



## The Technology

REPS is a **mechanical energy converter**, 12 meter long, equipped with 27 low-stroke triggers that compress a few centimeters when driven over. This movement over the REPS is not an obstacle, but a controlled mechanism that converts kinetic energy that would otherwise be lost into electrical energy.



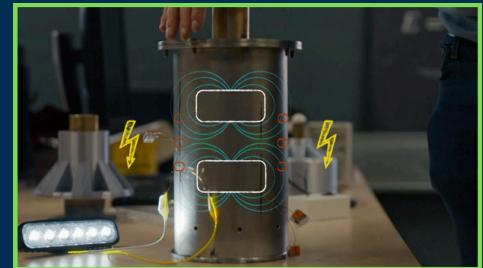
### PLATE SYSTEM

Captures the **lost energy** released by vehicles driving over it.



### HYDRAULIC SYSTEM

Efficiently **transmits** **impulses** from the road to the **energy converter**.



### ENERGY CONVERTER

Converts the impulses from the street into **clean electricity** – highly efficient and durable.

### Key Technical Features

- No abrasion of the tire tread.
- No additional load for vehicles.
- No change in driving behavior.
- Fully compatible with current road and safety standards.

### Our Validation encompasses:

- Over 20,000 measuring points,
- Over 2,000 simulations,
- Over 1 year of real-world operation on an industrial site.
- Over 1 year of additional testing and validation at the University of Innsbruck.



Animation Video  
and Deep Dive

## Green Energy

The energy source are trucks that **slow down or lose energy anyway** at stop signs, on slopes, at entrances and exits, intersections, and logistics areas. **Without REPS, this energy is completely converted into heat.** With REPS, it is converted into **clean electrical energy** – directly at the point of consumption.

### Energetic Amortization:

- Takes only 1–3 months.
- Once this period has passed, the system generates many times the amount of energy required for its production throughout many years.

### CO<sub>2</sub>-positive instead of just neutral:

- Produces more emission savings than it causes
- Leads to a clear net-CO<sub>2</sub>-reduction

### Places where vehicles naturally slow down and REPS can be installed:



Traffic lights  
and  
intersections



Toll stations



Stop signs



Slopes



Pedestrian  
crossings



Road exits

etc.

**REPS does not affect traffic.** Drivers perceive the crossing as a **slightly uneven surface** of **around 1.1 cm**. Once triggered, the system remains flush with the road surface and complies with **all relevant road construction and safety standards**. Vehicles are not affected in terms of handling or consumption.

## Handling and Comfort:

- Drivers feel almost no change
- No additional load or vibration
- No measurable influence on steering or braking behavior

## Technical Validation and Safety:

- Over 20,000 measured points,
- 2,000 simulations,
- 1 year of real-world operation on an industrial site.

## **Recuperation: Why REPS still recovers energy**

Even though vehicles can partially recover energy, a large portion of kinetic energy continues to be lost and unused in many real-world traffic situations. REPS harnesses precisely this energy — especially in situations where conventional recuperation systems are ineffective.

- **Passenger car:** Modern vehicles recover energy, **but not in all driving situations**. A large part of the kinetic energy continues to be lost and unused.
- **Trucks:** Most **trucks do not recover energy at all, or only to a very limited extent**. Retarders and brakes convert almost all kinetic energy into heat, resulting in large amounts of energy being lost every day, especially in places with high truck traffic such as ports — energy that REPS is making usable for the first time.

## **Economic Efficiency**

REPS is particularly economically attractive in areas where there is a high volume of heavy vehicle traffic. Typically, the system pays for itself within 2–10 years, depending on traffic volume and vehicle weights. **Deployment is worthwhile from around 350 trucks/day or 6,000 cars/day**. The system costs per unit are between €30,000 and €45,000. A 30-ton truck generates around 0.05 kWh per crossing (20t: 0.033 kWh, 40t: 0.065 kWh).

## Example: Economic Efficiency in the Port of Hamburg

The port offers ideal conditions and clearly demonstrates the potential:

- Roads with 1,000 to 5,600 trucks per day
- Annual yield per system between 18,250 kWh and 100,000+ kWh

This is energy that is generated reliably, close to the load, independent of weather conditions, and completely emission-free.



## **Infrastructure Perspective**

REPS is **not** a gimmick or **experimental technology**. It is a **new category of regenerative infrastructure** that:

- makes cities more resilient and generates energy where it is needed,
- makes logistics areas more efficient and sustainable,
- is fully compatible with existing traffic loads, and delivers immediate CO<sub>2</sub> savings.

**In a time when we need every kilowatt hour of clean energy, REPS utilises something that no one has used before: Every road is full of wasted energy. We make it visible and usable.**

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## **Recuperation: Why REPS still recovers energy**

Even though vehicles can partially recover energy, in many real-life traffic situations a large proportion of motion energy continues to be lost without being used. REPS makes exactly this energy usable – especially in situations where conventional recuperation systems are ineffective.

- **Passenger car:** Modern vehicles recover energy, **but not in all driving situations**. A large part of the kinetic energy continues to be lost and unused.
- **Trucks:** Most **trucks do not recover energy at all, or only to a very limited extent**. Retarders and brakes convert almost all kinetic energy into heat, resulting in large amounts of energy being lost every day, especially in places with high truck traffic such as ports – energy that REPS is making usable for the first time.

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## **Implementation at HCS**

## Energy for E-Vehicles:

The pilot project at HCS demonstrates how electricity is generated and used precisely where it is needed in port operations. The energy generated by the REPS system is used directly on site to charge electric forklifts and other electric vehicles.

## **Advantages for HCS:**

- Local electricity generation, independent of weather conditions and PV space availability
- Verifiable CO<sub>2</sub> reduction for customers and partners
- Lower energy costs through the use of own renewable energy