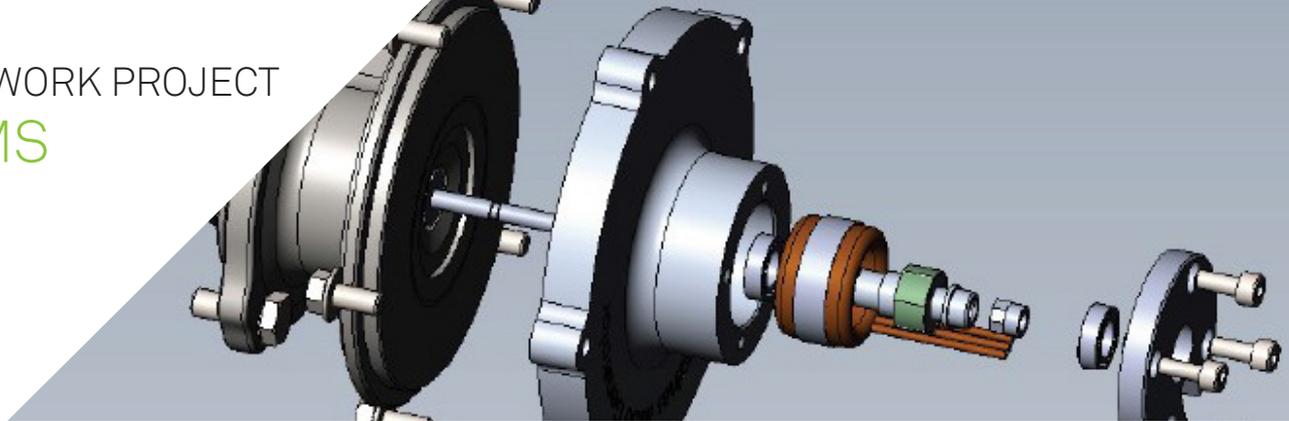


# EUREKA NETWORK PROJECT

## 6718 VEMS



## CLEANER ENGINES

**A Czech start-up has applied for a patent on a system that re-uses car exhaust energy and its CEO showcasing it on a motorised surfboard.**

Martin Šula is not what you would expect from a European chief executive. The Czech founder of MSR Engines is often found whizzing around on the motorised surfboards he invented and sells through his first company Jetsurf, competing regularly at the MotoSurf World Cup, to be held this October in Florida. "I tried normal surfing and engine power was the element missing," says Šula about his invention.

But for the last decade now, 44-year-old Šula has also joined the race to make cars greener and his efforts have resulted in his company being able to apply for a patent on a system that captures energy from exhaust gases, cutting vehicle fuel use by 5 to 10 percent. MSR Engines has developed, installed and tested its Vehicle Energy Management System (V.E.M.S) in the popular Czech car, the Skoda Fabia 1.0 TSI.

The company completed the system during a EUREKA partnership with Britain's High Tech Racing. Šula reached out to High Tech because he knew a friend at the firm that equips the British team that races in the FIA Formula 3 European and Asian Championships. High Tech provided its state-of-the-art emissions measuring technology and helped build a greener

turbocharger for use in racing cars.

"Lowering fuel consumption is the goal of all car manufacturers," says Šula. "When customers choose a car, they want low consumption to make running it as cheap as possible."

**“ ‘When customers choose a car, they want low consumption to make running it as cheap as possible’ ”**

Current gasoline or diesel cars power systems like air conditioning, the radio and opening the doors through electricity produced by the combustion engine directly linked to an alternator. The system can often be fuel inefficient since electrical energy is produced only by converting the chemical energy of the fuel through combustion in an internal combustion engine to mechanical energy (65-70 percent of energy is lost) and then from mechanical energy into electrical (20 to 30 percent is lost).

### Tapping exhaust energy

MSR developed a way to use the exhaust gas of the engine to rotate the alternator that produces electricity. Since exhaust gas energy is so high, the alternator can also produce electrical energy in the supply. The partners fitted an auxiliary electric motor in the vehicle in order to

use that captured energy for the energy-intensive start-up of the vehicle or for going up hill. "This reduces overall fuel consumption and exhaust gas emissions," explains Šula.

Although there is a commercial demand for greener cars, constant changes to regulation on fuel emissions in Europe, makes research and development in the field risky for small and medium-sized companies, which is why Šula believes EUREKA backing was so crucial. Indeed, commercial possibilities may take time to emerge in the consumer car market as manufacturers focus their efforts on 100 percent electric vehicles.

He is optimistic, however. "Some technologies can be introduced with the advent of new materials," he says. "Given that the VEMS system is relatively simple and is partly based on existing technologies, it could be implemented in passenger cars, trucks, buses and other vehicles within a few years."

In the meantime, MSR has begun implementing the system into dozens of racing cars and is in talks with the multinational HoneyWell, one of the largest manufacturers of sports car turbochargers to sell a licence.

And of course, Šula decided from 2017 to fit the new alternator into his Jetsurf to make his favourite hobby more sustainable.

## MAIN PARTNER

MSR Engines, Czech Republic  
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## OTHER PARTNERS

Sterk, Slovenia  
Hi Tech Racing, UK

## TOTAL R&D INVESTMENT

€ 0.85 million

## DURATION

March 2012 to January 2016

## COUNTRIES AND NATIONAL FUNDING BODIES INVOLVED

-  Ministry of Education, Youth and Sports (MEYS)
-  Ministry of Economic development and technology
-  Innovate UK

EUREKA is a European network for market-oriented R&D.

