# Updated development of Greenhouse Gas Emissions - delusions and reality

Hans-Joachim Ziesing

## 13h Annual Meeting of the Reform Group Schloss Leopoldskron, Salzburg, September 15-19, 2008

# 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

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- **UNFCCC: National Communications from Parties included in Annex I to the Convention; National Greenhouse Gas Inventory Data from Annex I Parties for 1990 to 2006,**
- **International Energy Agency (IEA): $CO_2$ Emissions from Fuel Combustion, 2007 Edition, Paris 2007; (up to 2005)**
- **BP Statistical Review of World Energy 2007, June 2008.**

**In most of the above sources the data on greenhouse gas or $CO_2$ emissions only goes up to 2005 or 2006 ($CO_2$ emissions in non-Annex I parties. The $CO_2$ emissions up to and including 2007 are extrapolated from the data on energy consumption up to 2007 published in the BP Statistics, which is shown by country and energy source.**

# GHG emissions in Annex I Parties
# 2006 to 2007

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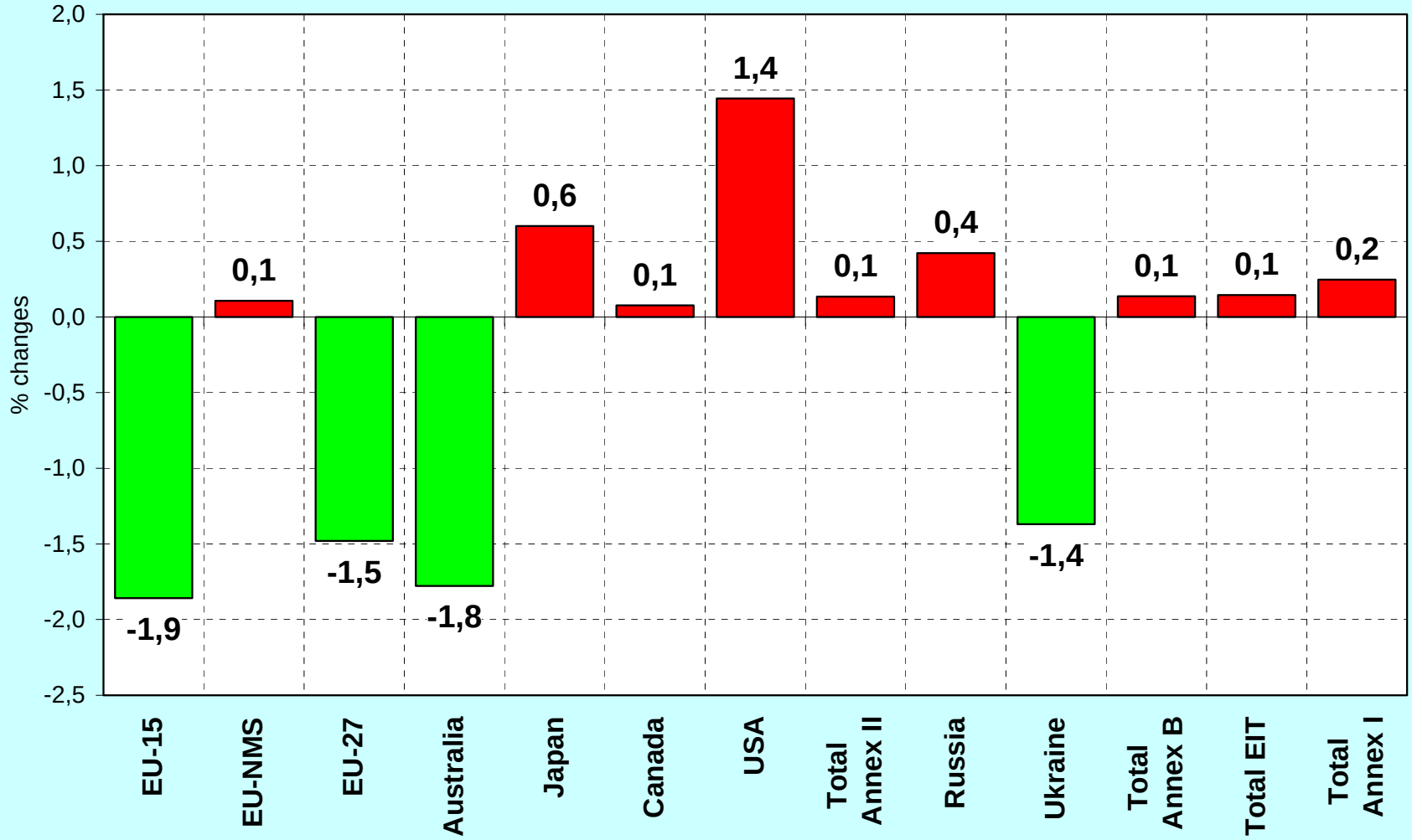


sources: UNFCCC; BP; author's calculations.

# GHG emissions in Annex I Parties base year to 2007

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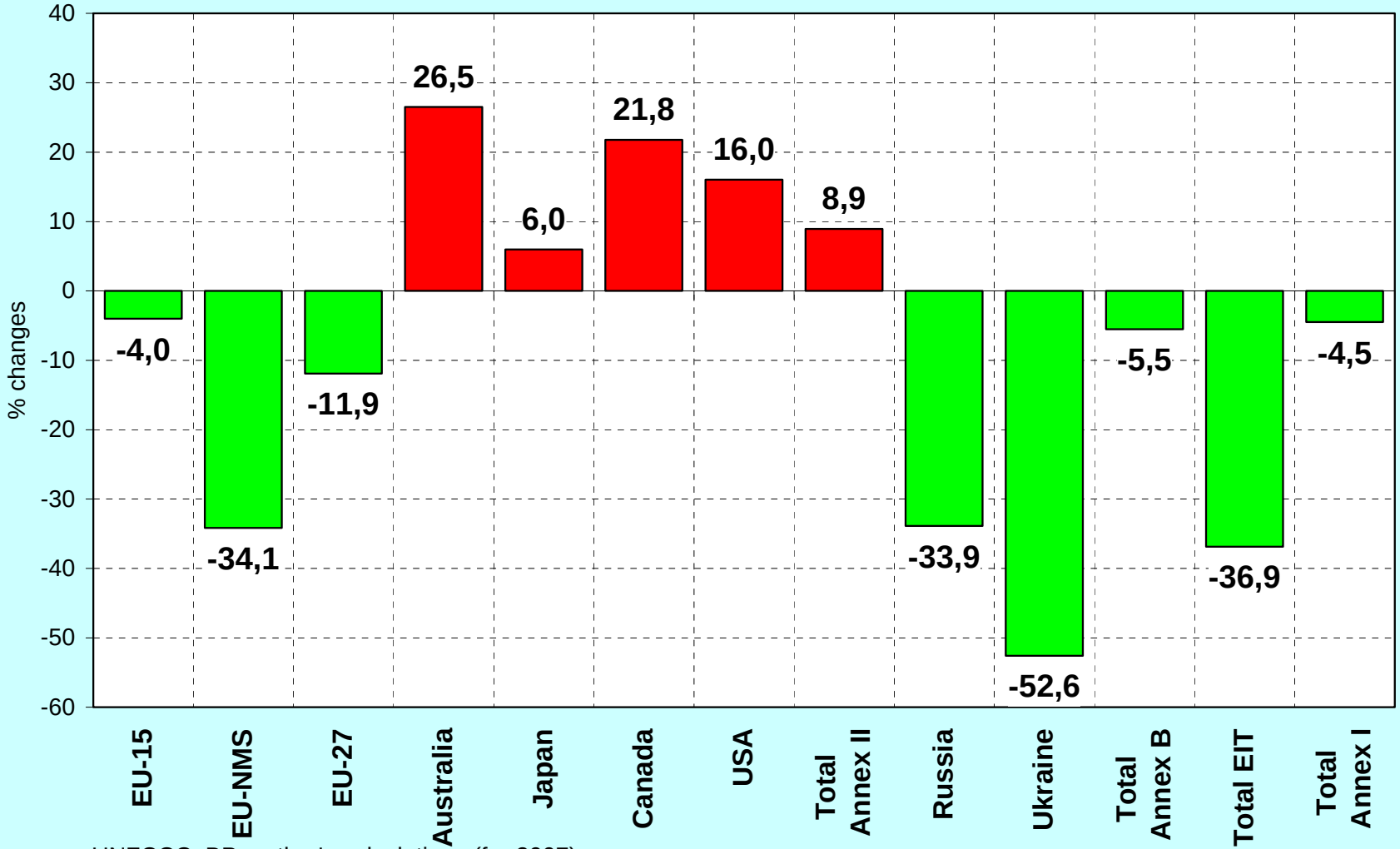


sources: UNFCCC; BP; author's calculations (for 2007)

# World-wide $CO_2$ emissions by regions 1990 to 2007

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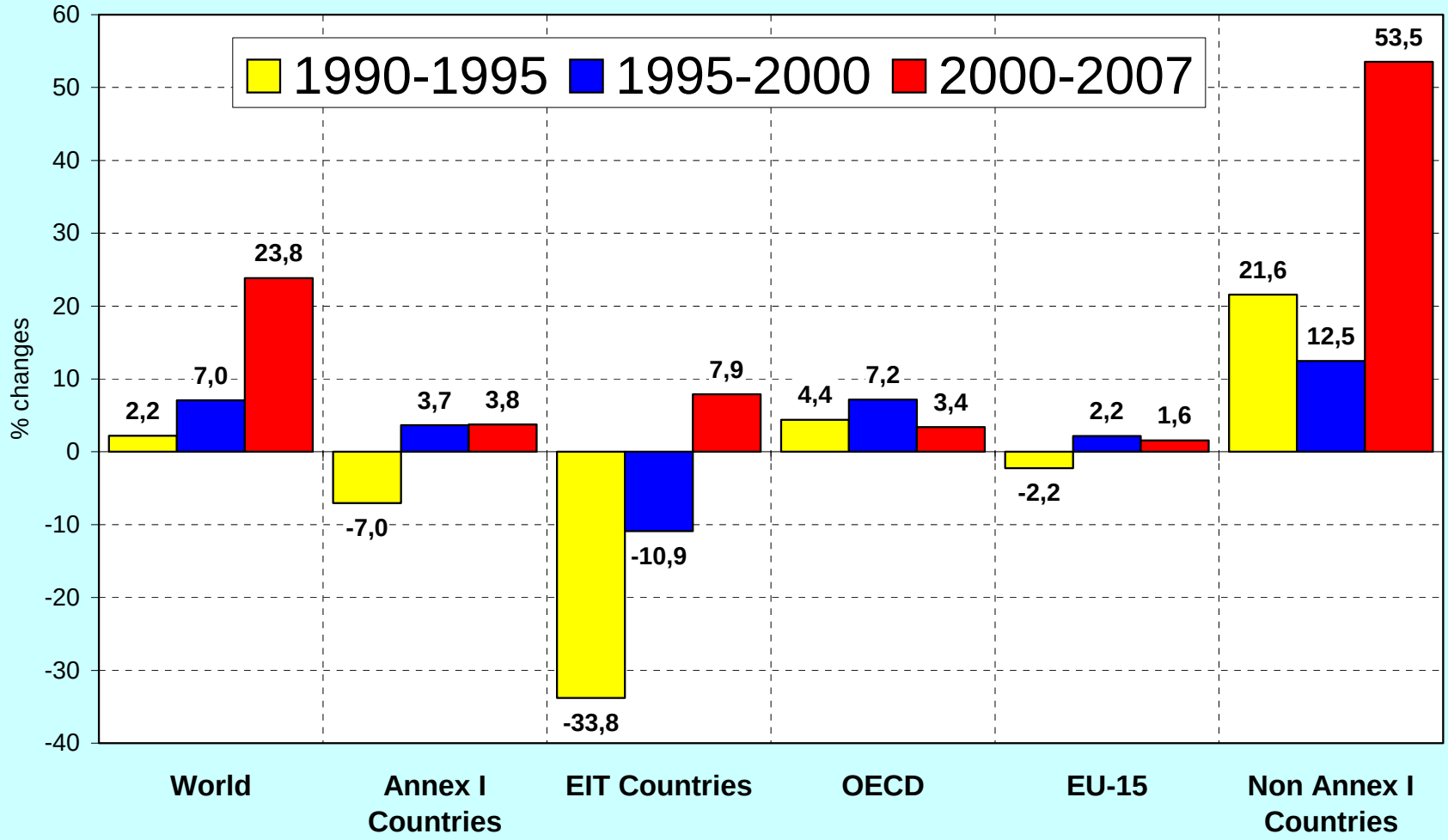


sources: UNFCCC; IEA; BP; author's calculations .

# World-wide $CO_2$ emissions 1990 to 2007

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| | 1990 | 2000 | 2007 | 1990-2007 | 2006-2007 |
|---|---|---|---|---|---|
| | CO2 emission in Gt | | | % changes | |
| EU-15 | 3357 | 3353 | 3405 | 1,4 | -1,9 |
| EU-NMS | 1039 | 751 | 792 | -23,8 | 0,0 |
| **EU-27** | **4395** | **4104** | **4197** | **-4,5** | **-1,5** |
| Australia | 278 | 350 | 381 | 37,1 | -2,5 |
| Japan | 1144 | 1257 | 1285 | 12,3 | 0,9 |
| Canada | 456 | 560 | 561 | 22,9 | 0,0 |
| USA | 5061 | 5932 | 6081 | 20,1 | 1,8 |
| **Total Annex II** | **10403** | **11571** | **11837** | **13,8** | **0,3** |
| Korea | 227 | 425 | 473 | 108,2 | 4,6 |
| Russia | 2497 | 1469 | 1579 | -36,7 | 0,1 |
| Türkei | 140 | 224 | 297 | 112,7 | 7,3 |
| China | 2244 | 3077 | 6086 | 171,2 | 7,5 |
| India | 587 | 968 | 1360 | 131,7 | 6,7 |
| Africa | 550 | 695 | 972 | 76,8 | 4,9 |
| Middle East | 586 | 967 | 1411 | 140,9 | 2,7 |
| Larin America | 602 | 862 | 1089 | 80,7 | 4,6 |
| Asia without China/India | 691 | 1149 | 1659 | 139,9 | 3,5 |
| Other countries | 676 | 387 | 472 | -30,2 | 3,1 |
| international bunker | 649 | 829 | 987 | 52,1 | 1,5 |
| **World** | **22025** | **24099** | **29846** | **35,5** | **2,8** |
| sources: UNFCCC; IEA; BP; author's calculations. | | | | | |

# Distance to targets

# GHG emissions in Annex I Parties
# base year to 2007 and targets for 2008/2012

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| | base year | 2000 | 2007 | base year to 2007 | targets 2008/2012 | changes 2008/12 vs. 2007 | absolute targets in 2008/12 |
|---|---|---|---|---|---|---|---|
| | GHG emissions in gt $CO_2$ equiv. | | | % changes | | | Gt $CO_2$ equiv. |
| EU-15 | 4248 | 4122 | 4078 | -4,0 | -8,0 | -3,8 | 3921 |
| EU-NMS | 1508 | 948 | 993 | -34,1 | -7,1 | 42,7 | 1416 |
| **EU-27** | **5756** | **5070** | **5070** | **-11,9** | **-7,8** | **5,3** | **5337** |
| Australia | 416 | 495 | 527 | 26,5 | 8,0 | -14,6 | 449 |
| Japan | 1272 | 1348 | 1348 | 6,0 | -6,0 | -11,3 | 1196 |
| Canada | 592 | 718 | 721 | 21,8 | -6,0 | -22,8 | 557 |
| USA | 6135 | 7003 | 7119 | 16,0 | -7,0 | -19,8 | 5706 |
| **Total Annex II** | **12832** | **13866** | **13977** | **8,9** | **-6,5** | **-14,2** | **11994** |
| Russia | 3326 | 2038 | 2200 | -33,9 | 0,0 | 51,2 | 3326 |
| Ukraine | 922 | 395 | 437 | -52,6 | 0,0 | 110,9 | 922 |
| **Total Annex B** | **18740** | **17332** | **17706** | **-5,5** | **-5,0** | **0,6** | **17807** |
| **Total EIT** | **5908** | **3466** | **3729** | **-36,9** | **-3,6** | **52,7** | **5696** |
| **Total Annex I** | **18910** | **17612** | **18059** | **-4,5** | **xxxx** | **xxxx** | **xxxx** |

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

# GHG emissions in EU-15:
# Base year to 2007 and targets for 2008/2012

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| | base year | 2000 | 2007 | base year to 2007 | | targets 2008/2012 | required changes by 2008/12 vs. 2007 | |
|---|---|---|---|---|---|---|---|---|
| | GHG emissions in gt $CO_2$ equiv. | | | % changes | | Gt $CO_2$ equiv. | | % changes |
| Belgium | 144,5 | 145,5 | 135,3 | -9,2 | -6,4 | -7,5 | 133,7 | -1,7 | -1,2 |
| Denmark | 69,7 | 68,6 | 66,6 | -3,1 | -4,4 | -21,0 | 55,0 | -11,5 | -17,3 |
| Germany | 1227,7 | 1019,5 | 979,3 | **-248,4** | -20,2 | -21,0 | 969,9 | -9,5 | -1,0 |
| Finland | 70,9 | 69,8 | 77,4 | 6,5 | 9,1 | 0,0 | 70,9 | -6,5 | -8,4 |
| France | 563,3 | 555,6 | 529,6 | -33,7 | -6,0 | 0,0 | 563,3 | 33,7 | 6,4 |
| Greece | 104,6 | 128,2 | 133,2 | 28,6 | 27,3 | 25,0 | 130,8 | -2,4 | -1,8 |
| UK | 772,0 | 673,8 | 632,6 | **-139,4** | -18,1 | -12,5 | 675,5 | 42,9 | 6,8 |
| Ireland | 55,5 | 69,0 | 66,8 | 11,3 | 20,4 | 13,0 | 62,7 | -4,1 | -6,1 |
| Italy | 516,9 | 552,3 | 558,4 | **41,5** | 8,0 | -6,5 | 483,3 | -75,1 | -13,4 |
| Luxembourg | 13,2 | 10,2 | 13,2 | 0,0 | 0,3 | -28,0 | 9,5 | -3,7 | -28,2 |
| Netherlands | 211,7 | 213,6 | 204,8 | -6,8 | -3,2 | -6,0 | 199,0 | -5,9 | -2,9 |
| Austria | 79,2 | 81,1 | 89,3 | 10,1 | 12,8 | -13,0 | 68,9 | -20,4 | -22,9 |
| Portugal | 59,1 | 81,5 | 81,6 | 22,5 | 38,1 | 27,0 | 75,1 | -6,5 | -8,0 |
| Sweden | 72,0 | 68,3 | 66,0 | -6,0 | -8,4 | 4,0 | 74,9 | 8,9 | 13,5 |
| Spain | 287,7 | 385,0 | 443,3 | **155,7** | 54,1 | 15,0 | 330,8 | -112,5 | -25,4 |
| **Total EU-15** | **4248,0** | **4122,0** | **4077,6** | **-170,4** | **-4,0** | **-8,1** | **3903,3** | **-174,3** | **-4,3** |

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

# GHG emissions in EU-NMS:
# Base year to 2007 and targets for 2008/2012

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| | base year | 2000 | 2007 | base year to 2007 | | targets 2008/2012 | required changes by 2008/12 vs. 2007 | |
|---|---|---|---|---|---|---|---|---|
| | GHG emissions in gt $CO_2$ equiv. | | | % changes | | Gt $CO_2$ equiv. | | % changes |
| Estonia | 41,6 | 18,2 | 19,1 | -22,4 | -54,0 | -8,0 | 38,3 | 19,1 | 99,9 |
| Latvia | 26,5 | 10,0 | 11,8 | -14,6 | -55,3 | -8,0 | 24,3 | 12,5 | 105,7 |
| Lithunia | 49,4 | 19,4 | 24,8 | -24,5 | -49,7 | -8,0 | 45,4 | 20,6 | 83,0 |
| Malta | 2,2 | 2,8 | 3,5 | 1,2 | 55,9 | | keine Ziele | | |
| Poland | 563,4 | 389,5 | 399,9 | -163,6 | -29,0 | -6,0 | 529,6 | 129,8 | 32,5 |
| Slovakia | 73,7 | 48,5 | 49,6 | -24,1 | -32,7 | -8,0 | 67,8 | 18,2 | 36,6 |
| **Slovenia** | **20,3** | **18,9** | **20,9** | **0,5** | **2,7** | **-8,0** | **18,7** | **-2,2** | **-10,4** |
| Czech Rep. | 194,2 | 147,0 | 144,4 | -49,8 | -25,7 | -8,0 | 178,7 | 34,3 | 23,7 |
| Hungary | 115,8 | 77,6 | 76,9 | -39,0 | -33,6 | -6,0 | 108,9 | 32,0 | 41,7 |
| Cyprus | 6,0 | 8,3 | 10,1 | 4,0 | 66,7 | | keine Ziele | | |
| Bulgaria | 132,6 | 68,7 | 75,2 | -57,4 | -43,3 | -8,0 | 122,0 | 46,8 | 62,3 |
| Romania | 281,9 | 138,7 | 156,8 | -125,1 | -44,4 | -8,0 | 259,3 | 102,6 | 65,4 |
| **Total NMS** | **1507,7** | **947,6** | **992,9** | **-514,8** | **-34,1** | **-7,1** | **1393,1** | **413,7** | **42,4** |
| **Total EU-27** | **5755,7** | **5069,6** | **5070,5** | **-685,2** | **-11,9** | **-7,8** | **5296,4** | **239,4** | **3,2** |

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

# GHG emissions in EU 15: base year to 2007 and targets for 2008/2012

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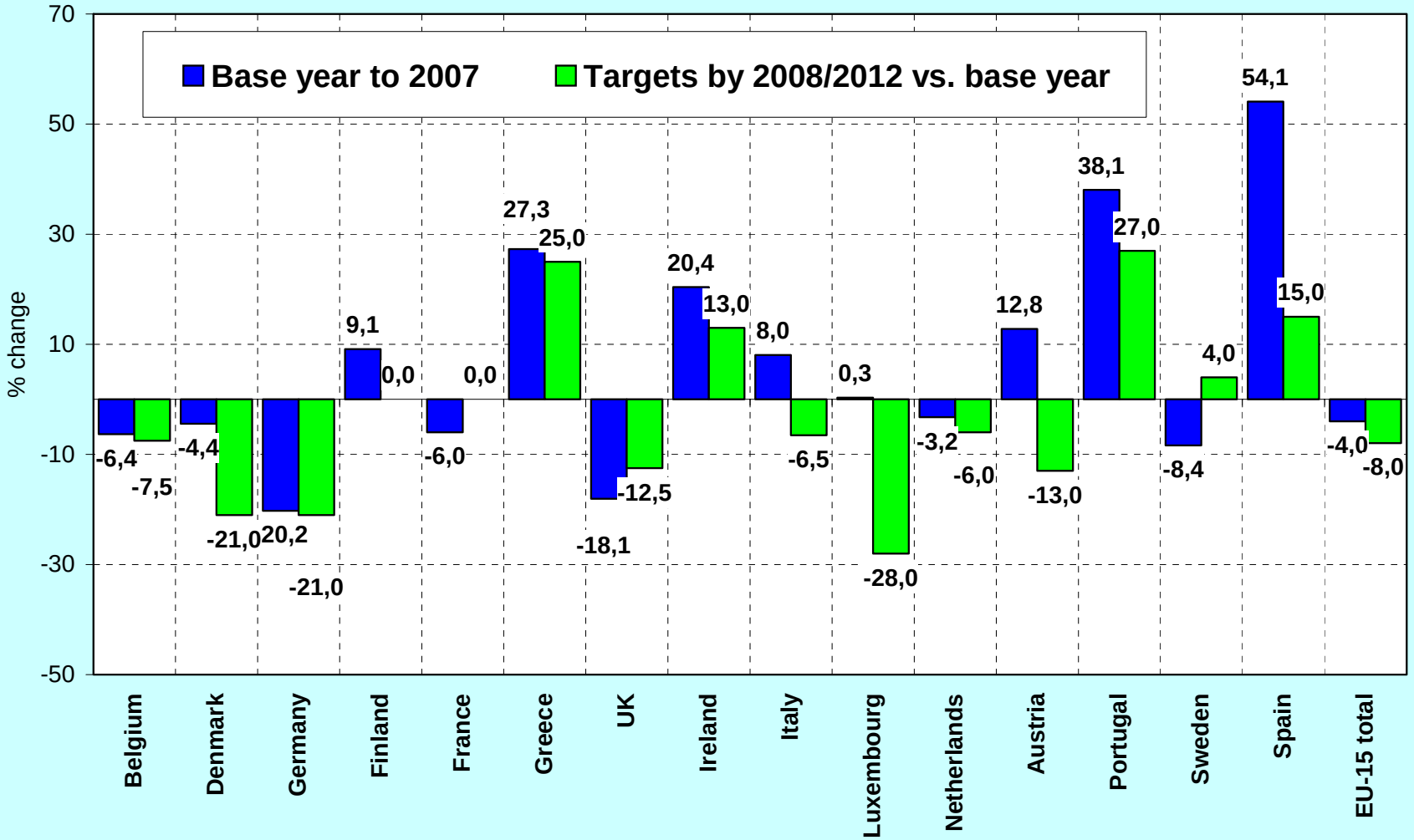


sources: UNFCCC; IEA; BP; author's calculations.

# Required changes of GHG emissions in EU-15 from 2007 and 2008/2012

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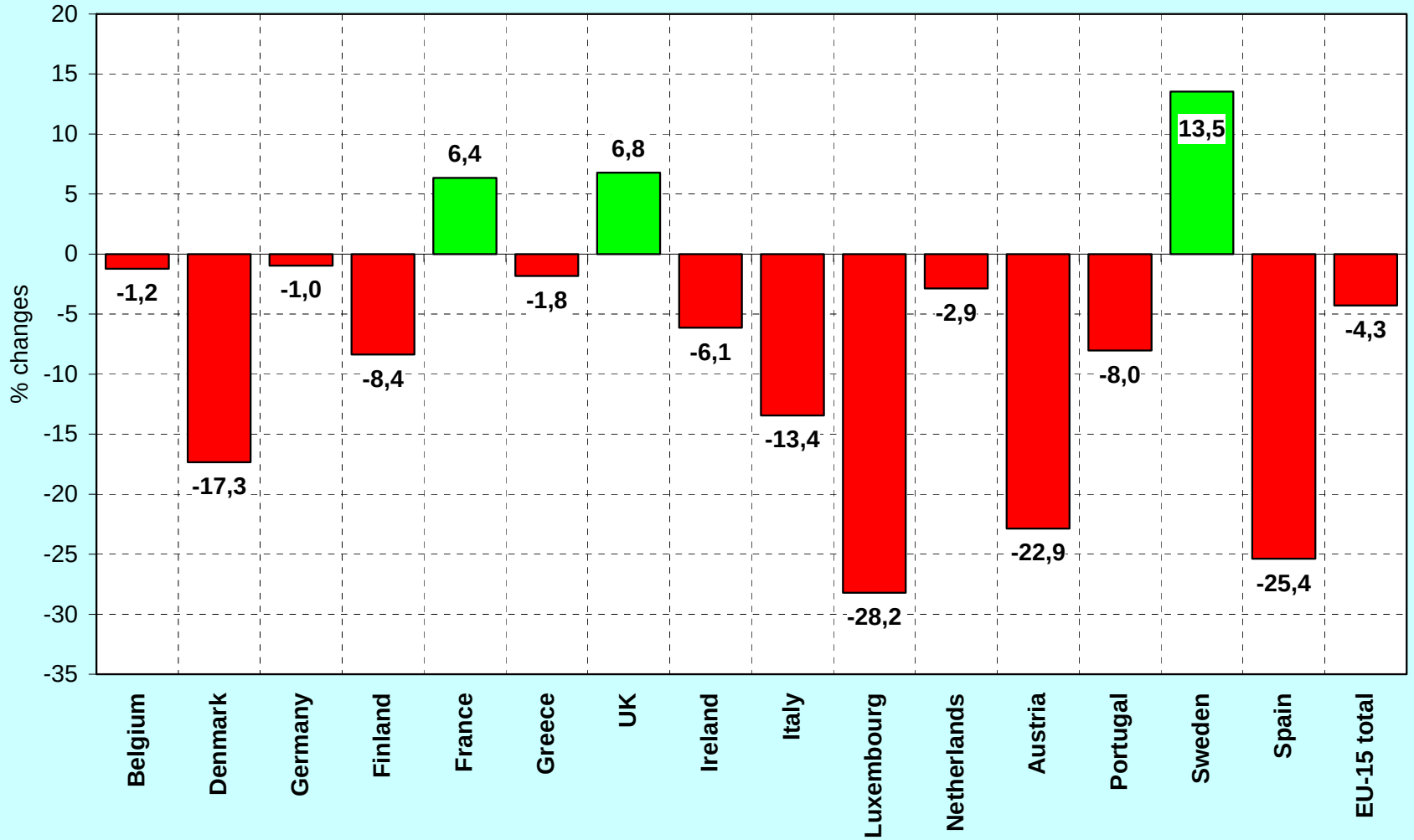


sources: UNFCCC; IEA; BP; author's calculations.

# GHG emissions in EU New Member States: base year to 2007 and targets for 2008/2012

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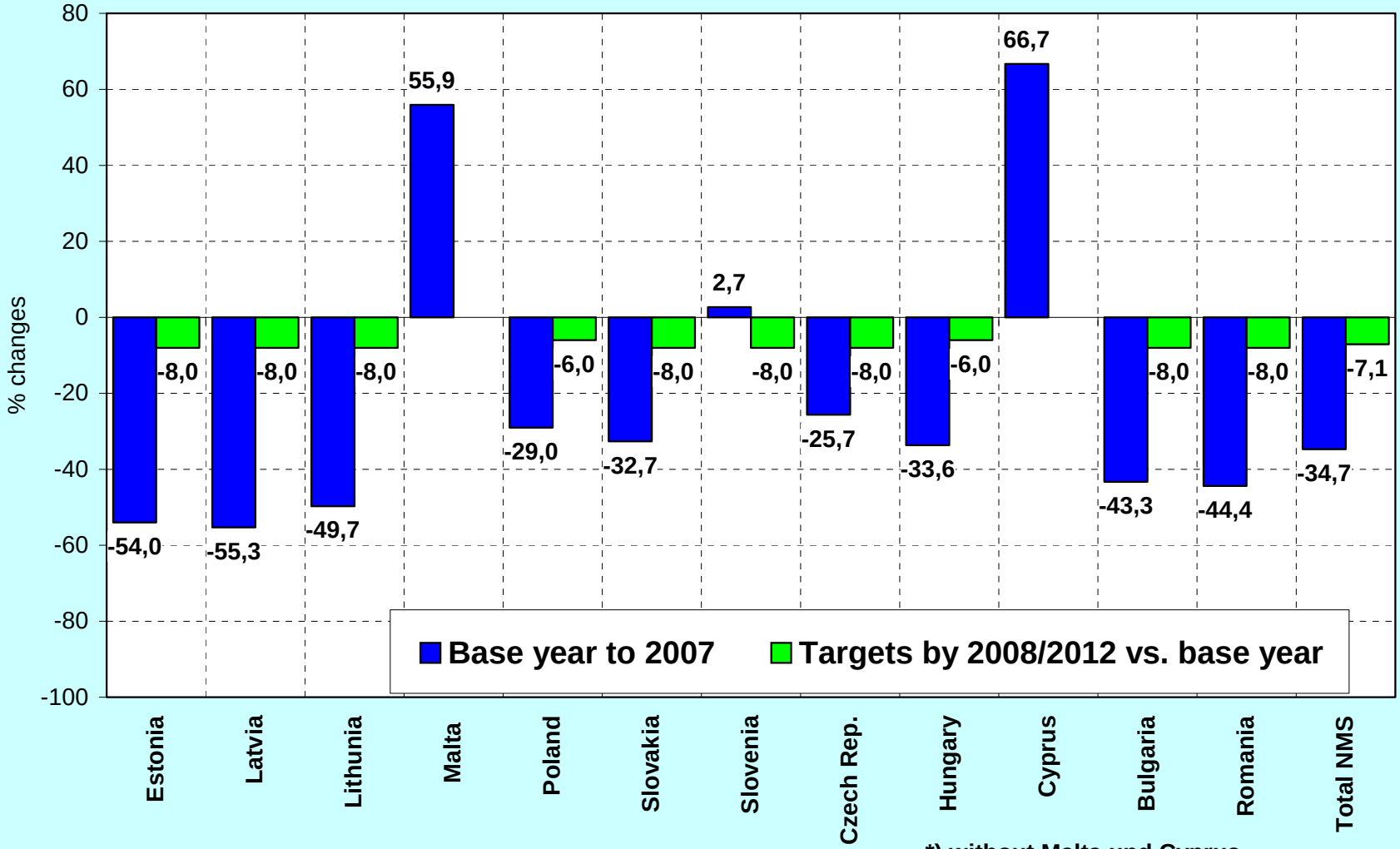


sources: UNFCCC; IEA; BP; author's calculations.

*) without Malta und Cyprus.

# Various components of changes in GHG emissions in Annex II countries 2007 vs. 1990

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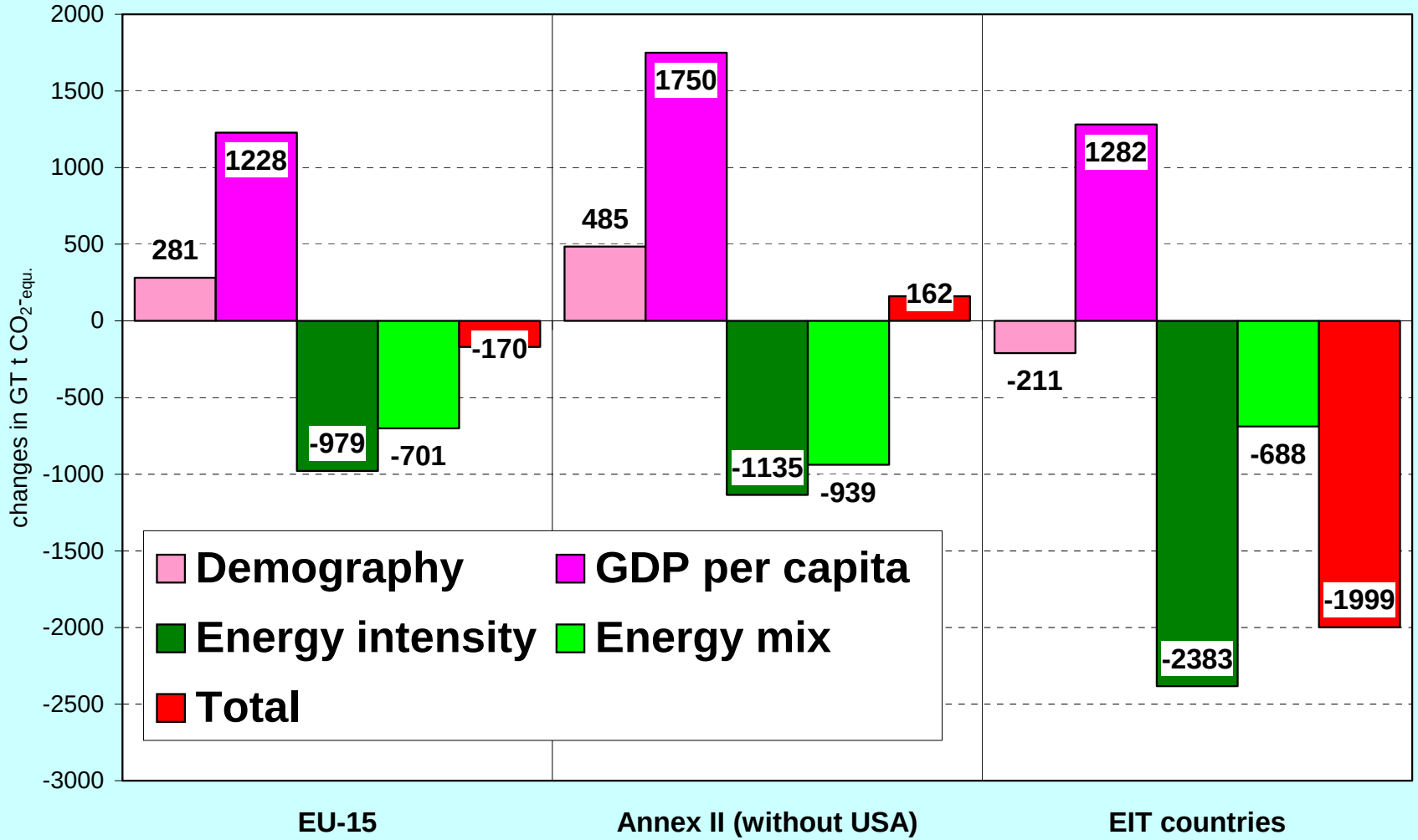



sources: UNFCCC; IEA; BP; author's calculations.

# A look forward

# The quantitative targets of EU Energy and Environmental Policy (1)

Hans-Joachim Ziesing

**Most influencing is the setting of targets on European level like …**

- **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**

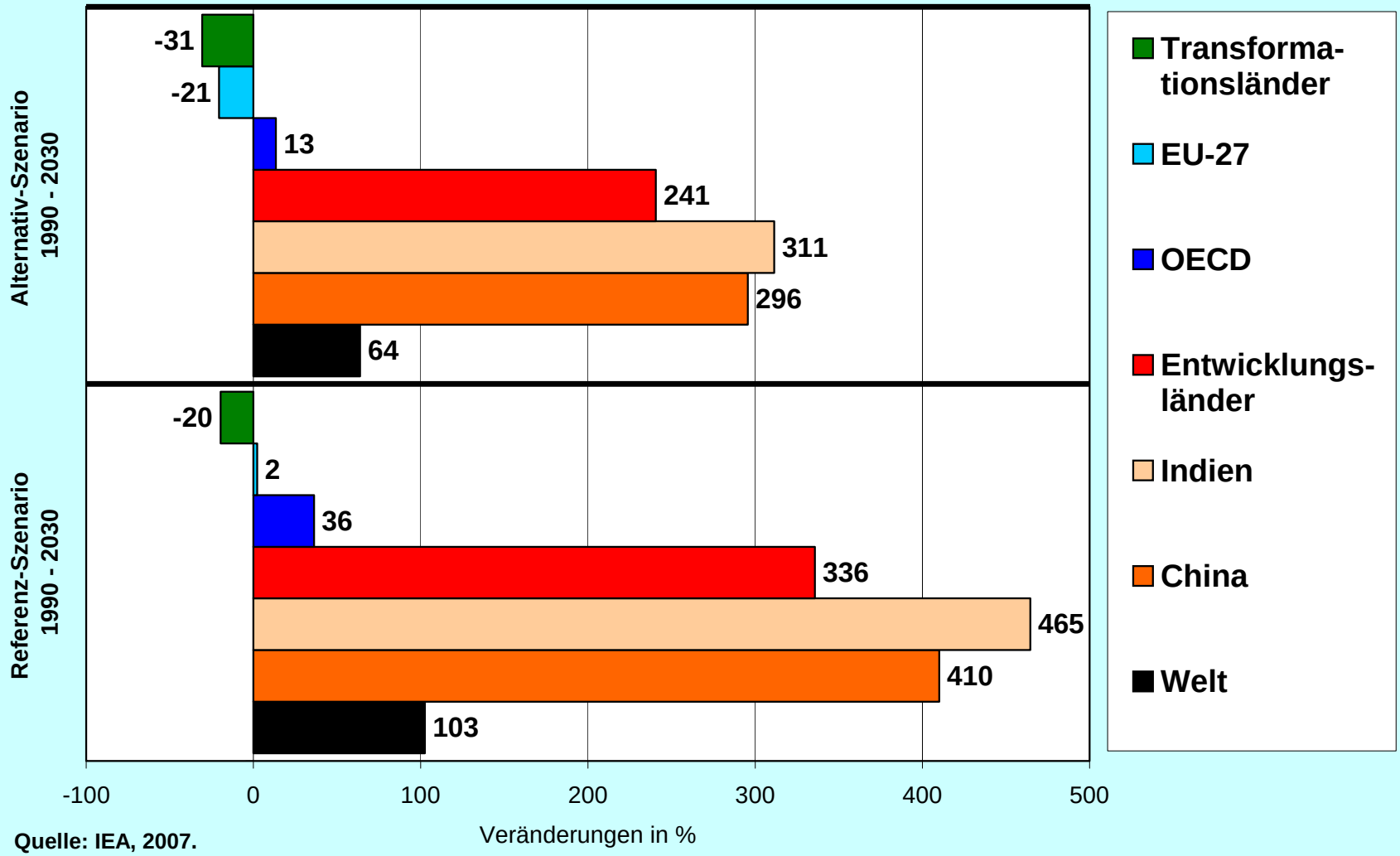
# The quantitative targets of EU Energy and Environmental Policy (2)

Hans-Joachim Ziesing

- A **binding target of a 20% share of renewable energies** in overall EU energy consumption by 2020 and a 10% binding minimum target to be achieved by all Member States for the share of biofuels in overall EU transport petrol/diesel consumption by 2020.
- Increasing **energy efficiency** in the EU so as to achieve the objective of saving 20% of the EU's energy consumption compared to projections for 2020, as estimated by the Commission in its Green Paper on Energy Efficiency.
- Enlarge the share of **electricity production of combined heat and power plants** (CHP) – the number still has to be fixed

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

Hans-Joachim Ziesing




Quelle: IEA, 2007.

# World-wide $CO_2$ emissions by regions and countries 1990 to 2030 (EIA)

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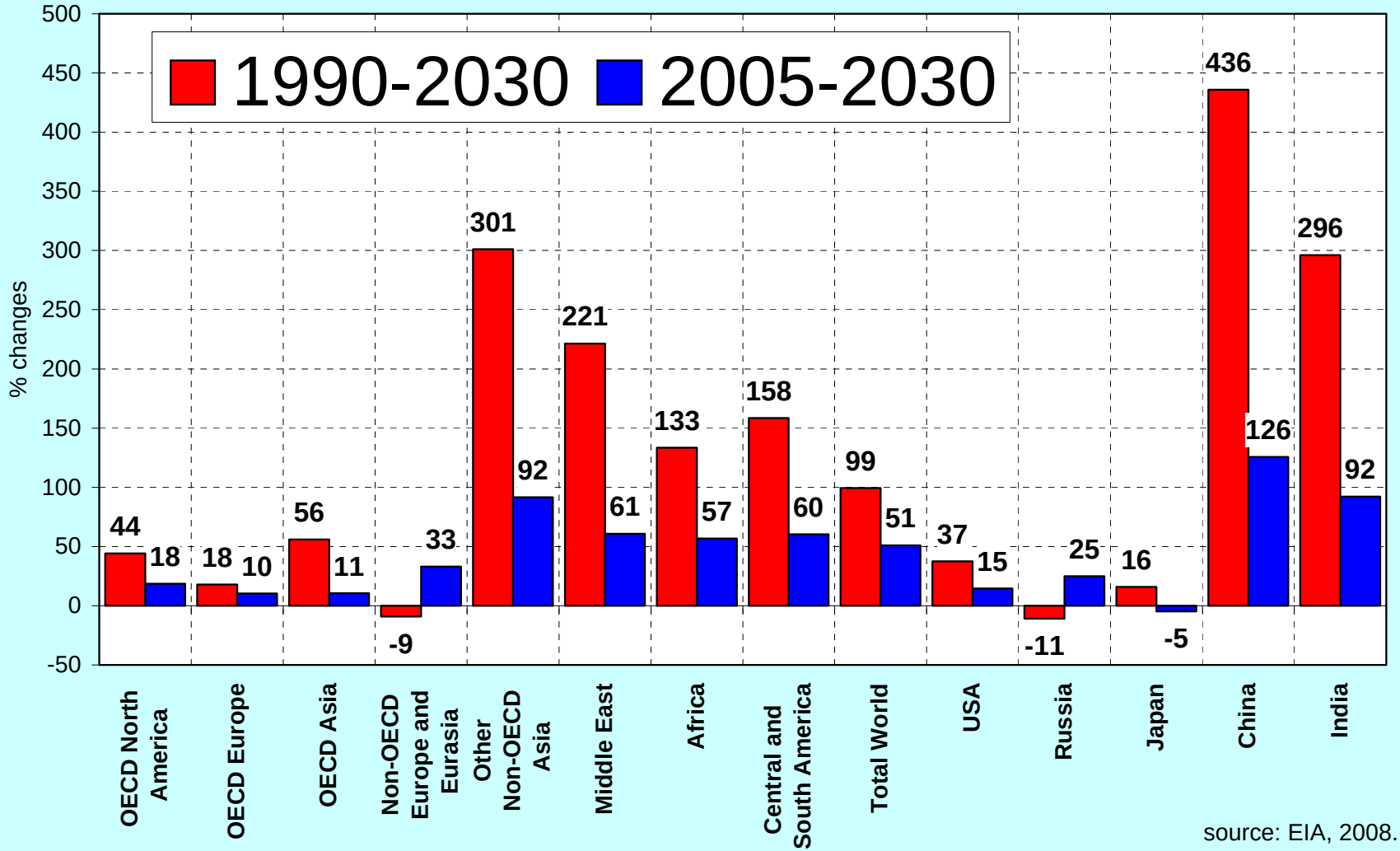


source: EIA, 2008.

# EU-12 (NMS): $CO_2$ emissions by countries 1990 to 2020 (PRIMES)

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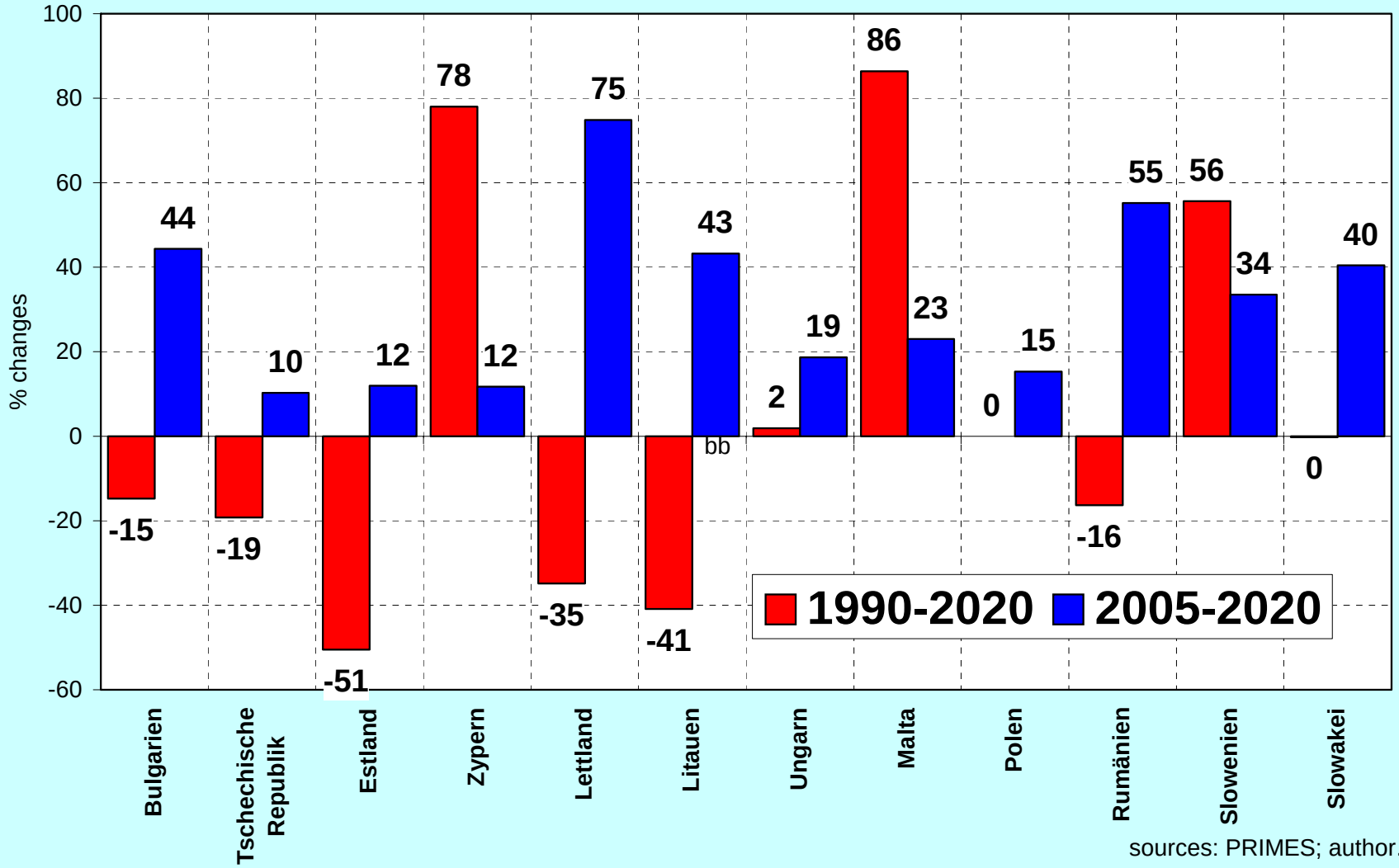


sources: PRIMES; author.

# $CO_2$ emissions %changes 1990 to 2020: EU-15; NMS; EU-27 (PRIMES)

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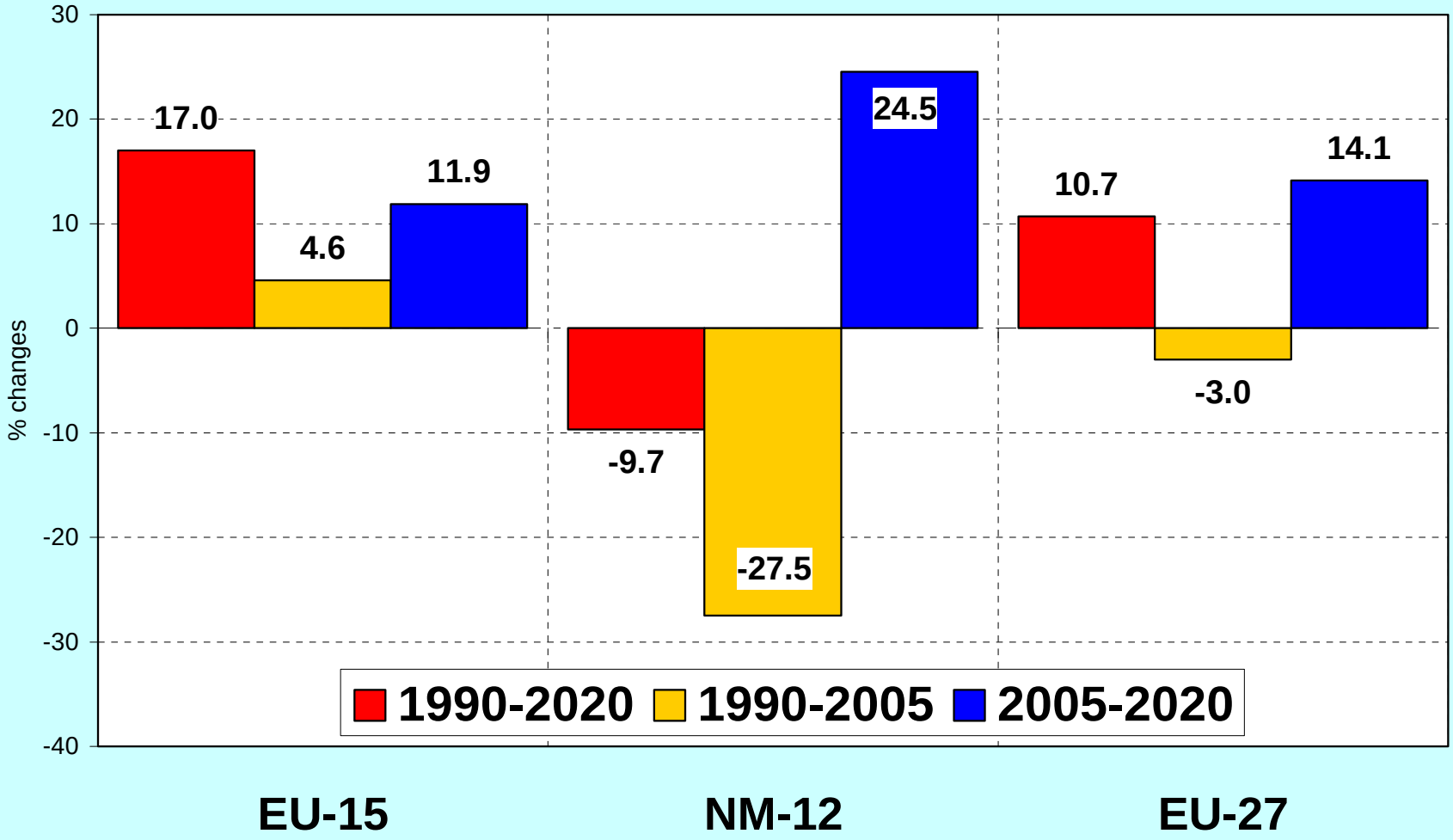


sources: PRIMES; author.

# $CO_2$ emissions Gt changes 1990 to 2020: EU-15; NMS; EU-27 (PRIMES)

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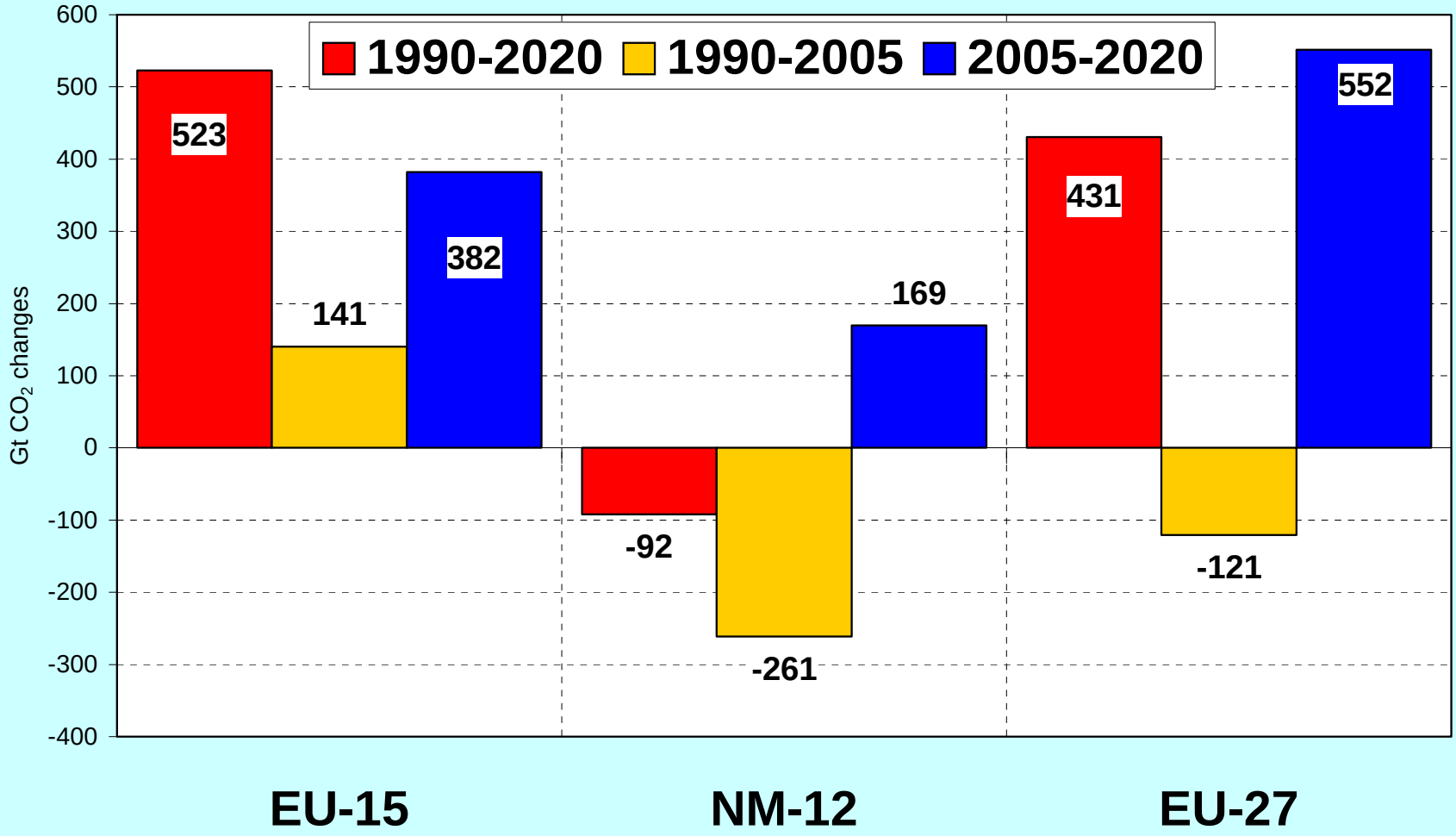


sources: PRIMES; author.

# Level of energy productivity in selected countries in 2007

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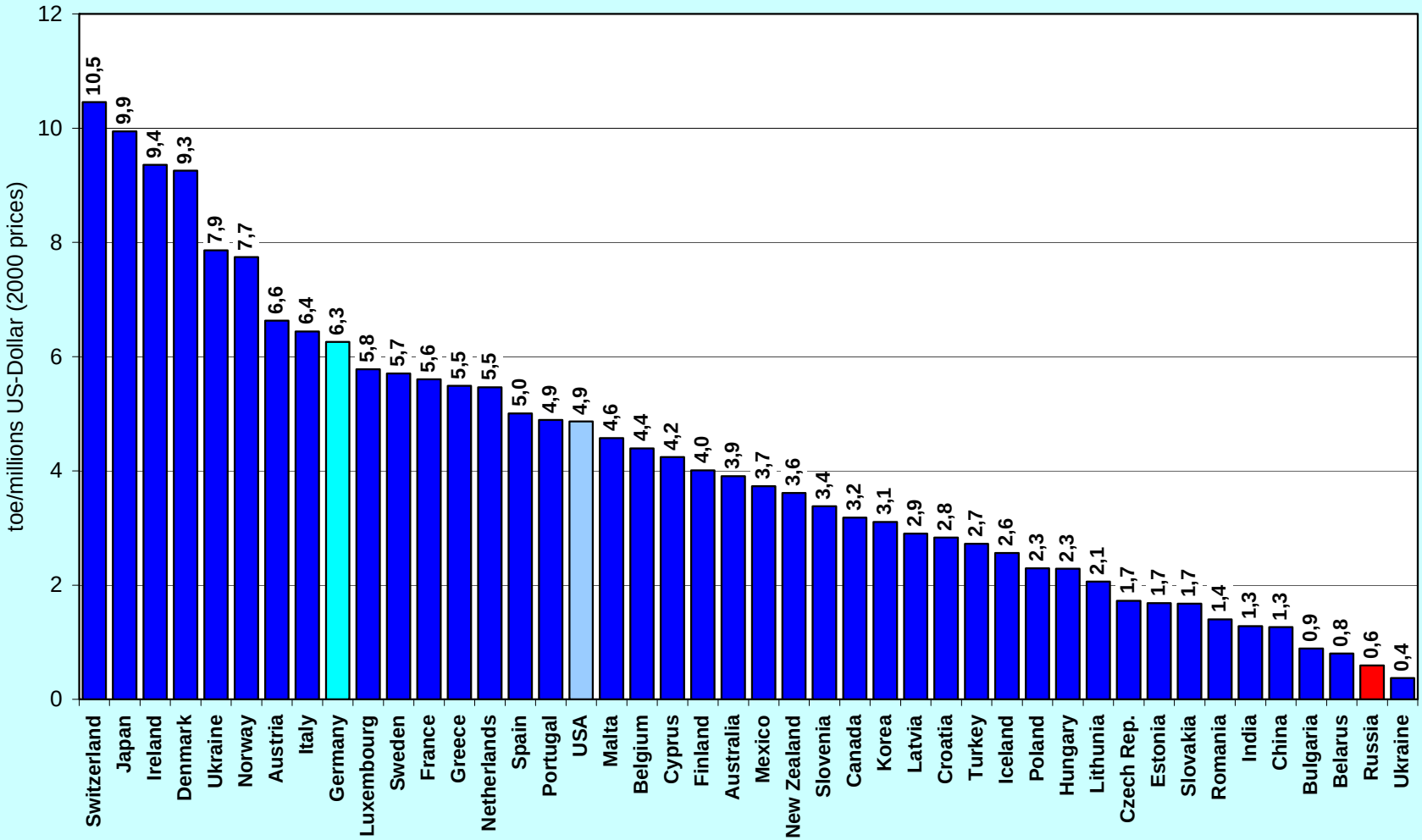


sources: UNFCCC; Worldbank; OECD; IEA; Eurostat; BP; author's calculations.

# Changes of energy productivity in selected countries from 1990 to 2007

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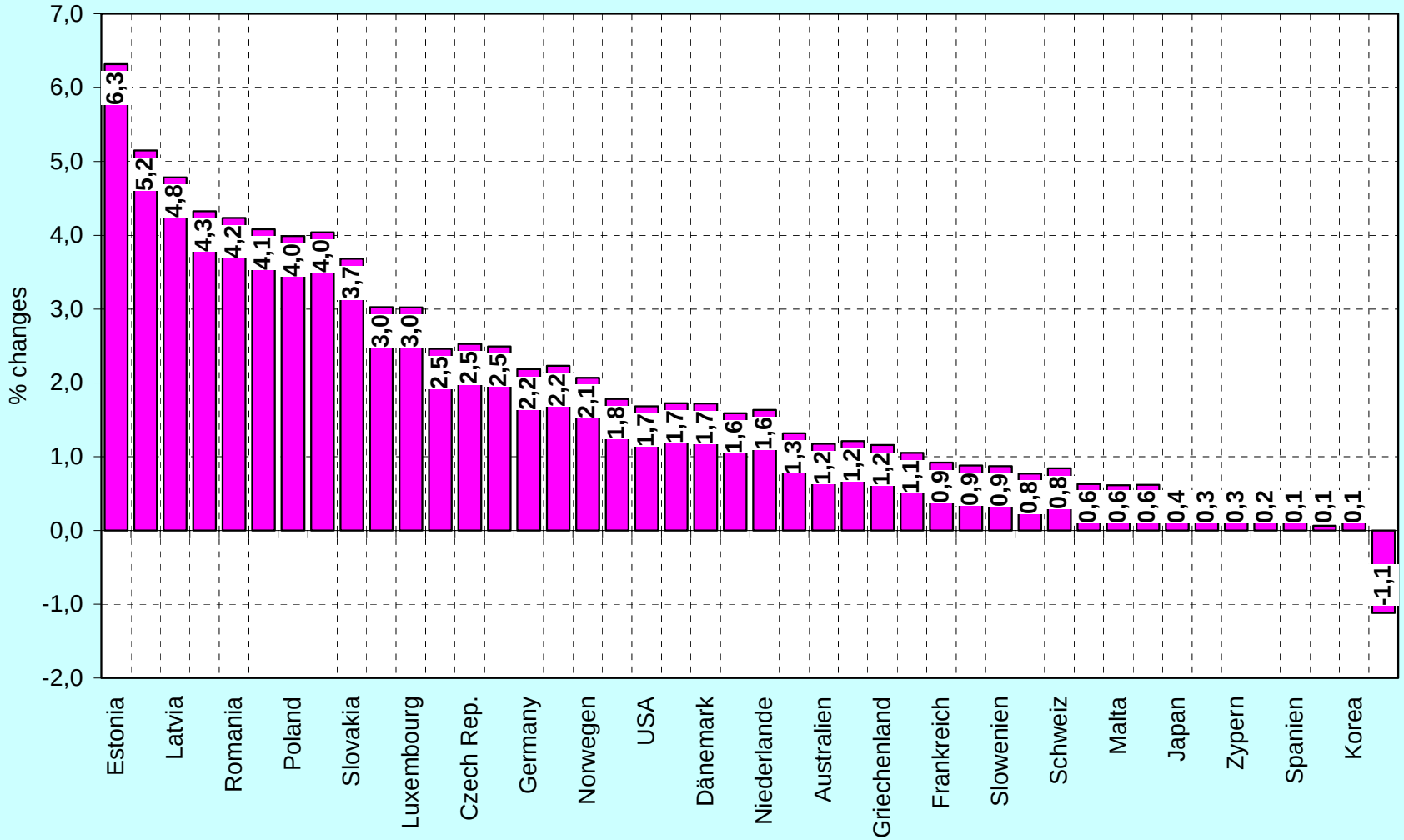


sources: UNFCCC; IEA; OECD; Eurostat; author's calculations.

# Conclusions

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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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