



## Statistics Netherlands

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

## BASE SHIFT DOCUMENT

Project number

*EBD*  
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Summary

*This document describes the base shift of the output price indices building costs of new dwellings from 2010=100 to 2015=100.*

Key words

*Price indices, building costs, new build, dwellings*

## Introduction

Every quarter, Statistics Netherlands (CBS) calculates figures as part of the series Output price index of new build dwellings (OutputPrijnsIndex van NieuwbouwWoningen, O-PINW) to monitor developments in the construction costs of new build dwellings in the Netherlands.

As of the first quarter of 2018, the O-PINW uses 2015 as the new reference year to calculate and publish figures starting from the first quarter of 2012 (2015=100).

This paper contains a description of how the O-PINW is calculated. The first paragraph contains an explanation of the current method of calculating the O-PINW. The second paragraph describes 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 2015=100 to the old series 2010=100, for example when amending contracts and the like.

## 1. Calculating the O-PINW

The O-PINW is based on monthly data received from municipal administrations (the number of building permits granted by municipalities for new build dwellings). Building permits are issued on a project basis, more than one dwelling may be constructed with one permit. Construction costs per dwelling are calculated by dividing the total project price by the number of dwellings in the project. These are the costs paid to the building contractor thus including general costs, profits and risk for the contractor. This makes the O-PINW an output price index figure.

Monitoring the development of construction costs of dwellings is difficult as no identical dwellings are built in two consecutive periods. We use a hedonic method to overcome this problem. This method offers the possibility to adjust for quality and allows price measurement without the need to observe the exact identical dwelling each quarter. The hedonic method means that the average construction costs are estimated in a regression model on the basis of a number of 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 data from the base year (2016) 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, the construction costs of the basic dwelling are estimated quarterly, and on the basis of the coefficients of each of the variables under the assumption that the dwelling was built in the quarter concerned. In order to calculate a price index, the estimated construction costs are compared with the estimated mean construction costs in the reference year.

Not all dwellings are automatically included in the regression analysis. Outliers are determined in order to prevent peaks in construction costs or the volume of the dwelling

from affecting the price index too much. The current outlier selection method indicates for each dwelling to what extent the construction costs could be accounted for by the variables in the regression model. Dwellings with the lowest explanatory factor are not included in the calculation. Because all dwellings under one building permit receive the same mean values and therefore an equally low explanatory factor, they will all be removed from the dataset in this case.

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

### 2.1 New base year

The main change is that the basic dwelling, which is used as a basis for monitoring price developments in construction costs of new dwellings, is being adjusted. The presently used basic dwelling is based on the most recent data and regulations, in this case 2016 (base year). The year 2017 cannot be used as base year, as not all building permits granted in 2017 have been reported to Statistics Netherlands yet.

The new basic dwelling expressed in mean values of the variables used in the regression calculation. Table 1 shows the means of the old base year 2011 and the new base year 2016.

*Table 1. Basic dwelling 2011 and 2016*

	2011	2016
Volume of dwellings in cubic metres*	501	491
Number of dwellings in project*	5.26	4.71
<b>Type of soil</b>		
Sand, mudflats, hills and dunes	0.53	0.45
low moorland	0.12	0.15
River areas	0.10	0.15
Sea clay soil	0.24	0.24
Zeeland and enclosed sea inlets, tidal areas	0.02	0.01
<b>Category of commissioning party</b>		
Government and housing corporations	0.21	0.10
Commercial developers and corporate investors	0.64	0.68
Private persons and others	0.15	0.22
<b>Market sector</b>		
Rental	0.24	0.29
Owner-occupied	0.76	0.71

The variables marked with an \* have been included in the index calculation as logarithms of their mean values. The other variables are changed into dummy variables, i.e. they have a value of 0 or 1 (present or not present).

The mean values in the sub categories Type of soil, Category of commissioning party and Market sector are the result of percentage distribution of the value within each category.

The comparison of the basic dwellings of 2011 and 2016 shows that, on average, smaller projects are built. This is consistent with the observation that the share of private commissioning parties has increased from 15 to 22 percent.

Furthermore, the share of rental dwellings has increased, from 24 to 29 percent. This explains why the average dwelling in 2016 is built approximately 2 percent smaller than in 2011. On average, rental dwellings are smaller built than owner-occupied dwellings.

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 2012 until the fourth quarter of 2017, different developments in the same period based on the old and the new basic dwelling are a possibility.

## **2.2 Different reference year**

In the new series, the price indices are calculated against the new reference year 2015. The average of the price indices of the four quarters is 100 in that year.

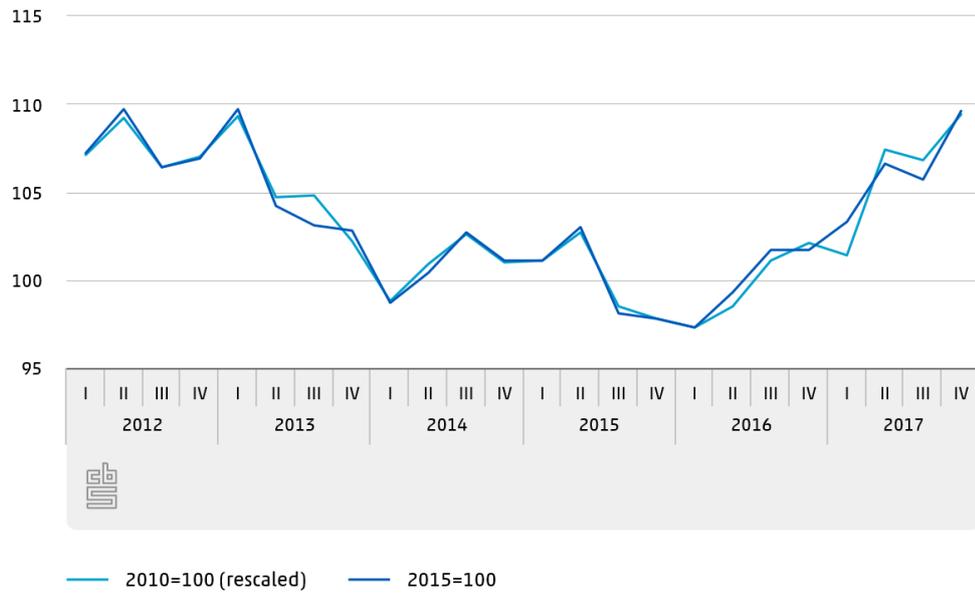
## **3. Old and new series O-PINW**

Determining the new basic dwelling also leads to a new series of price indices with reference year 2015=100. These new series based on the old and the new reference year are shown side by side in graph 1. Data which was not received in time by the Statistics Netherlands for the calculation of the definitive indices in the old series are no longer included in the calculation of these series. Therefore, the new series 2015=100 has been calculated on the basis of all available data. This explains why the dataset used is different from the one published in the index series 2010=100.

The 2010=100 series was also rescaled to 2015=100 to simplify comparison between both series. Both series show a highly similar development. Mid-way through 2013 and at the start of 2017, the series show a greater difference. Contributing factors are a difference in one dataset due to late available data and as a result of the outliers selection, as well as a different construction cost correction due to quality differences in time by tightening of the energy performance coefficient (EPC).

For the whole period of the first quarter of 2012 up to the fourth quarter of 2017, the average deviation between both series is 0.0 index points.

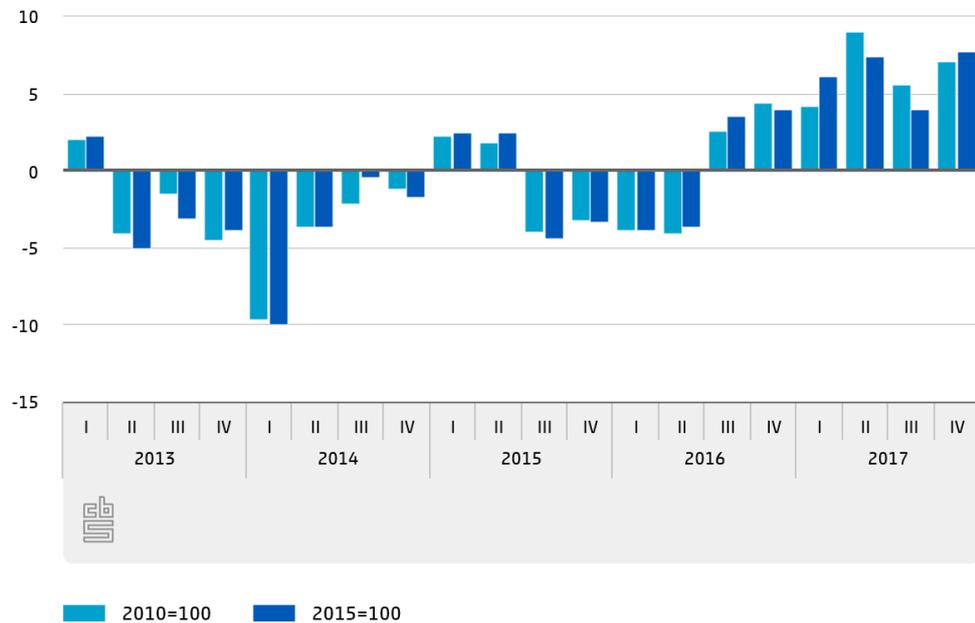
### Price indices O-PINW, series 2010=100 (rescaled) and 2015=100



The second graph shows the differences in year-on-year changes between the old and the new basic dwelling.

### Price indices O-PINW

%-changes to one year previously

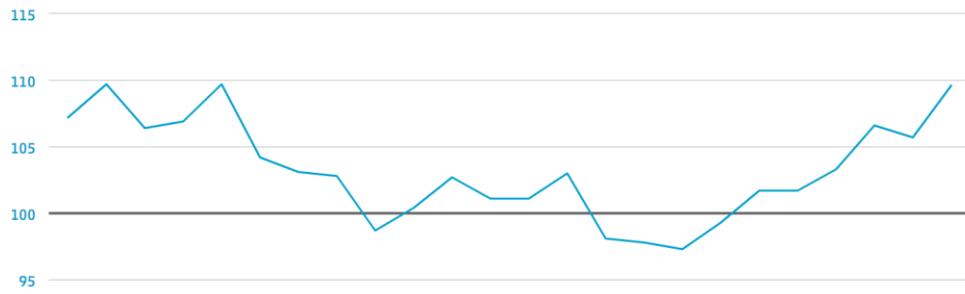


In the third graph below, the new series 2015 = 100 is shown. Also the index trend compared to one year previously is shown in the graph.

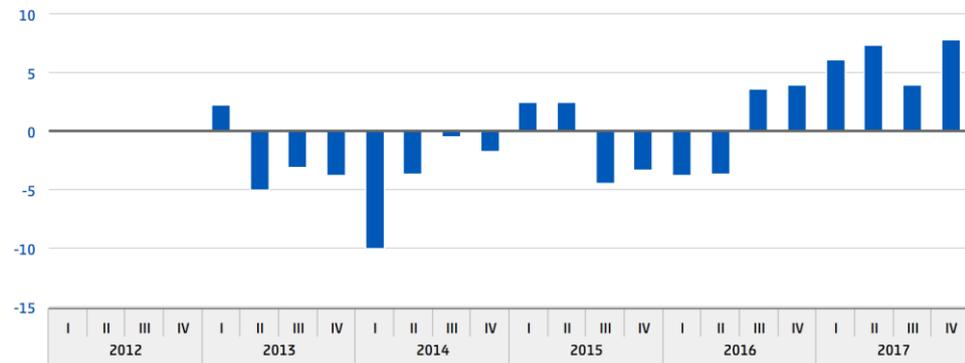
## New price indices O-PINW



Price indices O-PINW (2015=100)



%-changes to one year previously



#### **4. Transition from reference year 2010=100 to 2015=100, Price development over a longer period of time**

CBS also publishes a historical series especially for price developments over a period starting prior to 2012 (start of series 2015=100). This series, called *New dwellings; output price indices building costs 2000=100, since 1914* was created by linking several shorter time series. This historical series is ideally suited to calculate the construction cost development over a long series of years.