Updated development of Greenhouse Gas Emissions - delusions and reality

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Agenda

- A look back
- Distance to targets
- A look forward
- Conclusions

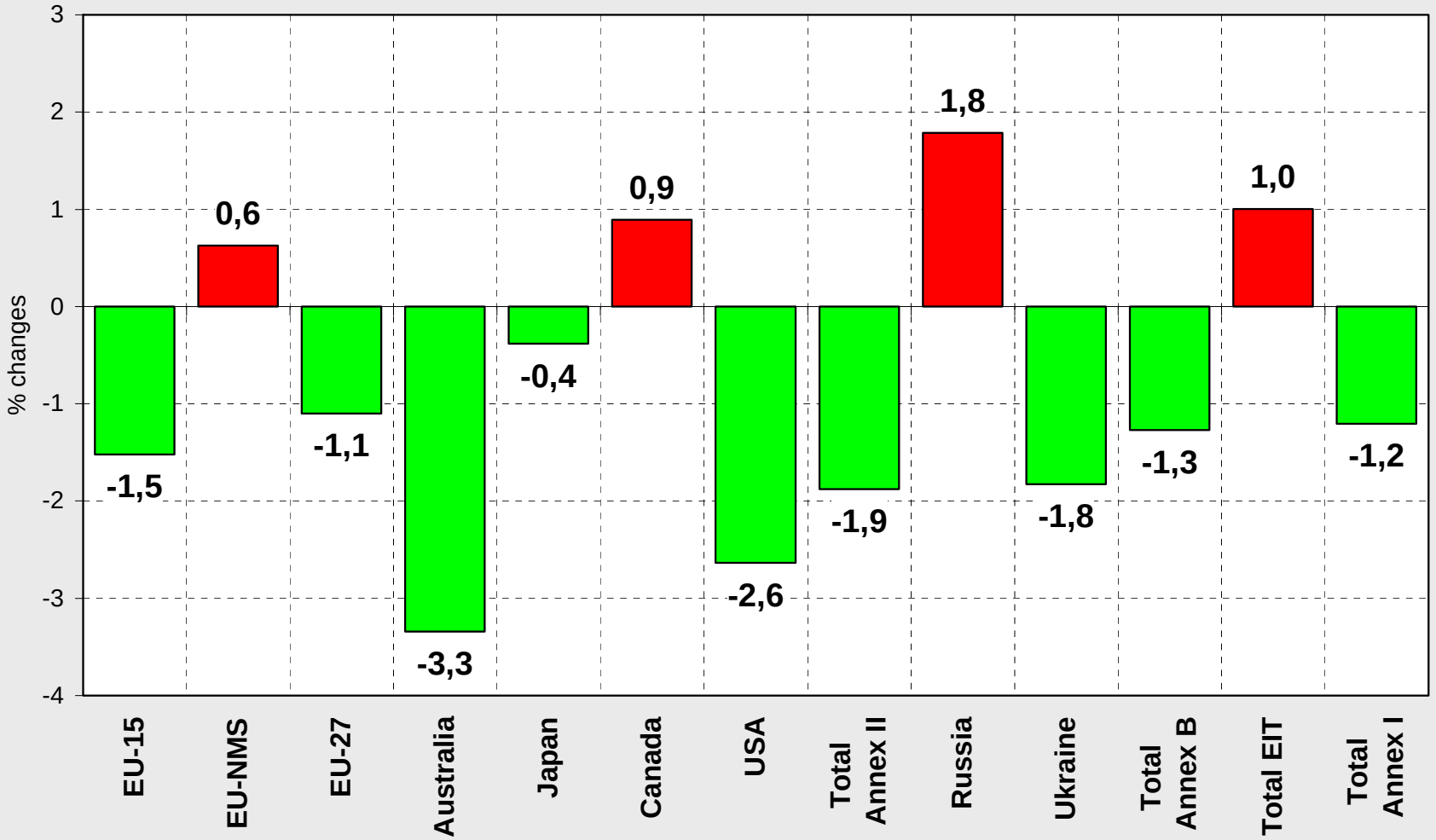
A look back

The main sources for estimating the development of GHG emissions world-wide

- **UNFCCC: National Communications from Parties included in Annex I to the Convention; National Greenhouse Gas Inventory Data from Annex I Parties for 1990 to 2007**
- **International Energy Agency (IEA): CO_2 Emissions from Fuel Combustion, 2007 Edition, Paris 2008; (up to 2006)**
- **BP Statistical Review of World Energy 2008, June 2009.**

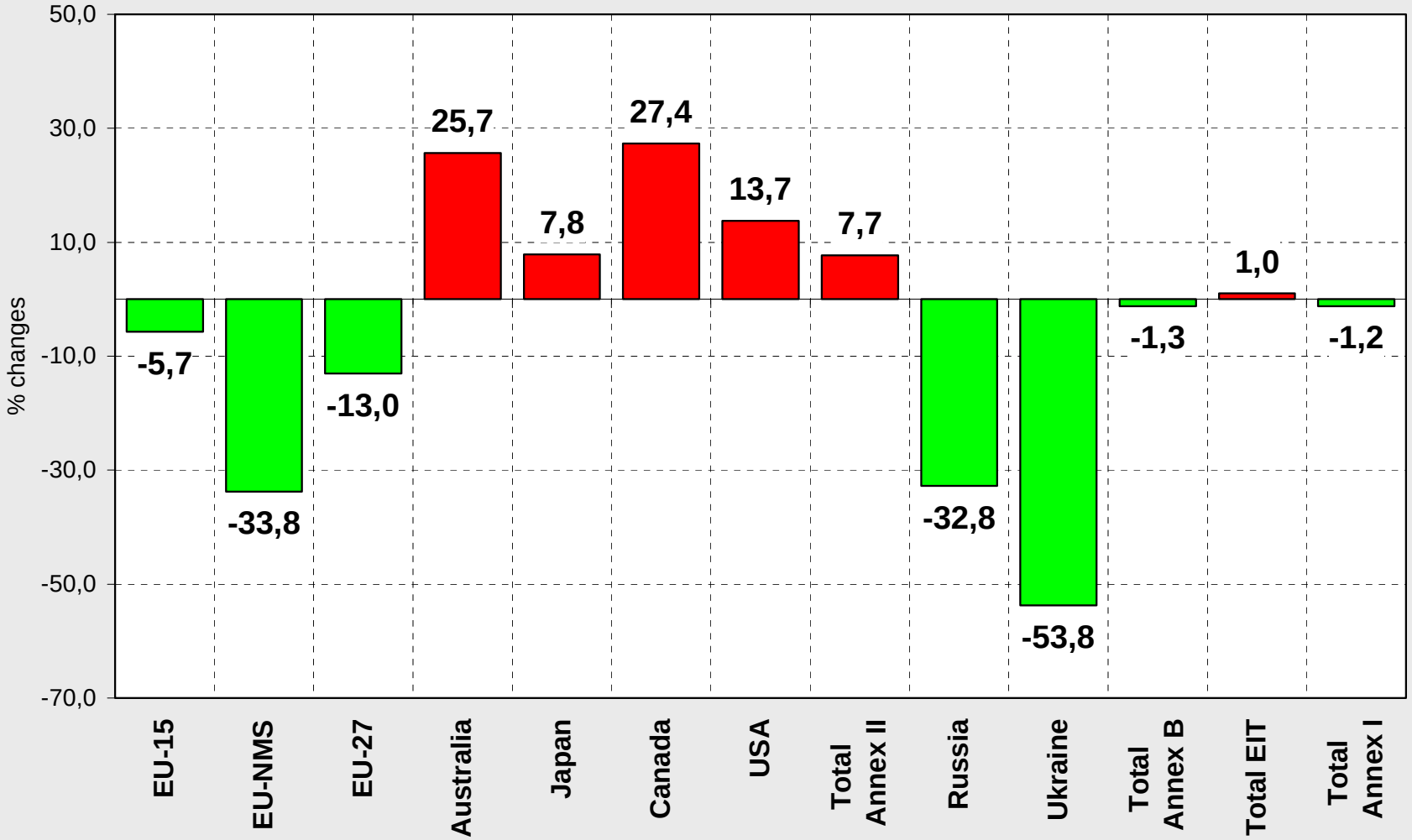
The CO_2 emissions up to 2008 are extrapolated from the 2008 data on energy consumption published in the BP Statistics, which are shown by country and energy source.

GHG emissions in Annex I Parties
2007 to 2008



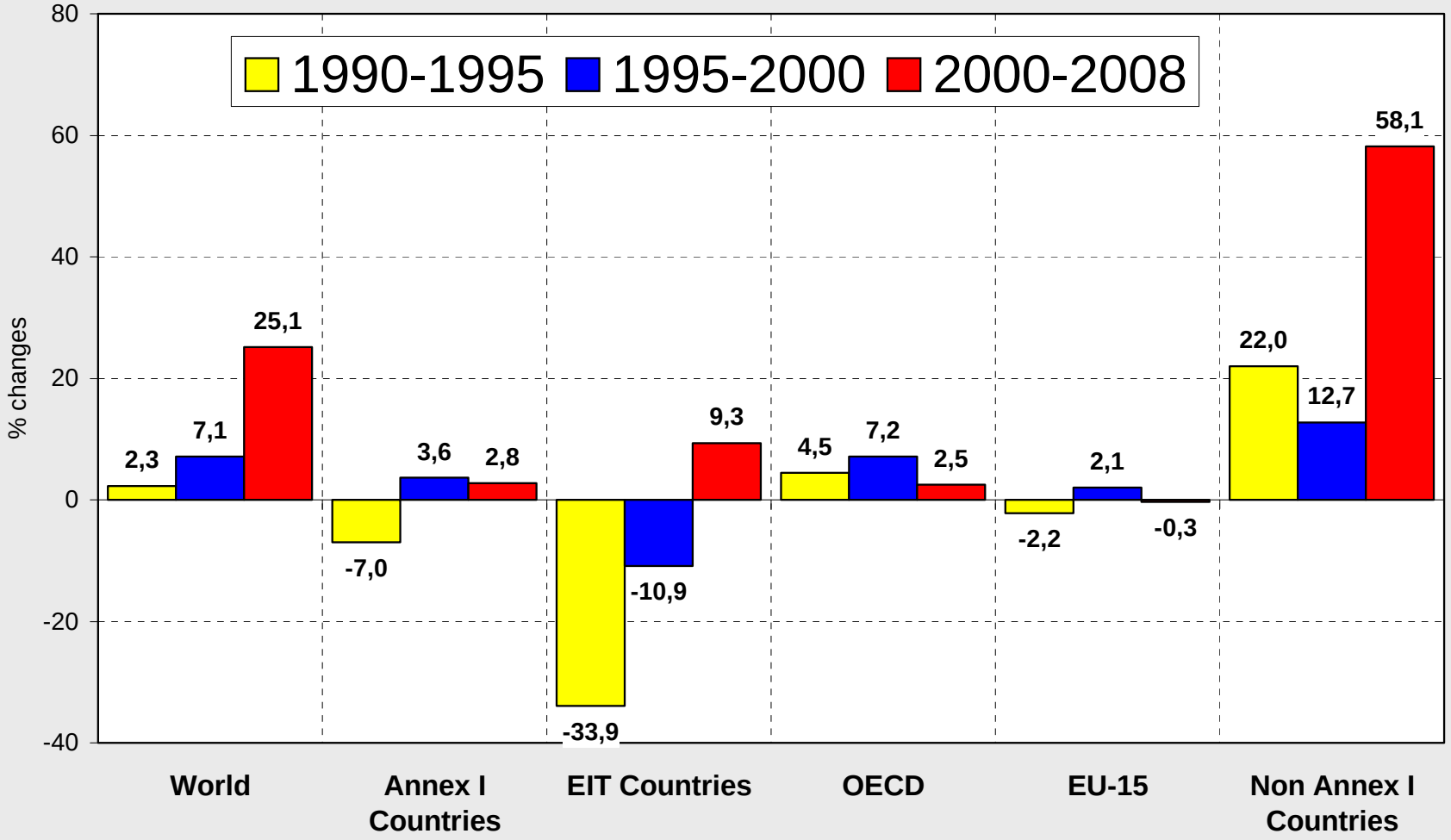
sources: UNFCCC; BP; author's calculations (for 2008)

GHG emissions in Annex I Parties base year to 2008



sources: UNFCCC; BP; author's calculations.

World-wide CO_2 emissions by regions 1990 to 2008



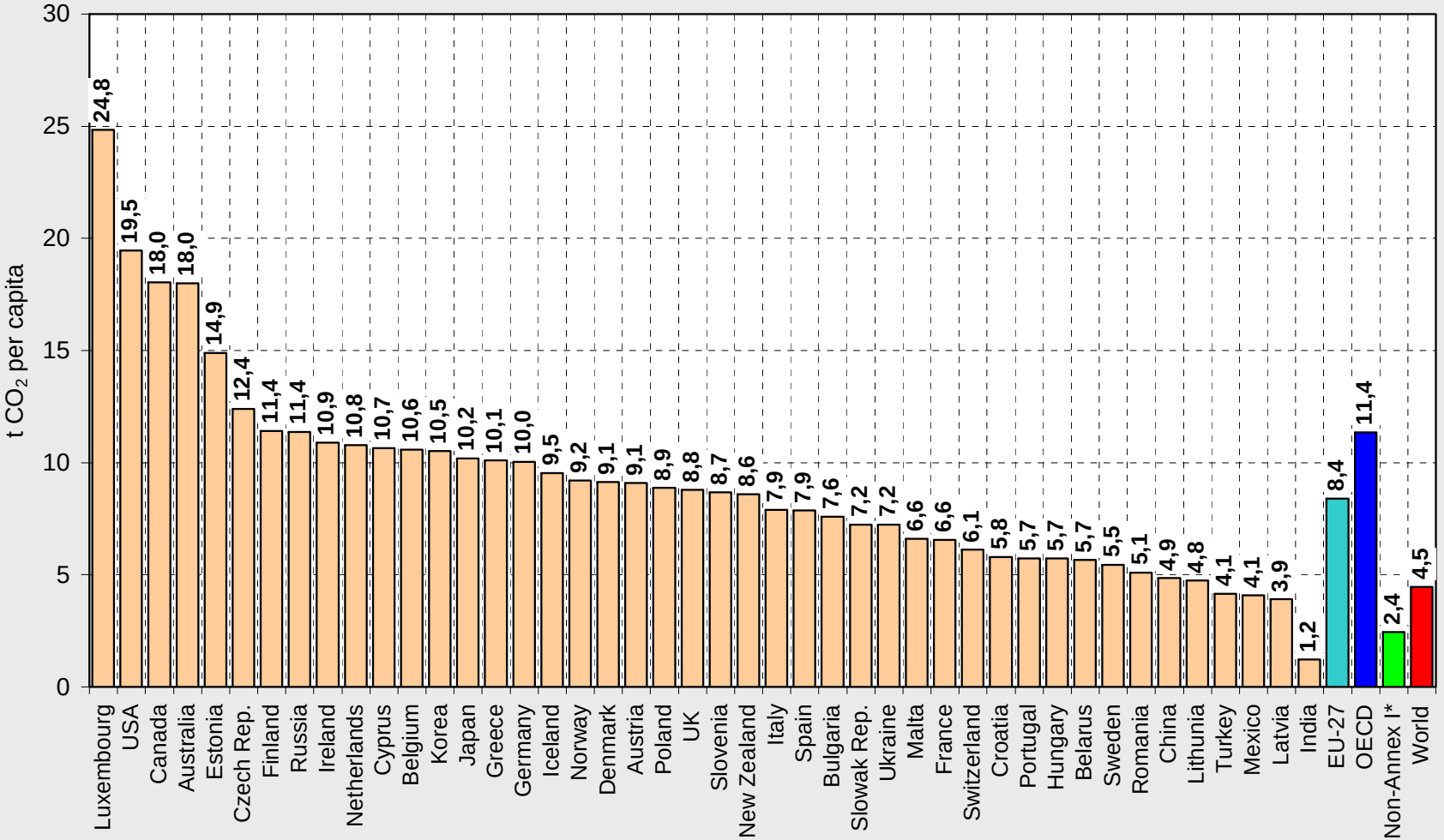
sources: UNFCCC; IEA; BP; author's calculations .

World-wide CO_2 emissions 1990 to 2008

	1990	2000	2007	2008[2]	1990 bis 2008	2007 bis 2008
	CO_2-Emissionen in Mio. t				Veränderungen in %	
EU-15	3364,9	3359,7	3398,3	3348,5	-0,5	-1,5
EU NMS	1039,3	752,2	795,5	801,1	-22,9	0,7
EU-27	**4404,2**	**4112,0**	**4193,8**	**4149,6**	**-5,8**	**-1,1**
Australia	277,8	349,8	396,3	378,2	36,1	-4,6
Japan	1143,2	1254,6	1303,8	1301,1	13,8	-0,2
Canada	455,8	559,9	590,2	596,9	30,9	1,1
USA	5068,6	5946,4	6094,4	5909,3	16,6	-3,0
Total Annex-II countries	**10417,4**	**11590,1**	**11910,3**	**11664,3**	**12,0**	**-2,1**
Korea	229,3	431,3	502,2	511,6	123,1	1,9
Russia	2499,1	1471,1	1579,8	1610,9	-35,5	2,0
Ukraine	715,6	289,1	340,1	332,8	-53,5	-2,1
China	2244,0	3077,6	6091,1	6496,2	189,5	6,6
India	589,3	976,5	1351,6	1449,6	146,0	7,2
Africa	549,3	694,4	884,7	925,4	68,5	4,6
Middle East	587,9	971,5	1341,2	1428,4	143,0	6,5
Latin America	603,1	859,8	1027,9	1068,0	77,1	3,9
Other Asia	685,3	1143,5	1528,3	1552,1	126,5	1,6
Other countries	679,9	402,4	493,9	509,7	-25,0	3,2
International bunkers	613,3	807,8	995,7	1000,7	63,2	0,5
World	**22010,5**	**24119,9**	**29655,5**	**30178,0**	**37,1**	**1,8**

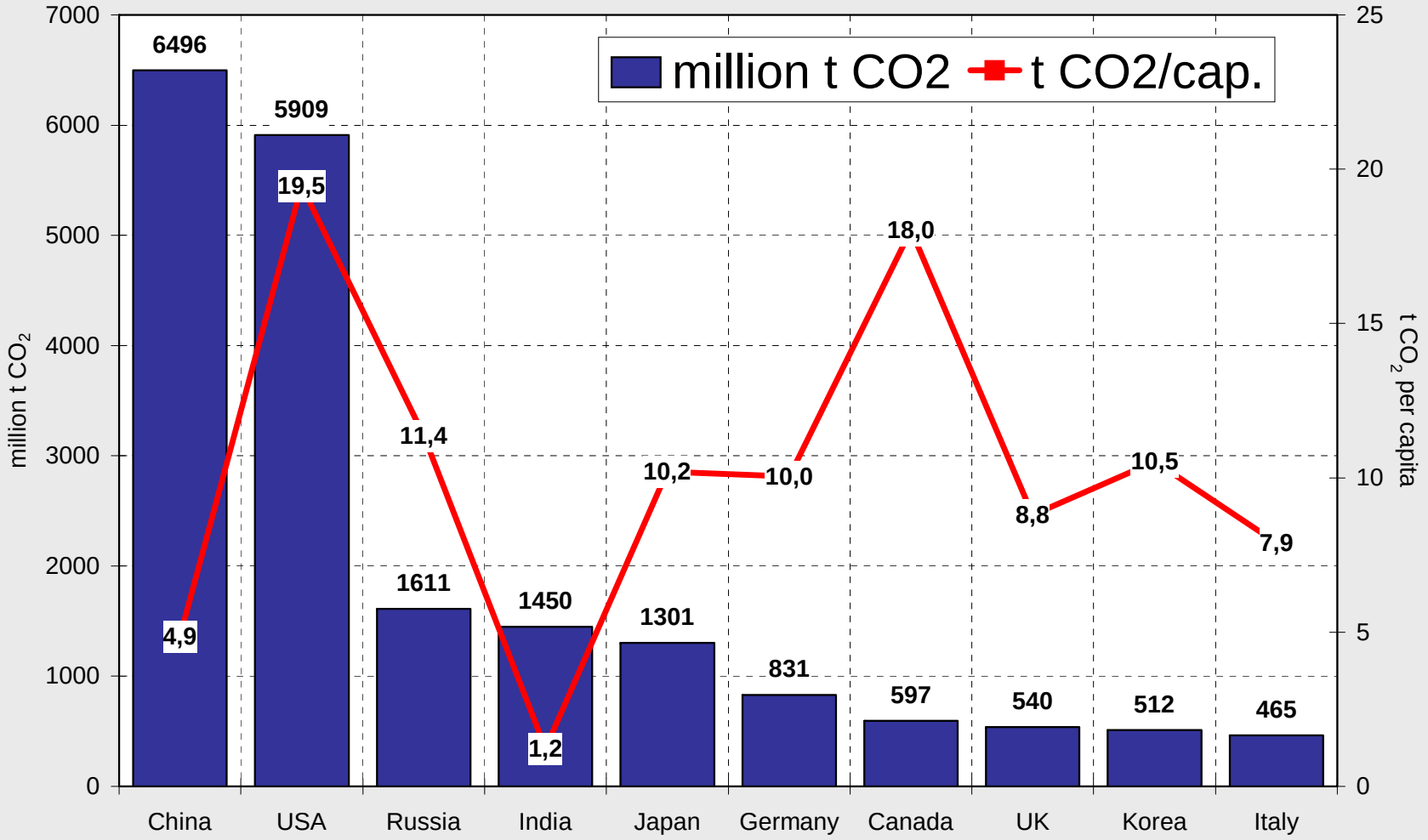
sources: UNFCCC;IEA; BP; author's calculations.

Per capita CO_2 emissions in EU-27 and in selected countries 2008



sources: UNFCCC; Worldbank; OECD; Eurostat; BP; author's calculations.

The 10 highest emitters worldwide and their per capita CO_2 emissions in 2008



source: UNFCCC; Worldbank; OECD; IEA; Eurostat; author's calculations.

Distance to targets

GHG emissions in Annex I Parties: base year to 2008 and targets for 2008/2012

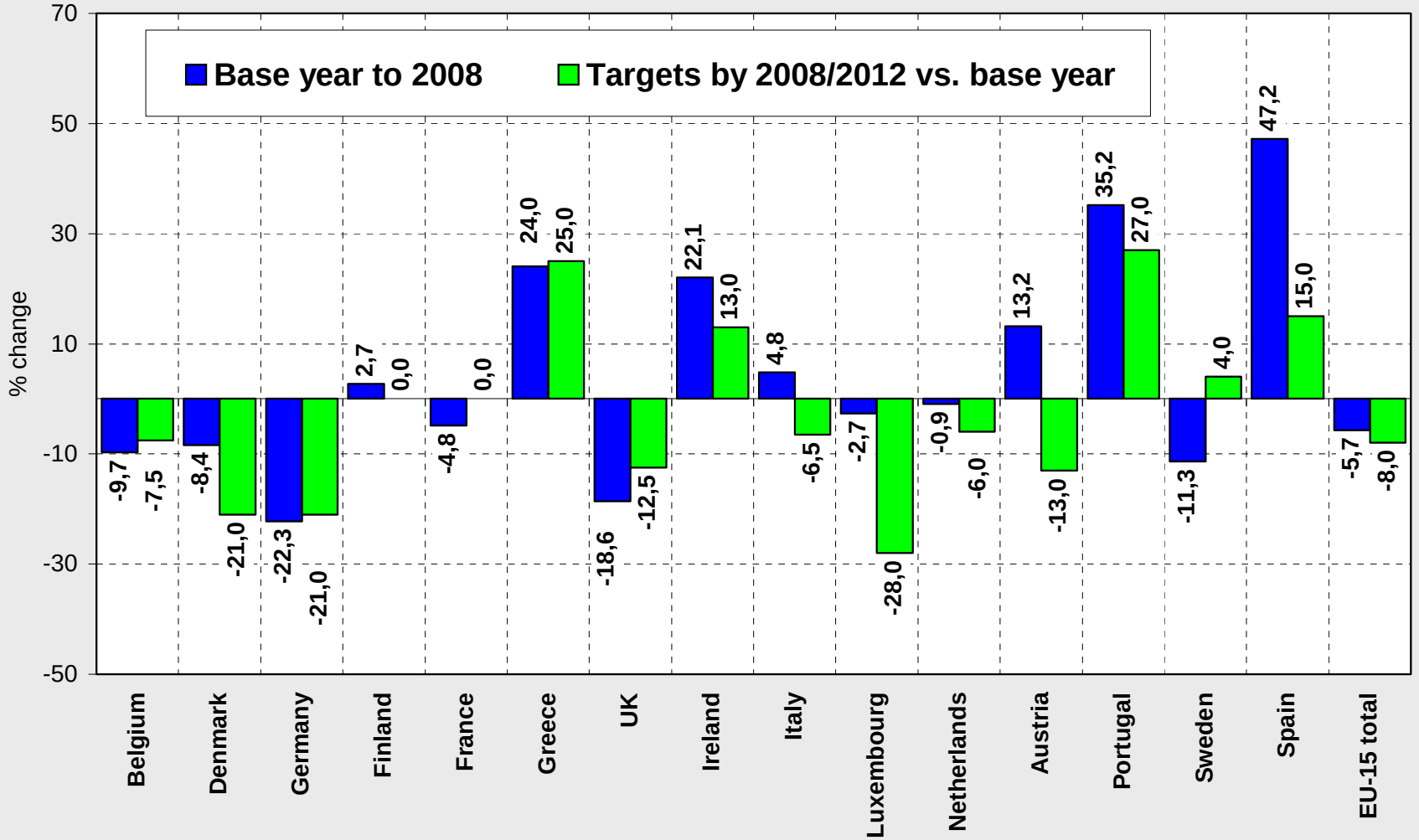
	base year	2000	2008	base year to 2008	targets 2008/2012	changes 2008/12 vs. 2008	absolute targets in 2008/12
	GHG emissions in gt CO_2 equiv.			% changes			Gt CO_2 equiv.
EU-15	4239	4115	3999	-5,7	-8,0	-2,5	3897,0
EU-NMS	1509	946	1000	-33,8	-7,1	39,6	1395,3
EU-27	**5748**	**5061**	**4998**	**-13,0**	**-7,8**	**5,9**	**5292,4**
Australia	416	495	523	25,7	8,0	-14,1	449,5
Japan	1270	1346	1369	7,8	-6,0	-12,8	1193,5
Canada	592	717	754	27,4	-6,0	-26,2	556,3
USA	6084	6975	6920	13,7	-7,0	-18,2	5658,6
Total Annex II	12769	13828	13754	7,7	-6,6	-13,3	11920,4
Russia	3319	2030	2232	-32,8	0,0	48,7	3319,3
Ukraine	926	390	428	-53,8	0,0	116,3	926,0
Total Annex B	**18676**	**17279**	**17512**	**-6,2**	**-5,2**	**1,1**	**17709,7**
Total EIT	**5908**	**3451**	**3759**	**-36,4**	**-4,0**	**50,9**	**5670,5**
Total Annex I	**18847**	**17559**	**17892**	**-5,1**	**xxxxxxx**	**xxxxxxx**	**xxxxxxx**
sources: UNFCCC; IEA; BP; author's calculations.							

GHG emissions in EU-15: base year to 2008 and targets for 2008/2012

	base year	2000	2008	base year to 2008	targets 2008/2012		required changes by 2008/12 vs. 2008	
	GHG emissions in gt CO_2 equiv.				% changes		Gt CO_2 equiv.	% changes
Belgium	143,2	145,1	129,3	-13,9	-9,7	-7,5	132,5	3,2	2,4
Denmark	69,1	67,8	63,3	-5,8	-8,4	-21,0	54,6	-8,7	**-13,8**
Germany	1215,2	1008,2	944,6	**-270,6**	-22,3	-21,0	960,0	15,4	1,6
Finland	70,9	69,5	72,8	1,9	2,7	0,0	70,9	-1,9	-2,6
France	565,5	560,6	538,1	-27,4	-4,8	0,0	565,5	27,4	5,1
Greece	105,6	127,1	130,9	25,3	24,0	25,0	132,0	1,0	0,8
UK	774,2	677,1	630,4	**-143,8**	-18,6	-12,5	677,4	47,0	**7,5**
Ireland	55,4	69,0	67,6	12,2	22,1	13,0	62,6	-5,0	-7,4
Italy	516,3	549,5	541,1	24,8	4,8	-6,5	482,8	-58,4	**-10,8**
Luxembourg	13,1	10,0	12,8	-0,3	-2,7	-28,0	9,4	-3,3	**-26,0**
Netherlands	212,0	214,4	210,1	-1,9	-0,9	-6,0	199,3	-10,9	-5,2
Austria	79,0	81,1	89,5	10,4	13,2	-13,0	68,8	-20,7	**-23,1**
Portugal	59,3	81,7	80,1	20,9	35,2	27,0	75,3	-4,9	-6,1
Sweden	71,9	68,2	63,8	-8,1	-11,3	4,0	74,8	11,0	**17,3**
Spain	288,1	385,8	424,0	**135,9**	47,2	15,0	331,4	-92,7	**-21,9**
Total EU-15	**4238,8**	**4115,0**	**3998,5**	**-240,3**	**-5,7**	**-8,1**	**3897,0**	**-101,5**	**-2,5**

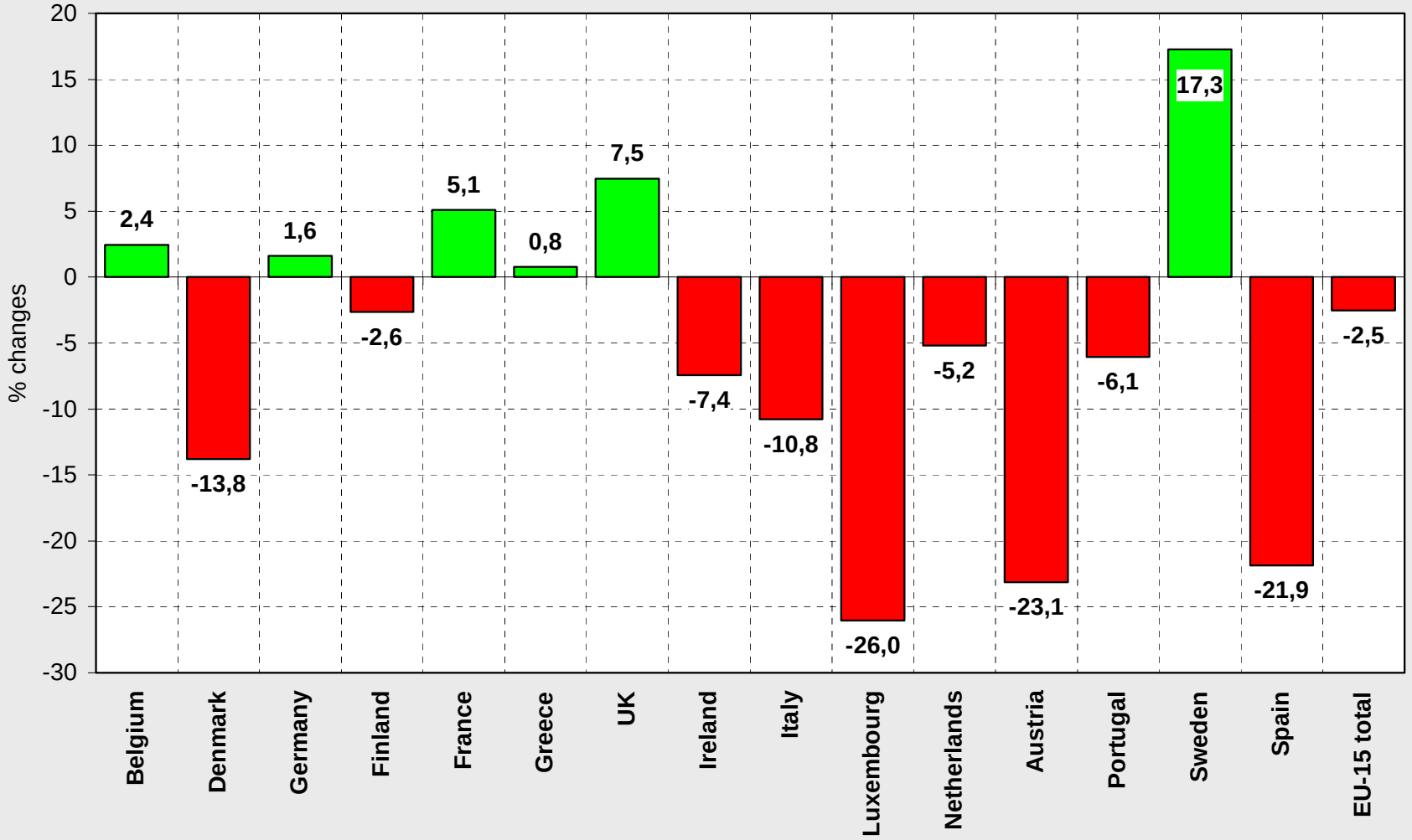
sources: UNFCCC; IEA; BP; author's calculations.

GHG emissions in EU 15:
base year to 2008 and targets for 2008/2012



sources: UNFCCC; IEA; BP; author's calculations.

Required changes of GHG emissions in EU-15 by 2008/2012 versus 2008



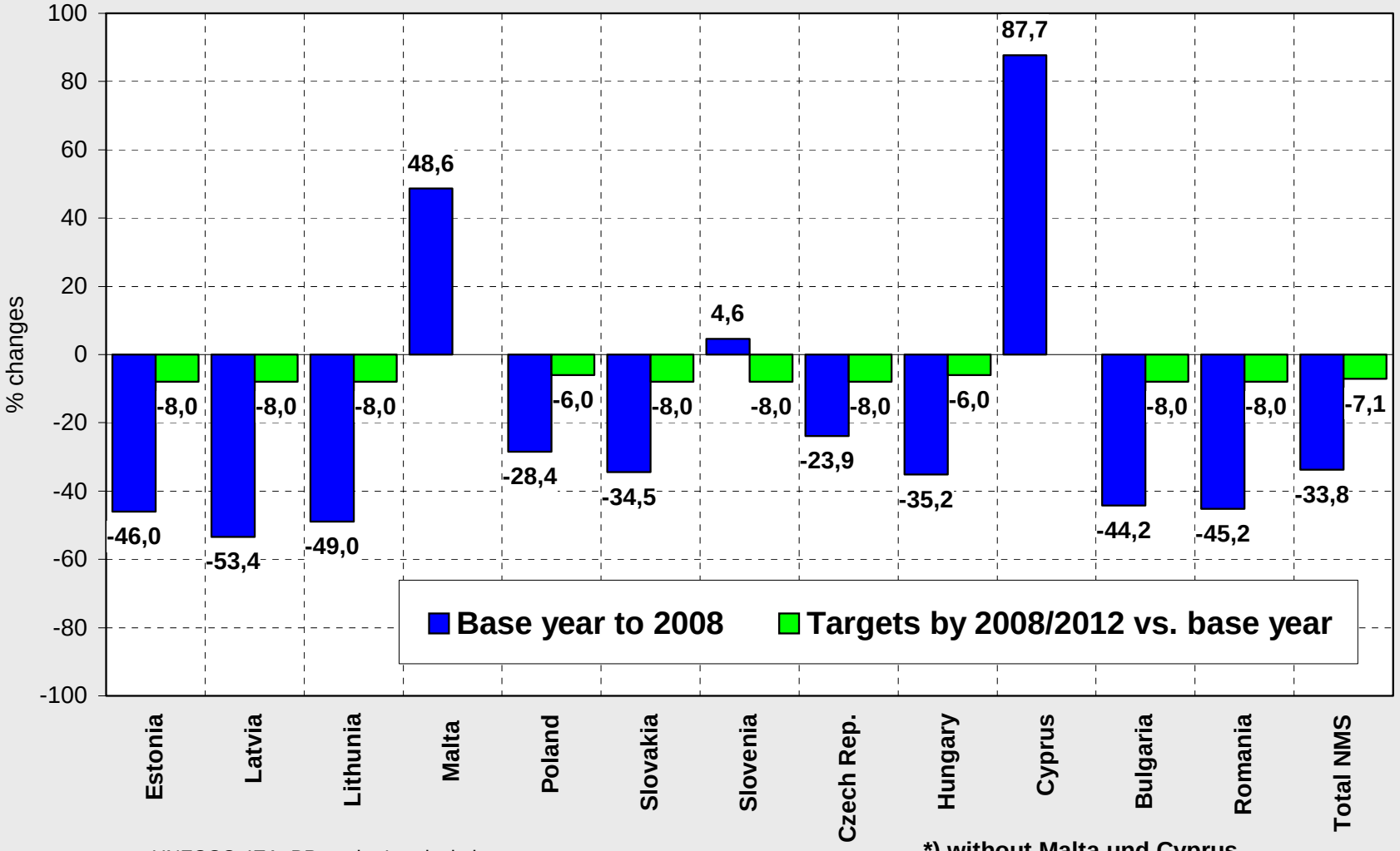
sources: UNFCCC; IEA; BP; author's calculations.

GHG emissions in EU-NMS: base year to 2008 and targets for 2008/2012

	base year	2000	2008	base year to 2008	targets 2008/2012		required changes by 2008/12 vs. 2008	
	GHG emissions in gt CO_2 equiv.				% changes		Gt CO_2 equiv.	% changes
Estonia	41,9	18,4	22,7	-19,3	-46,0	-8,0	38,6	15,9	70,3
Latvia	26,7	10,1	12,4	-14,3	-53,4	-8,0	24,5	12,1	97,5
Lithunia	49,1	19,2	25,1	-24,0	-49,0	-8,0	45,1	20,1	80,2
Malta	2,0	2,6	3,0	1,0	48,6		0,0	0,0	0,0
Poland	569,5	389,0	407,5	-162,0	-28,4	-6,0	535,3	127,8	31,4
Slovakia	73,3	48,4	48,0	-25,3	-34,5	-8,0	67,4	19,4	40,5
Slovenia	20,3	18,9	21,3	0,9	4,6	-8,0	18,7	-2,6	-12,1
Czech Rep.	194,7	147,2	148,2	-46,5	-23,9	-8,0	179,1	31,0	20,9
Hungary	116,5	78,0	75,4	-41,0	-35,2	-6,0	109,5	34,0	45,1
Cyprus	5,5	9,3	10,3	4,8	87,7		0,0	0,0	0,0
Bulgaria	133,7	69,2	74,6	-59,2	-44,2	-8,0	123,0	48,5	65,0
Romania	276,0	135,5	151,2	-124,8	-45,2	-8,0	254,0	102,7	67,9
Total NMS	**1509,3**	**945,9**	**999,6**	**-509,6**	**-33,8**	**-7,1**	**1395,3**	**395,7**	**39,6**
Total EU-27	**5748,1**	**5060,9**	**4998,1**	**-749,9**	**-13,0**	**-7,8**	**5292,4**	**294,2**	**5,9**

sources: UNFCCC; IEA; BP; author's calculations.

GHG emissions in EU New Member States: base year to 2008 and targets for 2008/2012

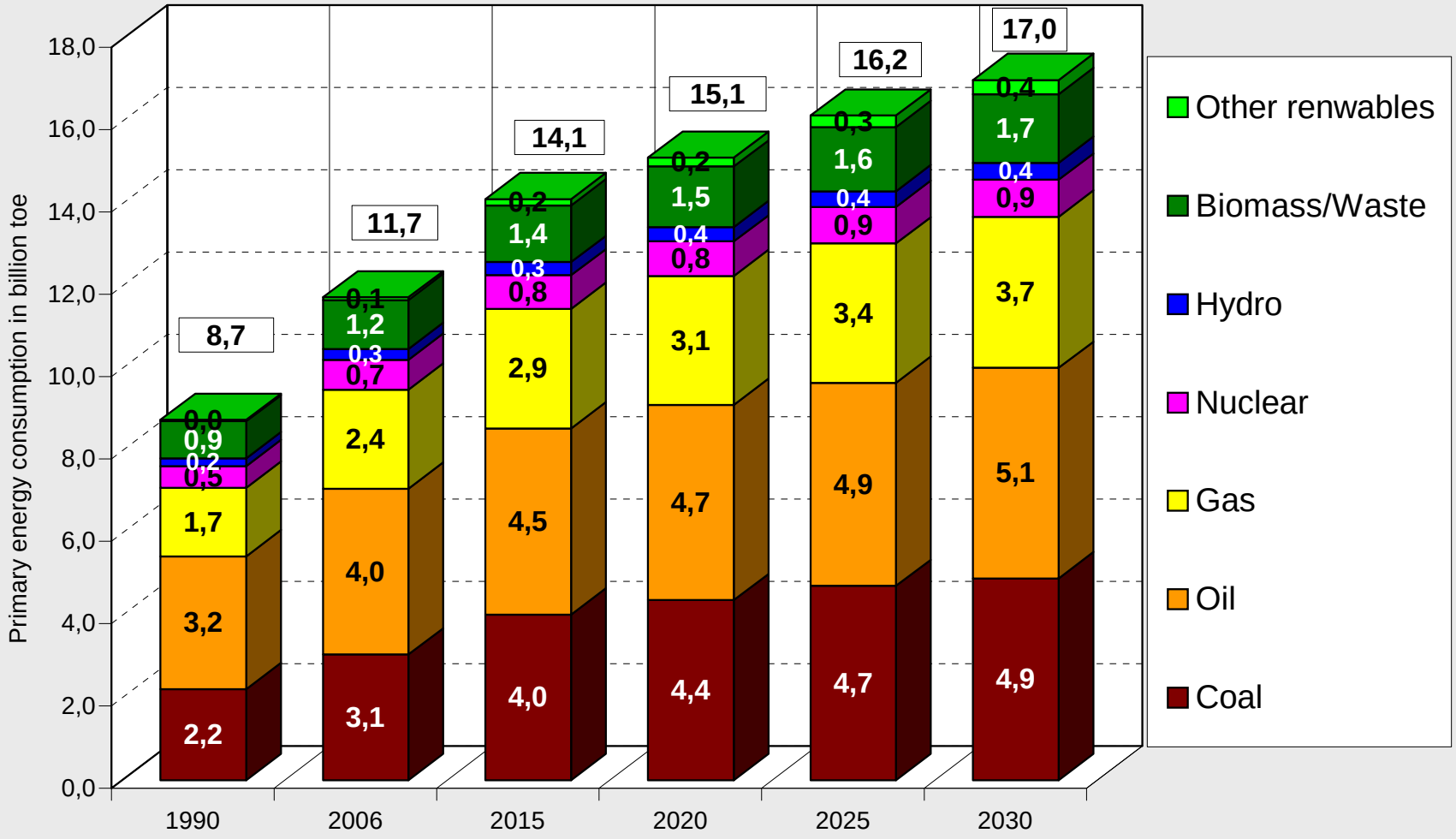


sources: UNFCCC; IEA; BP; author's calculations.

*) without Malta und Cyprus.

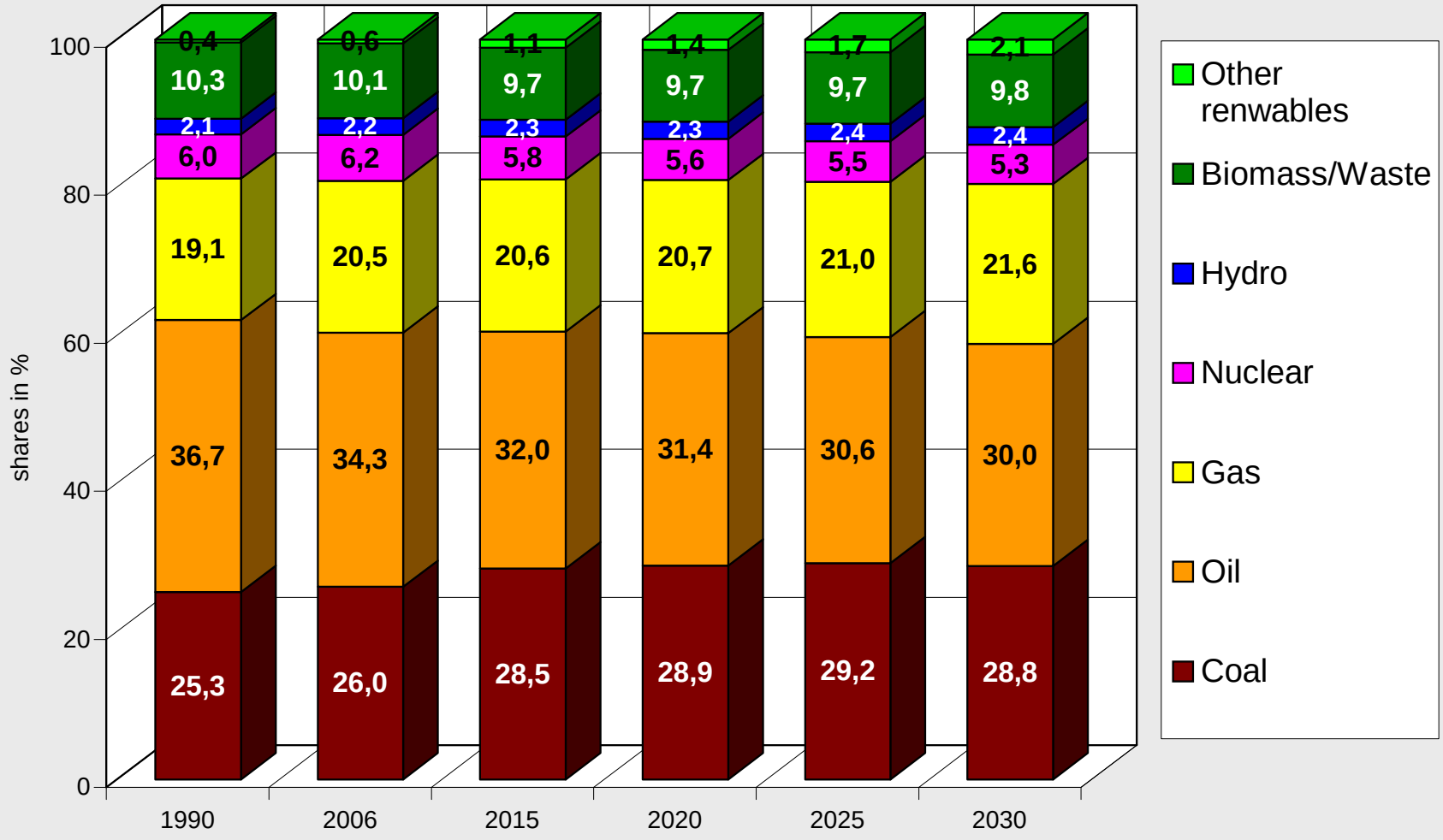
A look forward

World-wide primary energy consumption by energy sources 1990 to 2030 (IEA, 2008)



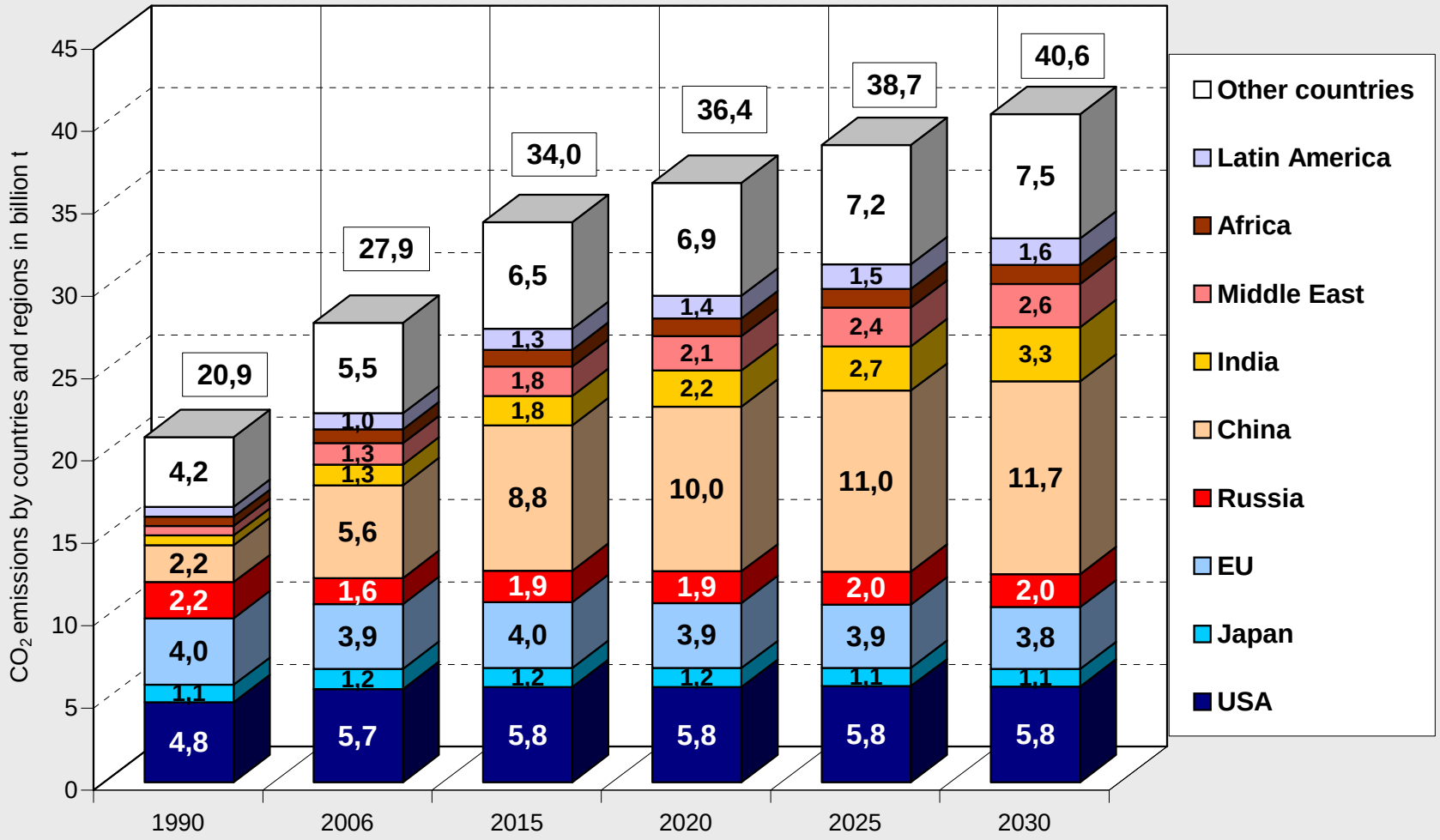
source: IEA, WEO 2008.

World-wide primary energy consumption by energy sources: shares 1990 to 2030 (IEA, 2008)



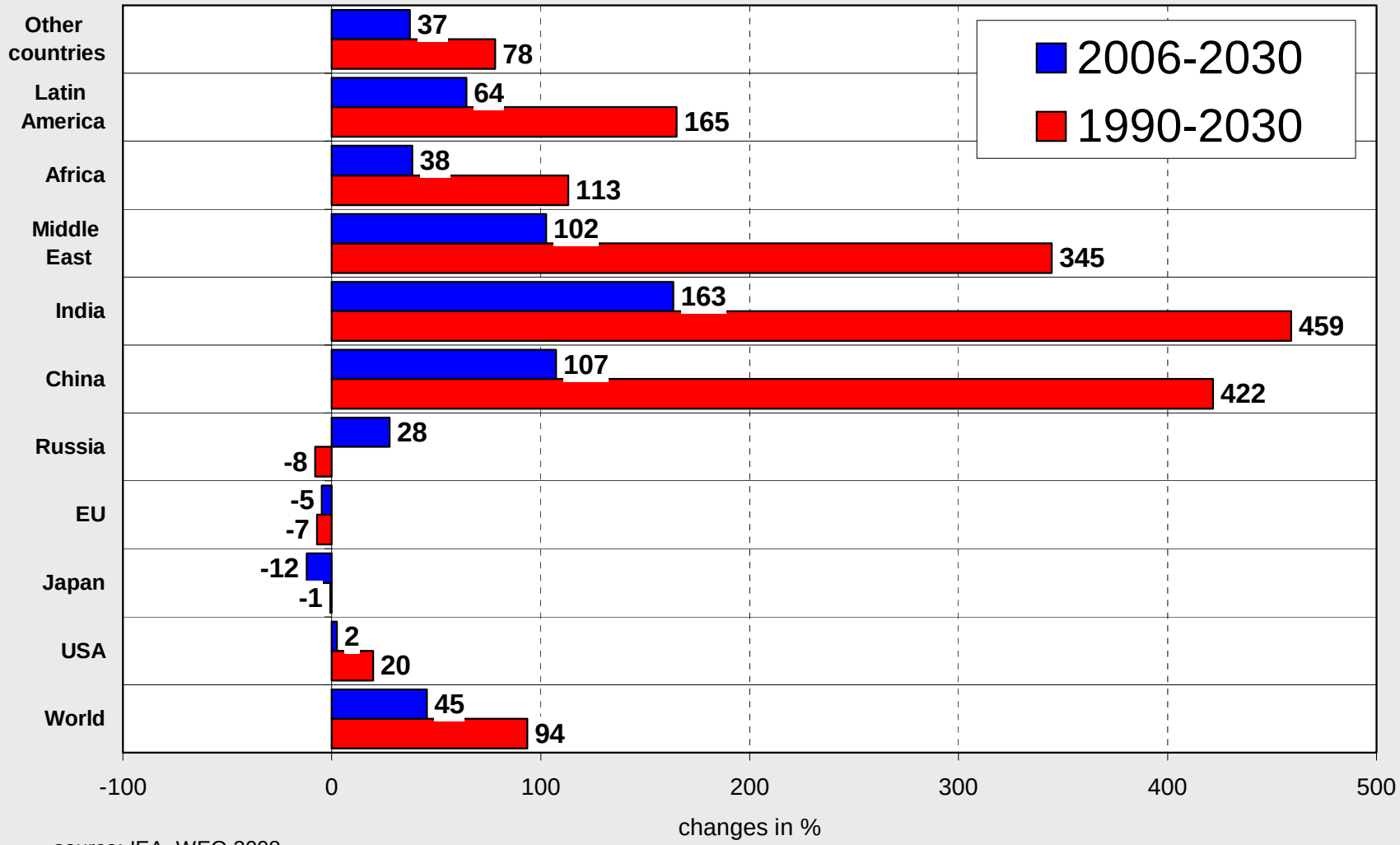
source: IEA, WEO 2008.

World-wide CO_2 emissions by regions and countries 1990 to 2030 (IEA, 2008)



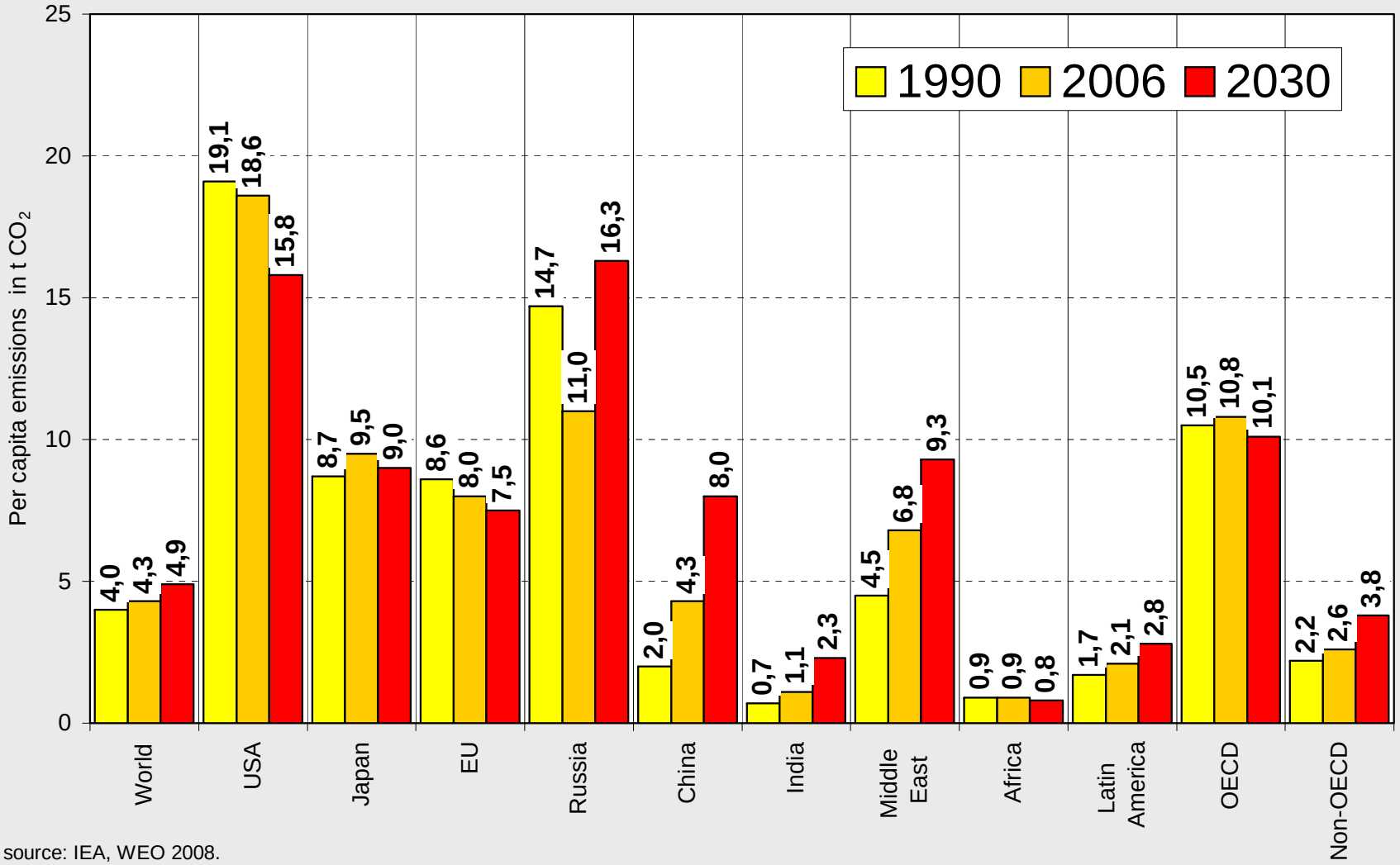
Quelle: IEA, WEO 2008.

Changes of world-wide CO_2 emissions by regions and countries 1990 to 2030 (IEA, 2008)



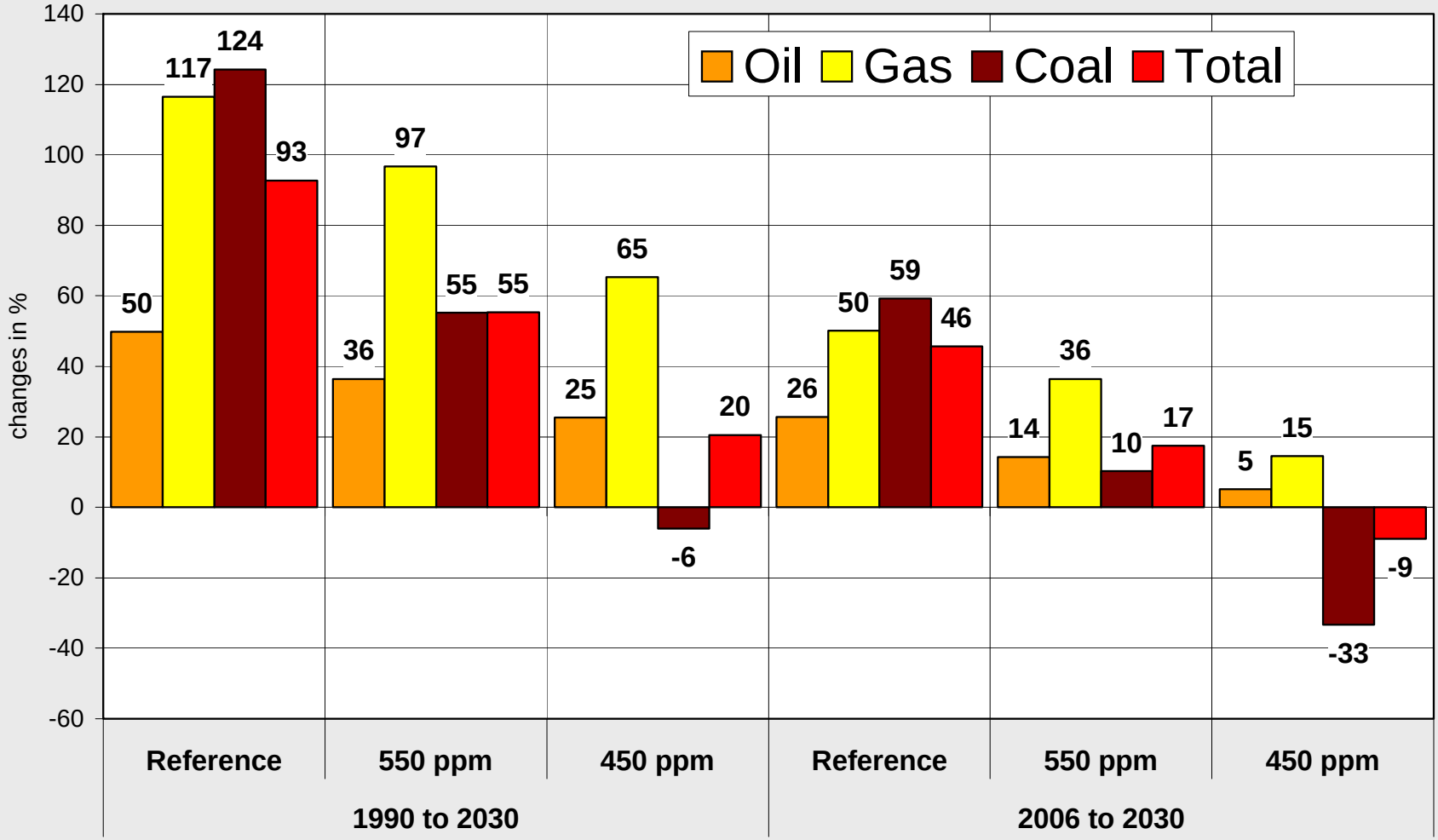
source: IEA, WEO 2008.

Per capita CO_2 emissions by regions and countries 1990 to 2030 (IEA, 2008)



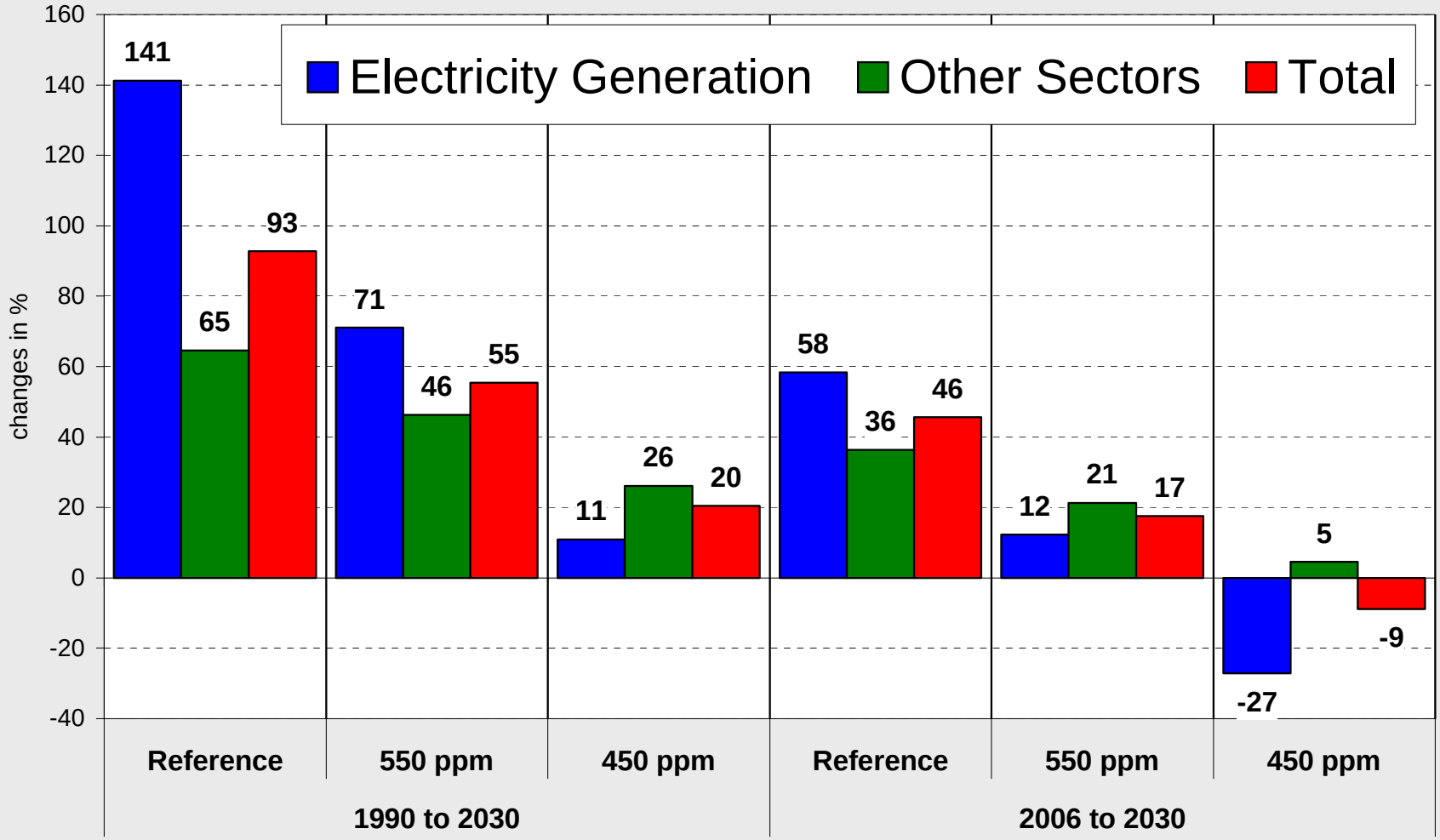
source: IEA, WEO 2008.

World-wide CO_2 emissions by energy sources and scenarios 1990 to 2030 (IEA, 2008)



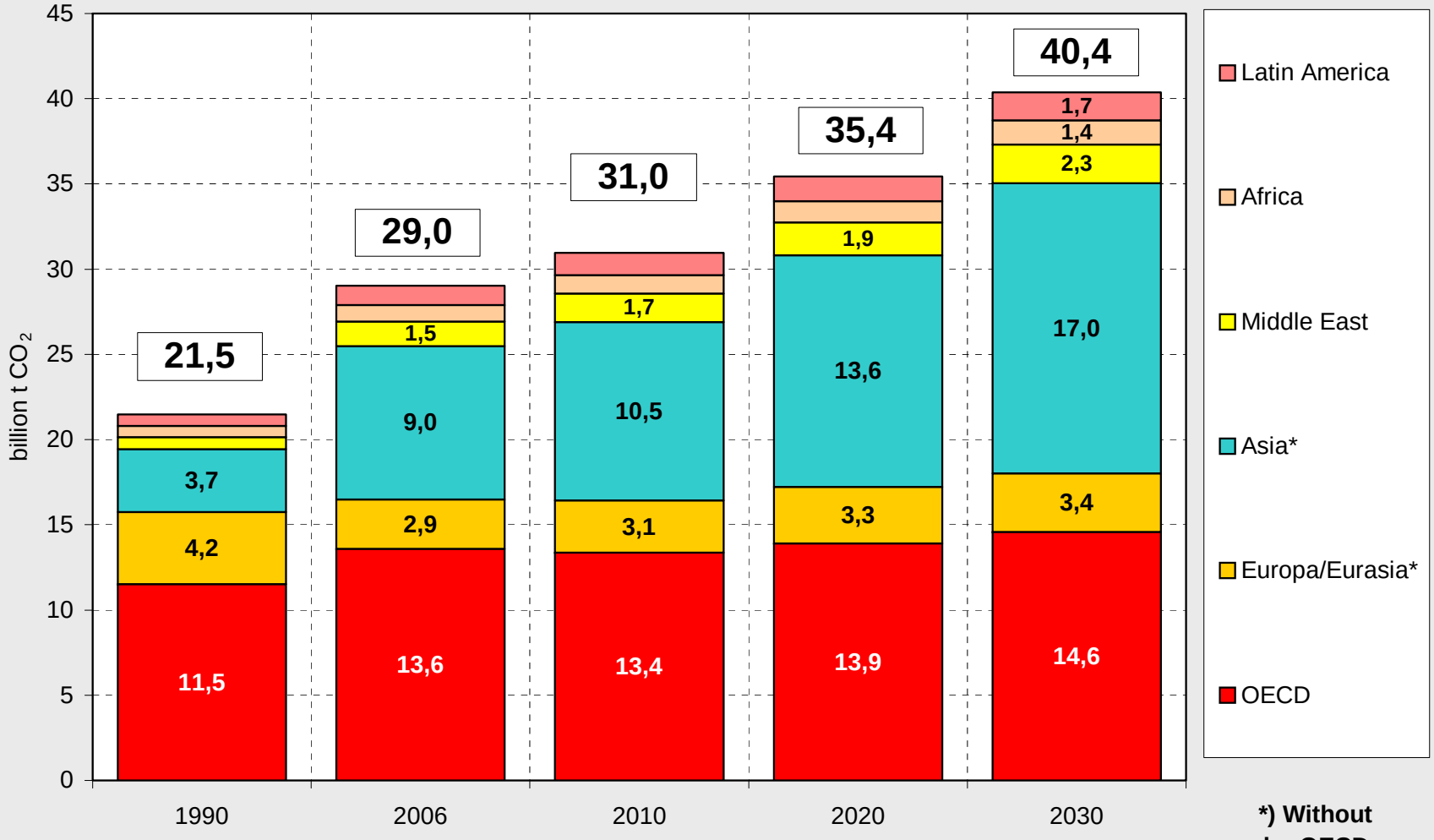
source: IEA, WEO 2008.

World-wide CO_2 emissions by sectors and scenarios 1990 to 2030 (IEA, 2008)



source: IEA, WEO 2008.

World-wide CO_2 emissions by regions and countries 1990 to 2030 (EIA, 2009)



*) Without der OECD.

source: EIA (Energy Information Agency), International Energy Outlook, Washington, 2009.

The quantitative GHG targets of EU-27

- Aiming for a global surface average temperature not to rise by more than 2°C compared to the pre-industrial level.
- A 30% reduction in greenhouse gas emissions by 2020 compared to 1990, provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries to contributing adequately according to their responsibilities and respective capabilities.
- Beside this the EU makes a firm independent commitment to achieve at least a 20% reduction.
- Developed countries should collectively reduce their emissions by 60% to 80% by 2050 compared to 1990

What does the 2020/2050 reduction targets mean for EU-27?

❖ Greenhouse gas emissions in base year:	5748	10^9 t CO_{2eq}
❖ Greenhouse gas emissions 2008:	4998	10^9 t CO_{2eq}
❖ Target 2020 (-20%):	4600	10^9 t CO_{2eq}
❖ Reduction rate 2008 to 2020	8	%
❖ Target 2020 (-30%):	4024	10^9 t CO_{2eq}
❖ Reduction rate 2008 to 2020	20	%
❖ Target 2050 (-80%)	1150	10^9 t CO_{2eq}
❖ Reduction rate 2008 to 2020	77	%

Consequences of the long-term emissions reduction targets to the Annex-I and Annex-II countries

	Past emissions		Reduction targets 2050 vs. 2000		Changes 2008 to 2050	
	2000	2008est.	50%	85%	50%	85%
	CO_2 emissions in billion tonnes				changes in %	
World	24.1	30.2	12.1	3.6	-60	-88
Annex-I countries	14.4	14.8	0	0	-100	-100
Non-Annex-I countries	9.7	15.4	12.1	3.6	-22	-76
Maximum per capita emissions 2050 in conjunction with a worldwide population of 9,150 bn in t CO_2		4.5	1.3	0.4	-71	-91
Maximum emissions with a proportional per capita allocation in 2050 in billion tonnes of CO_2					changes in %	
Annex-I countries (population 2050: 1,275 billion)		14.8	1.7	0.5	-89	-97
Non Annex-I countries (population 2050: 7,875 billion)		15.4	10.4	3.1	-33	-80
World		30.2	12.1	3.6	-60	-88

sources: UN, Worldbank, OECD, IEA, IPCC.

Conclusions

1. **The discussion mostly concentrates on emissions targets. This is necessary and has to be pursued in the future**

   but

2. **The real emission's development and their business-as-usual-perspectives should not be neglected.**
3. **The gap between the desired targets and the expected real development can only be filled with an appropriate policy and effective measures.**
4. **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 targets setting!**

Thanks for listening

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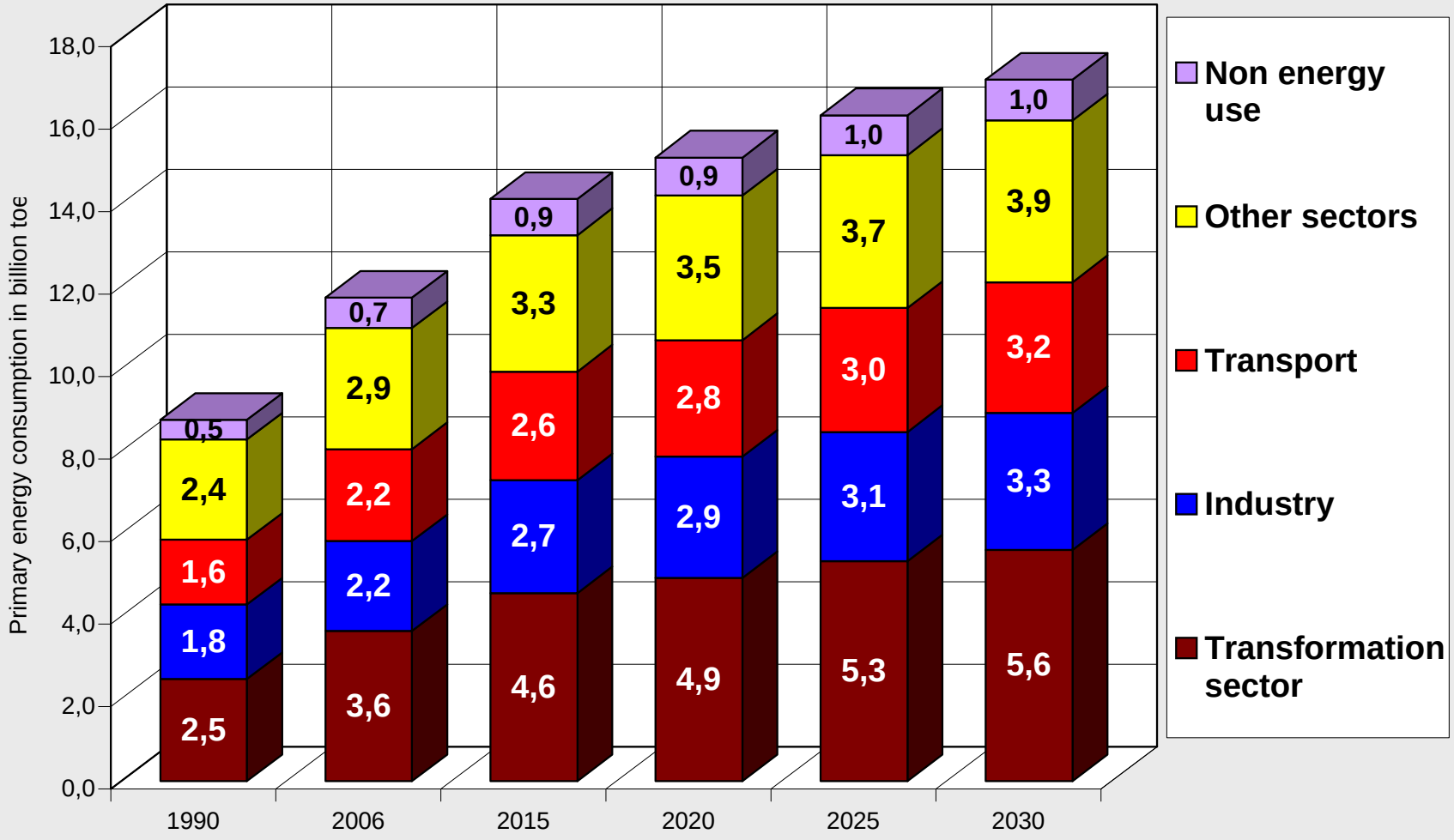
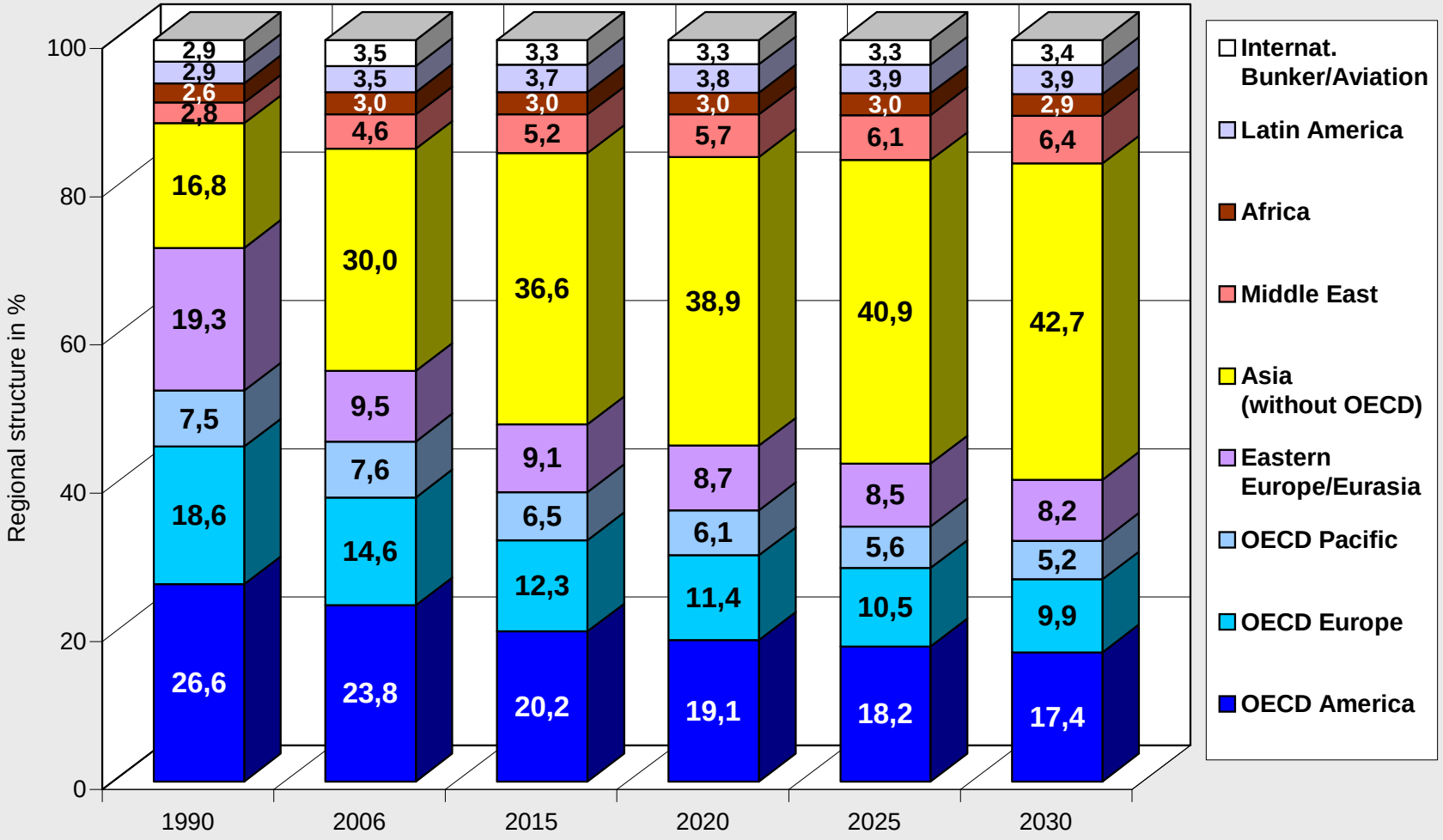
Some backups

World-wide primary energy consumption by sectors 1990 to 2030 (IEA)



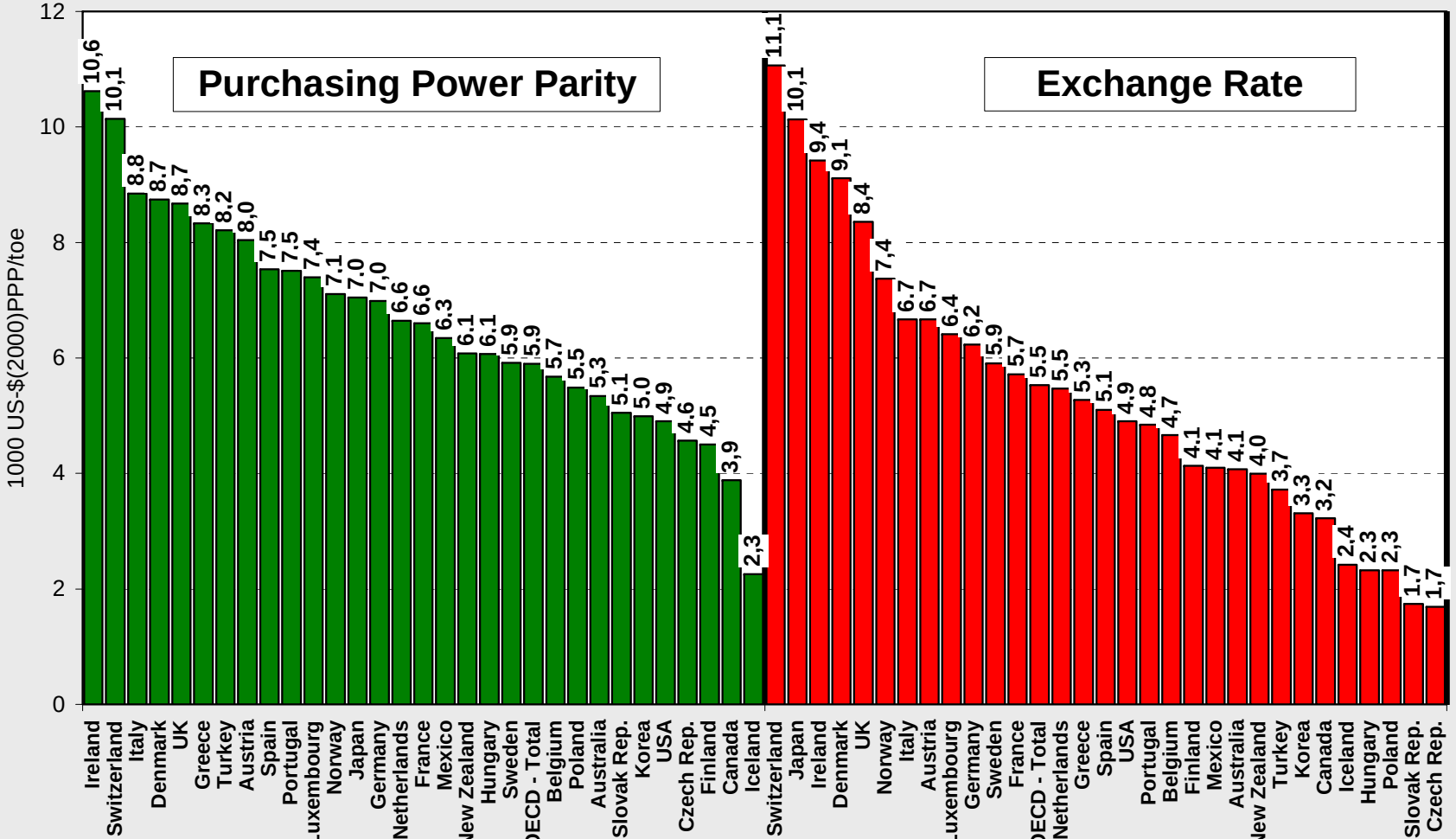
source: IEA, WEO 2008.

World-wide CO_2 emissions by regions and countries 1990 to 2030 (IEA)



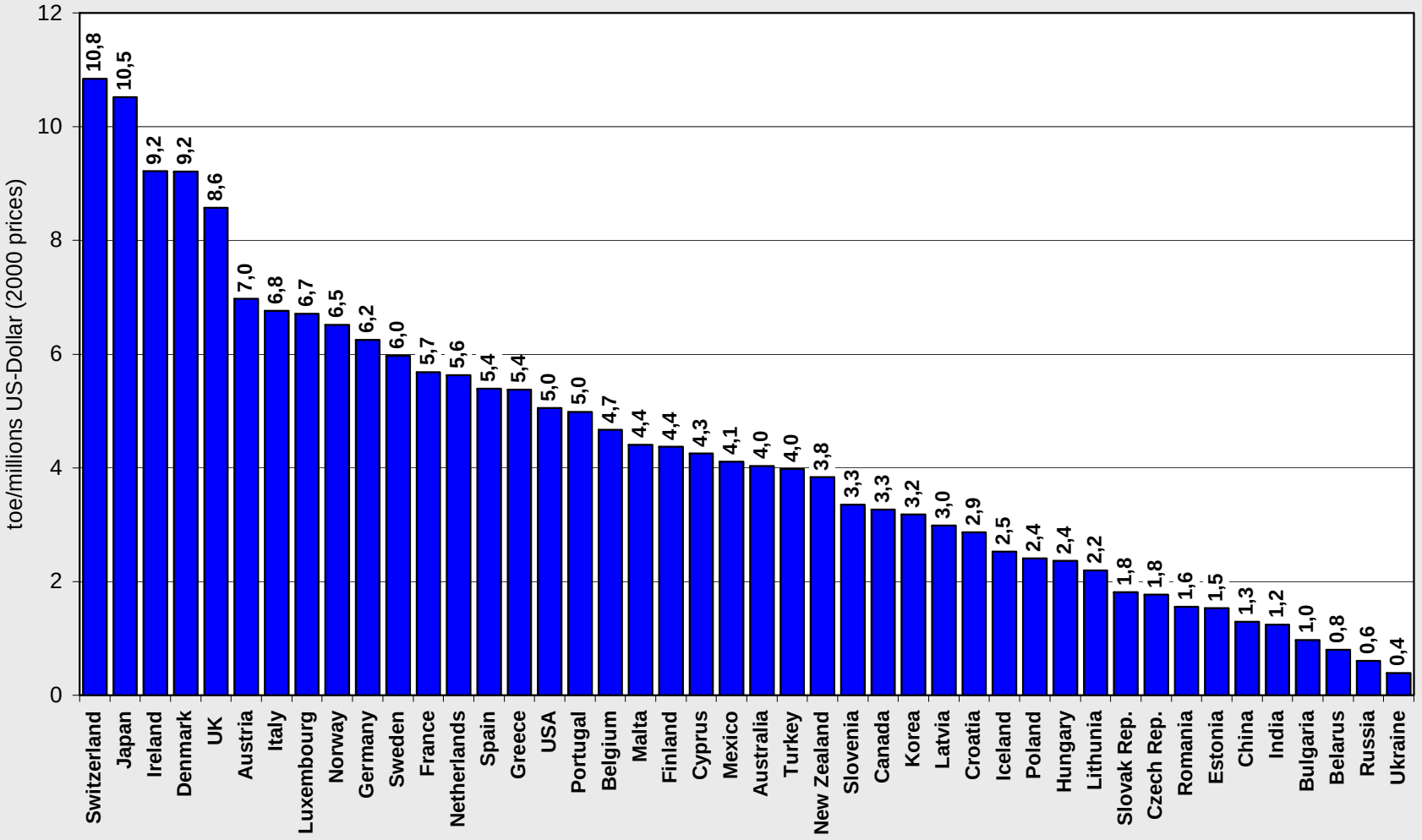
source: IEA, WEO 2008.

Energy Productivity in OECD Countries 2007 based on Purchasing Power Parity and Exchange Rate



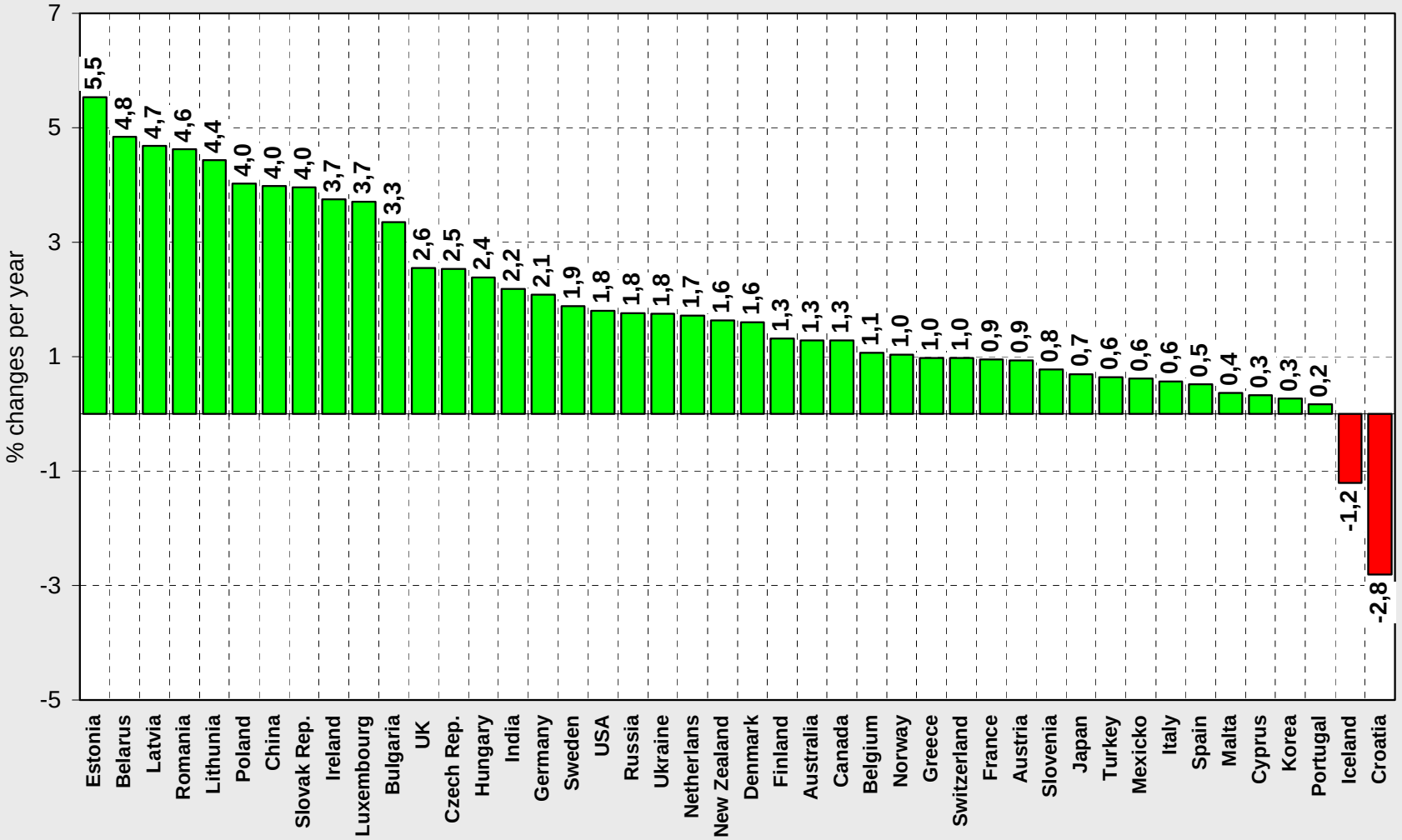
sources: OECD; IEA.

Level of energy productivity in selected countries in 2008



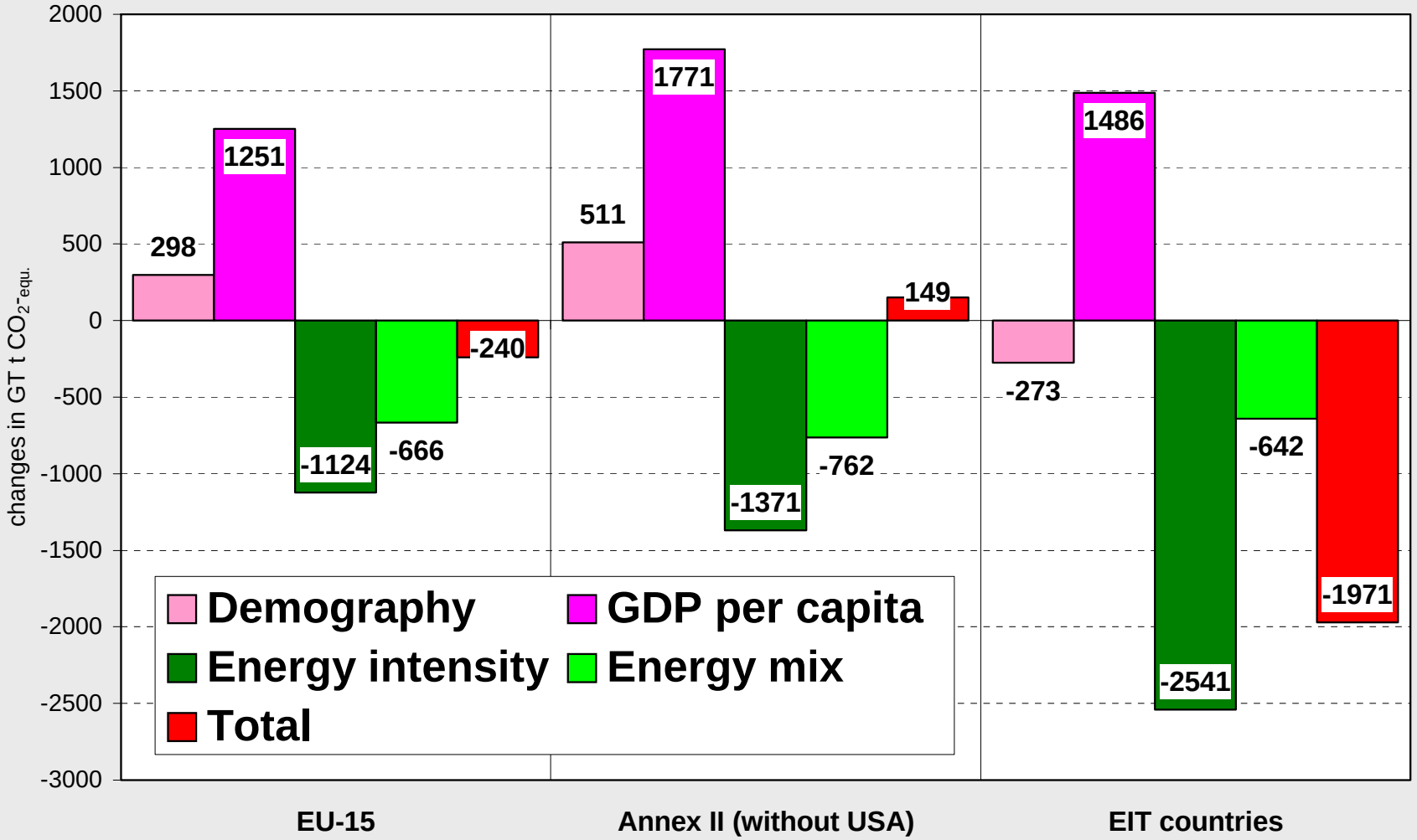
sources: UNFCCC; Worldbank; OECD; IEA; Eurostat; BP; author's calculations.

Changes (% per year) of energy productivity in selected countries from 1990 to 2008



sources: IEA; OECD; Eurostat; author's calculations.

Various components of changes in GHG emissions in Annex II countries 2008 vs. 1990



sources: UNFCCC; IEA; BP; author's calculations.