International Sugar Organization
1 Canada Square
Canary Wharf
London E14 5AA

EXECUTIVE DIRECTOR

Press Release(21)22
(English only)

12 May 2021

Letter from the International Sugar Organization's Executive Director to the Director of the Natural History Museum

Following up on the article published by the Natural History Museum on sugar, the Executive Director is pleased to circulate the letter sent to the Director of the Natural History Museum to counter the negative falsehoods contained in the article "Sugar: a killer crop?" published recently in its website. The Secretariat will diligently follow up on this to ensure that the record is set straight and that the misconceptions spewed by the author do not prevail as "the truth".

International Sugar Organization

1 Canada Square
Canary Wharf
London E14 5AA

Executive Director

London, 11 May 2021

Dr. Douglas Gurr
Museum Director
NATURAL HISTORY MUSEUM
Cromwell Road
London SW7 5BD

Dear Dr. Gurr,

Having been a longstanding admirer of the work done by the Natural History Museum, I was taken aback by the article "Sugar: a killer crop?" that appeared in your website the past month of March, and surprised that you would publish a piece plagued by inaccurate information and sweeping generalizations that have no facts to support them.

Instead of boring you with my personal opinions and seeing that H.E. Fred Arruda, Ambassador of Brazil, has already addressed the reality of his country and the truth about deforestation, I will focus on facts in a professional and transparent manner, all backed by reputable, internationally recognized sources:

1) The Water footprint of sugarcane is 175 m3.ton and features among the very lowest of all growing crops worldwide.

2) Two thirds of the water used by sugarcane production comes from rainwater and the Sugar Industry is a leader in optimum recycling, watershed protection and treatment of affluents.

3) The sugar industry significantly contributes to a massive reduction of emissions through the production of Ethanol derived from cane and beet.

4) The water footprint of ethanol produced from cane and beet is also among the lowest in the world.

5) The cogeneration of energy from bagasse offers a source of energy that is clean, environmentally-friendly, that translates into a huge reduction in the use of fossil fuels. This has enabled many countries throughout the globe to be classified by the World Bank among the most efficient in generating their total energy from renewable sources.

…./2

Seeing the Museum's keen interest in Climate Change and to bear out the facts spelled above, I am pleased to attach a recent presentation by Dr. Alex Guerra (PhD. Oxford University) that addresses Sugar and Climate Change. I would appreciate that in the interest of transparency and projecting to the public a truthful, balanced scenario, the Natural History Museum would place this piece in your website thereby encouraging a health discussion on an issue that affects us all.

I sincerely motivate you to ensure the content of pieces published by the Natural History Museum as your reputation and credibility should be underscored by veracity and accuracy.

Yours sincerely,

Mr José Orive
Executive Director

TEL: 020 7513 1144 http://www.isosugar.org E-MAIL: exdir@@isosugar.org

Covid19, climate change and the sugar industry

Challenges and opportunities for the long run

By Alex Guerra Noriega, PhD
Private Institute for Climate Change Research – Guatemala-El Salvador

Climate change as a physical and a political phenomenon

Physical aspects

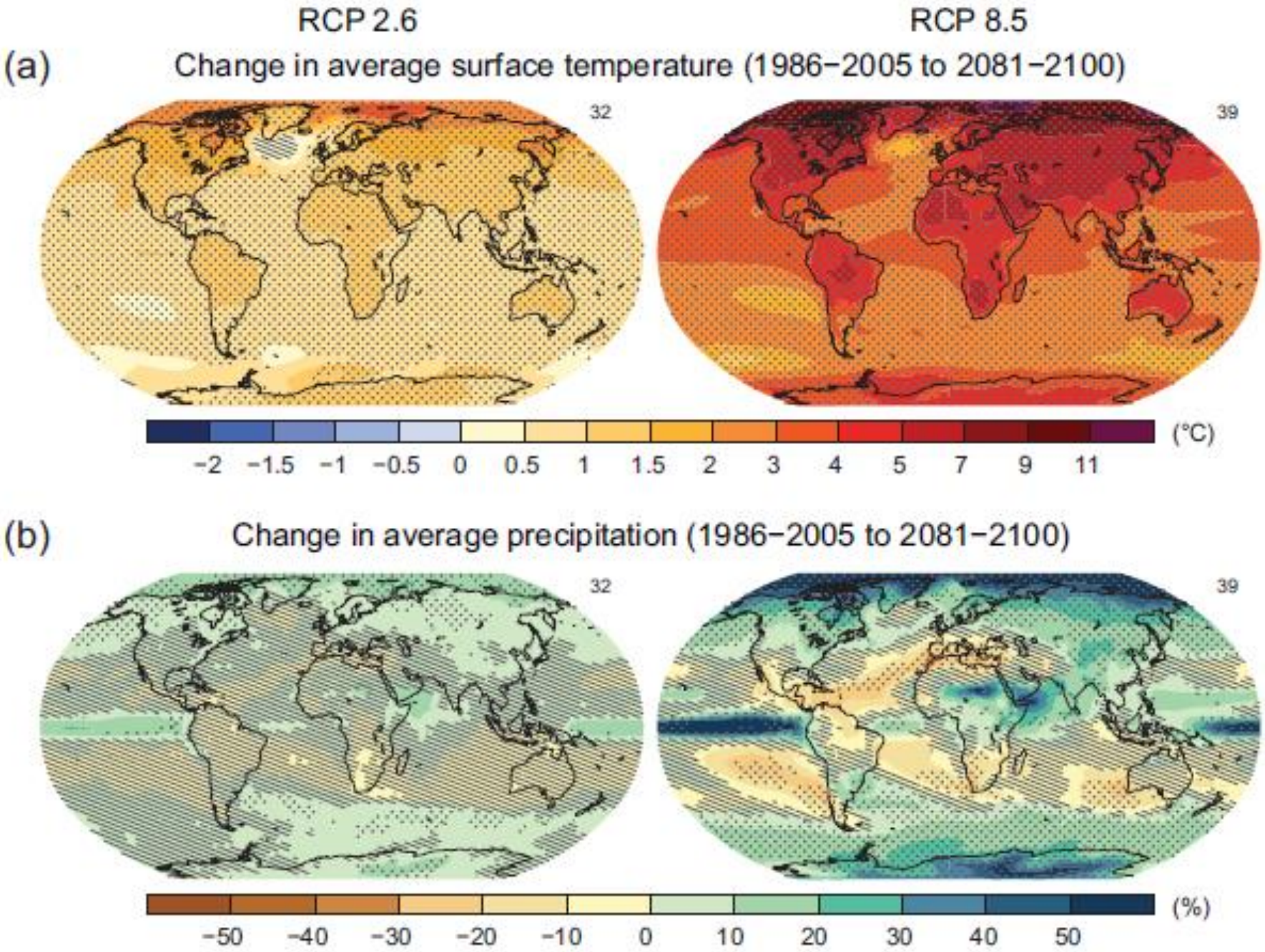
- Higher temperature
- Droughts
- Floods
- Pests and diseases
- Higher productivity
- Melting glaciers

Political aspects

- Who is to blame?
- Who pays?
- Stop using fossil fuels?
- Carbon tax?
- Who receives compensation?

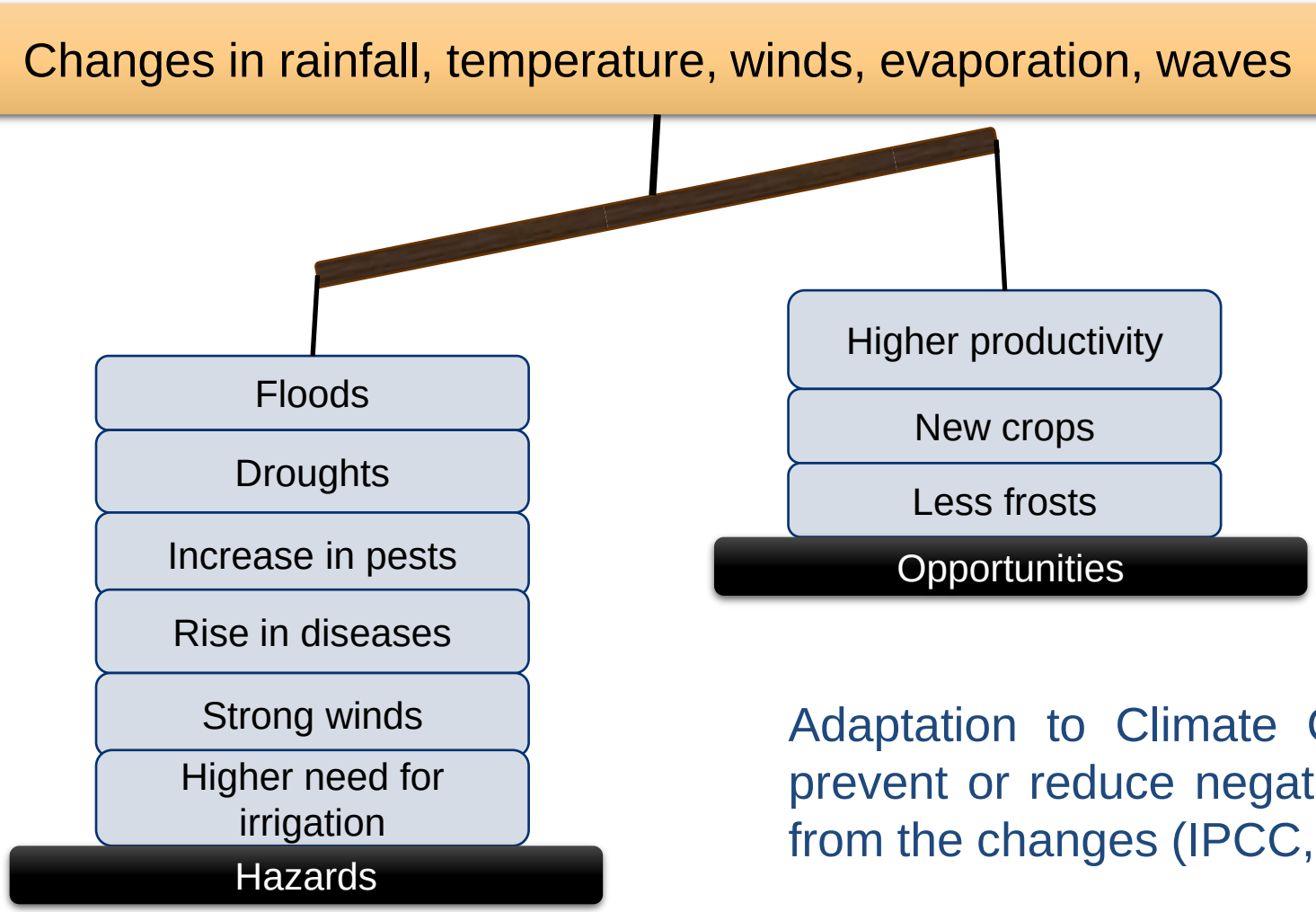
Observed changes

Projected changes



IPCC, 2013

Hazards and opportunities derived from climate change



Adaptation to Climate Change: adjustments to prevent or reduce negative impacts or to benefit from the changes (IPCC, 2014).

What impacts are expected from climate change on the sugarcane industry?

- A review article (100+ studies) by Linnenluecke et al. (2018): **"These studies reach largely different conclusions regarding how increases in air temperature or atmospheric carbon dioxide levels impact sugarcane production."**
- The reviewed papers are very diverse in terms of methodologies, time frames, and the geographic location of the study sites (resulting in differences in local factors, such as rainfall and temperature).

- "**neutral or positive** impacts on sugarcane production in New South Wales" (Everingham et al., 2015)
- **Yield losses** are likely be greater in the cooler southern regions (of Australia) due to increased water stress (Park et al., 2007)
- Climate changes might **reduce the potential sugarcane yield** in north-eastern Brazil (de Carvalho et al., 2015).

What impacts are expected from climate change on the sugarcane industry?

- **Projected yields could be up to 59%** higher than the current state average yield in southern Brazil (Marinet al., 2013)
- Medium-term (moderate) climate change could be **largely positive** for the South African sugar industry (Jones and Singels, 2015)
- Future **irrigation needs are predicted to increase** by 20–22% in Swaziland (Knox et al., 2010)
- Sugarcane **yields will be reduced** due to lower water use efficiencies and higher respiratory demands under various climate change scenarios – in Mauritius (Cheeroo-Nayamuth and Nayamuth, 2001)
- The **productivity** of the C4 sugarcane should be **enhanced** by future increases in atmospheric CO2 (Allen et al., 2011)

Improvement of air quality during Covid-19

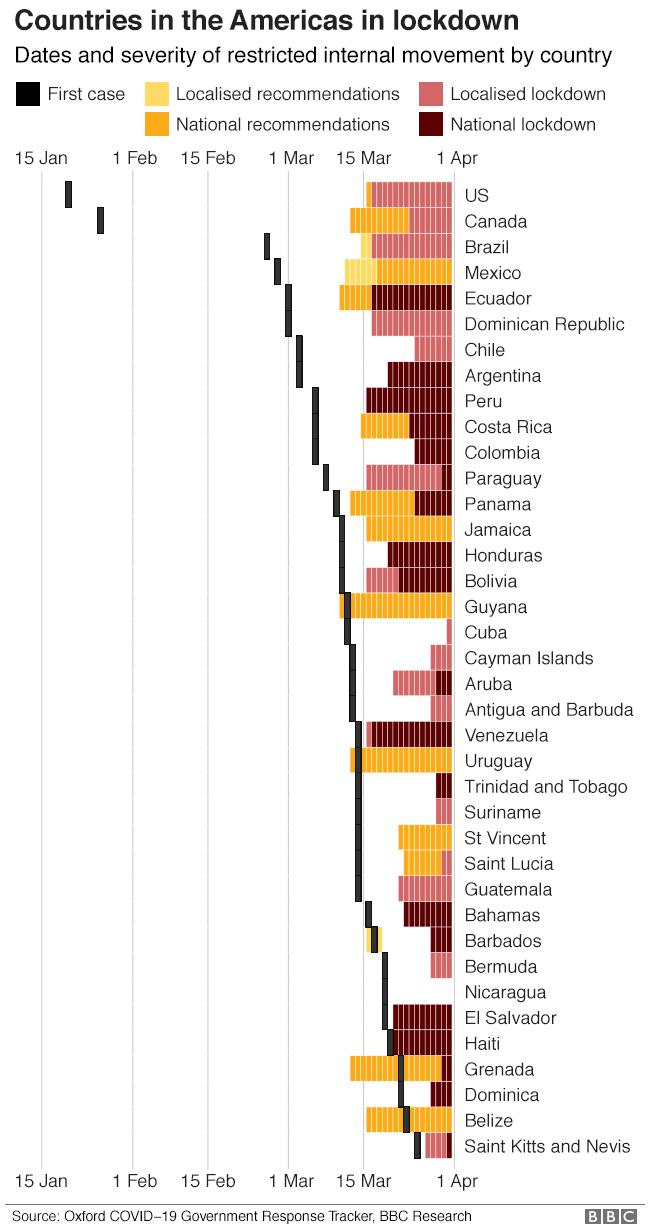
https://dynaimage.cdn.cnn.com/cnn/c_fill,g_auto,w_1200,h_675,ar_16:9/https%3A%2F%2Fcdn.cnn.com%2Fcnnnext%2Fdam%2Fassets%2F200401105309-20200401-indian-gate-air-pollution-split.jpg

Perception of the “Earth healing”

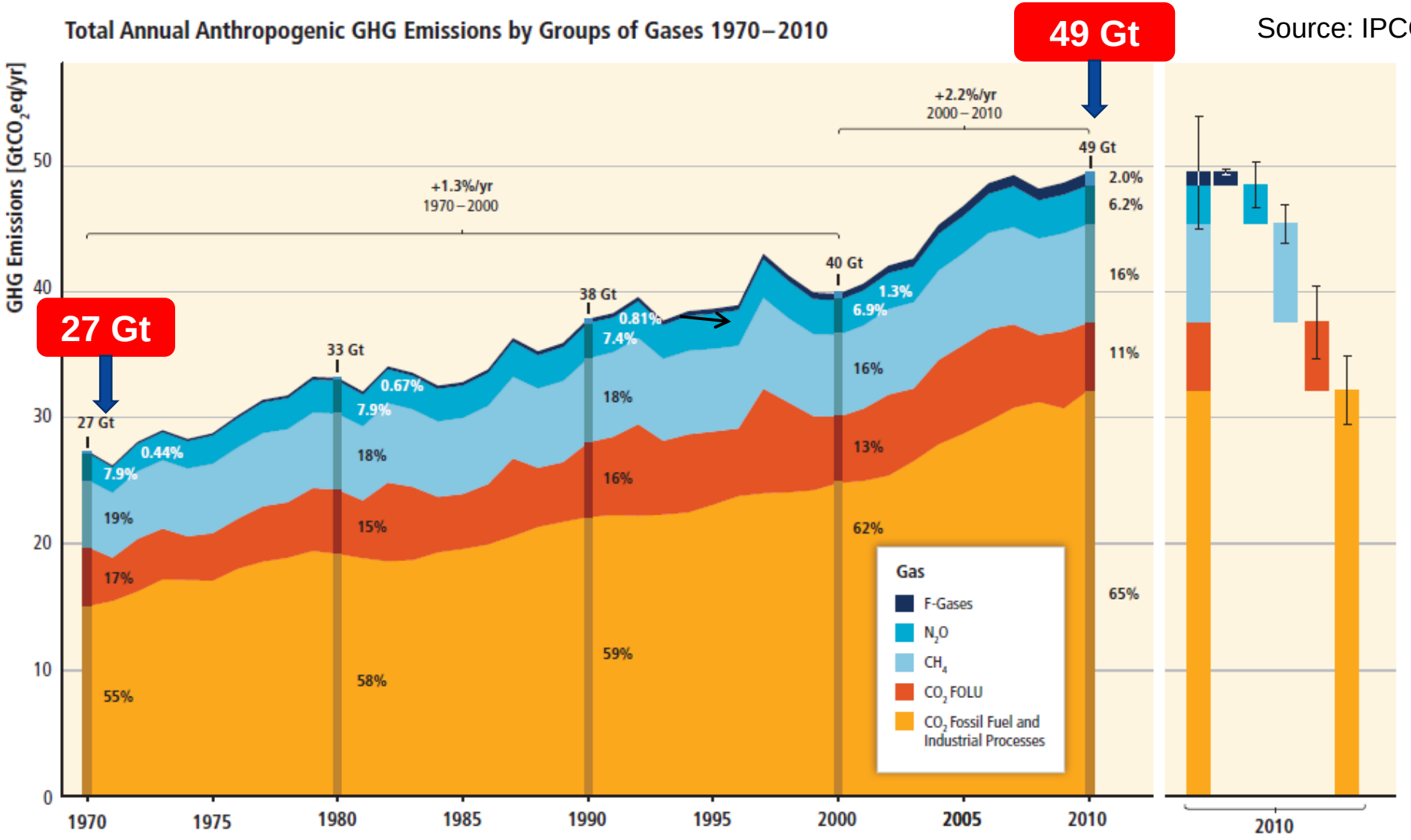
Discussions on whether the measures during the pandemic are the solution to climate change.

Measures during the Covid-19 pandemic

- Started in China at the end of 2019
- Spread of the virus increased in March
- 189 countries with cases
- More than 100 countries implemented lockdown measures
- Measures have varied across countries, thus impact hard to assess
- Conclusion: human activities never fully stopped



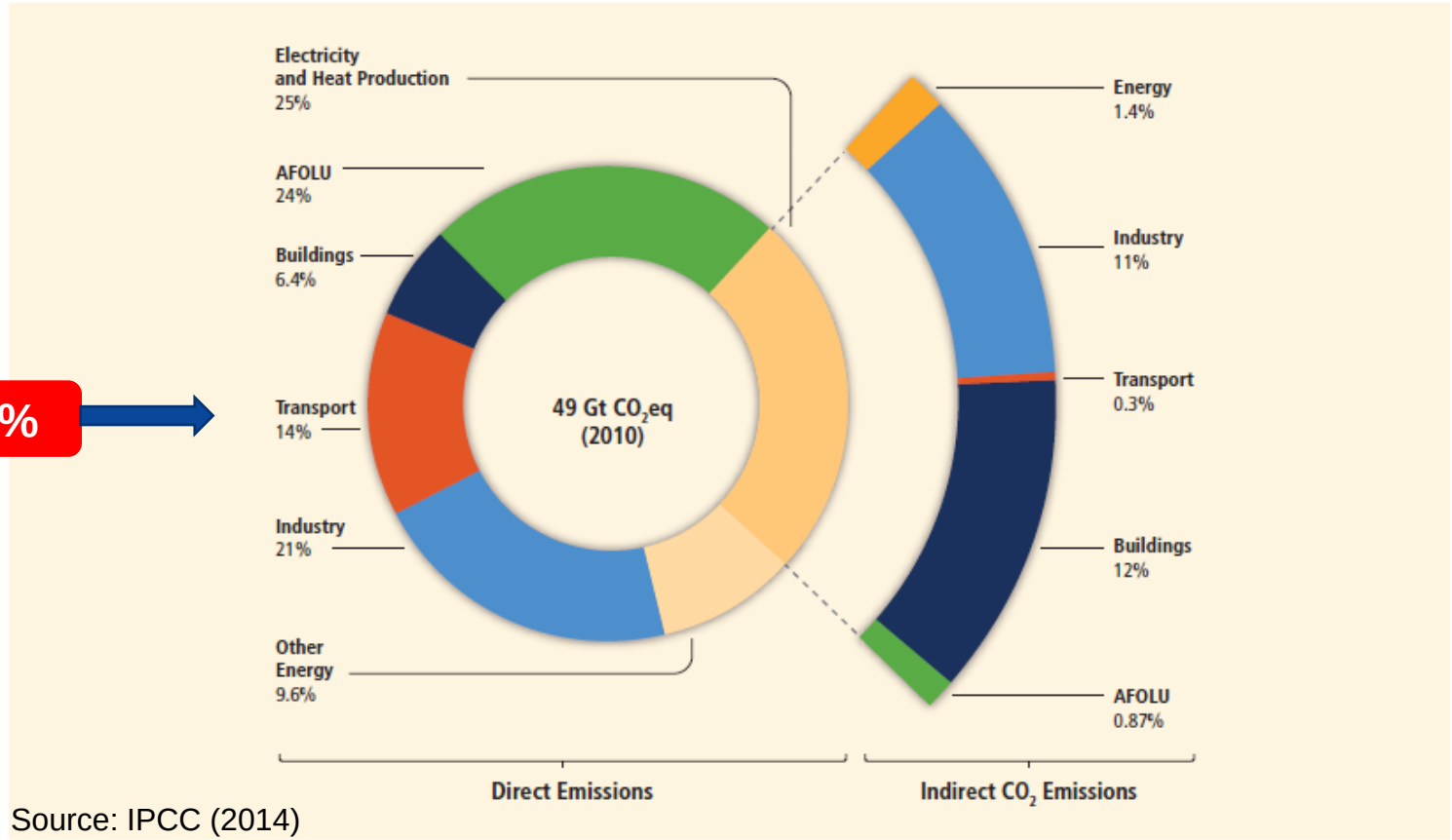
Global trend in greenhouse gas emissions



Source: IPCC (2014)

Sources of emissions by sector

Greenhouse Gas Emissions by Economic Sectors



14%

Source: IPCC (2014)

Figure SPM.2 | Total anthropogenic GHG emissions ($GtCO_2eq/yr$) by economic sectors. Inner circle shows direct GHG emission shares (in % of total anthropogenic GHG emissions) of five economic sectors in 2010. Pull-out shows how indirect CO_2 emission shares (in % of total anthropogenic GHG emissions) from electricity and heat production are attributed to sectors of final energy use. 'Other Energy' refers to all GHG emission sources in the energy sector as defined in Annex II other than electricity and heat production [A.II.9.1]. The emissions data from Agriculture, Forestry and Other Land Use (AFOLU) includes land-based CO_2 emissions from forest fires, peat fires and peat decay that approximate to net CO_2 flux from the Forestry and Other Land Use (FOLU) sub-sector as described in Chapter 11 of this report. Emissions are converted into CO_2-equivalents based on GWP_{100}[6] from the IPCC Second Assessment Report. Sector definitions are provided in Annex II.9. [Figure 1.3a, Figure TS.3 a/b]

- Traffic down 54% in the UK, 36% in the US and 19% in China.
- Flights decreased 60-95% globally

(https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2333)

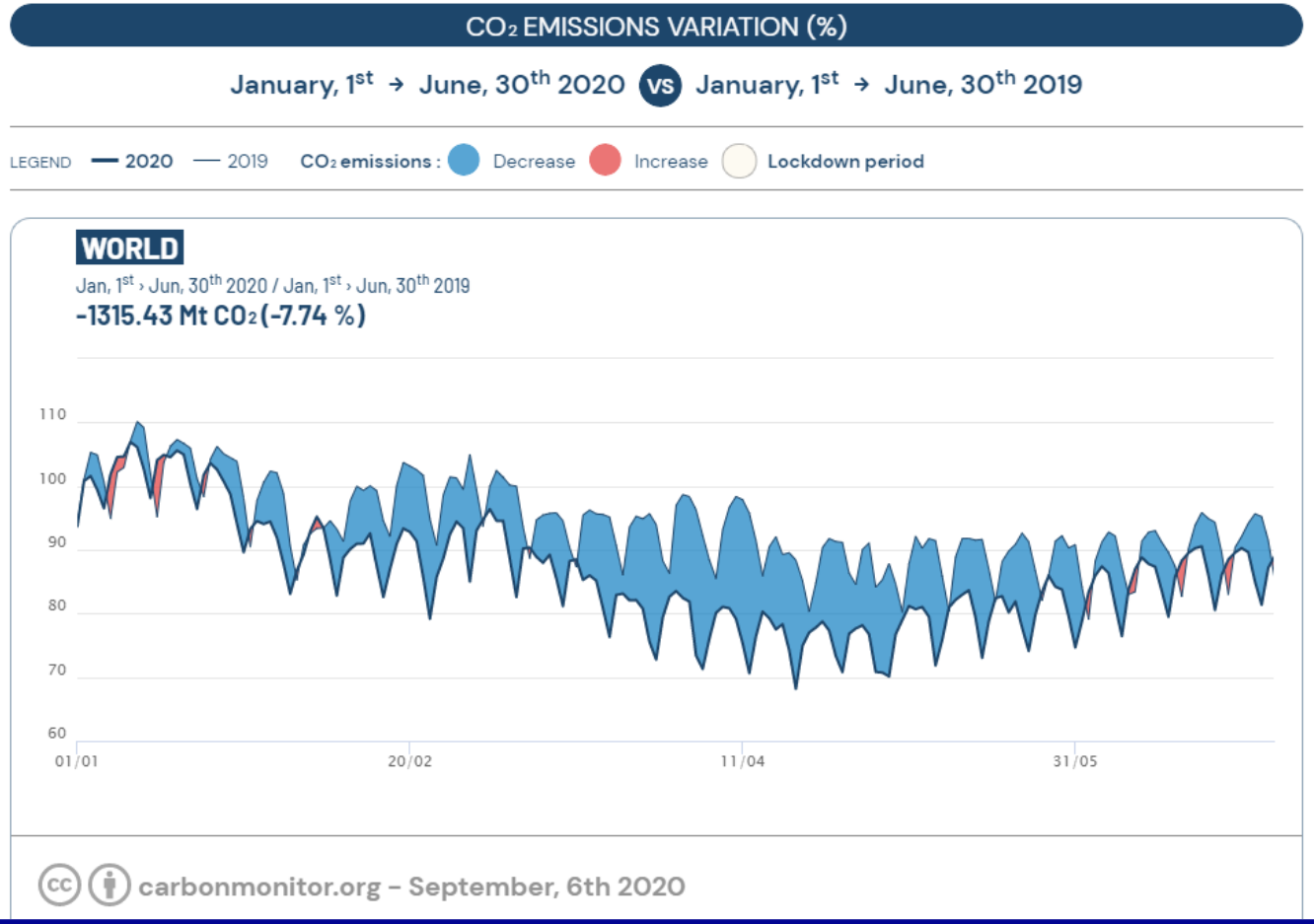
- Plane fuel expected to be down 65% April-May
- Diesel demand expected to fall 7% in 2020

https://www.scientificamerican.com/article/why-co2-isnt-falling-more-during-a-global-lockdown/

Transportation did not stop. Main changes in use of cars and flights.

- The IEA expects global CO_2 emissions to decrease 8% in 2020 compared with 2019.

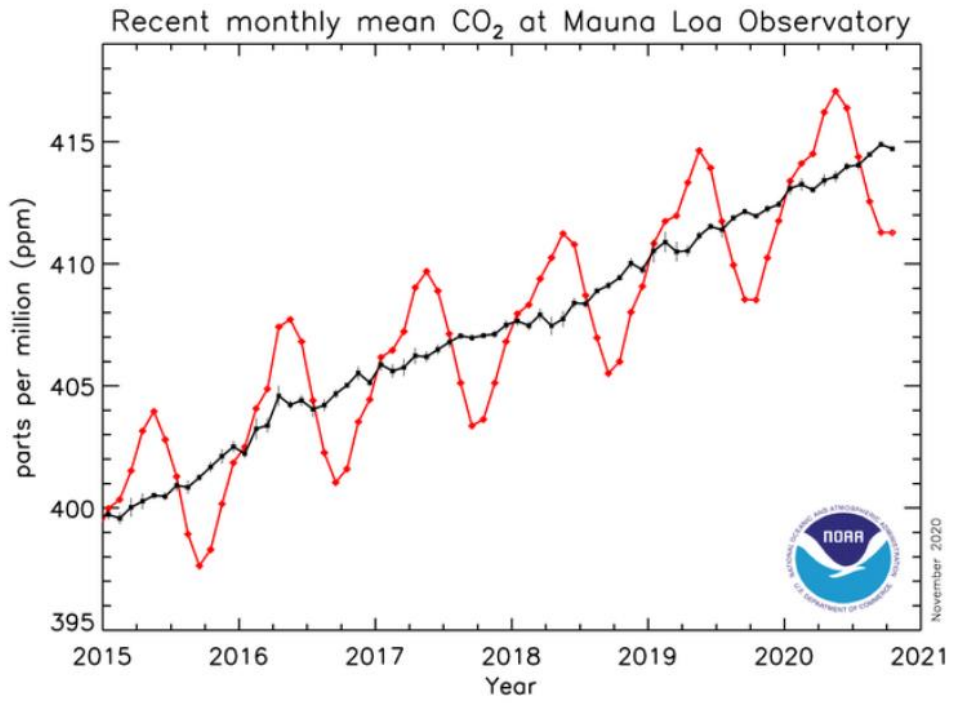
IEA (2020), *Global Energy Review 2020*, IEA, https://www.iea.org/reports/global-energy-review-2020.

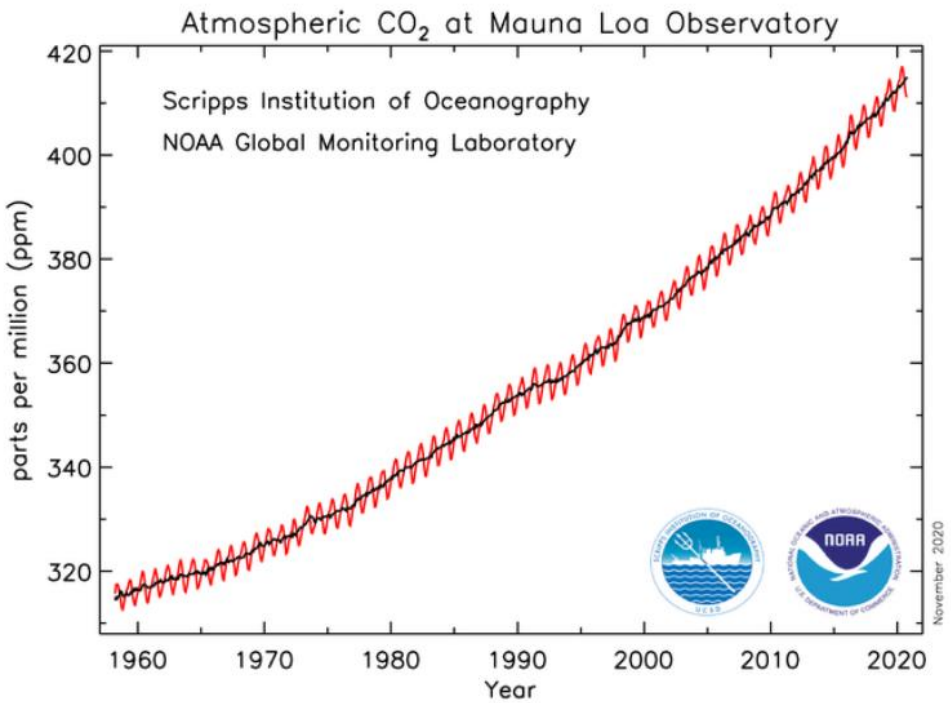


Atmospheric CO_2 as measured by the Mauna Loa Lab (Hawaii)

It shows there has not been a drop in atmospheric CO_2 during the pandemic

October 2020: 411.28 ppm
October 2019: 408.52 ppm
Last updated: November 6, 2020





https://www.esrl.noaa.gov/gmd/ccgg/trends/

"Visible, positive impacts [of the pandemic on the environment] are but temporary, because they come on the back of tragic economic slowdown and human distress"

Inger Andersen, Executive Director,

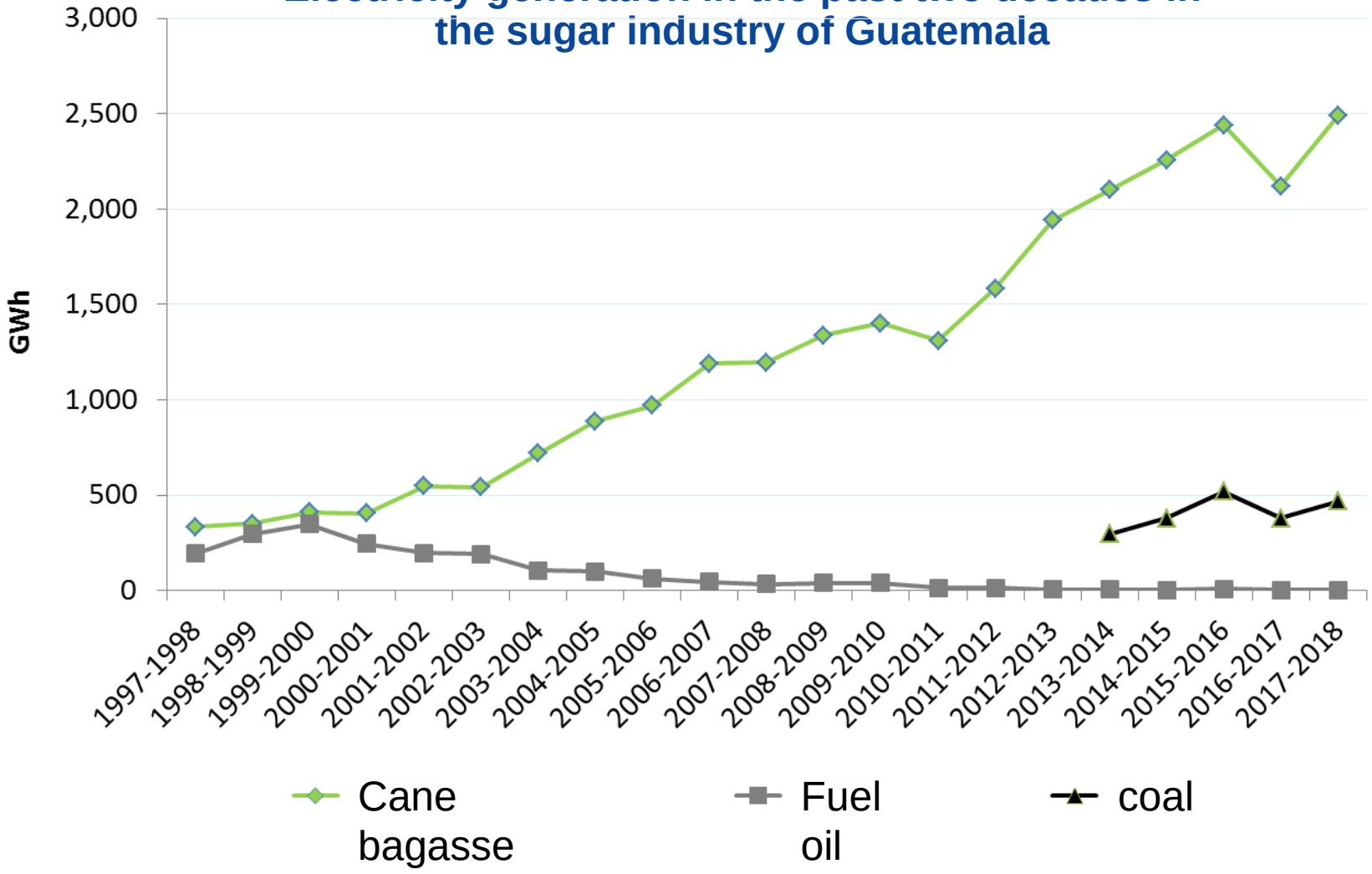
UN Environment

UN News April 5, 2020

First Person: COVID-19 is not a silver lining for the climate, says UN Environment chief
https://news.un.org/en/story/2020/04/1061082

The sugar industry as part of the solution to climate change

Electricity generation in the past two decades in the sugar industry of Guatemala

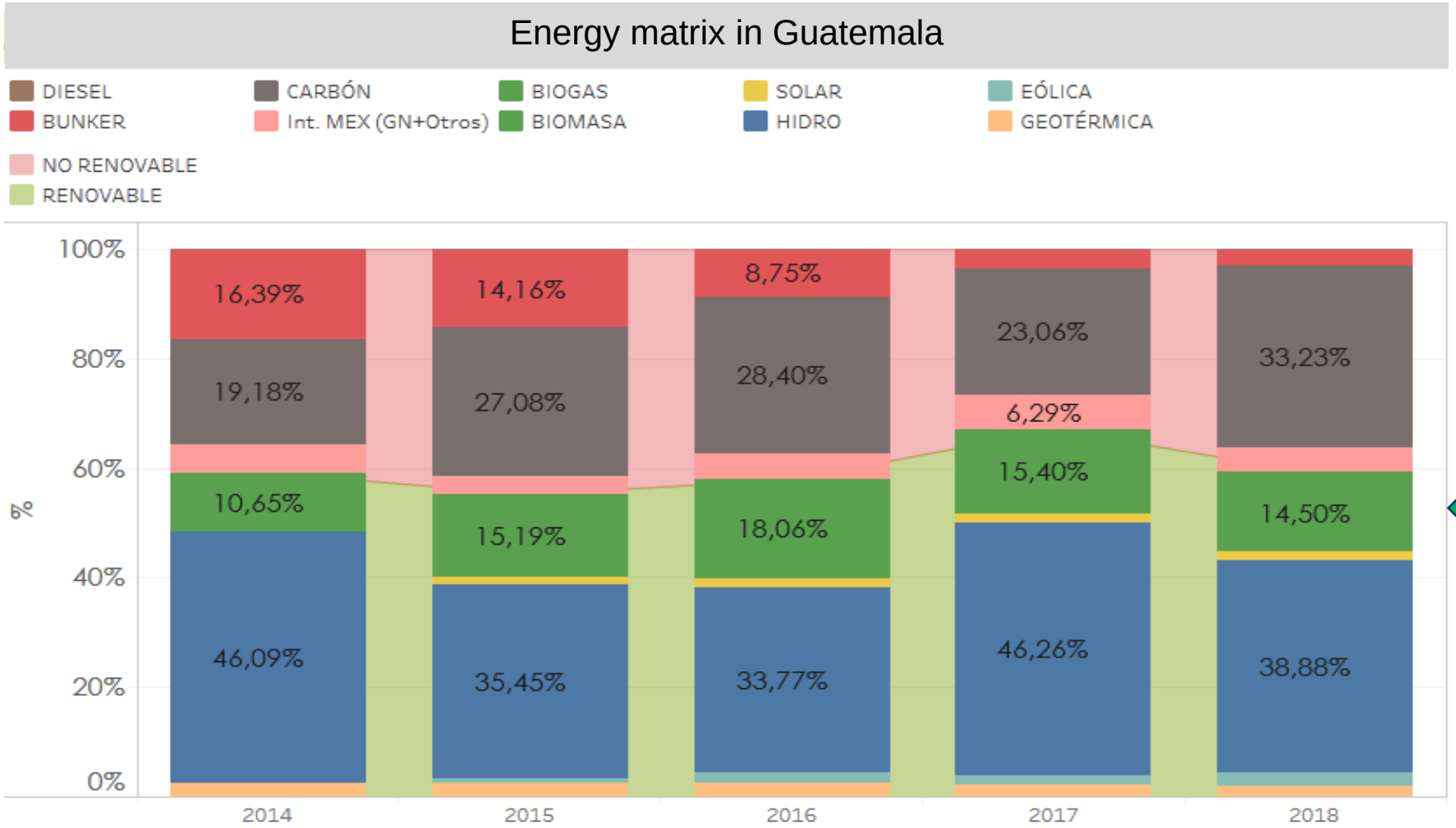


Growth has resulted from growth of cane crushed but also from **doubling efficiency**

Around 10% of the country's total emissions

4 million tons of CO2eq are prevented by generating renewable energy from sugarcane bagasse

Electricity generation from sugarcane in Guatemala



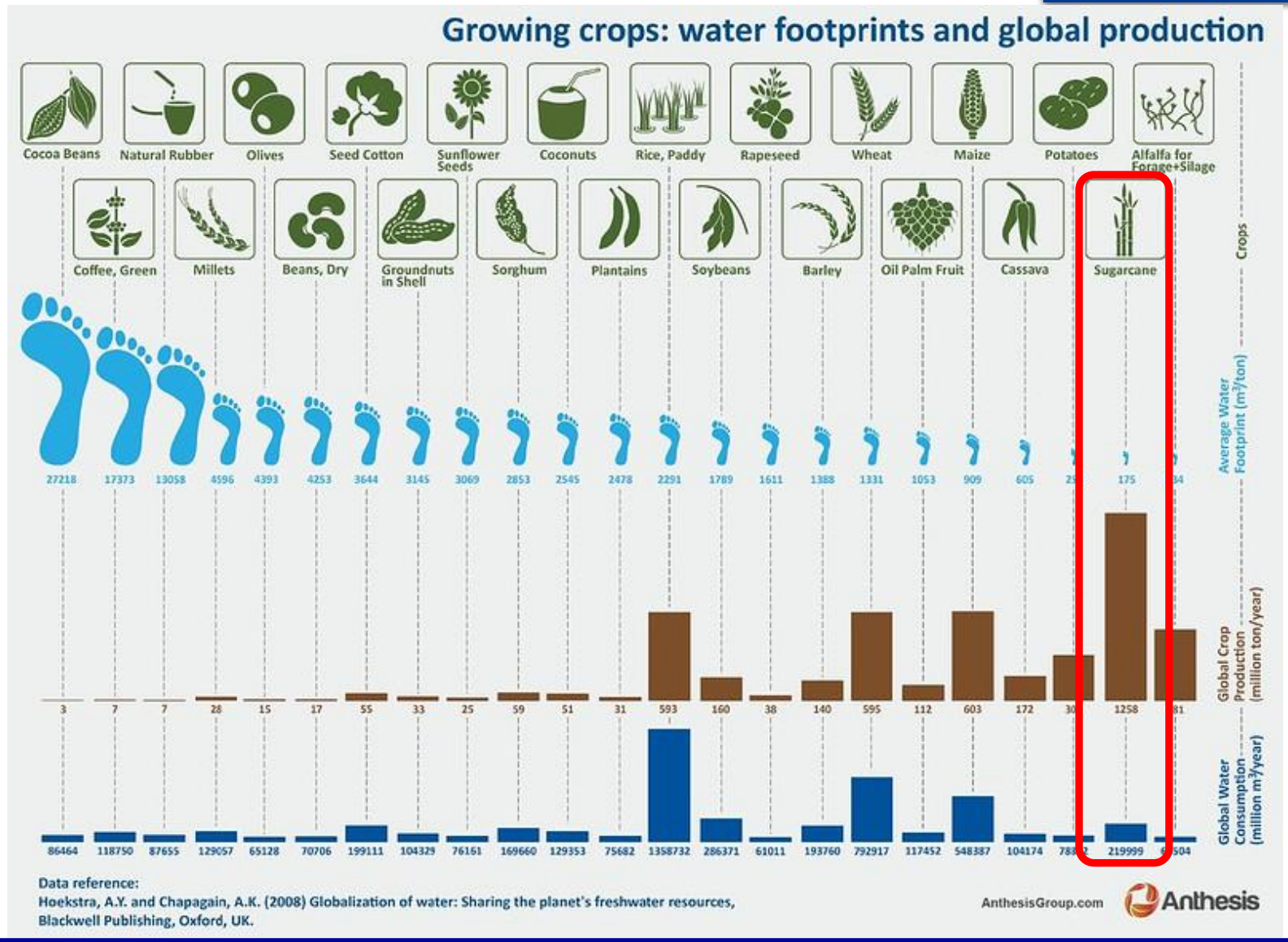
Biomass

(CNEE, 2019)

Contributions through ethanol

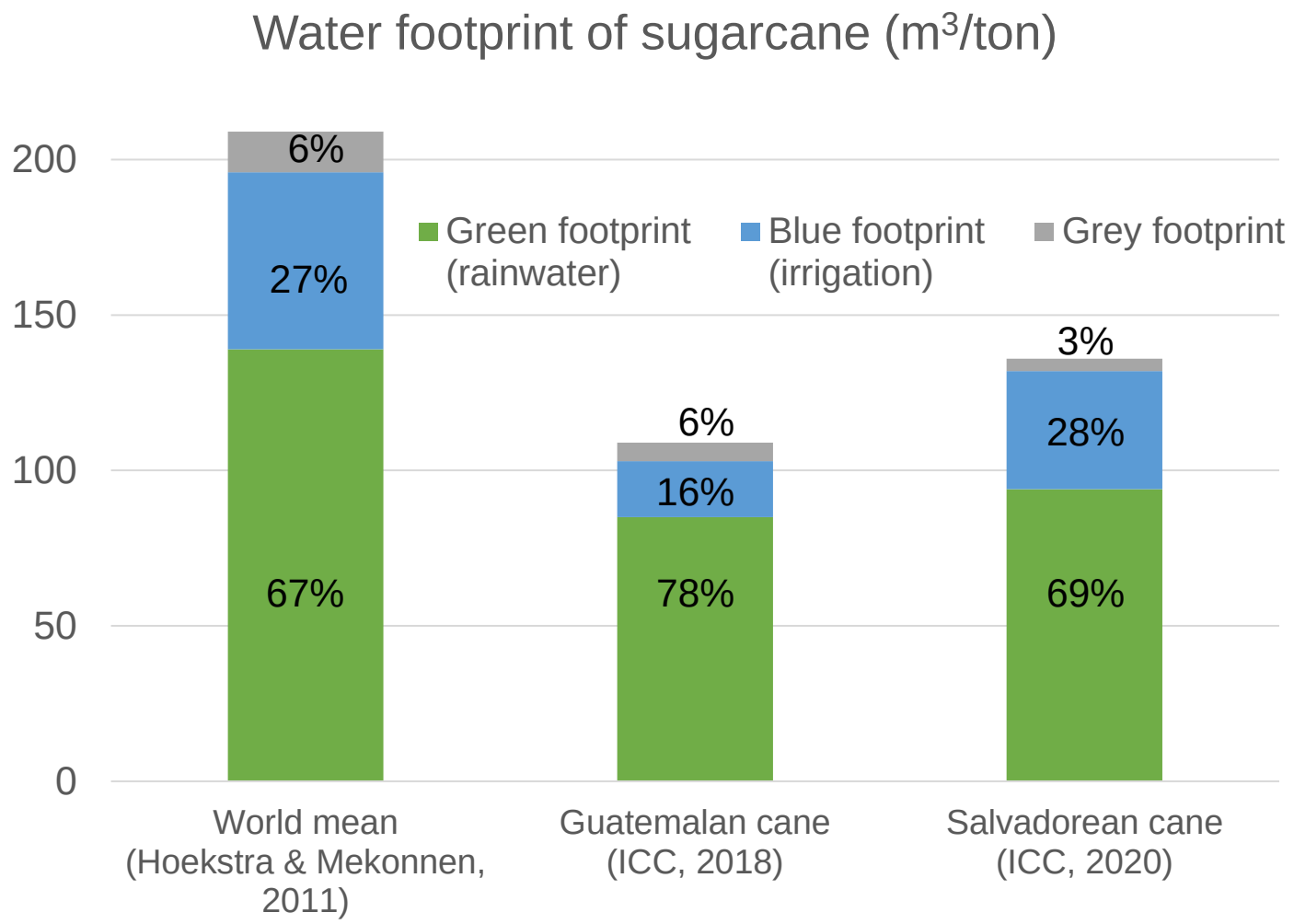
- Relative to the use of petroleum, ethanol from sugarcane would **reduce emissions by 40–62%** (Mendes Souza et al., 2015)
- Some of the current sugarcane used for sugar could be used for ethanol and there could also be expansion of the crop.
- The Brazilian Government mapped 63.5 Mha suitable for sugarcane production (without clearing forest land). This land area could allow the production of 800 Bl of ethanol by 2030, which in energy terms would be equivalent to 15% of total global liquid fuel use in 2009, while the bagasse could provide 30 GW of electricity (Somerville et al. 2010).
- **Main concerns**: **deforestation** (emissions and biodiversity loss) and **competition with food crops for land**. They can and must be tackled as they could cancel out the benefits or create conflicts.

Water footprint of sugarcane



Water footprint of sugarcane: 175 m^3/ton

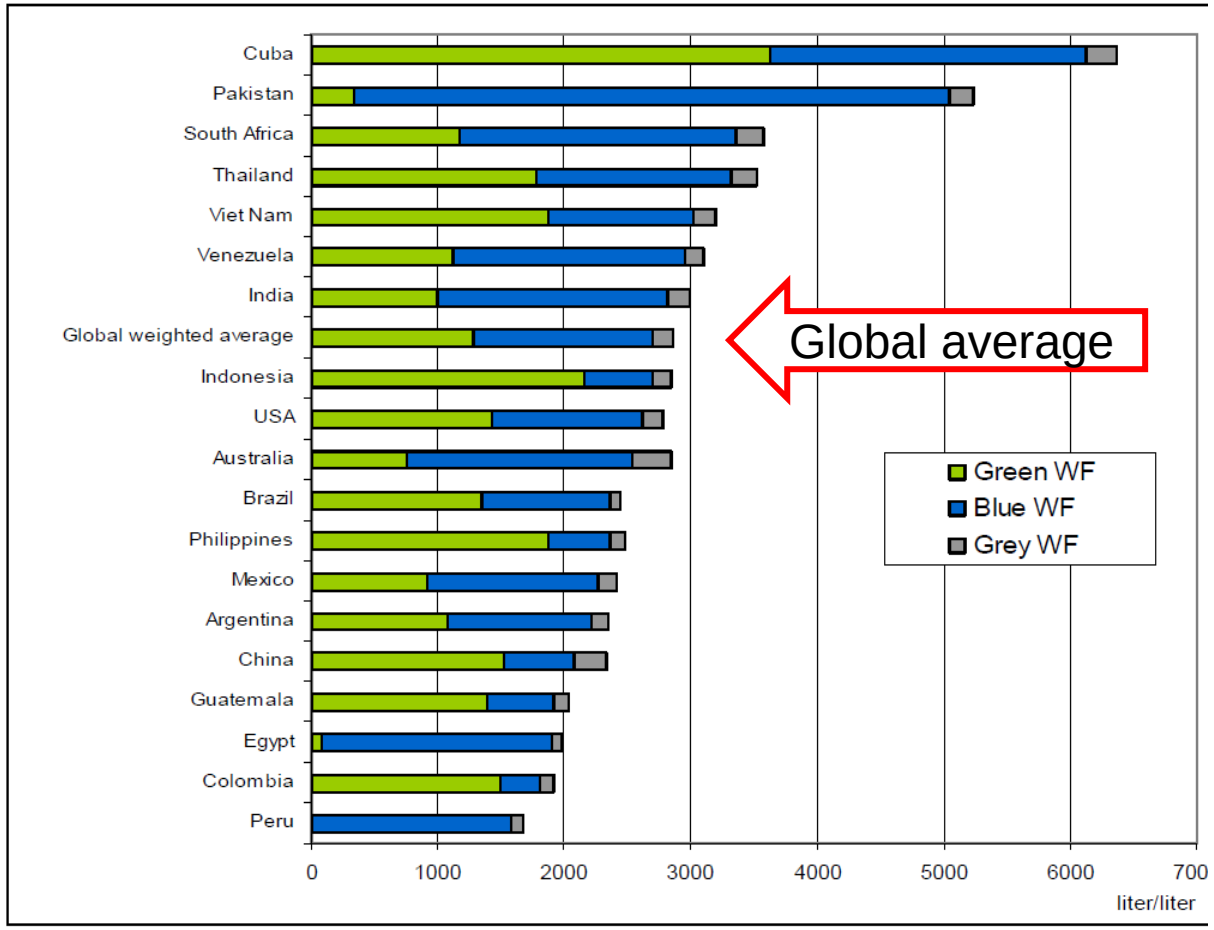
Water footprint of sugarcane



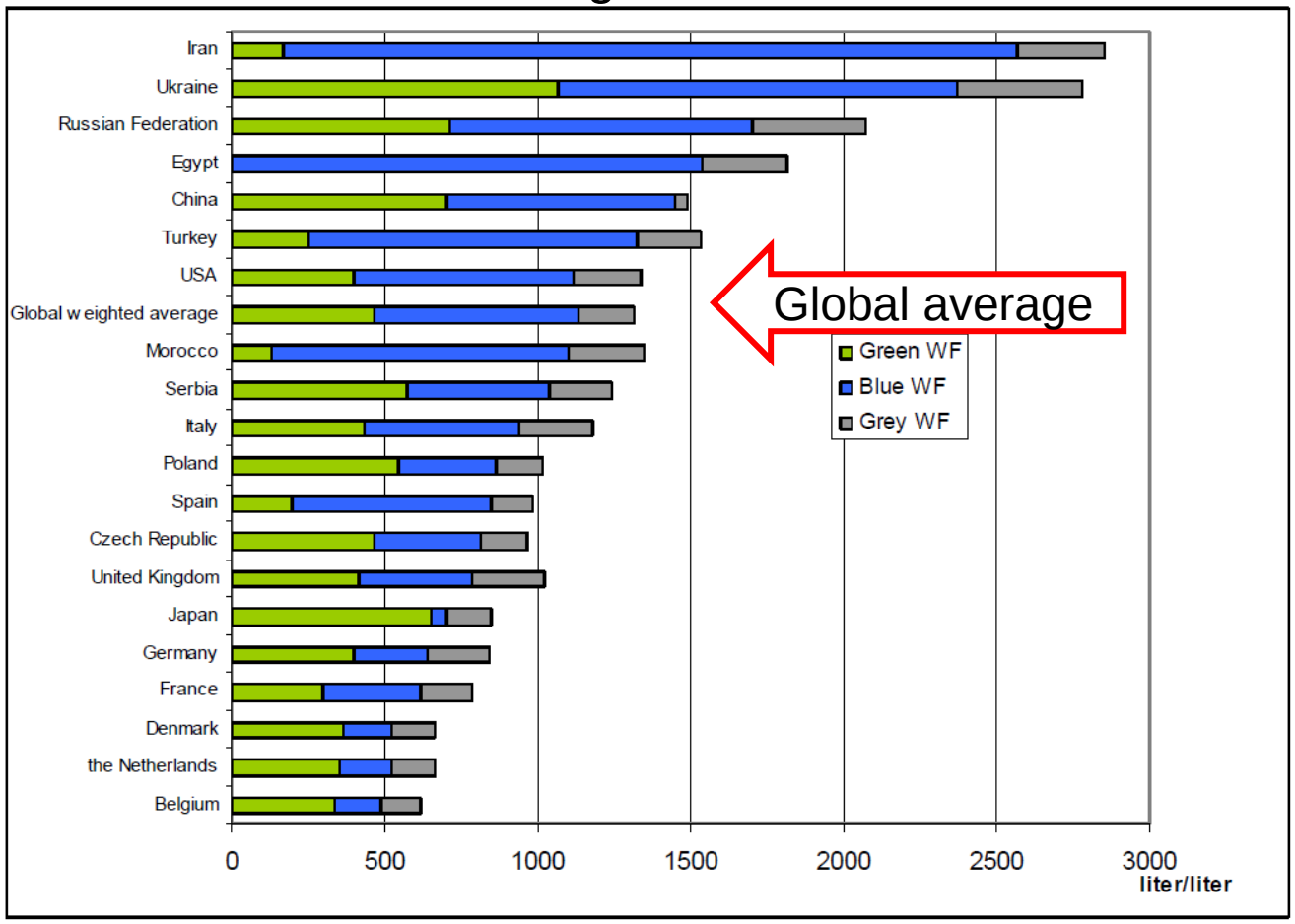
Two thirds or more of water used comes from rainwater

Water footprint of ethanol from sugarcane and beet

Sugarcane

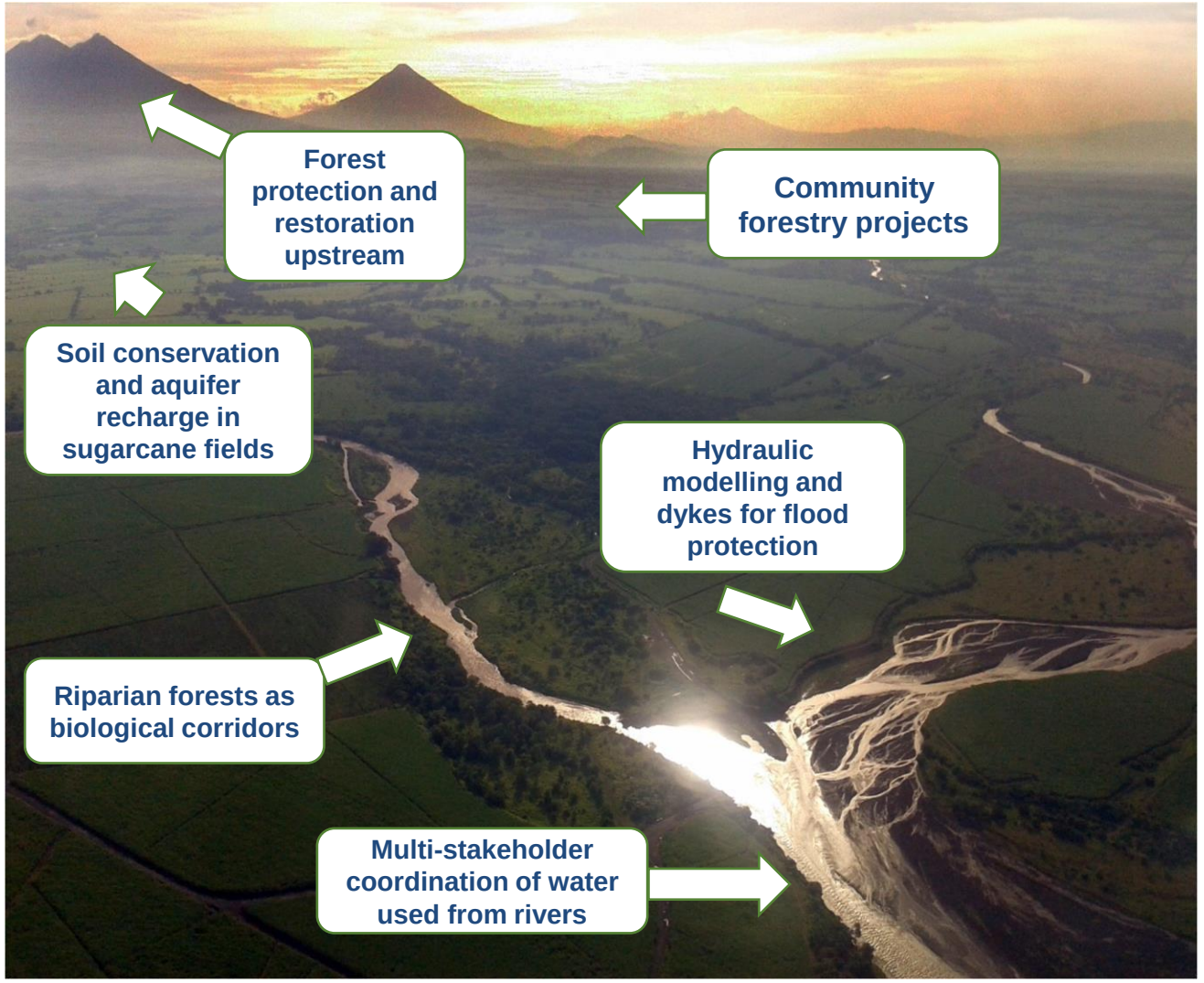


Sugar beet



Source: Gerbens-Leenen & Hoekstra (2009)

Actions implemented with support from the sugar industry at the landscape level in Guatemala and El Salvador



Key messages

- Halting transportation at the individual level (cars and flights) will not solve climate change. What is needed to fight climate change is technology and increasing use of renewable energy.
- The sugar industry has made contributions through electricity from biomass and biofuels. It is key to showcase those contributions and to take advantage of further opportunities (higher production of ethanol, sugarcane trash).
- Expansion of cultivated area is possible in a sustainable way. Attention should be given to avoiding deforestation and not using food crops land.
- The water footprint of sugarcane and beet ethanol is low.
- The sugar industry can and should engage in discussions on climate change solutions at a global, national and local level.

29th International Sugar Organization Seminar

Coronavirus and Climate Change

Alex Guerra Noriega, PhD

Climate Change Research Institute (ICC)

Guatemala-El Salvador, Central America

aguerra@icc.org.gt

Instituto Privado de Investigación sobre Cambio Climático

29th International Sugar Organization Seminar

Coronavirus and Climate Change

Q&As

Covid19, climate change and the sugar industry

Challenges and opportunities for the long run