





V#A





01.CONCEPT





the way towards a revolutionary road, energetically active with reduced environmental impact

The scope and purpose of the **E-RIB SYSTEM** project is to develop a revolutionary road, which is able to adopt technologies and solutions to reduce environmental and landscape impact: by exploiting natural factors, such as the sun and wind, along with the transit of the motor vehicles themselves, E-RIB SYSTEM will be able to produce clean and renewable energy.

The **E-RIB SYSTEM** project leader is Vita srl is an engeneering services company, whose core competencies are sustainable development and energy efficiency in the plannig and design of buildings and infrastructure. At today, its organisational chart is very simple, based on a general manager, the Arch. Cristian Vitali, a very skilled design-engeering team, and an admistration team. Although its small size, VITA has already aquired relevant knowledge in the development of real estate and transport infrastructure projects, which keywords are high technology, innovation, sustainability, environment, and efficiency.

E-RIB SYSTEM's mission is to be acknowledged as a new benchmark in the field of road infrastructure construction, introducing new performance criteria, which focus on environmental and energy-related safety, criteria of absolute paramount importance in today's large-scale project sector.

More specifically, E-RIB SYSTEM adopts a set of technologies to achieve abatement of acoustic and other polluting factors emitted into the atmosphere, the use of photovoltaic panels or micro wind modules for the production of electric energy, and even increase levels of safety with the addition of electric heating modules to the asphalt, which have antifreeze functions. Compared to a road of the same type (e.g. a motorway with two carriages in each direction) **E-RIB SYSTEM** requires a construction investment which is, on average, at least 20%-30% higher than normal, but when compared on a minimum life scale of 20 years, there is a significant decrease in maintenance and management costs in addition to producing additional revenue given by the generation of clean and renewable energy.

E-RIB SYSTEM is capable of producing in one kilometre with 5 thousand square metres of photovoltaic panels, an outstanding 750 thousand kWh, generating an annual revenue of \in 350 thousand and a payback period of 8 years. Or, looking at it from another aspect, with 3 thousand square metres of aerogenerators, it is capable of producing 3 million kWh, generating an annual revenue of \in 750 thousand and a payback period of 6 years. In the former case the annual savings would amount to 372 thousand kg of CO2 emitted into the atmosphere and in the latter, 552 TEP of fossil energy, in addition to the savings already achieved on the atmospheric pollution by vehicles using photocatalytic pigments in the acoustic and structural buffer solutions.

E-RIB SYSTEM is a concept for a road-system that operates like a human body, with its own internal metabolism, capable of communicating and interacting with the external environmental context to accomplish operational advantages, also in terms of safety and future economic management: the road is hence transformed from a pure cost into an energy resource, contributing to the safety and active integration of various functions.

WORKTEAM an integrated innovation oriented round table









MOBILITY and SUSTAINABILITY infrastructures and reverse marketing









EXTENDED BENEFITS of the system







CONSTRUCTION

USE OF INNOVATIVE MATERIALS AND RENEWABLE RESOUCES

REDUCTION OF POLLUTANT EMISSION

CONTROL OF THE BUILDING PROCESS

UTILISATION

REDUCTION OF ENVIRONMENTAL AND ACOUSTIC POLLUTION

ACTIVE AND PASSIVE SAFETY SYSTEM

REAL TIME MONITORING

CONTROLLED ACCESS

MANAGEMENT

POPTIMIZATION OF EXTRAORDINARY AND ORDINARY MAINTENANCE SYSTEM

CLEAN ENERGY PRODUCTION SELLING

SELF- SUFFICIENCY ENERGY















exploded isometric view

view from inside the motorway



SYSTEM





PHOTOVOLTAIC ELECTRIC POWER

Technical data

Main features

- Solar cells in high efficiency monocrystalline silicon for maximum yield.
- High stability and life cycle levels

Technical features

- Dimensions 1,045 x 1,045 x 39 mm
- Upper finishing in 4 mm tempered and textured glass
- Ultrarapid "click and connect" connections (electrical and mechanical) Rated power: 135 w







WIND DRIVEN ELECTRIC POWER

Mini wind power turbine with vertical and horizontal axis generators for the production of electric energy for sale to the grid and own consumption

Monitoring system for the generation of electric power exploiting wind (speed peaks) and the air generated by vehicle flows.

rated power	1	kW
rated wind speed	14	m/s
cut-in speed	3	m/s
cut-out speed	15	m/s
maximum no. of rotations	415	rpm
no. of blades	3	
voltage output	240	V
rotor weight	65	kg
rotor diameter	1.45	m
rotor height	1.45	m
swept area	2.10	m ²







PHOTO-CATALYTIC ASPHALT

This innovative product aims to contribute to reducing the organic pollutants present in the atmosphere originating from factories, vehicles, heating etc., exploiting the photocatalysis process, similar to the photosynthesis in plants.

The process is activated by the air and light, decomposing the polluting organic and nonorganic substances and transforming them into non-harmful substances.

The advantages of green concrete:

- 1. anti-pollutant
- 2. anti-dirt
- 3. anti-bacterial



LED ILLUMINATION

Increases road safety:

- Safetv signs

- Road visibility in bad weather or fog, increased life cycle, less maintenance, decrease in costs

General description/objectives:

The proposed system exploits the road network information to illuminate the sides of the roads according to the traffic conditions at any moment in time: Green: regular conditions Yellow: fog, bad weather warning Red: Incident or traffic congestion warning When integrated in the road surface it can indicate dangerous bends or the vicinity of emergency-breakdown stations.

Price evaluation per 1 km: 12 RGB coloured led lines - € 436,000 Excluding support systems Excluding Installation (+10%)









ROAD SAFETY

SENSORS VIDEO CAMERAS DATA MANAGEMENT CENTRES

Variable message sign management (VMS) Incident Detection / Module Code Detection CCTV system management Traffic Statistics and Reports - SRT Surveillance video cameras Emergency warning sign panels Electronic toll systems: Fast moving traffic Code reduction No specific personnel

SERVICE AREA

ELECTRIC VEHICLE CHARGING SYSTEM EPOS

EPOS is the solution proposed for the charging of electric vehicles and comprises the following subsystems:

1 Main EPOS charge station where it is possible to pay for the charge service.

2 Satellite stations where the actual vehicle charging takes place SW package City Control 6 compact to manage and control the EPOS system.

ERIBSYSTEM







ERIBSYSTEM





EQUATION ENERGY and ENVIRONMENTAL

	VEGETATION	GEOTHERMAL	SOLAR PANEL	AEROGENERATION
ENERGY PRODUCED	0	2 millions KWh/year	750 thousand KWh/year	Until 2,5 MegaWatt
CO ² SAVED	20/50 Kg CO2/year	175 millions Kg/year	372 thousand Kg/year	*
FOSSIL ENERGY SAVER	not definible in this preliminary phase*	60 TEP/year	140 TEP/year	*
INVESTMENT AND LOSS	470 thousand euros for each 2000 tree	520 thousand euros	2.200 thousand euros	1,2-1,5 Millions/megaWatt
REVENUE LOSS	0	90 thousand euros	350 thousand euros/year	*
PAY BACK	0	6 years	6 years	6 years



Viia

COSTS & BENEFITS

TIME 20 YEARS





03. PROJECT







RELATIONSHIP with the ENVIRONMENT

Buffer zone restrictions







CONCEPT DEVELOPMENT

Surveyed

VIIA



Trench





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