Challenges and obstacles, perspectives

From the point of view of a assetmanager

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ProRail

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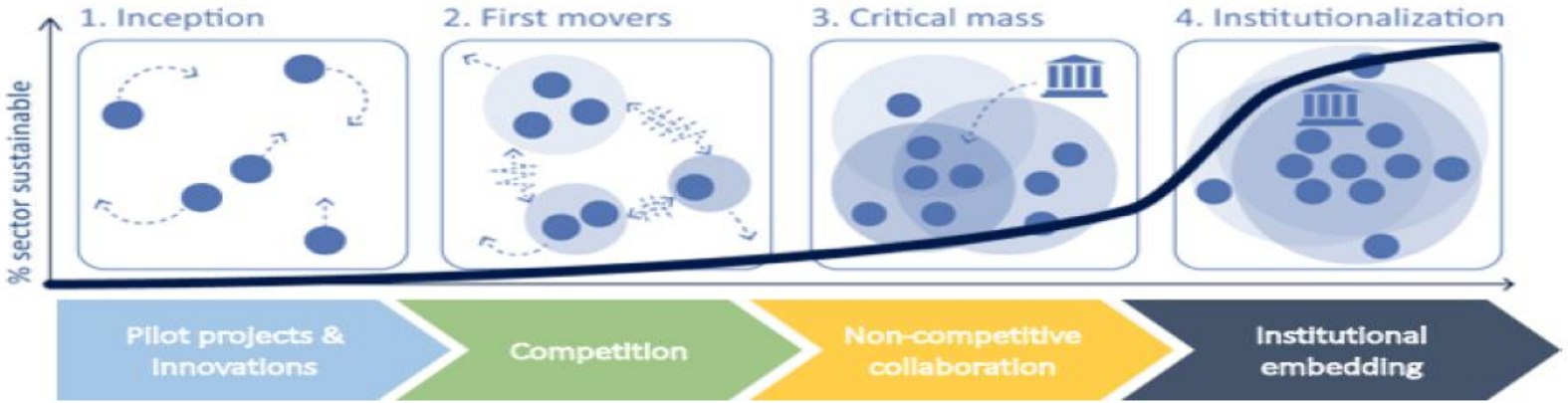
The Dutch case

- We have 3.400 km of tracks.
- Around 500 km is not electrified.
- Yearly the sector uses around 35 million litre of diesel.
- 21 locations where diesel can be fuelled. At 2 locations HVO.
- The railways want to be climate neutral in 2050. This means that no fossil fuels are being used in sector (trains & maintenance).

How does a transition work?



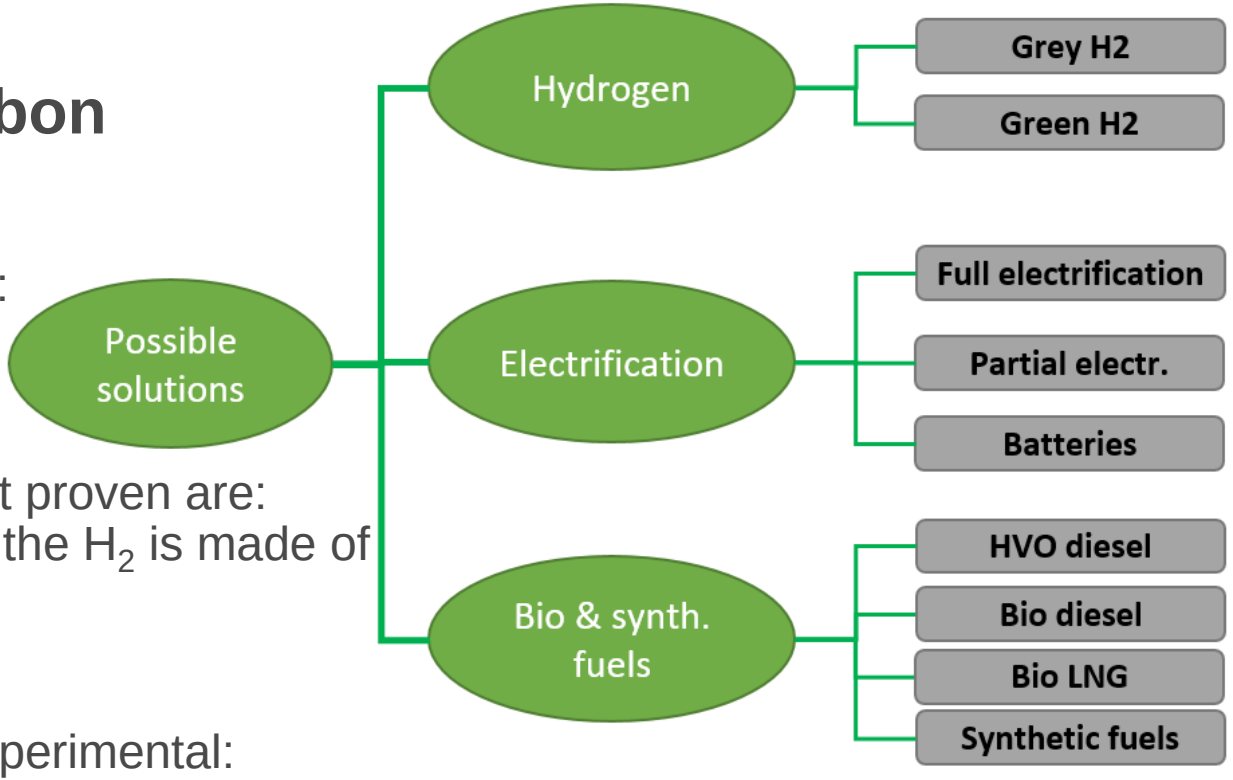
Characteristics				
	Projects, pilots, charity, subsidy programs, next to the core business	Competition, labels, rankings, branded programs, linked to or integrated in the competitive advantage of the business, value chain collaboration, selected group of multi-stakeholders in the program	Multi-stakeholder collaboration, platforms, pre-competitive agenda, structural collaboration with governments and civil society. Policy questions. Redesign of the 'business case'. Scaling-up	New policies, new legislation, new financial (e.g. tax) incentives. Compliance with law, enforcement.

Options for a carbon free railway

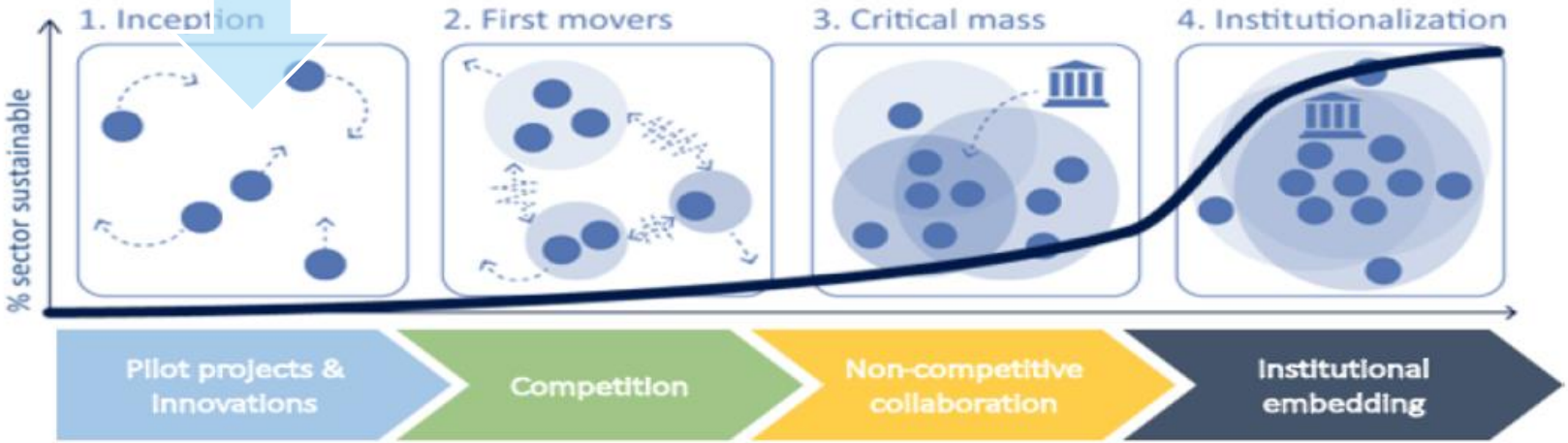
Proven technologies are:
- full electrification
- Bio- & HVO diesel

Solutions with are almost proven are:
- Hydrogen (but most of the H_2 is made of fossil fuels)
- Bio LNG

Solutions that are still experimental:
- Battery trains
- Synthetic fuels

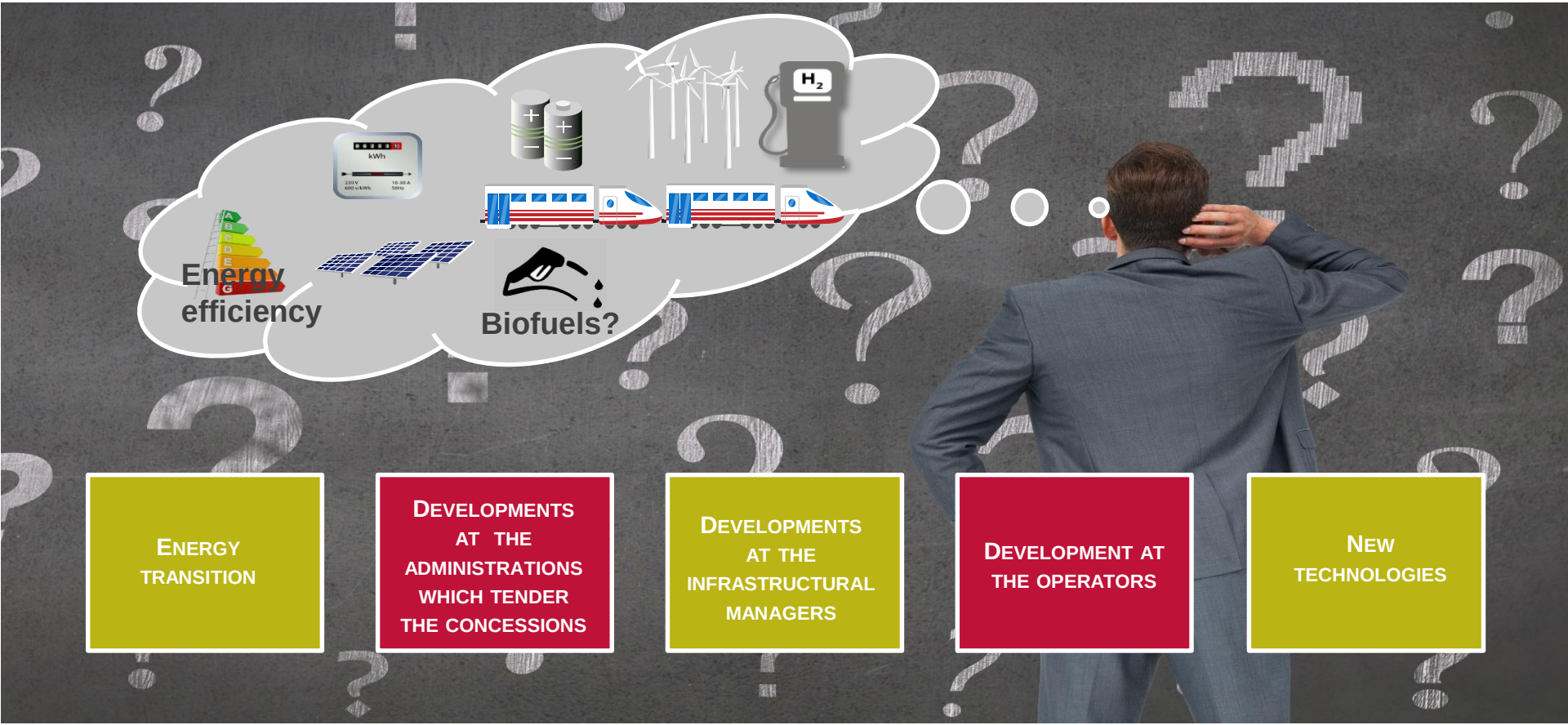


Where are we in the transition?



At the moment we have several pilots or projects:
Some biodiesel trains, hydrogen trains, hybrid trains, experiments with batteries and ideas about partial electrification. Absolutely no real competition, let alone institutional embedding.

What does this mean for a infrastructural manager?



- ENERGY TRANSITION
- DEVELOPMENTS AT THE ADMINISTRATIONS WHICH TENDER THE CONCESSIONS
- DEVELOPMENTS AT THE INFRASTRUCTURAL MANAGERS
- DEVELOPMENT AT THE OPERATORS
- NEW TECHNOLOGIES

Discussion

Trains are in service for 40 years, and assets as overhead wires, substations and hydrogen filling stations have also a lifespan of >40 years. So the choices we make will define the diesel lines for decades to come.

The questions we face are:
- How to choose?
- Are there solutions possible which are easy to implement?
- When to choose?
- Who does make the choice?
- In which technology and pilots does the IM invest?

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