

Rebasing the price indices of civil engineering works from 2000=100 to 2005=100

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Explanation of symbols

.	= data not available
*	= provisional figure
**	= revised provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2010–2011	= 2010 to 2011 inclusive
2010/2011	= average of 2010 up to and including 2011
2010/'11	= crop year, financial year, school year etc. beginning in 2010 and ending in 2011
2008/'09–2010/'11	= crop year, financial year, etc. 2008/'09 to 2010/'11 inclusive

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

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Introduction

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):

- 421111 Road construction; brick paving,
- 421112 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 2011, the price indexes for GWW will be published based on a new reference year: 2005. These new series were calculated retrospectively from January 2005 onwards. The base shift results in different figures from January 2005 to October 2010 compared with the old series based on 2000=100.

This article examines the changes that were implemented and the differences between the index series based on 2000=100 and the indices based on 2005=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 2000=100 and the 2005=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 2005). 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. The costs determine the percentage (weight) of that component in the total. 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 3.2 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 base shift also offers the possibility to implement other changes such as improved observation or new views. The changes made in aid of the base shift of the GWW price indices will be discussed step by step below.

2.1 New weighting schemes

To calculate the price indices of civil engineering, we use two weighting schemes. First, the price indices for labour, materials and equipment are weighted resulting in a price index of a particular area of civil engineering. Then there is a weighting scheme to combine the price indices of the particular areas of civil engineering which results in one total price index for civil engineering.

2.1.1 *Weighting schemes for labour, materials and equipment*

To determine the weights, quantity tables and cost estimates of representative projects were selected. These refer to activities and prices in various areas of civil engineering for the year 2010. These quantity tables and cost estimates provide information on the required amount of labour, materials and equipment types plus corresponding costs concerning construction work in the area concerned. These materials and equipment types are assigned to groups of goods of the PPI. Subsequently, the total cost for each group of goods is determined. These total costs per group of goods are the weight which reflects the proportion of the corresponding material or equipment type within that area. These weights are combined with the corresponding PPI and, together with the weight and the development of the labour costs per area, result in a price index.

2.1.2 *Weighting scheme areas*

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 for the year 2008. Turnover figures per area are derived from these data, which provide the proportion of each area in the total turnover of the civil engineering sector.

2.2 Reclassification according to the CPA

To render the results comparable, also in an international context, and linkable, the Classification of Products by Activity (CPA) is used. This classification also includes the products of civil engineering. Given that the CPA has no separate code for civil engineering, Statistics Netherlands combines the codes 42 and 43 to '42/43 Civil engineering'.

By using the CPA, the titles of the series are changed and there are some shifts of products between the areas. For instance, work for the construction of concrete or steel structures for railways are moved from area 'Railways' to area 'Bridges and tunnels'. As a result, the development of the new index series for each area may differ from the 'old' series based on 2000=100. The following table summarises the new and old names.

Table 1
Linking table new and old series names

New series, 2005=100		Old series, 2000=100
42/43	Civil engineering	Total civil engineering works
421111	Road construction; brick paving	Road construction with brick pavement
421112	Road construction; asphalt paving	Road construction with asphalt pavement
4212	Railways and underground railways	Railway construction
4213	Bridges and tunnels	Structural works (e.g. fly-over)
4221	Constructions for fluids	Sewerage construction
4291	Constructions for water projects	Execution of hydraulic engineering work
4312	Site preparation works	Earth moving activities

2.3 Producer Price Index

For the price development of materials and equipment, the Producer Price Indices (PPI), which are classified according to the so-called 'ProdComclassificatie' are used. Until the base shift of these statistics in February 2009, the price developments were calculated at 5 or 6-digit level. Therefore data were available for homogeneous groups of goods. Since the base shift in 2009, however, price movements are calculated at a higher level of aggregation (usually 4-digit). This means that new series contain less homogeneous groups of goods whereas the price development of the material and equipment costs in the period 2005-mid 2008, calculated on the new base 2005=100, may differ from the series calculated on the old base 2000=100.

2.4 Other distribution categories

Producer price statistics are based on various distribution categories such as Domestic sales, Imports and Domestic consumption. For the old series, price movements of the distribution category which represented the greatest value were used (Domestic sales or Imports). For the new series the price development of Domestic consumption is used. This is a weighted development based on domestic sales and imports.

3. Results for existing areas

The above-listed changes lead to differences between the price indices of civil engineering on the base 2005=100 and those based on the previous reference year 2000. This section explains the differences. The old series on base 2000=100 have all been rescaled to 2005=100.

3.1 42/43 Civil engineering

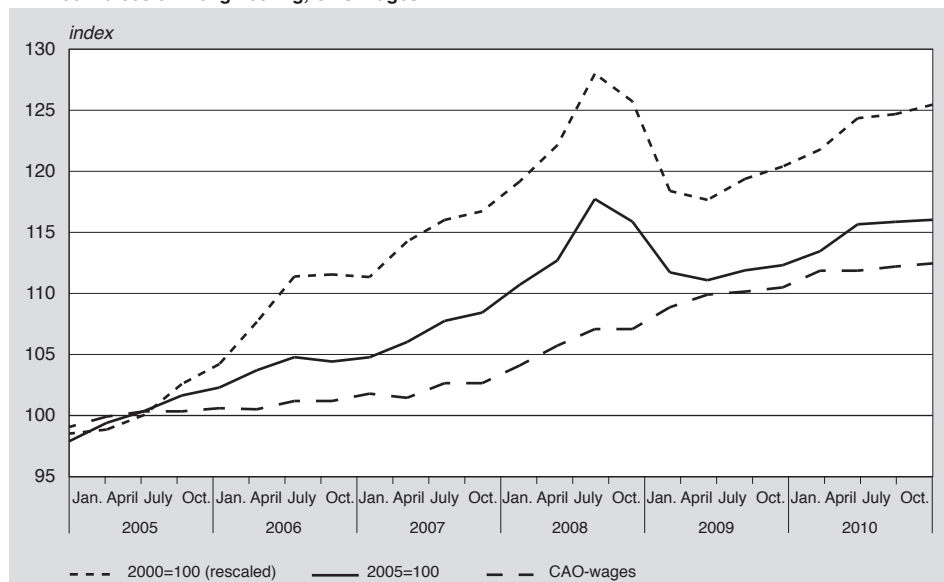
In addition to the series for the individual areas, a price index for the entire civil engineering sector is also published. This series is composed of the eight component series in the course of which the weighting scheme is based on the latest data of National Accounts (2008). Table 2 summarises the weighting scheme. The share of labour and materials and equipment in the total figure of the '42/43 Civil engineering' has also been added for the sake of information. These shares are a weighted sum of the division between labour and materials and equipment for each area.

Table 2
Shares of areas and of labour and material and equipment in 42/43 Civil engineering

Area of civil engineering	Weight
	%
421111 Road construction; brick paving	5,5
421112 Road construction; asphalt paving	22,3
4212 Railways and underground railways	5,0
4213 Bridges and tunnels	9,6
4221 Constructions for fluids	11,2
4291 Constructions for water projects	13,0
4312 Site preparation works	11,3
4321 Electrical installation works	22,0
42/43 Civil engineering	100,0
of wich:	
share of labour	26,5
share of materials and equipments	73,5

Surprisingly, the course of the old and the new series from mid-2006 is almost the same. The difference arises in 2005 and is caused by the series of 'Road construction; asphalt paving', 'Railways and underground railways' and 'Electrical installation works'. This is elaborated in the description of the various areas below.

1. Price indices civil engineering, CAO-wages

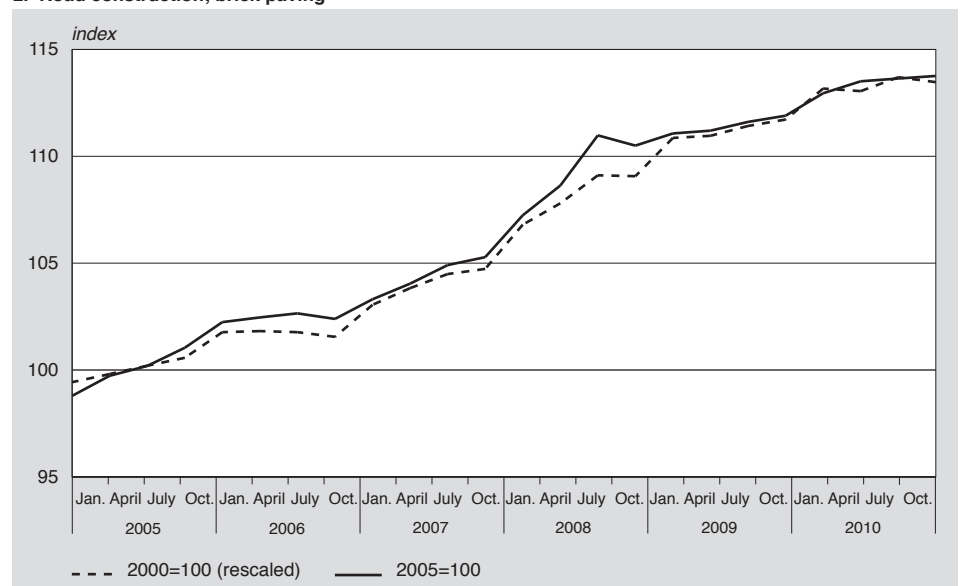


Like almost all the series for the various areas, the price index for '42/43 Civil engineering' shows an increase in 2008. This is mainly caused by the sharp movement in prices of some materials which occur in all areas. For instance, in 2008 the price of reinforcing bars increases by nearly 60 percent. Prices of gas oils and bituminous materials rose by 35 percent and nearly 25 percent respectively. 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 are included. These affect 25 percent of the development of the 42/43 Civil engineering price index.

3.2 421111 Road construction; brick paving

Graph 2 shows the new and the old series: there are no significant differences between the courses of the two series.

2. Road construction; brick paving



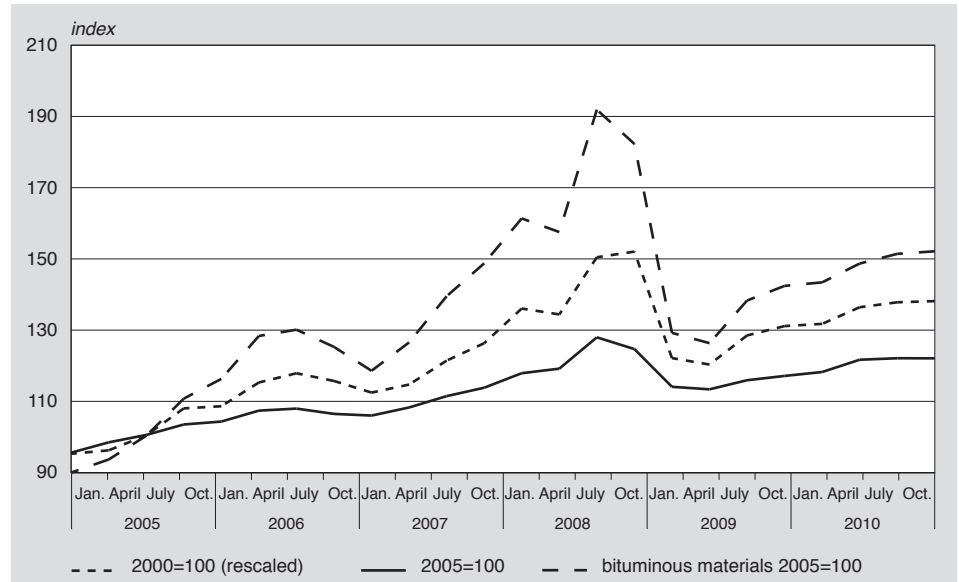
3.3 421112 Road construction; asphalt paving

This area covers the construction of asphalt roads. In addition to main roads, this also includes paved access roads and bicycle paths. Results differ between the old and the new series (see figure 3) because the new models also include other types of roads in the calculation. As the new model also includes bicycle paths, residential streets and access roads in addition to main roads, the significant price increase of bituminous materials has less influence, and the share of labour costs – with a smaller price development – increases. For the sake of clarity, the price development of bituminous materials is included in the graph. This determines, albeit to a small extent, the development of the entire series.

3.4 4212 Railways and underground railways

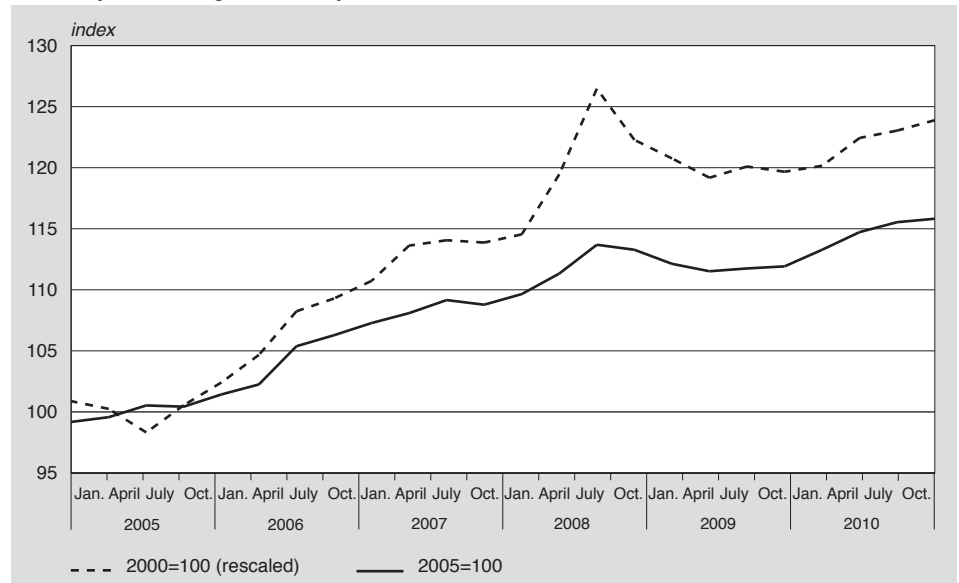
There are two main reasons for the different development between the old and new series. First, because the CPA is used series are now calculated only for the components superstructure/track work and security. The security element is new in this area and was formerly included in 'Electrical installation works'. Excavation/groundwork is included in 'site preparation works' and work for the construction of concrete or steel structures for railways has been moved to the area 'Bridges and tunnels'. Secondly, less homogeneous

3. Road construction; asphalt paving



groups of goods are now used (see section 2.3) which has an impact on this series. The new product group of metal profiles, for example, shows a more moderate price development than the product group used in the old series.

4. Railways and underground railways

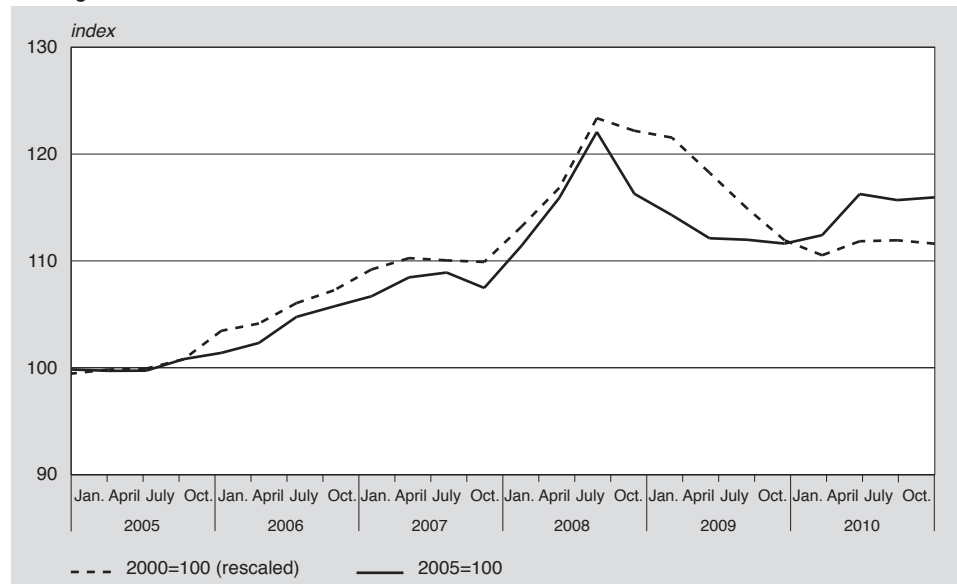


3.5 4213 Bridges and tunnels

The old series were solely based on a viaduct in which many prefab concrete elements were used (70 percent). In the new representative model, the concrete construction of the viaduct is mainly cast in and a steel bridge is also added to the model.

The developments in the two series differ from mid-2008. The price development of (reinforcing) bars and prefab concrete elements explains this difference. Now, the new series follows the prices of (reinforcing) bars, which initially increased sharply, then fell below the old level in 2009 and began to rise again in 2010. The price of prefab concrete elements largely determines the course of the old series. Prices of prefab concrete elements increased in 2008, and fell again in early 2010.

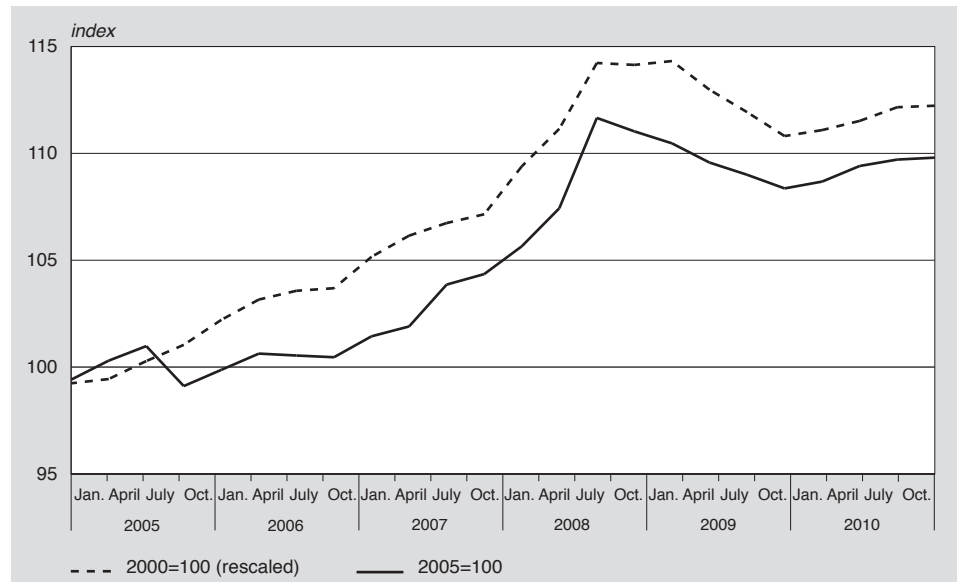
5. Bridges and tunnels



3.6 4221 Constructions for fluids

'Constructions for fluids' is the new name for the old series 'Sewerage construction'. The course of the new series differs from the old series. The difference arises in October 2005. After that, the course of the two series is virtually identical. The difference is caused by the sharp drop in the price of the product group which included concrete pipes (Prodcomcode 23691930) in October 2005. This group of products has a heavy weight and largely determines the course of this series. The decrease is caused by the choice for also using prices of imported products.

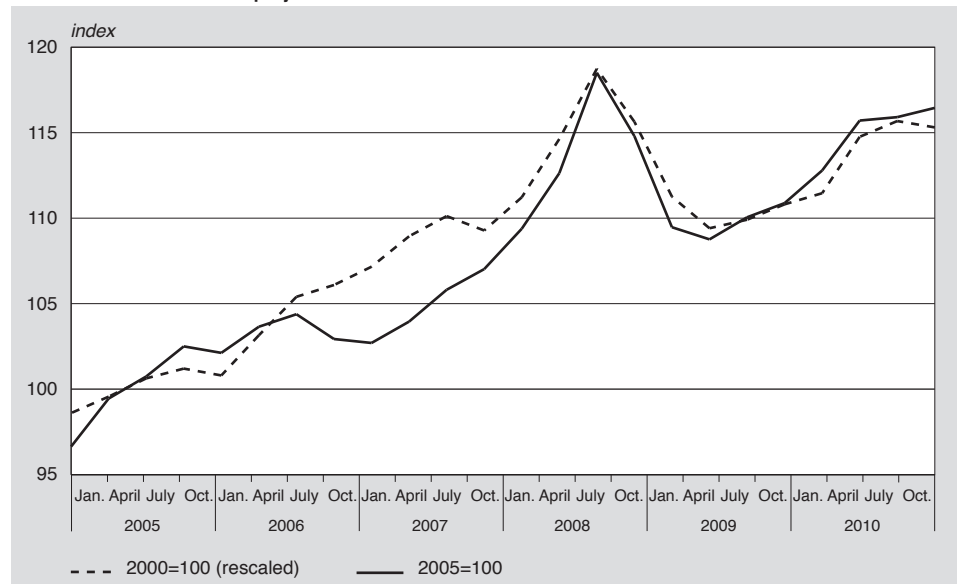
6. Constructions for fluids



3.7 4291 Constructions for water projects

From mid-2006 to 2007 a difference between the two series arises. This is caused by the new weighting schemes which are based on new models in which fuels, as a result of high prices in 2010, have a larger share in the building sums. Therefore, the development of fuel prices has an important effect on the course of the series.

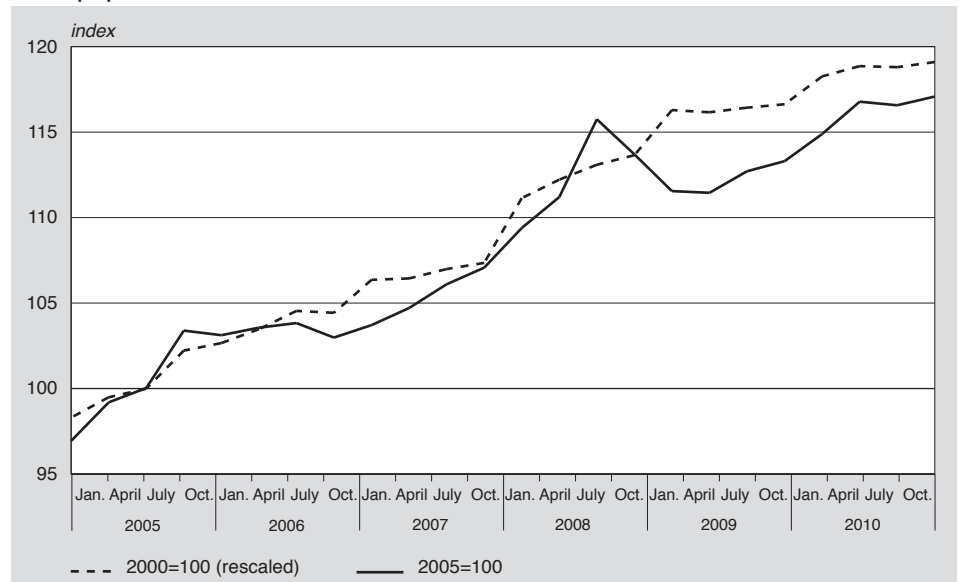
7. Constructions for water projects



3.8 4312 Site preparation works

The area 'Site preparation works' is the new name for the series 'Earth moving activities'. Again, the new series shows a different price development than the old one, mainly caused by higher motor fuel prices. Just as 'Constructions for water projects' these have a greater weight in the new model because of the high prices in 2010.

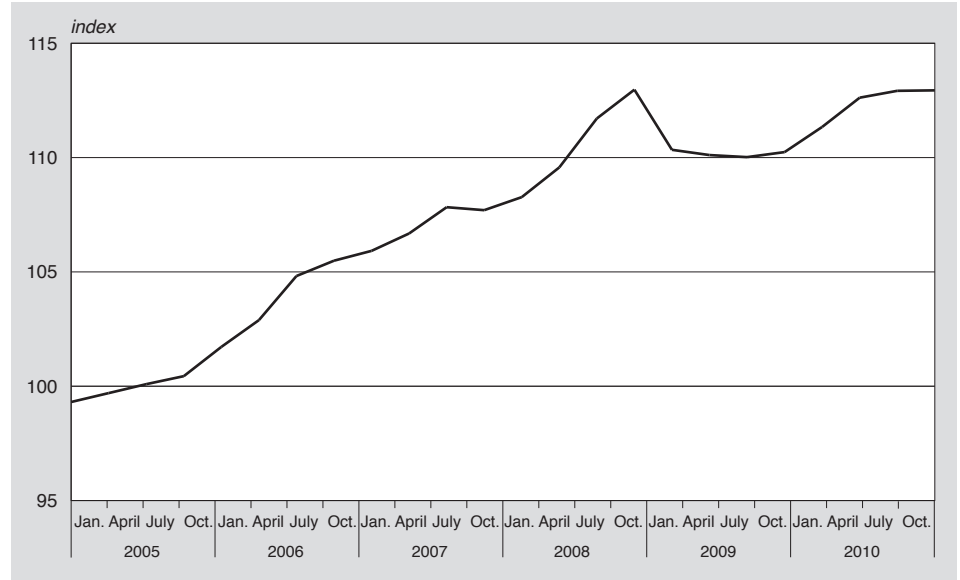
8. Site preparation works



3.9 4321 Electrical installation works

Starting from this base shift, the series 'Electrical installation works' is also published. Until now this series was not published as it did not fit into the selected classification of areas. As the CPA classification is now used, we decided to publish this series too. Figure 9 shows the course of this series.

9. Electrical installation works, 2005=100



4. Switching from base 2000=100 to 2005=100

At the same time as the publication of the new figure for January 2011, the figures for the series 2000=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 2005=100.

For 42/43 Civil engineering, and the distinguished component areas, the new series (2005=100) can be linked to the old series (2000=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 2000 and ending no later than October 2010 is based on the series 2000=100.
- The calculation of a price change over a period starting in or after January 2005 and ending after October 2010 is based on the series 2005=100.
- The calculation of a price change over a period starting between January 2000 and October 2004, and ending after October 2010 is based on the linked series 2000=100. From January 2011 in the series 2005=100 the percentage change compared with October 2010 must be calculated, as the price index for October 2004 is the last figure published on base 2000=100; this change must then be adjusted to the results for October 2010 of the series 2000=100 (see example).

Tabel 3
Linking example

Period	Price indices		
	2000=100	2005=100	chained series
October 2010	140	117	140
January 2011		120	144

The January index of the linked series is calculated by calculating the difference between October 2010 and January 2011 according to the series 2005=100 and multiplying this by the index for October 2010 according to the series 2000=100. In the example: $(120/117) * 140 = 144$ (rounded). For April 2011 the index is calculated analogously, where because of rounding problems the October 2010 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.

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