




REPS

ROAD ENERGY PRODUCTION SYSTEM

A hand is shown plugging a black charging cable into a car's charging port. The background features a collage of renewable energy sources: wind turbines and solar panels. A teal diagonal line separates the image from the text on the right.

Electricity demand grows faster than the implementation of **green energy converter**

The increasing demand for electricity is expected to rise unabated in the future, driven by factors such as electrification, population growth, electric vehicles, and others. However, the availability of renewable energy sources lags behind this development, which could lead to a growing need for fossil fuels.



Innovation

Green energy sources

Limited space, scarce resources, permissions and many other factors present a challenge to fully meeting current and future electricity demand through photovoltaic, wind, and hydropower. In order to successfully combat fossil fuels, innovative solutions such as REPS are essential.

REPS not only transforms streets into a green source of energy but also provides ample space for implementation within pre-existing human-made structures, all without disrupting nature. We now do have the possibility to show the world a new way of energy production.

Load

Competition/Streets

There is no known competitor that can convert roads into green energy sources. One reason for this is the tremendous stress that roads endure, including heat, cold, dirt, mechanical loads from vehicles, and much more.



Piezo/Dynamo

Competition/Well known systems

In our world, there are two known systems that are particularly suitable for energy harvesting: piezoelectric effects and dynamo principles. However, both of them have significant disadvantages that make them unsuitable for applications on roads, disqualifying them as viable options for mechanical energy conversion on roads, both in terms of energy efficiency and economic feasibility.

Piezoelectric effects

Looking beyond the efficiency of piezoelectric effects and focusing on a fundamental physical issue with this mechanism: the energy to be harvested is always distance-dependent. Piezoelectric crystals deform in the micrometer range when subjected to force. As a result, such mechanisms can only generate 10,000 times less energy compared to **REPS**, regardless of their lifespan or efficiency. Consequently, they can never be designed as a viable energy source.

Dynamo principles

Dynamos require a significant delay of 30 to 100 seconds after activation to reach optimal efficiency, posing a significant disadvantage in high-frequency areas. Furthermore, dynamos rely on the conversion of translational motion into rotational motion, but the presence of friction leads to a rapid reduction in their lifespan. In order to capture substantial amounts of energy, such as from vehicles, exceedingly large dynamos would be necessary. However, employing large dynamos for impulse capturing purposes proves impractical as they become inefficient and prohibitively expensive. Dynamos demonstrate optimal efficiency when confronted with continuous forces rather than intermittent ones.





What is REPS?

REPS stands for Road Energy Production System and describes a mechanical energy converter that converts lost energy from vehicles into clean electrical energy. The electricity generated can be fed into nearby infrastructure, regardless of the network and therefore create energy conservation systems.



REPS-Modul

Disruptive technology

REPS ist not based on these principles mentioned before, and therefore is very efficient and durable to the following reasons:

- Unique permanent magnetic bearing
- The mechanism requires only one energy conversion step to transform the entire energy of a passing vehicle into clean electricity
- Electronic components and the mechanism itself are located outside the road, allowing for easy maintenance
- REPS has been granted a European patent, and no one worldwide has been found to have discovered this method of energy generation.



Patented

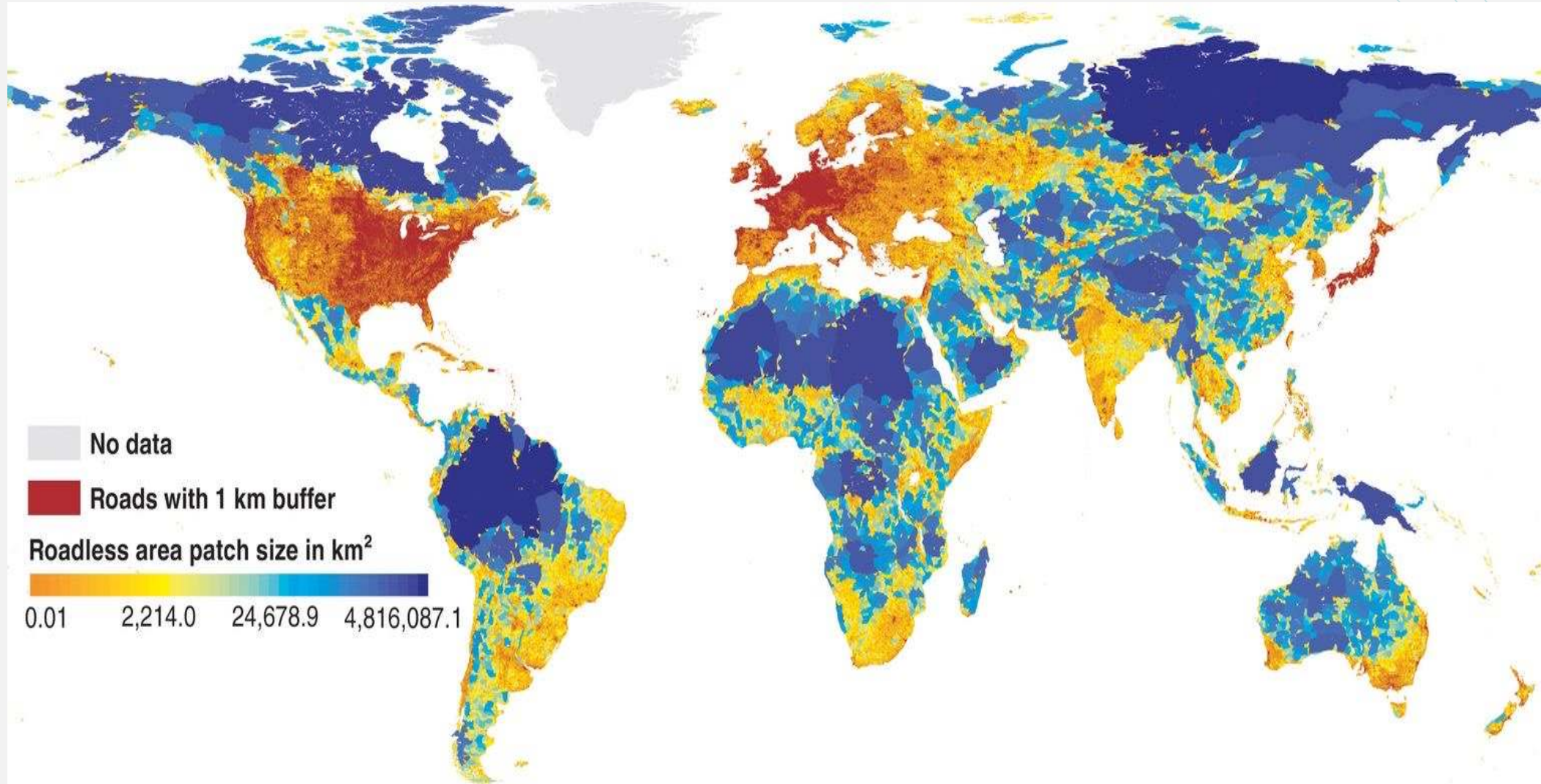


Efficient



Durable

Market potential (roads)



As of 2016, approximately **36 million kilometers** of roads had been constructed worldwide. It was estimated at that time that by 2050, an additional **25 million kilometers** would be built.

Austrian highways

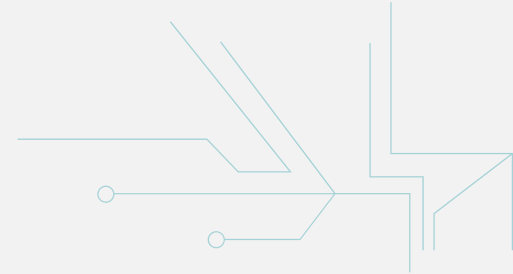
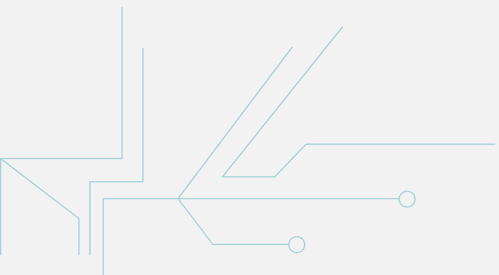
REPS has the remarkable capability to generate **200 GWh** of clean electricity annually in Austria through its exclusive application on highways, all within a conservative amortization period of **10 years**.



Austria

Market Potential

Highest frequented road known



Salik toll station in Dubai

Could generate **16.440.000 million kWh** of clean electricity annually and pay off in **3.7 years**.



Examples

REPS in Numbers

The energy yield of **REPS** is determined by the **frequency**, the number of installed ground plates, and the weight of the passing vehicle (truck or car). In these examples, a length of 80 meters was used for calculations.

1 REPS-system

A single REPS system is defined by a length of 80 meters, and typically, one truck passing over it generates 1 kWh of energy.

1200 REPS-systems

At highways could replace a mid-size nuclear power plant.

REPS at a federal road “Bahnhofstraße Wattens”

Could generate **200 000 Kwh** yearly and pay for it self in **10.2 years**.

REPS at the Toll Station “Brenner”

Could generate **2 Million Kwh** yearly and pay for it self in **under 3 years**.





10 years amortization period

REPS in Numbers

REPS has the potential to greatly reduce its amortization time in 6-8 months. This can be supported by external factors such as a normalization of raw material prices and sustained demand for electricity.

Additionally, professional supply chains can help minimize the cost of materials.

Research has shown that just by optimizing the mechanism of REPS, half of the amortization time can be achieved in 1 1/2 year.

10000 Cars daily
or
4000 Trucks daily

are currently needed for a 10 year amortization period





Current Status

Research 2019-2023 Q4

To provide verified statements about REPS, the team follows a 3-pillar principle:

1. Calculations verify whether the idea works in principle.
2. 3D and 2D simulations confirm the idea.
3. Practical tests verify the assumption.

Patent 2022 Q3

On November 30th, 2022, REPS was granted the European patent. Currently, the team is working on internationalization to secure patents for REPS worldwide.

Partnerships 2023 Q2

REPS is collaborating with Tyrolean companies to jointly design a roadworthy plate for the already verified mechanism.

Test track 2023 Q4

REPS fulfilled all the needs and regulations to install a test road at the end of the year to get from TLR 4-5 to TLR7-8

Business plan



Sell



License



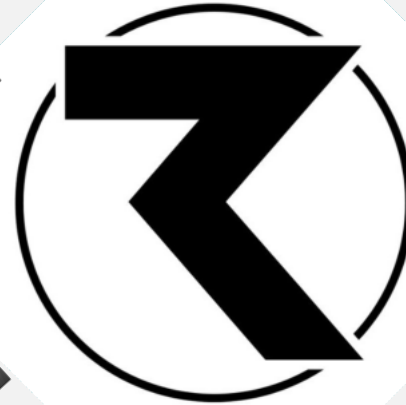
Rent streets

Based on the regulations of each country, REPS has the potential to engage in various activities, such as selling systems, granting licenses to countries, or even leasing streets to function as an electricity manufacturer.

Impact Hub Tirol



TEAM
REPS-Tirol GmbH



Dollinger & Pfeifer



Johannes Völlenklee
Founder



Alexander Auer
Founder/CEO



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Alfons Huber
Founder/CEO



**Univ. Prof. Dr.
Lukas a. Huber**
Founder



Christian Dollinger
Founder/CEO



Marco Pfeifer
Founder/CEO

Passion

Team description

REPS is responsible for further developing the energy modules and finally linking them to the roadworthy plate, switching electronics that store the electricity in order to provide a green energy converter for roads

Impact Hub Tirol plays an important role in overseeing the establishment of the company. On the other hand, Alex is an energy industry expert who brings important knowledge to establish a new energy converter in the market.

Dollinger & Pfeifer are responsible for the production, installation, and are also partners in the research and development of roadworthy panels.





Vision

REPS will change the view of our currently energy production by revolutionizing energy harvesting by creating an economical green energy converter for roads.

