



## **Statistics Netherlands**

Division of Macro-economic Statistics and Dissemination  
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### **NEW DWELLINGS; OUTPUT PRICE INDICES BUILDING COSTS, 2010 = 100**

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*Date:*

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## **Introduction**

Statistics Netherlands calculates a quarterly output price index of newly built dwellings (OutputPrijsIndex van NieuwbouwWoningen, O-PINW) to monitor developments in the buildings costs of newly built dwellings in the Netherlands.

Starting from the figures of the first quarter of 2013, the O-PINW is calculated and published with 2010 as the new reference year (2010 = 100).

This paper contains a description of how the O-PINW is calculated. Furthermore, the development of the O-PINW with reference year 2010 = 100 is discussed. The first paragraph contains an explanation of the current method of calculating the O-PINW. The second section discusses the base year revision and subsequent changes. The third section deals with the course of the old and new price indices. Finally, we give some advice on how to link the new series 2010 = 100 to the old series 2005 = 100.

### **1. Calculating the O-PINW**

The O-PINW is based on information from the municipal administrations (the number of building licences issued). Municipalities provide these data to Statistics Netherlands every month. Building licences are issued on a project basis, i.e. more than one dwelling may be constructed with one licence. The observed prices refer to complete projects. Prices per dwelling are calculated by dividing the project price by the number of dwellings in the project. The building costs are the costs paid to the building contractor, and thus include general costs, profits and risk. This makes the O-PINW an output price index.

Monitoring the development of building costs of dwellings is difficult because no identical dwellings are built in consecutive periods for which we can monitor price developments. In order to overcome this problem, we use a hedonic method. This method provides the possibility to accommodate quality and measure the prices without the need of identical dwellings being observed in consecutive periods. The hedonic method means that the average building costs are estimated in a regression model on the basis of some price-defining variables. These variables are [1] volume of the dwelling (in cubic metres), [2] the number of dwellings in the project, [3] category of commissioning party, [4] type of soil, and [5] market sector of dwelling (owner-occupied or rental). Based on information from the base year (2007) a basic dwelling is determined, expressed as means of the five variables. This basic dwelling is not a real new dwelling, but an “average” house used to monitor price changes through time. Subsequently each quarter the building costs of the basic dwelling are estimated by means of the coefficients of the variables under the assumption that the dwelling was built in the quarter concerned. In order to calculate

a price index, the estimated building costs are compared with the estimated mean building costs in the reference year.

Not all dwellings are included in the regression analysis. We determine outliers in order to prevent peaks in building costs or the volume of the dwelling affecting the price index too much. The current outlier detection method indicates for each dwelling to what extent the building costs could be accounted for by the variables in the regression model. The dwellings with the smallest accounted factor are not included in the calculation. Because all dwellings under one building licence receive the same accounted factor, they will all be removed from the dataset in this case.

## **2. Alterations as a result of the base shift**

### **New base year**

The main change is that the basic dwelling, which is used as a basis for monitoring the developments in building costs of new dwellings, is adjusted. The basic dwelling is now based on the most recent regulations, in this case 2011 (base year). The year 2012 can not be used as base year, because not all building permits granted in 2012 have been reported to Statistics Netherlands yet.

The new basic dwelling is based on the average values of the variables used in the regression. Table 1 shows the means of the old base year 2007 and the new base year 2011. The comparison shows that the volume of an average newly built dwelling was 5 percent smaller in 2011 than it was in 2007. A possible explanation for this could be that the dwellings are put cheaper in the market in these economically difficult times.

Table 1.  
Basic dwelling 2007 and 2011

	2007	2011
Volume of dwellings in cubic metres *	529	501
number of dwellings in project *	5,19	5,26
<b>Type of soil</b>		
Sand, wadden sea, hills and dunes	0,53	0,53
Fenland	0,10	0,12
River Areas	0,10	0,10
Sea clay soil	0,25	0,24
Tidal areas, Zeeland and enclosed sea inlets	0,03	0,02
<b>Category of commissioning party</b>		
Government and housing corporations	0,22	0,21
Comercial developers and corporate investors	0,64	0,64
Private persons and others	0,14	0,15
<b>Market sector</b>		
Rental	0,18	0,24
Owner-occupied	0,82	0,76

The variables 'Volume of dwelling in cubic metres' and 'Number of dwellings in project' are included in the index calculation as the logarithm of their means. The other variables are changed into dummy variables, i.e. they have a value of 0 or 1 (present or not present).

The means in the sub categories type of soil, category of commissioning party and market sector represent the proportional share of the value within a category.

The average number of dwellings per project increased from 5.19 in 2007 to 5.26 in 2011. Compared to 2007 the percentage of houses built for the rental sector was higher. Analysis has shown that this is because the number of rental dwellings of builders for the market and institutional investors has increased.

Due to the adjustment of the basic dwelling, the course of the new price indices changes compared to the old series. From the first quarter of 2008 until the fourth quarter of 2012, different developments in the same period based on the old and the new basic dwelling are a possibility.

#### **Different reference year**

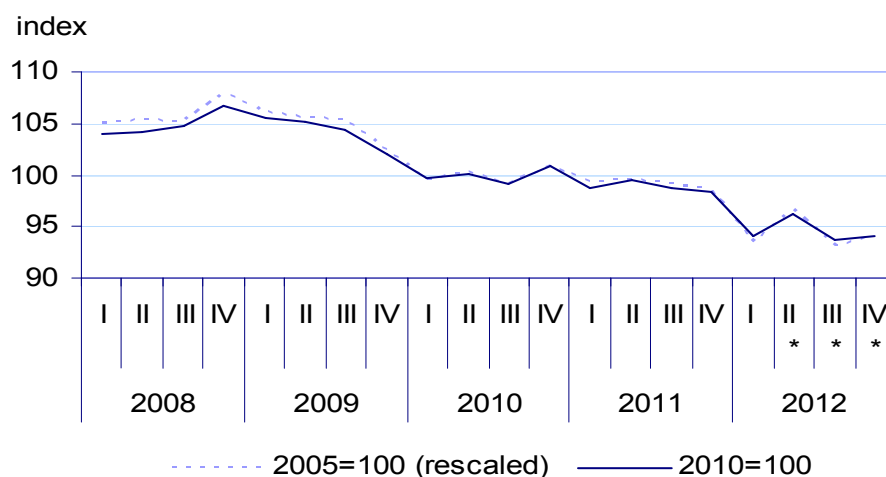
In the new series the price indices are calculated compared to the new reference year 2010. In that year the average of the price indices of the four quarters is 100.

### 3. Old and new series O-PINW

The new basic dwelling also leads to a new series price indices with reference year 2010 = 100. These new series based on the old and the new reference year, are shown in graph 1. Both series are based on all available data. Data that arrives too late at the Statistics Netherlands for the calculation of the definite index figures are now included. Therefore the dataset differs from the one used for the published index series 2005 = 100. The 2005 = 100 series is also rescaled to 2010 = 100 to simplify the comparison with the new series.

The course of both series is practically the same. Both series increase and decrease at the same time. At the end of the series (fourth quarter 2012) the difference between the two series is 0.1 of an index point. The average variance between the two series is 0.34 of an index point.

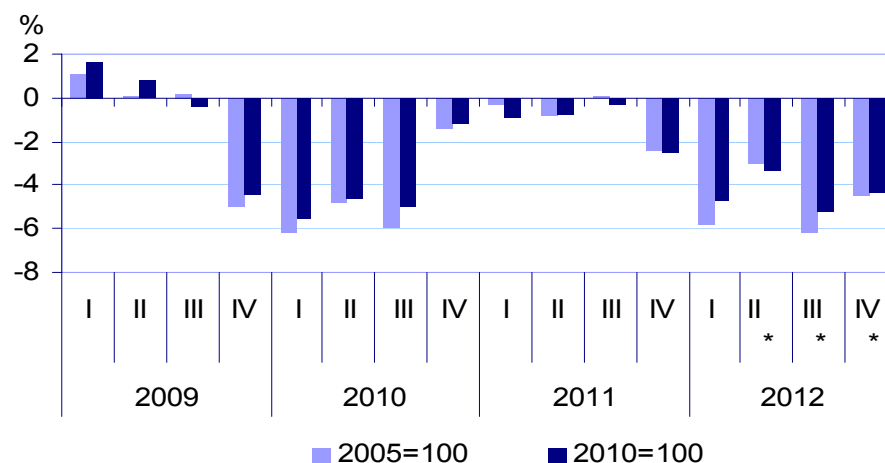
Graph 1. Price indices O-PINW, series 2005 = 100 (rescaled) and 2010 = 100



In the second quarter of 2008 the biggest difference is noted (1.2 index points). The differences between the developments are caused exclusively by the new defined basic dwelling.

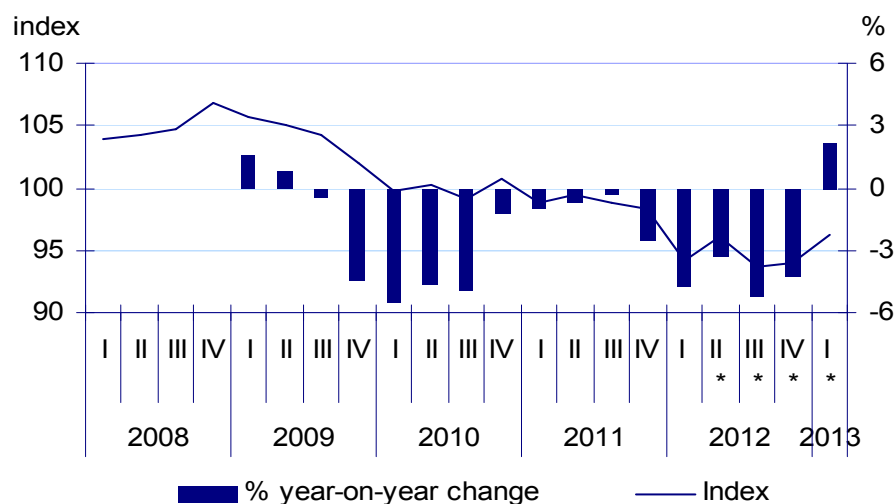
Graph 2 shows the differences in year-on-year changes between the old and the new basic dwelling.

Graph 2. Price indices O-PINW, changes to one year earlier



In graph 3 below, the new series 2010 = 100 is shown. Also the index trend compared to a year earlier is shown in the graph.

Graph 3. Price indices O-PINW, 2010 = 100 and changes to one year earlier



#### 4. Transition from reference year 2005 = 100 to 2010 = 100

At the same time as the first publication of the new figures in the series 2010 = 100, the figures for the series 2005 = 100 were revised for the last time based on the most recent building permits. After this, the old series is declared definite and more recent figures will only be available on the basis of 2010 = 100.

Statistics Netherlands advises for administrative applications (for example in contracts) of the O-PINW, to calculate price developments as much as possible within one series. In that case, an identical product in the time is compared.

Further recommendations:

- The calculation of a price change in a period starting in or after January 2005 and ending no later than December 2012 is based on the series 2005 = 100.
- The calculation of a price change in a period starting in or after January 2008 and ending no later than December 2012 is based on the series 2010 = 100.
- The calculation of a price change in a period starting between January 2005 and December 2007, and ending after December 2012 is based on the linked series 2005 = 100. From the first quarter of 2013 the percentage change compared to the last quarter of 2012 must be calculated on base 2010 = 100, as the price index for the last quarter of 2012 is the last figure published on base 2005 = 100. This development must then be adjusted to the results for the last quarter of 2012 of the series 2005 = 100 (see example).

*Table 2.*

*Linking example for different series of price indices*

Index series	2012	2013
	4th quarter	1st quarter
2005 = 100	98,5	
2010 = 100	94,0	96,2
Linked series 2005 = 100	98,5	100,8

The index for the first quarter of 2013 of the linked series is calculated by calculating the difference between the fourth quarter of 2012 and the first quarter of 2013 according to the series on 2010 = 100 and multiplying this by the index for the fourth quarter of 2012 according to the series 2005 = 100.

In the example:  $(96.2 / 94.0) * 98.5 = 100.8$  (rounded).

For the second quarter of 2013, the index is calculated analogously, where the figures for the last quarter of 2012 must be used for the link because of rounding problems.

If you have any questions please contact the infoservice of Statistics Netherlands