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IRAN'S COMMITMENTS TOWARD MEETING THE GOALS OF PARIS AGREEMENT HARNESSING THE GLOBAL TEMPERATURE RISE

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Since its inception in Rio, 1992, United Nations Framework Convention for Climate Change (UNFCCC) has held 23 Conference of Parties (COP). COP21 of Paris, December 2015, by consensus, is a breakthrough in more than 25 years of debates and disputes over climate change and global warming issues. COP21 invites the world players to reduce the Global Greenhouse Gas (GHG) emissions, to limit Planet's temperature rise to below 2 degrees Celsius, if not below 1.5, by the end of the 21st century. To meet the challenge, the main recommendations of the agreement are as follows: COP21 invites its member to propose an intended Nationally Determined Contribution (NDC), towards meeting its goals, proportionate to their administrative, economic, and technological capabilities. NDCs are required to be Measurable, Reportable, and Verifiable (MRV). NDCs should be revised every 5 years on the basis of knowledge and experience gained in the process. COP21 urges the developed countries to assist the developing ones, technology-, finance-, and knowhow- wise to develop and execute their NDCs. Recommendations of COP12 are nonbinding. Islamic Republic of Iran is a member of UNFCCC since 1996. President H. Rouhani attended the Paris Conference and pledged to reduce Iran's GHG emissions: a) Voluntarily by 4% in the period 2020-30; and b) Conditionally by an additional 8% by 2050. The reference year for GHG reductions is 2010 on BAU basis. Conditions for the 8% reduction are, the availability of financial and technological means, and lifting of the sanctions imposed upon the country. Again, the pledges are non-binding, as for all UNFCCC parties. A Working Group on Climate Change (WGCC), stationed in the Department of Environment of Iran (DOE), is the liaison with UNFCCC. WGCC is given the task of drawing up Iran's NDC. A first draft of this document is now available to public.

Keywords: climate change, Paris Agreement, GHG emissions, adaptation, Iran.

Introduction

Since its inception in Rio, 1992, United Nations Framework Convention for Climate Change (UNFCCC) has held 23 Conference of Parties (COP). The Latest, COP23, was presided by the Fiji government with the support of Germany in Bonn, November 2017. COP21 of Paris, December 2015, by consensus, is a breakthrough in more than 25 years of debates and disputes over climate change and global warming issues. COP21 invites the world players to reduce the Global Greenhouse Gas (GHG) emissions, to limit Planet's temperature rise to below 2 degrees Celsius, if not below 1.5, by the end of the 21st century. To meet the challenge, the main recommendations of the agreement are as follows:

- COP21 invites its member countries, to propose an intended Nationally Determined Contribution (NDC), towards meeting the goal of COP21, proportionate to their administrative, economic, and technological capabilities.
- To ensure realization of the NDCs, COP21 requires its members to submit, bi-annually, a Measurable, Reportable, and Verifiable (MRV) docu-

ment explaining the State of their NDCs.

- COP21 recommends revision of NDCs every 5 years on the basis of knowledge and experience gained in the process.
- COP21 urges the developed countries to assist the developing ones, technology-, finance-, and knowhow- wise to devise and execute their NDCs.

Recommendations of COP21 are nonbinding. They are meant to draw attention of the governments and people everywhere in the world, to the fact that a warming planet endangers the existence and wellbeing of all societies and bio systems.

Islamic Republic of Iran as a member of UNFCCC

Islamic Republic of Iran is a member of UNFCCC since 1996. Its representative in UNFCCC is the Department of Environment (DOE) of Iran. A Working Group on Climate Change (WGCC), stationed in DOE is its liaison. The President of the Islamic Republic of Iran, His Excellency Hassan Rouhani attended the Paris Conference and pledged to reduce Iran's GHG emissions:

- a. Voluntarily by 4% in the period 2020–2030; and
- b. Conditionally by an additional 8% (totaling 12%) by 2050.

The reference year for reduction of the GHG emissions is the year 2010 on business as usual basis. Conditions for the 8% reduction are, the availability of financial and technological means, and lifting of the sanctions imposed upon the country. Again, the pledges are non-binding, as for all UNFCCC parties.

WGCC is given the task of drawing up Iran's NDC. A first draft of this document is now available to public. The main items in Iran's NDC are the following:

1. The energy sector of Iran is responsible for more than 80% of country's GHG emissions. Provisions to reduce them are:
 - to replace old single cycle gas turbines by combined cycle plants;
 - to develop new combined cooling-heating and power plants;
 - to replace the coal and oil burning plants by gas burning ones;
 - to initiate structural changes in technical configuration of oil refineries and improve energy efficiency in oil & gas refineries;
 - to prevent leaks in the country-wide oil and gas pipe lines and in electricity distribution grids.
2. The energy intensity of the country's industrial production and building sector is unacceptably high, twice that in the region, four times that in Europe, and almost nine time that in Japan. Recommendations are:
 - to review and upgrade routine maintenance check lists in all steps of production;
 - to replace old technologies by modern ones;
 - to create agile managements from top to bottom;
 - to replace the coal and oil burning plants by gas burning ones.
3. Fugitive gases from oil and natural gas fields, refineries, and petrochemical plants in 2010 constituted 18% of GHG emissions of the Country (table). It is somewhat lower now. Researchers of Sharif Energy Research Institute (SERI) estimate that collection and reuse of 75% of the fugitive gases is possible and can reduce Iran's CO₂ emissions by 5%, one percent more than the voluntary pledge of the country. If reduction in methane emission is included, further reduction of GHG emission by 11%, can be accomplished. These two items add up to 16%, significantly more than the total 12% voluntary and conditional pledges of the country. The main obstacle on the way of implementation of such an ambitious, but a do-

able policy is the international political tension and exertion of sanctions on the country.

4. Presently, the hydropower capacity of Iran is 12-15%. In the face of global warming, and reduced precipitation in the mid-latitude dry and warm Iran, however, this potential is expected to decline rapidly.
5. Contribution of Renewable Energies, solar heating, solar photovoltaics, wind and biomass, to the energy mix of the country is, presently, insignificant. But it can be increased significantly, as part of the country's NDC. Main obstacles in the development of renewables are the heavily subsidized prices of oil and natural gas in the country, scarcity of capital and inaccessibility of efficient technologies. These factors leave no incentive for prospective private investors to come forward.

Vulnerabilities

- Mid-latitude Iran is dry and warm, is located in the main global dust belt bellowing easterly and bringing in the dust storms of African Sahara, the Arabian peninsula and the Mesopotamian plateau.
- Iran's annual precipitation is one third of the global average. Evaporation from its wetlands is three times that of the global average.
- Considering its expanse of 1.6 million square kilometers, Iran's share from the world's forests is one third, and from its deserts is three times the world average.
- In the past ten years programmable water of the country has dropped from 130 to 90 billion m³. Projections indicate that there will be further reduction to one half by 2030.
- Model simulations show that Iran's temperature rise by 2030 will reach 1.5 degrees Celsius. This means an additional annual loss of 10 billion m³ of water from the wetlands and agricultural fields of the country.

Potentials for Adaptation and Mitigation

A good fraction of the Iranian population is young and educated while most of Iran's problems, in coping with global warming, demand low tech solutions. Low tech is available country-wide. To reduce losses in the delivery of water, gas, and electricity from production points to consumers' doors is a household knowhow, available everywhere.

There are, however, serious obstacles. Government controlled economy, bureaucratic administration, and lack of discipline in industrial productions to manufacture standard products are among the most distractive factors on the way of steady and sustainable development of the society.

GHGs Emission Inventory of Iran, 2010 (Kton)

Sources	CO ₂	CH ₄	N ₂ O	Total
1. Energy	584,451	5,437	4.0	699,868
Fuel Combustion	543,569	71	4	546,300
Fugitive Emissions	40,882	5,366	0	153,568
2. Industry	67,840.8	29.8	4.5	69,846
3. Agriculture	598.8	966.1	75.7	44,367
4. Forestry	9,181	0.3	0.0	9,187
5. Waste	29.0	1,308.2	1.3	27,905
Total GHG's Emissions	662,101	7,741	85	851,173
GWP	1	21	310	
Total CO ₂ Equivalent	662,101	162,570	26,502	851,173

Source: Iran's third National Communication

Nonetheless, researchers in SERI and elsewhere in the country, maintain that with well thought planning and management, Iran can reduce its GHG emissions by about 40% by 2050. Private investors, domestic and/or foreign, should be encouraged to come forward. The initial investment may be high, but the return of the capital is quick and profits are rewarding.