

PARIS HYBRID



ETH zürich **IWF** inspire

Our Vision

We are designing the hybrid vehicle of the future

Electromobility is changing our world. Apart from the economic aspects, sustainability and environmental protection are also driving this technology forward. However, construction vehicles are hardly affected by these changes so far. We see a great potential in this industry as well as the need to catch up. The Project Paris Hybrid has set itself the goal, to create a sustainable basis in this segment.

Words by Stefan Schneider

Project Leader, Inspire AG

«Alternative, renewable drivetrain strategies enable the efficient, low emission and inexpensive operation of a variety of different vehicles. How exciting is the approach of combining all the advantages of a serial and parallel hybrid system? The challenge of implementing this system architecture in a demonstration carrier requires well trained engineers with skills in the field of mechanics, thermal management, electrical engineering, and system control. Thus, a perfect starting position to reach for the stars, with this focus project.”

Our Project

We demonstrate the conversion to an efficient hybrid

Using a dump truck as an example we will demonstrate how a construction vehicle can be converted successfully. Opposing the powerful combustion engine, one finds the energy efficient electric drive. With the 4QT powertrain we combine the advantages of both concepts in one vehicle, with the goal: less fuel consumption with a simultaneous high performance.

The Paris Hybrid Team

Our team consists of eight students from the ETH Zürich, studying in the fields of electrical and mechanical engineering in the fifth semester. With our unbiased way of thinking, our interest in electric mobility and our creative way of solving a problem, we want to do pioneering work with Paris Hybrid. We work with focus, determination and great enthusiasm – by uniting our forces we are realizing our project for a clean world.

Our generation will be strongly impacted with the issue of climate change and its serious consequences. With this project, we do not only want to discuss the issues but actively contribute and offer a possible solution to the politically defined CO₂ emissions targets which have been set. Our focus does not lie on the already advanced electric mobility in the automotive industry, but on the hybridization of pre-existing construction vehicles. With the conversion of the all-terrain dump truck we can not only expect sustainability but also large cost savings.

Short and sweet

We are a team of enthusiastic students from the ETH Zürich, who are remodeling a dump truck into a hybrid vehicle with 4QT drive, in collaboration with our partners. We are implementing our knowledge specifically into practice.



Team Paris Hybrid: (left to right) Pjeter Berisa, Severin Wallimann, Nerit Küneško, Arne von Hopffgarten, Seraina Wurster, Dario Walde, Lenny Rhiner, Stephan Eugster

Mechanics

From axes and shafts down to the smallest screw; everything that belongs to the mechanics of the drive, gets designed and implemented by this team.

Electronics and software

This area of responsibility includes the electric motors, the inverters as well as all the wiring and the system control.

Battery & Thermal Management

Given the many temperature sensitive parts of the system, especially the battery, a specific thermal management is required.

The Project

Hybrid vehicles are not a new invention. On the streets today we often encounter this combination of a combustion engine and an electric machine. In most cases however these are so called serial or parallel hybrids. Both approaches still suffer weaknesses.

Thanks to the innovative method of the 4QT-System, the strengths of both approaches are combined. This system enables the combustion engine to always operate at its most efficient operating point, regardless of the driving conditions. With the installation of an electric motor and the DRM of 4QT, speed and torque can be perfectly adapted to the current driving needs. This allows for a much more efficient use of the fuel, than would be the case in conventional systems. Additionally, there is the possibility of recharging the built-in battery when braking, as well as reusing the recovered energy.

It is Paris Hybrid's goal to bring the 4QT concept on the road for the first time. In this case we are talking about a RACO 2500 HSK dump truck, that will be converted into a hybrid vehicle. All in all, 4QT enables fuel-efficient and low emission mobility, thus contributing to a greener future.

Short and Sweet

It is Paris Hybrid's goal to bring the 4QT concept on the road for the first time. Thereby the potential of 4QT and hybrid vehicles around construction sites will be demonstrated. The vehicle used is a RACO 2500 HSK dump truck.

Our Partnership

This project requires large financial expenditures. In order to realize our idea and reach our goal, we are dependent on your financial support.

Your support pays off!

- You are part of an ETH project and are supporting innovative research and development
- You are helping with our quest to reduce CO₂ emissions and therefore are supporting the achievement of climate targets
- You have networking possibilities with like-minded companies and even more ETH students
- You are enhancing your image as an attractive employer

Your Advantages

- Company presence on several channels such as the home-page, Instagram, LinkedIn, as well as your logo on our prototype
- Invitations to (web-)reviews including reporting on the current status of the project
- Regular newsletters concerning the project status
- By arrangement and request, the possibility of a project presentation at your company

Paris Hybrid



Impressum

Paris Hybrid

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Unsere Partner

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IWF

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