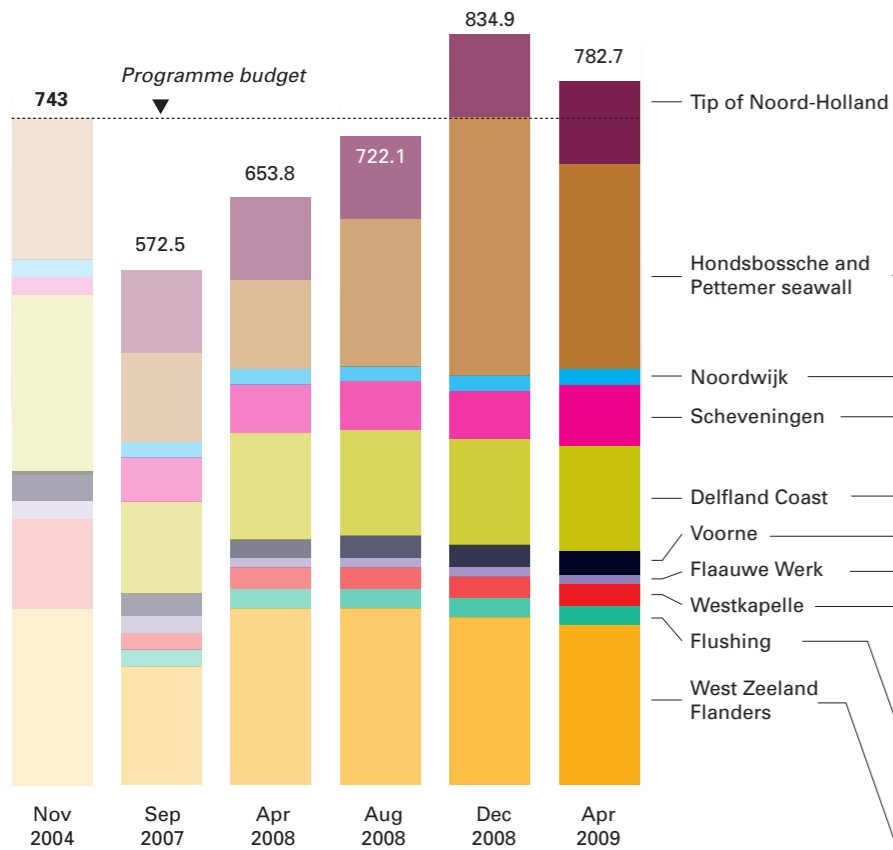


Cost of the *Weak Links in Coastal Defences Programme*

A review performed in 2003 revealed a number of weak links in the Dutch coastal defences, where the seawall no longer met safety standards. The Ministry of Transport, Public Works and Water Management has now decided to strengthen the seawalls in ten places and to this end has drawn up a plan called the Weak Links in Coastal Defences Programme. The idea is for work on the strengthening of the coastal defences at the ten locations to be completed by the end of 2015. The Ministry has budgeted a sum of € 743 million for the programme.

Changes in estimated total cost of *Weak Links in Coastal Defences Programme*

Estimated cost of each project, at six different points in time (in millions of euros)



- Tip of Noord-Holland
- Hondsbossche and Pettemer seawall
- Noordwijk
- Scheveningen
- Delfland Coast
- Voorne
- Flauwe Werk
- Westkapelle
- Flushing
- West Zeeland Flanders

Dual object: simultaneous improvements in safety and quality of the spatial environment

The Weak Links in Coastal Defences Programme is designed to achieve two objects at the same time: to improve safety and to raise the quality of the spatial environment. This dual objective has the effect of raising the level of spending by the Ministry of Transport, Public Works and Water Management. The extra cost does not stem from the requisite level of investment in land-use planning, as these charges are borne by the relevant

local authorities. The problem is that the safety solution associated with changes in the spatial environment (such as the use of consolidation sand) is generally costlier than a simpler solution that would nevertheless meet the relevant safety standard, e.g. dyke reinforcement. To date, the additional cost thus incurred for the programme as a whole stands at approximately €107 million (+14%).

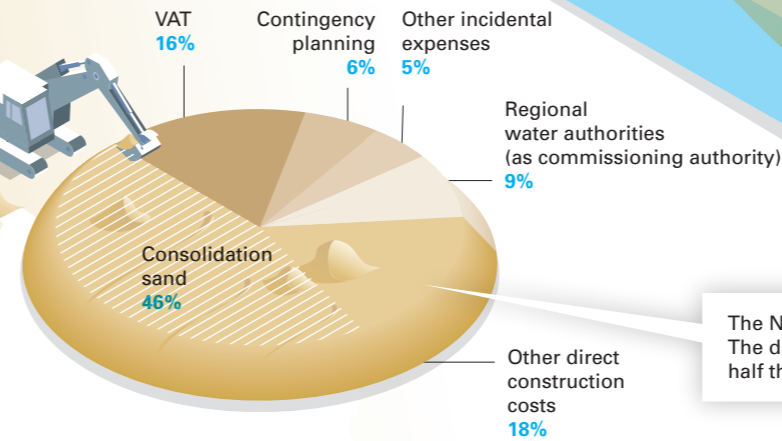
A modest alternative

The simplest solution would simply involve raising the dykes along the coast. Here, public safety (i.e. flood defence) would be the only consideration.

The preferred option

Using consolidation sand to strengthen the coastal defences is a more expensive solution. However, this option does enable the authorities to adapt the spatial environment in a manner that caters not just for the interests of the flora, fauna and the landscape, but for people's leisure needs as well. The local and regional authorities pay for the cost of this type of spatial adjustment.

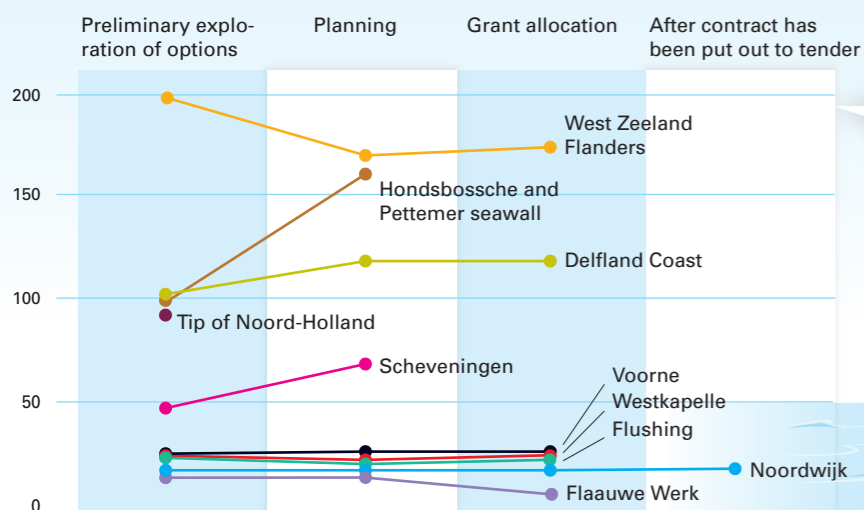
Distribution of costs arising from Noordwijk project



The Noordwijk project is the project that has made the most progress to date. The distribution of expenditure is shown in the diagram opposite. Almost half the budget has been spent on consolidation sand.

How are costs controlled in successive project stages?

Cost per stage and per project (in millions of euros)



In the case of most coastline defence projects, the estimated cost remains more or less stable in successive project stages.

When the programme was launched, market prices were running at around € 3 per m³. This proved to be an all-time low, however, and by the end of 2008 market prices were generally over € 7 per m³.

Main cost factor: the price of consolidation sand

The cost of extracting sand from the seabed and then using it for infill purposes has a huge impact on the cost of the programme as a whole. This is because tens of millions of cubic metres of sand are needed for the purpose of recharging beaches and dunes.

Estimated price of consolidation sand for each project, per m³

