

## POWER ROAD® by Eurovia

by Mariama Simaga / 2019-05-28 14:22:24 / Francia / 8938 / FR



**Year of commitment** : 2017

**Address 1 - street** : PéAGE A10 SAINT-ARNOULT-EN-YVELINES, France

**Diameter** : 500

**Green energies** : Thermal solar, Heat, Thermal storage

**Sustainable mobility** : Roads

**Circular economy and waste management** : Save of ressources



4 600 000 €

**Builder**

Eurovia

**Manager / Dealer**

VINCI Autoroutes

### GENERAL INFORMATION

Power Road® is based on a simple concept: a road that has all the usual safety, durability and recyclability characteristics for a roadway and that adds to these performances a thermal energy production capacity, capturing the heat of the sun.

This heat is stored and transmitted to surrounding infrastructure that helps to heat residential buildings, office buildings, shops, eco-neighborhoods or public facilities such as swimming pools, by improving their energy mix. It can also be used in winter to clear snow and ice from airport roads or runways by reducing salting operations, and in summer to cool pavements and help to reduce urban heat islands through surface heat capture. .

The application of this concept is based on the integration, in the upper layers of the roadway, of a heat exchanger, consisting of tubes in which circulates a coolant.

### Progress Status

Delivered

## Data Reliability

Self-declared

## Funding Type

Private

## Website Enterprise / Infrastructure

<https://www.power-road.com/>

## Sustainable Development

**Attractiveness :**

**Well Being :**

The road, in all its forms, is closely inscribed in the fabric of the territories, especially when it comes to urban roads. With Power Road®, the road does not only connect locals by allowing them to travel; it also connects them to renewable energy produced nearby, according to a short circuit that takes advantage of the tight interweaving of transport networks, activity pools and living areas.

Pavement cooling has the effect of mitigating the effects of urban heat islands (ICU); Power Road® prevents heat from accumulating in the pavement by capturing and storing it.

**Social Cohesion :**

**Responsible use of resources :**

One of the main challenges of Power Road® is to develop the use of geothermal and solar thermal energy: the road becomes a producer and a renewable heat vector, limiting the use of fossil fuels, sources of greenhouse gas emissions. This issue is fully in line with the objective set by the law for the energy transition of 2015, which is to increase by 50% the capacity of renewable energies in France by 2023.

Power Road® also participates in the fight against climate change by helping to reduce the effects of urban heat islands (ICU) through the cooling of pavements. It limits the demand for energy related to air conditioning systems.

## Testimony / Feedback

*Power Road® Demonstrator in St Arnoult (Yvelines)*

*Power Road®: technical testing and fuel efficiency*

## Governance

VINCI Autoroutes

**Holder Type :** Private Company

Eurovia

**Builder Type :** Construction Industry

VINCI Autoroutes

**Manager / Dealer Type :** Private

This project is supported by the Program Investissement d'Avenir (PIA) operated by ADEME.

Together with Eurovia's teams, the involvement of specialized partners complements Eurovia's expertise in the three specific areas of mechanical behavior of the Power Road® roadway under traffic, energy performance and the design of thermal systems using Power Road®.

The IFSTTAR (French Institute of Science and Technology for Transport, Development and Networks), a public scientific and technological institution, is associated with the project for the analysis of the mechanical behavior of Power Road®. IFSTTAR has equipped one of the demonstrators with a fatigue carousel (FABAC) that tests the mechanical behavior under simulated traffic of the Power Road® pavement. It monitors the results and will participate in their analysis.

CEA Tech, the "technological research" pole of CEA (Commissariat for Atomic Energy and Alternative Energies), supports Eurovia in the energy component of the project, in order to model and optimize the performance of Power Road® in this field. Studies and experiments are carried out on the platforms of the National Institute of Solar Energy (Ines), of which the CEA is one of the partners.

BURGEAP, an engineering office specializing in environmental professions, is Eurovia's partner for the geothermal design of the project. BURGEAP is responsible in particular for studying the recoverable performances of the inter-seasonal vertical geothermal probe (SGV) storage method, coupled with the Power Road® concept.

## Sustainable Solutions

The Saint-Arnoult demonstrator - Power Road®

Description :

**The demonstrator d1 in Saint Arnoult: heating of building and resistance to the traffic of millions of heavy vehicles**

Installed in July 2017, the D1 demonstrator is located on the access road to the HGV parking lot of the A10 highway tollgate at Saint-Arnoult-en-Yvelines (78) on the Cofiroute network ( **VINCI Autoroutes** ). It represents 500 m<sup>2</sup> of roadway. This car park has a building (Cofiroute customer area) whose ground floor is heated by the Power Road® process, associated with inter-seasonal storage (vertical geothermal probe field).



These probes are located under a parking lot. Their number, spacing and depth have been optimized to meet the energy needs of the building. The production of heat is ensured by a heat pump.

The facility is instrumented to recover and store all data from energy exchanges between the various devices and geothermal generation. A remote monitoring and maintenance device is installed to interact on the regulation and the various modes of operation of the installation.

In order to evaluate the mechanical strength of Power Road® under traffic, heavy goods vehicle traffic is simulated by the installation of a FABAC fatigue train - operated by the IFSTTAR - which allows the analysis of the mechanical behavior of the roadway under simulated traffic. This carousel will solicit the test board in a few months for an equivalent of 3 to 5 million trucks.

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- Mobility :
- Resources :
- Energy/climate :
- Urban project governance
- Infrastructure
- Renewable energies

[http://eb8ecd4bd5.url-de-test.ws/wp-content/uploads/2017/10/2\\_dossier-presse\\_illustre\\_HD.pdf](http://eb8ecd4bd5.url-de-test.ws/wp-content/uploads/2017/10/2_dossier-presse_illustre_HD.pdf)

Company (es) Website :

## Contest

### Reasons for participating in the competition(s)

L'un des enjeux principaux de Power Road® est de **développer l'utilisation de la géothermie et de l'énergie solaire thermique** : la route devient ainsi un producteur et un vecteur de chaleur renouvelable, en **limitant le recours aux énergies fossiles**, sources d'émissions de gaz à effet de serre.

Power Road® participe également à la lutte contre le changement climatique en contribuant à **réduire les effets d'îlots de chaleur urbains (ICU)** grâce au rafraîchissement des chaussées. Il permet de **limiter la demande en énergie relative aux systèmes de climatisation**.

En mode régulation thermique de la chaussée, dit « mode hivernal », la chaleur disponible dans le sol permet d'assurer le déneigement et le déverglaçage de la chaussée en **supprimant l'usage des sels fondants** et en **réduisant ainsi l'impact environnemental des opérations de maintenance** routière.

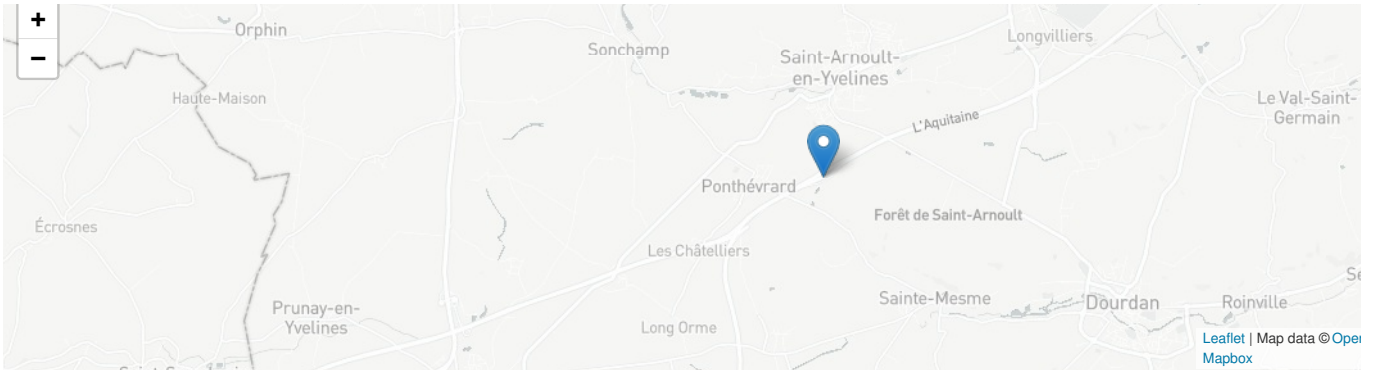
### Building candidate in the category



Grand Prix Infrastructure Durable



Prix du public



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