

**RECYPMA**  
Possibilities for high quality **RECY**cling of **Polymer Modified Asphalt**

a research project of the  
cross-border funded joint research programme  
“**ENR2011 DESIGN – Rapid and durable Maintenance Method and Techniques**”

### 1) Introduction

“ENR2011 DESIGN – Rapid and durable Maintenance Method and Techniques” is a trans-national joint research programme that was initiated by “ERA-NET ROAD II – Coordination and Implementation of Road Research in Europe” (ENR2), a Coordination Action in the 7th Framework Programme of the EC. The funding partners of this cross-border funded Joint Research Programme are the National Road Administrations (NRA) of Belgium, Germany, Denmark, Finland, France, Netherlands, Norway, Sweden, Slovenia and United Kingdom.

### 2) Project Facts

<b>Duration:</b>	01-10-2011 – 30-09-2013
<b>Budget:</b>	EUR 315.000
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### 3) Project Description

Throughout Europe polymer modified asphalt (PMA) is used extensively in the past decades for high trafficked roads and premium pavements; especially for surface layers. The addition of polymers contributes to the durability and functionality of these premium pavements, such as noise reducing pavements (the Netherlands) or rutting resisting pavements (Denmark and Slovakia). These pavements are now more and more reaching their end of life. Therefore the road sector is facing a rapidly increasing source of reclaimed asphalt (RA) that contains polymer modified bitumen (PMB), which offers a potential premium binder contribution. Depending on the hardened state of the combined binder and the deterioration of the aggregate gradation during milling and further pre-processing, it is the challenge to the road sector to ensure – as far as possible – that the PMB containing RA is recycled at its highest practical potential. The goal is to avoid downgrading of RA containing a potential valuable asset.

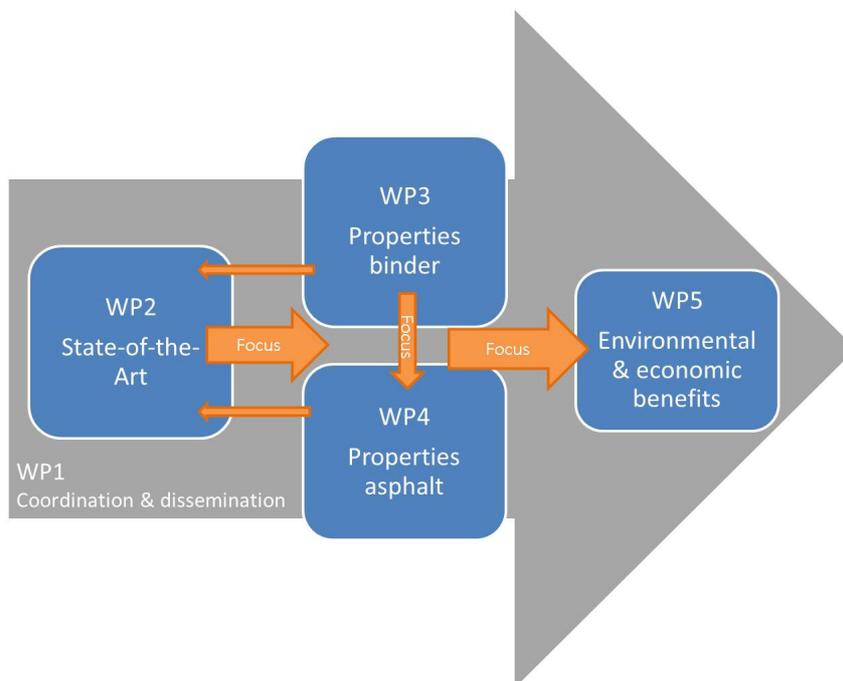
From a technological perspective, the hypothesis is that the impact of the rheology of the aged polymer modified bitumen predominantly originates from aging of the base bitumen while the polymer remains reasonably inert to oxidative hardening. If the old binder can be recycled into new hot mix asphalt without excessive thermal impact on the polymer (degradation) a positive impact on the properties of a revived binder can be achieved.

From an economical and ecological perspective, the hypothesis is that when RA from premium quality, high trafficked pavements can be recycled into new premium quality pavements, the benefit for National Road Authorities as well as the road sector will be

considerable because of the shorter hauling distances (lower carbon footprint) and the fact that less primary resources are needed for premium quality bitumen and aggregate (important for EU countries that are dependent on import of primary raw materials).

In the RECYPMA project we will investigate the possibilities for recycling polymer modified asphalt from surface layers into new high quality surface layers using hot mix recycling. The recycle process will be based on a state-of-the-art-review and laboratory scale experiments. The economic and ecological effects of the of recycling PMA will be evaluated.

The project consists of 5 Workpackages. WP 1 is set up for coordination and dissemination. To ensure a diversity that is relevant for Europe, a broad departure is taken through the state-of-the-art review (WP2), followed by gradually focusing to three types of RA asphalt mixtures (one per participating country), one type of polymer modification and one type of pavement application (surface layer) for determining the binder properties in WP3. Based on the results of WP3 three asphalt mixtures will be designed with the reclaimed asphalt in order to determine the asphalt properties and quality. At the end, based on the results of WP 2, 3 & 4, focus is made on a specific road case for estimating environmental and economic benefits (WP5). A schematic figure of how the work packages are linked in terms of focus and chronology is given below.



#### 4) Expected Results

The research in this project will particularly contribute on gaining technical knowledge on the challenges, the possibilities and limits of high quality recycling of aged polymer modified bitumen through laboratory studies.

The project will show the possibilities and effects of recycling of polymer modified asphalt and will quantify the benefits. These quantified benefits can easily be translated into schemes that National Road Authorities use in their demands for environmental friendly and cost effective solutions.

The improved knowledge will create a market for the new type of reclaimed asphalt containing polymer modified binders. This will avoid downgrading and allow for a better utilization of the potential properties of polymer modified reclaimed asphalt in recycling in European countries.