



Rijkswaterstaat
Ministerie van Infrastructuur en Milieu

Sustainability at Rijkswaterstaat (RWS)

Road Pavements (and contracts)

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Strategic targets RWS

- *“Rijkswaterstaat aims to be in 2012 the leading, public orientated and sustainable (execution) organisation of the government.”*
- Focus sustainability:
 - Reduction energy use and production of green energy
 - Sustainable (green) procurement
 - Sustainable spatial planning





We do not start from scratch

RWS is already for decades working on sustainability:

- Large scale re-use of secondary materials: >95%
- Life-cycle cost management
- Design for recycling
- Porous asphalt: safer and quiet
- Destruction of tar containing asphalt
- Dynamic public lighting
- Ecological management of verges
- RWS manages 70% of the Dutch Ecological Main structure in the Netherlands
- Environmental impact studies



Market approach RWS

- Give functional specifications and design freedom for the market
- Do not prescribe solutions (unless...)
- So, do not prescribe recycling, low energy asphalt, sustainable materials.
- Challenge the market to come forward with innovations (techniques, materials, processes)



General preconditions

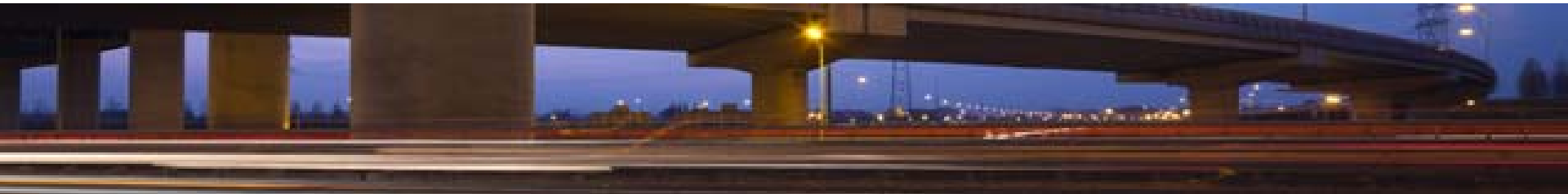
- Market is needed for achieving goals
- Market only invests in economical sound solutions
- Government is not always reliable (changing political views)
- Investment in:
 - Clear and unambiguous stable policy
 - Knowledge (performance of materials in time)
 - Hard technology
 - Standards
 - Image (champions needed)
 - Economical conditions (price performance, value based procurement)





Instruments for GPP and value procurement

- National minimum criteria
- RWS has a higher ambition:
 - CO2 performance ladder
 - Dubocalc
- Value procurement
 - What are we willing to pay for sustainability (We=RWS/society/Service level agreement)





Focus RWS GPP Road Pavements

- Focus sustainability:
 - Reduction RWS carbonfootprint
Aim: 50% reduction in 5 year

(note: besides aspects as noise, fine dust, recycling, ecological green maintenance et cetera)

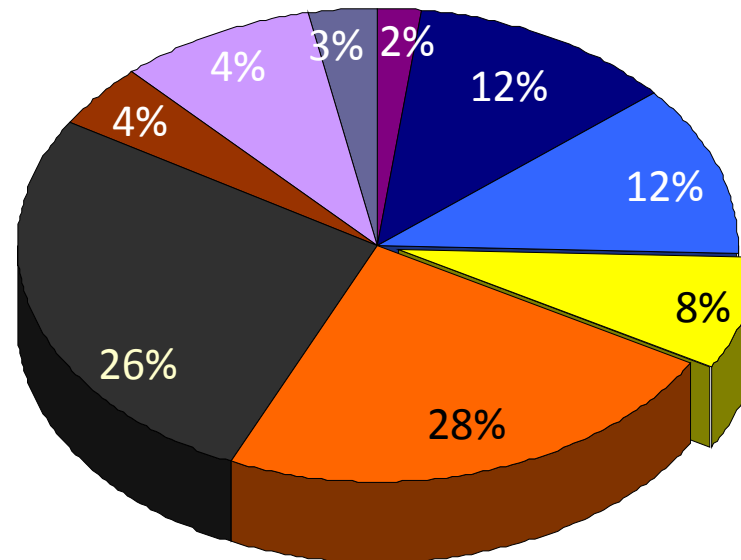
- Sustainable materials





Rijkswaterstaat Carbon Footprint 2010: 912 Kton

- Anchorstone
- Dredging + "room for rivers"
- Coastal sand suppletion
- scope 1 and 2 energy use
- Groundworks roadbuilding
- Asphalt
- Road base materials
- Concrete construction
- Steel construction





All in perspective

- CO2 reduction:
 - pavements = 28 % (of Carbonfootprint)
 - earth works = 30 % „
 - dredging = 21 % „
 - public lighting = < 0,5 % „
- CO2 emission traffic 30 Mton
- Carbonfootprint RWS total 0,9 Mton
- Carbonfootprint RWS pavements 0,3 Mton
- Carbon footprint electricity use RWS 0,009 Mton



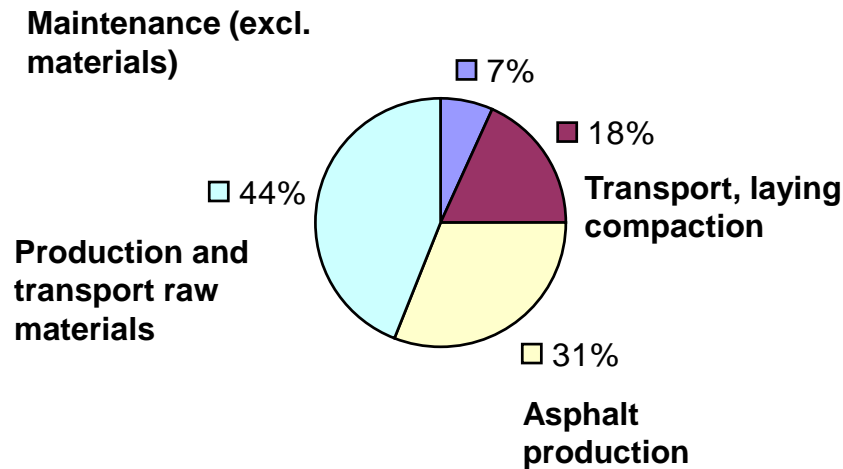
Life is never simple

- Conflicting requirements.
 - Safety
 - Environment
 - Noise
 - Comfort (e.g. water drainage)
 - Hindrance to road users
 - Speed of execution
 - Costs
- Technique is not the problem, problems are always political and managerial
- What is possible with pavements



Carbonfootprint Asphalt

Globale CO2 footprint asfaltconstructie





Conclusions CO2 reduction pavements

- Applied instrument Dubocalc, Life Cycle Approach; CO2 emission over 30 years so incl. maintenance.
- RWS applies eternal life strategy, so in principle only wearing course to replace and after 20-30 years strengthening
- Reduction of number of tons is dominant
 - Thinner construction/ thin inlays instead replacing PA
 - Longer life time (increase quality)
 - Elongation life time existing infrastructure (sealing)
 - High recycling percentages
- Low temperature asphalt
 - Circle of influence of asphalt producer
- Concrete for road: use blast furnace cement instead of Portland cement



Conclusions CO2 reduction pavements

- In figures
 - Maintenance : Thin inlay (- 8%)
Remix (-9%)
Seal techniques (LVO -15%)
 - New Roads: Thinner constructions (EME - 20%)
Blast furnace cement (-22%)
 - General: Recycle PA in PA(-10%???)
Low temperature asphalt (-5/-10 %
only with same amount of recycling and
same functional properties (life time)





Attention points

- Always needed same functional properties and durability
- Technical quality (durability) has an great effect but is easily neglected
- Take in consideration the inflexibility of the market (blast furnace cement, recycling)





Sustainable use of materials

- Is sustainability = CO₂ reduction? Not per definition
- Road construction: materials and energy are dominating dominant
- Nature of materials determine possibilities to recycle but also management and control aspects.
- Dubocalc is LCA based. LCA does not give all answers.
 - Recycling is a fine goal
 - But not all forms of recycling is desirable



Recycling: Netherlands at the top of the world

- Use of raw materials (mostly aggregates) app 150-180 million ton
- Use of secondary materials app. 30-40 million ton annually
- Main streams concrete and masonry (>95% recycled)
- Asphalt (4 million ton, 3 million hot mix recycling, 1 million tar containing incinerated) average 50% in base course mixes

- Netherlands on the top of the world in recycling
- Tar incineration unique in the world

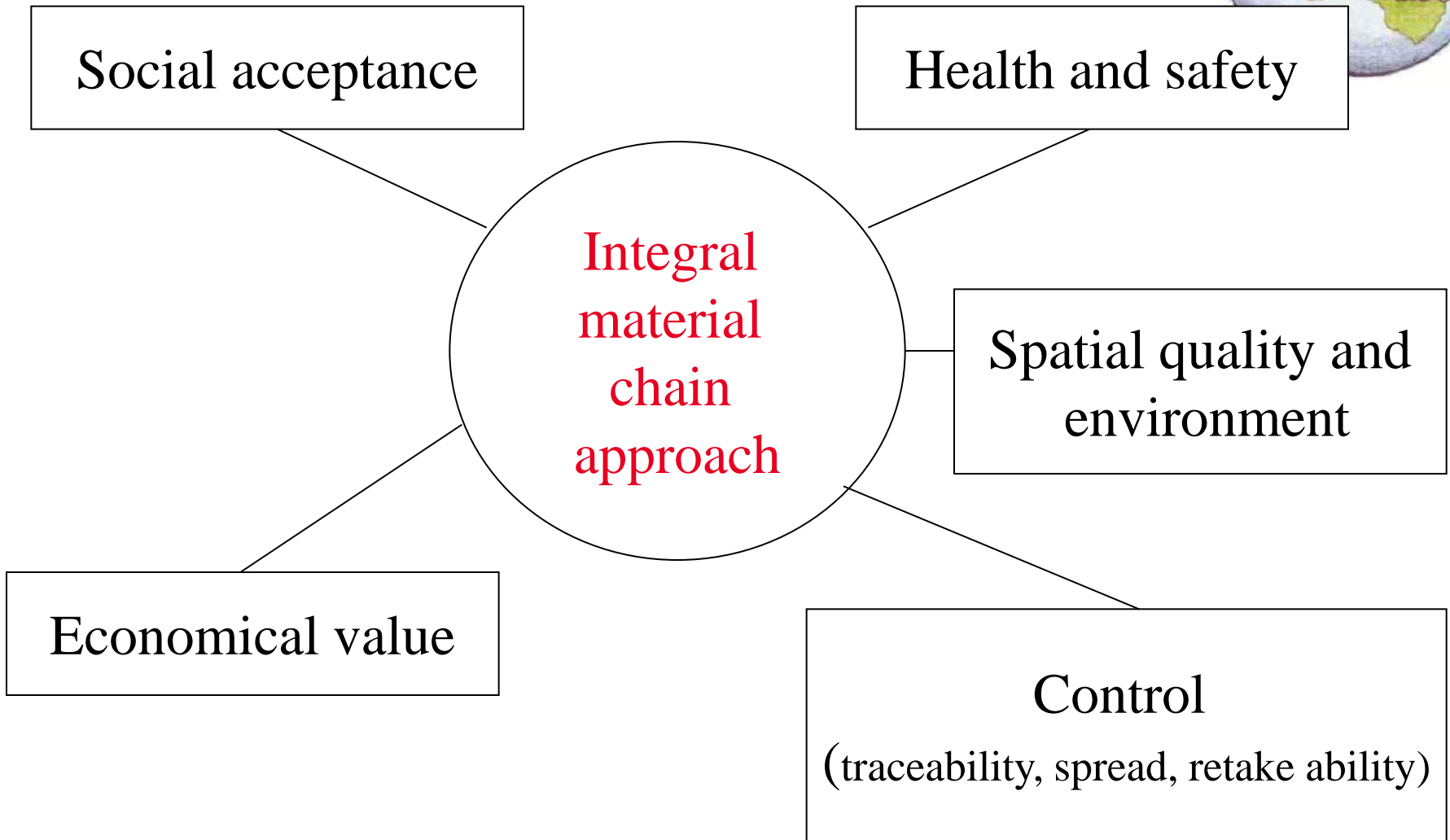
- Why
 - Netherlands densely populated
 - Scarcity of raw materials and space
 - Prosperous country
 - Recycling is made economic feasible



Sustainable use of materials

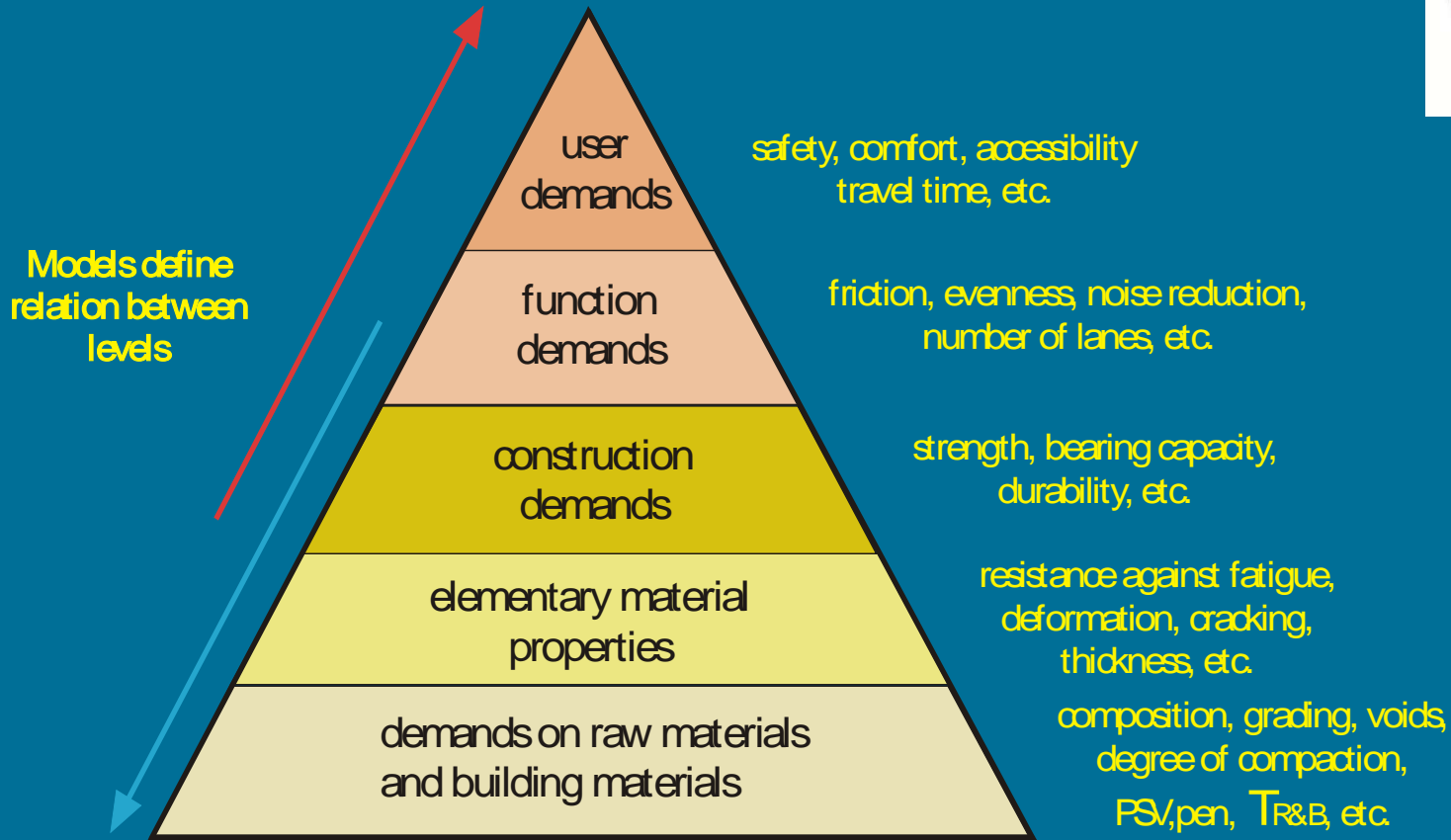
- Market is looking at financial possibilities
- Some waste materials have a negative market value
- Reusing/ recycling can therefore be very financially attractive
- Who takes the long term risks
- Example: Waste incineration bottom ash
 - Does not fulfil environmental criteria
 - Reuse under strict conditions
 - Or immobilisation?
- Advantages/disadvantages??







Discussion ???



Pyramid of demands