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۱۳۹۵ - ۱۳۸۶
5th INTERNATIONAL SYMPOSIUM ON IRAN 2026 VISION

با مشارکت و همکاری علمی شرکت ملی صنایع پتروشیمی

راهبرد مقررات ایمنی و کاهش آلاینده‌های محیط زیست

بر اساس معاهده پاریس ۲۰۱۵

Strategies for Reducing Environmental Pollution & Safety Regulations

۱۷ اسفند ۱۳۹۵ / مرکز همایشهای بین‌المللی صداوسیما

7th March 2017 -Tehran, IICC

According to PARIS AGREEMENT 2015

Second PANEL

- Establishing Procedures to Reduce Greenhouse Emissions

Olga Alcaraz & Josep Xercavins

GGCC GROUP GOVERNANCE CLIMATE CHANGE
STH. Sustainability, Technology and Humanism
UPC Singular Research Group
UNIVERSITAT POLITÈCNICA DE CATALUNYA

From the Global to the Country References in the road towards 2°C

The Model of Climate Justice per capita

Iran Case Study

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"THE CARBON BUDGETS THAT WILL PREVENT THE AVERAGE TEMPERATURE OF THE EARTH'S SURFACE FROM INCREASING BY MORE THAN 2°C WHEN COMPARED WITH THE TEMPERATURE OF THE PRE-INDUSTRIAL ERA"

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Contents

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- The translation of the 2°C references to the country level
- The Model of Climate Justice per capita. Iran Case Study
- The INDC analysis from the perspective of the 2°C global references. Iran Case Study
- Key drivers of CO2 emissions. Iran Case Study
- Final considerations

Contents

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- The translation of the 2°C references to the country level
- The Model of Climate Justice per capita. Iran Case Study
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- Final considerations

Introduction in the Paris Agreement context

- **The aims of PA article 2.1, defined at global and general levels** (i.e. global average temperature –the long-term goal-, low greenhouse gas emissions development, food production, etc.) **are a big challenge**
- Article 2.2. specifies that the agreement *"will be implemented to reflect* ***equity*** *and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances"*
- In the preamble of the Paris agreement we can read: *"Noting the importance for some of the concept of* ***"climate justice"****, when taking action to address climate change"*

Contents

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- The translation of the 2°C references to the country level
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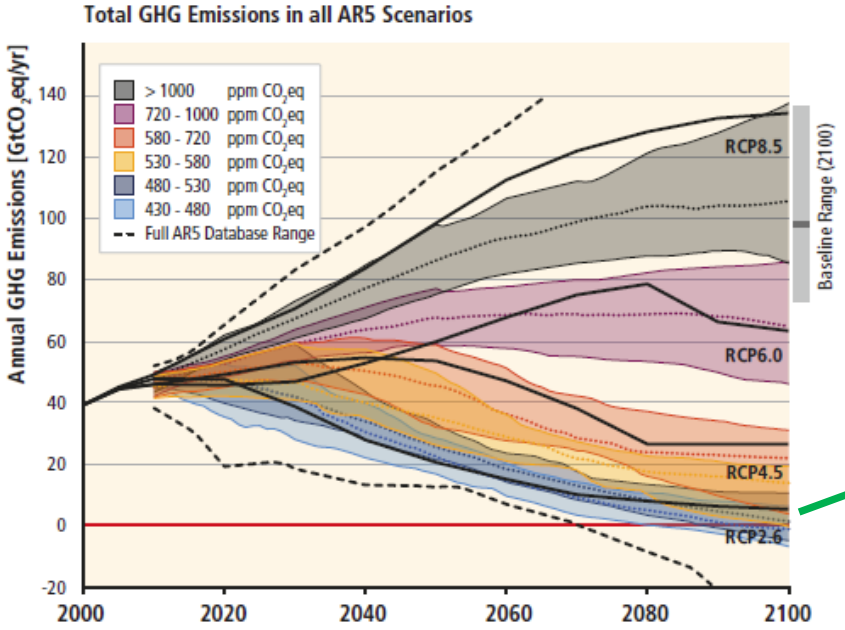
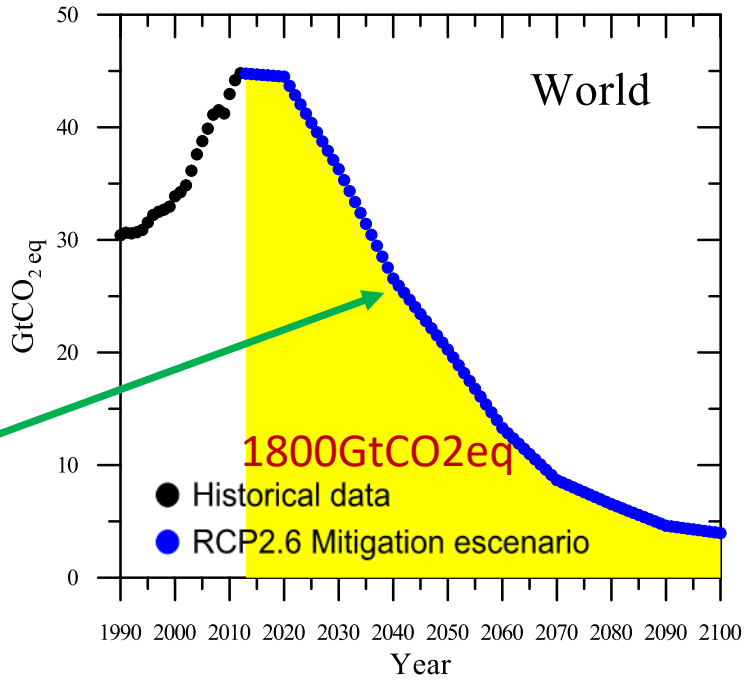
The **GLOBAL REFERENCES**

1. The 2ºC Global Carbon Budget: The cumulative CO2 emissions consistent with the goal of keeping the global average temperature rise below 2ºC with > 66% probability

According to IPCC, from 2011 to 2100 → 1000GtCO2 → 1800GtCO2eq

2. The World 2ºC emissions scenario for all GHG: the RCP 2.6 scenario





Contents

- Introduction in the Paris Agreement context
- The global references for the 2°C scenario
- **The translation of the 2°C references to the country level**
- The Model of Climate Justice per capita. Iran Case Study
- The INDC analysis from the perspective of the 2°C global references. Iran Case Study
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The need to translate the World 2°C references to regional and country levels

- The RCP2.6 scenario and the 2°C Global Carbon Budget are the World references that we have to follow in order to achieve the 2°C goal.
- It's necessary to translate, to specify, these two references for different regions and/or countries.
- These **"country specific 2°C reference scenarios"** have to be available before countries produce their second NDCs (2020) because they could be used as a common reference for everyone.
- All the countries (and the international community) need these references in order to check if the commitment of each country is on track for the common 2 °C goal. And, if it is not on track, to know how far away it is.

Contents

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- The translation of the 2°C references to the country level
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How to distribute the Global Carbon Budget with Climate Justice?

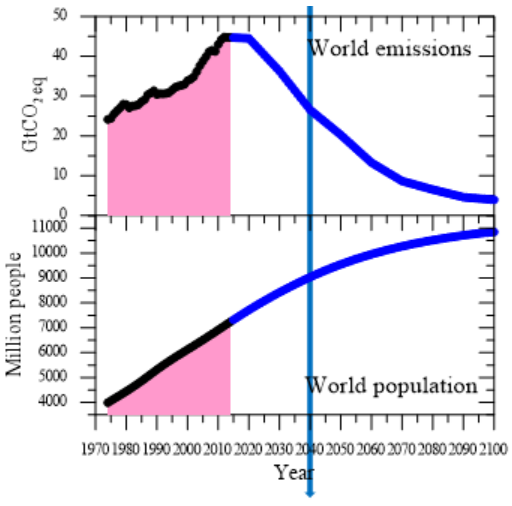
- There are several ways to introduce an ethical concept like CLIMATE JUSTICE in a computer with the aim of calculating a fair distribution of the Global Carbon Budget among the UNFCCC state parties. One of them is our **Model of Climate Justice per capita (MCJ).**

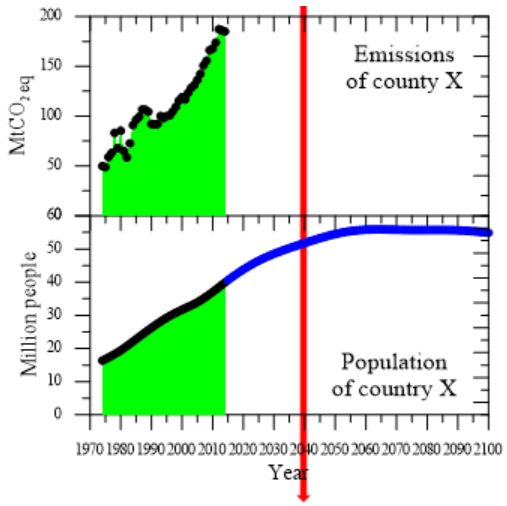
- The **MCJ** has been produced with the aim of determining the total amount of emissions, or carbon budget, which would be available to all the UNFCCC state parties from now until 2100, distributing these carbon budgets according to the following criterion…

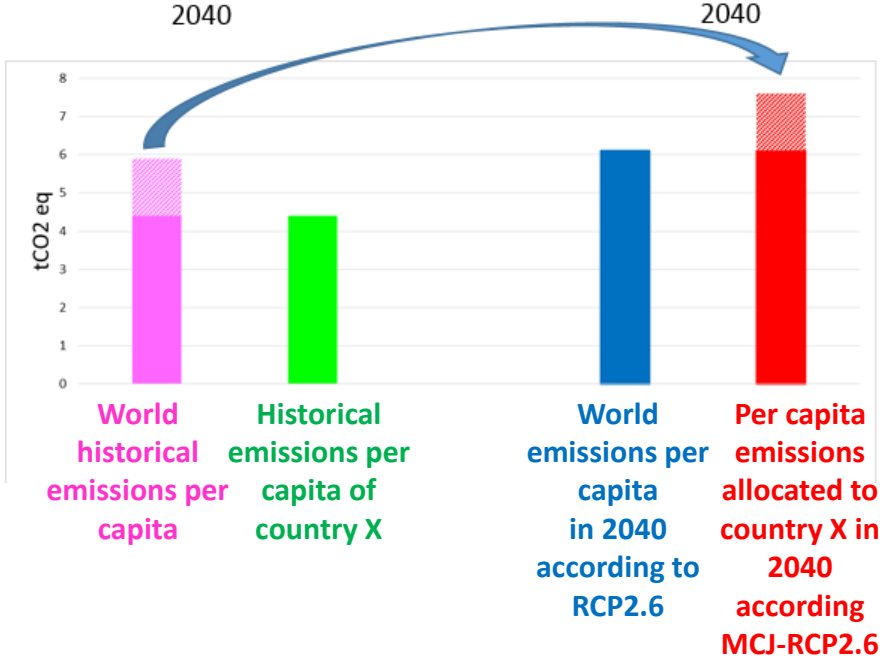
The Model of Climate Justice per capita (MCJ)

The **MCJ** treats all inhabitants of the planet **equally**, but taking into account the different **historical responsibilities** of each one of the UNFCCC state parties, insofar as emissions are concerned.

To the extent that emissions per capita of GHG are not the same, **the model quantifies the historical responsibility per capita** and takes it into account when determining the possible future emissions per capita of each of the countries (less historical responsibility means more possible future emissions per capita and vice versa).

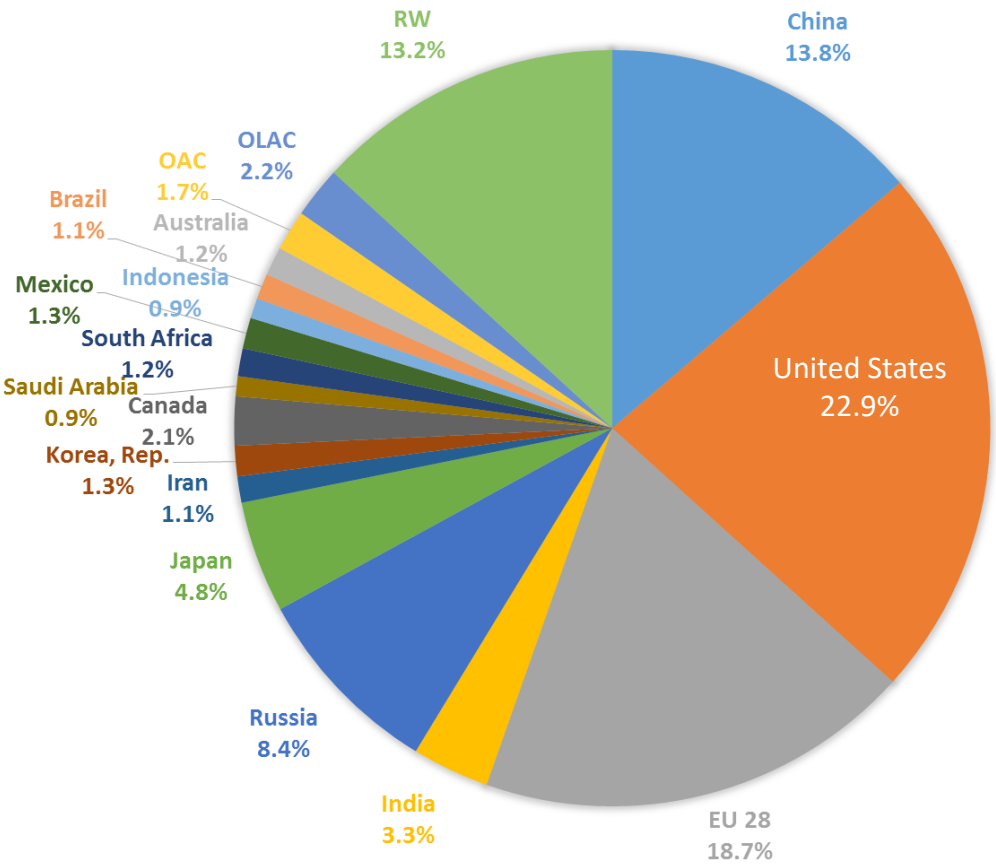




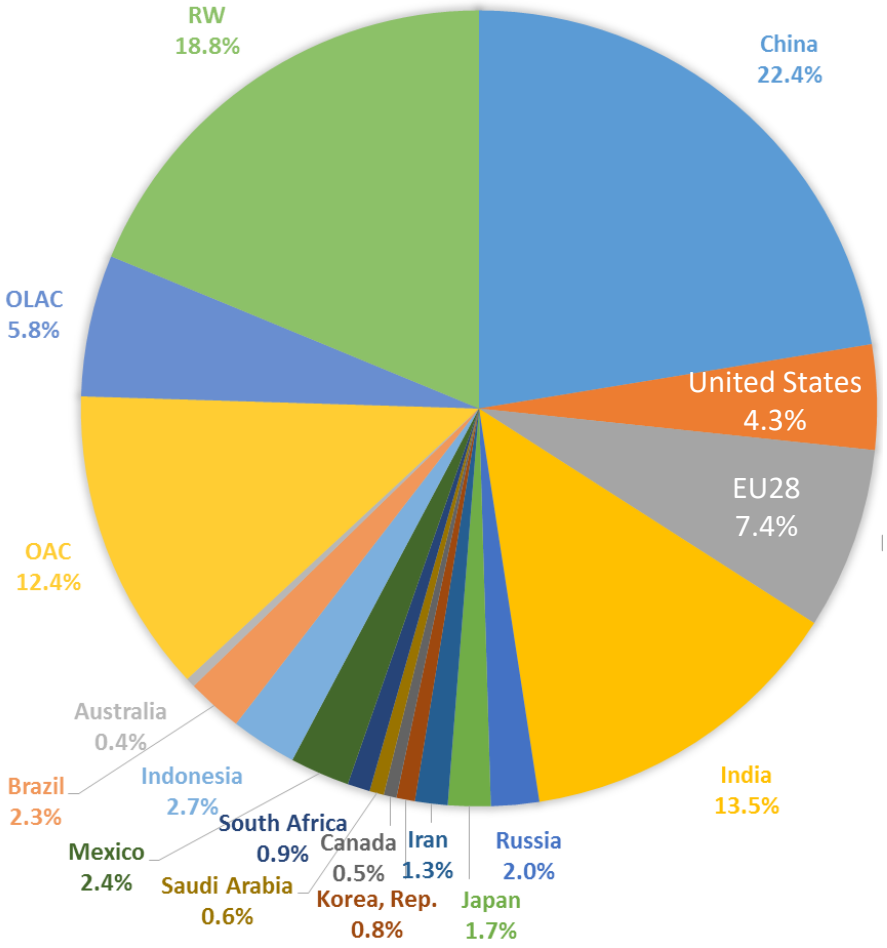


Carbon Budget distribution according to our Model of Climate Justice

Cumulative emissions 1971-2010 (884GtCO2)



Carbon Budget 2011-2050 (1013 GtCO2)



OAC: Other African countries
OLAC: Other Latin-American and Caribbean countries

Contents

- Introduction in the Paris Agreement context
- The global references for the 2°C scenario
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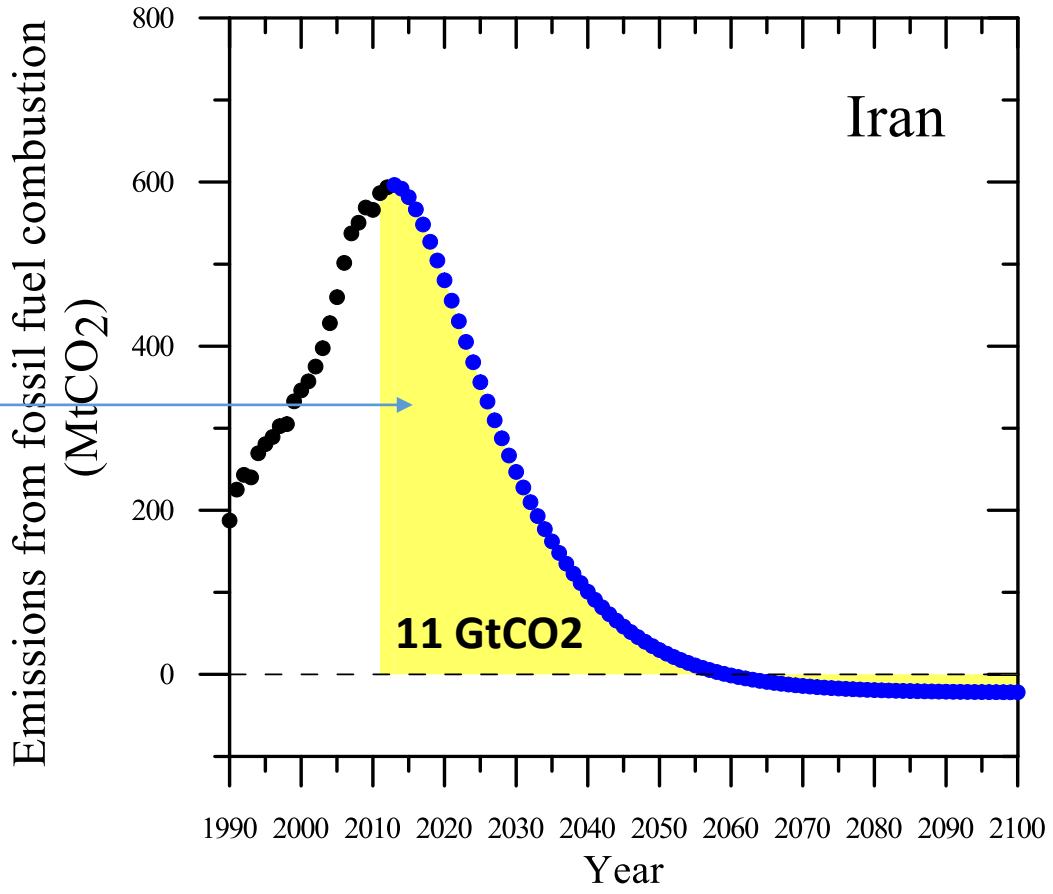
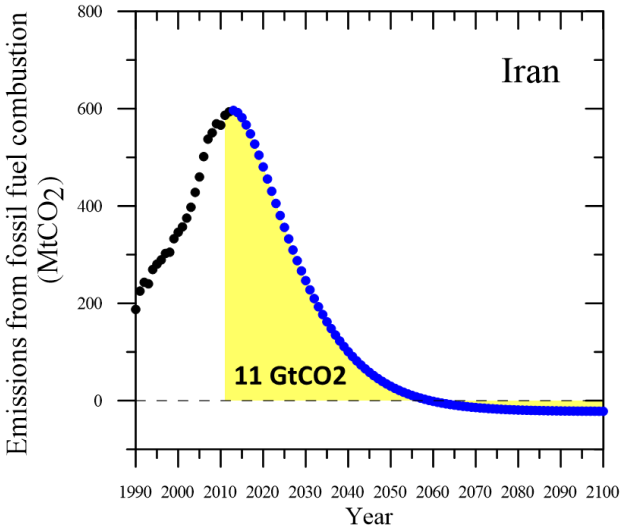
From the Carbon Budget to the Iran mitigation pathway

CB 2011-2100 (GtCO2)	
World	1057
China	183
United States	29
EU 28	58
India	202
Russia	15
Japan	13
Iran	11
Korea, Rep.	6
Canada	4
Saudi Arabia	4
South Africa	7
Mexico	19
Indonesia	39
Brazil	30
Australia	3
TOP15	621
OAC	202
OLAC	44
RW	191



Main results of the MCJ for Iran



	WORLD	IRAN	%
Cumulative emissions 1971-2010 ($GtCO_2$)	884	9.9	1.1
Cumulative emissions per capita 1970-2010 (tCO_2 per capita)	4.1	4.6	
Emissions 2010 ($MtCO_2$)	32350	566	1.8
Emissions 2010 per capita (tCO_2 per capita)	4.7	7.6	
Carbon budget 2011-2050 MCJ-RCP2.6 ($GtCO_2$)	1013	10	1.3
Carbon budget per capita 2011-2050 (tCO_2 per capita)	3.0	3.0	
Carbon budget 2011-2100 MCJ-RCP2.6 ($GtCO_2$)	1057	11	1.0
Carbon budget per capita 2011-2100 (tCO_2 per capita)	1.2	1.4	

Contents

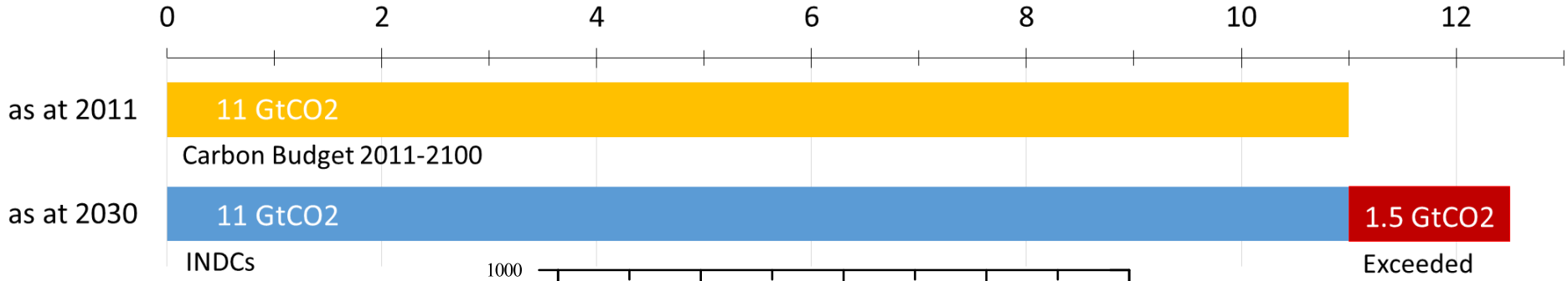
- Introduction in the Paris Agreement context
- The global references for the 2°C scenario
- The translation of the 2°C references to the country level
- The Model of Climate Justice per capita. Iran Case Study
- **The INDC analysis from the perspective of the 2°C global references. Iran Case Study**
- Key drivers of CO2 emissions. Iran Case Study
- Final considerations

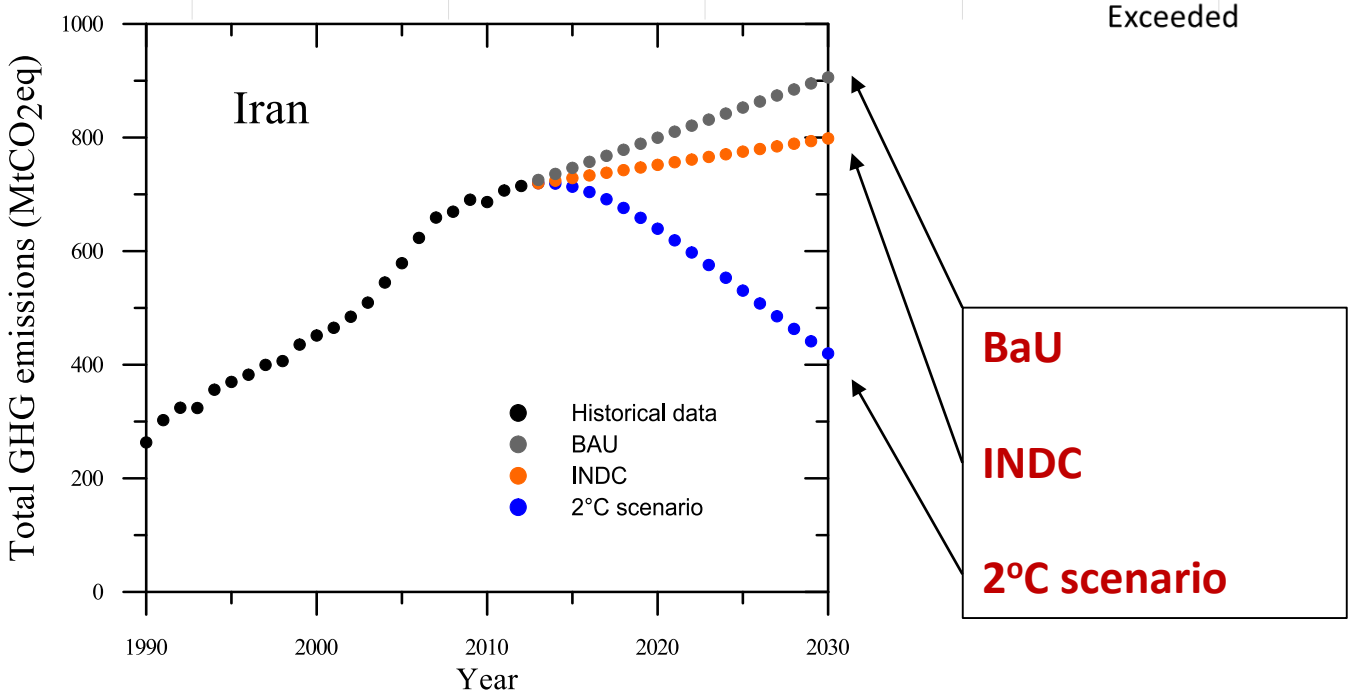
The Iranian INDC

- *…"emission reduction will be achieved through development of combined cycle power plants, renewable energies and nuclear power, as well as reduction of gas flare emissions,* ***increasing energy efficiency*** *in various consuming sectors, substituting high-carbon fuels with natural gas, strategic planning for utilizing low-carbon fuels,* ***intensifying economic diversification*** *and participation in market-based mechanisms at the national and international levels".*
  - ***IRAN INDC (pag. 4)***

The Iranian INDC. The 2ºC Iran Reference

- **Our Model** of Climate Justice per capita **allocates to Iran a carbon budget of 11 GtCO2.**
- The current Iranian compromises implies that from 2011 to 2030 Iran will release to the atmosphere 12.5 GtCO2. Concordant with the TOP15 emitters trend!





Contents

- Introduction in the Paris Agreement context
- The global references for the 2°C scenario
- The translation of the 2°C references to the country level
- The Model of Climate Justice per capita. Iran Case Study
- The INDC analysis from the perspective of the 2°C global references. Iran Case Study
- **Key drivers of CO2 emissions. Iran Case Study**
- Final considerations

Key drivers of the CO2 emissions

- The amount of emissions that a country release to the atmosphere depends on different factors.

- We can analyse some of this factors. Now we will focus or attention in:

✓ **The energy intensity (*ei*) of the economy:** $ei = \frac{Energy\ supply}{GDP}$

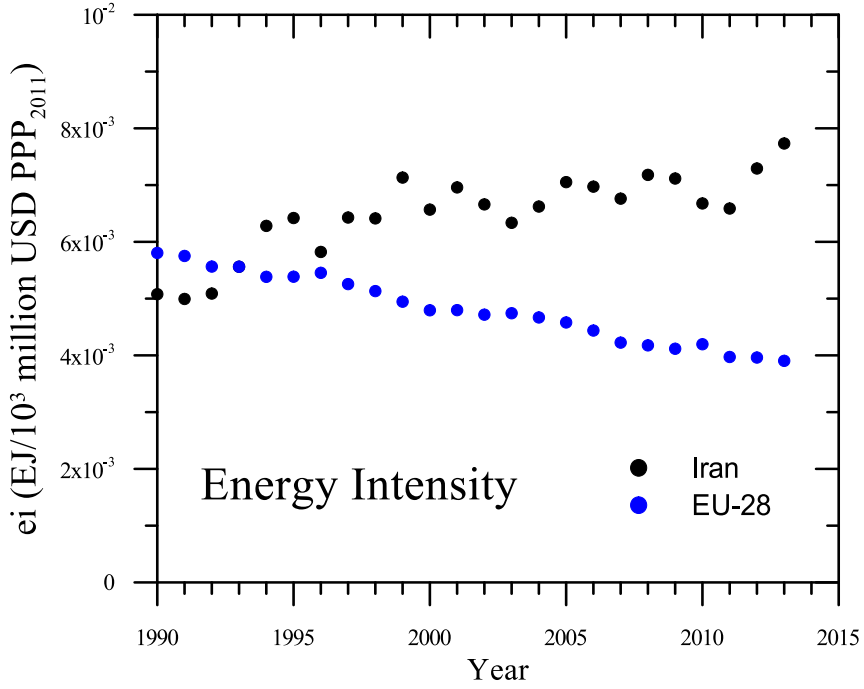
✓ **The carbon intensity (*ci*) of the energy mix:** $ci = \frac{CO2\ emiss.}{Energy\ supply}$

The Iranian and EU-28 energy intensity compared

- *“The Islamic Republic of Iran has already included a program to mitigate GHGs emission in its "Fifth 5 Year National Development Plan" (2010 to 2015),* ***targeting 30% reduction in energy intensity****. Unfortunately, due to the unjust sanctions imposed on our economic, financial and technological sectors, not only this target was not achieved, but energy intensity was increased in recent years.*
  - *IRAN INDC (pag. 5)*

The Iranian and EU-28 energy intensity compared

$$Energy\ intensity = \frac{Energy\ supply}{GDP}$$

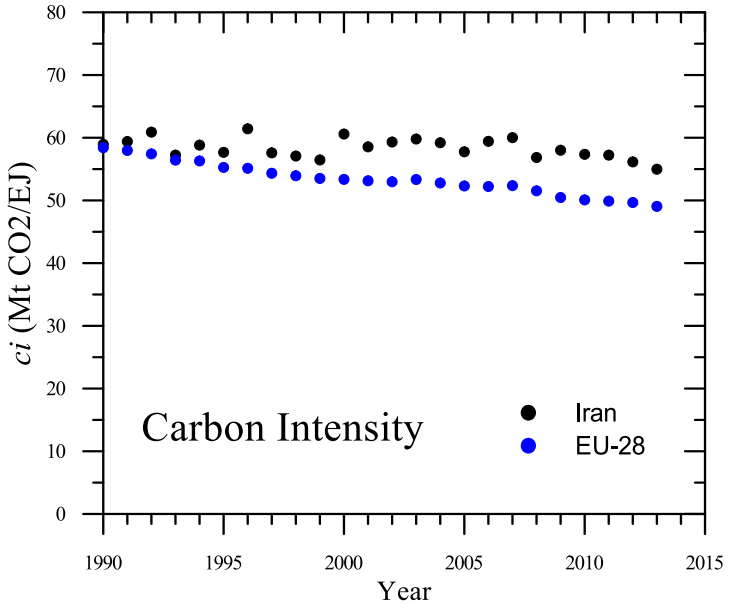


Iran Second National Communication to UNFCCC (pag. 70)

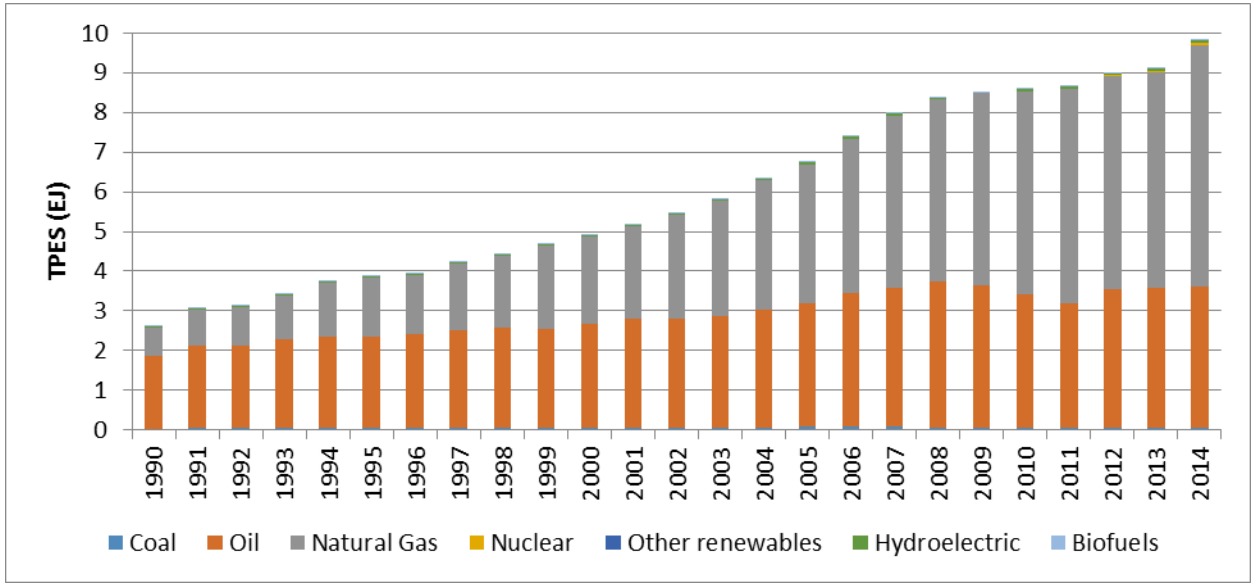
… the most effective policy is the MP1 that relates to energy efficiency improvement of the end-use sectors. This means that Iran needs to plan to make the end-use sector less energy consuming by applying market policies like subsidies on efficient equipment for end users, establishing incentives for producers who produce low energy consuming devices, etc.

The Iranian and EU-28 carbon intensity compared

$$Carbon\ intensity = \frac{CO2\ emiss.}{Energy\ supply}$$

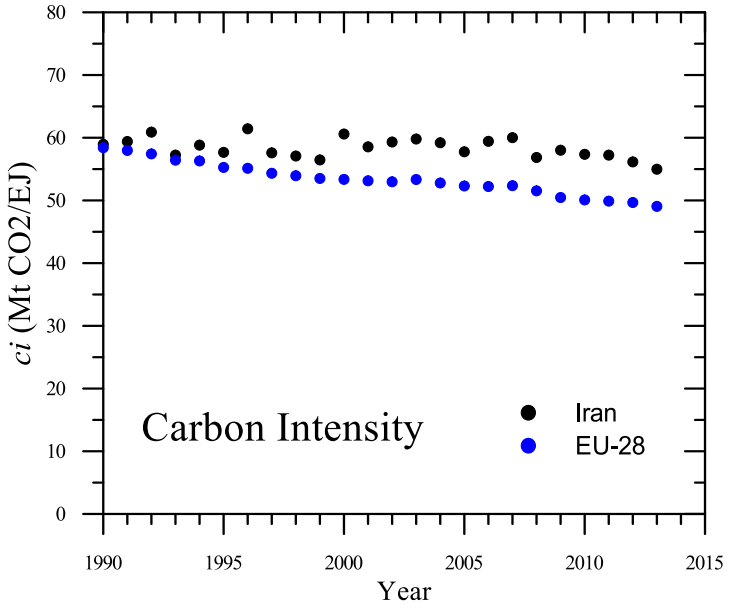


Evolution of Total Primary Energy Supply Iran

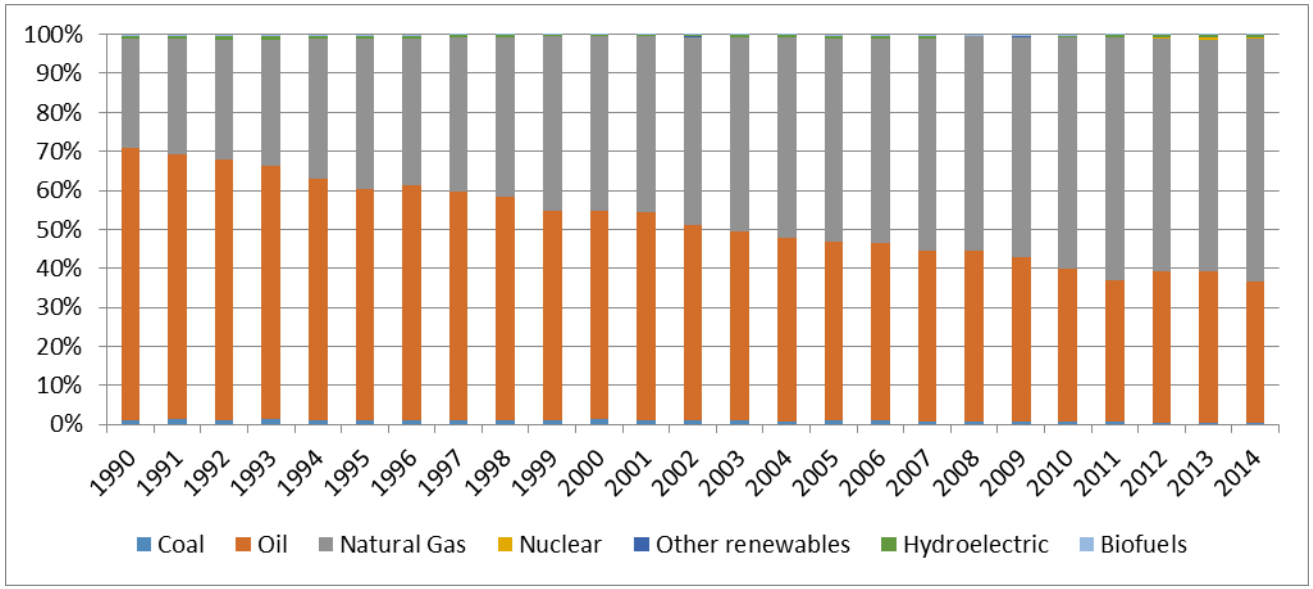


The Iranian and EU-28 carbon intensity compared

$$Carbon\ intensity = \frac{CO2\ emiss.}{Energy\ supply}$$



Evolution of the share of the different primary energy sources in Iran



Iran 2n NC to UNFCCC (pag. 70)

The next important initiative is the MP3 that is to increase the share of NG in the industry sector.

Contents

- Introduction in the Paris Agreement context
- The global references for the 2°C scenario
- The translation of the 2°C references to the country level
- The Model of Climate Justice per capita. Iran Case Study
- The INDC analysis from the perspective of the 2°C global references. Iran Case Study
- Key drivers of CO2 emissions. Iran Case Study
- **Final considerations**

The Iranian emissions from the sectors

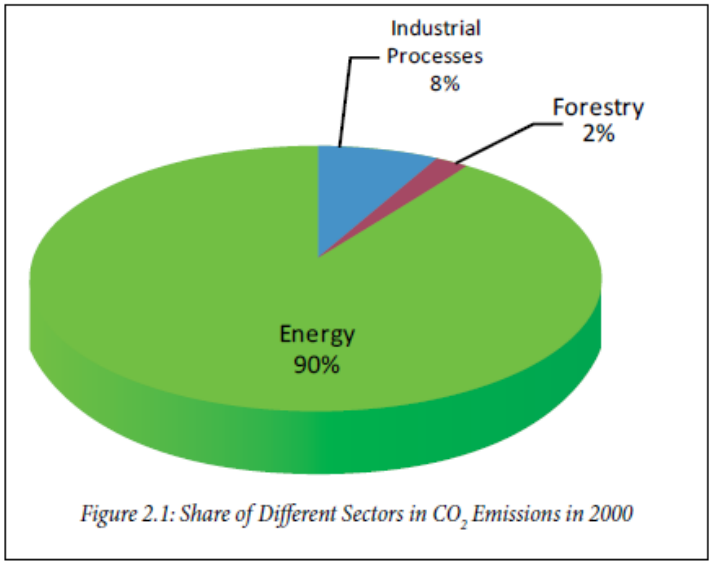


Figure 2.1: Share of Different Sectors in CO_2 Emissions in 2000

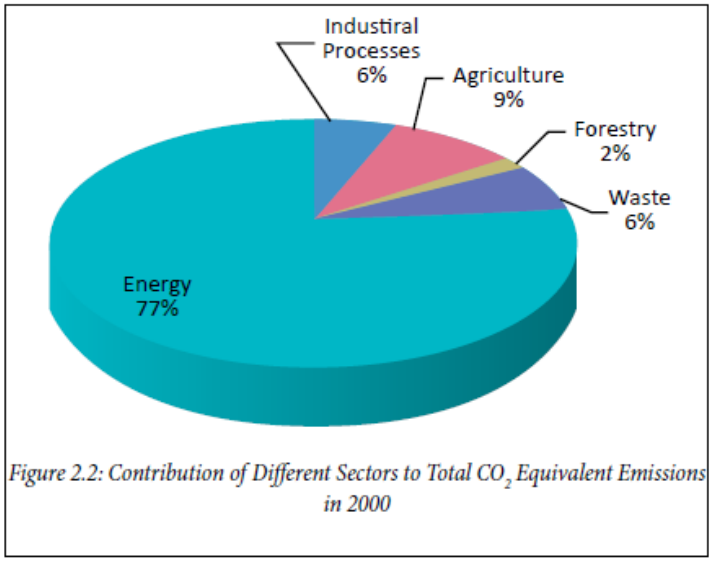


Figure 2.2: Contribution of Different Sectors to Total CO_2 Equivalent Emissions in 2000

IRAN 2n NC (pag. 42)

Just some few bold comments from outside!:

- **Climate Change fight would probably need some significant paradigm shifts:**

✓ **The quantity and the economy of the forests should be improved, in a sustainable manner, increasing the Iran absorption of CO2**

✓ **The food security, the food sovereignty (without any need of net importation) and the improving of the rural standard of live in Iran should probably be considered as one of the most strategic sectors of the vision 2026 of Iran. The future agriculture of Iran must be sustainable in the production and in the emissions/absorption sense!**

Final considerations - 1

- The PA *"will be implemented* ***to reflect equity ("climate justice")*** *and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances"*
- The **"country specific 2°C reference scenarios"** –in our terminology- have to be available before countries produce their second NDCs (2020) because they could be used as a common reference for everyone.
  - All the countries (and the international community) need these references in order to check if the commitment of each country is on track for the common 2 °C goal. And, if it is not on track, to know how far away it is.

Final considerations - 2

- The Iran INDC "implies" a gap of 1,5GtCO2 in relation of the Carbon Budget that our model allocate to Iran if we follow the 2ºC Iran reference scenario.
- But always according the *respective capabilities* and *in the light of* its *different national circumstances* we could emphasize several clear options that would improve its contribution to the global long-term goal:
  - ✓ *There is a large potential of reducing the energy intensity (improving the energy efficiency)*
  - ✓ *There is a good strategy towards using less and low-carbon fuels*
  - ✓ *The Green Economy (forests, agriculture, rural life) could be considered as a new emergent strategic future crucial sector!*

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