



*University of Banja Luka  
Faculty of Mechanical Engineering*



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# PROCEEDINGS

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30<sup>th</sup> May – 1<sup>th</sup> June 2013*



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## PREFACE

Dear colleagues,

DEMI Conference has brought us together for the 11<sup>th</sup> time to show the current state of research in the field of Mechanical and Electrical Engineering as well as Information Technology.

From the very beginning, the Conference has aimed strengthening cooperation between companies and science. However, we live at the time of a severe economic crisis that even affects the richest economies. Furthermore, stagnation of the real economy and unemployment are present in technologically developed countries, whereas investments in the R&D sector are small, all of which reflects on the field of scientific research.

There was concern that such a state of the economy may cause a lack of interest and potential of scientific workers to participate actively in the work of scientific conferences. However, DEMI will not flinch. With great pleasure, I would like to point out that the DEMI 2013 Conference gathered a record number of participants so far. The Conference Proceedings contains 174 papers by authors from 14 countries. Scientists and researchers have traditionally been the most active in the field of Production Technology and Engineering (41 papers), followed by Energy and Thermal Engineering (37 papers), Mechanics and Design (28 papers), Transport Vehicles and Transportation (23 papers), Mechatronics (20 papers), Maintenance of technical systems, Occupational safety (17 papers).

On behalf of Organizational Board of the 11th International Conference on Accomplishments in Electrical and Mechanical Engineering and Information Technology, DEMI 2013, I wish all our guests a warm welcome to Banja Luka and successful work to all participants. Furthermore, I would like to express my gratitude to all the authors, members of the Scientific Committee, institutions, companies and individuals who have contributed to successful organization of the DEMI 2013 Conference.

In Banja Luka, May 2013  
Chair of DEMI 2013 Organizational Board  
Valentina Golubović-Bugarski

## PREDGOVOR

Poštovane kolege,

Konferencija DEMI okupila nas je po 11. put da prezentujemo trenutno stanje istraživanja u području mašinstva, elektrotehnike i informacionih tehnologija.

Konferencija DEMI odavno je za svoj cilj postavila jačanje oblika saradnje između privrednih preduzeća i nauke. Međutim, živimo u vrijeme teške ekonomske krize koja pogađa i najbogatije ekonomije, stagnacija realne privrede i nezaposlenost prisutni su i u tehnološki najrazvijenijim zemljama, ulaganja u razvoj i istraživanja su mala, što se sve reflektuje i na područje naučnih istraživanja.

Postojala je bojazan da će ovakvo stanje privrede uzrokovati i manjak interesovanja i mogućnosti naučnih radnika da aktivno učestvuju u radu naučnih konferencija. Ipak, DEMI ne posustaje.

S posebnim zadovoljstvom ističem da je Konferencija DEMI 2013 okupila do sada rekordan broj učesnika. U zborniku radova objavljeno je 174 radova autora iz 14 zemalja. Naučnici i istraživači tradicionalno su najaktivniji u području Proizvodnih tehnologija i inženjerstva, a rezultati istraživanja u ovom području saopšteni su kroz 41 radova. Slijede područje Termotehnike i energetike (37 radova), Mehanika i konstrukcije (28 rada), Saobraćaj i transportna sredstva (23 rada), Mehatronika (20 radova) i Održavanje tehničkih sistema i zaštita na radu (17 radova).

U ime Organizacionog odbora Konferencije DEMI 2013 iskazujem svim našim gostima toplu dobrodošlicu u Banju Luku i želim uspješan rad učesnicima Konferencije. Takođe, zahvaljujem se svim autorima, članovima Naučnog odbora, institucijama, firmama i pojedincima koji su svojim angažovanjem doprinijeli da Konferencija DEMI 2013 bude uspješno organizovana.

U Banjoj Luci, maj 2013. godine  
Predsjednik Organizacionog odbora  
Konferencije DEMI 2013  
Valentina Golubović-Bugarski



## CONTRIBUTION TO THE REDUCTION OF TRAFFIC NOISE BY APPLICATION OF THE CNG BUSES

Saša Milojević<sup>1</sup>, Jovanka Lukić<sup>2</sup>, Radivoje Pešić<sup>3</sup>

**Abstract:** *The noise that comes from the road traffic, along with other emitters of environmental noise has a largely negative impact on quality of life. In the Republic of Serbia as in communities everywhere in the world, the noise that comes from the road traffic has become an increasingly noticeable and serious problem which is especially pronounced in large industrialized cities. Regarding to the current situation, as a special contribution to reducing noise in road traffic, it is proposed solution in terms of replacement of the existing city buses with original engines or vehicles on Compressed Natural Gas CNG, that produce less noise emission. This was confirmed with parallel tests of the buses with drive on diesel and CNG. The results obtained by measuring the noise of the vehicles according to the Regulation UN ECE No. 51, are shown a significant noise reduction compared to the situation when used diesel buses.*

**Keywords:** Road traffic noise, CNG buses, ecology.

### 1. INTRODUCTION

European Union (EU) indicates the noise emission as one of the ecological problems of modern society. According to the EU statistics, nearly 40% of the population today is exposed to the noise level in excess of 55 dB(A), that is upper limit for clearly residential territory. Through 20% of the population is exposed to the noise level in excess of 65 dB(A), that is upper limit for urban center, commercial and administrative area with residences, zone along highway, main route and city roads, until above 30% of the European population is exposed to the noise level in excess of 55 dB(A) nightly, that challenge the problems with dream [3,7].

Today, increased noise, due to emission from diesel vehicles intensified the applications of CNG vehicles. As a contribution, we started the proper researches during it was realized the reconstruction of the low floor city bus with diesel engine, for CNG drive, by mounting of original CNG engine (eng. dedicated NGV) [4].

During the tests, we are measured the emission of noise on the new bus variant according to the Regulation UN ECE 51R [2]. Based on the results, we are verified the reduction of noise in the case when used gas instead of the diesel engine.

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