 1,347 | 249.2 |
| Commercial | Million Tonnes | 96 | 16.4 |
| | Billion Pounds | 211 | 36.1 |
| Industrial | Million Tonnes | Not calculated | 3.7 |
| | Billion Pounds | Not calculated | 8.2 |
| TOTAL | Million Tonnes | 708 | 133 |
| | Billion Pounds | 1,558 | 293.5 |

(Source: "Green and Competitive: Energy, Environmental, and Economic Benefits of Fiberglas and Mineral Wool Insulation Products" by Energy Conservation Management, Inc., et al, June 1996.)

Similarly for Europe, households account for a quarter of the $CO_2$ emissions; with space heating accounting for 60-80% of these emissions. As illustrated in Table 3, there is an annual saving potential of approximately 310 million tonnes of heating-related $CO_2$ emissions in Europe which could be realised by the application of state-of-the-art thermal insulation.

| Possible reduction of $CO_2$ emissions caused by heating by means of better building insulation | | | | | |
|---|---|---|---|---|---|
| EURIMA Countries | Actual emissions million t | | Possible reduction | | |
| | Total | Heating | Million t | % Total | % Heating |
| Austria | – | 21 | 10 | – | 48 |
| Belgium | 112 | 33 | 22 | 20 | 67 |
| Denmark | 64 | 12 | 3 | 5 | 25 |
| Finland | 65 | 12 | 1 | 2 | 8 |
| France | 280 | 55 | 36 | 13 | 65 |
| Germany | 743 | 150 | 100 | 13 | 67 |
| Ireland | 27 | 7 | 5 | 18 | 71 |
| Italy | 360 | 36 | 18 | 5 | 50 |
| Netherlands | 167 | 40 | 27 | 16 | 68 |
| Norway | 35 | 3 | 1 | 3 | 33 |
| Spain | 186 | 27 | 13 | 7 | 50 |
| Sweden | 93 | 20 | 2 | 2 | 10 |
| Switzerland | 42 | 17 | 11 | 26 | 65 |
| Turkey | 186 | 69 | 17 | 9 | 25 |
| UK | 542 | 75 | 37 | 7 | 49 |
| TOTAL | (~3,000) | (~600) | (~310) | (~10) | (~50) |

(Source: "Thermal Insulation Means Environmental Protection", Study by the European Insulation Manufacturers Association (EURIMA), 1990.)

If one calculates the potential for improved insulation in the buildings sector alone in Europe and the United States, a reduction of 450 million tonnes of $CO_2$ is attainable on an annual basis.

**Justification for Use of Thermal Insulation**

One main advantage of thermal insulation is that it represents proven technology combined with a well established manufacturing base and sound installation techniques. The use of thermal insulation represents good business practice; and is a prime example of a 'no regrets" policy which employs a technology that pays for itself in terms of reduced energy costs and increased environmental benefits. In addition, the benefits from insulation far outweigh the cost of production with a ratio of energy savings to energy investment of 12 to 1 per year. This means that for every Joule or Btu invested in the manufacture of thermal insulation, 12 Joules or Btu in energy saving is realised in every year of service.

Despite the many and considerable benefits that accrue, there are a number of challenges in providing adequate levels of thermal insulation -none of them however are of a technical nature. First, many decision makers are poorly informed about the benefits of improved insulation and are thus often short of immediately available funds for capital investment. Second, in many countries, building energy codes or regulations are not efficient and often only apply to new constructions or, in some cases, there are no energy codes at all. Third, building codes are frequently poorly enforced. Finally, most homes represent existing house stock, and insufficient attention is paid to thermal insulation needs when renovating the dwellings.

All these challenges can be remedied by the application of available insulation technology, the implementation of good standards, economic analyses and incentives. The Kyoto Conference can agree binding commitments by industrialised countries in the following areas:

* quantitative $CO_2$ reductions for the next decade in respect of space heating and cooling;

* the establishment of ongoing education campaigns for purchasers of new and existing homes, as well as for the financial community;

* the implementation of appropriate building energy codes which recognise the environmental benefits of energy reduction for both new construction and renovation work;

* the enforcement of building energy codes;

* the provision of tax incentives for energy efficiency capital investment directed towards first-time home buyers.

**Feasibility**

The manufacturing and installation processes of insulation are well known, and at once require no expensive research. More intensive use of thermal insulation can begin today, giving immediate and long-lasting results for the entire lifetime of a building. The use of thermal insulation has no negative impact on the competitiveness of national industry. In fact, insulation has a positive effect on the balance of payment.

**Financial implications**

The proper use of thermal insulation for new buildings as well as the retro-fitting of existing buildings increases their value. As such, thermal insulation represents a capital gain for the home or building owner. As for public costs, little is required from the public purse other than tax incentives, which will obviously be limited.

**Joint implementation**

High on the agenda for the Kyoto negotiations is the joint implementation of the Treaty. In this respect, the Kyoto Conference presents a valuable opportunity for thermal insulation. The quality of building stock in Central and Eastern Europe is poor, much of which is in need of improvement and considerable renovation. Joint implementation by the EU together with Central and Eastern Europe can be targeted towards thermal insulation with relative ease. Similarly, the opportunity exists for joint implementation by the United States and other nations.

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Talking Pts

# TALKING POINTS: EVOLVING U.S. POLICY ON CLIMATE CHANGE

## BACKGOUND

**Since the Denver Summit and the UN Special Session on Rio, U.S. policymakers have focused on climate change policies and how to move toward successful, longterm implementation of the UN Framework Convention on Climate Change (UNFCCC), given the current negotiations on a protocol to the Convention that would be signed in Kyoto in December 1997. The highlevel examination of current and prospective U.S. policies that is underway clearly presages modifications to the U.S. position announced in January 1997. We want to keep our major international partners informed and impress upon them the importance of this policy process. One important element in the now-public debate on this issue is, of course, the Byrd Resolution, which passed the U.S. Senate 95-0. As the Senate vote underscores concerns of many U.S. citizens and interests groups, it must also be taken into account as we proceed, but it is only one of many factors under consideration.**

## TALKING POINTS

- **The United States is committed to the implementation of the UNFCCC. To achieve effective implementation, any protocol agreed to in Kyoto must be workable and incorporate commitments from all parties to the Convention.**
- **For any protocol to be workable, the U.S. must have a reasonable expectation of securing Senate ratification.**
- **In this context, I note a recent nonbinding resolution unanimously enacted by the Senate, which stated the Senate's belief that the United States should not sign a new climate change agreement unless that instrument mandates "new specific scheduled commitments to limit or reduce greenhouse gas emissions" for developing country parties "within the same compliance period." Our approach to the resolution has been to focus on its "spirit" -- its premise that a global solution to the problem of climate change must involve concerted actions by both developed and developing countries. This is the policy that the U.S. has articulated since the current process began.**
- **In light of the above, a White House-led review of these negotiations has recently underscored that the proposals the United States has currently put on the table -- elaborating Article 4.1 commitments, Annex B, and evolution -- reflect the minimal appropriate level of action.**
- **In the months between this session and our next meetings in October, the U.S. Government will be looking at these issues -- along with obligations to be assumed by developed countries -- to determine whether additional initiatives would be appropriate.**
- **We will keep you informed as we develop our positions on these issues.**

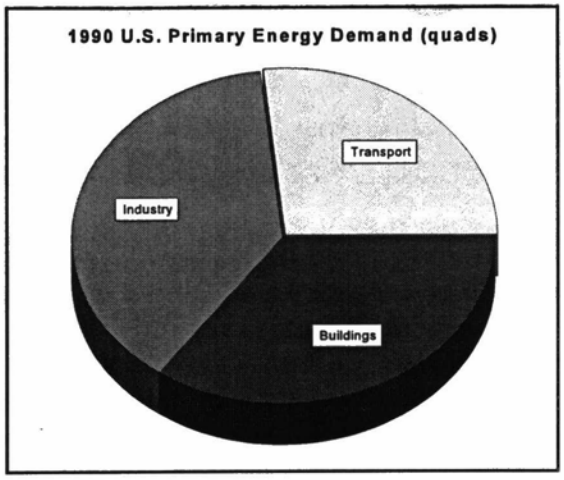
# DISCUSSION PAPER

# A TECHNOLOGY APPROACH

# TO ADDRESSING GLOBAL CLIMATE CHANGE

July 28, 1998 Draft

## PROFILE OF U.S. CARBON EMISSIONS BY INDUSTRIAL SECTOR

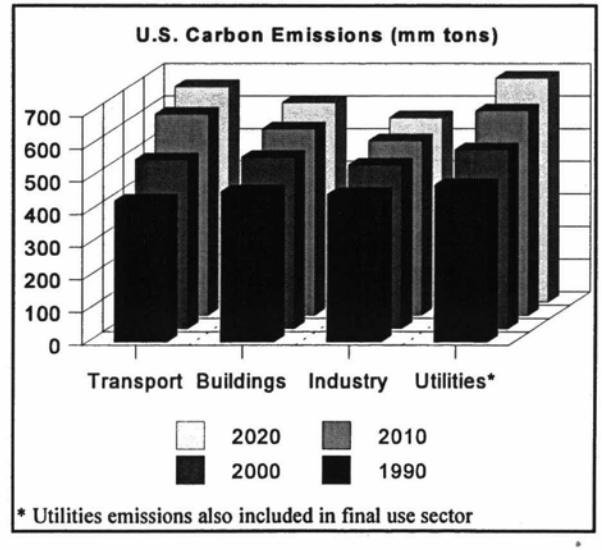



# Energy Profiles

- Three sectors each account for approximately one-third of U.S. primary energy demand — transportation, commercial and residential buildings, and industry
- The electric utility sector supplies about one-third of this demand, virtually all in the buildings and industrial sectors, and consumes fuels to generate that power. In the buildings sector, two-thirds of the energy usage is from electricity, and in industry the share is just over 10%
- Growth in U.S. energy consumption changed dramatically after the 1973 energy crisis, but is projected to continue steadily in the absence of new policies:
  - — the 1960s +52%
  - — the 1970s +14%
  - — the 1980s +11%
  - — the 1990s +12% (already +9% by 1997)
  - — the 2000-2010 decade +12%
  - — in total, 2010 will be 26% above 1990

# Carbon Emissions Trends — 1990 - 2020

- The profile in U.S. carbon emissions parallels the pattern of energy demand — the three sectors, transportation, buildings, and industry, each account for approximately equal shares
- Electric utility emissions in the chart at the right are double-counted in the end-use sector in which the electricity is used — and can only be reduced by either reducing end-use electricity demand or by switching to lower carbon content fuels
- Growth projections also parallel the pattern of energy growth. DOE's Energy Information Administration (EIA) projections show:
  - — Total emissions up 28%, or 377 million tons, from 1990 to 2010
  - — Transportation up 43%, or 184 million tons
  - — Buildings up 24%, or 111 million tons
  - — Industry up 18%, or 82 million tons
  - — Utilities, included in the other sectors, up 30%, or 146 million tons



## LONG-TERM TECHNOLOGY STRATEGY

In the long-term, over several decades, reductions in carbon emissions will require two fundamental changes, (1) shifts in the basic forms of energy used, and (2) significant improvements in the efficiency of our energy usage. A technology strategy can achieve both and provide a strong competitive position for the U.S. by advancing improvements such as the following:

| Transportation | Buildings | Industry | Electric Utilities |
|---|---|---|---|
| o Biofuels<br>o Hydrogen fuels<br>o Electric vehicles<br>o Hybrid vehicles<br>o Full PNGV 80 mpg vehicles | o Fuel cells<br>o Efficient systems — heating, cooling, lighting, windows<br>o Intelligent mgmt systems<br>o Efficient "plug load" — computers, equipment, etc. | o High efficiency motors<br>o Process changes<br>o Recycling to reduce primary production | o Renewable energy systems — solar, wind, biomass<br>o Distributed power<br>o Improvements in power generation & transmission<br>o Dispatching & load sharing |

**Long-term Market and Economic Uncertainties**

- Electricity deregulation, international competitiveness
- Lifestyle trend changes (eg, telecommuting, consumer preferences for large vehicles)
- Commercial transport shifts in modes, speed, and the role of short- and long-range transportation of goods and people

**Cost Issues**

- Currently, the federal government spends only .....% of its energy R&D budget, or $..... annually on long-term technologies
- There are no estimates of the amount of public and private investment that will be needed to achieve these major advances
- In the long run, it is uncertain whether there will be an incremental cost or savings from such technological changes

**Policy Issues**

- Federal and private R&D funding
- Role of public/private partnerships
- Incentives.....funding, prices, emissions trading allocations, partnerships, public relations, published performance data, required performance standards, other

## MEDIUM-TERM, TECHNOLOGY AND EMISSIONS TRADING PROVIDE A BRIDGING STRATEGY

In the medium-term, technology can serve a "bridging" function to allow time for the long-term R&D developments and the commercialization of various technologies to reach significant levels.

Emissions trading and joint implementation are critical to a technology strategy in providing timing flexibility to deploy efficient technologies at rates close to normal capital stock turnover cycles, and to provide a "safety valve" if the required rates of technological change cannot be achieved fast enough.

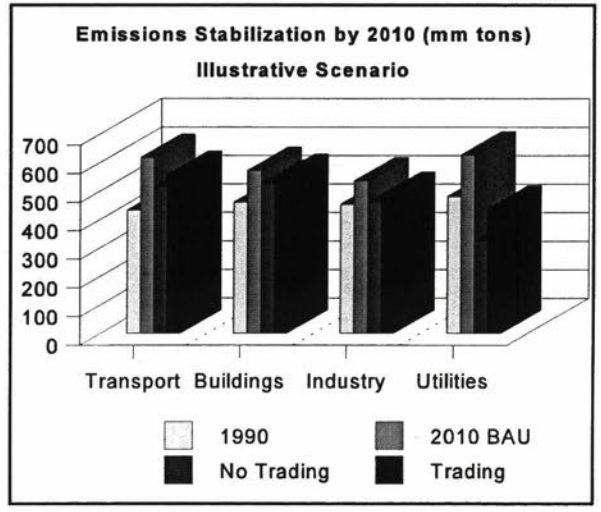
**Technology Implications**

For example, the DOE "Labs Study" and the IAT computer modeling suggest ambitious rates of technological change would be needed to return U.S. carbon emissions to 1990 levels by 2010:

- Overall, emissions growth of 28%, or 377 million tons, would have to be avoided or offset
- If done all in the U.S., energy growth would probably have to drop to half its present rate, to about 10 to 12% over the 20-year period, and it's already about 9% above 1990 levels in 1997
- With emissions trading and joint implementation, the models suggest that up to 40% of the 2010 emissions reduction might be achieved abroad, at U.S. expense, to buy time for a more orderly technological transition here

**Transportation**

- Without trading, growth in energy usage would have to drop to about half its business as usual rate of 30% to 40%, down to 15% to 20%
- Unless consumer preferences for large cars and increased driving change, 30% of PNGV improvements would have to be integrated into new cars and light trucks by 2010...for 45 mpg new automobiles
- With trading, the pace of improvements could be slower, but would likely still lead to .....




**Commercial and Residential Buildings**

- Without trading, growth in energy usage would have to be cut in half, to a rate of about 10% by 2010, vs. BAU projections of about 20% to 25%
- High efficiency equipment would be needed on one-third of new installations and normal replacement cycles of building systems and equipment, compared to current rates of .....

Continued.....

**MEDIUM-TERM.....continued**

**Industry**

- Without emissions trading, energy growth would have to be almost flat at 1990 levels, instead of increasing about 20% by 2010
- Increased use of heat recovery, cogeneration, and more efficient motors offer the greatest generic opportunities, with other specific technologies also available in individual industrial sectors, such as those detailed in DOE's "Technologies for the Future" cooperative program with seven major energy-intensive industries
- With emissions trading, modest emissions and energy growth of around 7% by 2010 could be possible
- Industrial energy efficiency has improved since 1972, now requiring just 67% as much energy per unit of output

**Electric Utilities**

- Without emissions trading, utilities would likely have to make absolute reductions on the order of 30% in carbon emissions below 1990 levels in order to offset the increases in other sectors above, while at the same time supplying more electricity to customers
- Coal usage would have to drop to about half the 1990 level, while natural gas would roughly triple its 1990 usage in the industry
- With emissions trading, the coal-to-gas shift could be less severe, but electricity demand would also rise faster. Overall, emissions would still probably have to be about 10% below 1990 levels in 2010

**Costs**

- There is great uncertainty about just how much these changes would cost the U.S. economy. In some recent experiences, such as with the Montreal Protocol on ozone depletion and the sulfur dioxide emissions trading system under the Clean Air Act, actual experience has turned out to be substantially less costly than expected
- Preliminary estimates for the scenario above, returning emissions to 1990 levels by 2010, in the absence of emissions trading and joint implementation, are that it could result in annual costs of $ ..... billion, including amortization of approximately $..... of investment
- With international emissions trading and joint implementation, that cost could fall to $..... annually

**Policy Issues**

- Incentives are needed to stimulate R&D, commercialization of new technologies, and the purchase and use of advanced technologies as capital stock turns over in the economy

**DOE'S 'Labs Study'**

**"U.S. CARBON REDUCTIONS BY 2010 AND BEYOND**
**The Potential Impact of Energy-Efficient and Low-Carbon Technologies"**

This report provides details on the technologies that can potentially achieve the energy usage and carbon emissions reductions necessary if the U.S. commits to a scenario like the one outlined in the sections above, which would return U.S. carbon emissions to 1990 levels by 2010.

(This page to be supplied by DOE)

## POLICY OPTIONS FOR A U.S. TECHNOLOGY STRATEGY

### GOALS

For the long-term, provide basic R&D and other support for the fundamental technological advances needed in the economy

For the short- and medium-term, provide incentives and support to:

- encourage manufacturers, builders, etc. to produce high efficiency equipment, systems, materials, etc.
- stimulate consumers and purchasers to accelerate their acquisition and use of those technologies
- encourage the development of financial, service, and other infrastructure to support those technologies

### POLICY OPTIONS

- **Prices in the economy**
  - — Valuing carbon emissions rights, through a "cap and trade" system
  - — Investment tax credits, special depreciation treatment, differential fuel taxes (such as the ethanol tax credit), or other financial incentives through the tax system
  - — Feebates, or complementary product fees and rebates depending upon product energy efficiency

- **Financing**
  - — Financial community partnerships with insurance, financial, utility and others to support advanced technologies
  - — Incorporate incentives into federal loan, loan guarantee, and grant programs to promote high efficiency technologies

- **Federal R&D policy**
  - — National public/private initiatives in key technologies, modeled after the Partnership for a New Generation of Vehicles, eg:
    - in DOE's 7 "Technologies for the Future" programs for Pulp and Paper, Chemicals, Petroleum Refining, Glass, Aluminum, Iron and Steel, and Metal Casting
    - in residential and commercial buildings
  - — Increased federal funding for R&D, pilot projects and demonstrations leading to commercialization and/or wider availability of new technologies — current federal funding is $..... annually

- **Market transformation**
  - — Market aggregation, for local governments and companies to coordinate purchases for greater influence
  - — State and local partnerships with the federal government to provide information, demonstrations, and technical assistance
  - — Field verification of advanced technologies

Continued.....

**POLICY OPTIONS.....continued**

- **Federal leadership through procurement**
  - — Federal agencies "lead by example" by adopting aggressive policies to implement energy savings technologies at new and existing federal facilities, and to acquire and use more efficient and alternative-fuel vehicles in federal fleets
  - — Broaden the participation in Federal Energy Savings Performance Contracts which DOE is implementing to leverage private sector financing through third party energy services companies to reduce the federal government's $8 billion annual energy bill
  - — Executive Orders to provide clear direction and management flexibility for greenhouse gas emission reductions within agency plans and programs
  - — Green Power Purchasing, by which agencies can negotiate contracts to supply a fraction of their electricity from renewable energy sources

- **Regulation and standards**
  - — Appliance efficiency standards, negotiated with the industry and public, such as the recent refrigerator standards
  - — Building energy efficiency codes, implemented at the state and local level
  - — Expedited environmental permitting for highly efficient or low carbon technologies
  - — Coordinated implementation of National Ambient Air Quality Standards with climate change policies
  - — Restructuring of the electric utility industry in a way that facilitates investment in new technologies

- **Information and education**
  - — Information disclosure requirements, such as efficiency labels on appliances, computers, equipment, and commercial and residential heating and air conditioning systems
  - — Federally-supported multi-media materials development for use in schools and the mass media

- **International market development**
  - — Special focus on bilateral trade agreements, export assistance, and financial assistance in support of U.S.-produced advanced technologies for energy efficiency, renewable energy supplies, etc.

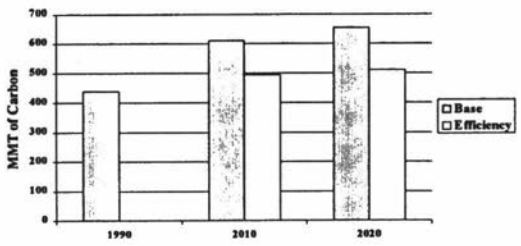
## BACKGROUND ON KEY SECTORS

The material on these pages provides brief, thumbnail sketches of six key sectors of the economy, listed below. For each, the information profiles the sector's current energy and carbon emissions profile and trends, the types and extent of technological improvement needed under the scenario in which U.S. emissions are returned to 1990 levels by the year 2010. These descriptions assume no emissions trading or joint implementation, in order to provide a benchmark for further examination.

1. **Autos and Light Trucks**
2. **Freight, Aircraft and Rail**
3. **Residential and Commercial Buildings**
4. **Electric Utilities**
5. **Renewable Energy**
6. **Industrial Emissions**

# Autos and Light Trucks

**Transportation Carbon Emissions**




Source: Markal-Macro Technology Investment Case

**Key Trends — 1990-2010**

- The transportation sector generates one-third of all energy-related carbon emissions in the United States. Moreover, this is the fastest growing end-use sector. Cars and light trucks (light duty vehicles) alone account for 58 percent of the total transportation emissions.
- Average fuel economy for new automobiles has been regulated at a minimum 27.5 mpg since 1985. It is projected to grow to 31 mpg in 2010. New minivans, sports utility vehicles, and other "light trucks" now get 21 mpg and are projected to get 23 mpg in 2010.
- Light trucks were 20 percent of the personal vehicle market in 1974, 44 percent in 1996, and are projected to be 50 percent by 2010. Assuming no change in this trend, this will result in a declining overall fuel economy for all light duty vehicles.
- Vehicle miles traveled have been growing 2-3 percent per year for the past 30 years and are expected to grow 1.4 to 2 percent or more per year through 2010. Improved fuel economy will help maintain desired levels of vehicle miles traveled.

**Needed Technological Improvements**

- By 2010, about 30 percent of new light duty vehicles would have to meet the Partnership for a New Generation of Vehicles (PNGV) goal of a tripled fuel economy (e.g., 80 mpg for automobiles) to help reduce overall carbon emissions to 1990 levels. On the other hand, all new cars and light trucks would have to embody 30 percent of the improvement represented by the PNGV goal (e.g., 45 mpg for automobiles).
- On-Road fuel economy for all cars and trucks (including both new and existing vehicles) would need to reach 25 mpg by 2010 and 31 mpg by 2020.
- Key technologies needed are vehicle weight reduction through advanced materials and design, hybrid/electric drivetrains, and improved aerodynamics.

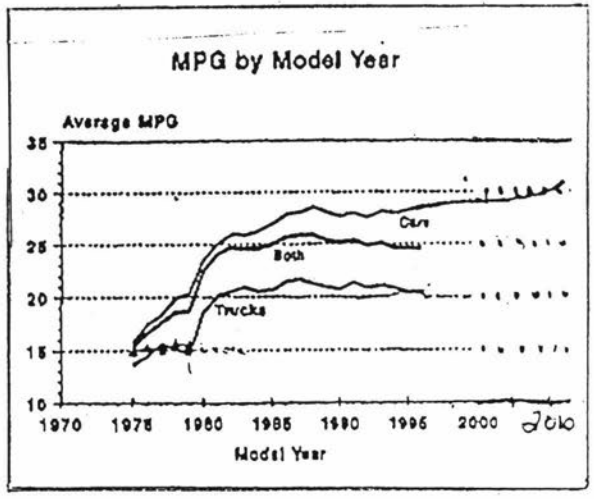
**Costs**

- If PNGV goals are met, the more efficient light duty vehicles will have no increased cost for consumers.

•At currently anticipated technology costs, new autos in 2010 would have an incremental price of $800-1,200. At gasolines prices forecasted for the year 2010, these higher costs would pay for themselves in fuel savings within 3.5-5.3 years.

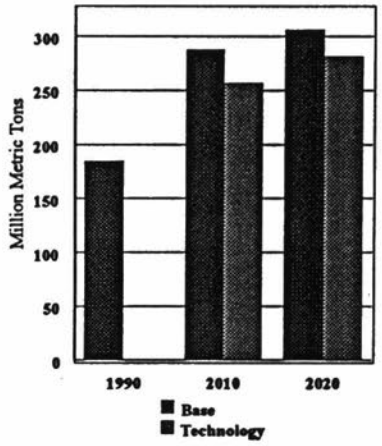
**Policy Challenges**

- Ensure that PNGV technologies fully penetrate all markets for all new light-duty vehicles by 2010 and continue through the period 2020.
- Devise new commercialization strategies, including new approaches to fuel economy standards and market incentives (e.g., Green Machine Challenge, financing packages, bonus emission credits).



# Freight, Aircraft and Rail

**Carbon Emissions**




**Key Trends: 1990-2010**

- Freight, aircraft and rail together accounted for 185 million tons of carbon dioxide emissions in 1990, nearly 40 percent of all emissions from transportation.
- All modes of freight transport have improved their energy efficiency. However, increased freight tonnage and shifts toward more energy-intensive modes have meant a 60 percent increase in the amount of energy used to haul freight since 1972-1995, although about three times as much freight was transported.
- Opportunities to reduce carbon emissions from freight are expected to come mainly from trucking and air transport.

**Needed Technological Improvements**

- Key technologies to reduce energy intensity in truck freight in the next 10-15 years include vehicle weight reduction through materials substitution, improved tires, electronic engine and transmission controls. Larger reductions are possible beyond 2010 if hydrogen-powered, fuel cell powertrains are developed and commercialized for truck transport. Also, a more aggressive technology scenario might include rapid penetration of diesel trucks that are 20 percent more efficient that current diesel engines.
- NASA programs have helped to reduce energy intensity in air transport for over 20 years. NASA's high performance turbine engine technology program aims to achieve a 40 percent increase in fuel efficiency by 2003, and such engines could conceivably be on commercial aircraft within 15 years.

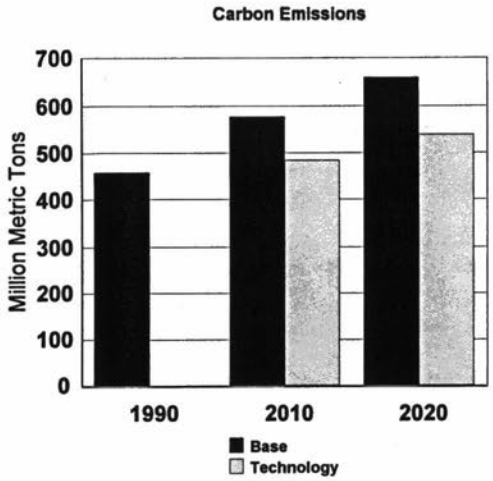
**Costs**

- DOE estimates that annual costs needed to achieve emissions reduction in transportation range from $25-40 billion, and could save $35-40 billion annually in fuel costs.
- PNGV is funded at $_____, and to succeed in achieving the kinds of emissions reduction sketched above, might need two to ten times this funding.

**Policy Options**

- PNGV is key to reducing energy intensity in truck the medium and long term. Hybrid powertrains could likely be significantly advanced with increased R&D funding.
- To achieve a high efficiency/low carbon technology scenario, R&D programs might need to be increased 2 to 10 times.

# Residential and Commercial Buildings

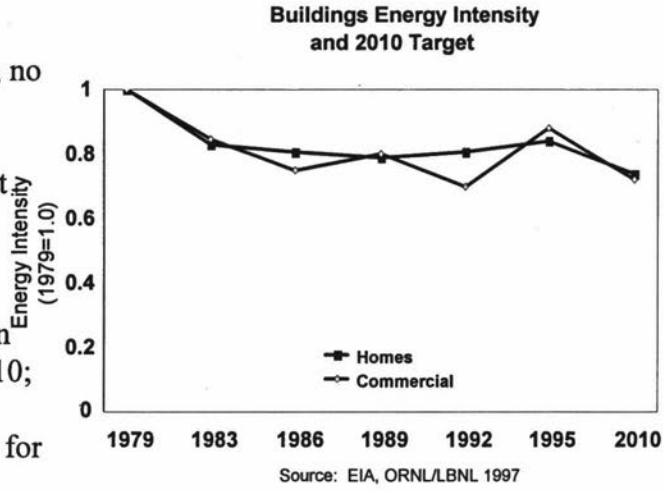



## Key Trends - 1990-2010

- 35% of U.S. carbon emissions are attributable to energy use in buildings, with homes emitting 19% and commercial buildings emitting 16%.
- Energy intensity in buildings has declined substantially since the late 1970s. Primary energy intensity in commercial buildings declined by 22% between 1979 and 1992, while residential primary energy intensity dropped by 15% since 1978.
- Buildings have become increasingly electrified - driven by rapid growth in office equipment, small appliances and other devices collectively know as "plug loads". From 1978 to 1992, commercial electricity consumption grew by 37%, while residential electricity grew by 36%.
- Due to continuing electricity growth, the EIA forecasts that future commercial energy intensity will decline by only 0.2% per year, and residential intensity by 0.5% per year. However, numerous studies identify substantial additional potential for cost-effectively reducing buildings energy consumption and greenhouse gas emissions.

## Needed Technological Improvements

- Technologies needed to achieve the emissions reductions above largely exist today; no major technological breakthroughs are needed.
- The large potential emissions reductions are not being achieved in current markets because of a number of market barriers that impede the diffusion of energy-efficient technologies - such as lack of reliable product information; higher up-front costs; split incentives between efficiency purchasers and beneficiaries; conflicting building codes; and lack of market expertise in efficiency design and construction.
- To achieve the efficiency savings in 2010, the equipment that naturally turns over in about 35% of buildings is replaced with the most cost-effective technologies by 2010; these savings assume normal retirement of equipment at the end of its useful life.
- Energy efficiency improvements needed are 12% for residential buildings and 18% for commercial buildings by 2010.




Source: EIA, ORNL/LBNL 1997

**Costs**

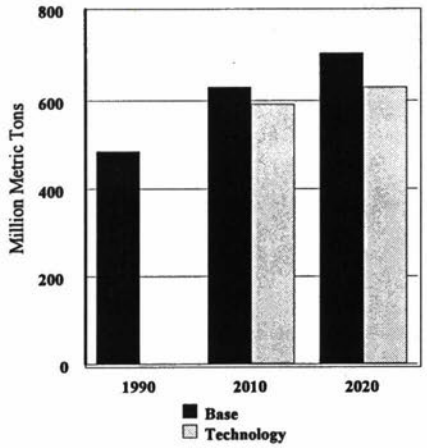
- Investments to achieve these 2010 savings are $7-$14 billion per year and result in 2010 energy bill savings of $18-33 billion - a net savings of $10-19 billion and a 20% return on investment.
- Costs of Federal programs to accelerate the use of energy efficient technologies in buildings are $300 million per year; achieving the above savings will require a rough doubling of budgets.

**Policy Challenges**

- Federal, state and local policies that accelerate technology deployment and energy efficient building design, construction and operation.
- Partnerships with states, local government and industry to improve efficiency of existing buildings and remove market barriers.
- Research and development of a portfolio of advanced buildings technologies.

# Electric Power

**Carbon Emissions**

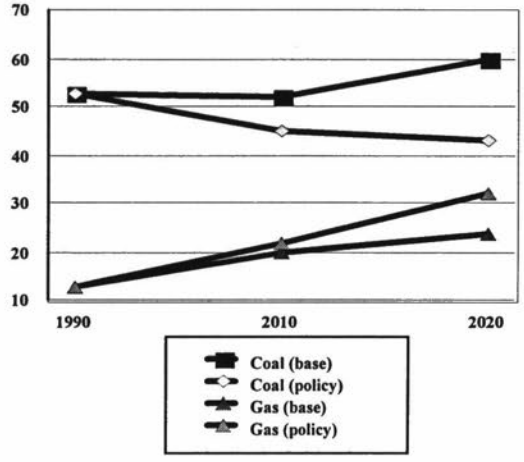



**Key Trends -- 1990-2010**

- 36% of US carbon emissions are in the electric utility sector, primarily from burning of coal and natural gas.
- Coal and natural gas together are projected to increase from 63% of energy inputs to 70% by 2010, increasing the carbon intensity of this sector.
- Demand for electricity is projected to rise by 20 percent per decade compared to 30% from 1980 by 1990.
- Renewable power (other than hydroelectricity) is projected to rise from 1.5% of generation currently to 1.8% in 2010.

Source: EPA, DRI 1.25 Base Case

**% Share of US Generation**




**Needed Technological Improvements**

- No breakthroughs are projected in generation technology. Incremental improvements will be possible from combined cycle turbines, gasification for biomass fuels, wind turbines and system improvements (such as transmission efficiency).
- First, end use electricity demand growth must slow--efficient technologies can cut U.S. electricity growth from 30% down to 15% above 1990 levels by 2010.
- Second, those reductions must primarily reduce coal-fired generation.
- Third, remaining coal-fired generation must be reduced in favor of natural gas, through gas co-firing, conversions to gas, and increased use of combined cycle gas turbines.
- Beyond 2010, nuclear plant life extensions may be an economically viable option.
- Renewables such as solar, wind, and biomass must be promoted for the long term, but will not make significant contributions sooner.
- Overall, carbon emissions .....

**Costs**

- Switching from coal to natural gas, renewables or demand-side efficiency will cost $50-120 per ton of carbon in 2010. Total capital investments will rise by $3-5 billion, or 30-50%. Fuel and operating costs will also rise by about $3-5 billion, or 5-10%.
- In total, utility annual costs could increase by $..... billion, or .....%, by 2010.

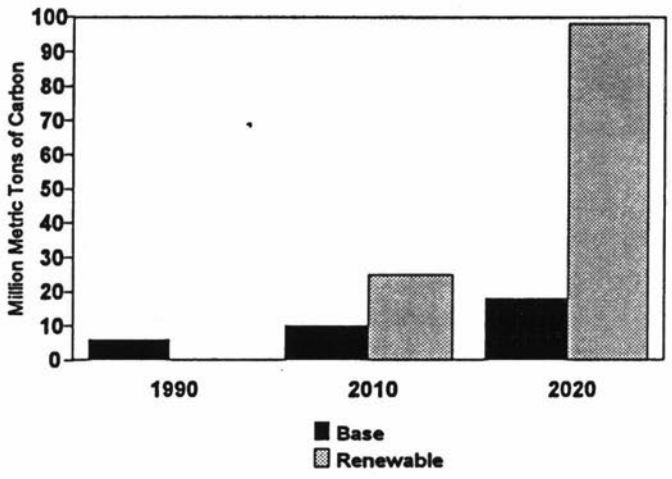
[• ?Overall, coal use would decline to roughly 1990 levels (plus or minus 10%) by 2010 in a US program without international trading -- with trading coal use could grow by 20-25% above 1990 levels.]

**Policy Challenges**

- Aggressive R&D and marketing for energy efficiency sectors is essential.
- Integrate climate policy with competitive trends and air quality regulation.
- Incentives for shifting power to lower-emitting fuels -- pricing, emissions trading credits, promotion, regulation, and financing.

# Renewable Energy

**Carbon Emissions Savings**




**Key Trends - 1990-2010**

- Today, roughly 12% of the country's electricity generating capacity is from renewable energy - with 85% of this from hydropower. Newer renewable technologies - including wind, biomass, photovoltaics, solar thermal and geothermal - are increasingly economic and have large potential.
- Costs have dropped dramatically -photovoltaic cells have dropped from $0.90/kilowatt-hour in 1980 to under $0.20/kWh today, while wind power has dropped from $0.25/kWh to $0.05/kWh.
- Cost reductions will continue because of R&D advances and as manufacturing efficiencies.
- Cost performance improvements have resulted in several technologies being competitive in selected markets today and others will be competitive in broader markets in the near future.
- Several major international companies such as Royal/Dutch Shell, expect these technologies to be dominant global energy sources and are substantially investing in their development.

**Needed Technological Improvements**

- The contribution of renewable electric technologies to emissions reductions could be substantially higher than projected in the base case.
- Costs and performance of these technologies continue to improve, but additional advances in wind, biomass, photovoltaics, geothermal, solar thermal and transportation biofuels are needed - such as: wind turbine blade design and materials, photovoltaics materials efficiencies, geothermal drilling technology and resource verification, large-scale celluosic biomass fuels production and manufacturing cost improvements.
- Non-hydro renewable energy generation capacity could grow from 9 gigawatts (GW) today to 21-24 GW in 2010 and 77-108 GW by 2020.

**Costs**

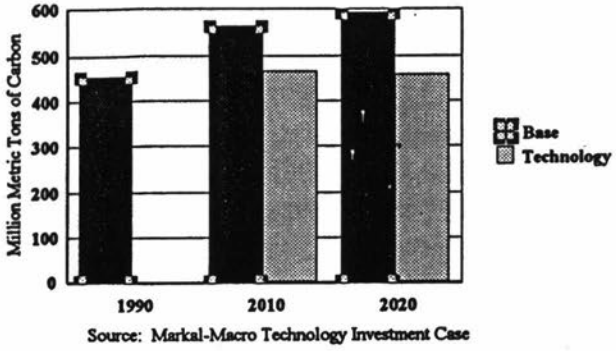
- The incremental capital investment in renewable power systems needed to achieve the above results is $2-3 billion in 2010 and $15-25 in 2020 - although fuel cost savings in 2020 will result in net incremental that are low or negligible.
- The incremental production cost of renewable electricity is estimated to be $2-3 billion/yr in 2010 and negligible in 2020 as multiple renewable technologies are widely competitive with gas technologies.

**Policy Challenges**

- Expand technology R&D to lower costs and increase performance.
- Conduct cost-shared technology diffusion with industry to increase utility system experience and increase U.S. renewable energy production capacity.
- Conduct R&D on key support systems such as power storage, controls and superconducting materials.
- Encourage use of U.S. renewable technologies abroad to tap the huge global market for renewable energy.

## Industrial Emissions and Economic Impacts

**Carbon Emissions**

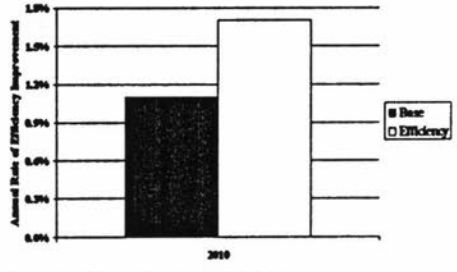



Source: Markal-Macro Technology Investment Case

**Key Trends -- 1990-2010**

- The industrial sector now uses 37 percent of the nation's energy, or 34.4 out of a total 93.6 quads. Carbon emissions are now at about 32 percent or total emissions in the United States, or 471 of 1467 million metric tons (MMT).
- Within the industrial sector, electricity accounts for 10% of the total energy consumed and about 37% carbon emissions.
- With normal rates of capital stock turnover, the industrial energy intensity is expected to decline at a rate of 1.2 percent in base case forecast for the period 1997-2015. Historically, energy intensity has decreased by an average of 1.8 percent annually from 1972 to 1995.
- The industry sector is also responsible for most of the non-energy related emissions of carbon dioxide (21 MMT) and other greenhouse gases (219 MMT of carbon equivalent). Although industrial emissions of these gases are far smaller that energy-related carbon emissions by weight, they have global warming potentials (GWP) that range from 21 for methane to 23,900 for sulfur hexafloride (SF6).

**Average Rate of Industrial Energy Efficiency Improvement: 2000 to 2010**




Source: Markal-Macro Technology Investment Case

### Needed Technological Improvements and Opportunities--Cross-cutting

- The industrial sector the potential to reduce energy use by up to 10% in carbon emissions by nearly 17% over 2010 baseline forecast through cost effective investments in energy efficient technolgies and low carbon technologies.
- The use of heat recovery and combined heat and power (i.e., cogeneration) systems such as the Advanced Turbine System can reduce industrial carbon emissions by up to 35 Mmt/year in 2010 with electricity costs that are 10 percent lower than current systems.
- Motor systems account for 70 percent of industrial electricity use (about 120 MMT). Better designed energy-efficient motor systems could reduce electricity use by up to 40 percent. Better maintenance of compressed air systems can also save 40 percent of the energy used in such systems.
- In addition, there are important longer term opportunities to reduce the carbon intensity of industrial operations through changes in the fuel mix, and by using lower-carbon fuels.

**Costs**

- There are readily-available but underutilized technologies with two and three-year paybacks that can reduce industrial energy use by 10 percent or more.
- The annual investment necessary to stabilize overall carbon emissions to 1990 levels (15 percent) is on the order of $5 billion per year (about 4 percent of the investments made by the manufacturing sector in 1995). The energy cost savings in 2010 are $8 billion/year.
- Many of the most successful technologies have multiple benefits, including environmental- or productivity-enhancing features may actually improve the competitive position of many industries.

**Policy Challenges**

- Policies to encourage the more rapid diffusion of existing technologies include: (1) incentives to accelerate the investment in new capital stock and equipment; (2) increased RD&D to facilitate the development of improved technologies as well as the development of a new generation of industrial technologies; (3) incentives to increase the use of recycled feedstocks; and finally, (4) expediting the use of combined heat and power systems through improved environmental permitting and by incorporating provisions into the ongoing utility restructuring that facilitate the sale of excess power by industrial plants; and finally (5) a life cycle approach to environmental permitting and regulations.

Talking pts. for L

Jonathan,

I'm not sure about the topic of the 2 p.m. meeting, but here are a few items that I think we need:
- General Message Talking Points (for cabinet, surrogates, etc.);
- Tough Questions and Answers (largely based on recent anti-opinion editorials);
- Basic Fact Sheets (general climate change, "myths," top reasons to deal with issue now, etc.).; and
- Draft Opinion Editorials (with different focuses such as science, economy, brief/easy-to-read).

Thanks, Natalie

Talking Points
'97 AUG 19 PM4:37

**Facsimile**
**Transmission**

August 19, 1997

TO: Todd Stern

FROM: Rafe Pomerance

RE: Climate Change: Engaging Secretary Rubin to Obtain Adequate Funding for the Global Environment Facility (GEF)

Attached per our conversation yesterday are points to make with Secretary Rubin regarding the vital need to obtain full funding for the GEF in order to gain developing country support for our climate change agenda in Kyoto. Please feel free to call me (or in my absence, Pam Pearson at 647-1123) with any questions!

Summary:

We face a serious threat to our strategy for gaining the support of developing countries in upcoming climate change negotiations due to persistent Congressional under funding of the GEF, the only financial implementing mechanism for any Kyoto agreement.

Background:

The U.S. pledged $430 million in 1993 to support the GEF's current four-year (FY95-98) work program; yet over the past three years, the U.S. has given barely half its pledged amount due to Congressional under funding (see table below). Despite sustained effort from the Administration, NGOs and particularly Senator Leahy's office, this year's appropriations bill appears headed in the same direction, with the Senate approving $60 million and the House Appropriations Committee currently at $35 million for FY98.

We now carry GEF arrears from FY96 and FY97 of $132 million, already damaging the credibility of our global environmental agenda. A "business-as-usual" compromise in September of $45-50 million for the GEF will send a disastrously wrong signal to ongoing climate change negotiations – not only to the developing world, but to our fellow donors, several of which have tied their own GEF contributions to the percentage of pledge met by the U.S. Our failure to meet our pledge thus produces a ripple effect of decreased GEF funding across-the-board. We need to convince Congress to increase its FY98 conference funding for GEF at least to our pledged level once the bill goes to conference.

| | | | | FY98 | |
|---|---|---|---|---|---|
| | **FY95** | **FY96** | **FY97** | **Senate Floor** | **House Com.** |
| **GEF Pledge** | 107.5 | 107.5 | 107.5 | 107.5 | 107.5 |
| **GEF Actual** | 120* | 35 | 35 | 65 | 35 |
| **Arrears** | – | (60) | (132.5) | (175) | (215) |

*includes $30 million held back from FY94 appropriation to GEF pilot stage

GEF: Key to Climate Change Negotiations

A key element in gaining support from developing countries for any climate change treaty at Kyoto, including emissions limits that apply to them as well as to the developing world, is money: funding to support the necessary technical and economic changes in their developing economies. The key symbol for that funding – the sole multilateral financial mechanism to implement the treaty – is the GEF. If we can come out of conference with a decent appropriation for the GEF – one of at least $100 million, which is still less than our annual pledge, and much less than our current $132 million arrears – it will provide a badly-needed boost to our negotiating strength at Kyoto.

Conversely, yet another year of under funding, coming just prior to the Kyoto conference, would deal a tremendous blow to Administration efforts to gain the support of China, India and other developing countries in those negotiations.

Two Possible Solutions

When the House returns, we expect it to approve the bill as currently configured, with only $35 million for the GEF. Once the bill goes to conference, we will have the opportunity to act for an increase in the GEF appropriation. House and Senate Congressional staff have indicated it would be quite possible to come out of conference negotiations with a figure for GEF funding higher than that currently provided in either the House or Senate versions of the Foreign Ops bill, by either:

- convincing Senate and House negotiators to approve a higher FY98 figure; or
- requesting the negotiators to make a special off-budget arrears payment that brings the total appropriation up to the $100 million level.

With either solution, we will need to bring total funding within range of our annual GEF pledge of $107 million to make any impact on the climate change front.

Next Steps: Need for Cabinet-level Approaches

The only way effectively to deliver this message would be through direct approaches from both Department heads involved. Even more so than Secretary Albright, Secretary Rubin is key in this regard, since Treasury has the lead for GEF issues. Unfortunately, Treasury thus far has subsumed any concern for GEF appropriations to funding for the World Bank and its regional counterparts (Asian Development Bank, etc.). Funding for the GEF is a pittance compared to these big-ticket items, all of which (other than the troubled African Development Fund) received full or near-full funding in both House and Senate versions of the Foreign Ops bill.

In the last few weeks, however, Treasury has become seized of the climate change issue, and Secretary Rubin likely can be convinced of the need for a renewed effort on behalf of the GEF in light of its impact on the Kyoto negotiations.

9/3/97

THE WHITE HOUSE
WASHINGTON

Todd,

Nicholas created this informational packet and Natalie wants to send it in her information packets

NO — Nat. Le should talk to me.

T.

# WHAT WE KNOW ABOUT THE SCIENCE

◊ Scientists have long understood that greenhouse gases (principally water vapor, carbon dioxide, methane, and nitrous oxide) in nature keep the Earth's temperature an estimated 60 degrees F warmer than it would otherwise be – sustaining life as we know it.

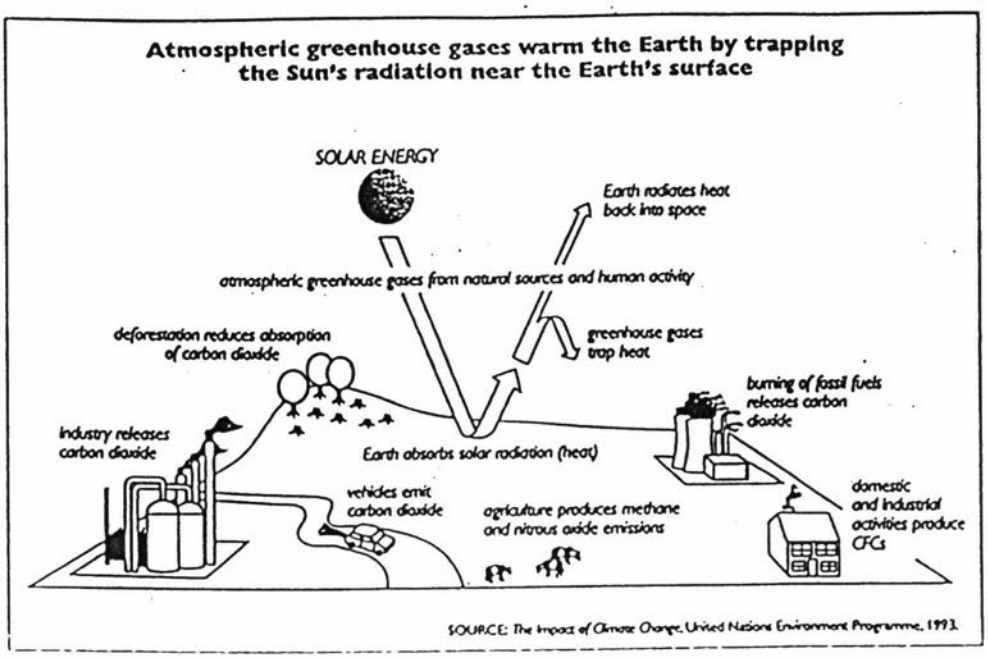
◊ Human activities are dramatically increasing the build-up of these gases in the atmosphere. Since the beginning of the Industrial Revolution, CO2 concentrations have increased 30 percent, methane levels have doubled, and nitrous oxide concentrations are up by 15 percent.

◊ Since 1900, average global temperature has increased 0.5 - 1.0 degree F. Eleven of the warmest years on record have occurred since 1979, with 1995 being the warmest ever. Sea level has risen 4-10 inches. (Source: IPCC, 1995) Total precipitation in the U.S. is up 6 percent, while extreme precipitation events (> 2 inches a day) have increased 20 percent. (Source: NOAA)

◊ The natural variability of the climate system makes it difficult to separate the contribution of human activity to these changes. Nevertheless, the international scientific consensus as reflected by the Intergovernmental Panel on Climate Change (which includes the work of more than 2,000 scientists from more than 60 countries) is that, "the balance of evidence suggests a discernible human influence on global climate."

◊ Current projections show that absent controls on carbon dioxide emissions, atmospheric concentrations of this greenhouse gas will more than double from today's levels (to 750 parts per million) by 2100. This is predicted to warm the planet an additional 2.0 - 6.5 degrees F – a faster rate of warming than any observed in the past 10,000 years. (Source: IPCC, 1995)

◊ While many uncertainties remain in our understanding of the complexities of the climate system, it is clear that warming of this magnitude will have serious consequences. Sea level rise; greater intensity and frequency of floods and droughts; human health problems; shifts in agricultural patterns; and the disappearance of many natural ecosystems are among the predicted effects. (Source: IPCC, 1995)




Fact Sheet 1

# THE U.S. POSITION ON CLIMATE CHANGE

◊ The Clinton Administration is convinced that further steps are required to address climate change and supports efforts to reach a comprehensive and cost-effective international treaty this December at the Third Conference of the Parties to the Framework Convention on Climate Change in Kyoto, Japan.

◊ This view is based on two key points. First, the scientific evidence indicates that human actions are changing the climate system, and that unless greenhouse gas emissions are reduced, such changes threaten unacceptable impacts on the United States and the world. Second, international efforts to date have not proved effective in dealing with the problem.

◊ The U.S. has proposed a three-part framework for a more effective international agreement:

1. **Binding emissions targets for developed nations.** Almost all developed countries, including the United States, will fall short of the non-binding aim in the current Climate Convention, which calls on nations to reduce emissions to 1990 levels by 2000. Shifting to a medium-term, binding, realistic, and achievable target should spur greater commitment and action by countries to limit greenhouse gas emissions.

2. **Flexibility to achieve cost-effective reductions.** The U.S. proposal calls for emissions trading and joint implementation. As it makes no environmental difference where emissions reductions are achieved, these proposals aim to allow the greatest reductions to be gained at the least cost. The U.S. has also called for multi-year emissions targets and the possibility of banking and borrowing emissions from one period to the next.

3. **Participation of developing countries.** Based on the principle of "common but differentiated responsibilities" contained in the Climate Convention (signed by President Bush and ratified by the Senate), the U.S. has proposed a comprehensive package of elements on developing country commitments. In the near term, all would be required to take specific actions to mitigate their emissions and report on their activities, while the more advanced economies would adopt binding targets (though these targets would be necessarily less stringent than those of developed nations). Lastly, the U.S. has stipulated that *every* developing country agree to negotiate binding targets by 2005.

◊ In putting forward this framework, the U.S. has rejected proposals by some for what we believe to be unrealistic near-term cuts in emissions. These include a proposal from the Association of Small Island States for a 20 percent reduction below 1990 levels by 2005 and a proposal from the European Union for a 15 percent reduction below 1990 levels by 2010.

◊ The Administration expects to have specific proposals for emissions cuts, as well as other initiatives, as appropriate, to present in time for the Kyoto Conference.

# CLIMATE CHANGE TIMELINE

1896 -- Arrhenius, a Swedish chemist, first advances the notion that CO2 emissions from the burning of coal would enhance the greenhouse effect and warm the planet.

1967 -- The first reliable computer model predicts an increase of 4 degrees F in global average temperature when CO2 concentrations double from pre-industrial times.

1987 -- Analysis of an Antarctic ice core reveals an extremely close correlation between CO2 concentrations and temperature going back over 100,000 years.

1988 -- The Intergovernmental Panel on Climate Change (IPCC) is formed to bring together the world's best climate scientists to assess, and advise the world's governments on, the state of technical and scientific knowledge on climate change.

1992 -- 155 nations sign the UN Framework Convention on Climate Change (FCCC) which calls on developed nations to reduce emissions to 1990 levels by 2000 and which recognizes the "common but differentiated responsibilities" of all Parties.

-- The U.S. Senate ratifies the Convention later in the year.

1995 -- The Berlin Mandate is adopted at the First Conference of the Parties to the FCCC.

-- The IPCC releases its Second Assessment Report concluding that the "balance of evidence suggests a discernible human influence on global climate."

-- The year 1995 is determined to be the hottest ever recorded.

1996 -- The Geneva Declaration, affirming the latest science and calling on developed countries to accept binding emissions limits, is adopted at the Second Conference of the Parties to the FCCC.

1997 -- The U.S. submits its framework proposal for a new international agreement, emphasizing binding limits, flexibility, and global participation.

-- Over 2,000 economists, including eight Nobel Laureates, conclude that climate change is a serious problem justifying preventive steps and state that, "Sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run."

-- The nations of the world gather in Kyoto for the Third Conference of the Parties to the FCCC in hopes of reaching a new agreement on post-2000 emissions reductions.

# CLIMATE CHANGE: WHO'S SAYING WHAT

***"The balance of evidence suggests a discernible human influence on global climate."***
-- Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers, 1995.

***"Our familiarity with the scale, severity, and costs to human welfare of the disruptions that the climatic changes threaten leads us to introduce this note of urgency and to call for early domestic action to reduce U.S. emissions via the most cost-effective means."*** -- Scientists' Statement on Global Climatic Disruption, June 1997.

***"We are performing a global experiment on our natural ecosystems for which we have little information to guide us. While plant and animal communities may be able to eventually adapt to a stable climate system that is warmer than the existing one, many species may not be able to survive a rapid transition to that new climate. The prudent course would be to limit climate change to the lowest rates feasible given current atmospheric accumulations of greenhouse gases."*** -- Ecologists' Statement on the Consequences of Rapid Climatic Change, May 1997.

***"As economists, we believe that global climate change carries with it significant environmental, economic, social, and geopolitical risks, and that preventive steps are justified. Economic studies have found that there are many potential policies to reduce greenhouse-gas emissions for which the total benefits outweigh the total costs. For the United States, in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run."*** -- Economists' Statement on Climate Change, January 1997.

***"Based on the current status of climate research and on their experience as insurers and reinsurers, the member companies of the UNEP-Insurance Industry Initiative conclude that ... Man made climate change will lead to shifts in atmospheric and ocean circulation patterns. This will probably increase the likelihood of extreme weather events in certain areas. Such effects carry the risk of dramatically increased property damage, with serious implications for property insurers and reinsurers... We are convinced that in dealing with climate change risks, it is important to recognize the precautionary principle, in that it is not possible to quantify anticipated economic and social impacts of climate change fully before taking action. Research is needed to reduce uncertainty but cannot eliminate it entirely... We insist that in accordance with the precautionary principle, the negotiations for the Framework Convention on Climate Change must achieve early, substantial reductions in greenhouse gas emissions."***
-- UNEP Insurance Initiative, Statement of Environmental Commitment by the Insurance Industry, Position Paper on Climate Change, July 1996.

Talking
Pts

DRAFT

# CABINET BRIEFING

make clear where scientists agree & don't...

## I. SCIENCE

**The Greenhouse Effect** [Insert Graphic #1] --

- Scientists have long understood that greenhouse gases in nature (e.g., principally water vapor, carbon dioxide, methane and nitrous oxides) keep the Earth's temperature an estimated 60°F. warmer than it otherwise would be -- sustaining life on our planet.

**Atmospheric Concentrations** [Insert Graphic #2] --

- Current projections suggest that without controls on carbon dioxide, atmospheric concentrations would ~~rise from~~ 280 parts per million to almost ~~triple pre-industrial levels~~ by 2100 ( 750 parts per million). This would be the highest level of carbon dioxide in the atmosphere in 50 million years.

**The Most Recent International Scientific Assessment: IPCC Predictions**

- Due to human activities, atmospheric concentrations of greenhouse gas emissions have substantially increased since the beginning of the Industrial Revolution: carbon dioxide concentrations have increased by 30% [Insert Emissions Graphic (#3)-- Looking for graphic with cumulative emissions for past 150 years].

- The Earth's climate is changing already. Average global temperatures have increased by 0.5 -1.0° F. during the past century.

- Climate models project a temperature increase of an additional 2 - 6.5° F. by 2100 unless actions are taken to slow the build up of carbon dioxide emissions. This rate of warming would be faster that any observed during the past 10,000 years.

- Because of the substantial natural variability of the climate system, separating the contribution of human activity from natural variations is difficult. The IPCC concluded that "the balance of evidence suggests that there is a discernible human influence on climate change."

**The Experts Agree**

- More than 2,400 of the world's leading scientists have endorsed the findings of the IPCC and "observe that the further accumulation of greenhouse gases commits the earth irreversibly to further global climatic change..."

- More than 2,400 economists, including eight Nobel laureates, have stated that the risks justify preventive steps. Their statement concludes that there are policy options "that would slow climate change without harming American living standards, and these

measures may in fact improve U.S. productivity in the longer run..." They endorse market-based policies such as international emissions trading as the most efficient way to address rising greenhouse gas emissions.

**Changes Can Already Be Seen**

- Studies suggest climate changes are underway, even though the scientific models have not yet been able to show definitive causality between increased greenhouse gas concentrations and these changes.

- Eleven of the warmest years on record have occurred since 1979.

- Extreme precipitation events in the U.S. have increased by 20 percent over the past century. [Insert Precipitation Intensity Graphic (#4)]

- In the United States, temperatures have increased this century in the Northeast, the upper Mid-West and the West Coast by as much as 3°C. On average, temperatures have declined in the Southeast. [Insert Graphic #5]

- During the same time period, precipitation has increased by as much as 20 percent in many areas, with precipitation decreasing by equal amounts in the Great Plains, California, Texas and Maine. [Insert Graphic #6]

**Risks of Inaction**

- Human-induced changes in temperature, precipitation, soil moisture and sea level add important new stresses on natural and manmade systems. While region-specific changes generally remain beyond the predictive ability of current models, scientist raise a number of concerns:

severe weather

-- **Human Health**: Warmer temperatures are projected to increase fatalities from heat stress and increase the potential for the spread of vector-borne diseases (e.g., malaria and dengue fever). One study projected an increase of 50-80 million cases of malaria worldwide if carbon dioxide levels doubled. [Insert Mortality graphic (#7)]

-- **Sea Level Rise**: Sea level has increased by 4-10 inches over the last century and is projected to increase by an additional 6-38 inches by 2100. An increase of this magnitude would inundate 9,000 square miles of the United States with the Florida and Gulf Coasts most at risk. [Insert Florida graphic (#8)]

-- **Agricultural Impacts**: Agriculturally productive regions and production processes may be altered through changes in growing seasons, water availability, soil moisture and precipitation. [Insert Runoff Graphic (#9)]

--**Natural ecosystems**: Ecosystems will be degraded as the composition, geographic distribution, and productivity of many ecosystems will shift. For example, during the next century the geographical range of forests is expected to move several hundred miles north exceeding the ability of many forests to migrate. [Insert Beech Trees graphic (#10)]

## II. History of Negotiations on the Framework Convention on Climate Change

### The Framework Convention on Climate Change

- The United Nations Framework Convention on Climate Change was adopted in 1992 at the Rio Earth Summit.
- 160 nations are party to the Framework.
- Developed countries agreed to non-binding commitments to adopt policies and measures aimed at returning their greenhouse gas emissions to 1990 levels by the year 2000. In addition, industrialized countries are asked to provide "new and additional financial resources" to assist developing countries.
- The F. requires Developing countries ~~are committed~~ to developing national mitigation strategies and compiling emissions inventories.
- The Third Meeting of the Parties to the Framework will be held in early December in Kyoto, Japan. In addition, there will be two negotiating sessions in Bonn in August and October.

### Future Emissions Trends

- ~~Global~~ climate change is a global issue, requiring a global response. While developed countries have contributed 75 percent of total greenhouse gas emissions since the beginning of the Industrial Revolution, by 2035, developing country emissions are expected to exceed those in developed countries. [Insert Graphic #11]
- The United States currently emits more than 20% of global emissions with only 4% of the world's population. U.S. per capita emissions are roughly 50% greater than the OECD average and eight times that of China.
- 1990 $CO_2$ emissions in the United States were divided equally among the three major end uses: buildings (34%), industry (34%), and transportation (32%).
- Current carbon emissions in the United States by fuel type are: petroleum (42%), natural gas (23%), and coal (35%).

- Need to do Berlin
- Need say countries not meeting RIO - US 13% over In Europe only UK & Germany, etc.

## III. Statements by the President

### Recent Statements by the President on Climate Change

- "We must take the lead in addressing the challenge of global warming that could make our planet and its climate less hospitable and more hostile to human life. Today, I reaffirm my personal, and announce our nation's commitment to reducing our emissions of greenhouse gases to their 1990 levels by the year 2000." April 21, 1993 [Earth Day speech on the Climate Change Action Plan]

- "We must stand together against the threat of global warming. A greenhouse may be a good place to raise plants; it is no place to nurture our children. And we can avoid dangerous global warming if we begin to day and if we begin together." November 22, 1996 [President's speech in Australia]

- "There is no secret plan. There is no scheme here to try to put thousands of Americans out of business. I have devoted my passion and the best ideas I could come up with to try to get this country in good shape economically and socially. But I do believe it is folly for us to believe that we can go into the next century without a strategy that says we're going to be responsible and we're going to do our part and lead the world on environmental issues...Let's find a way to preserve the environment, to meet our international responsibilities, to meet our responsibilities to our children, and grow the economy at the same time." June 12, 1997 [Business Roundtable]

- "Here in the United States, we must do better...In order to reduce greenhouse gases and grow the economy, we must invest more in the technologies of the future. I am directing my Cabinet to work to develop them. Government, universities, business and labor must work together...We have to first convince the American people and Congress that the climate change problem is real and imminent. I will convene a White House Conference on Climate Change later this year..." June 26, 1997 [United Nations Special Session on the Environment and Development]

## IV. Current U.S. Position

### The United States' Protocol Proposal

- The United States has proposed a three-part framework for achieving a stronger, more cost-effective and comprehensive treaty:

  1. **Binding emission targets** for developed nations: Almost all developed countries, including the United States, will fall short of the non-binding aim in the current Convention. Shifting to a medium-term, binding, realistic and achievable targets should spur greater commitment and action by countries.

  2. **Flexibility** to achieve cost-effective reductions: The U.S. proposal calls for

emissions trading and joint implementation with credit. These proposals would allow trading across nations, thus providing an incentive to achieve the greatest possible reductions at the lowest possible costs.

3. **Participation of developing countries**: Based on the principle of "common but differentiated responsibilities" contained in the Climate Convention, the U.S. has proposed a comprehensive program of increasingly stringent actions by developing countries. These provisions escalate over time as the emissions from developing countries increase and call for agreement in Kyoto on a date certain by which developing countries would agree to binding targets.

**Policy Priorities**

- In putting forward this framework, the United States rejected proposals by some for what we believe to be unrealistic near-term cuts in emissions.

- We have also rejected calls by other nations for inflexible harmonized policies and measures.

- We are advocating flexibility because we believe that implementation costs can be reduced by as much as 85%. [Insert Graphic #12]

**Domestic Implementation Policies**

- Initial thoughts about U.S. domestic implementation of any internationally agreed upon target and timetable focus on three areas:

  -- **emissions trading**: a market-based, cost-effective way to limit greenhouse gas emissions;

  -- **technology development**: enhanced programs and incentives to spur U.S. leadership in developing the energy technologies of the 21st century.

  -- **transition assistance**: programs aimed at facilitating a smooth transition for those sectors that may be adversely impacted by climate policies.

**Technology Provides a Path Forward**

- Energy efficiency and alternative energy technologies offer many opportunities to:

  -- achieve money saving reductions in energy use;
  -- reduce both greenhouse gas and harmful conventional pollutants (hydrocarbons and nitrous oxides);
  -- enhance energy security by reducing dependence on foreign oil;
  -- challenge U.S. industry to provide energy solutions for the 21st century.

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not useful. This should be an intelligent discussion of where key interests and who makes them up. carefully worded in very neutral fashion

**Positions of Key Interest Groups**

- **Business Roundtable**: "We acknowledge the findings of the ...Intergovernmental Panel on Climate Change...Until the scientific and economic issues are better understood, there should be no rush to impose climate change policy measures, either by individual nations or, collectively. Further agreements reached must include a requirement or negotiating position to bring all countries, developed and developing, into the commitments making process."

- **Global Climate Coalition**: "Reducing current scientific uncertainty about the risk of climate change and engaging in a transparent and balanced decisionmaking process that produces comprehensive, flexible and cost-effective policy responses that address known climate risks are the cornerstones of the Global Climate Coalition's public policy." — Who is in it?

- **International Climate Change Partnership**: "ICCP's members believe that it is appropriate for policy makers to act to slow the rate of growth of greenhouse gas emissions until we are better able to define a more specific goal." — Who

- **The Business Council for Sustainable Energy**: "Climate policy should promote economic efficiency and technology promotion. Climate change policy should be developed based on principles of economic efficiency and promoting 'climate friendly' produce and process acceptance. Policies should be designed to achieve a series of clearly articulated targets designed to first stabilize, and then reduce, global greenhouse gas emissions." — Who

- **AFL-CIO**: "The AFL-CIO applauds President Clinton for his remarks...that invite discussion and dialogue...We are committed to exploring the widest range of solutions with all parties. Provided that all are committed to include economic as well as environmental co-----s on their list of key concerns." — 2000

- **Western Governors' Association**: "The Western Governors' Association urges that the President and the U.S. Department of State international negotiating team to proceed cautiously with regard to new aims and post-2000 commitments for greenhouse gas mitigation strategies that would place an undue cost burden on energy consumers of the states while supporting agreements for globally applicable provisions that will significantly reduce the impacts of greenhouse gas emissions."

- **Environmental Defense Fund**: "Our power to affect the Earth's climate may have outstripped our ability to understand and predict the consequences. It's time to catchup and prepare to adjust our actions accordingly. There is no other responsible course."

- **Natural Resources Defense Council**: "President Clinton is right. But unless he leads the way...our children will live in a greenhouse -- a planet enduring unprecedented global warming due to the burning of coal, oil, and gasoline."

- **United States Energy Association**: "A significant portion of the energy industry does not

support the mandatory approach. However, the industry is supportive of the Administration's approaches that advocates flexible and voluntary selection of implementation measures, emissions trading mechanisms around the world and "Joint Implementation..."

## WHAT THE ADMINISTRATION'S PROTOCOL PROPOSAL MEANS

The Administration's proposed protocol, dated January 17, 1997, specifies 1990 as the base year for the first budget period.

Carbon Emissions from Fossil Fuel Energy Consumption (Million Metric Tons Per Year)

| | 1990 | 1995 | 2010 | 2015 | Change 1990 to 2010 | Change 1990 to 2015 |
|---|---|---|---|---|---|---|
| U.S. total[1] | 1,344.2 | 1,423.7 | 1,722.4 | 1,799.3 | **28.14%** | **33.86%** |
| Electric generation[1] | 476.9 | 506.3 | 626.4 | 678.1 | **31.35%** | **42.19%** |

Talking Pts

The government projects that carbon emissions from U.S. electricity generation would increase by more than 42 percent between 1990 and 2015. If the Administration's proposal were adopted by the COP, and assuming the electric utility industry did not have to bear a greater proportional share of the nation's burden than any other sector, the permitted carbon emissions from U.S. electricity generation in 2015 *would have to be more than 200 million metric tons (about 30 percent) lower than they otherwise would be in 2015 in spite of the nation's economic and population growth, as well as any shifts from other forms of energy to electricity, during a full quarter of a century.*

If the first budget period is 2010 to 2015, electric utilities would be required to reduce their emissions during the first budget period by an *estimated 877 million metric tons (more than 175 million metric tons each year below the average annual emissions projected for the period).*[2]

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[1] 1990 data for U.S. total emissions and electric generation emissions, respectively, are from Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 1995*, p. 16, Table 5, and p. 19, Table 12 (October 1996). 1995 data and Reference Case projections for 2010 and 2015 are from EIA, *Annual Energy Outlook 1997*, Table A19 (December 1996).

[2] Annual EIA projections for the years between 2010 and 2015 currently are not available. The indicated estimates are based on averaging the annual projections for 2010 and 2015.

DRAFT 9/19 Talking Pts

**Climate Change: Possible U.S. Approach Towards Developing Countries**

**Background**

Since the beginning of the AGBM process in August 1995, we have recognized the climate change issue as a "global problem" requiring a "global solution." In his June 26th address before the Special Session of the United Nations General Assembly, President Clinton indicated that the U.S. would propose significant steps at Kyoto, while emphasizing the important role which developing countries must play, as well.

Presently, developed country emissions (including those from the OECD, the former Soviet Union, and Eastern Europe) account for approximately 60 percent of the global total. However, developing country emissions are growing rapidly, and by 2035 will account for more than half of the world's emissions. China, currently the second largest emitter, will surpass the U.S. within 15 years.

Recognizing the importance of controlling global aggregate emissions in order to mitigate climate change, it is imperative that any next step we take include actions from both developed and developing countries and, especially, from those key developing countries that are responsible for a significant portion of global emissions or that have relatively high per capita incomes.

**Talking Points**

-- We have long recognized that the stabilization of greenhouse gas concentrations at safe levels will require reductions in global emissions over the next several decades. OECD or Annex I actions alone will clearly be inadequate.

-- Consequently, we believe that the Kyoto outcome must reflect a "two step" approach in order to make concrete progress in our efforts to address the critical problem of global warming:

- Consistent with the Berlin Mandate, we will agree that developed country Parties should agree first on the level of their commitment.

- At the same time, it is critical to focus on binding quantitative commitments for developing countries and particularly on those countries that are responsible for a significant portion of global emissions or whose rapid economic development gives them the capacity to help the international community in its quest for remedial action.

-- This latter step could take the form of a "Kyoto Mandate." We will be providing additional details, as our thinking evolves, in October. This can be done without impeding the GDP growth in developing countries.