Updated development of global greenhouse gas emissions 2019

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"How to reach Carbon Neutrality/Climate Neutrality?"

24th REFORM Group Meeting
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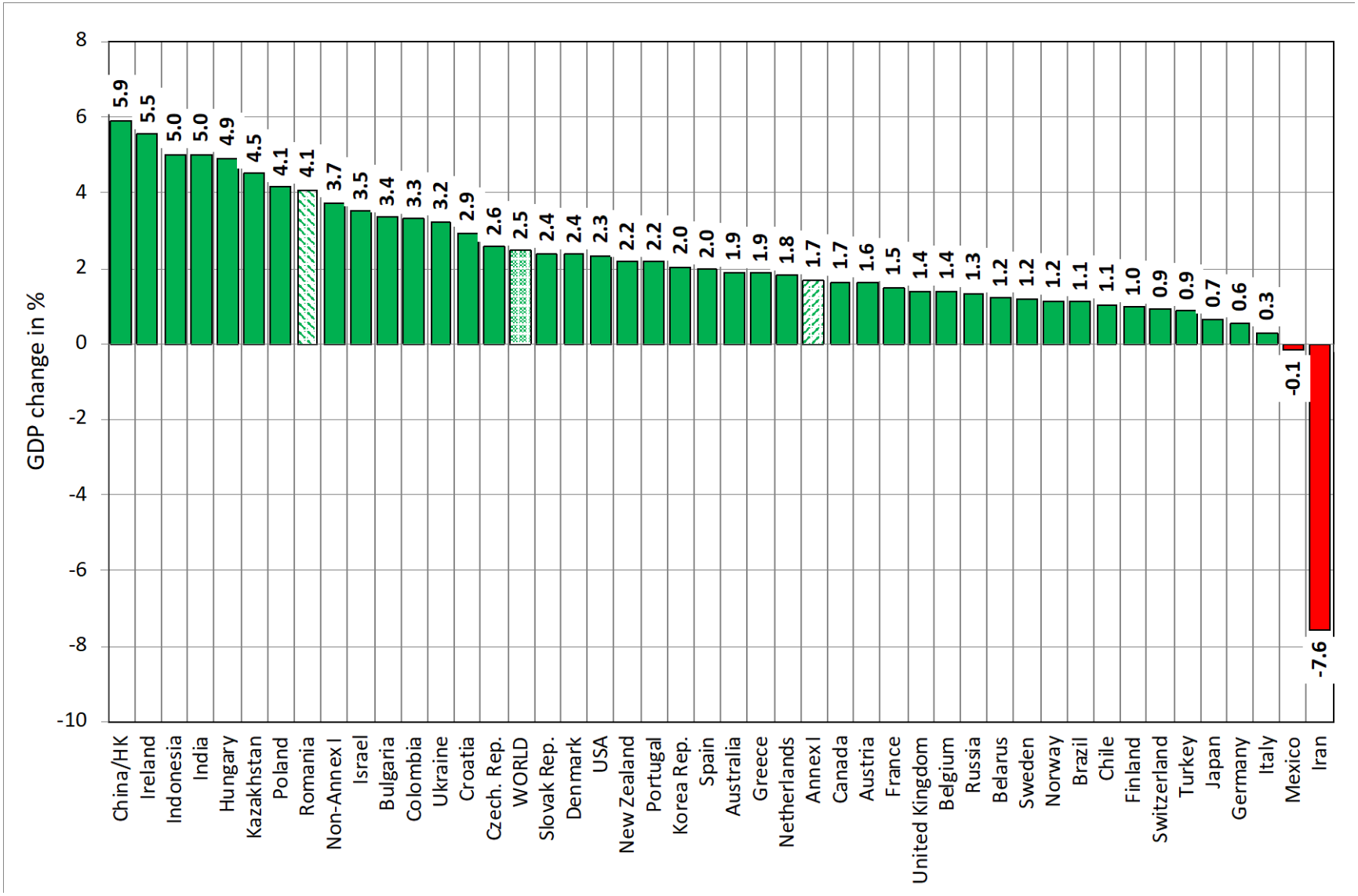
Main data for estimating GHG emissions for 2019

- **UNFCCC: National Communications from Parties included in Annex I to the Convention; National Greenhouse Gas Inventory Data from Annex I Parties for 1990 to 2018 (Greenhouse gas emissions/CO_2-emissions)**
- **International Energy Agency (IEA): CO_2 Emissions from Fuel Combustion, 2019 Edition, Paris 2019 and CO_2 Highlights 2019 (both data up to 2017)**
- **BP Statistical Review of World Energy 2019, June 2020**
- **The World Bank, World Development Indicators, Database July 2020**
- **Eurostat Database**

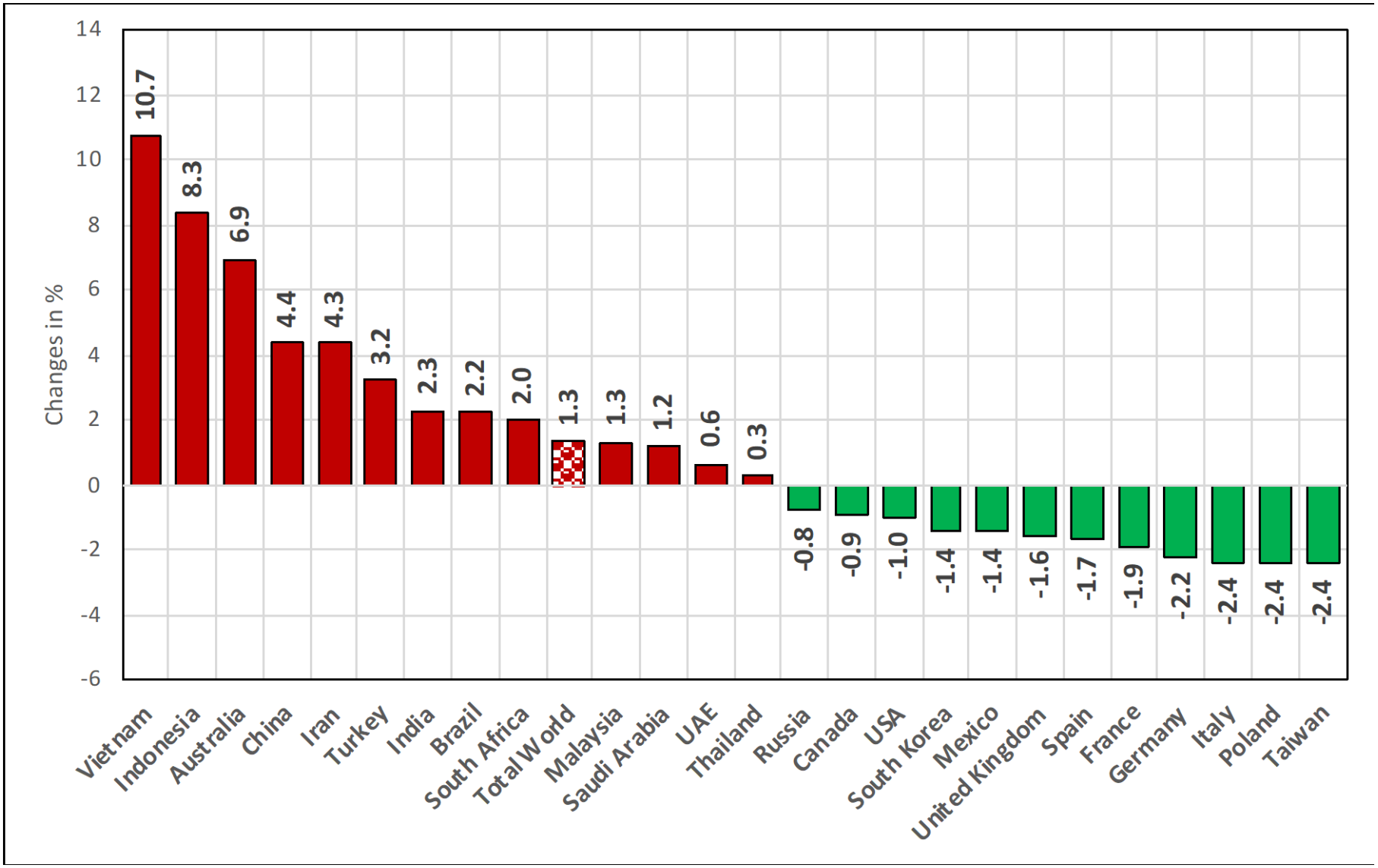
CO_2 emissions up to 2019 are extrapolated from the 2019 data on energy consumption published in the BP Statistics, June 2020, which are shown by country and energy source.

Changes of real GDP 2019 versus 2018 in Annex I parties and others



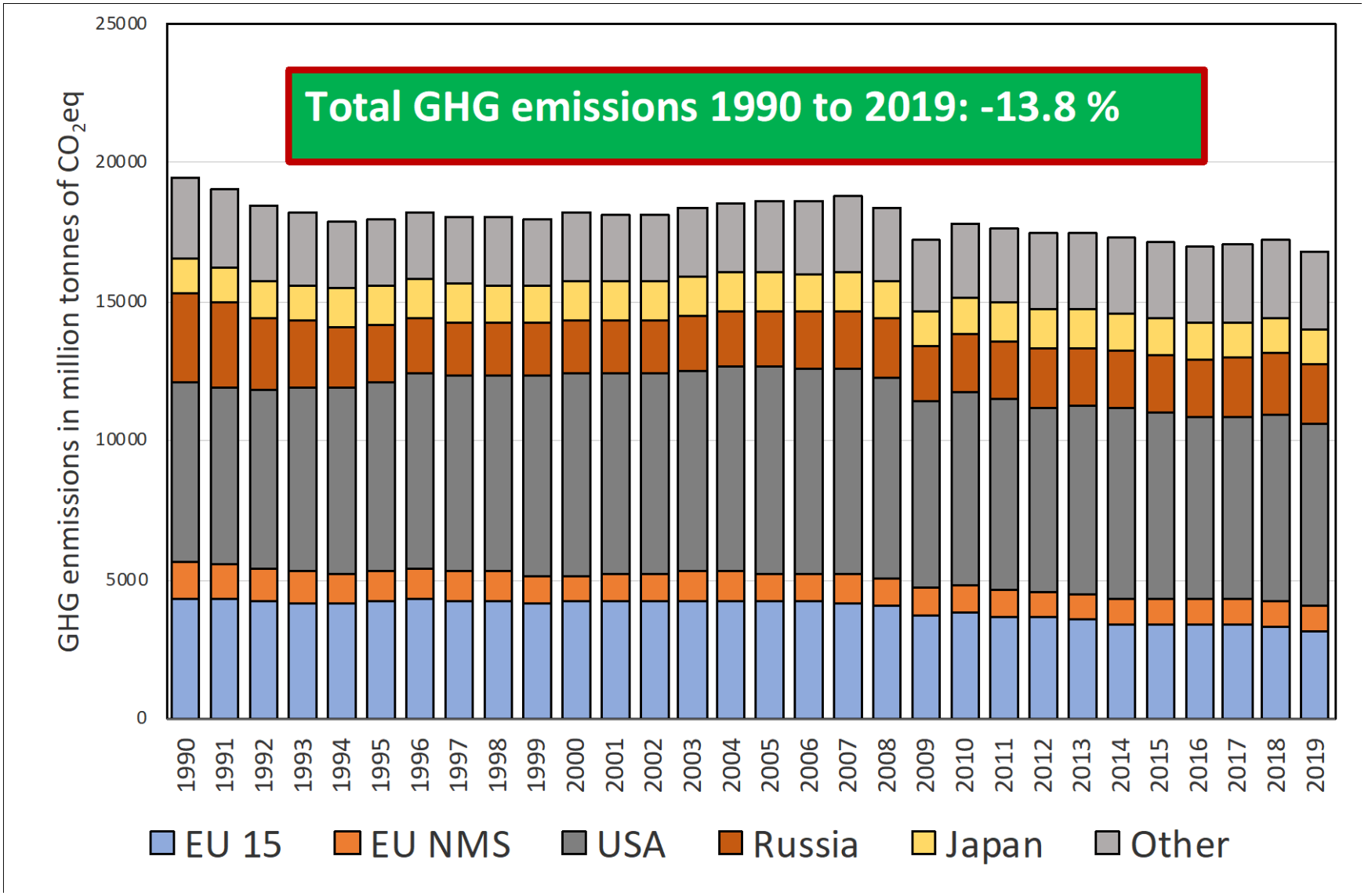
sources: World Bank (World Development Indicatorts – WDI), July 2020

Changes of primary energy 2019 vs 2018 in countries with ≥ 4 Exajoule (around 100 Gtoe)



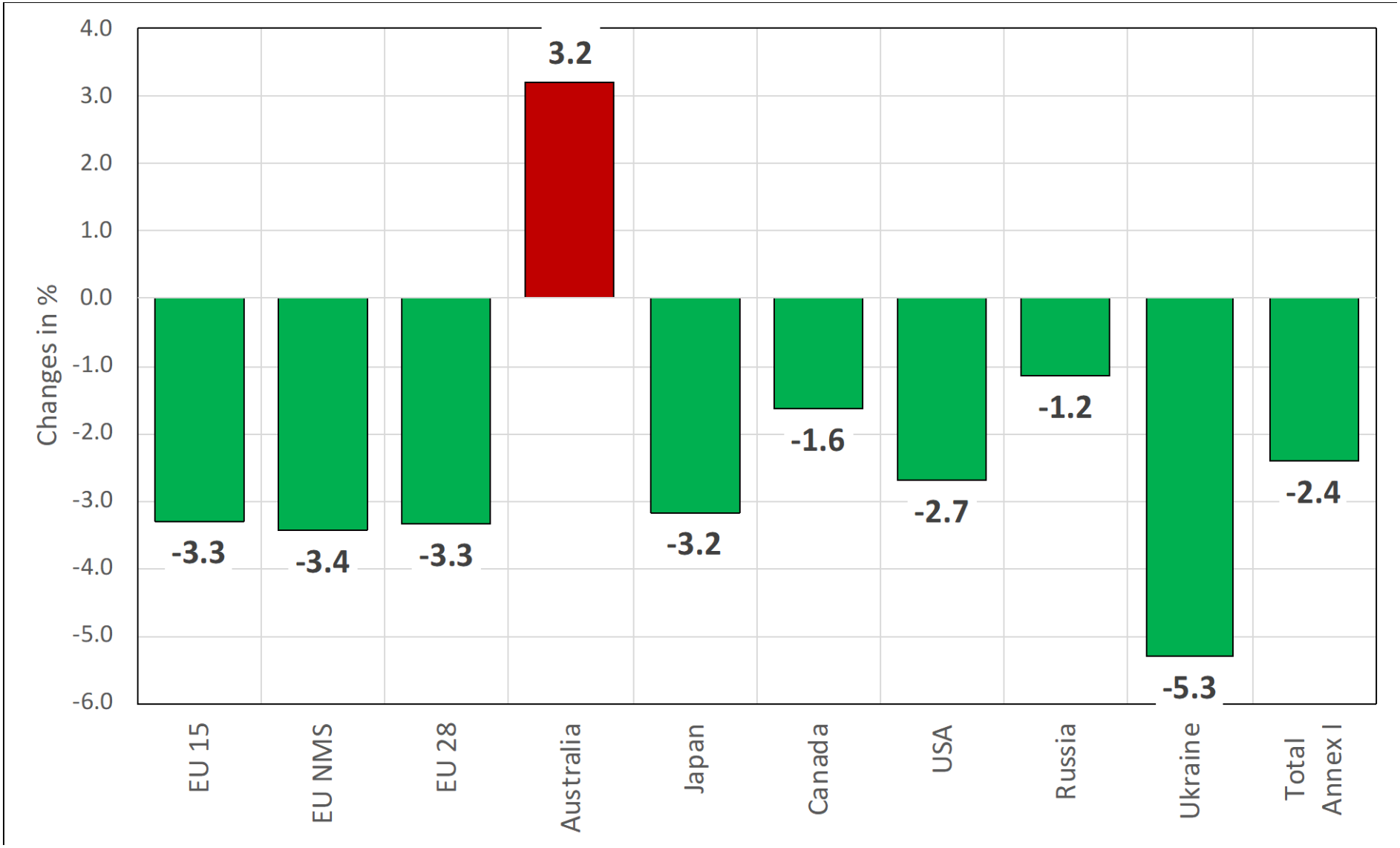
source: BP Statistical Review of World Energy June 2020

GHG emissions in Annex I parties 1990 – 2019



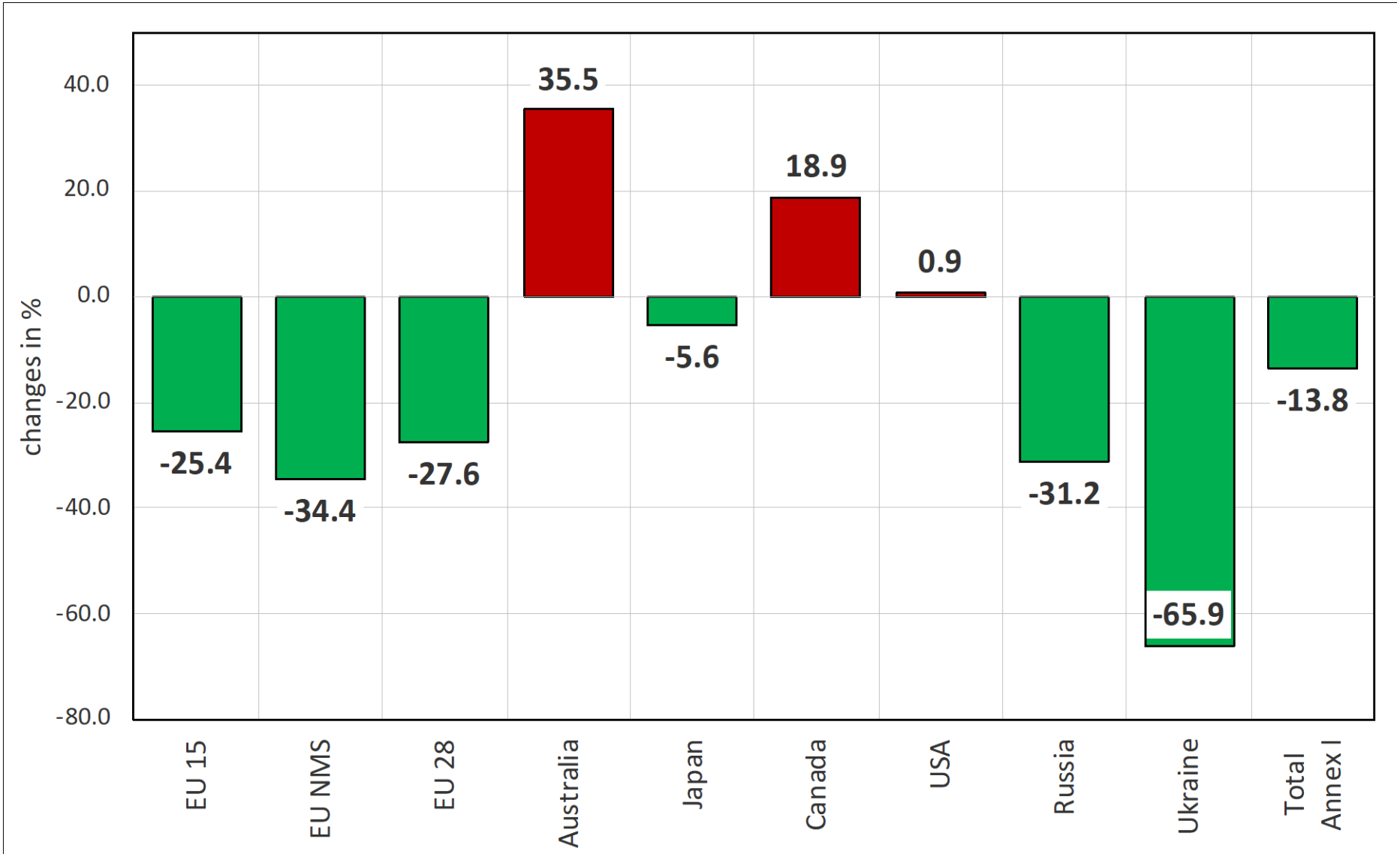
sources: UNFCCC; World Bank; OECD; IEA; author‘s calculation.

GHG emissions in Annex I parties: 2018 - 2019



sources: UNFCCC; IEA; BP; author‘s calculation.

GHG emissions in Annex I parties: 1990 - 2019



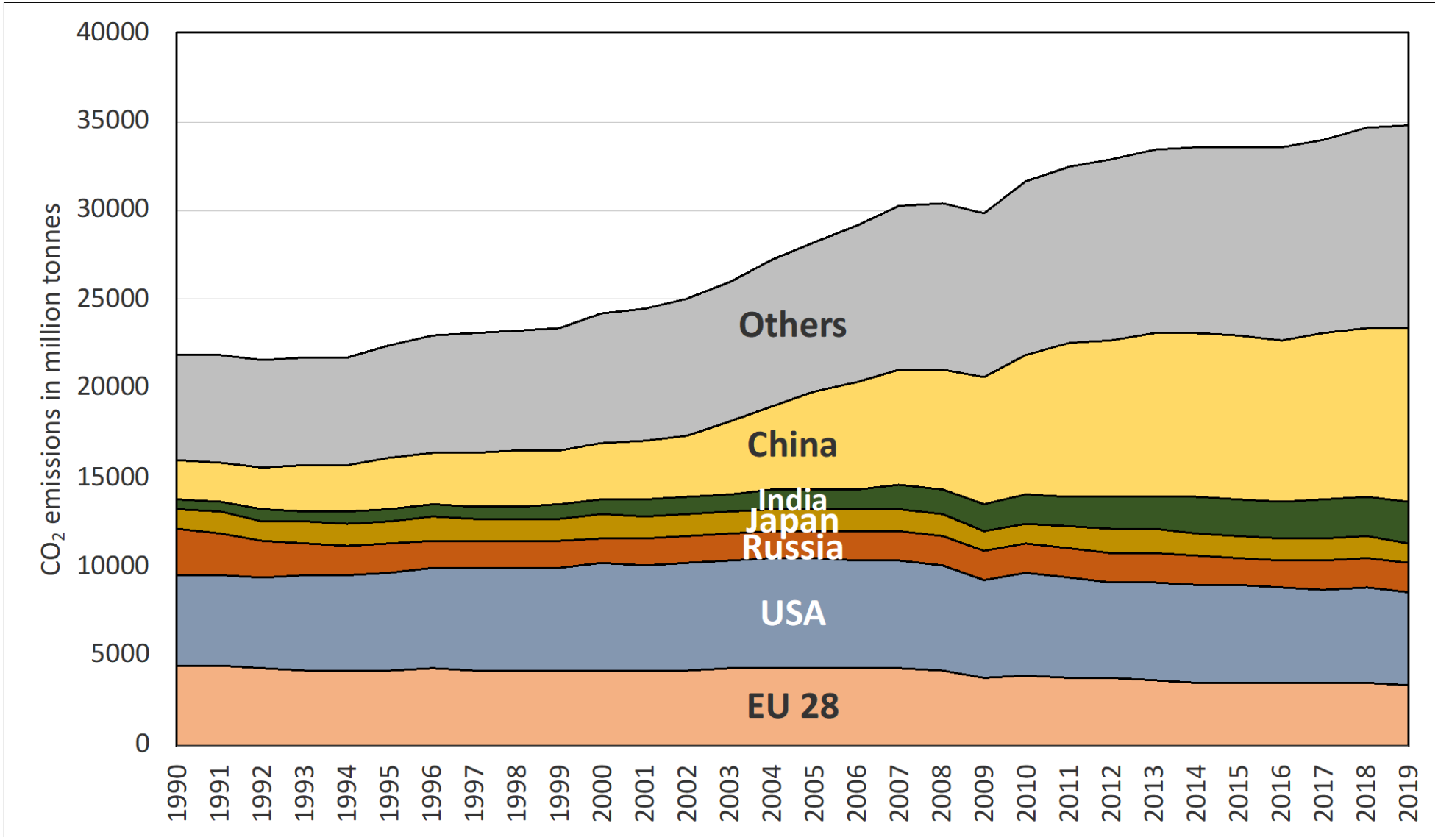
sources: UNFCCC; IEA; BP; author‘s calculation.

GHG emissions in Annex I parties 1990 – 2019

	1990	1995	2000	2010	2018	2019	2019/2018	1990/2019
	GHG emissions in Gt CO_2eq						changes in %	
EU 15	4293	4214	4203	3844	3312	3203	-3.3	-25.4
EU NMS	1363	1100	974	963	925	893	-3.4	-34.4
EU 28	**5656**	**5314**	**5177**	**4807**	**4237**	**4097**	**-3.3**	**-27.6**
EU 27	**4858**	**4562**	**4461**	**4193**	**3771**	**3641**	**-3.4**	**-25.0**
Japan	1270	1375	1375	1303	1238	1199	-3.2	-5.6
Australia	425	439	489	541	558	576	3.2	35.5
USA	6437	6771	7275	6982	6677	6498	-2.7	0.9
Canada	603	653	731	691	729	717	-1.6	18.9
Turkey	219	248	299	399	521	510	-2.1	132.4
Russia	3188	2085	1901	2058	2220	2195	-1.2	-31.2
Ukraine	942	562	427	407	339	321	-5.3	-65.9
Belarus	138	82	80	92	92	93	1.0	-32.6
New Zealand	64	67	74	77	79	80	1.4	25.7
Total Annex I	**19453**	**17959**	**18179**	**17791**	**17191**	**16778**	**-2.4**	**-13.8**

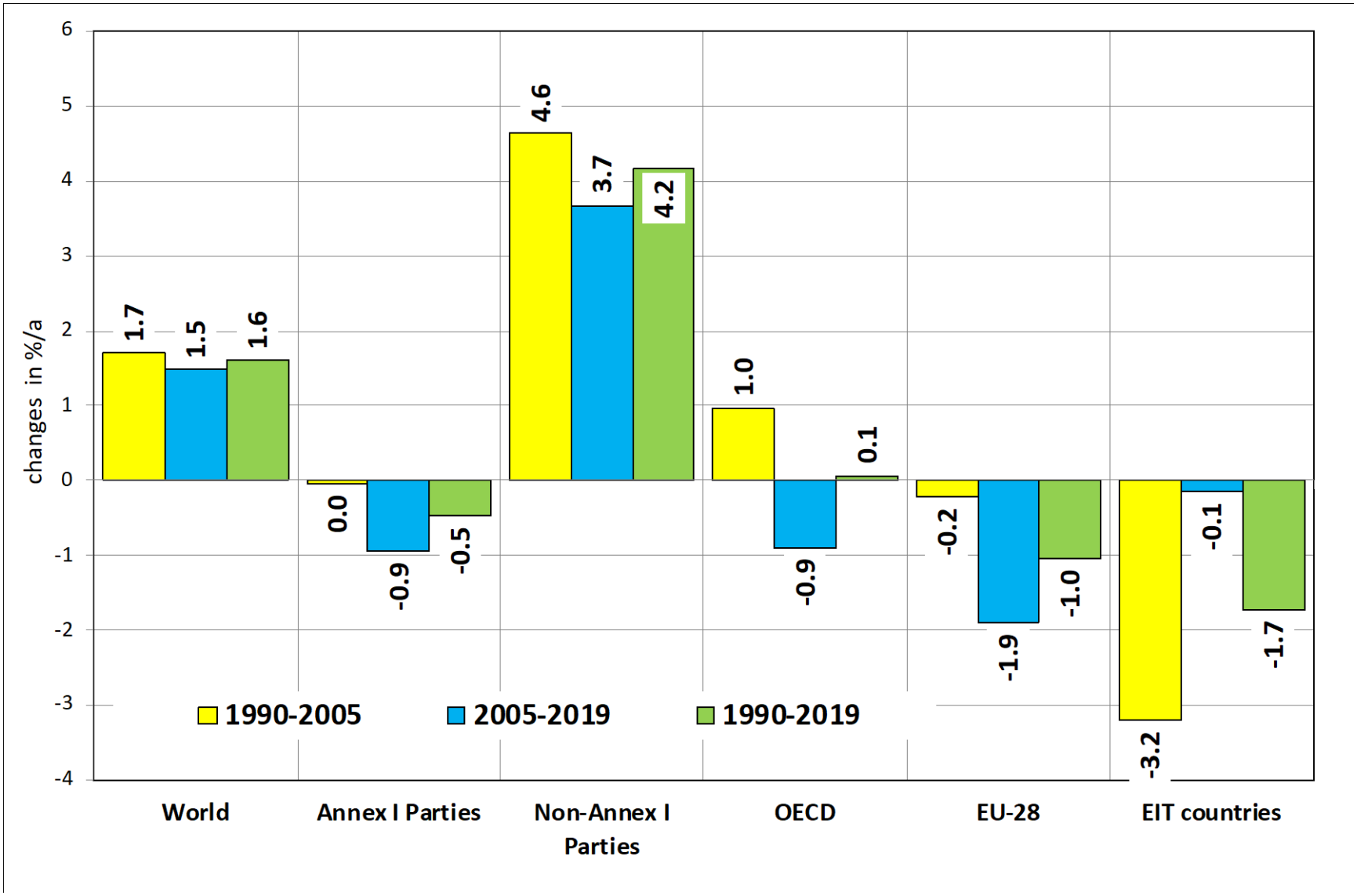
sources: UNFCCC; World Bank; IEA; BP; author‘s calculation.

World-wide CO_2 emissions by countries 1990 - 2019



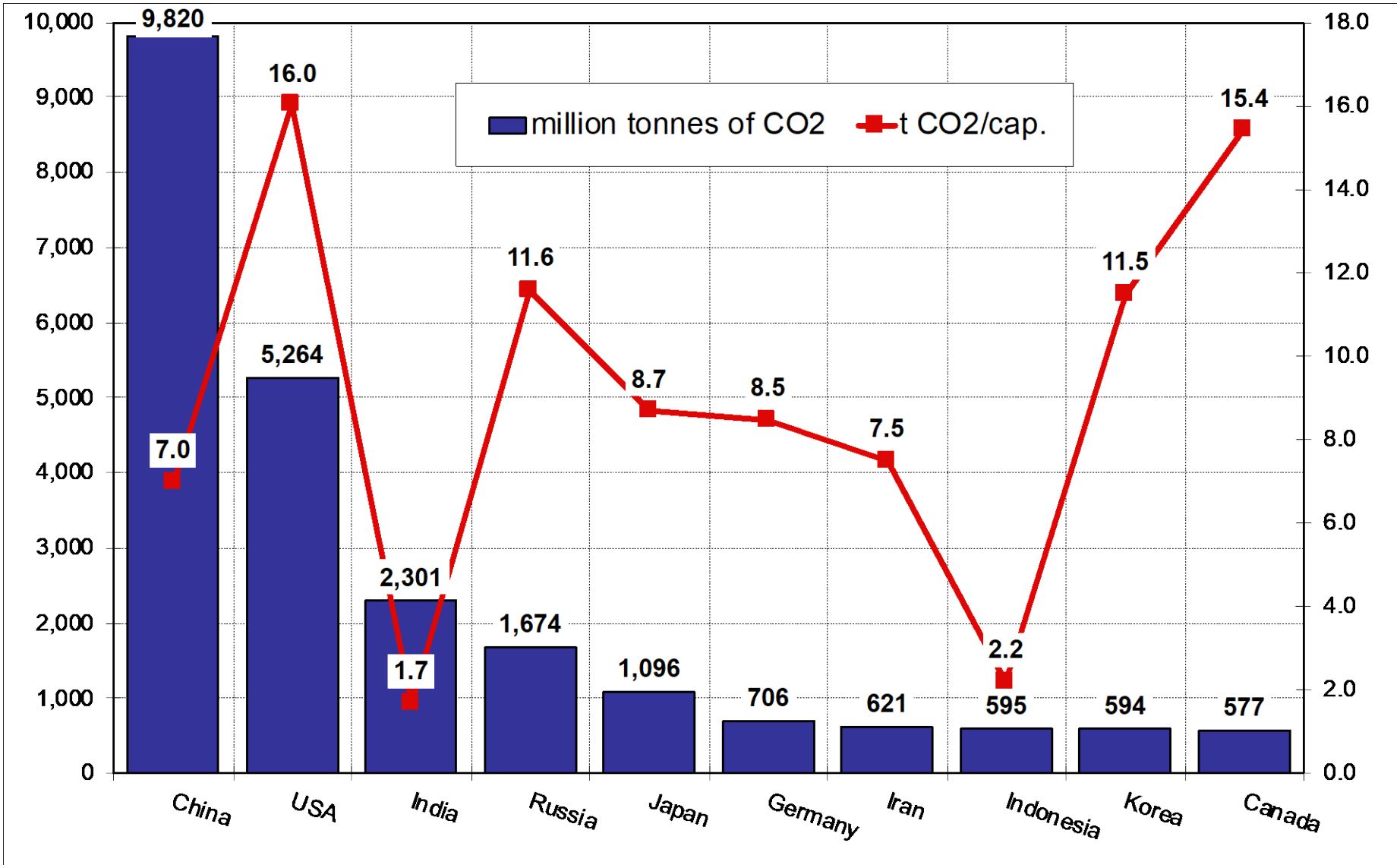
sources: UNFCCC; IEA; BP; author‘s calculation.

World-wide CO_2 emissions by regions 1990 - 2019



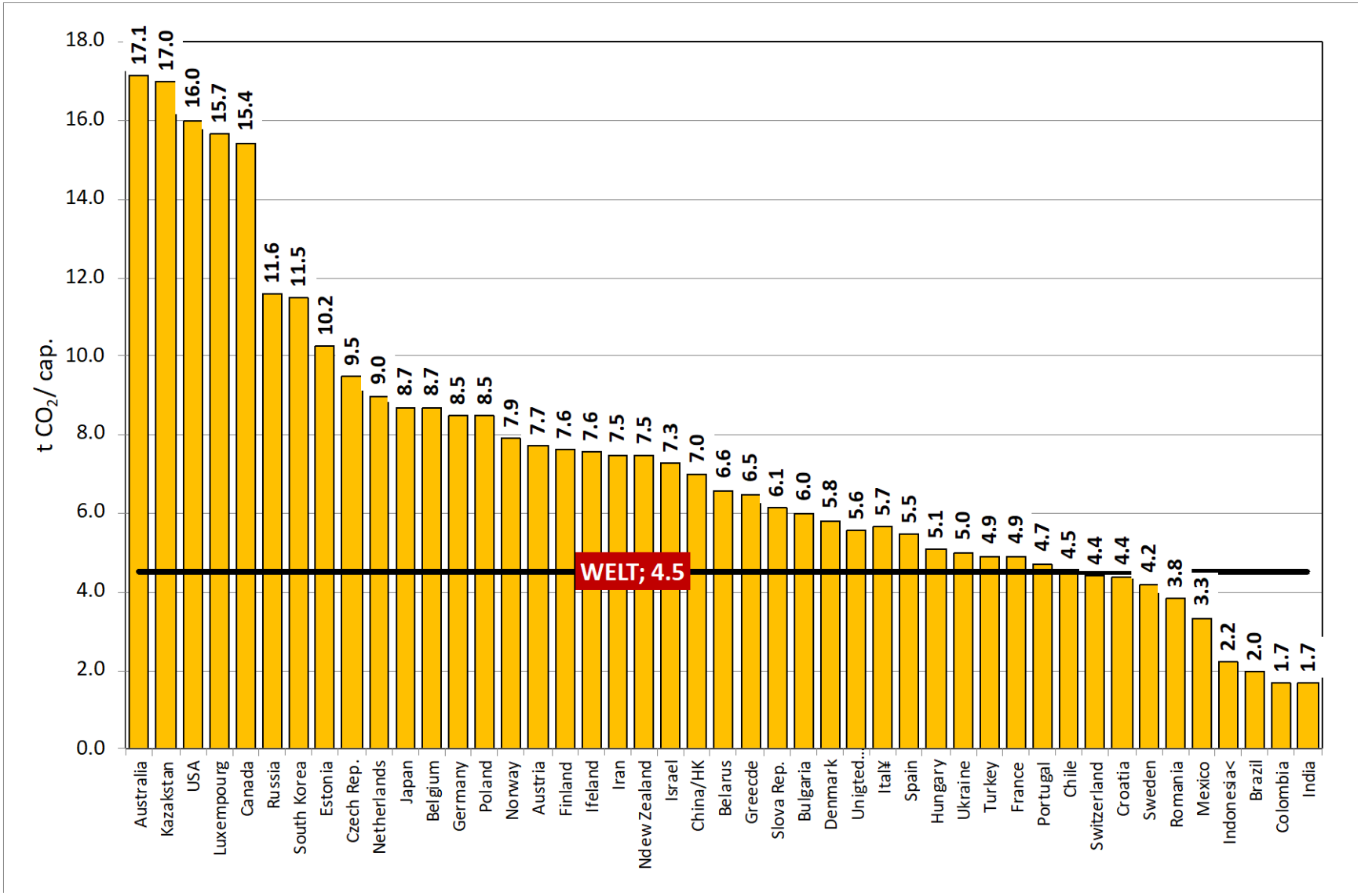
sources: UNFCCC; IEA; BP; author‘s calculation.

The ten major CO_2 emitters world-wide 2019



sources: UNFCCC; World Bank; OECD; IEA; Eurostat; author‘s calculation.

Per capita CO_2 emissions: EU-28 and selected countries 2019



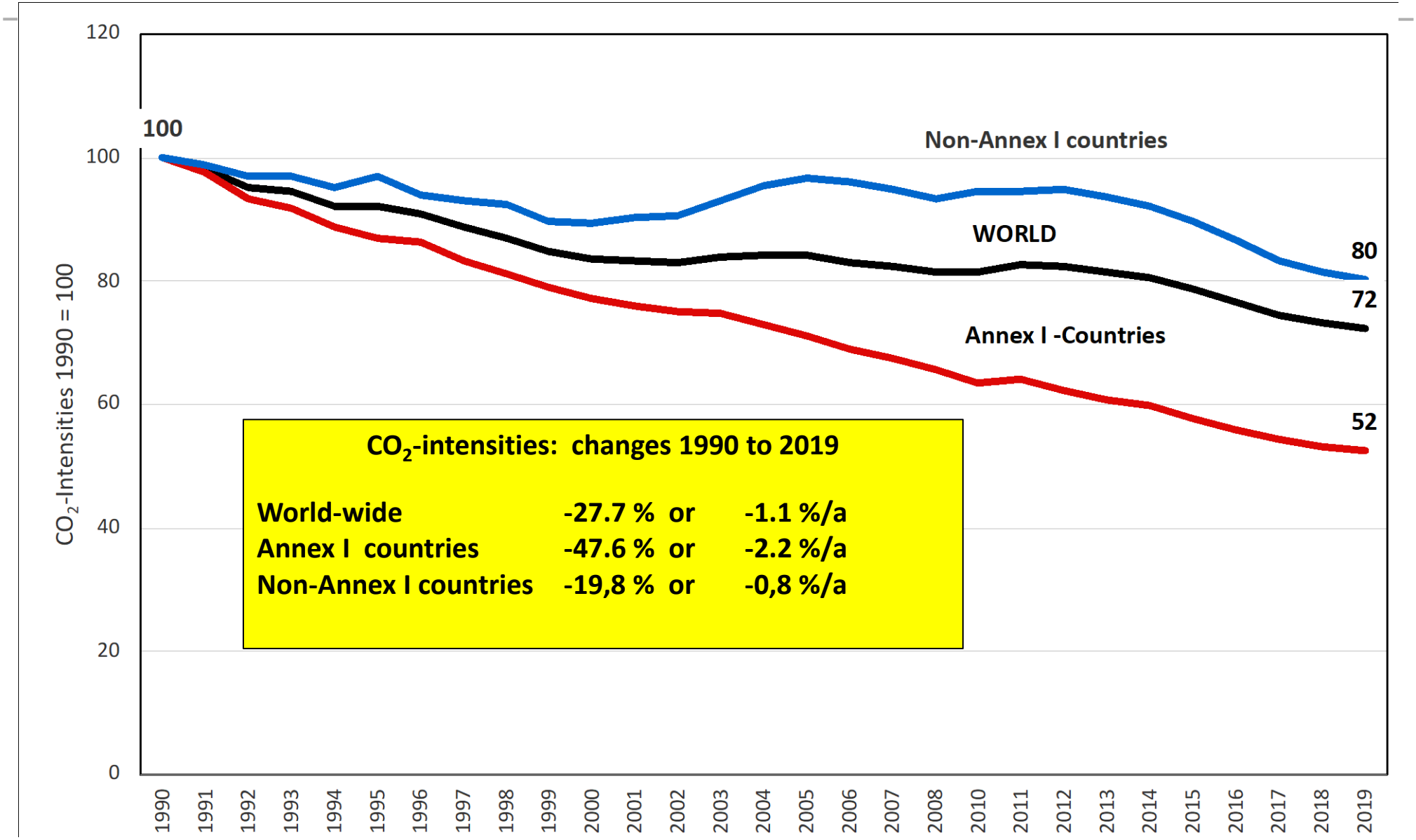
sources: UNFCCC; World Bank; IEA; Eurostat; BP; author‘s calculation.

World-wide CO_2 emissions 1990 – 2016 by regions

	1990	1995	2000	2010	2018	2019	2018/2019	1990/2019
	million tonnes of CO_2						changes in %	
WORLD	**21,937**	**22,456**	**24,180**	**31,610**	**34,634**	**34,781**	**0.4**	**58.5**
Annex I	**15,094**	**14,053**	**14,533**	**14,248**	**13,530**	**13,166**	**-2.7**	**-12.8**
Non-Annex I	**6,214**	**7,685**	**8,793**	**16,241**	**19,864**	**20,340**	**2.4**	**227.3**
incl. China	2,122	2,937	3,140	7,875	9,510	9,820	3.3	362.7
EIT	4,364	2,903	2,546	2,703	2,687	2,630	-2.1	-39.7
OECD	12,079	12,568	13,501	13,303	12,677	12,321	-2.8	2.0
EU 28	4,473	4,220	4,186	3,961	3,444	3,308	-3.9	-26.0
EU 15	1,060	868	764	764	729	697	-4.3	-34.2
EU NMS	3,413	3,352	3,422	3,196	2,715	2,611	-3.8	-23.5

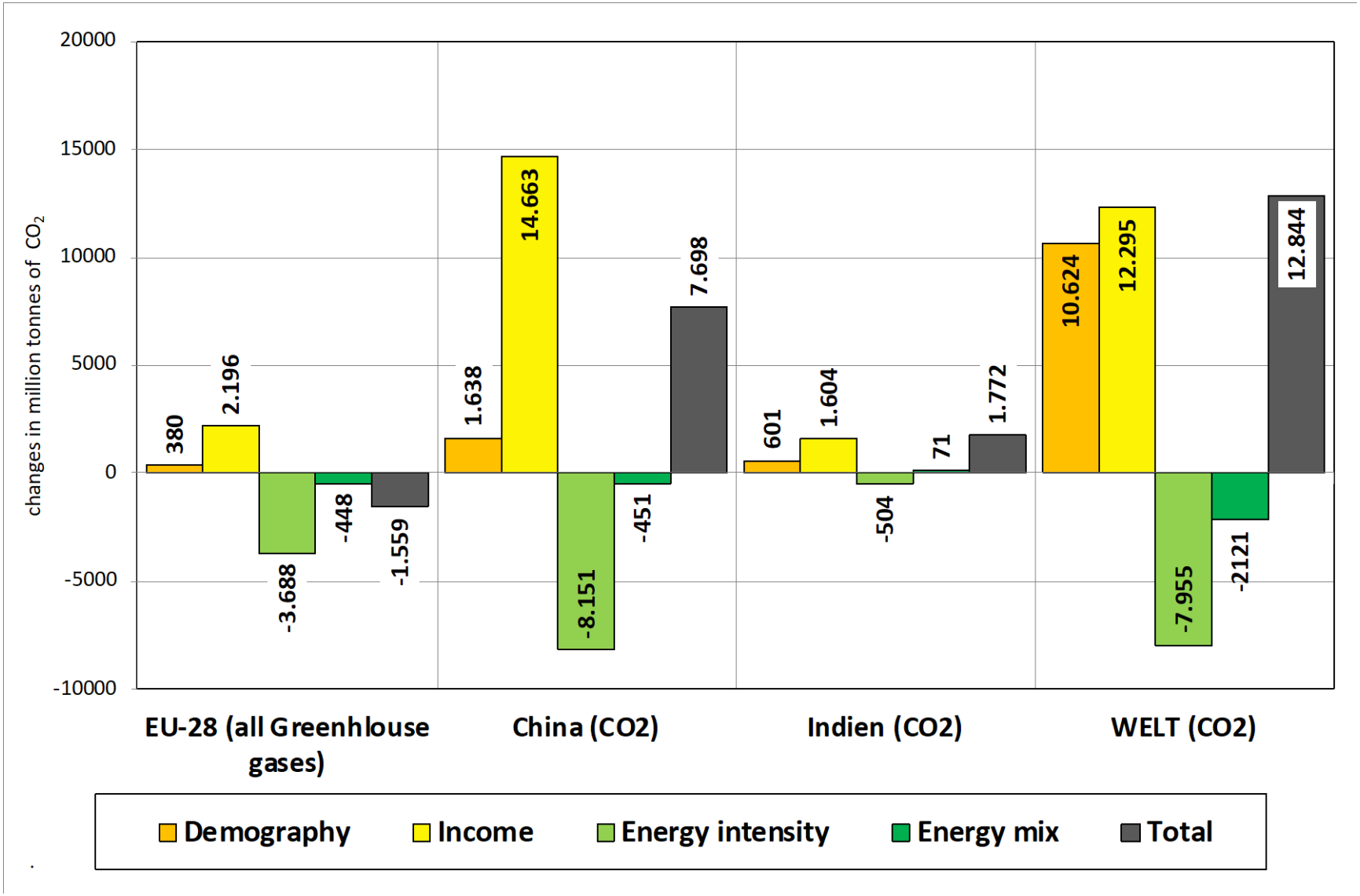
sources: UNFCCC; IEA; BP; author‘s calculation.

GHG/CO_2 intensity in Annex I countries/world-wide CO_2 intensity 1990 - 2019



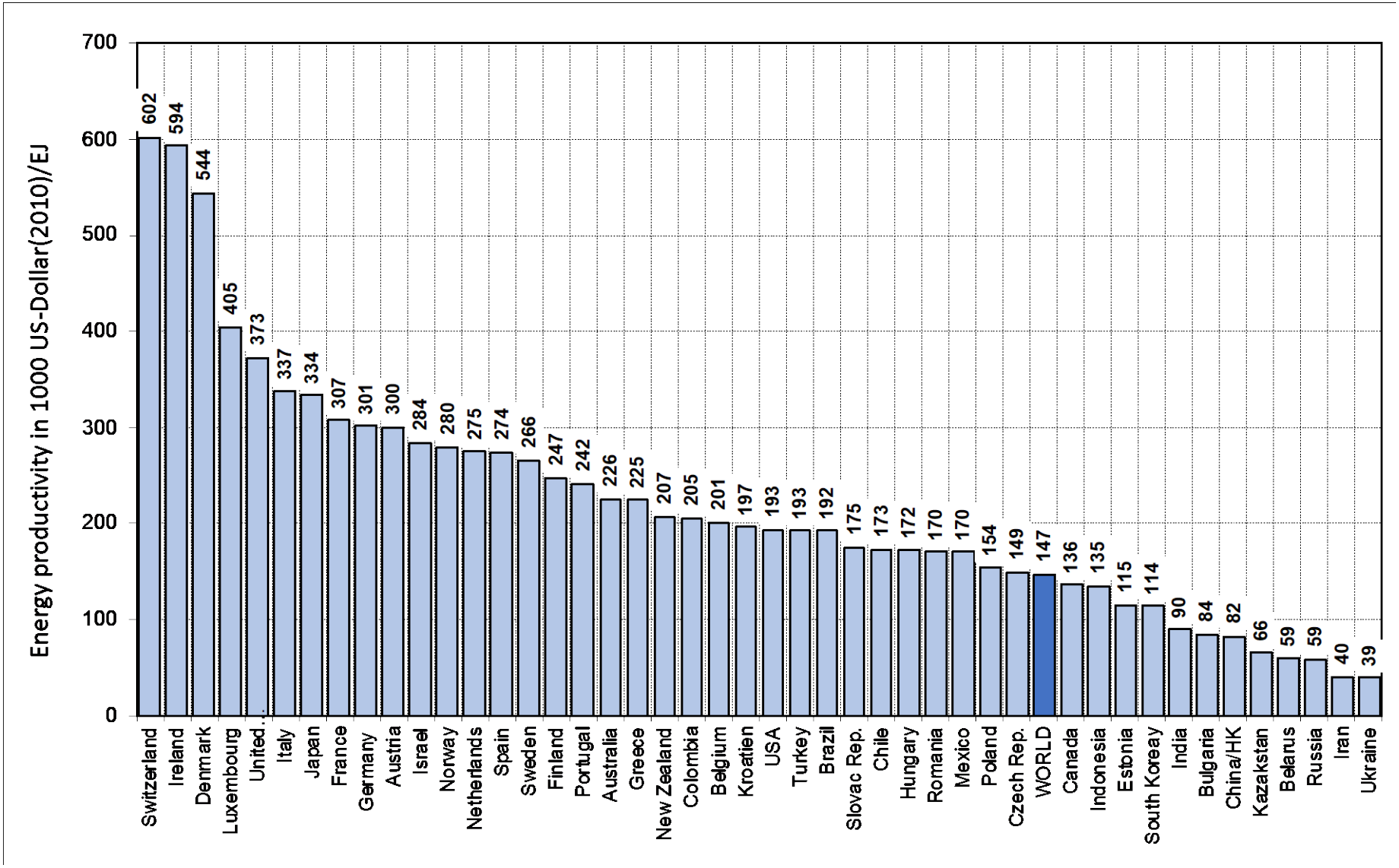
sources: UNFCCC; IEA; World Bank; BP; author‘s calculation.

Components influencing GHG emissions 2019 vs. 1990



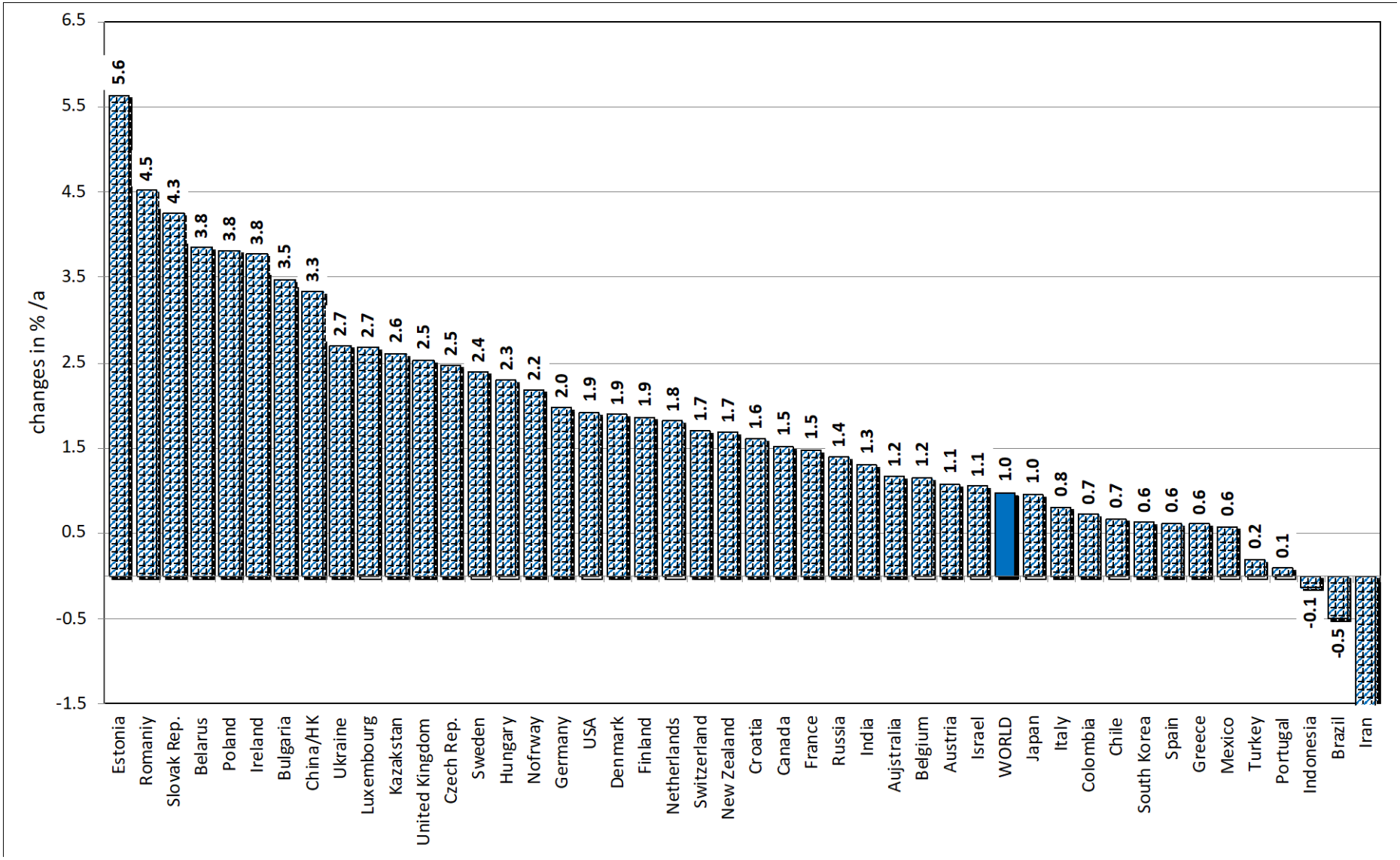
sources: UNFCCC; IEA; World Bank; author‘s calculaton.

Energy productivity in selected countries 2019



sources: World Bank; IEA; BP; author‘s calculations.

Changes of energy productivity in selected countries 1990 - 2019



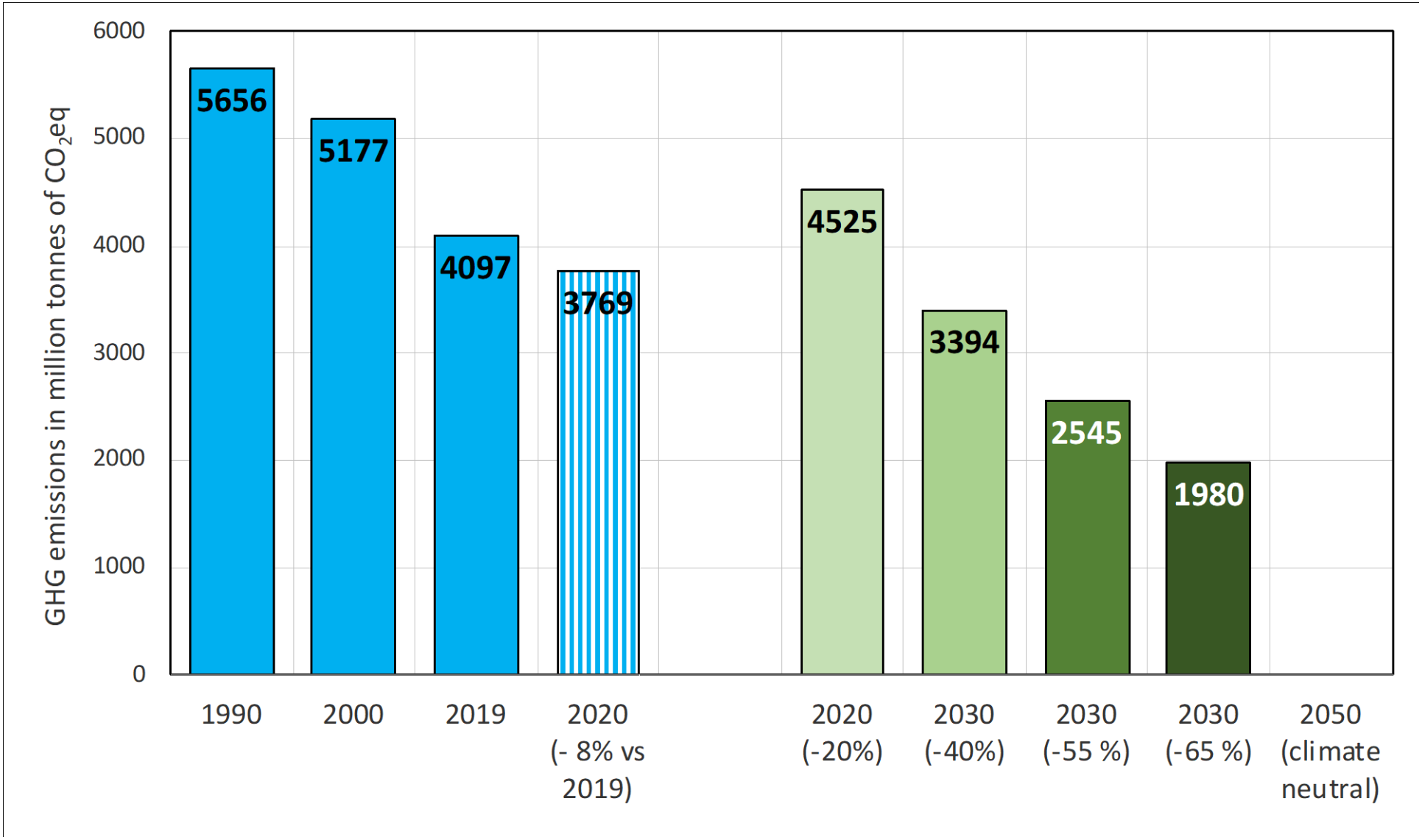
sources: World Bank; IEA; BP; author‘s calculation.

Outlook: Estimated changes in real gross domestic product in 2020 and 2021 - Worldwide and euro area

Institutions	2020	2021	2020	2021
	worldwide		Euro area	
World Bank	-5.2	+4.2	-9.1	+4.5
International Monetary Fund	-4.9	+5,4	-10.2	+6.0
OECD (Double-hit Scenario)	-7.6	+2.8	-11.5	+3.5
OECD (Single-hit Scenario)	-6.0	+5.2	-9.1	+6.5

sources: UNFCCC; author‘s calculation.

EU 28: GHG emissions 1990 to 2020 and targets for 2020, 2030 and 2050



source: UNFCCC; EU Commission; DIW Berlin.

Periodic emission budgets with different reduction targets for 2030 and 2050

Targets (2030/2050 versus 1990)	Targets 2030 (Basis 1990 = 4.858 Mt CO_2e)	Actual budget 1990 to 2020	2021 to 2030	2031 to 2050	2021 to 2050	1990 to 2050
	Million t CO_2e	Emission budgets in billion tons CO_2 equivalent				
-40%/-100%	2,915	133.1	31.1	27.7	58.8	191.9
-55%/-100%	2,186	133.1	27.1	20.8	47.9	181.0
-65%/-100%	1,700	133.1	24.4	16.2	40.6	173.7
		Annual average emission reduction in million tons CO_2 equivalent				
-40%/-100%		-50	-44	-146	-112	-81
-55%/-100%		-50	-116	-109	-112	-81
-65%/-100%		-50	-165	-85	-112	-81

sources: UNFCCC; author‘s calculation.

Conclusions – almost the same as all the previous years

- The discussion often concentrates on emissions targets. This is necessary and has to be pursued in the future - **but**
- The real emission's development and their business-as-usual-perspectives should not be neglected.
- The gap between the desired targets and the expected real development can only be filled with an appropriate policy and effective measures for more energy efficiency and renewable energies.
- Targets are necessary but not sufficient: It needs policies and measures. That's the proof for an effective climate protection policy and not only the target setting!
- The present figures shows some promising results but the overall turning point is still far away.

The paper is published in September in:
„Energiewirtschaftliche Tagesfragen“, 9/2017 (in German only)

Thanks for listening

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