VOLVO TRUCKS



VOLVO

Advanced Technology & Research

Energy efficiency and other challenges

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R&AE Coordinator

The Volvo Group vision:

To become the world leader in sustainable transport solutions

The Volvo Group vision:

HOW we will reach our vision

By creating value for customers in selected segments

By pioneering products and services for the transport and infrastructure industries

By driving safety, quality and environmental care

By working with energy, passion and respect for the individual

GROUP TRUCKS TECHNOLOGY

Volvo Group organization

Group Trucks Sales & Marketing EMEA

Group Trucks Sales & Marketing Americas

Group Trucks Sales & Marketing and JVs APAC

Group Trucks Operations

Group Trucks Technology

Construction Equipment

Business Areas

Volvo Financial Services

GROUP TRUCKS TECHNOLOGY

RESEARCH AND TECHNOLOGY DEVELOPMENT

For all Volvo Group brands

Eicher JV

Prevost

Sunwin JV

DFCV JV

Renault Trucks

UD Trucks

Mack Trucks

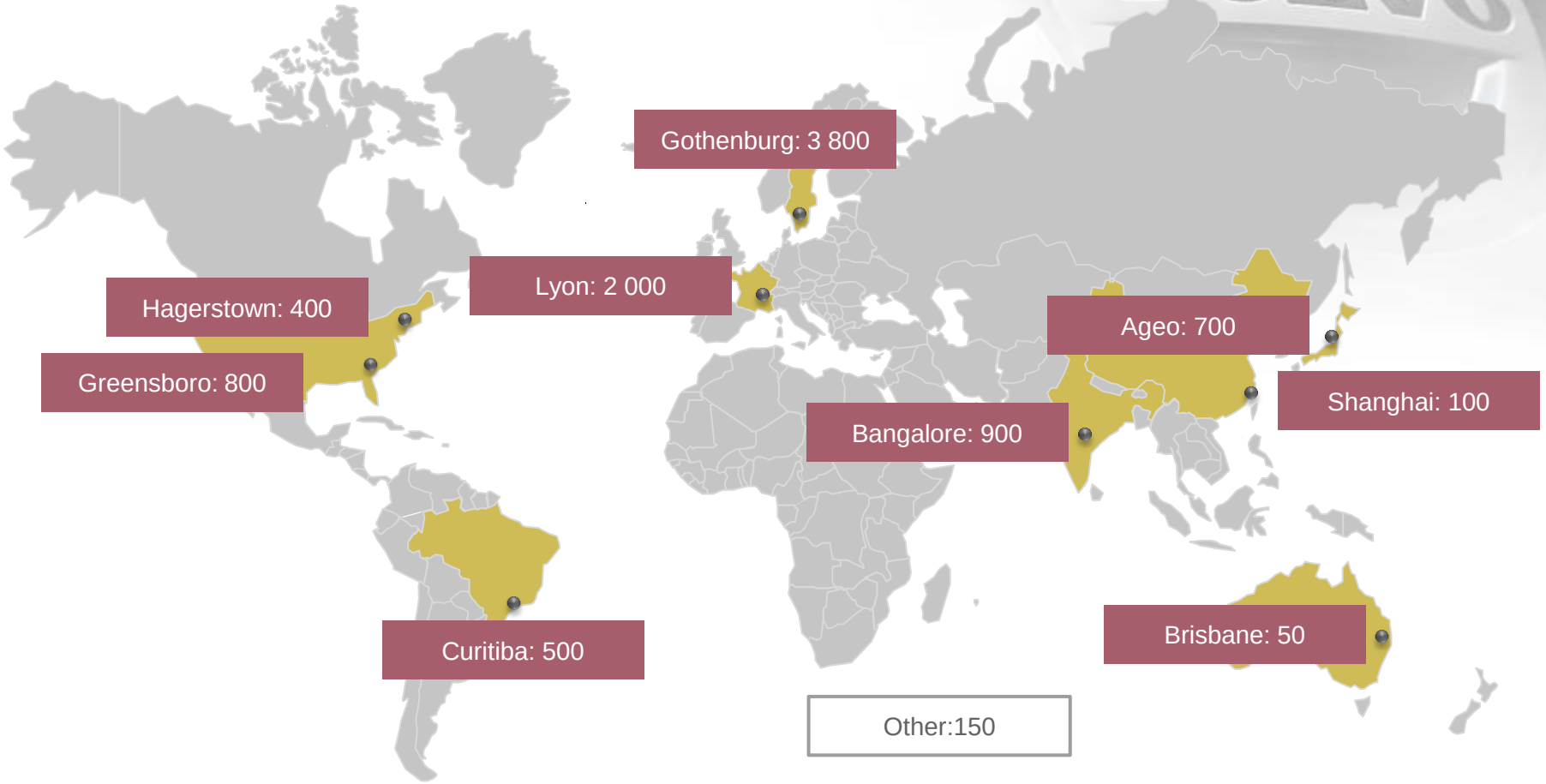
SDLG JV

Volvo

Nova

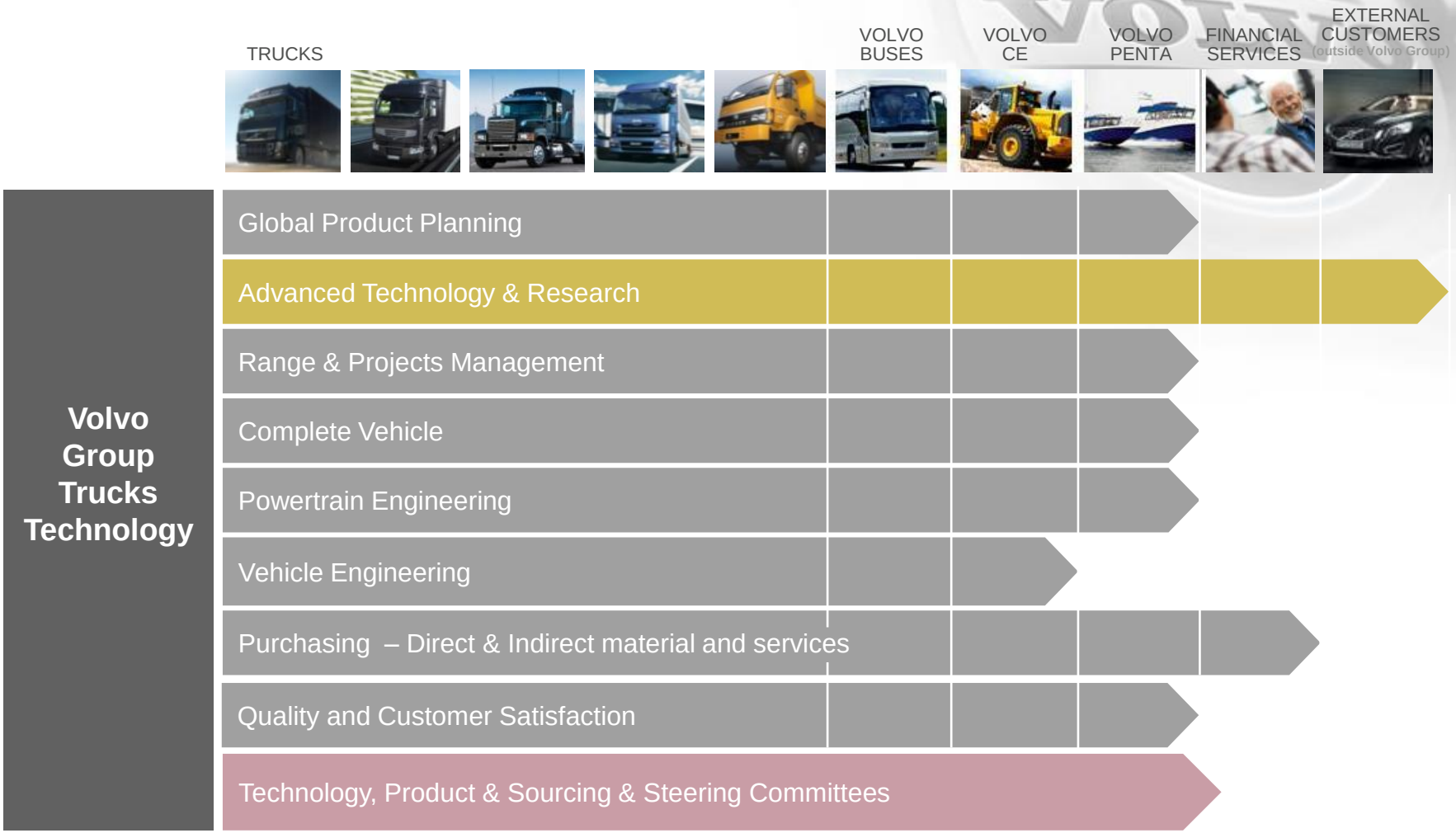
Global cooperation – every day

Approx. 9 400 GTT people at our R&D main sites



EMPLOYEES, TEMPORARIES AND CONSULTANTS

Scope and responsibilities within Volvo Group



Sustainable transport solution technologies for society today and in the future

RENEWABLE FUELS	ALTERNATIVE DRIVELINES	FUEL ECONOMY	NOISE REDUCTION	SAFETY FOR DRIVERS AND SURROUNDINGS





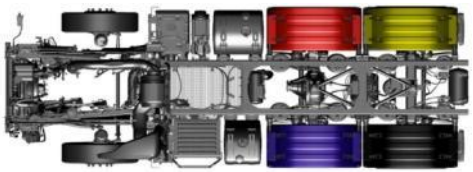
ENERGY EFFICIENCY

Extensive development work

CAB

ELECTRICAL
AND ELECTRONICS

CHASSIS AND VEHICLE
DYNAMICS

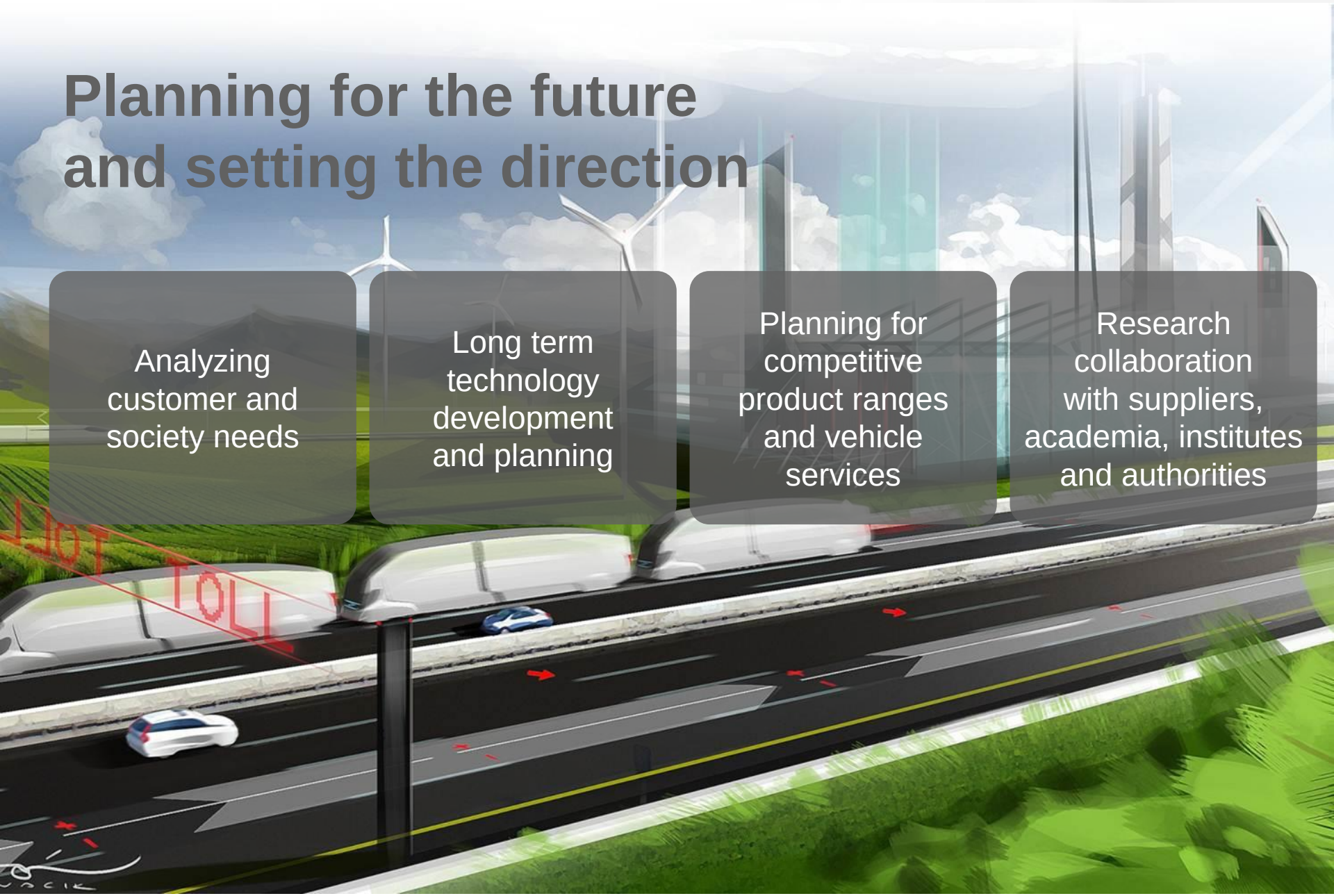


ENGINES, TRANSMISSIONS
AND AXLES

CONTROLS AND SOFTWARE
FUNCTIONALITIES

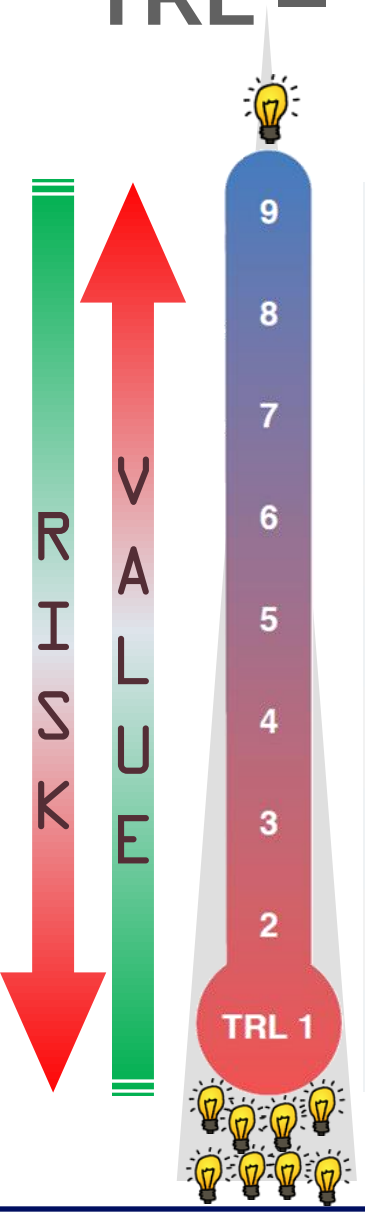
Planning for the future and setting the direction

- Analyzing customer and society needs
- Long term technology development and planning
- Planning for competitive product ranges and vehicle services
- Research collaboration with suppliers, academia, institutes and authorities

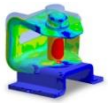


Efficient and robust R&D processes are the foundation

TRL – Technology Readiness Level



Technology indicator	
Has an identical unit of the technology been successfully launched/operated on the market in an identical configuration/environment?	*Product launched*
Has an identical unit of the technology been successfully qualified under operational conditions (field tests)?	*Field test*
Has a system prototype, in a near final form, been successfully operated under expected conditions?	*Project Builds verification*
Has a virtual prototype, in a near final form, been successfully operated under expected simulation conditions?	*DMU/Virtual verification*
Has a representative system prototype of the technology been demonstrated in a relevant (product/process) environment?	*AE demonstrator/ Mule/System test bench*
Has a prototype of the key elements of the technology been demonstrated in a laboratory environment?	*Component test*
Has analytical and experimental proof-of-concept been demonstrated?	*Calculations/ Simulations and experiments*
Has key elements of the technology been identified and expected benefits formulated?	*AE proposal*
Have basic principles been identified that could potentially form the basis of a new or improved technology?	



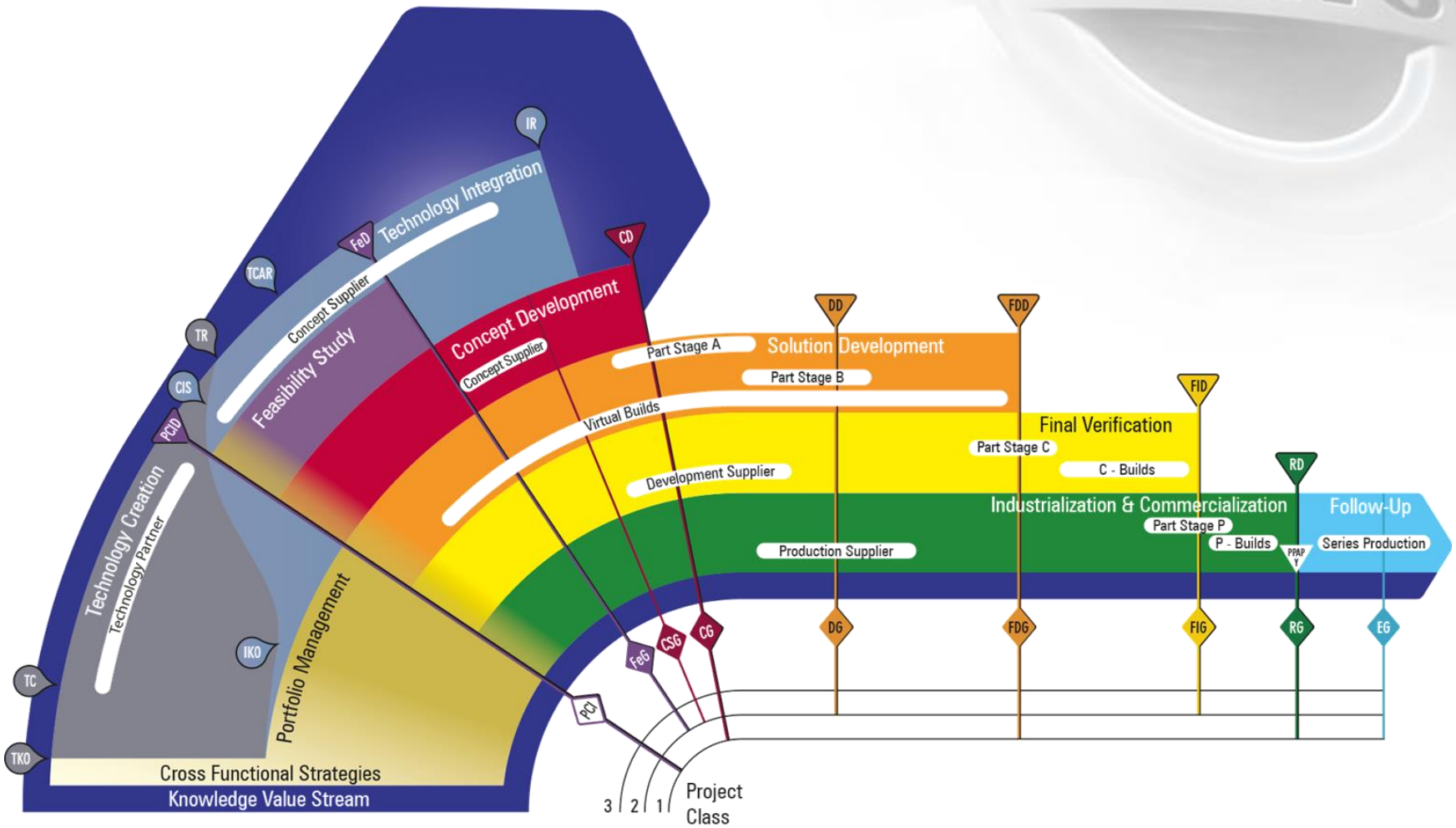
Technical principle + Application = Expected Benefit

Technical Principle

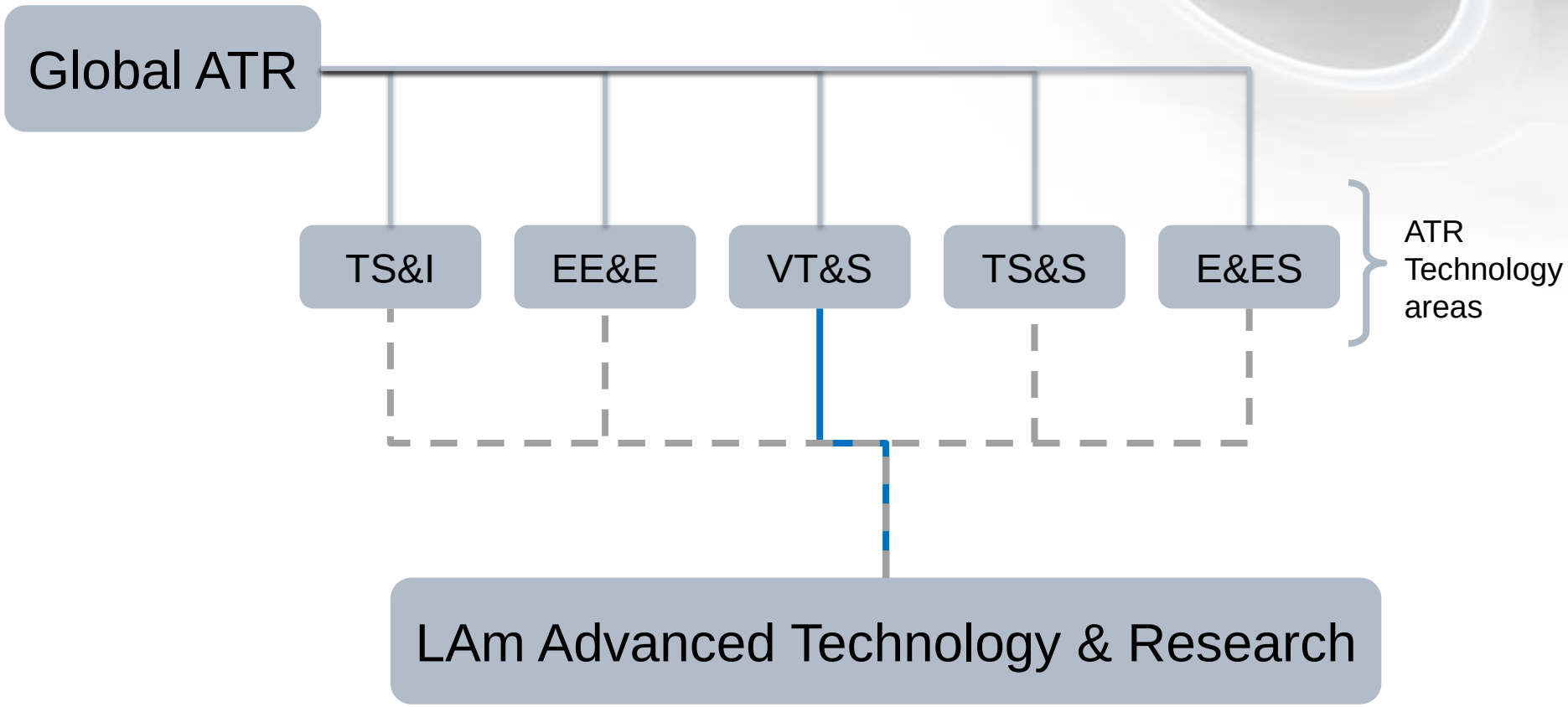
ATR + RnP

ATR + STI

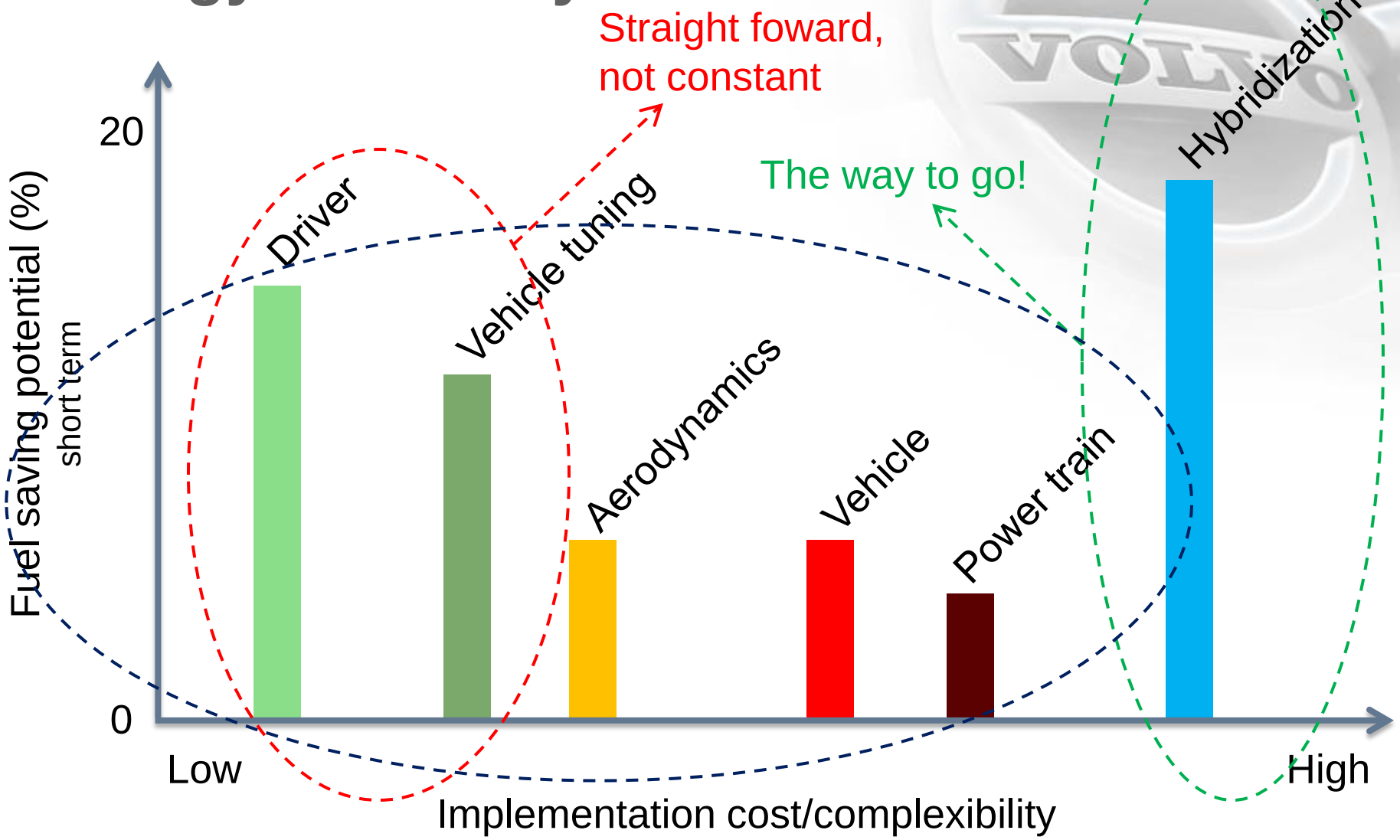
Efficient and robust R&D processes are the foundation



LAm Advanced Technology & Research



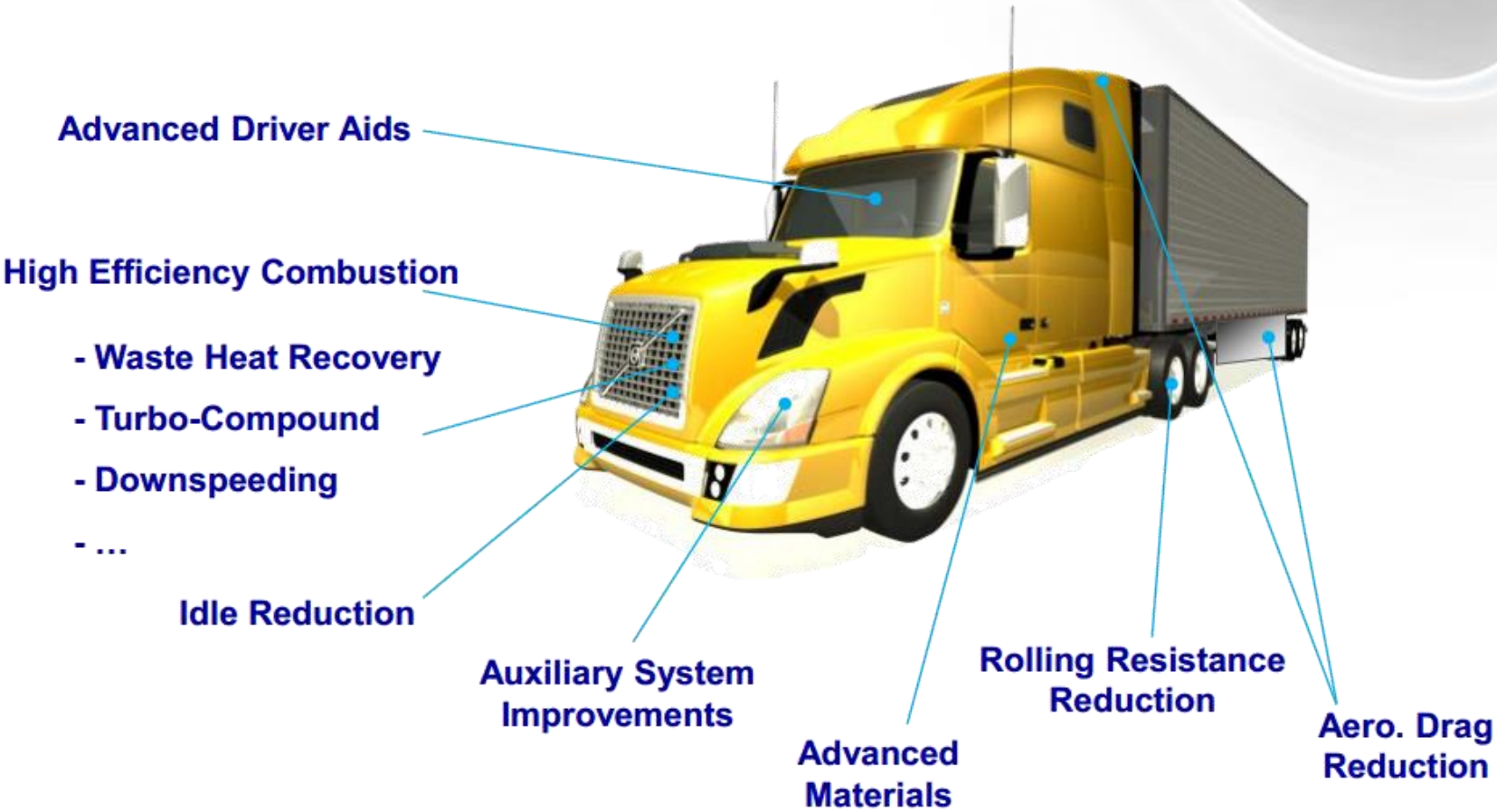
Energy Efficiency



The VOLVO Efficiency Vehicle Super Truck

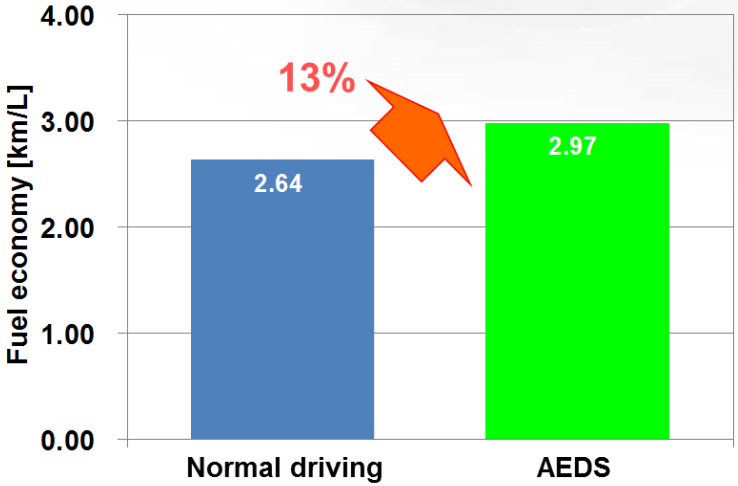
- Improve Freight Efficiency by 50%
- Demonstrate a 55% Brake Thermal Efficiency Concept

The VOLVO Efficiency Vehicle Super Truck



Energy Efficiency – Driver Assistance

- The Nenphio System
  - Electronics Solution for Fuel Saving – ESFS – eHorizon based system



Energy Efficiency – i-See

Energy Efficiency - Hydridization

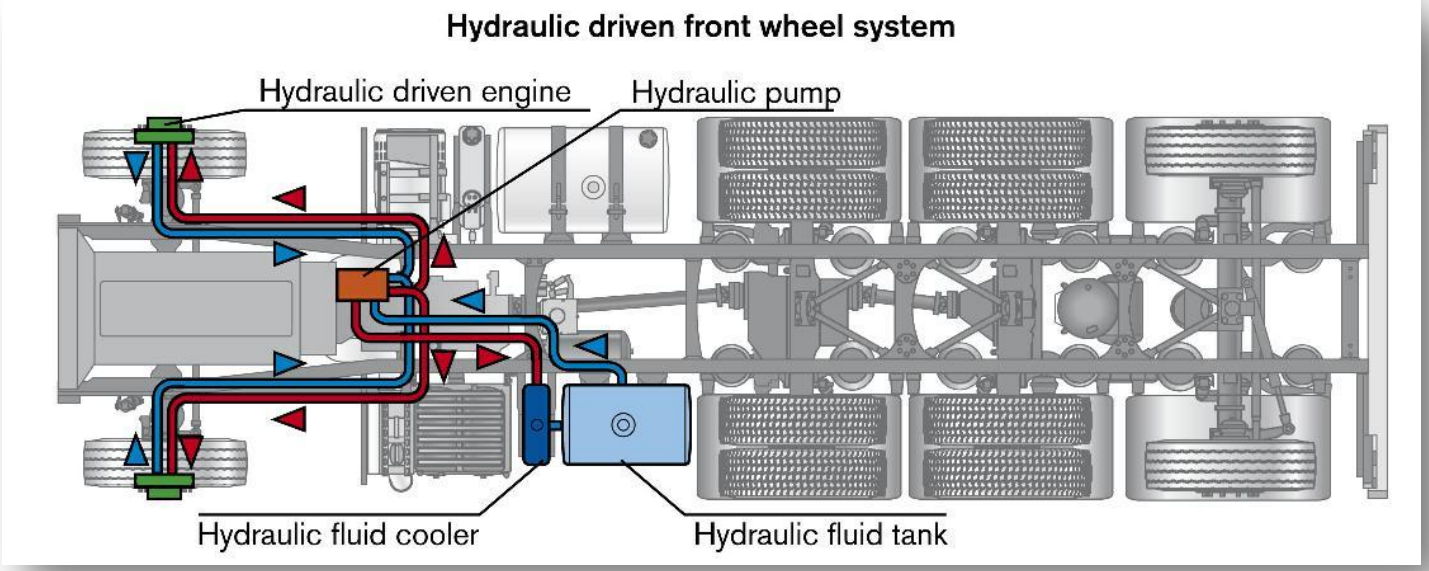
- Hybrid Electric bus
  - 37% Fuel Economy

Energy Efficiency - Hydridization

- Hybrid plug-in bus
  - 75% Fuel Economy

VOLVO Hydraulic Front-wheel-drive

- Hydraulic motor for start assist (Bosch Rexroth)
- For long haul application, it can work as regenerative brake
- µHybrid

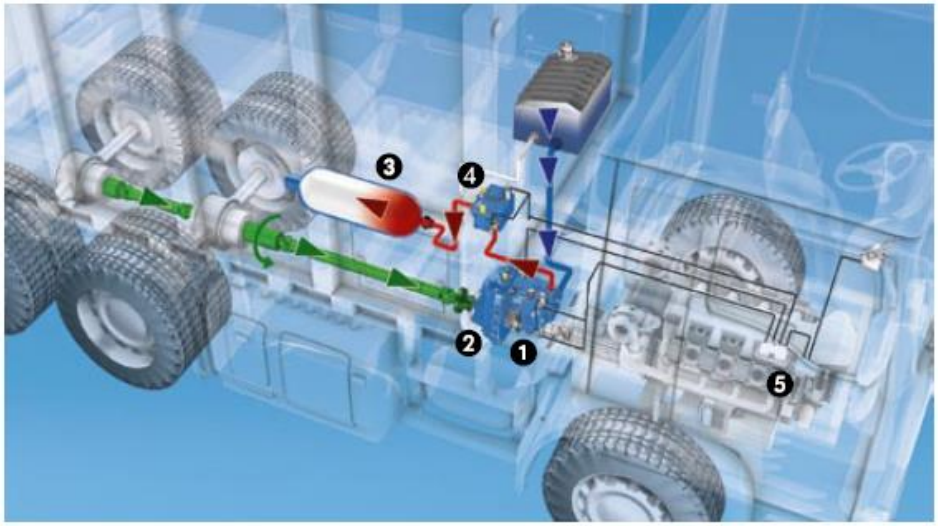


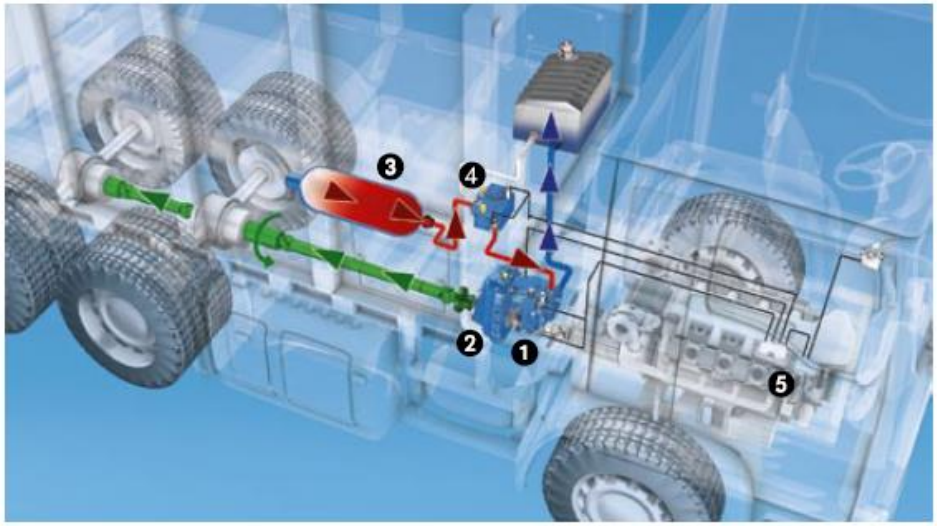
VOLVO Hydraulic Front-wheel-drive

- Maximum torque available at the wheel is determined by a combination of the pump and motor size (16,000 Nm)
- The speed is also limited by that, and is about 22 km/h with the current system.
- HRB Systems

HRB

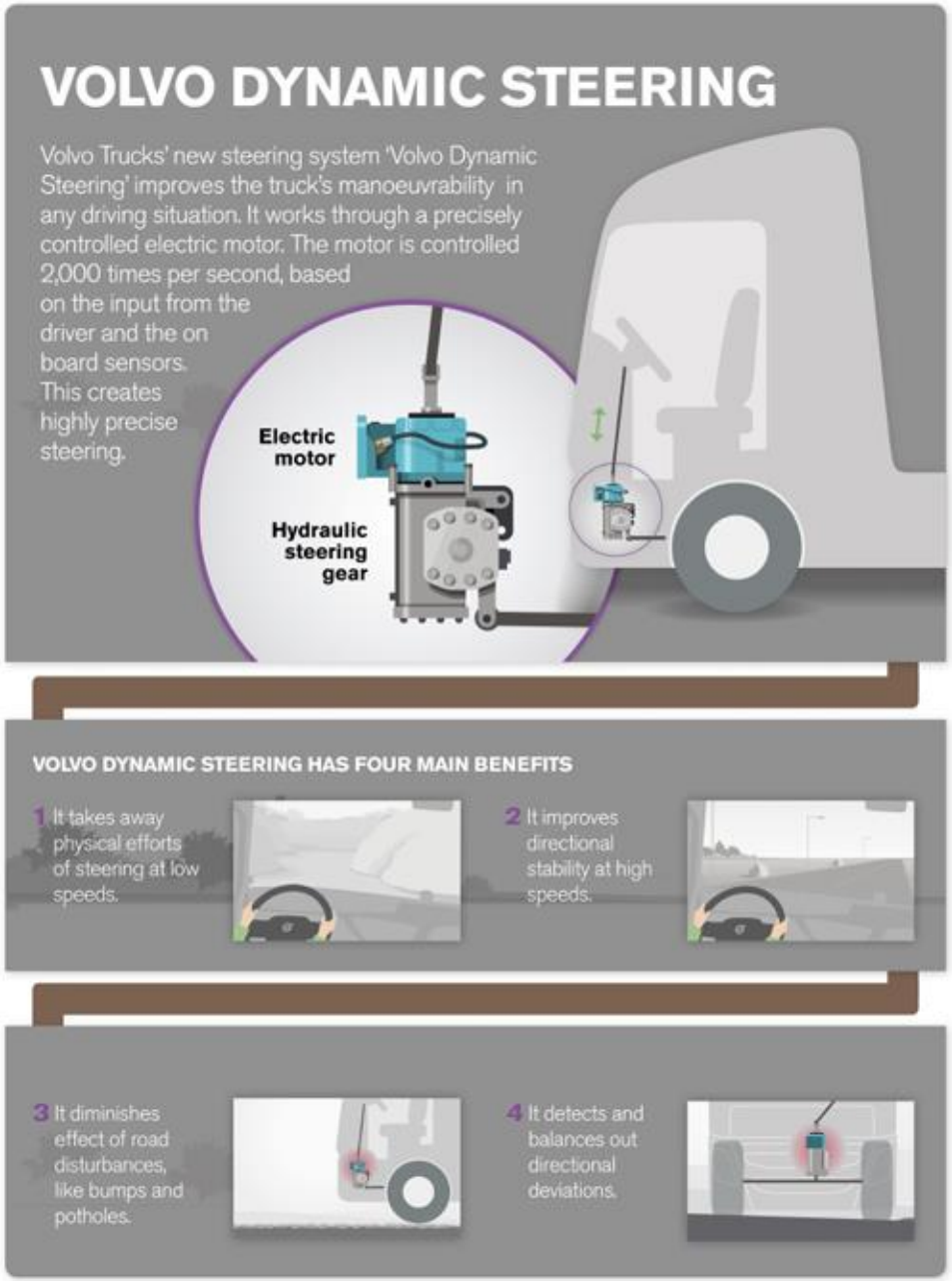
- 25% Fuel Economy possibility for city applications





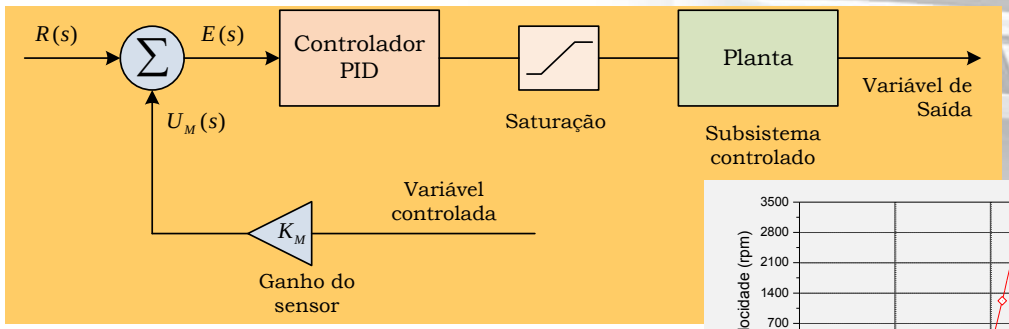
Volvo Dynamic Steering

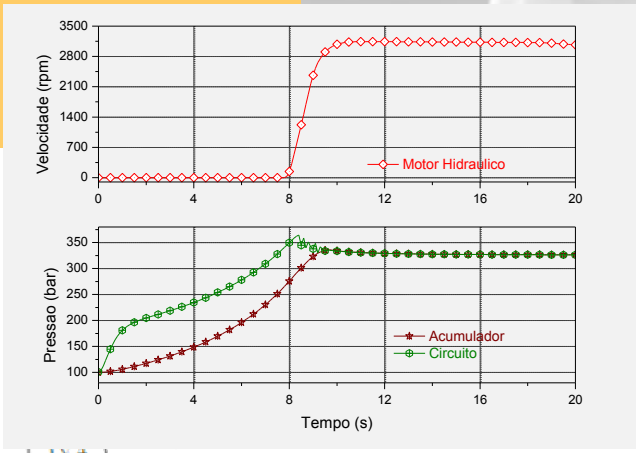
- A breakthrough for effortless steering without strain or pain
- Volvo Dynamic Steering combines conventional hydraulic power steering with an electronically regulated electric motor fitted to the steering gear.
- The result is precise steering that gives the truck driver a safer, more comfortable and more enjoyable working environment

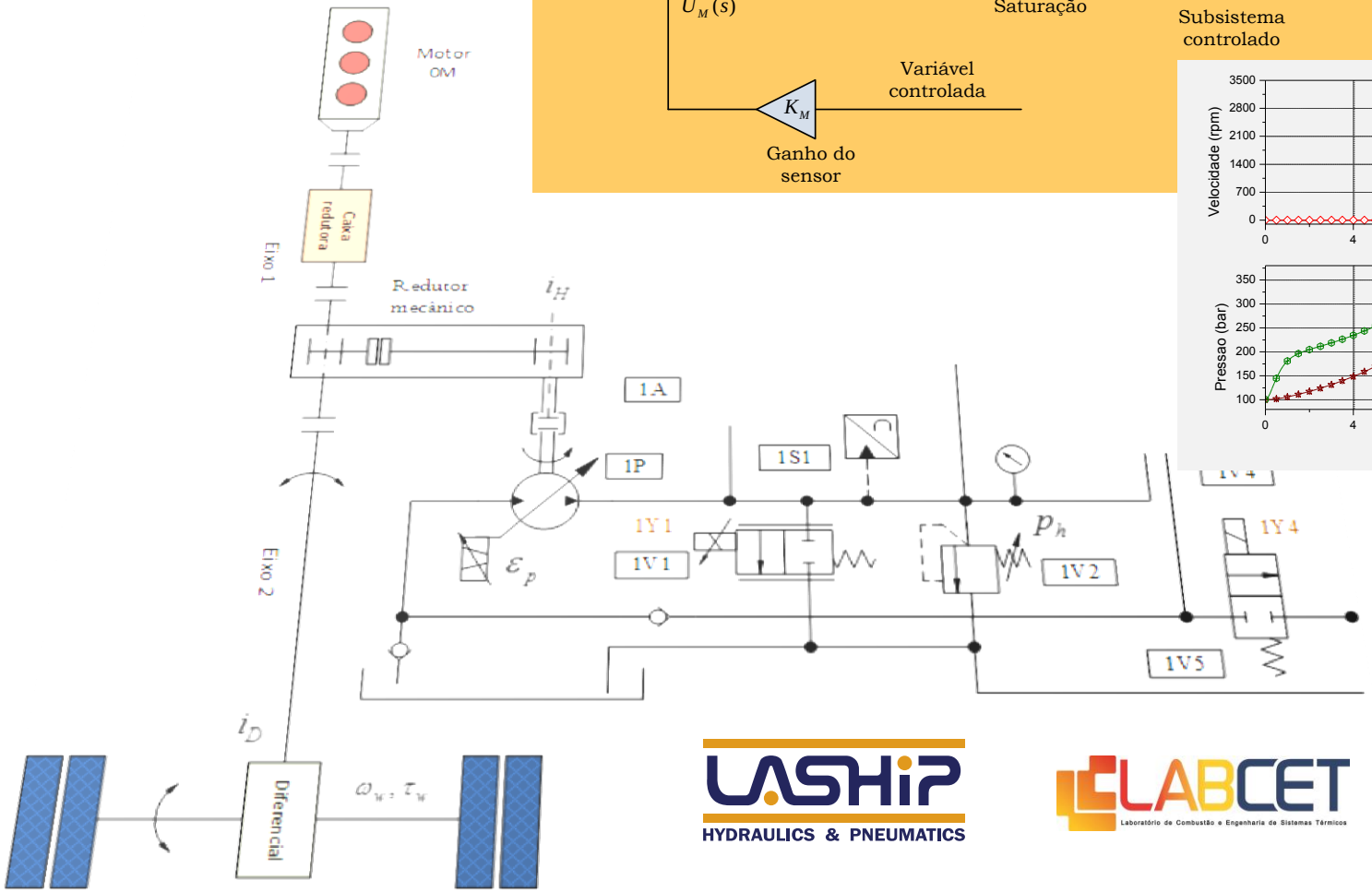


Volvo Dynamic Steering

Hydraulic Hybrid Systems for Heavy Vehicles







Rafael Bravo
Rafael Goularte

The most POWERFULL truck in the world!!

VOLVO TRUCKS. DRIVING PROGRESS