

# Rebasing input price indices of Civil engineering from 2005=100 to 2010=100

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To follow the price developments in various areas in civil engineering (in Dutch: Grond-, weg- en waterbouw (GWW)) in the Netherlands, Statistics Netherlands publishes quarterly price indices of Civil engineering works. In total, eight series are published, each covering an area of civil engineering. The areas are based on the Classification of Products by Activity (CPA):

- 4211a Road construction; brick paving,
- 4211b Road construction; asphalt paving,
- 4212 Railways en underground railways,
- 4213 Bridges and tunnels,
- 4221 Constructions for fluids,
- 4291 Constructions for water projects,
- 4312 Site preparation works,
- 4321 Electrical installation works.

From the first quarter of 2014, the price indexes for GWW will be published based on a new reference year: 2010. These new series were calculated retrospectively from January 2008 onwards. The base shift results in different figures from January 2008 to October 2013 compared with the old series based on 2005=100.

This article examines the changes that were implemented and the differences between the index series based on 2005=100 and the indices based on 2010=100. The first section gives a description of how the price indices of civil engineering are calculated. Then the changes that were carried out are described. The third section discusses the effect that the base shift has on the course of the price indices of the series that already have been published on the old base. Finally, some recommendations are given on how to link the series 2005=100 and the 2010=100 series, by adjustments of contracts and the like.

# 1. The price indices of Civil engineering

Statistic Netherlands publishes a total of eight series of price indices for different areas of the civil engineering. A price index reflects the price changes for a project compared with a fixed period (in this case 2010). This is called a Laspeyres index. The price index of each area of civil engineering is based on price developments of required materials, equipment and labour of a project. The series are calculated as follows:

To determine the materials, equipment and labour, for each area we used a representative project for which quantity tables and cost estimates were formulated. Quantity tables and cost estimates contain information about the required amount and costs of labour, materials and equipment involved in the work on the building project. Based on the costs the percentage (weight) of that component within the type of work is determined. Subsequently, the weights of the materials and equipment are linked to the Producer Price Index figure (PPI) of the material or equipment type concerned. Among other things, producer price statistics aim to show the development of prices of goods produced for the Dutch market. For the development of labour costs, developments in the CAO wage of the construction industry are used. Together, this yields a civil engineering price index that reflects the prices for each area.

In addition to the series for the eight individual areas, a weighted index series is also published for the eight series together: 42/43 Civil engineering. Section 3.1 discusses this compound series.

## 2. Summary of changes

Once every five years, the base year of a price index is changed. This is because over the years the production ratio shifts, and thus the ratio between and within different parts of the civil engineering. To present an accurate picture of the price developments, the weights are adapted on a regular basis to the more recent production ratios. This is the main purpose of the base shift. The changes made in aid of the base shift of the GWW price indices will be discussed step by step below.

### 2.1 Titles of the series

A breakdown of the total civil engineering and the names of these areas are derived from the standard Classification Products to Activity (CPA). Because of adjustments in this standard also the code of some series are changed. These changes are:

#### 2.1.1 Adjustments names of areas civil engineering

New names	Old names
42.11a Road construction; brick paving	42.111 Road construction; brick paving
42.11b Road construction; asphalt paving	42.112 Road construction; asphalt paving

### 2.2 New weighing schemes

For the base shift to 2010=100 it has been decided that the models that were used for the series shift to 2005=100 still are sufficiently representative to be used for the new base. This means that all source data -such as the budgets of the various areas of the GWW- for determining the weights can still be used. However, the relationships between various cost items may have changed as a result of price changes between 2010 and 2012. For this reason, the former weights from the series 2005=100 have been adjusted by means of adjusting prices to the 2012 level or by using recent data from the National accounts (NA).

For the calculation of the price indices of the GWW we use weighting schemes on three levels. First of all, the price indices of the cost items labour, the materials and the equipment are weighted together into one price index of a particular type of work within an area of civil engineering. Then the various types of work are weighted together into one of the 8 published areas of civil engineering. Finally, the price indices of the eight areas of civil engineering are weighted together to one price index for the entire civil engineering.

In addition to the series for the eight individual areas, a weighted index series is also published for the eight series together: 42/43 Civil engineering. Section 3.1 discusses this compound series.

Annex 1 contains an overview of the weights for the 42/43 Civil engineering and the eight subareas by 2-digit prodcom and labour.

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### 2.2.1 Weighting schemes costs items within a type of work

For the determination of the new weights, the old weights from the series 2005=100 are -as written- adjusted to the price level 2012. This means that the old weights are adjusted by the percentage by which the prices of the respective cost items material, material or wage between the 2 time points were changed. In this case the price development between 2010 (price level series 2005=100) and 2012 (price level new series 2010=100).

Example calculation price adjustment 'labour ':

Share labor	2010: € 265,000.–
Index salaries	2010: 100.0
	2012: 104.1
share labor	2012: € 265,000.– * 104.1 / 100.0 = € 275,865.–

### 2.2.2 Weighting schemes types of work within an area of civil engineering

After the weights of the individual cost items are calculated again, the weights of the different types of work within the areas are determined. This weight is equal to the sum of the weights of all cost items within the work type. In this way, the proportion of each type of work within an area of civil engineering is calculated. These are therefore also automatically adjusted to price level 2012

### 2.2.3 Weighting schemes areas of civil engineering

To achieve a price index for the entire civil engineering sector, the price indices per area are then weighted based on data from the National accounts. Sales data by branch are derived from these data, with which is calculated how big the proportion of each area is in the total turnover of the civil engineering sector. At this time the most recent data from NA are of the year 2010. Because the price level of the cost items is fixed on 2012, the price indices of the areas of civil engineering are also used to update the sales data from NA to the price level of 2012.

## 2.3 Producer price indices PPI

For the price development of materials and equipment, the Producer price indices (PPI), distribution categories Domestic consumption are used. Also this statistics has been shifted from 2005=100 to 2010=100. The result of this is that by applying new weights the development of the price indices in the new series may differ from the figures from the old series 2005=100.

# 3. Results for existing areas

The above-listed changes in the PPI and the weights of the cost items, types of work and areas lead to small differences between the price indices of civil engineering on the base 2010=100 and those based on the previous reference year 2005. This section provides an overview of the series of the GWW-total and its various areas. The old series on base 2005=100 have all been rescaled to 2010=100.

### 3.1 42/43 Civil engineering

In addition to the series for the individual areas, a price index for the entire civil engineering sector is also published. This series is composed of the eight component series, for which the weighting scheme is based on the most recent data from the 2010 National accounts with a price adjustment to 2012.

#### 3.1.1 Shares of areas and of labour and material and equipment in 42/43 Civil engineering

Area of civil engineering	Weights	
	2005=100	2010=100
	%	
4211a Road construction; brick paving	5.5	6.2
4211b Road construction; asphalt paving	22.3	20.7
4212 Railways and underground railways	5.0	7.4
4213 Bridges and tunnels	9.6	7.9
4221 Constructions for fluids	11.2	20.3
4291 Constructions for water projects	13.0	15.8
4312 Site preparation works	11.3	7.9
4321 Electrical installation works	22.0	13.7
42/43 Civil engineering	100.0	100.0
of which		
share of labour	26.5	29.8
share of materials and equipments	73.5	70.2

Table 3.1.1 summarizes the weighting scheme. A considerable part of the shifts is caused by a revision at NA. The share of Work for liquids has almost doubled while the share Electrical installation works is almost halved. Because the sum of the weights always add up to 100 these adjustments have also affects the other weights.

In table 3.1.1 the share of labour and materials and equipment in the total figure of the '42/43 Civil engineering' has also been added. These shares are a weighted sum of the division between labour and materials and equipment for each area.

The course of the old and the new series is almost the same. Both in the beginning as in the end of the series the series 2010=100 is slightly higher than that of 2005=100. This is mainly caused by the series of 'Road construction; asphalt paving', 'Constructions for fluids' and 'Electrical installation works'. For the overlapping period from January 2008 to October 2013, the average absolute deviation is not more than a quarter of an index point with a maximum of 0.6 index point.

Like almost all the series for the various areas, the price index for '42/43 Civil engineering' shows an increase in 2008. This is mainly caused by the sharp movement in prices of some materials which occur in all. For instance, in 2008 the prices of concrete reinforcing bars increases by 60 percent. Gas oils and bituminous materials were respectively 35 percent and almost 25 percent more expensive. The prices of these products subsequently fell back to the level of early 2008, or even lower. In the graph, the development of the labour costs (Cao-wages) are included. These affect almost 30 percent of the development of the 42/43 Civil engineering price index.

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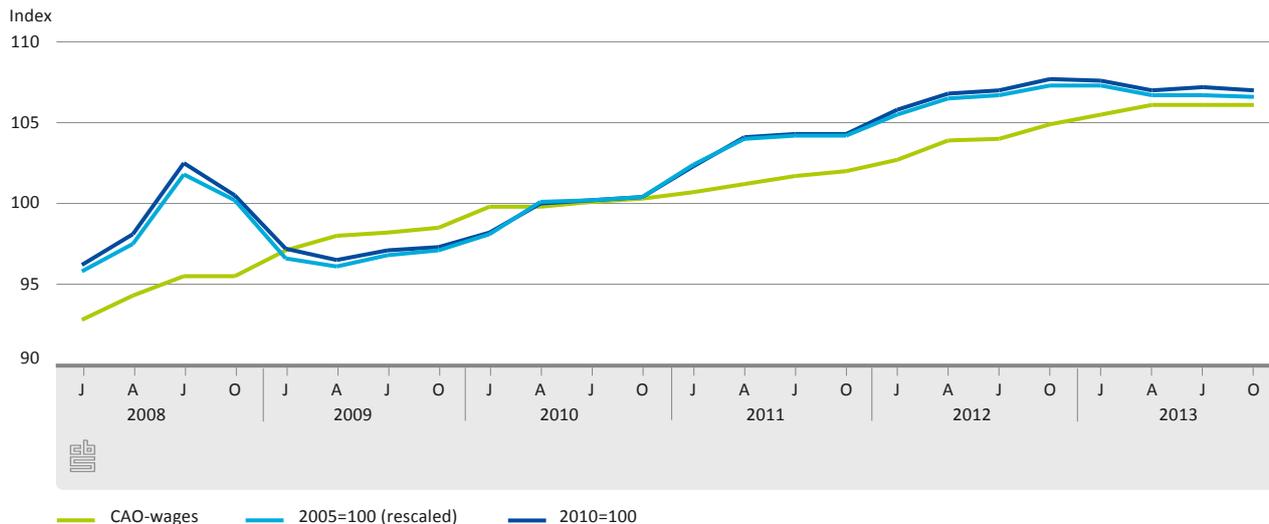
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### 3.1.2 Civil engineering

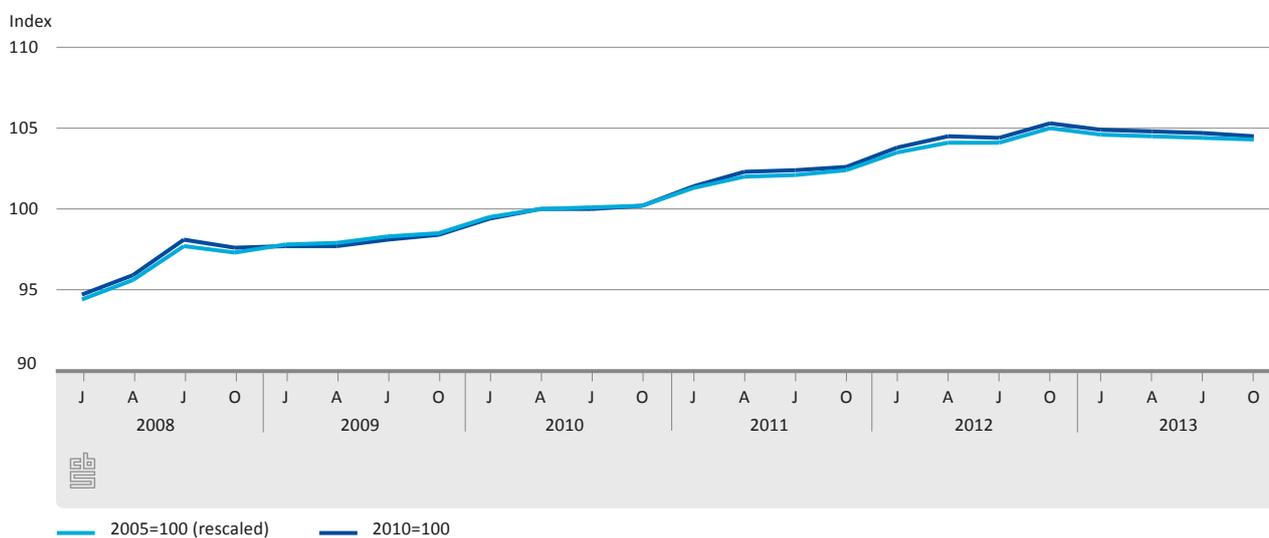


## 3.2 Areas

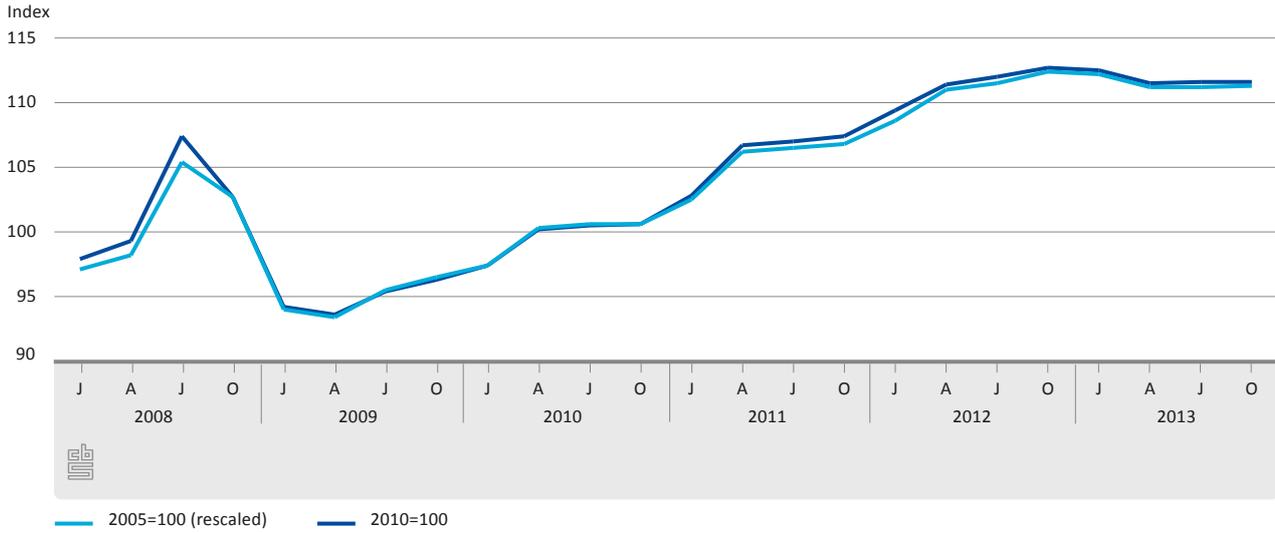
For the areas it mainly counts the same as for the total of civil engineering. After the price rise in mid-2008 a (strongly) price drop follows in the second half of that year. In the period 2009 to 2013 the prices increase again to stabilize more or less in 2013.

Below you see the graphs in which the course of the series 2005=100 and 2010=100 from the several areas is shown.

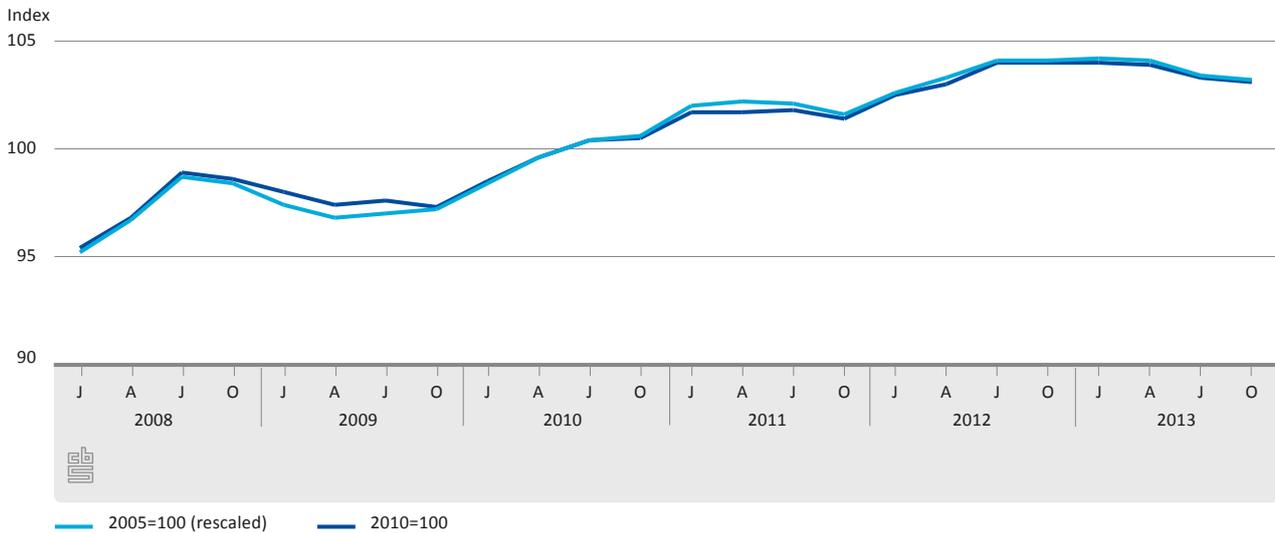
### 3.2.1 Road construction; brick paving



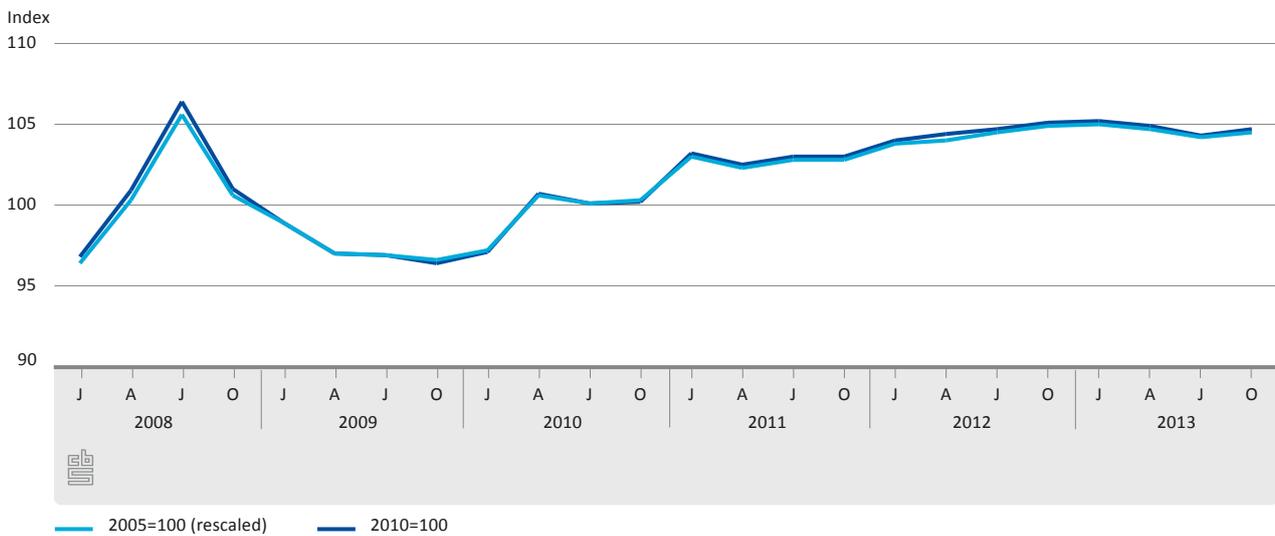
### 3.2.2 Road construction; asphalt paving



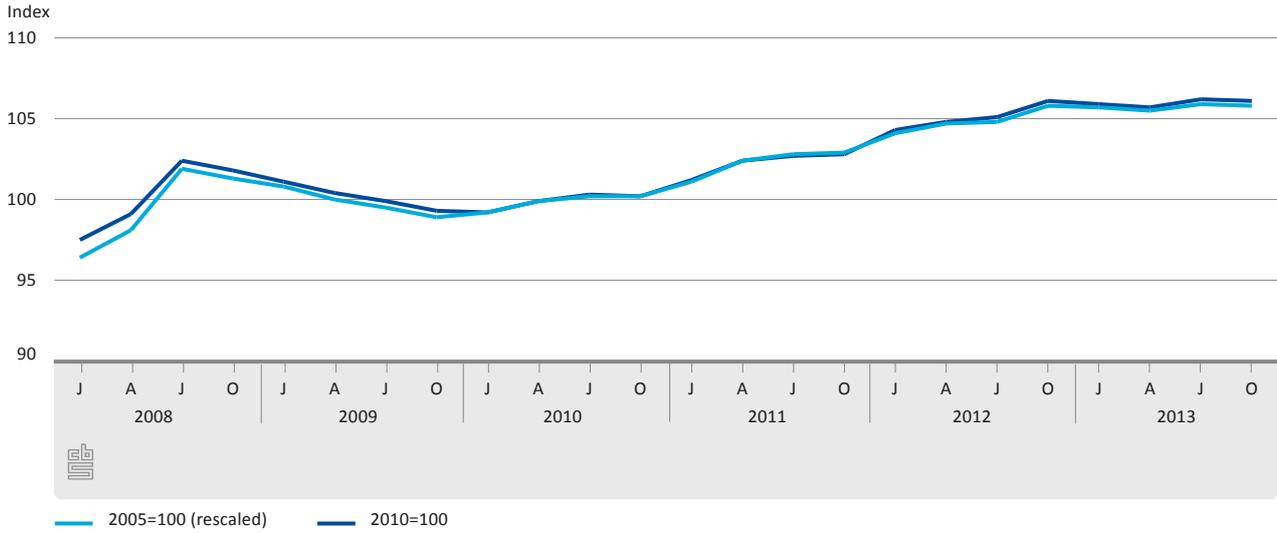
### 3.2.3 Railways and underground railways



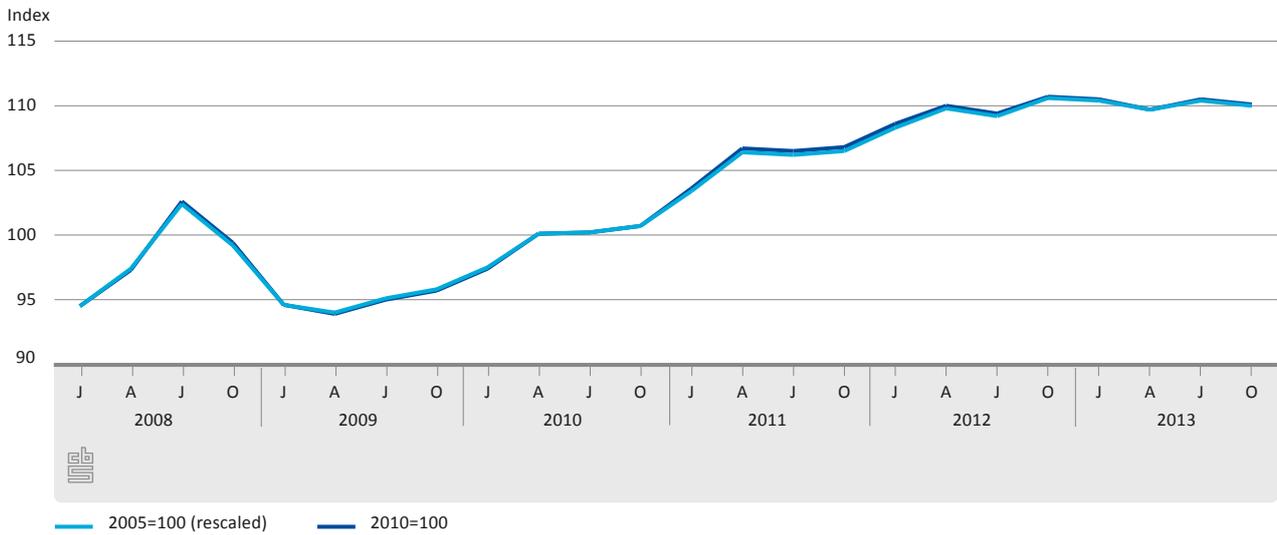
### 3.2.4 Bridges and tunnels



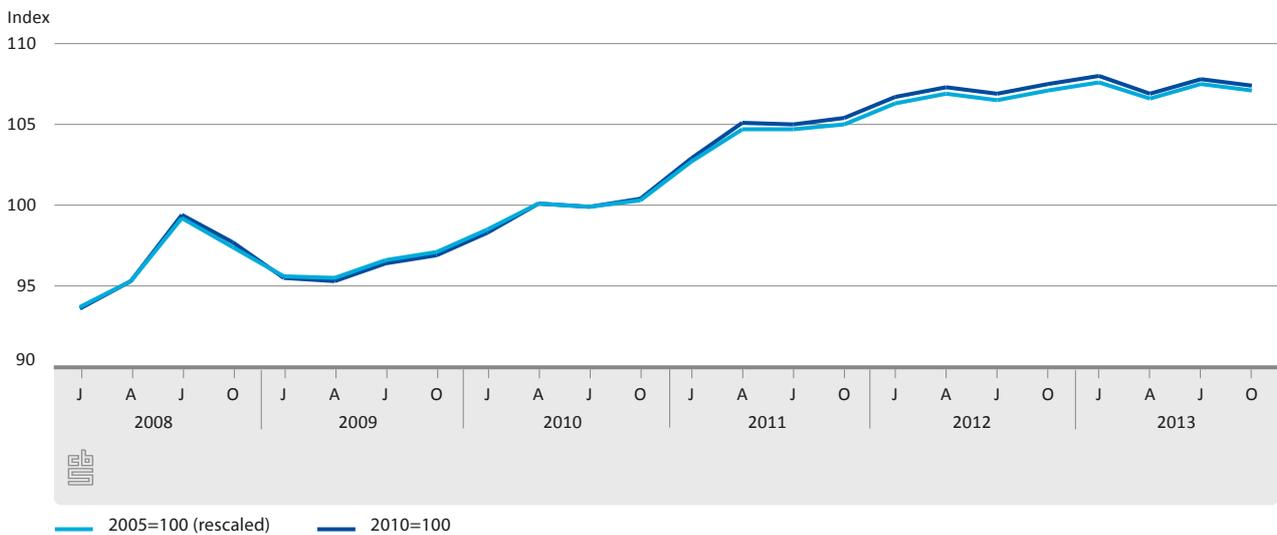
### 3.2.5 Constructions for fluids



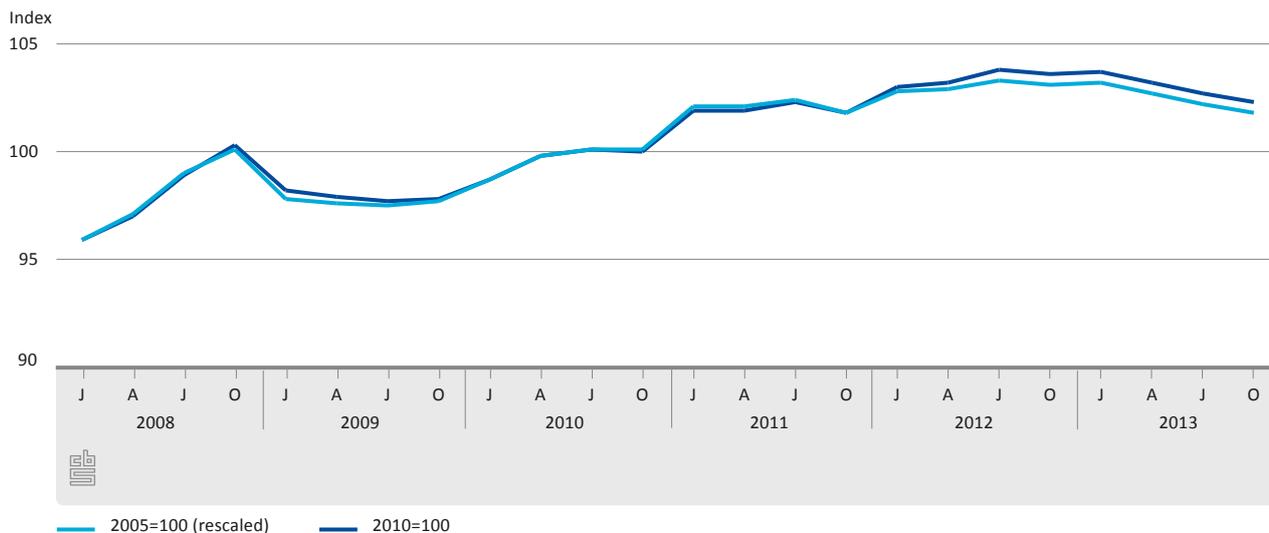
### 3.2.6 Constructions for water projects



### 3.2.7 Site preparation works



### 3.2.8 Electrical installation works



## 4. Switching from base 2005=100 to 2010=100

At the same time as the publication of the new figure for January 2014, the figures for the series 2005=100 were revised for the last time based on the most recent producers' price indices and the wage figures. After this, the old series is declared definite and more recent figures are only available in the series 2010=100.

For 42/43 Civil engineering, and the distinguished component areas, the new series (2010=100) can be linked to the old series (2005=100). Recommendations on how to do this are given below. If the results of the price indices of civil engineering works are used for indexation purposes, there are a number of options:

- The calculation of a price change over a period starting in or after January 2005 and ending no later than October 2013 is based on the series 2005=100.
- The calculation of a price change over a period starting in or after January 2008 and ending after October 2013 is based on the series 2010=100.
- The calculation of a price change over a period starting between January 2005 and October 2007, and ending after October 2013 is based on the linked series 2005=100. From January 2014 in the series 2010=100 the percentage change compared with October 2013 must be calculated, as the price index for October 2013 is the last figure published on base 2005=100; this change must then be adjusted to the results for October 2013 of the series 2005=100 (see example).

#### 4.1.1 Linking example

Period	Price indices		
	2005=100	2010=100	chained series
October 2013	152	121	152
January 2014		123	155

The January index of the linked series is determined by calculating the difference between October 2013 and January 2014 according to the series 2010=100 and multiplying this by the index for October 2013 according to the series 2005=100. In the example:  $(123/121) * 152 = 155$  (rounded). For April 2014 the index is calculated analogously, where because of rounding problems the October 2013 figures must be used for the link.

This recommendation is based on two assumptions: (1) that the price developments are calculated as much as possible within one published series, and (2) adjustments ex post are avoided as much as possible.

In addition to the series with different base years that describes a limited period, CBS also publishes a historical series 2000=100, from 1979. In this historic series are the series from first period of publication linked.

If you have any questions please contact the Infoservice at Statistics Netherlands.

**Annex 1 Weights for the 42/42 Civil engineering and the eight subareas by 2-digit prodcom and labour for the series 2010=100**

Prod-com	Omschrijving	42/43 Civil enginee- ring works	4211a Road construc- tion; brick paving	4211b Road construc- tion; asphalt paving	4212 Railways and under- ground railways	4213 Bridges and tunnels	4221 construc- tions for fluids	4291 Construc- tions for water projects	4312 Site pre- para- tion works	4321 Electrical installa- tion works
08	Sand and gravel	11	7	26	8	0	0	9	45	
13	Wovens	0						0		
16	Wood products	0			3	1		0		
19	Diesel and lubricating oils	7	5	10		1	5	17	13	0
22	Rubber or plastic	2	0	0		0	7			2
23	Concrete mortar, concrete products and bituminous products	19	33	20	5	20	49	4		3
24	Metal	2			7	17		0		3
25	Constructions of metal	5		7		3				24
26	Elektronic and optical products	1	0	0	7				0	2
27	Electronic equipments	8			23	0	1			47
28	Machines and tools	6	4	11	15	8	4	1	10	2
29	Cars and trailers	3	4	7		2	2	0	7	0
30	Other transport equipment	6						38		
Labour		29	45	19	33	49	34	31	25	18
TOTAL		100	100	100	100	100	100	100	100	100

## Explanation of symbols

.	Data not available
*	Provisional figure
**	Revised provisional figure (but not definite)
x	Publication prohibited (confidential figure)
–	Nil
–	(Between two figures) inclusive
0 (0.0)	Less than half of unit concerned
empty cell	Not applicable
2013–2014	2013 to 2014 inclusive
2013/2014	Average for 2013 to 2014 inclusive
2013/'14	Crop year, financial year, school year, etc., beginning in 2013 and ending in 2014
2011/'12–2013/'14	Crop year, financial year, etc., 2011/'12 to 2013/'14 inclusive

Due to rounding, some totals may not correspond to the sum of the separate figures.

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