Climate Change Office
Department of Environment
Islamic Republic of Iran

Iran's Initial National Communication to UNFCCC

Presented at COP 7, November 5, 2001

by

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PRESENTATION OVERVIEW

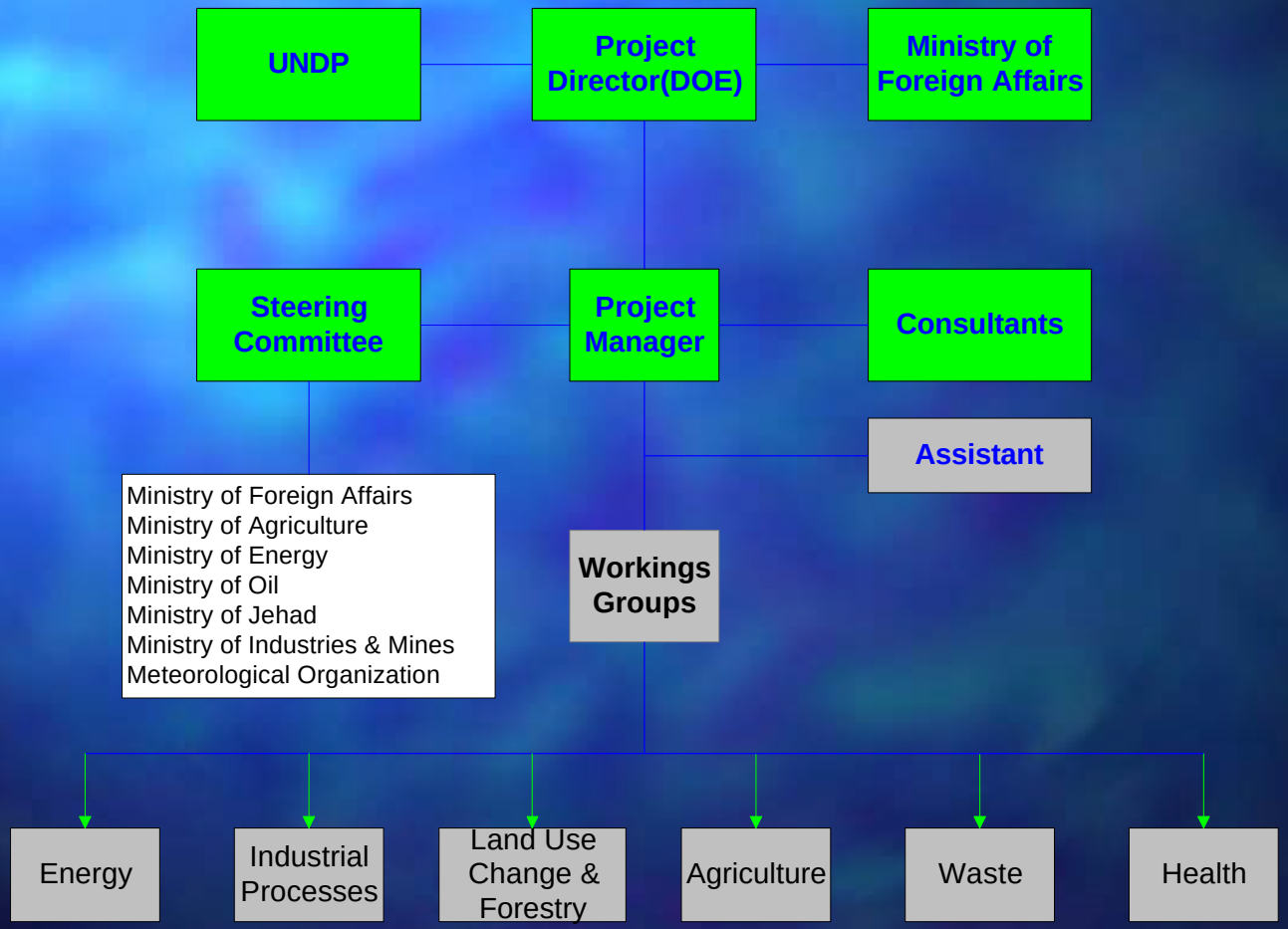
- General Information on Climate Change Enabling Activity in Iran
- National Circumstances
- Summary of Results
- Problems and Gaps
- GHG Inventory
- Proposed Policies and Measures for GHG Abatement
- Vulnerability and Adaptation Assessment
- Recommendation for Future Communications

General Information on Climate Change Enabling Activity in Iran

- National Focal Point : Ministry of Foreign Affairs / Department of Environment
- Fund provided by: GEF/ UNDP
- Project starting date: January 1998
- Submission of Initial Communication to UNFCCC: December 2001

General Information

Project Organization



General Information
Objectives

- National Capacity Building for Activities on Climate Change
- Preparation of the Initial Communication for Submission to the UNFCCC
- Preparation of the Cross-sectoral National Climate Change Strategies (Preliminary Action Plan)

National Circumstances

- Geography (next slide)
- Area: 1,648,000 sq.km
- Language: Farsi (Persian)
- Population: Approx. 60,000,000 (1994)
- Population Growth Rate: 1.8%(1994), 1.5%(2000)
- Literacy : 78% (1995)
- Distribution of GDP(1994):
- Agriculture 21.1%
  Oil 18.9%
  Manufacturing & Mining 18.6%
  Services 41.4%


Iran
International boundary
Province (ostān) boundary
National capital
Province (ostān) capital
Railroad
Road
0 250 Kilometers
0 250 Miles
Lambert Conformal Conic Projection, SP 12N/35N
ARMENIA
Yerevan
AZERBAIJAN
Baku
TURKEY
Türkmenbashi
Nebitdag
TURKMENISTAN
UZBEKISTAN
Caspian Sea
Gyzylarbat
Charjew
Ashgabat
Mary
Tejen
Bojnurd
Sarakhs
Saragt
Mashhad
Gushgy
Herât
AFGHANISTAN
Farâh
Birjand
Van
Orūmiyeh
Tabriz
Ardabil
Âstārā
Rasht
Bandar-e Torkeman
Gorgan
Irbīl
Karkūk
Mahābād
Zanjān
Qazvin
Tehrān
Semnān
Shahrūd
MAZANDARAN
SEMNĀN
KHORĀSĀN
railroad u/c
Harīrūd
Dasht-e Kavir (salt desert)
Kavir-e Namak
Sanandaj
Hamadān
Bākhtarān
Kāshān
Esfahan
Shahr-e Kord
CHAHAR MAHALL VA BAKHTIARI
YAZD
Yazd
Bafq
Baghdad
IRAQ
Ilām
Khorramabad
Dezful
Ahvāz
An Nāṣirīyah
Al Basrah
Umm Qasr
Abādān
Bandar-e Khomeyni
Yāsūj
KOHKILUYEH VA BUYER AHMADI
Kermān
KERMAN
Sīrjān
Bām
Zahedān
PAKISTAN
Nok Kundi
KUWAIT
Kuwait
Shatt al Arab
BŪSHEHR
Shīrāz
FARS
Bandar-e Būshehr
SAUDI ARABIA
Kangān
HORMOZGĀN
SĪSTAN BALUCHESTAN
Bazī
Persian Gulf
Manama
BAHRAIN
QATAR
Doha
Bandar-e Lengeh
Strait of Hormuz
Bandar-e 'Abbās
OMAN
Jāsk
Dubai
Administrative Line
Bandar Beheshtī
Gwadār
Abu Dhabi
UNITED ARAB EMIRATES
no defined boundary
Gulf of Oman
Arabian Sea
Muscat
De Facto Boundary
Boundary representation is not necessarily authoritative.
20% Over Normal
Normal
40% Under Normal
60% Under Normal
80% Under Normal
Base 802511 (R01078) 9-96

National Circumstances (continued)

- Oil Export (Mb/d)-1994/95 2.22
- Oil Output (Mb/d)-1994/95 3.60
- GNP ($ million) -1994/95 72,800

Climate: Extreme varieties

- Hyper-arid : 35.5% area coverage
- Arid : 29.2% “
- Semi-arid : 20.1% “
- Mediteranian : 5.0% “
- Wet (cold mountain type) 10.0% “

National Circumstances (continued)

Temperature Extremes (-33 to +52^0 C)

* 17% area coverage - extra cold
* 47% area coverage - cold
* 22% area coverage - temperate
* 12% area coverage - warm/hot

- Energy

* Oil: Crude (1994) 3.596 Million barrel/day
  Refined (1994) 0.917 Million barrel/day
* Natural Gas : (1994/95) 35.5 Billion cubic meters

(Domestic consumption for power plants, household, industrial and refineries).

National Circumstances (continued)

* No. of Refineries : 8 with capacity of 1.4 Mn b/d
* Electricity Generation (1994/95): 82,019 Mn kWh

- Steam power plants	:	65.1%
- Hydropower	:	9.1%
- Gas Turbines	:	18.8%
- Diesel Generators	:	1.0%
- Private Sector	:	6.0%
Total	:	100.0%

National Circumstances (continued)

Electricity Consumption

Household	22,473 mn kW	35.3%
Commercial	13,747 " "	2.06%
Industry	20,470 " "	32.2%
Agriculture	5,169 " "	8.1%
Other	1,766 " "	2.8%
Total		100.0%

Summary of Results

- Establishment and initiation of the Climate Change activities in Iran.
- Acquisition and compilation of the Activity Data.
- Identification of problems and gaps (to be described in the next slides).
- Preparation of the National Greenhouse Gas Inventory.
- Proposing policies and measures for GHG abatement.

Summary of Results (Continued)

- Assessment of the vulnerability of the country and adaptation to climate change.
- Preparation of a “preliminary” National Action Plan.
- Designing a national climate change “website”.
- Organizing three national workshops on climate change.
- Preparation of public awareness brochures.

Summary of Results (Continued)

- Preparation of the Initial National Communication to the UNFCCC.
- Preparation of the proposal for “Phase II” of the Climate Change Enabling Activity for future National Communications.

Problems and Gaps

- Great uncertainties in activity data, emission factors, monitoring data, as well as in modeling results. Need for improvements in all of these aspects.
- Lack of local emission factors in all areas.
- Slow start-up of the project due to financial and logistics limitations.
- Difficulties in obtaining the activity data and the pertinent information regarding climate change.

Problems and Gaps
(Continued)

- Difficulties in identification of the national experts familiar with the climate change concept.
- Difficulties in institutional coordination on different aspects of the climate change project.
- Insufficient information sources for climate change studies.
- Insufficient funds for educational, research, training, and public awareness activities in climate change.

Problems and Gaps
(Continued)

- The need for educational programs at different levels from elementary schools to universities.
- The need for training, public awareness, and research programs.
- The need to enrich the human resources knowledgeable in the field of climate change.
- The need to improve and expand the national climate change monitoring network.

Problems and Gaps
(Continued)

- Emphasis on the continued support by GEF or other sources in order to prepare the future National Communications and strengthening the national enabling activities on climate change.

- The need for more coordination and link between the Sustainable Development of the country and the Climate Change abatement

Problems and Gaps (Continued)

- The need for enhanced international cooperation.

- Technological constraints on the implementation of the national plans for sustainable development.

- Financial limitations and economic constraints on the implementation of the national sustainable development plans.

Problems and Gaps (Continued)

- Economic burden on the country due to drought, fluctuation of oil prices, over 1.5 million Afghan refugees, constraints on technology transfer to Iran, and the cost of the 8-year imposed war against Iran during 1980-1988.

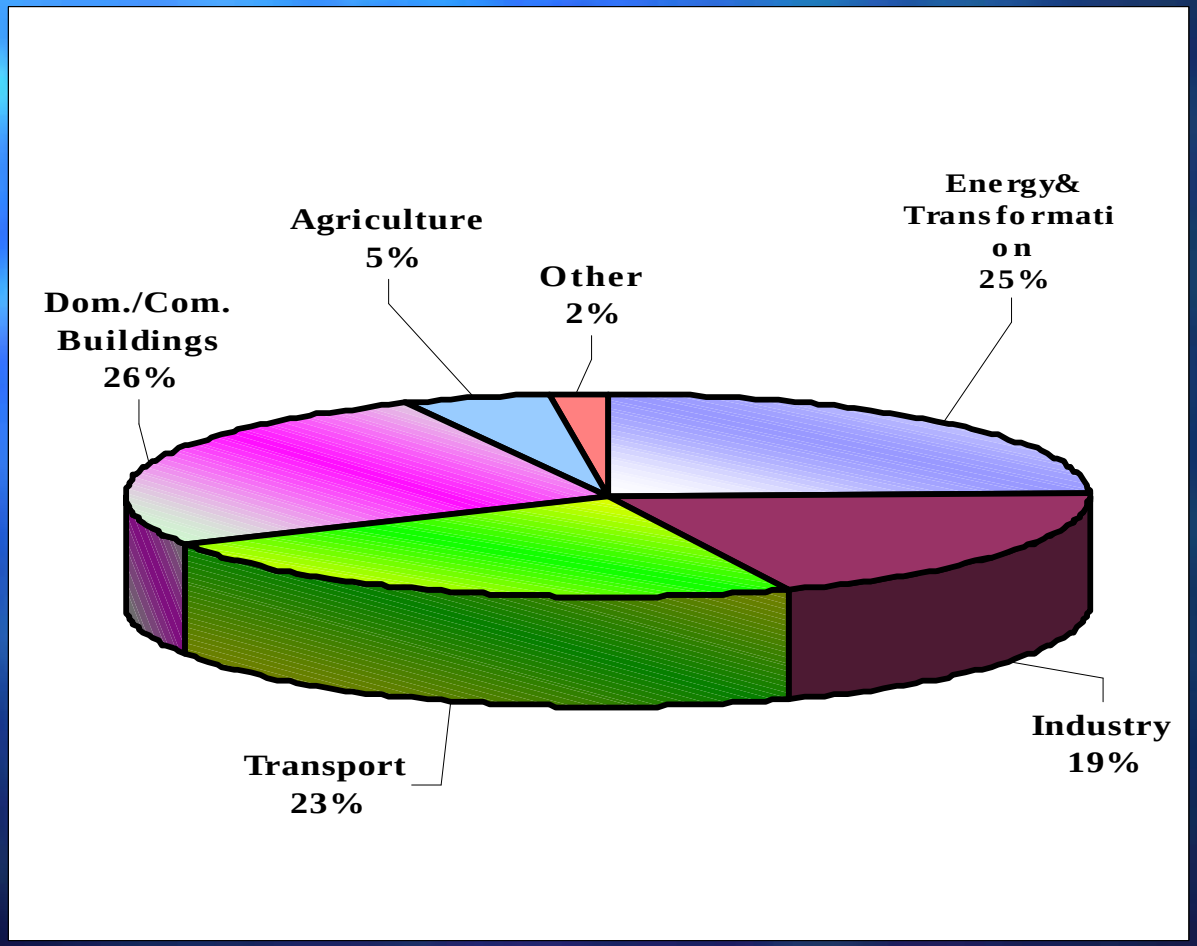
National GHGs Inventory

CO_2 Emissions from Different Energy Sub-sectors(Gg)-1994

Sources	CO_2 Emissions
Energy &Transformation	63,197
Industry	48,179
Transportation	58,709
Commercial and Residential Buildings	66,512
Agriculture	12,689
Other	5,067
Sub- total	**254,354**
Hot flaring	**31,537**
Total	**285,891**

National GHGs Inventory

Contribution of Energy Sub-sectors to CO_2 Emissions (1994)



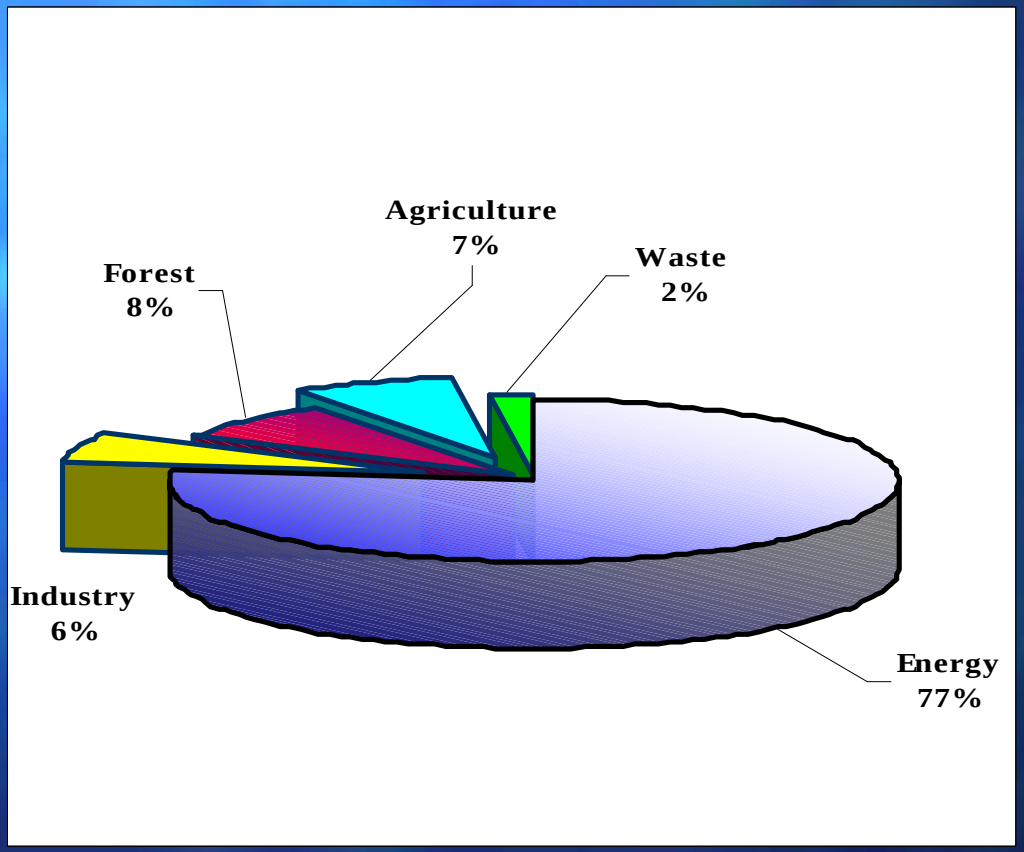
National GHGs Inventory

Summary of GHGs Inventory of Iran in 1994 (Gg)

Sources	CO_2	CH_4	N_2O
1.Energy	285,891	1559.0	8.79
Fuel Combustion	254,354	80.58	8.79
Fugitive Emission	31,537	1478.0	0.0
2. Industrial processes	24,754	1.85	2.2
3. Agriculture	0	643.09	54.0
4. Forestry	31,416	6.97	0.049
5. Waste	0	326.71	4.64
Total	**342,062**	**2537**	**70.0**
GWP	1	21	310
Total CO_2 Equiv.	**342,062**	**53,290**	**21,657**

National GHGs Inventory

Contribution of Different Sectors to total GHGs in 1994 (Gg)



Policies and Measures for GHGs Abatement

- Oil & Gas Activities
  - Fuel switching
  - Energy efficiency
  - Gas injection to wells
  - Collection and use of flared gas, needs to be supported by CDM and Technology Transfer in the following areas:
    - Gas-to-Liquid Processes (GTL)
    - Oxidative Coupling of Methane (OCM)
    - Well- to- Watt (WW)
    - etc.

Policies and Measures for GHGs Abatement

- Transportation
  - Improvement of Fuel Quality & Fuel Pricing
  - Improvement of Public Transportation
    - Fleet Increase
    - Conversion to CNG
    - Catalytic Converter & Particulate Trap
    - Expansion of Metro, LRT
    - Scrappage & Retrofit Program for aged Vehicles
  - Urban Traffic Management
    - Parking Policies
    - Intelligent Traffic Lights
    - Enforcement of Traffic Regulation

Policies and Measures for GHGs Abatement

- Power Generation
  - Fuel Switching
  - Hydro Power Plants
  - Energy Efficiency
    - Combined Cycle
    - Combined Heat & Power
    - Small Power Plants
  - Renewable & Clean Energy Resources
    - Nuclear
    - Solar and Wind
    - Geothermal, Wave, Tidal and Hydrogen
- Industries
  - Fuel Switching and Energy Efficiency

Policies and Measures for GHGs Abatement

- Commercial & Residential Building
  - Fuel Switching
    - Expansion of Rural Electrification
    - Expansion of Rural LPG Uses
    - Expansion of Urban NG Uses
  - Energy Efficiency
    - Efficient Home Appliance
    - Buildings Insulation
    - Double Layer Windows
- Agriculture
  - Agricultural Irrigation system of Electricity Network
  - Use of More Efficient Engine

CO2 Emission Trends for Power Plants in Baseline Scenario

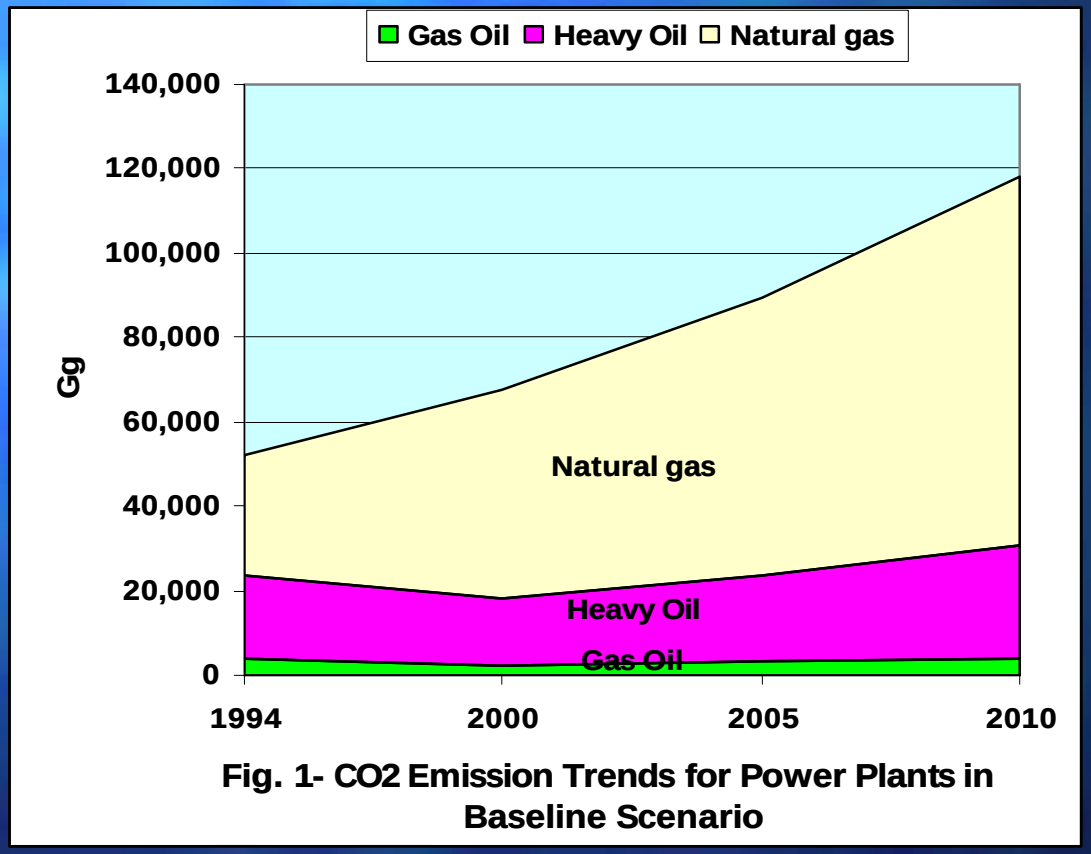


Fig. 1- CO2 Emission Trends for Power Plants in Baseline Scenario

CO2 Emission for Different Measures in Power Plants

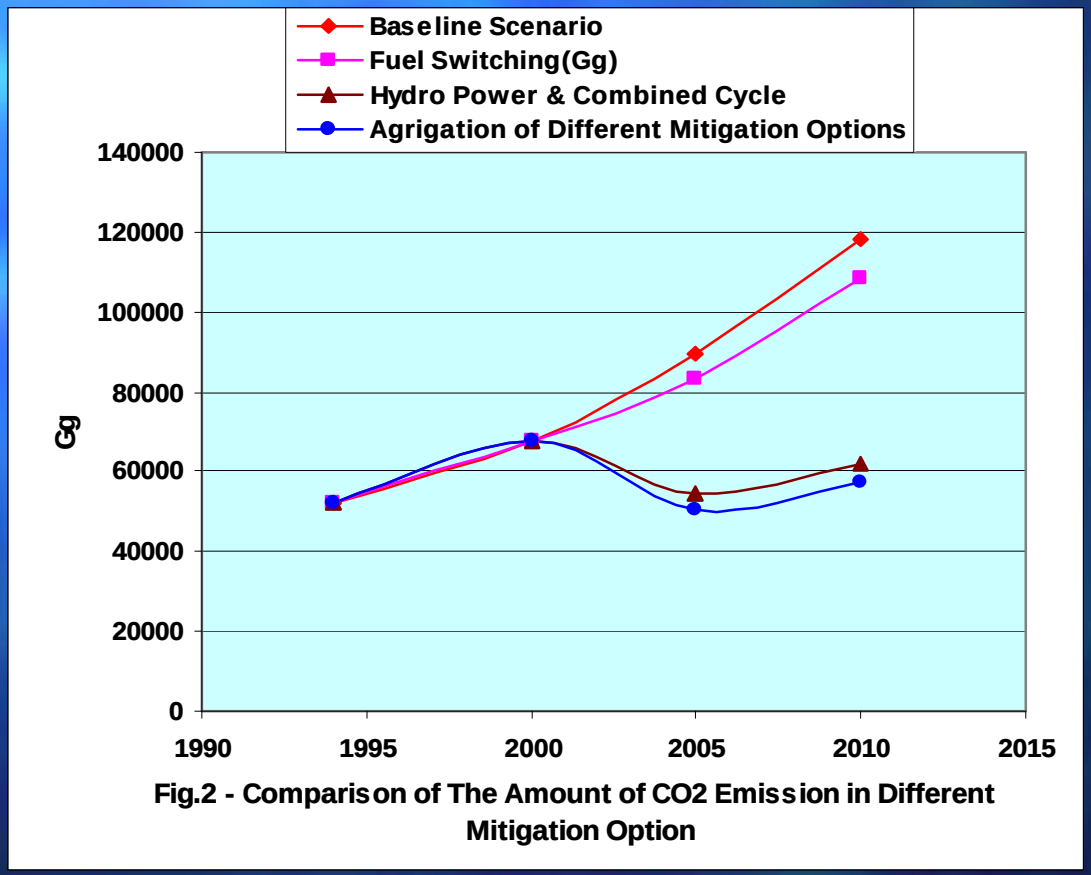
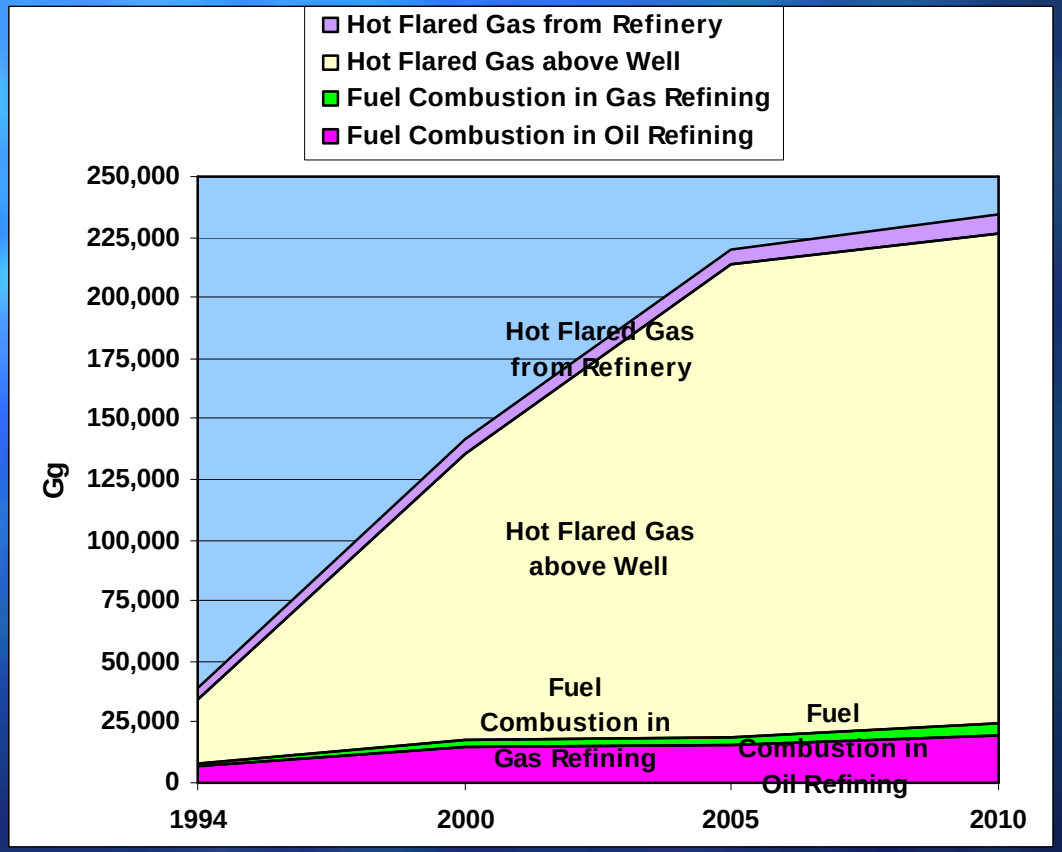
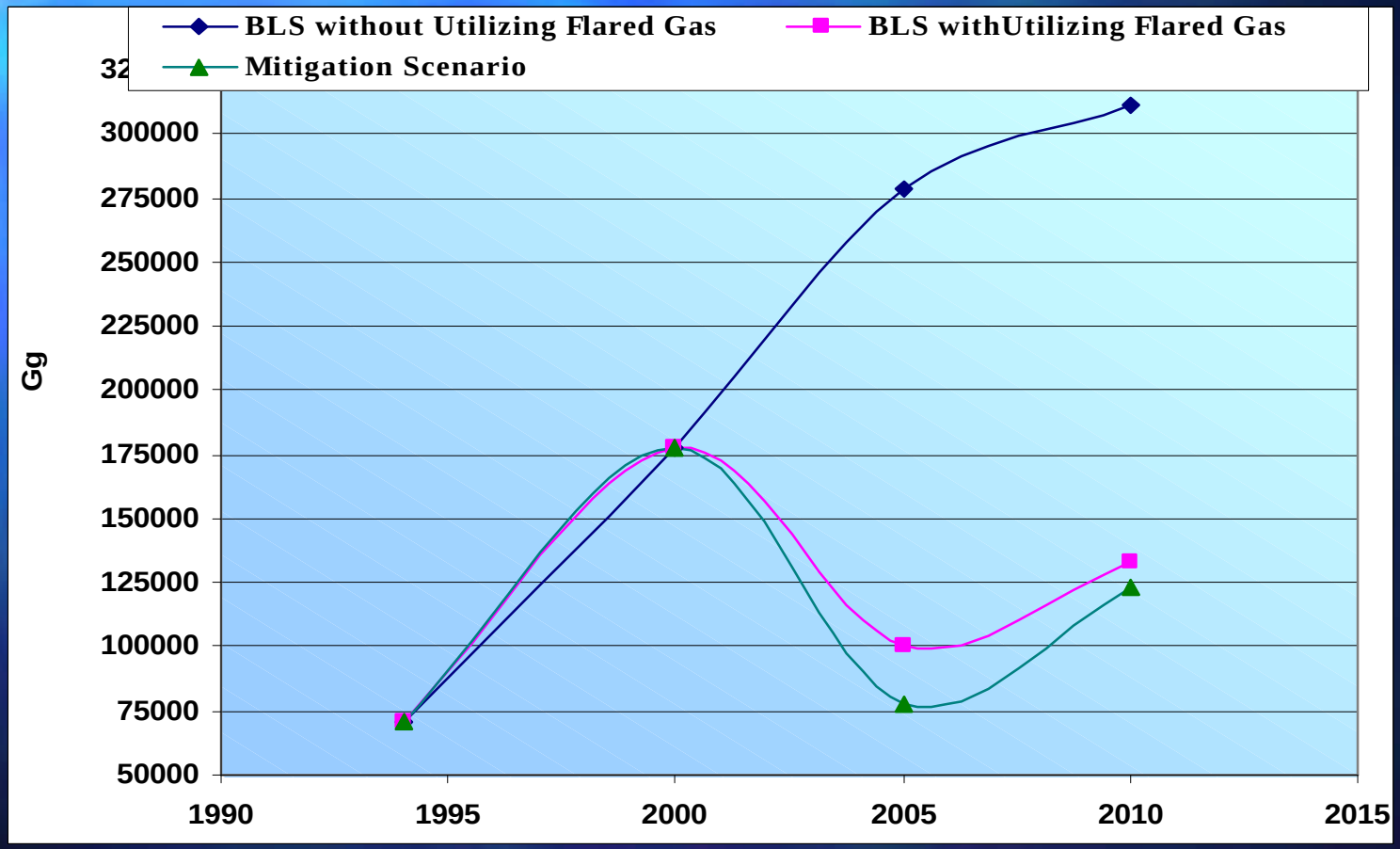


Fig.2 - Comparison of The Amount of CO2 Emission in Different Mitigation Option

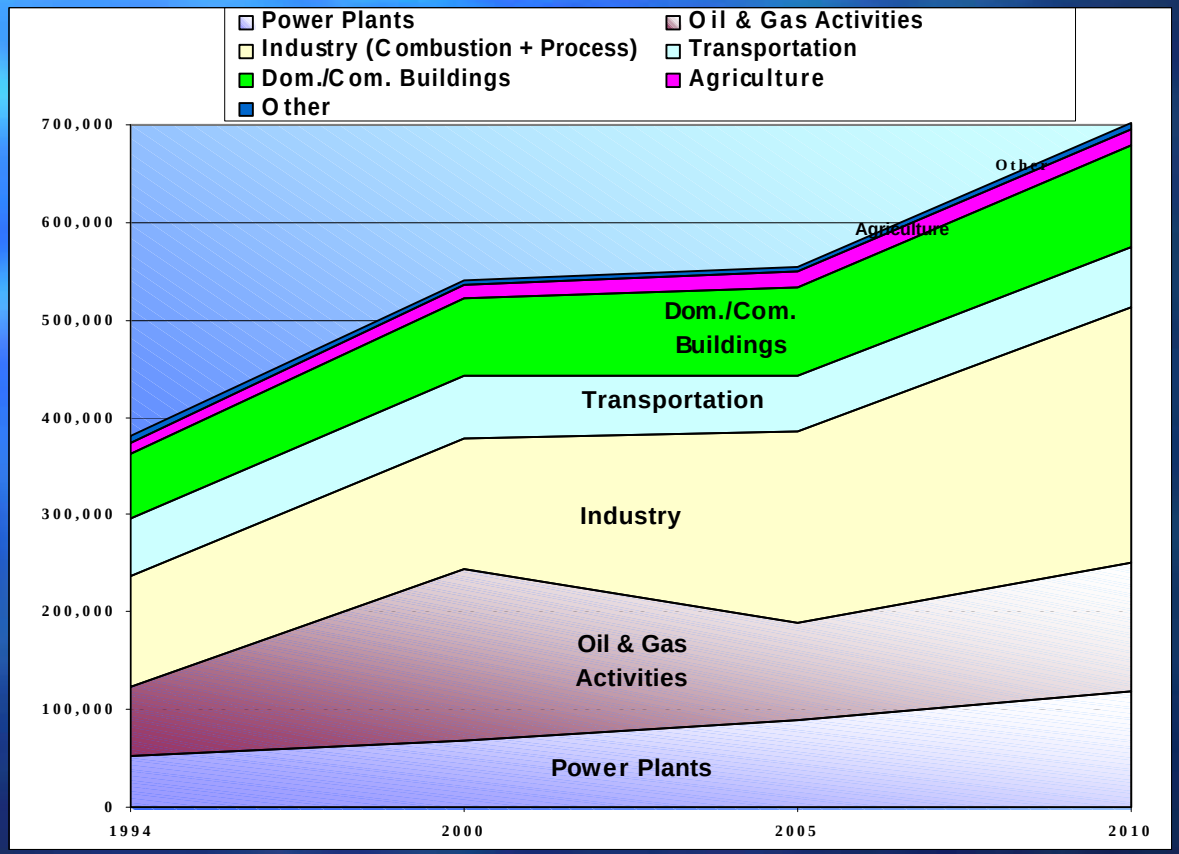
CO2 Emission Trends in Baseline Scenario for Oil & Gas Activities with Gas Flaring



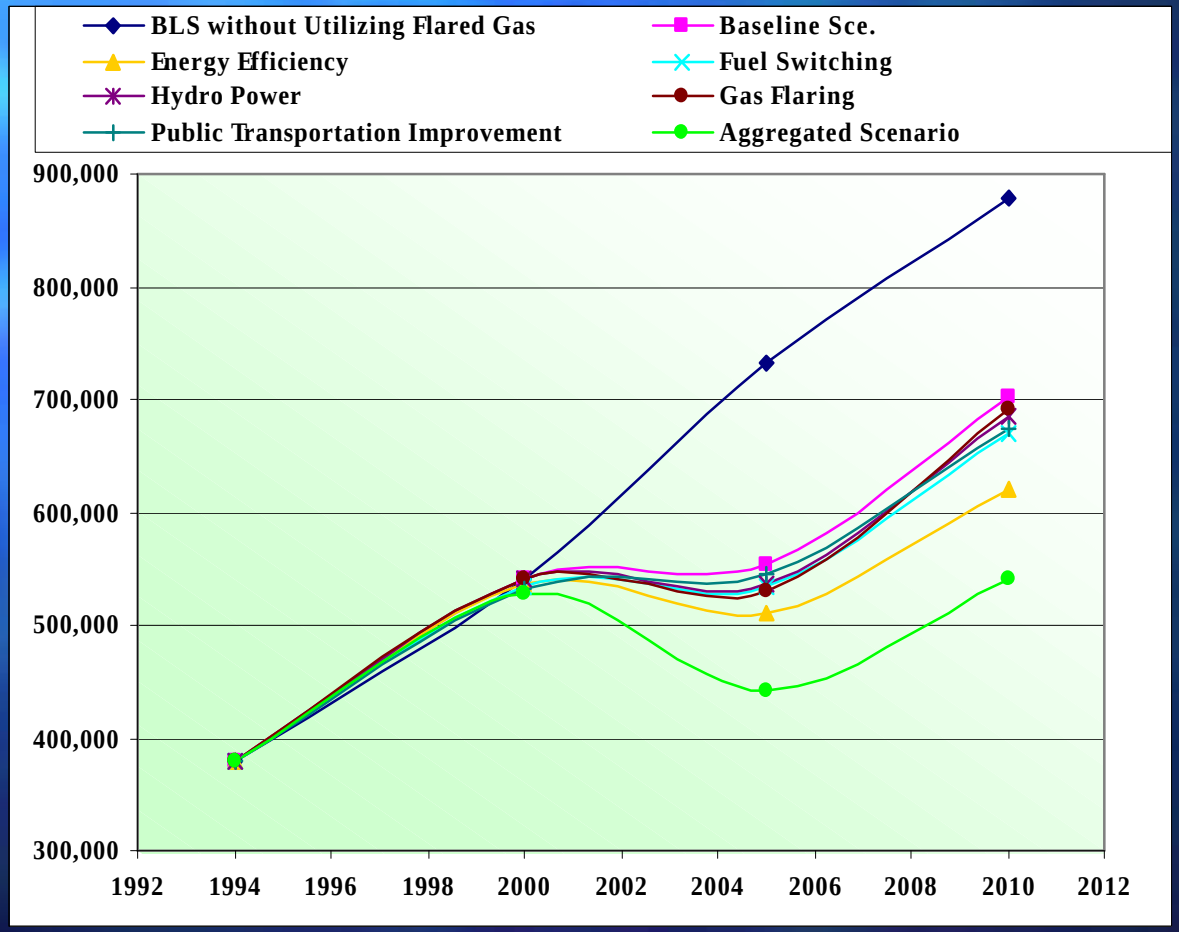
CO2 Emission Trends in Different Scenarios for Oil & Gas Activities



GHGs Emission Trends in Baseline Scenario for Energy Sector



GHGs Emission Trends in Different Scenarios for Energy Sector



Vulnerability & Adaptation Assessment

- **Water Resources**
  - Agricultural usage: 81.4 billion cubic meters (94%)
  - Domestic and drinking: 4.5 billion cubic meters(5%)
  - Industry: 0.9 billion cubic meters (1%)
  - More than 68% from ground water.

A. Vulnerability

- Reduction in snow fall in winter resulting in changes in seasonal pattern of river flows.

Vulnerability & Adaptation Assessment (continued)

- Changes in water quality

- Severe drought caused by reduction in precipitation of at least 30% during the past 3 years

- Many rivers dried or had flow reductions of more than 50%

- More than 30 billions cubic meters of flow reduction in surface water and 15 billions in ground water in the year 2000

Vulnerability & Adaptation Assessment (continued)

- **B. Adaptation**
  - Water conservation in all sectors
  - Integrated ground and surface water management
  - Improved operation of reservoirs
  - Construction of new dams
  - Artificial ground water recharge
  - Water reuse and recycling
  - Further research and investigation to obtain hydrological data

Vulnerability & Adaptation Assessment (continued)

- Construction of low-cost miniature reservoirs for local irrigation
- Rehabilitation of small tanks in dry zones
- Sound watershed management
- Use of sprinkling and pressurized irrigation systems
- Water rationing and pricing policies

Vulnerability and Adaptation Asseessment

Energy

Response measures impacts:

- Reduction of the demand for energy in Annex B countries results in adverse effects on energy prices and export revenues.
- Multi-sectoral (MS) - Multi-regional Trade (MRT) model predicts the impact of response measures on energy prices, terms of trade, and ultimately the welfare effects.
-

Vulnerability and Adaptation Assessment (continued)

- It would take between $45 and $79 billions to restore Iran's welfare.
- The net impact of Annex B policies on oil prices and export causes Iran's welfare to fall between 1.8% and 3.1%.

Vulnerability and Adaptation Assessment (continued)

Power Plants

- Damage to coastal installations for power plant cooling.
- 2% loss in efficiency caused by 1 C in ambient temperature and extra cooling load.
- Loss of hydropower output due to lack of water supply.
- Increase in electricity demand for cooling.

Vulnerability and Adaptation Assessment (continued)

Adaptation

- Diversification of industrial activities and sources of foreign revenues.
- Prevention of gas flaring and venting.
- Use of dry cooling systems in power plants.
- Expansion of combined cycles in power plants.
- Development of co-generation.
- Expansion of hydropower capacity.

Vulnerability and Adaptation Assessment (Continued)

- Increase the share of natural gas in energy sector.
- Development and expansion of solar and wind energies.
- Increase the efficiency of transportation system.

Vulnerability and Adaptation Assessment

- **Agriculture**
  - Very important in Iran's economy & national security
  - Provides 75% of the food for the country
  - Contributes to about 26% of GDP
  - Contributes to about 25% of the non-oil export
  - Contributes to about 24% of the total employment

Vulnerability & Adaptation Assessment (continued)

- In wheat production alone , the 1998-99 drought caused a reduction of more than 3.5 mn tonnes
- Severe decrease in all agricultural products due to higher evapo-transpiration and drought

Adaptation

- Historically adaptive [for example: use of underground canals, or “Ghanats”]
- Development of new crop (early maturing type) varieties

Vulnerability and Adaptation Assessment (continued)

- Deep tillage
- Timeliness of tillage
- Construction of small scale reservoirs and dams
- Enclose the irrigation canals
- Reuse of drainage water
- Pressurized irrigation systems
- Leaching of salt affected soils

Vulnerability and Adaptation Assessment

Coastal zones (Caspian Sea and Persian Gulf)

A. Vulnerability

- Sea level rise, salt water intrusion
- Coastal erosion
- Inundation

B. Adaptation

Adaptation capacities in Iran's coastal zones are not well known and need to be investigated further.

Vulnerability and Adaptation Assessment (continued)

Forestry

A. Vulnerability

- Intensification of forest land erosion, particularly in the arid and semi-arid areas

- Changes in the hydrological cycles

- Retrogression of forests from the sea and destruction due to the sea level rise

- Increase of fire danger in forests

- Unsuitable environment for wildlife

Vulnerability and Adaptation Assessment (continued)

B. Adaptation

- Rehabilitation, development and treatment of forest resources

- Afforestation

- Balancing forest harvesting volume with forest growth and forest ecological capacity

- Forest tree improvement and use of fast growing species for reforestation

Vulnerability and Adaptation Assessment(continued)

- Changing the abandoned farm lands to forests

- Developing wood farming and agro-forestry system

- Implementation of national plan for “Green Movement” throughout the country

Recommendations for the Preparation of Future Communications

- The need for continued financial support from GEF or other sources.
- The need for continued cooperation and support of the UNFCCC.
- Studies and research to be carried out to acquire more reliable activity data to reduce uncertainties.
- Development of national emission factors to replace the IPCC default emission factors in order to reduce the uncertainties in emission estimates. This activity can be carried out in Iran to provide the required data for regional countries as well.

Recommendations for the Preparation of Future Communications(Continued)

- Development of educational programs at different levels from elementary schools to universities to raise the awareness to climate change.
- Development of research programs and support of the ongoing research on climate change.
- Development and enhancement of the national climate change monitoring system with the support of GEF/NCSP (National Communication Support Programme).
- Organizing national, regional, and international workshops.

Recommendations for the Preparation of Future Communications(Continued)

- Identification of the projects to be implemented for GHG mitigation in relation with CDM and Technology Transfer.

- Studies on the impact of response measures of Annex I countries on Iran as an oil producing country.

Thank you for your attention