

## RESEARCH AND DEVELOPMENT IN 2013

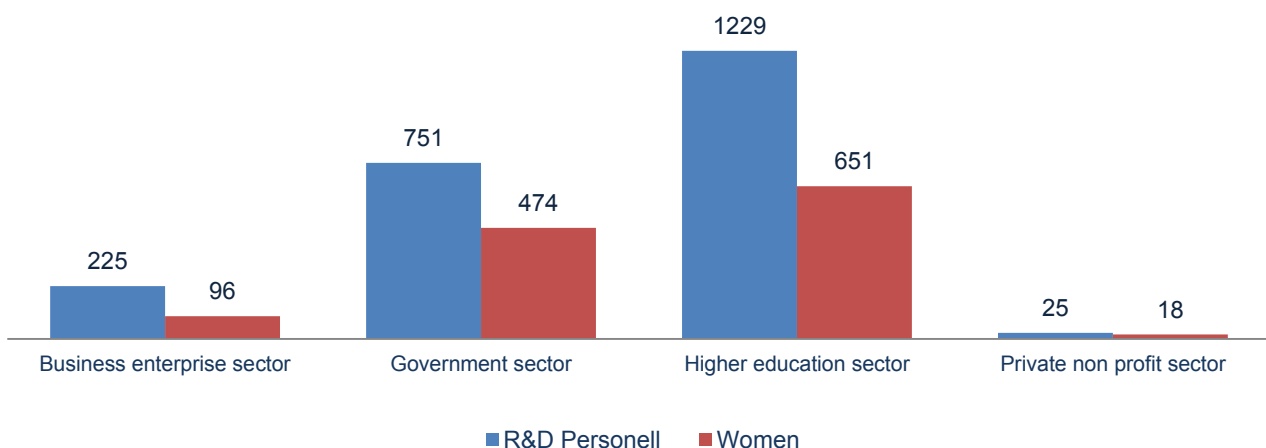
Data presented in this report are result of processing of annual reports collected form legal subjects which performed activities of research and development in Montenegro in 2013. The questionnaire used was: Annual report on research and development for scientific-research institutions and research and development units in 2013.

The data are gathered from 58 reporting units, which performed activity of research and development in the territory of Montenegro, and for 4 sectors: business – enterprise, Government, higher education and private non-profit sector. 32 of total number of units are from the higher education sector, 13 from the business enterprise sector, 11 from the Government sector and 2 from private non-profit sector.

Key findings of this survey show that:

- Gross Expenditure on Research and Development - GERD in 2013.g. amounts at 0.38% GDP<sup>1</sup>. The total expenditures on R&D were 12 586 543 EUR. Current expenditures were 90% and capital expenditures 10%.
- From the total number of the employees engaged on research and development in 2013, there were: 1 617 researchers, 301 technicians and other equivalent staff and 312 other supporting staff. Considering that R&D activities of some employees require only part-time, full-time equivalent is calculated. Expressed in full time equivalent, 530 persons were hired by contractual agreement or author's contract working full-time in R&D.
- According to the annual reports for 2013, there were no inventions or patents registered by the reporting units

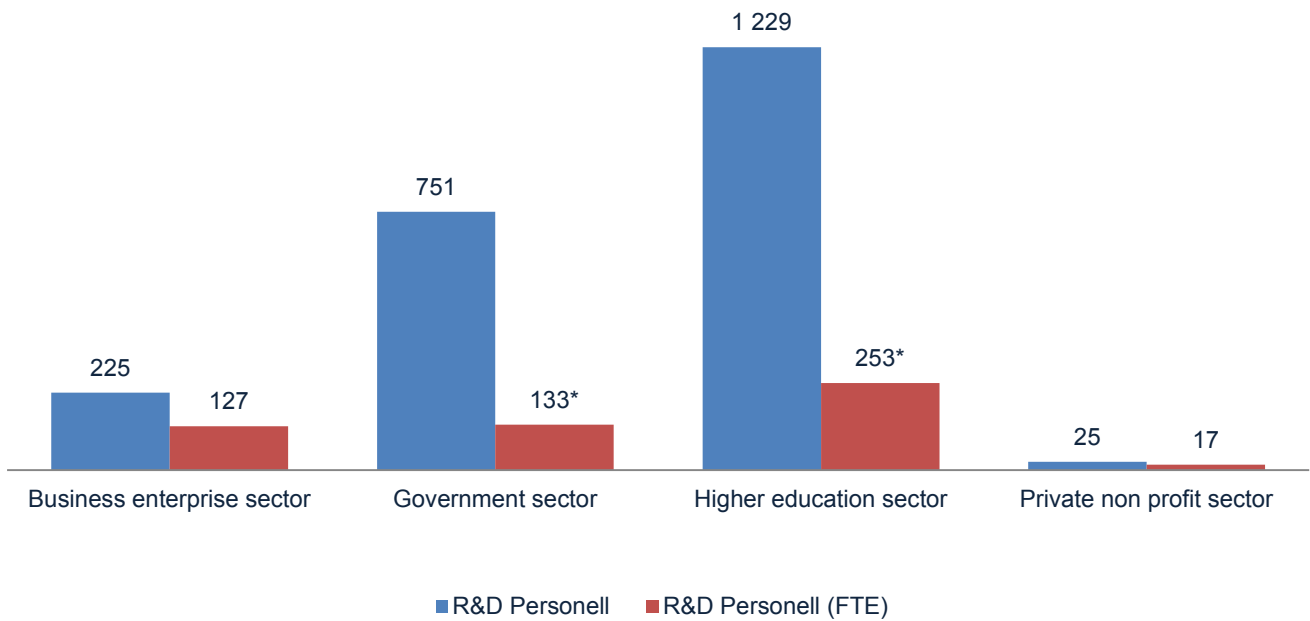
### R&D personnel in 2013 - by sector of realization and gender –



2 230 persons were engaged on research and development jobs in 2013, out of which 2 046 employed full time in the reporting units, and 184 part-time employed.

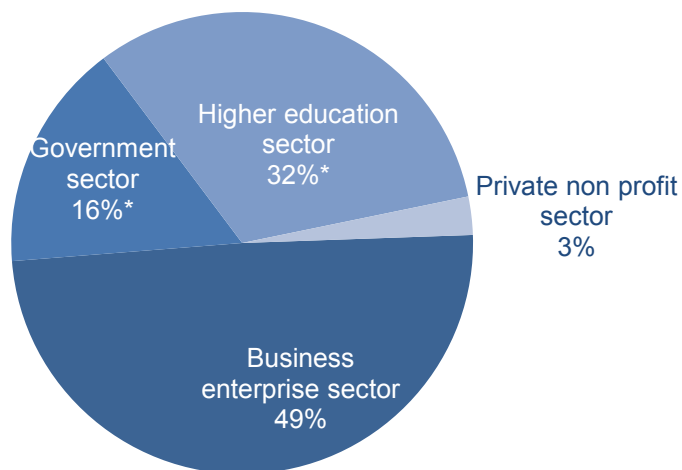
<sup>1</sup>GDP in 2013 in Montenegro was 3,327,077,000 EUR

**R&D personnel in 2013  
Headcounts and Full-time Equivalent (FTE)**



The highest number of researchers full-time was employed in the higher education sector (53.9%), Government sector (36.5%), business – enterprise (8.6%) and private non-profit sector (1%).

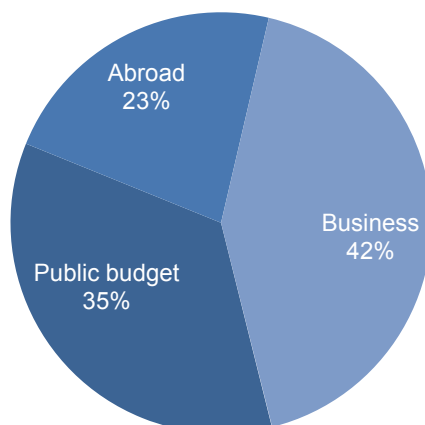
**Expenditures on R&D in 2013 - by sector of realization**



The highest expenditures for R&D activity are realized in business-enterprise sector, in the amount of 6 205 617 EUR, which is 49% out of total expenditures.

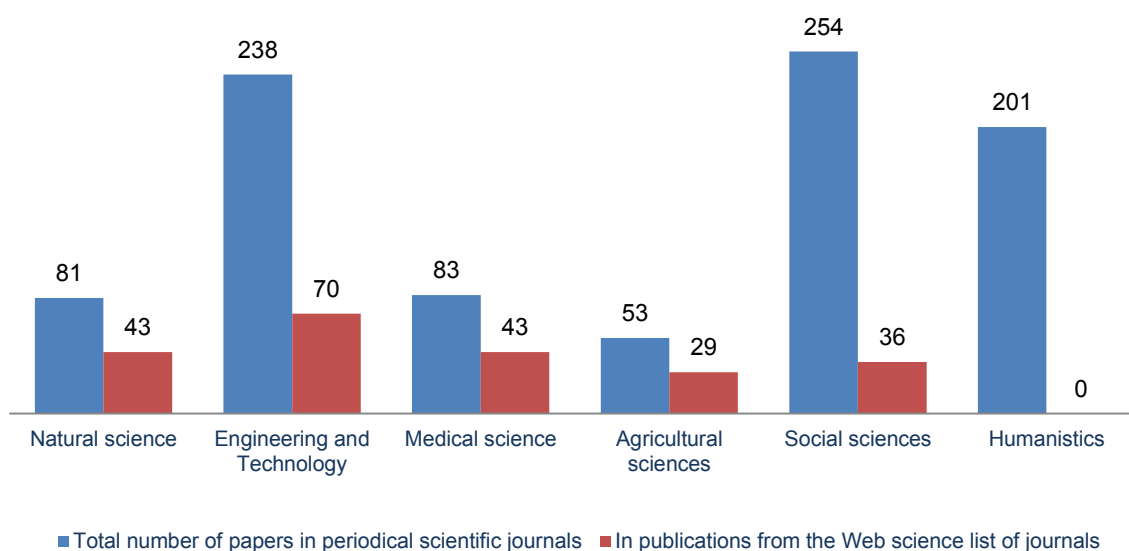
\* = corrected data

### **Expenditures on R&D in 2013 - by sources of funding**



35% of the stated expenditures on R&D were covered from the public budget, 42% from the business and 23% from abroad (mostly from EU and international organizations). From private-nonprofit sector less than 1% is covered for R&D expenditures, and that is not shown in the graph.

### **Published scientific papers by fields of science in 2013 – Total and in Web of Science publications –**



There were 910 published scientific papers, out of which 452 in Montenegro and 458 abroad.

221 of total number of scientific papers were published in journals from the Web of Science list, and from the following fields: engineering and technology (70), natural sciences (43), medicine (43), social sciences (36), agricultural sciences (29) and humanities (0 scientific papers).

There were 55 scientific monograph published in 2013 (43 in Montenegro and 12 abroad).

## METHODOLOGICAL NOTES

*This survey was prepared in line with EU regulation on science statistics (Regulation of the Commission (EC) No 753/2004). Methodology used while conducting this survey is harmonized with the international standards which the OECD established and published in the Frascati Manual (The Measurement of Scientific and Technological Activities – Proposed Standard Practice for Surveys of Research and Experimental Development–Frascati Manual, 2002 and 2007; publisher: Organization for Economic Cooperation and Development).*

*The aim of I&R statistics is to give data on the state, structure of the scientific organizations development, structure and movement of scientists, scientific works and factors that influence them. Basic data sources are: documentation of human services, accounting records of the revenues and realized investment in R&D, as well as documentation of professional services on the results of research work - projects, papers, reported patents, etc.*

*With this statistical survey we can obtain data on the intensity of scientific-research activity in the country, by measuring **inputs for research and development** (human resources and expenditures on R&D). This survey covers the outputs from R&D only to a minor extent. There are separate surveys for these indicators, such as Innovation Survey, but they are still not implemented in Montenegro. EU comparable indicators provided by the R&D survey are: GERD - Gross expenditure on research and development, R&D personnel – headcounts and full-time-equivalent, with relevant breakdowns of data.*

*Scientific research activity considers the creative activity on scientific discoveries, application and use of scientific results, training of researchers for scientific research and specializations of researchers. Scientific research activity is an activity of public interest. Performing scientific research activity is free and available to all domestic and foreign individuals and legal entities.*

*The data are collected for 4 sectors and they are: business-enterprise, Government, higher education and private non-profit sector. According to the Frascati Manual, affiliation of the reporting units to particular sector is determined by economic activity in which research and development activity is undertaken.*

**Business sector** that includes companies (enterprises) and organizations whose primary activity is the market production of goods and services and to be sold at economically significant prices, as well as research and development units within the company.

**Government sector** includes organizations, agencies and other bodies that company provide, to the society, one free shared services, except higher education, which, according to market conditions could not provide, and are an expression of economic and social policy of the society. By definition, this sector includes activities of administration, defense and regulation of public order, health, education, culture, recreation and other social services.

**Higher education sector** includes universities with units, faculties, academies and scientific institutes, regardless of their funding and legal status. To this sector belong research institutes and clinics that are under the direct control or administration of institutes of higher education.

**Non-profit organization sector** includes non-market private non-profit organizations and provide services to households free of charge or at low cost, these organizations can be established by an association of citizens for providing goods and services for members of associations or for general purposes.

*Under R&D employees, are considered all those who are directly engaged in these activities, as well as those who provide direct services and support to R&D.*

**Researchers** are experts engaged in creating new knowledge, methods and systems, conducting research projects. They are individuals with research and scientific titles, in compliance with Law on scientific-research activity, as well as individuals elected in academic and associate vocations within high education institutions. An individual with high education degree, master degree or doctorate can perform scientific research activity, without being elected in research or scientific title, in sense of Law mentioned above, and with references based on published scientific works, which allow him the perform scientific research activity.

**Professional and technical assistants** do not bear scientific or research titles, directly cooperate with researchers, performing professional and technical activities connected to scientific research and R&D tasks (laboratory technicians, engineers and technicians of technical sciences, sketchers, librarians, curators, documents, IT, lectors etc.)

Support staff is solely and mainly dealing with organizational, management, legal, administrative or financial operations (managers, lawyers, treasurer, etc.), connected to R&D activities.

**Full-time equivalent (FTE)** presents time as a share of full working time in which persons in employment are engaged in the work related to research and development.

Full-time equivalent for persons engaged in full-time employment on R&D is equal to unit of full time equivalent (= 1 FTE)

**Expenditure on R&D (GERD)** is the total intramural expenditure on R&D performed on the national territory during the reporting calendar year, and consists of gross current and investment expenditures.

**Published research works** are those published during the reporting year.

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