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**VEHICLE AS A SAFETY FACTOR  
OF THE TRANSPORTATION ACTIVITY**

**Proceedings of Papers**



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**VEHICLE AS A SAFETY FACTOR OF  
THE TRANSPORTATION ACTIVITY**

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**MVM2014-054**

**Radivoje Pešić<sup>1</sup>**  
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**Emil Hnatko<sup>3</sup>**  
**Stevan Veinović<sup>4</sup>**

## **DOWNSIZING INTERNAL COMBUSTION ENGINE WITH VARIABLE COMPRESSION RATIO: EFFECTS AND POTENTIALS**

**ABSTRACT:** Downsizing represents the only way to achieve the performance, emissions, and – above all – the efficiency of internal combustion engines. The biggest largest power is situated in the transport sector: up to 15 times bigger of larger than all energy resources in the USA and up to 10 times larger than all energy resources in Serbia. The medium term (2025) perspectives for vehicles and fuel use are double. Improved engine technologies, optimized combustion and multi fuel systems can improve near- and mid-term fuel economy for passenger 25-40% and commercial vehicles about 20% by using:

- Downsizing in combination with turbocharging, this currently represents the main technology trend
- VCR (variable compression ratio) with flexible Otto/Diesel or Diesel/Otto cycle and HCCI combustion
- New diversity of fuels: this change will bring about proliferation of engine variants to cater for alternative fuels (ethanol blends, biodiesel, propane, compressed natural gas, hydrogen and electricity).

The paper focuses on the variable compression application from engine investigations on test bench using continuously variable compression.

**KEYWORDS:** alternative fuels, controlled auto-ignition, internal combustion engines, variable compression ratio

### **STRATEGIC COMMITMENT**

Serious forecasts say that the global flood of motor vehicles is to double, reaching 1.7 billion by 2025 but without the likely support of sufficient amounts of fuels energy.

Forecasts of oil consumption in the US have varied widely. Here is how American presidents perceive their role. The USA politicians have, by clear imposition of authority introduced a "political ecology" in the world of vehicle claims which do not support basic laws of nature. In fact, American arrogance at the global level was humiliated by the economic crisis, which is an example of multiple misuse of the dollar "free trade". In analogy, to the political and military transition from the earlier "Cold War" to the present state of "Cold Peace", the essential economic revision of global behavior is inevitable. Germany suggests replacement of "dollar free market" with new global "fair trade" that rules out hidden slave labor (in the Far East).

The USA could not restrain spending in transportation, fig1a. In the 2000 presidential election campaign of the former candidate Al Gore the program "CAFE" was presented as a dramatic goal in the economy of passenger vehicles from 80 mpg. He has later as a "consolation" received half of the Nobel Prize for Ecology!? George

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