

Introduction

The delta 'Rijnmond-Drechtsteden' is a vulnerable area where the sea and the rivers meet. The densely populated area is the economical heart of the Netherlands and is surrounded by green polders with agriculture, nature and recreation areas. It is utmost important that also in future the Rijnmond-Drechtsteden will remain protected from high water. As a part of the Dutch Delta programme, the government parties in this region developed a new strategic approach that is effective and adaptive. Flood protection is linked with the objectives for economic development, nature and landscape preservation and living and recreation. To achieve this, a chain of new 'models' were developed covering 3 fields of decision making:

- **Protection against floods:** flood risk management strategies including an update of protection standards;
- **Costs-benefit models;**
- **Governance:** program management, joint-fact finding and a new approach on adaptive spatial planning.

This multi-disciplinary, multi-actor approach can be used all over the world.

Strategic Approach

Joint fact finding: all parties in the region, including NGO's and industries are invited to bring in knowledge and expertise in order to develop a strategic approach.

Adaptive spatial planning: Four strategic spatial perspectives have been developed on flood management, in accordance with the characteristics of the distinctive areas. These perspectives provide guidelines for the measures that will be taken.

Governance

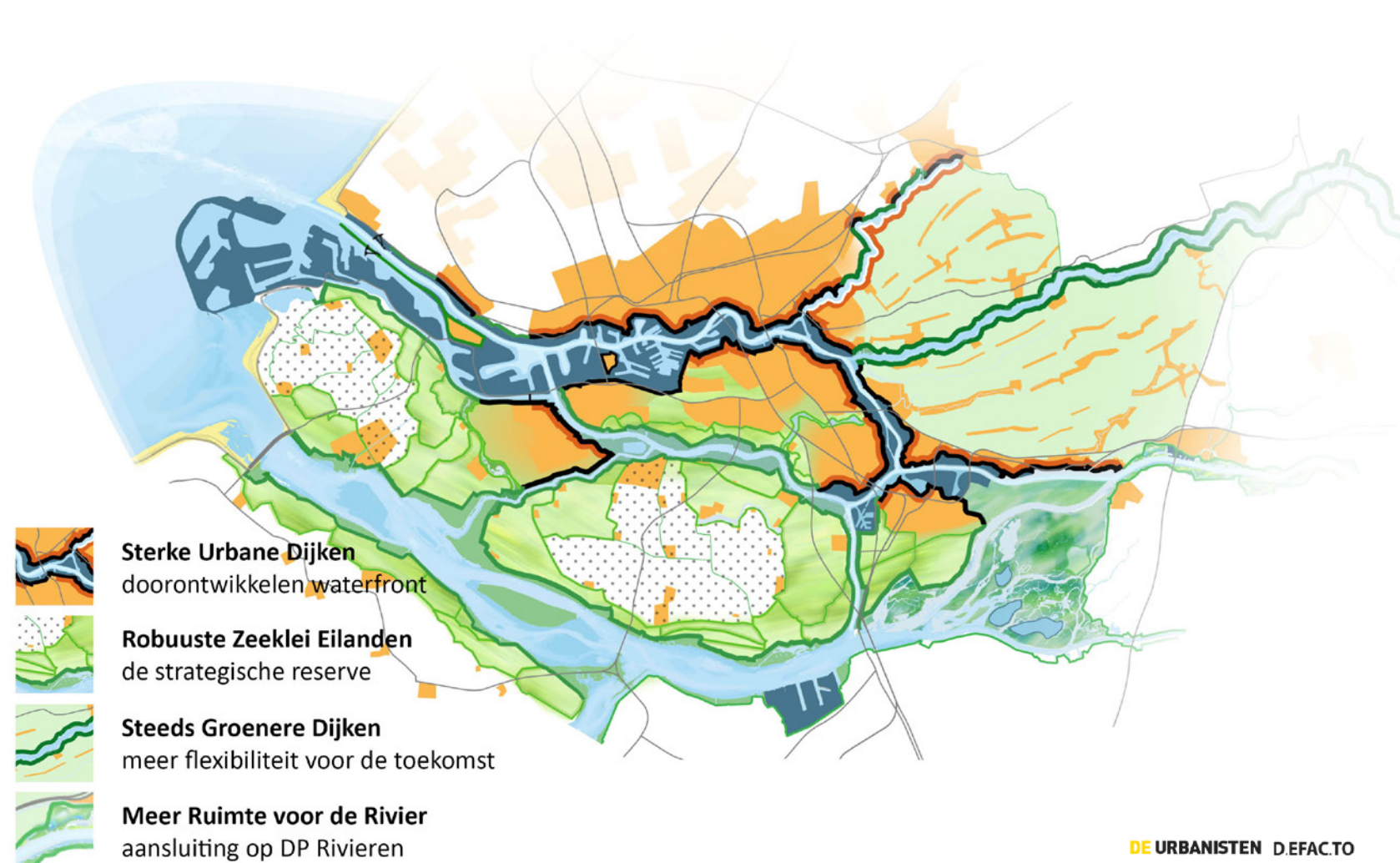
National and regional government developed a new way of working and decision-making. Joint fact finding and joint spatial planning are essential.

Program management

Both national and regional government participated in a steering committee. They have a joint responsibility concerning the strategic approach. They have been advised by a societal advisory group. A multi-party program organisation supported the steering committee and carried out research.

Combining agenda's of FRM projects and spatial planning projects:
line up various investment programs (HWBP, MIRT, ...); adaptive planning.

RUIMTELIJKE DOORVERTALING



Protection against floods:

- Full probabilistic simulation of required dike height.
- Update of legal standards, validated with local stakeholders.

Flood Probability

(Future) hydraulic boundary conditions for dikes are depended on the legal standard, the climate scenario and the strategy (i.e. other measures) and are modelled by:
Full probabilistic simulation of hydraulic loads due to storms on sea, high river discharges and wind waves (Deltamodel)
Assessment of overtopping (PC-overslag) and piping (DAM)
Reference dike geometry and soil subsidence data from local water boards and reference failure probability from WV21.



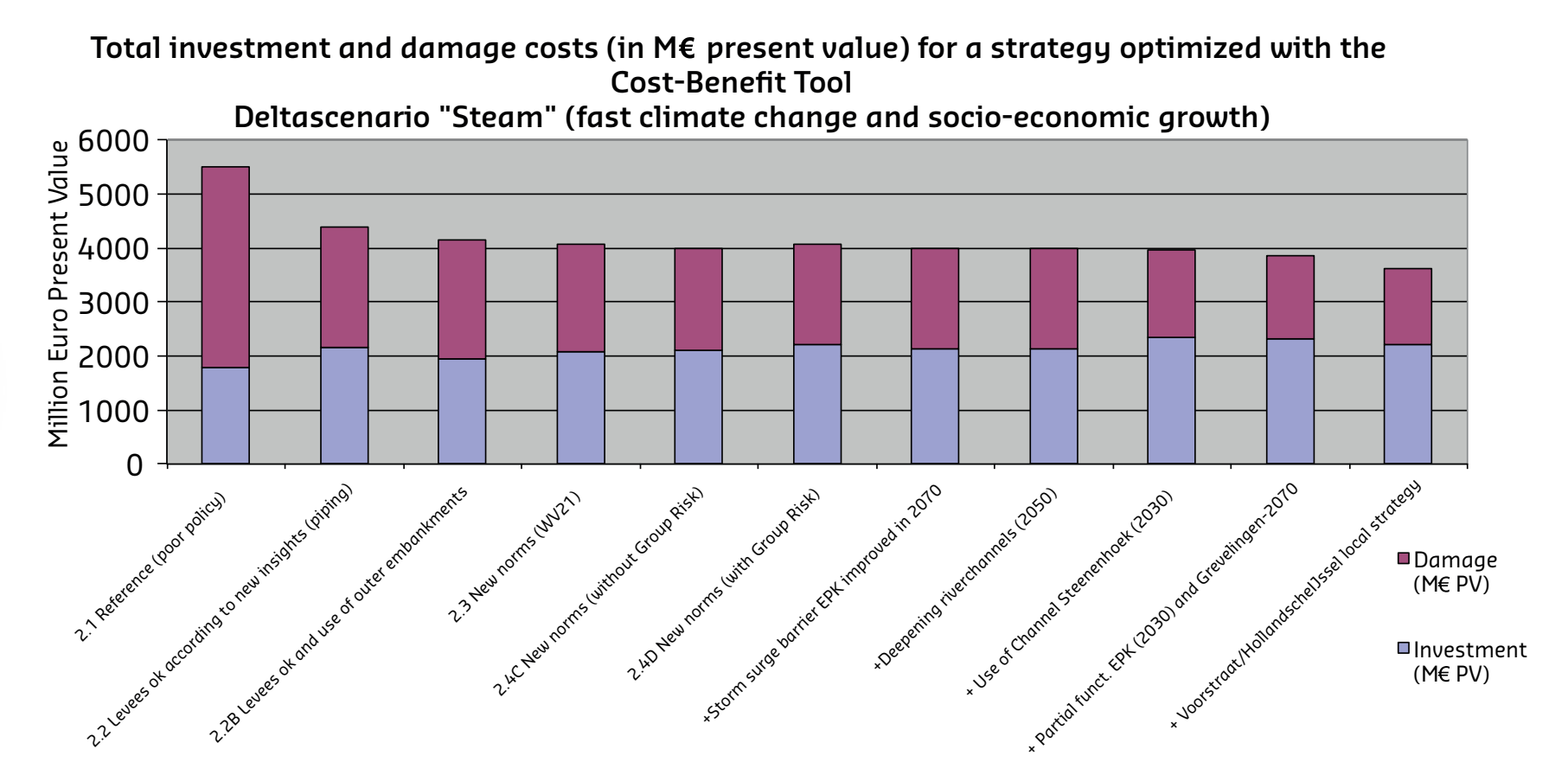
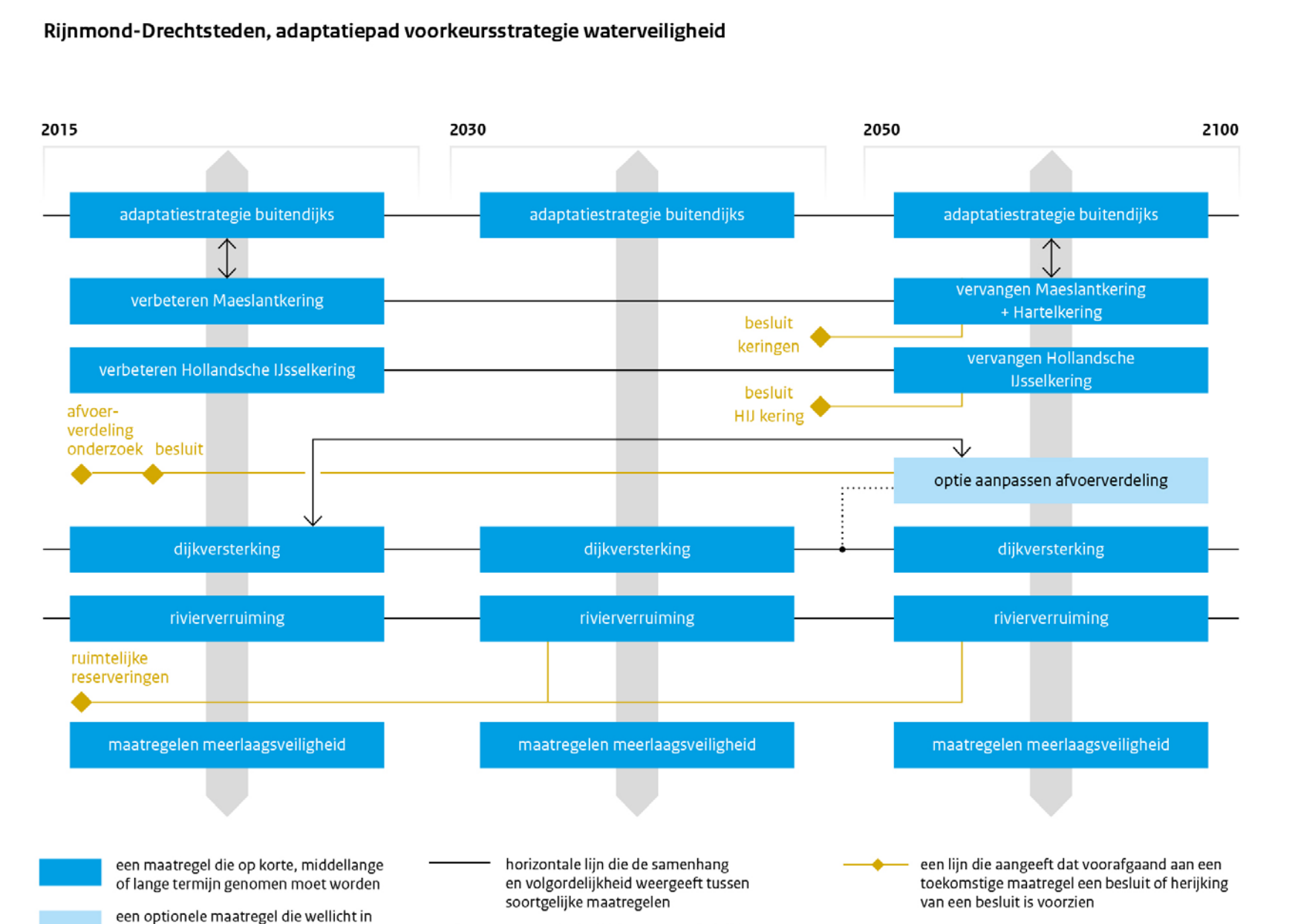
Gover-
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Preferential Integrated FRM Strategy

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| <p>Preventie als basis voor veiligheid</p> <ul style="list-style-type: none"> Gedrag en de leersituatie worden vast en daar onder weten kinderen Is het vinden van het juiste antwoord | <p>4. Overleef de situatie met het regulerend netwerk</p> <ul style="list-style-type: none"> Bewustzijn dat je de situatie moet reguleren Handelingsplan Handelingsplan Handelingsplan Handelingsplan | <p>6. Onderzoek</p> <ul style="list-style-type: none"> Wat is er gebeurd? Wat is er gebeurd? Wat is er gebeurd? Wat is er gebeurd? Wat is er gebeurd? |
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Protection standards

Benefits and Costs



Improvements of Approach:

1. Improvement on damage assessment, not only for flooding but also for navigation, salinization, environment & spatial quality and flooding of outer embankments
2. Assessment of dike strength with more depth
3. Enhance the cooperation of various governmental organizations in order to get a better integral approach, and better interference between flood risk management and spatial planning
4. Adapt organisations to a new way of working and joint decision-making and empower personnel to develop new skills