Attachment 1 protection of the Danish west coast by Ecobeach

Stronger beach

Sand particle analyses in the Netherlands and Denmark (TU Delft)
During the test it has been observed that large quantities of fine sand are blown towards the dunes in the test areas. If the coarse fraction of the sand remains on the beach it will increase the resistance of the beach progressively.

Both in the Dutch and in Danish test areas it has been investigated whether this would affect the particle size distribution on the beach. It has been found that in the southern test area at Egmond, the particle size diameter had significantly coarsened compared to the particle size before the test. This coarsening has occurred only in the upper 2 m – the active zone- of the beach.. The Ecobeach /PEM areas are located within the dashed lines.

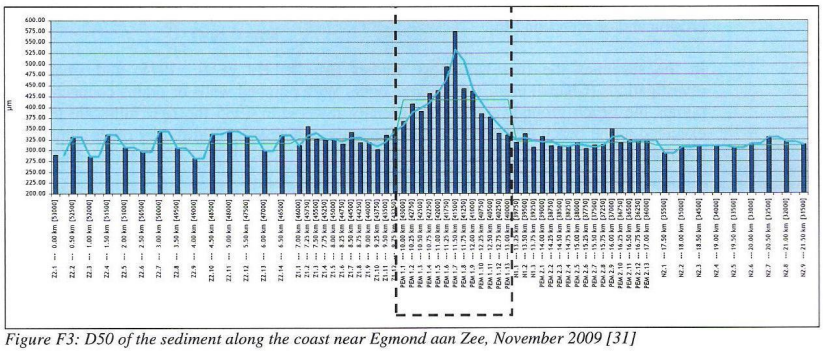
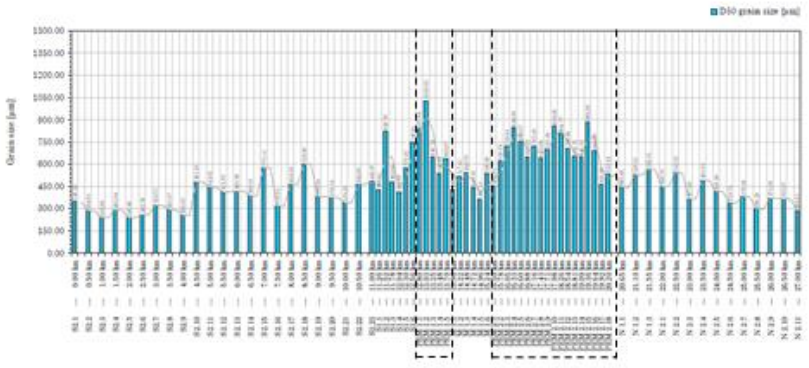


Figure F3: D50 of the sediment along the coast near Egmond aan Zee, November 2009 [31]

Also in the test areas at Hvide Sande significant coarser sand has been found in the Ecobeach/PEM area compared to the adjacent areas.



The coarsening of the sand caused by Ecobeach leads to a beach which is more stable under wave attack.
The sand particle size is in all coastal formulas a decisive parameter for the stability of the beach.

More sand on the beach

first Analyse of the PEM site near Hvide Sande (situation 2014)
In 2015 BAM received the surveys of the Ecobeach/PEM site near Skodbjerge. BAM has made some first analyses. This Ecobeach site is active for almost ten years.

In the reference area 2, PEM tubes have only been installed since 2009. The reference area 2 is trapped between the two initial PEM areas and shows a significant 200 m3/m' decrease of the beach volume in comparison to the PEM areas up to 2009.

After placing the PEM/Ecobeach in 2009 system in the reference 2 area there is a significant recovery of the beach volume. The behaviour of the ref 2 area after Ecobeach installation can easily be explained by the effects of the system on the beach such as the coarsening of beach sand induced by the system.