Updated development of global greenhouse gas emissions 2014

Hans-Joachim Ziesing

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20th REFORM Group Meeting,
Schloss Leopoldskron,
Salzburg, August 31, 2015
Main data for estimating GHG emissions for 2014

- **UNFCCC**: National Communications from Parties included in Annex I to the Convention; National Greenhouse Gas Inventory Data from Annex I Parties for 1990 to 2012
- **BP Statistical Review of World Energy 2014, June 2015**
- **The World Bank, World Development Indicators, Database July 2015**
- **Eurostat Database**

CO₂ emissions up to 2014 are extrapolated from the 2014 data on energy consumption published in the BP Statistics, June 2015, which are shown by country and energy source.
Changes of real GDP 2014 versus 2013 in Annex I countries and others

sources: Worldbank; IMF; OECD, Eurostat.
Changes of primary energy 2014 vs 2013 in countries with ≥100 Gtoe

source: BP June 2015
GHG emissions in Annex-I countries 1990 – 2014

Total GHG emissions in Annex I countries 1990-2014: -1.4%

sources: UNFCCC; Worldbank; IEA; BP; author's calculation.
GHG emissions in Annex I countries: 2013 - 2014

- EU 15: -5.2%
- EU 13: -2.5%
- EU 28: -4.6%
- Australia: -1.6%
- Japan: -3.0%
- Canada: -0.1%
- USA: 0.6%
- Russia: -0.9%
- Ukraine: -13.8%
- Total Annex I: -1.6%

sources: UNFCCC; IEA; BP; author’s calculation.
GHG emissions in Annex I countries: base year - 2014

- EU 15: -20.9%
- EU 13: -42.9%
- EU 28: -26.7%
- Australia: 27.1%
- Japan: 4.7%
- Canada: 18.9%
- USA: 7.1%
- Russia: -33.2%
- Ukraine: -64.7%
- Total Annex I: -12.2%

Sources: UNFCCC; IEA; BP; author's calculation.
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<td><strong>GHG emissions in Gt CO$_2$eq</strong></td>
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<td><strong>EU 15</strong></td>
<td>4270</td>
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<td><strong>12942</strong></td>
<td><strong>12743</strong></td>
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<td><strong>Total Annex I</strong></td>
<td><strong>19055</strong></td>
<td><strong>17000</strong></td>
<td><strong>16733</strong></td>
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<td><strong>17893.2</strong></td>
<td><strong>16911.9</strong></td>
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EU 28: GHG emissions targets by 2020, 2030 and 2050

2014 vs. base year: -26.7%

<table>
<thead>
<tr>
<th>Year</th>
<th>GHG emissions in million tonnes of CO2eq</th>
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<tr>
<td>1990</td>
<td>5806</td>
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<td>2000</td>
<td>5130</td>
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<td>2014</td>
<td>4256</td>
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<td>2020 (-20%)</td>
<td>4645</td>
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<td>2030 (-40%)</td>
<td>3484</td>
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<td>2050 (-80%)</td>
<td>1161</td>
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<tr>
<td>2050 (-95%)</td>
<td>290</td>
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World-wide CO₂ emissions 1990 - 2014

sources: UNFCCC; IEA; BP; author's calculation.
World-wide CO₂ emissions by regions 1990 - 2014

[Bar chart showing changes in CO₂ emissions by regions from 1990 to 2014.]


World  11.3  22.9  9.5
Annex I-Annex I parties  -3.7  4.2  -9.9
Non-Annex I parties  45.4  52.6  31.6
OECD  12.1  4.2  -8.6
EU 15  0.2  1.1  -19.2
Annex I EIT  8.1  -41.3  -7.6

Sources: UNFCCC; IEA; BP; author’s calculation.
The ten major emitters world-wide 2014

sources: UNFCCC; Worldbank; OECD; IEA; BP; author's calculation.
Per capita CO\textsubscript{2} emissions: EU-27 and selected countries 2014

Sources: UNFCCC; Worldbank; OECD; Eurostat; BP; author’s calculation.
World-wide CO$_2$ emissions 1990 – 2013 by regions

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<td>WORLD</td>
<td>21774.1</td>
<td>22326.7</td>
<td>24235.3</td>
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<td>Annex I</td>
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<td>Non-Annex I</td>
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GHG intensity in Annex I countries/world-wide CO$_2$ intensity 1990 - 2014

changes 1990 - 2014
GHG intensity (Annex I): -43 % or -2.3 %/a
CO$_2$ intensity (World): -20 % or -0.9 %/a

source: UNFCCC; Worldbank; IEA; BP; author’s calculation.
GHG/CO₂ intensity in Annex I and Non-Annex I countries 1990 - 2014

Graph showing the changes in GHG intensity and CO₂ intensity in Annex I and Non-Annex I countries from 1990 to 2014. The graph compares GHG intensity (Annex I; ExR) with CO₂ intensity (world-wide; ExR) and CO₂ intensity ( Annex I; ExR) with CO₂ intensity (Non-Annex I; PPP). The sources of the data are UNFCCC, IEA, BP, and author's calculation. ExR = Exchange rate; PPP = Purchasing power parity.
Components influencing GHG emissions 2014 vs. base year (1990)

EU 15 (Greenhouse gases)  China (CO2 only)  India (CO2 only)  WORLD (CO2 only)

- Demography  - Income  - Energy intensity  - Energy mix  - Total

sources: UNFCCC; Worldbank; IEA; BP; author's calculation.
Energy productivity in selected countries 2014

sources: Worldbank; OECD; IEA; BP.
Changes of energy productivity in selected countries 1990 - 2014

sources: Worldbank; IEA; Eurostat.
Energy productivity 1990 – 2014 with different base of calculation:

![Energy Productivity Chart](chart.png)

Sources: Worldbank; IEA; Eurostat; author’s calculation.
Perspective: World-wide CO₂ emissions by countries/regions 2013-2030

Conclusions – almost the same as all the previous years

- The discussion mostly 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!