

# Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport

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# Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport

29th January 2018

*UNECE WP29 GRVA, Geneva*



*The research leading to these results has received funding from the European Union*

# Goal and objectives

## Goal

Develop and demonstrate new technologies, concepts and architectures for complete vehicles meeting future logistics and co-modality needs.



## Boundaries & Constraints

of the European freight transport market, the drivers, the constraints, the trends, and the mode and vehicle choice criteria

## Technologies and Innovations

New concepts and technologies for trucks with reduced drag, which are safer, comfortable, configurable and cost effective and ensure satisfaction of customer needs under varying transport tasks and conditions

18-33% Efficiency Improvement Long Haul

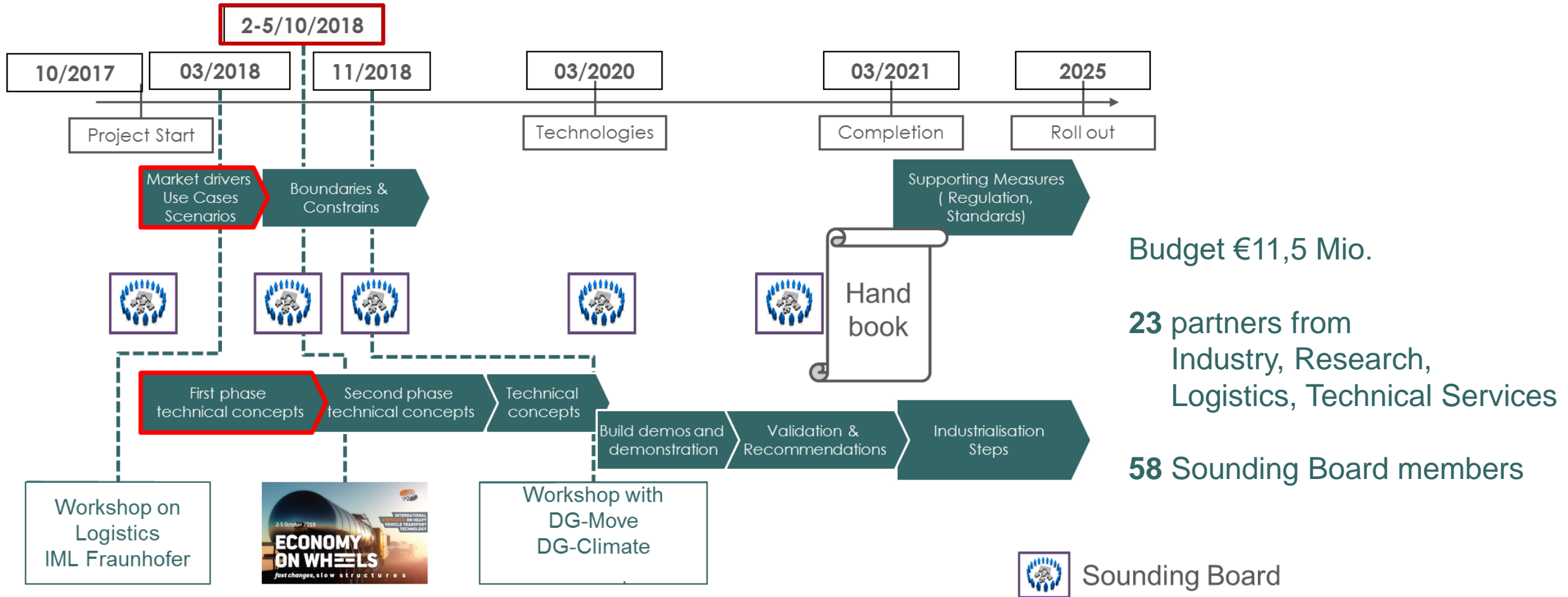
## Demonstration and impact assessment

of potential truck aerodynamics and energy management improvements.

## Recommendations

for revising standards and legislative frameworks in order to allow the new aerodynamic and flexible vehicle concepts on the road.

# Project overview



## Our contribution to 30% more efficiency and 30% less GHG emissions in road transport

### ● Vehicle concepts

- EMS provides potential for significant contribution to efficiency targets

### ● Logistics operations

- Low and high density goods; long and short haulage
- Consolidation of freight (precondition)

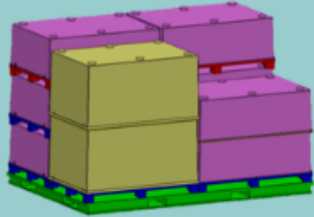
### ● Transformation of the assets (semi-trailers, boxes, wagons, cranes, locomotives) into **smart devices** (Physical Internet)

### ● **Smart Infrastructure Access Policies (SIAP)** for optimal matching of novel vehicle concepts and infrastructure is **highly important**


# Innovations overview

- 4–5% energy saving by separate platforms
- 4–6% energy saving by using loading space more effectively
- 5–12% energy efficiency improvement from the integration of more flexible, advanced powertrains
- 5–10% reduction in energy consumption through improved truck aerodynamics
- Standardised interfaces and the resulting sharing of components leading to higher economies of scale
- Front end designs to ensure survivability in crashes up to 50 km/h for occupants and vulnerable road users


## Smart Loading Units



## Powertrain



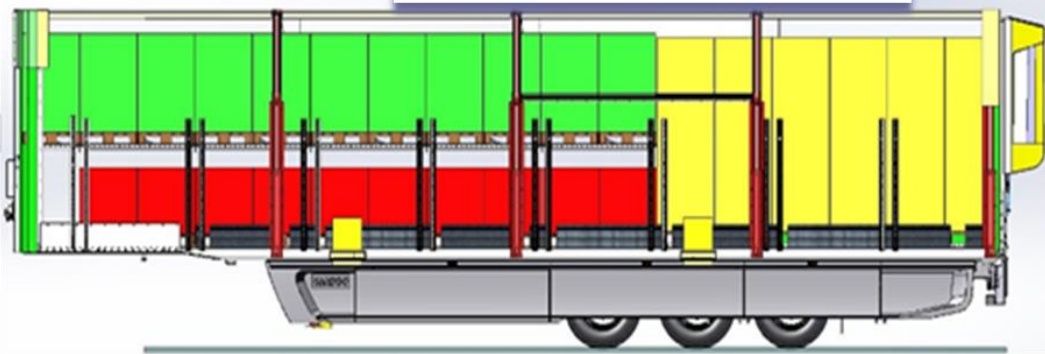
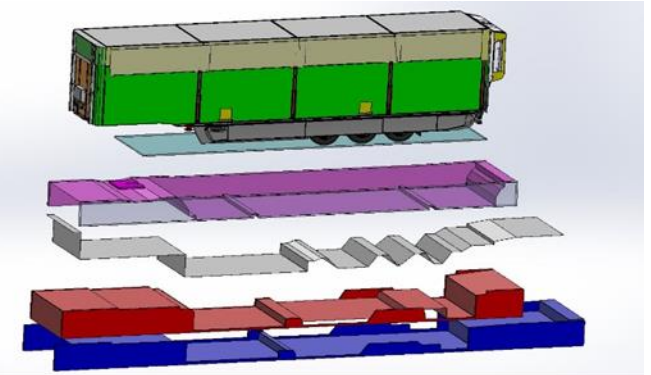
## Aerodynamics



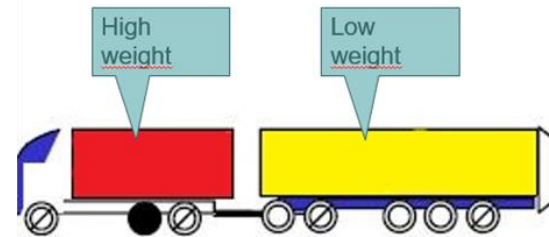
## Front End Design



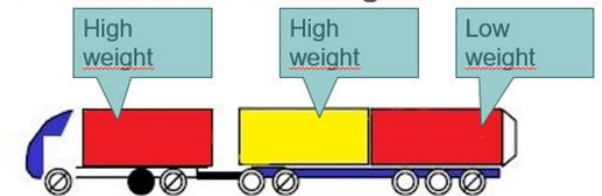
# Smart Loading Units



Combine heavy weight with light weight to fill both volume and weight !

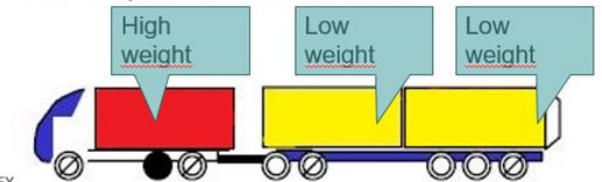


Demonstrator Truck +Dolly+ VEG trailer



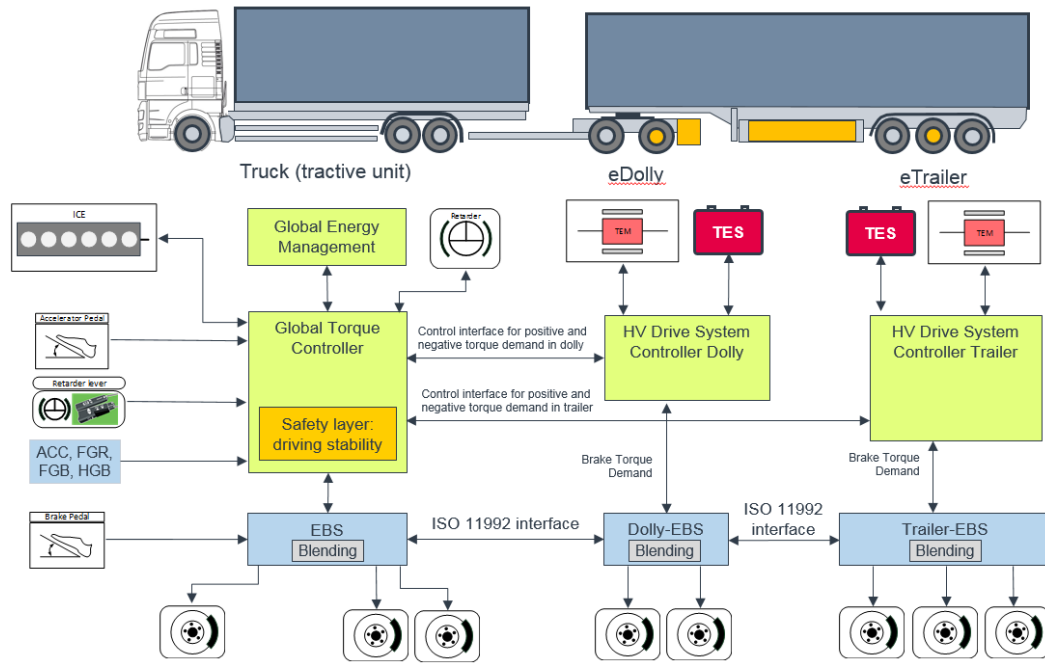
• Intermodal Truck +dolly+containerchassis

• 1 x C 7,82 2x 20 ft container

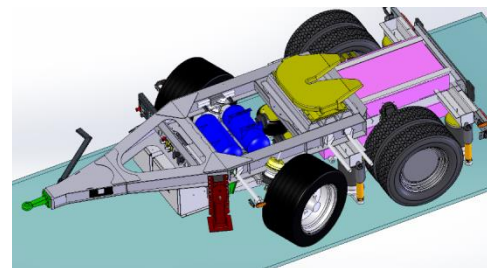
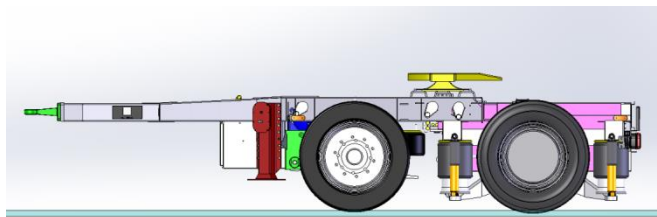


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# Hybrid Distributed Powertrain



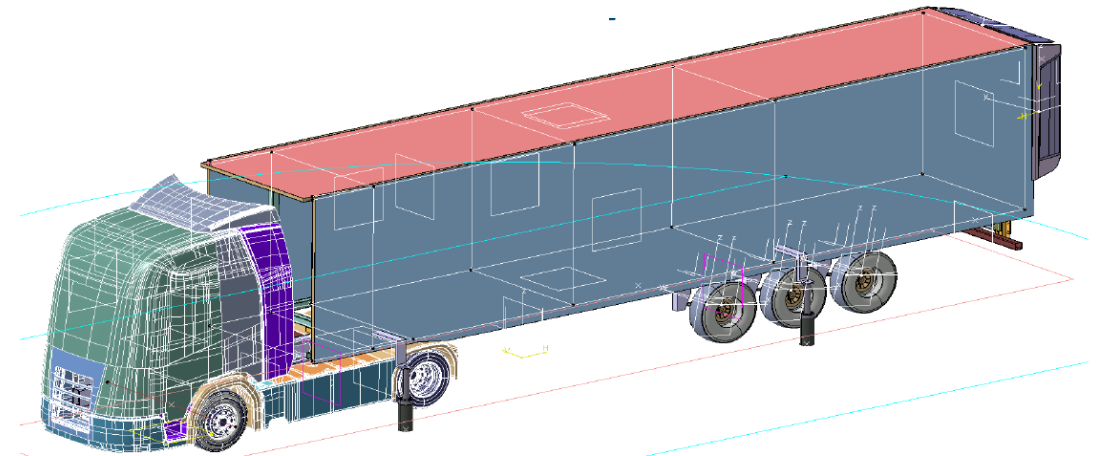
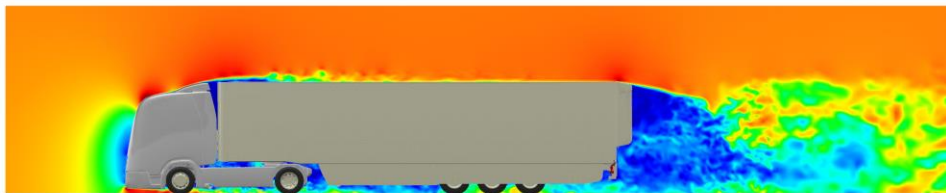
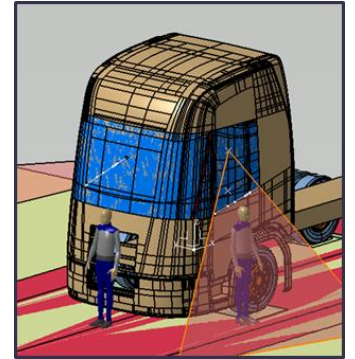
- Develop an electrically driven dolly
- Build of a EMS demo vehicle incl. the e-dolly and an electrified trailer (trailer provided by Transformers project)



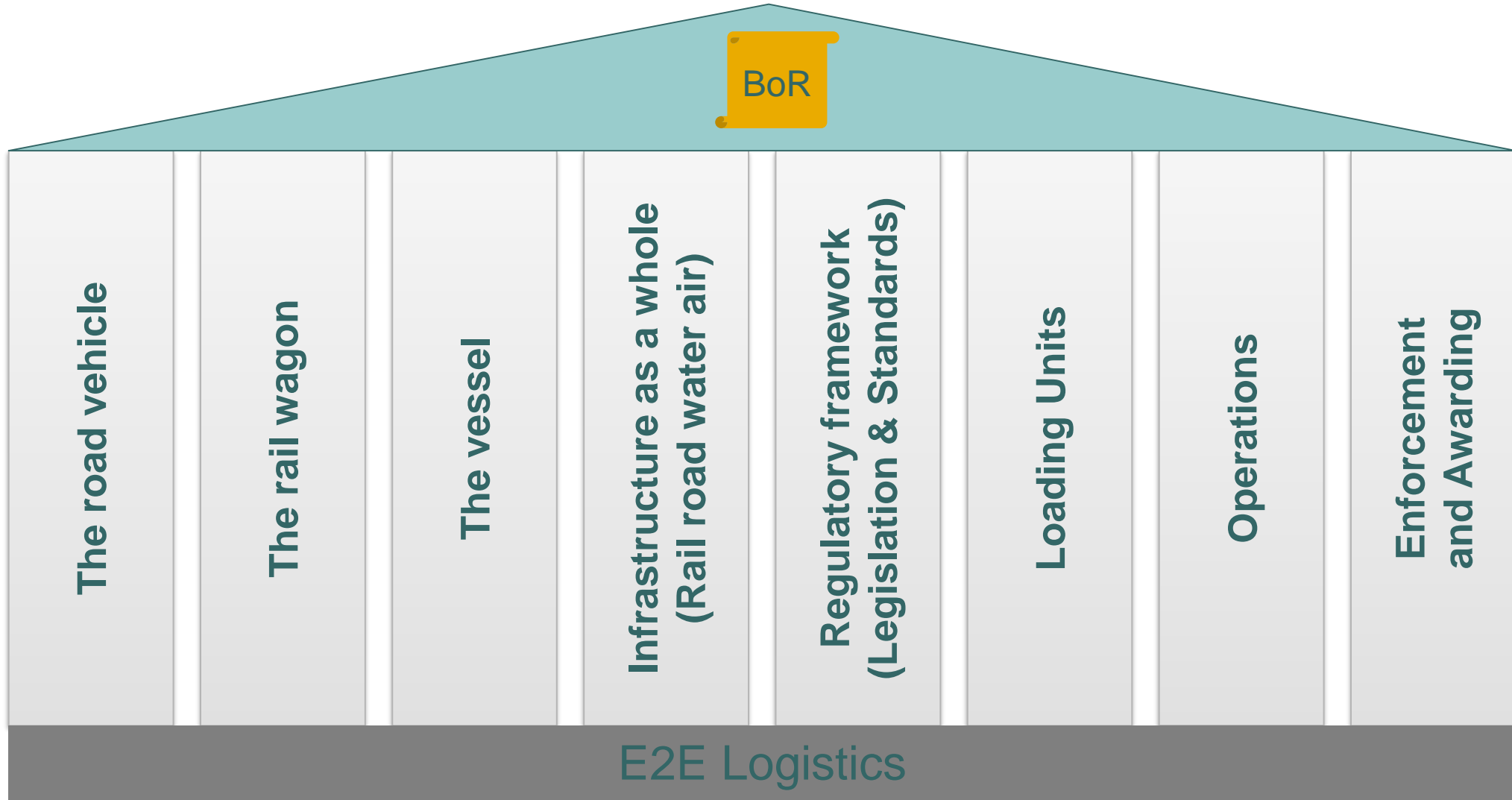


# Aerodynamic Features for the Complete Vehicle

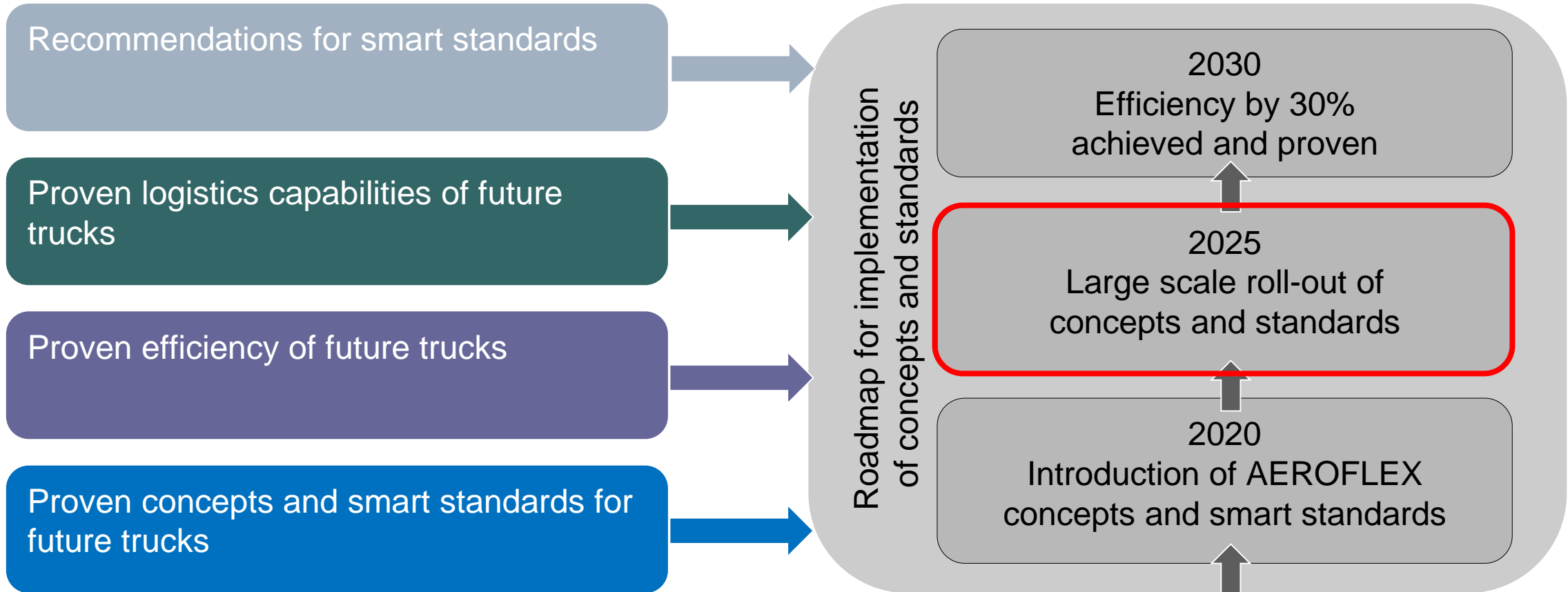
- Active and passive aerodynamic features; simulations by CFD and wind tunnel and vehicle for demonstration



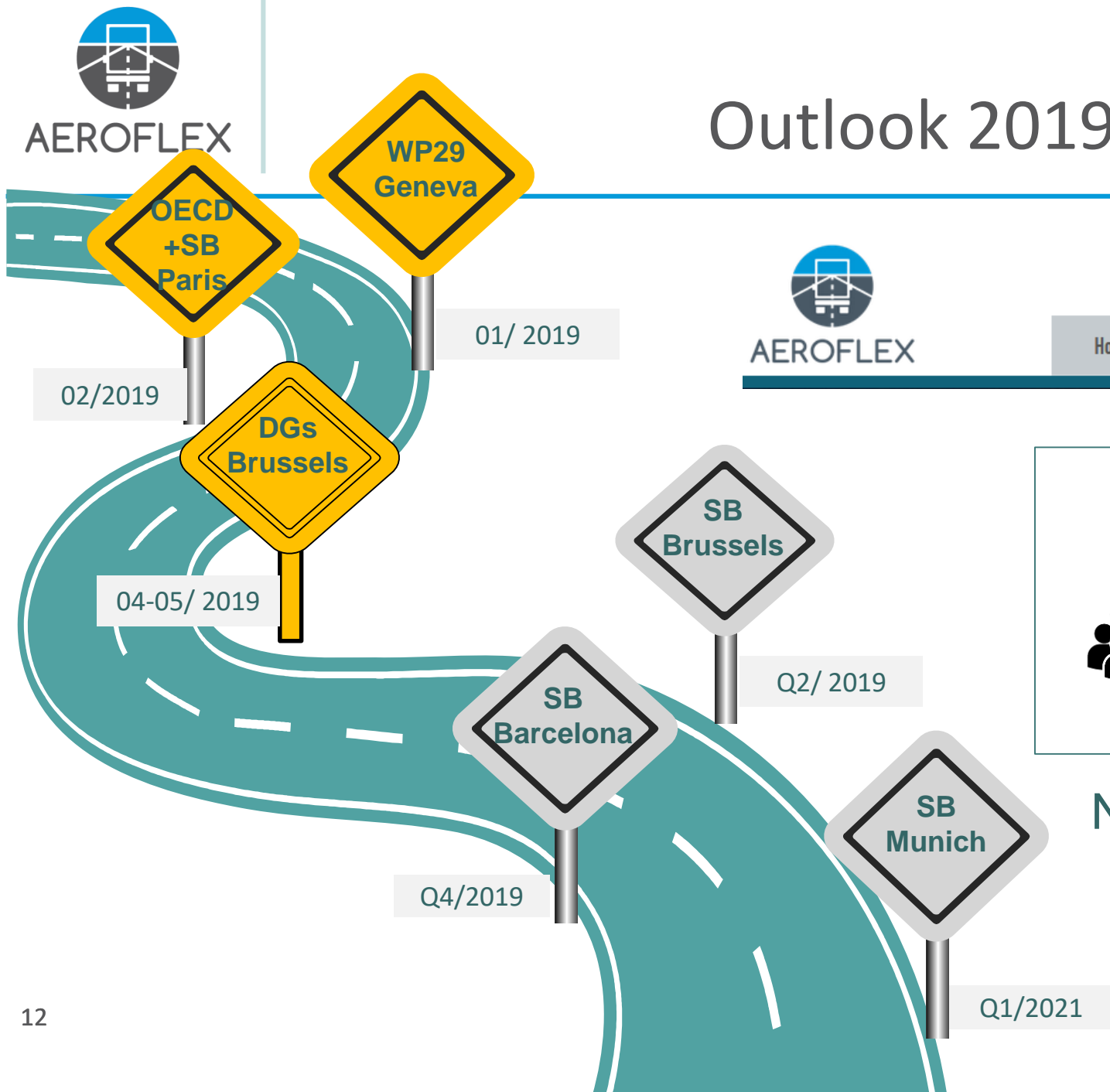
# Transform complexity into sustainable pillars



# Pathway dependency on open legislative framework



# Outlook 2019 and invitation to join us

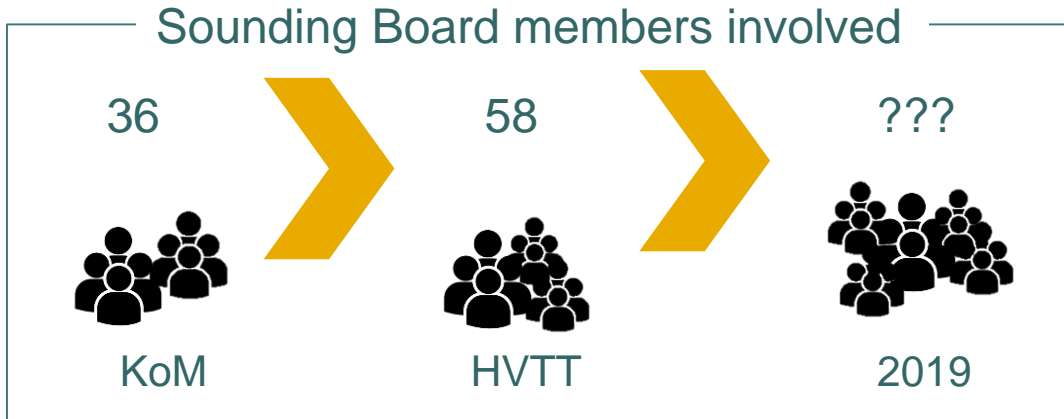


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New SB members still welcome



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The research leading to these results has received funding from the European Union