

CO₂ emissions on a quarterly basis

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Content

- Background and reason for quarterly CO₂ emissions
- Estimation methods for stationary sources
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Introduction

Goal: investigate if it is possible to calculate structural CO₂ air emission accounts for the Netherlands on a quarterly basis (t+45).

- Faster (create awareness for policy makers and general public)
- Analyses (more datapoints, influence of weather)

Eurostat Grant: Study executed in 2010



Point of departure

- Environmental accounts concepts → resident principle
- Not Kyoto data on a quarterly basis
- On the basis of existing source statistics
- Testing how well quarterly emissions can estimate the annual figure

Methodology for stationary emissions and mobile sources

1. the annual emissions for each energy input in a particular industry have to be determined. In most cases the emission levels obtained from the Dutch Emission Inventory are used here as benchmark.
2. In the second step one needs to determine for every quarter the emissions for the different energy inputs in a particular industry.
3. In step 3 an indicator has to be selected which is capable of estimating the emissions for the same quarter the next year for a particular energy input in a particular industry.
4. In step 4 one needs to sum up the estimated emissions of the four quarters. For every year it has to be assured that the level and the development of the computed year emissions, which are based upon the four quarters, are close by or equal to that of the year figures of the already existing year statistic.
5. Finally, after carrying out the estimation for the four quarters, one has to rebase the sum of the four quarters with the 'real' emissions



Most important sources for stationary sources

- Gas balance
- Oil products balances
- Coal balance
- Renewable energy statistics (biomass input, incineration of waste)
- Sum of degrees below 18 degrees (agriculture)



Stationary sources: average absolute error in development

- Quality level, due to lack of information or imperfect indicators, for some individual NACE classes not good enough → aggregating
- On the macro scale we have complete information (3 months) for natural gas combustion. This information serves as a good macro indicator and quality check. Sum of individual NACE classes must equal macro indicator. This is not the case → action: adapt data individual NACE classes
- The Netherlands uses a lot of natural gas, so we are lucky to have complete information on this energy carrier



Data sources for mobile sources

Road transport (month information)

- delivery of petrol, diesel and LPG for road traffic

Water transport (month information)

- Bunkering data from the energy statistics.
- Output data from the quarterly economic accounts.

Air transport (month information)

- Bunkering data from the energy statistics.
- Output data from the quarterly economic accounts.
- ASK (Available Seat Kilometres) from KLM

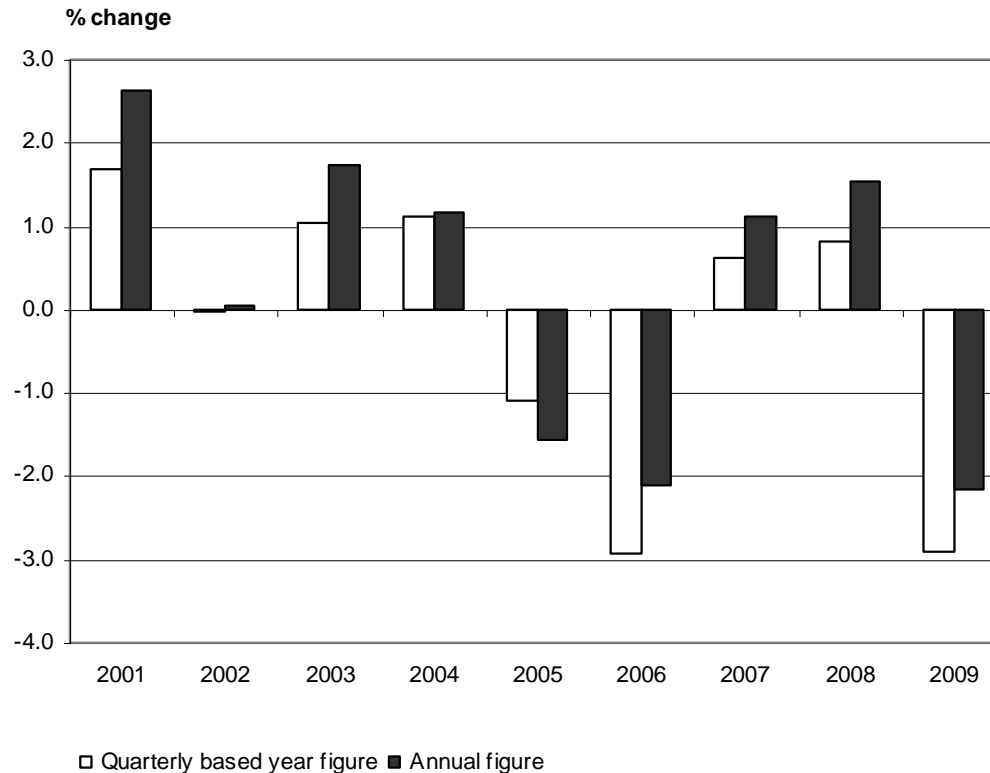
Mobile sources: average absolute error in development

data source		delivery %	bunkering	output	ASK	best available method
Road traffic	petrol	1,0				1,0
	diesel	0,5				0,5
	LPG	2,0				2,0
	total					0,4
Water transport	Inland shipping		9,9	6,0		6,0
	Seagoing		12,7	3,2		3,2
Air traffic			2,2	2,0	1,3	1,3
Total mobile sources						0,8

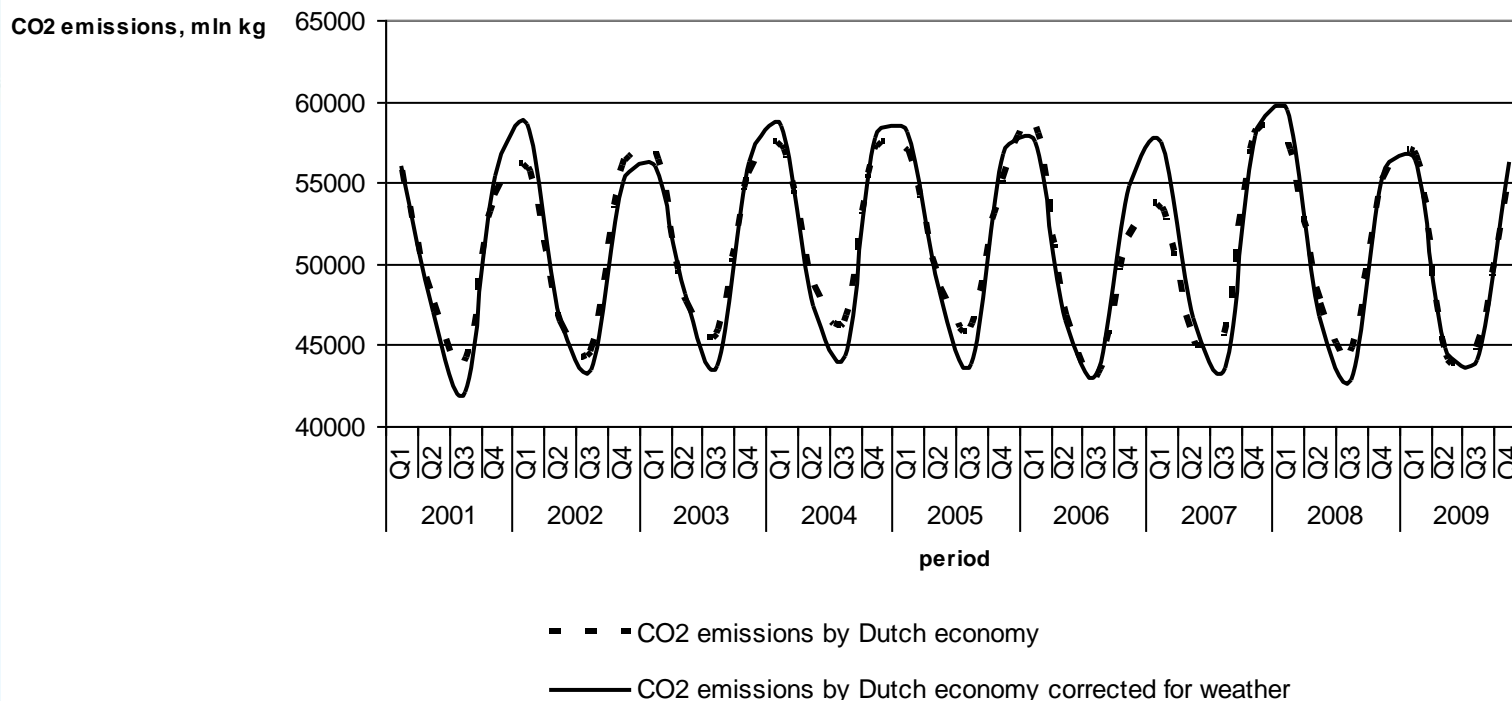
Overall quality assessment: macro level

- An essential test to assess the overall quality of the applied methodology is to compare the sum of the estimated emissions for the four quarters with both the level and the development of the already existing annual statistic for CO₂ emissions from the air emission accounts.
- This is very important because one needs to avoid major adjustments in figures in publications. Also, this should avoid difficulties in communicating CO₂ emissions to the public.

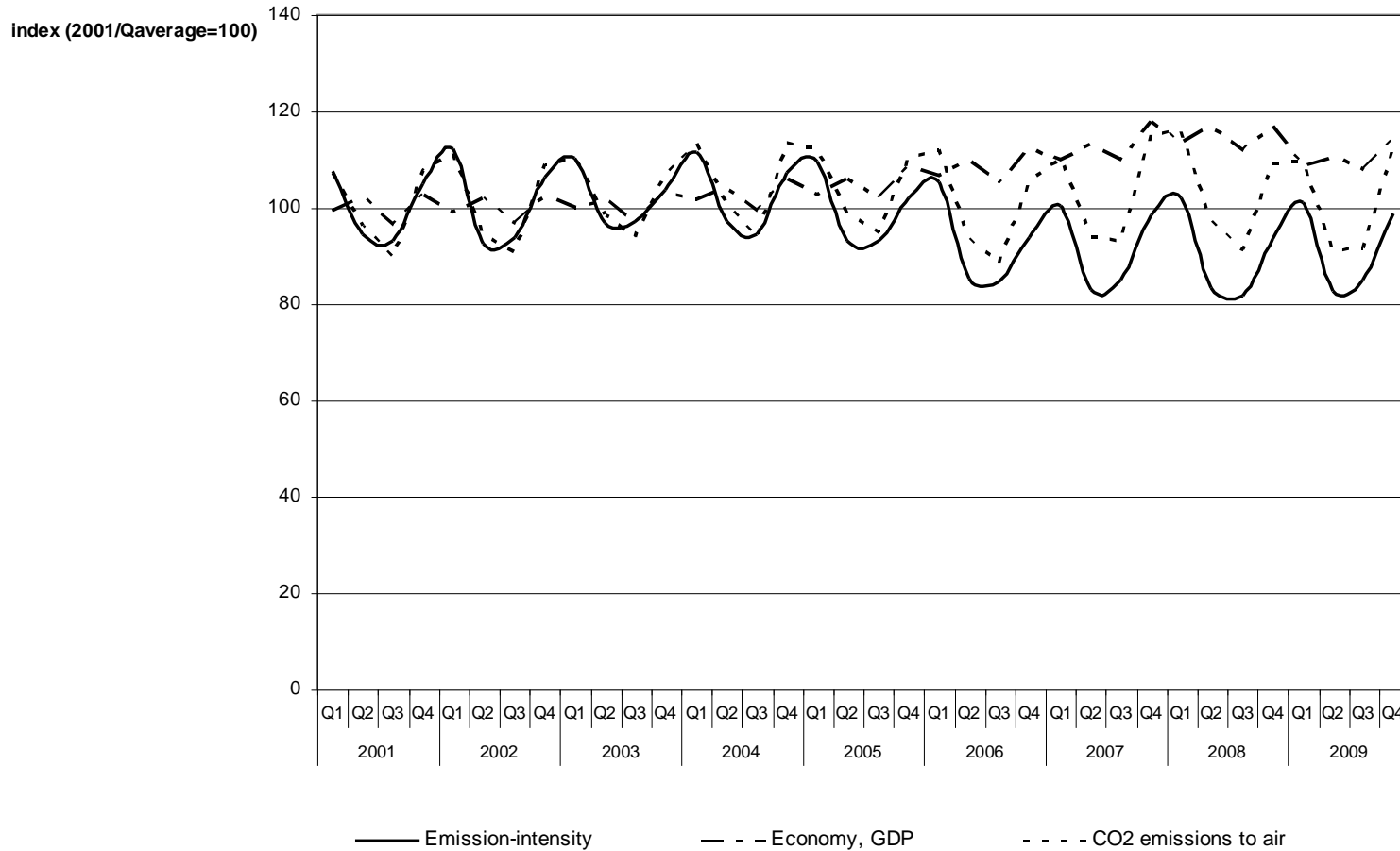
Yearly change in CO₂ emissions, Estimate (sum 4 quarters and annual figure)



Results on macro level: strong seasonality

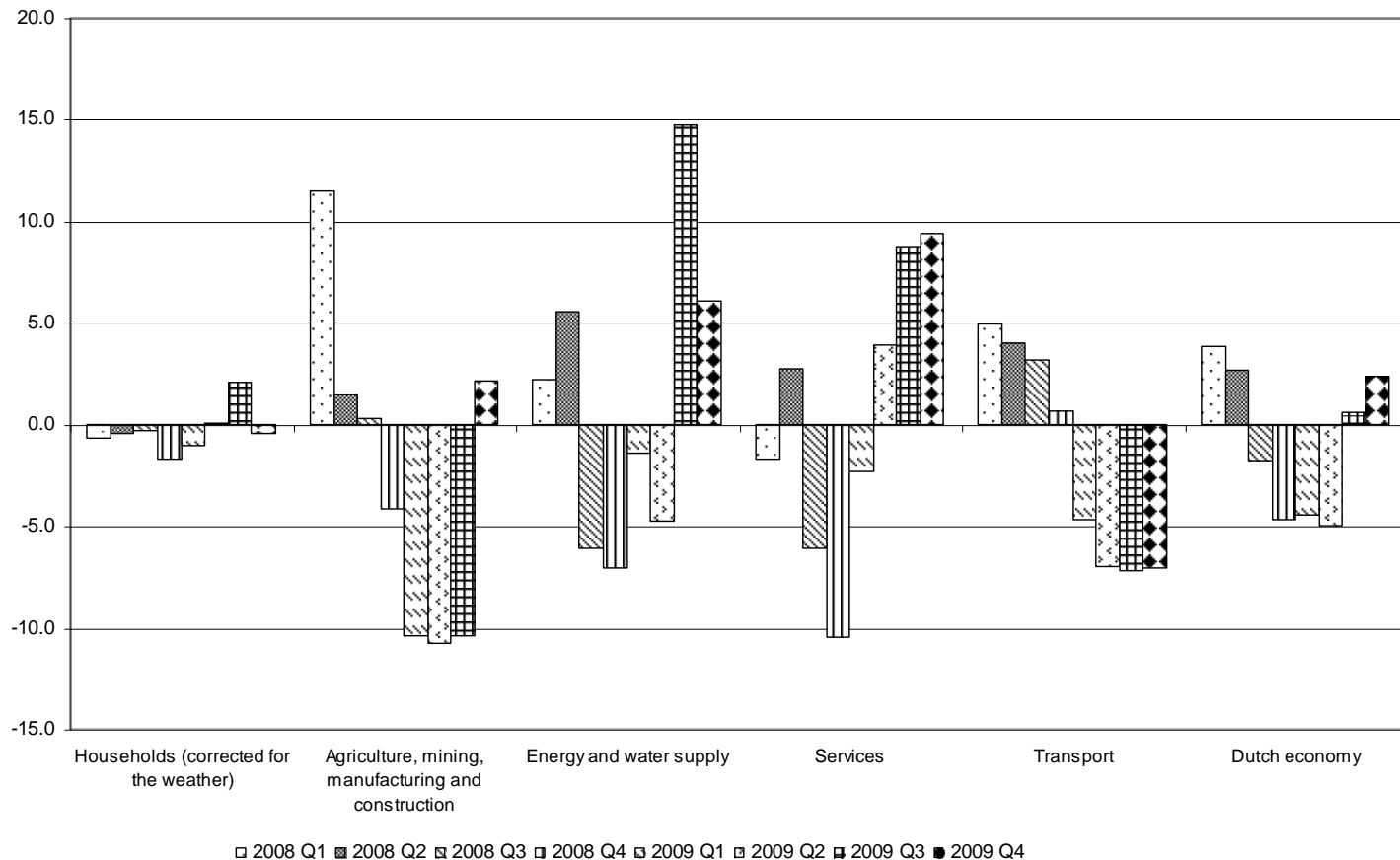


Decoupling of economy and CO₂ emissions

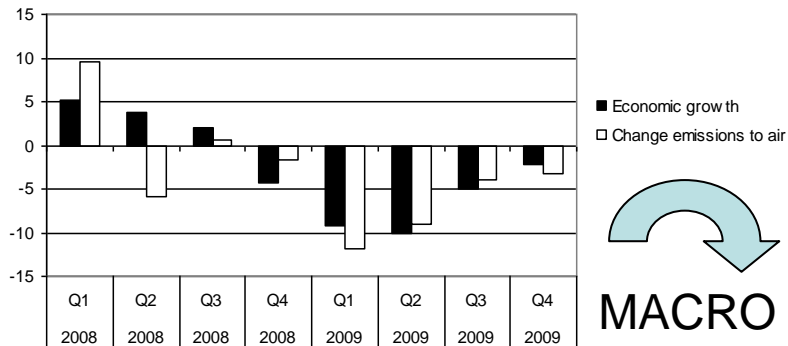


Quarterly change per sector in the economy: influence of crisis

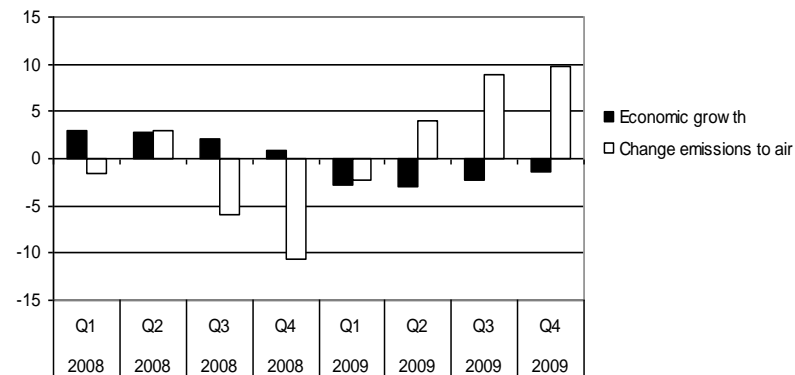
percentage change in emissions
Q-4



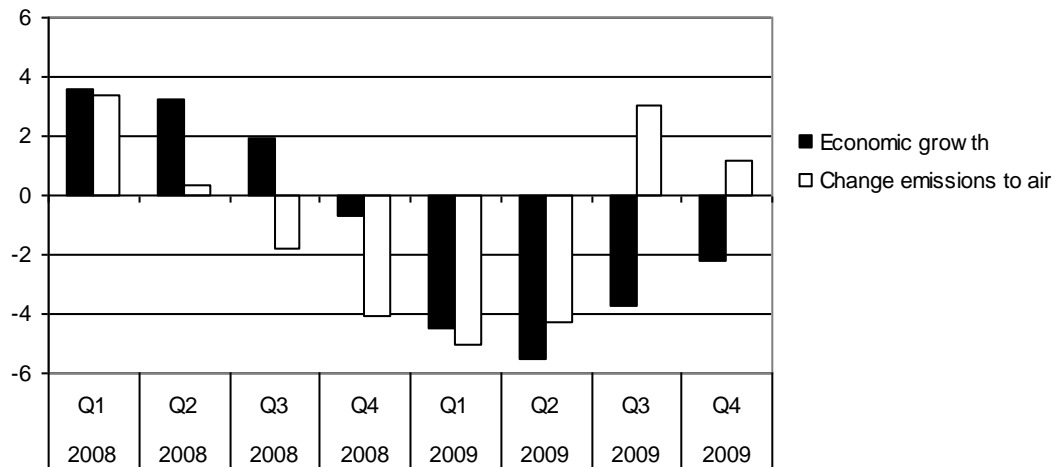
Agriculture, mining, manufacturing and construction



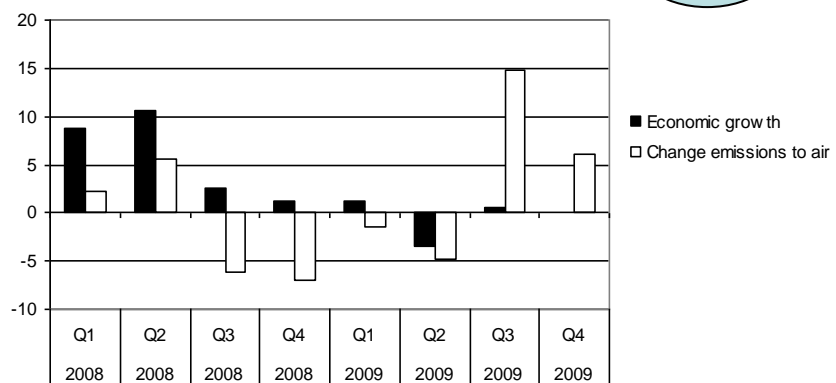
Services



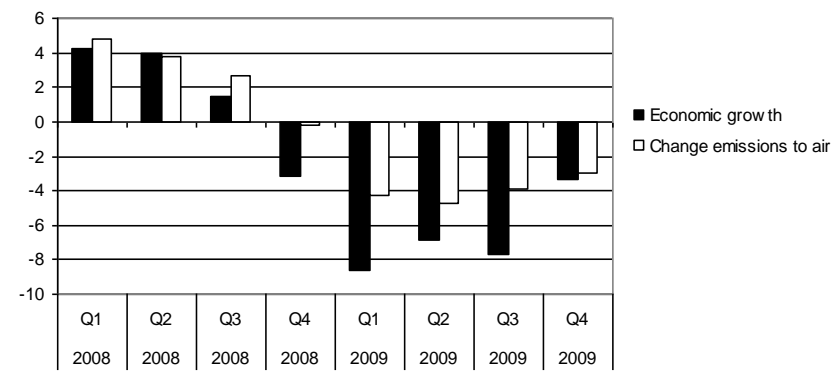
MACRO figures for the Dutch Economy



Energy and water supply



Transport



Moment of publishing

- **Aim** is to publish the first results as soon as possible to provide the most actual data to the public.
- On the other hand, **constraints** with regard to the availability of data sources, the quality of the data sources , the time needed to process the data
- **Preference** to publish quarterly CO₂ emissions at the same moment in time as the results of the quarterly National accounts : t+45

Level of publishing

Not publishing the absolute emissions levels, but only the actual changes with regard to the previous year

- Agriculture, mining, manufacturing and construction (NACE 1-37 and NACE 45)
- Energy and water companies (NACE 40-41)
- Transport sector (NACE 60-62)
- Other services (NACE 50-55; NACE 63-95)
- Waste disposal sites
- Households
- Total emissions

Dealing with updates: two options

1. ***Publish quarterly CO₂ emissions only once (at t+45) and not to provide updates***
 - Advantage: new CO₂ data are mostly interesting when it first becomes available
 - Advantage: less time has to be spent on calculating the updates
2. ***Provide and publish updates of the rebased data***
 - Advantage: data available to the public to analyse an up-to-date time series for quarterly emissions
 - Disadvantage: extra time and capacity it takes to rebase, update, check and publish these results. Also the readjustments in the updates have to be explained in the form of quality reports

Choices made

- Publish moment: $t+45$
- Publish only mutations for 4 clusters of NACE classes and households
- Publish only once figures on quarterly emissions
- Rebased figures are not published. Rebased figures are only input for new calculations

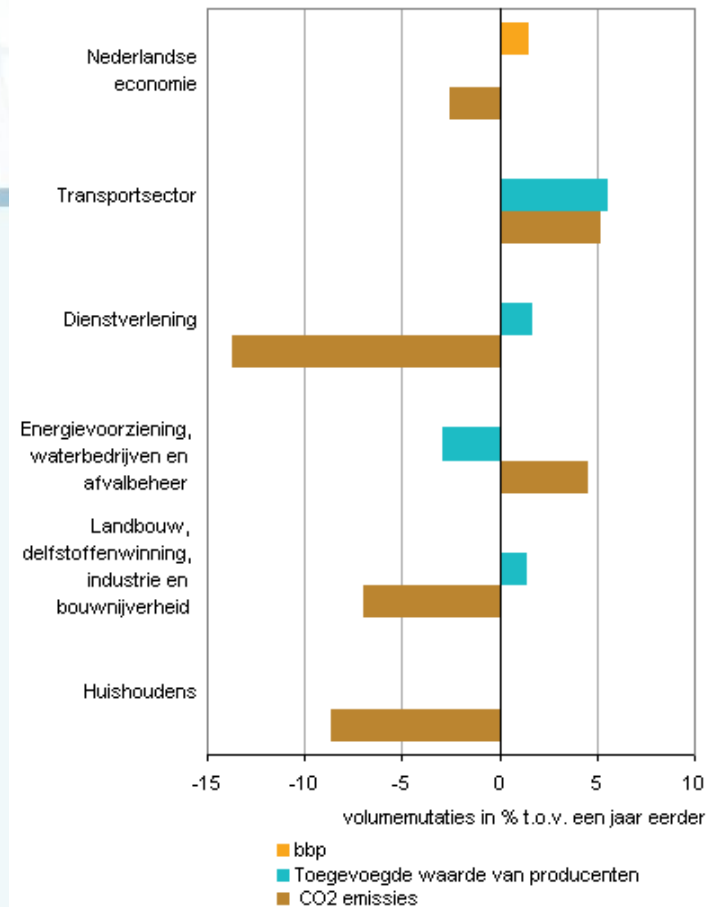


Article published second quarter 2011 on cbs website

- Link to article:

[Quarterly emisissions q2 2011](#)

Important: link in article to document where differences in definitions are explained including bridge table (Kyoto emissions, territory emissions, air emission accounts)



Bron: CBS

Conclusions and recommendations

- CO2 emissions can be constructed on quarterly basis
- Actual publication of figures 'challenging' process
- Keep track of absolute error in estimations (sum of 4 quarters vs annual figure)
- Further improvement of methodology
- Further development of dissemination strategy

