

Warsaw School of Economics  
Enterprise Institute

**Labour market in selected sectors of economy in  
Lubuskie voivodship in 2008  
and its changes in the years 2005-2007**

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## Introduction

The aim of the report is to present basic parameters of labour market in selected sectors in Lubuskie voivodship in 2008 as well as its changes in years 2005–2008. The analysed sectors cover engineering, electronics and automotive industries, the medical biotechnology sector and the sector business services.

The change in employment in the sector of enterprises in 2005-2007 (an 11% increase) along with the migration outflow of work resources shaped basic parameters of labour market in Lubuskie region such as: the number of the employed, the employment rate, the number of the unemployed, the registered unemployment rate, the rate of unemployed persons per 1 work offer.

**Table 1. Basic parameters of labour market in Lubuskie voivodship in 2005–2007**

No.	Basic parameters of labour market	2005	2006	2007
1	2	3	4	5
1	Employed persons (in thousands)	398	419	437
2	Employment rate (in %)	44.6	45.7	48.2
3	Employment rate of persons at working age (in %)	55.4	57.5	61.1
4	Unemployed persons (in thousands)	89.1	72.8	52.3
5	Registered unemployment rate (in %)	23.0	19.0	14.2
6	Unemployment rate according to BAEL* (in %)	19.1	13.9	9.8
7	Number of unemployed persons per 1 work offer	169	126	53

Source: own work on the basis of Regional Database of the Central Statistical Office.

In the period of 2005 – 2007 the access to work resources of persons at working age in Lubuskie voivodship significantly improved due to an increase of 1%. It means that in 2007 the total number of persons at working age constituted 70% which was by 1 percentage point higher than the country average. The indicator of the total number of persons at working age enables to define potential capacities of the regional labour market. The employment rate of persons at working age indicates actual use of regional work resources. In the analysed period it increased from 3.8 percentage points to almost 61.1 % which denotes in turn a 5.7

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\* BAEL: Badania Aktywności Ekonomicznej Ludności, (Labour Force Survey, LFS) [translator's annotation].

percentage points increase. In comparison to the country employment indicator, Lubuskie voivodship reached a level which was lower by 1.3 percentage points in the group of persons at working age. Therefore in the analysed period, this indicator was decreasing faster in Lubuskie region than the country average. The unemployment level indicators that is the number of unemployed persons and the unemployment rate decreased in the period of 2005-2007. The fall amounted to 41.3% and 9.1 percentage points respectively. It is worth mentioning, that in the recent statistics on the labour market <sup>1</sup> this trend continues to go downwards. In September 2008 the registered unemployment rate in Lubuskie region reached 11.4% and was higher by 2.5 percentage points than the country average unemployment rate. As far as the number of the unemployed is concerned, by the end of September 2008, it amounted to 42258 persons and was by 52.6% lower than the value of the year 2005. Additionally, the number of the unemployed in Lubuskie voivodship constitutes 3.1% of the registered unemployed persons in Poland. It can be assumed that, both the employment rate in the sector of enterprises of much higher decrease in Lubuskie voivodship and migration movements of work resources played an important role in the changes in the labour market. In Lubuskie region, the growth in work offers also influenced the unemployment rate which in turn contributed to the drop in the unemployed persons per 1 work offer from 169 persons in 2005 to 53 in 2007, and then, to 25 persons in the 2<sup>nd</sup> quarter of 2008.

### **1. Employment in selected sectors of economy in 2005 - 2008**

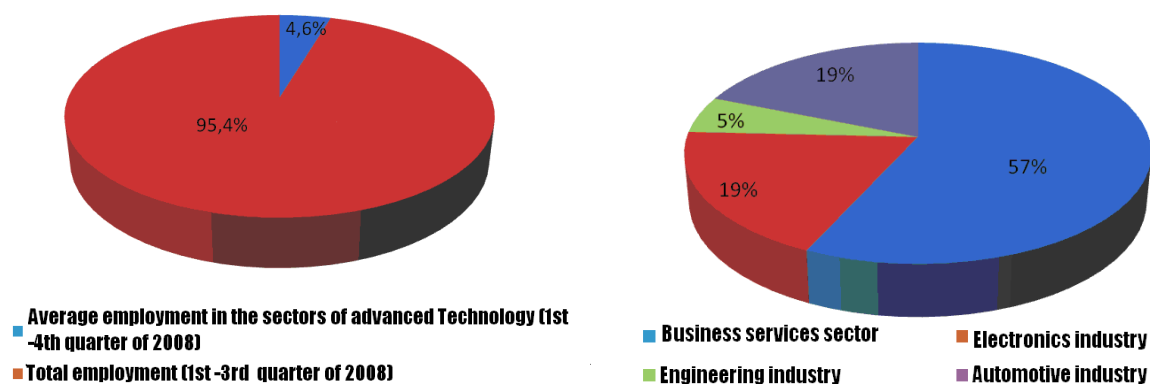
Positive changes in the regional labour market which are reflected in the increase in persons employed in the sector of enterprises were reported not in general terms, but also with respect to the sectors under analysis. Total employment in enterprises of the analysed sectors in Lubuskie voivodship in the 2<sup>nd</sup> quarter of 2008 reached 18514 persons. In comparison to the base-year (2005), it indicates an increase by almost 36%. It should be taken into consideration that the total employment in the analysed sectors makes up 16% of the total of persons employed in the enterprises sector which is almost 4.6% of the total employment in Lubuskie region <sup>2</sup>. As a result of the changes in 2005–2008 (the 2<sup>nd</sup> quarter) the percentage of persons employed in the analysed sectors in Lubuskie voivodship fell from 1.5% to 1.3% with respect to the total number of persons employed in the sectors under study in the country.

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<sup>1</sup> *Information on the unemployment in 2008*, MPiPS, Warsaw October 2008, <http://psz.praca.gov.pl> (30.10.2008 r.).

<sup>2</sup> In comparison to the 1st quarter of 2008 of the analysis, economic activity of persons of 15 years of age and above according to BAEL

**Graph 1. Employment in the sectors of advanced technology in Lubuskie voivodship in 2008**



Source: own work on the basis of *Statistical bulletin of Lubuskie voivodship*, Zielona Góra Statistical Office, Zielona Góra February 2006, June 2008.

Przeciętne zatrudnienie w sektorach wysokich technologii (I – VI 2008)	Average employment in the sectors of advanced Technology (1 <sup>st</sup> -4 <sup>th</sup> quarter of 2008)
Pracujący ogółem (I-III 2008)	Total employment (1 <sup>st</sup> -3 <sup>rd</sup> quarter of 2008)

Sektor usług dla biznesu	Business services sector
Przemysł maszynowy	Engineering industry
Przemysł elektroniczny	Electronics industry
Przemysł motoryzacyjny	Automotive industry

The pace of change in the employment varied in different sectors in Lubuskie voivodship in 2005-2008 (2<sup>nd</sup> quarter). The highest increase, by 121% concerned the automotive sector. A high employment increase was reported in the engineering sector (34.5%) and the business services sector (22.9%). In 2008 the employment in the electronics industry grew by almost 20% from the year 2005.

In the period under analysis, the level of employment in specific sectors of enterprises in Lubuskie voivodship slightly fluctuated. In the 2<sup>nd</sup> quarter of 2008 it reached the following level:

- 9.1% - business services sector – an increase by 0.5 percentage point from 2005;
- 3.0% - engineering industry - an increase by 0.4 percentage point from 2005;
- 0.9% - electronics industry;

- 3.0% - automotive industry - an increase by 1.4 percentage points from 2005.

In 2005 the lowest average employment in the sectors under analysis concerned the electronics sector. The highest average employment was in the business services sector. As a result of these changes, also in 2008 the lowest employment referred to the electronics sector whereas the highest one, to the business services sector. In the engineering and automotive industries the employment level was similar and amounted to 3501 and 3497 persons, respectively. It is important to add that the statistics of Lubuskie voivodship do not take account of the values of '*Production of electrical machines and devices*,' aviation industry and the medical biotechnology sector.

**Table 2. The employment dynamics in the analysed sectors in 2008 – 2005 in Lubuskie voivodship**

Sector	2005	2006	2007	2 <sup>nd</sup> Q. 2008	<u>2005</u> 2006	<u>2006</u> 2007	<u>2005</u> 2007	<u>2005</u> 2 <sup>nd</sup> Q. 2008
Total employment in enterprises sector	99786	104857	110780	115503	5.1%	5.6%	11.0%	15.8%
Aviation industry*	-	-	-	-	-	-	-	-
Medical biotechnology sector*	-	-	-	-	-	-	-	-
Business services sector	8560	9408	10111	10523	9.9%	7.5%	18.1%	22.9%
Engineering industry	2603	2902	3386	3501	11.5%	16.7%	30.1%	34.5%
Electronics industry	830	903	1000	993	8.8%	10.7%	20.5%	19.6%
Automotive industry	1579	2043	3383	3497	29.4%	65.6%	114.2%	121.5%

\* the statistics of Lubuskie voivodship do not take account of this sector.

Source: own work on the basis of *Statistical bulletin of Lubuskie voivodship*, Zielona Góra Statistical Office, Zielona Góra February 2006, June 2008.

The changes in the average employment in Lubuskie voivodship were taking place at the increase in the number of enterprises operating in the sectors of high technology. The number of entities in the analysed sectors in the region increased by over 16% that is from 165 in 2005 to 192.

## 2. Students and graduates of post-gymnasium schools numbers and fields of study \*

Sectors of advanced technology have a demand for high quality human resources that is persons with higher as well as secondary technical, often specialised level of education. The system of education created in the region, in particular specialisations at post-gymnasium and higher levels contribute to meeting this demand.

Graduates of Lubuskie voivodship in 2007 made up 2.6% of the total number of post-gymnasium graduates (except special schools) in Poland, of which the graduates of postsecondary schools made up 17%, graduates of technical secondary schools and specialised lyceums constituted 16% and 15%, respectively. 12% of persons graduated vocational schools. Graduates of general lyceums amounted to 41% which was the largest group. In comparison to the country average of the structure of graduates in 2007, it can be noticed that in Lubuskie region, there was a relatively low number of general lyceum graduates (41%, the country average: 44%). Relatively more persons graduated specialised lyceums (15%, the country average: 11%). The graduates structure of technical and post-

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\* Structure of Polish Educational System:

- *Primary*: Primary School (Szkoła Podstawowa)
- *Basic Vocational*: Basic Vocational School (Zasadnicza Szkoła Zawodowa)
- *Lower Secondary*: Gymnasium (Gimnazjum)
- *Technical Secondary*: Technical Secondary School (Technikum)
- *Upper Secondary*: General Lyceum (Liceum Ogólnokształcące)
- *Vocational Secondary*: Vocational Secondary School (Liceum Zawodowe) /Specialized Lyceum (Liceum Profilowane)
- *Post- secondary*: Post- secondary Vocational School (Szkoła Policealna)
- *Higher education*:
  - o first level courses (studia pierwszego stopnia); title of Bachelor or Engineer (licencjat/ inżynier);
  - o second level courses (studia drugiego stopnia); title of Master (magister)
  - o uniform 5-year magister level courses (jednolite studia magisterskie)

[translator's annotation on the basis of *The European Education Directory*  
<http://www.euroeducation.net/prof/polaco.htm>.(accessed: 15<sup>th</sup> December 2008).]

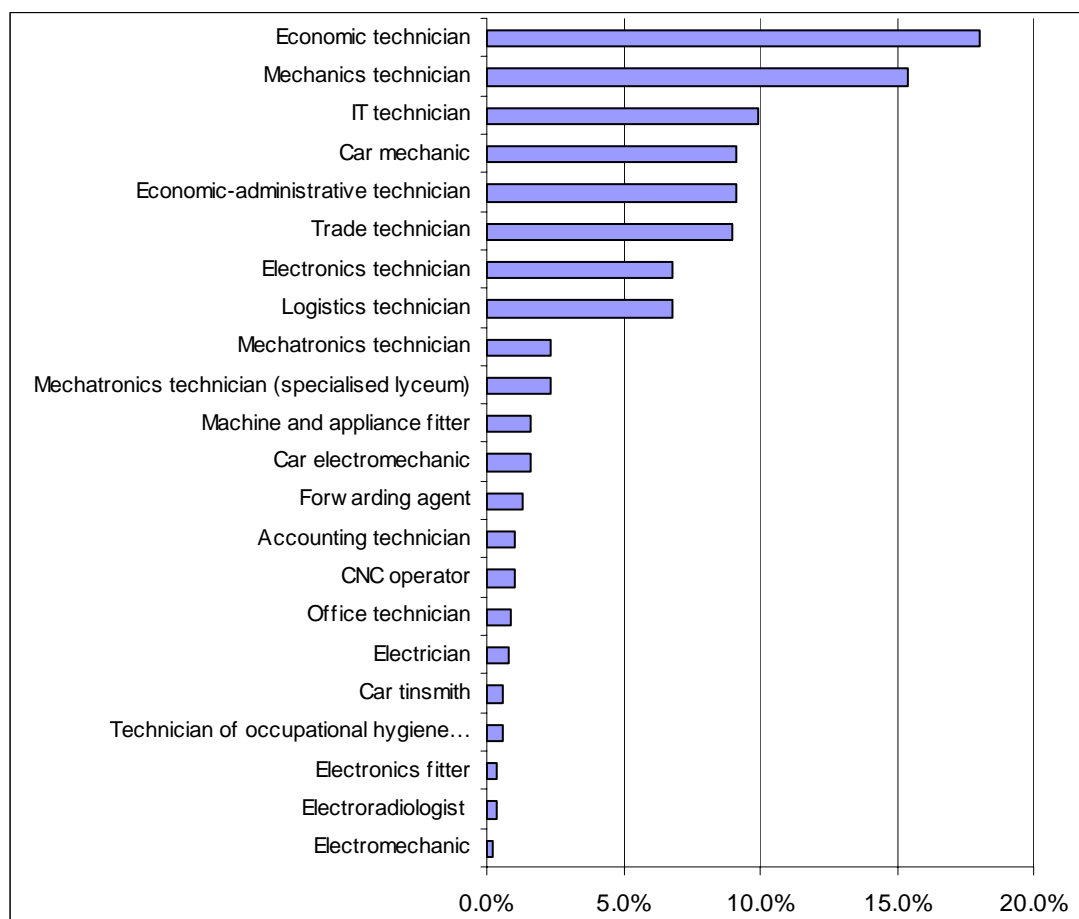
secondary schools as well as vocational schools, in Lubuskie voivodship was similar to the country average.

Fields of training in occupation-oriented schools (specialised lyceums, technical schools, vocational schools) are in a different degree adjusted to the needs of high technology sectors. In order to assess their usefulness, professions were divided into three groups:

- economic and administrative (this group covers economic and administrative professions offered by specialised lyceums, such as: administrative clerk, technician of occupational hygiene and workplace safety, technician of economy, trade technician, office technician, accounting technician),
- general technical (this group covers technical professions, such as: IT technician, mechanic, car mechanic),
- specialist and technical (this group covers specialist and technical professions, such as: car tinsmith, electronics engineer, electrotechnician, electromechanic, electrician, car electromechanic, mechanic production technicians, machine and appliance fitter, mechanic of industrial automatic devices and precision appliances, precision mechanic, mechatronics worker, electronics fitter, mechatronics fitter, CNC operator, operator of chemical industry devices, electronics technician, technician for electrodiology, technician of logistics, mechanic technician for aviation, mechatronics technician, forwarding agent, technician of teleinformation, technician of telecommunication).

In Lubuskie voivodship the total of 14653 persons study the above-mentioned specialisations which is 2.8% of the total number of students in Poland. From the point of view of enterprises operating in high technology sectors, the most desirable persons are those with specialist and technical professions. In Lubuskie voivodship the percentage of persons studying specialist and technical specialisations equals 20.8% of the total number of students of all the occupational specialisations which is by 0.4 percentage point below the country average. In Lubuskie voivodship most of the students: 42.4% gain general technical professions which is by 4.4% percentage points more than the country average. The number of persons preparing for economic and administrative occupations in Lubuskie voivodship is lower than the country average. As far as teaching of specific professions is concerned, in Lubuskie voivodship a great deal of persons study the occupations of: economic technician, IT technician, mechanics technician, car technician and administrative clerk.

**Graph 2. Estimated graduates number by professions in Lubuskie voivodship in 2008**



Source: own work on the basis the SIO databases – as of date of 31<sup>st</sup> March 2008

In the conditions of the opening of the national economy and strict relations of the sectors of high technology with the global economy, the command of foreign languages is an important element of education. In 2007 in Lubuskie region, English was the most frequently chosen language by the graduates at the school leaving exam. It was taken by 61.4% of students. The second most popular language in 2007 was German which was taken by 34.1% of the school-leavers. 2.8% of the youth of Lubuskie region took Russian and 1.5% French exams. The structure of persons who chose a foreign language at the school-leaving exam in 2007 in Lubuskie voivodship in comparison to the country average indicates that relatively



more students took German exams at both the standard and extended level in Lubuskie region than in other regions. English language exams at standard and extended levels were less frequently taken in Lubuskie voivodship than in other regions of the county.

The majority of learners of vocational secondary schools of Lubuskie region learnt German. Nearly a half of them (49%) was learning this language in the schoolyear 2006/2007 which was by 9.1 percentage points higher than the country average. Over 42.5% of learners of vocational secondary schools in Lubuskie voivodship was learning English language which was by 4.1 percentage points less than the Polish average.

**Table 3. Learners number learning a foreign language at vocational schools in the schoolyear 2006/2007 - by voivodships**

Language	Lubuskie voivodship	Poland	Lubuskie voivodship	Poland
	Total		In %	
English	19310	718595	42.5%	46.6%
French	2219	47548	4.9%	3.1%
German	22276	614579	49.0%	39.9%
Russian	1659	158112	3.6%	10.3%
Other	0	2014	0.0%	0.1%
Total	45464	1540848	100.0%	100.0%

Source: Own work based on *Oświata i wychowanie w roku szkolnym 2006/2007 (Education and training in the school year 2006/2007)*, GUS Warszawa 2007.

3.6% of persons attending vocational secondary schools in Lubuskie region was learning Russian language. It is by 6.7 percentage points less than the country average. Slightly more persons, that is 4.9% of the total number of foreign languages learners at vocational secondary schools in Lubuskie voivodship was learning French which was by 1.8 percentage points more than the country average.

### **3. Students and graduates of higher schools: numbers and fields of study**

In Poland the number of university students and graduates is gradually increasing. In Lubuskie voivodship there are 10 universities (including 4 private ones) which attend 32 thousand students. In terms of the number of students, about 18 thousand persons attend Uniwersytet Zielonogórski (University of Zielona Góra). Another large academic centres of the region cover: Państwowa Wyższa Szkoła Zawodowa w Gorzowie Wielkopolskim (State School of Higher Vocational Education in Gorzów Wielkopolski) (over 4.7 thousand students), Państwowa Wyższa Szkoła Zawodowa w Sulechowie (State School of Higher

Vocational Education in Sulechów) (about 3 thousand students) and Wyższa Szkoła Biznesu (Academy of Business) (about 1.3 thousand students). The largest universities of Lubuskie region offer the following specialisations: pedagogy, English, German, Roman, Russian and Polish studies, philosophy, history, interior design, graphic, jazz and stage music, painting, economics, national security, nursing, physical education, political science, social science, biomedical engineering, biology, wood technology, management and production engineering, marketing and management, astronomy, physics, mathematics, computer science, electronics and telecommunication, electrical engineering, mechanics and machine construction, construction science, architecture and town planning, environmental engineering, environmental protection, automatics and robotics. The prevailing specialisations at State Schools of Higher Vocational Education: pedagogy, Polish, English, German and studies, administration, marketing and management, political science, food technology and human nutrition, tourism and recreation, gardening. At other universities of the region prevail the humanities and economic specialisations. The other universities of the region generally offer specialisations in the humanities and economics, due to the fact that in Poland technical education system requires more capital intensity the absence of which hinders its development.

In most of the cases specialisations suitable for the demands of high technology sectors, due to high capital intensity, are offered by public universities. In 2007 about 12.7 thousand persons studied in the public sector of higher education in five study subgroups selected for the analysis that is, economic and administrative, computer science, engineering and technical, production and processing and social services specialisations, which constituted about 2.7% of this type of students in Poland. The most numerous population in this group were students of economic and administrative specialisations: 7772 persons (61%) which is by 16 percentage points more than the country average. In terms of the number of students it was followed by: engineering and technical (about 13%), computer science (11.3%), production and processing (8.3%) and public services (6.6%) specialisations. The number of persons studying economic and administrative specialisations was above the country average. The graduates of these specialisations can constitute attractive work resources for the analysed sectors, in particular for the business services sector. With respect to the entire country, the percentage of students of engineering and technical and production and processing specialisations was lower than the country average by 14.5 and 3.8 percentage points respectively.

Specialisations reflect the structure of university graduates. In 2007 in Lubuskie voivodship the number of university graduates equalled 7624 persons which was 2% of all the graduates in Poland that year. The number of university graduates per 10 thousand inhabitants above 25 years of age is higher was Lubuskie region than the country average.

**Table 4. University graduates in Lubuskie voivodship in 2007 compared to the country**

Specification	Number of university graduates		Number of university graduates
	Total	In percent	10 thousand inhabitants over 25 years of age
Poland	408 066	100%	157
Lubuskie voivodship	7 624	2%	112

Source: own work on the basis of *Universities and their finances in 2007*, CSO. Warsaw 2008.

The number of university graduates in Lubuskie voivodship grew by 7.9% in the academic year 2006/2007 in comparison to the previous year. The most significant increase concerned 1<sup>st</sup> level Bachelor's degree vocational courses (by 23.2%) and uniform 5-year magister level courses (Master's degree ) (by 9.9%). The number of graduates of 1<sup>st</sup> level courses (Engineer's degree) and 2<sup>nd</sup> level courses (Master's degree) faced a drop by 18.2% and 16.3%, respectively.

In 2005-2007 various changes in the structure of graduates in terms of studies level took place. In the academic year 2006/2007, about a half of the students graduated 1<sup>st</sup> level vocational courses (56.8%). Their part in the study structure increased by 2.9 percentage points in comparison to the previous year. The reason for this growth was a higher number of persons graduating 1<sup>nd</sup> level courses (Bachelor's degree) (an increase by 5.9 percentage points). The number of persons graduating vocational courses (Engineer's degree) decreased by 3 percentage points. The number of graduates of 2<sup>nd</sup> level courses (Master's degree) in Lubuskie region decreased by 3.5, whereas in 2007 the graduates number of full time 2<sup>nd</sup> level courses increased by 0.6 percentage point from 2005.

#### **4. Research fellows**

An indirect measure of the development level of high technology sector in the region is the number of persons employed in the area of research and development. The presence of employees working in the field of research and development in Lubuskie voivodship reflects

the employment indicator of this group per 1000 economically active persons. In Lubuskie region it is significantly lower than the country average and equals 1.6 and 4.3, respectively. In the employment structure of the research and development activity in Lubuskie voivodship prevail scientific and research workers. It is over 96% of all the employed. Another two groups specified in the statistics on research and development activity, namely technicians and equivalent workers and other personnel make up the total of 4%. At the national economy level it is 20.5%. Such a high number of the research and development workers (16.5 percentage points more than the country average) in the employment structure in Lubuskie voivodship is not an indicator of a very good condition of the sector. In such a case, some technical and organisational tasks are performed by research and development personnel.

**Table 5. The employment status and structure in the research and development activity in 2006**

Specification	per 1000 economically active persons	scientific and research workers	technicians and equivalent workers	other personnel
Poland	4.3	79.5%	11.2%	9.4%
Lubuskie voivodship	1.6	96%	3%	1%

Source: own work on the basis of *Science and Technique in 2006*. Statistical information and reports.

CSO, Warsaw 2007.

The analysis of the changing employment rate in the groups of research and development activity in Lubuskie voivodship, indicates that in 2006 with respect to 2005:

- The employment insignificantly fell by 21.2%;
- Employment of scientific and research workers decreased by 14.8%;
- The number technicians and equivalent workers fell by 63%;
- Employment in the group of other personnel grew by 64%.

Scientific workers of the university located in Lubuskie voivodship lend also support to the analysed sectors present in this region. In 2007 in Lubuskie voivodship the number of university scientific workers amounted to 1606 persons, of which 26% were of independent status. Lecturers and assistants made up altogether about 51% of scientific workers in the voivodship and other personnel constituted 26% of the universities staff. Scientific workers in Lubuskie Voivodship, however, constitute a small part of the total number of scientific workers in the country which equals 1.6 %.

**Table 6. Employment in higher education by independent and dependent groups in 2007**

<b>Specification</b>	<b>Total</b>	<b>Independent</b> (professors and senior lecturers)	<b>Dependent</b> (lecturers and assistants)
Poland	99 221	24%	76%
Lubuskie voivodship	1 606	23%	51%

Source: own work on the basis of Regional Database of 22<sup>nd</sup> of October 2008.

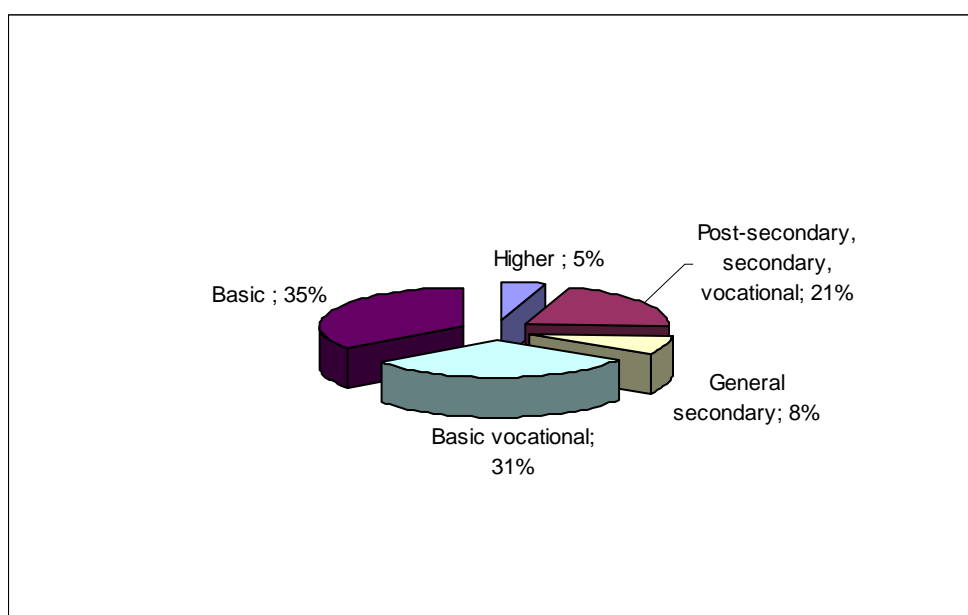
The conditions in which the sectors of high technology in Lubuskie voivodship operate, incline enterprises from these sectors to use human resources employed in research and development centres and universities. Therefore, the development of the sectors of high technology is determined by interrelations between universities, research and development centres and the area of economic activity, also with enterprises operating in advanced technology sectors. In the aspect of the need for technology transfer to the sectors of high technology the institutions located in Lubuskie voivodship mentioned above can be of particular assistance.

## **5. Unemployment – deficit/surplus professions**

The development of high technology sectors also determines the unemployment level present in the region. It can also be a sign of insufficient adoption of specialisations offered by the educational sector in the region to the demands expressed by enterprises. On the other hand, the level of unemployment reflects the unused potential of work resources from which also the enterprises operating in the field of advanced technology can benefit. In the context of high technology sectors, changes which took place in the rate and structure of unemployment in Lubuskie voivodship in the period under analysis are worth considering. Firstly, from the point of view of advanced technology sectors, the unemployment structure in the aspect of the level of education is important. In 2005–2008 persons with basic vocational or at most with gymnasium education constituted the most numerous group of the unemployed, that is 66% of the total of the unemployed in 2007. Persons representing these two groups, without an adequate training do not constitute attractive resources of potential workers for the needs of the sectors of advanced technology. In the aspect of balancing

inequalities between the supply and demand for work resources in the sectors of high technology, the unemployed with higher or secondary technical education seem to be potentially more useful. With respect to the total of the unemployed, the number of persons with higher or secondary technical education in Lubuskie voivodship in 2005-2007 remained at the same level, that is, the persons with higher education made up 4%-5% and the persons of vocational secondary education constituted 21% of this group. In comparison to the country average, the number of unemployed persons in Lubuskie region in 2007 was lower by 2 percentage points, more specifically: by 2 percentage points among higher education graduates and by 1 percentage point in the group of secondary education graduates.

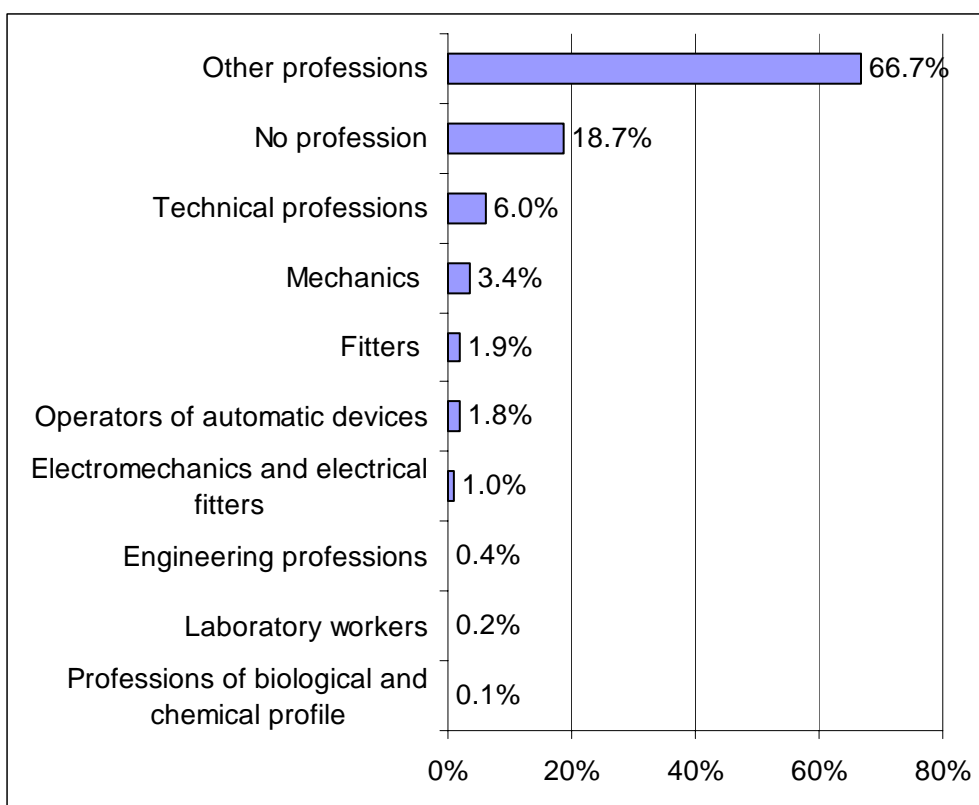
**Graph 3. Education structure of the unemployed in Lubuskie voivodship in 2007**



Source: own work on the basis of Regional Database CSO as of date of 11<sup>th</sup> of October 2008.

Secondly, information of the unemployment structure by profession groups is also important for the sectors of advanced technology. In 2007 in Lubuskie voivodship persons with technical professions (6%), mechanics (3.4%), fitters (1.9%), operators of automatic devices (1.8%), electromechanics and electrical fitters (1%) constituted a numerous group of the unemployed. Persons of engineering professions constituted about 0.4% of the unemployed. In the other profession groups useful for the sectors of advanced technology, the unemployment rate was very low.

**Graph 4. The unemployment structure in Lubuskie voivodship by profession groups by end of 2007**



Source: own work on the basis of the data of the Labour Office.

What is more, the enterprises of advanced technology can use information provided by the monitoring of deficit and surplus professions<sup>3</sup>. The application of this tool potentially enables to tailor the training offer to the needs of the labour market. As for the monitoring of professions related only to the sectors of advanced technology, it can be noticed that in 2005-2007 in Lubuskie voivodship a surplus rather than a deficit was observed. It is important to mention that, in 2007 the deficit concerned three profession groups: intermediate office personnel, assessors, customs officers and equivalent workers, money flow clerks and customer services clerks. The highest reported demand was for intermediate office personnel. Public employment services do not indicate all free vacancies through the monitoring of deficit and surplus professions. The reason for it is that the employers do not report on free vacancies to labour offices on the assumption that such offices are not adequate places for the search of specialists who are recruited outside public employment services. On the other hand, persons representing professions demanded by the enterprises operating in the field of

<sup>3</sup> Shortage (surplus) is a difference between the number of registered unemployed persons and the number of reported work offers in a given profession. In the monitoring of shortage and surplus professions an indicator of shortage (surplus) intensity of a profession which is calculated as a quotient of the number reported work offers and the number of registered unemployed persons in a given profession. More information: *Shortage and surplus professions in 2007 (diagnostic part)*, MPIPS, Warsaw 2008.

advanced technology, do not register at labour offices and search work without the assistance of public employment services.

The results of analyses conducted by the Enterprise Institute indicate that the personnel demand of enterprises operating in high technology sectors is not satisfied (Table 6). The comparison of the workforce demand in the analysed sectors with the structure of unemployed persons shows a potential possibility of balancing the differences between the work supply and demand in the analysed sectors. Labour offices organise trainings which are partially useful for enterprises of high technology sectors. However, the most useful work resources in the aspect of the analysed sectors are the least numerous groups of unemployed persons in the sought after profession groups. It applies, among others, to the following occupations: mechanics, fitters, electromechanics and electrical fitters and engineering professions.

**Table 7. Vacant posts in the analysed sectors (in 2008)**

Sector	Vacancy problem - due to qualifications	Sector	Vacancy problem - due to qualifications
Medical Biotechnological sector	Customer acquisition		Consultant
	Production manager		Technical expert
Electronics industry	Offer specialist		Technical inspector
	Programmer		Constructor
	Electrical fitter		Control systems specialist
	Electromechanic		IT specialist in a tribology facility
	Production manager		Analyst
Aviation industry	Production manager	Services for business (including R&D)	IT specialist - programmer
	Locksmith		Foil appliers
Automotive industry	Project account manager		Lawyer
	Physical worker		Foreman
	Welder		Translator
	Bookkeeper		Welder
	Locksmith		Information systems implementation specialist
	Diagnostic laboratory manager		Trade teaching methodology specialist
Automotive industry including the production of parts	Project account manager		ERP projects implementation specialist
	CNC operator		
	Mechanic		
	Lorry driver		
	Bookkeeper		
	Mechanic		

Source: Analysis by the Enterprise Institute 'Labour market in Polish regions in 2008'.



## 6. Economic availability – remunerations

Generally speaking, the analysed sectors in Lubuskie voivodship in years 2005-2007 marked the growth. The potential increased both in terms of the number of economic entities operating in this field and the number of persons employed in these sectors. In the discussed period, the employment in the analysed sectors increased by over 34%, whereas the number of enterprises increased by over 16%.

The access to work resources for high technology sectors in a certain mode sets the level of remuneration. The pay level in the enterprises representing the sectors under analysis in Lubuskie voivodship was diverse. In 2005-2008 in Lubuskie region the average monthly remuneration increased by over 24%.

**Table 8. Average gross remuneration levels and their change in high technology sectors in Lubuskie voivodship in 2005 – 2008**

Sector		2005	2006	2007	I-VI 2008	<u>2005</u> <u>2006</u>	<u>2006</u> <u>2007</u>	<u>2007</u> <u>2008</u>	<u>2008</u> <u>2005</u>
Aviation industry*		-	-	-	-	-	-	-	-
Medical biotechnology sector*		-	-	-	-	-	-	-	-
Engineering industry		2825.58	3022.68	3326.51	3496.92	7.0%	10.1%	17.7%	23.8%
Electronics industry	Manufacture of machinery and electrical equipments *	-	-	-	-	-	-	-	-
	Manufacture of medical, precision and optical instruments, watches and clocks	2141.09	2235.26	2524.05	2542.05	4.4%	12.9%	17.9%	18.7%
Automotive industry		2093.25	2163.64	2168.81	2370.71	3.4%	0.2%	3.6%	13.3%
Business services	Publishing; printing and reproduction of recorded media	3605.17	3700.3	3851.96	3370.82	2.6%	4.1%	6.8%	-6.5%
	Real estate activities	2219.25	2277.11	2451.52	2585.32	2.6%	7.7%	10.5%	16.5%
<b>In enterprises sector</b>		2060.68	2177.15	2391.37	2555.89	5.7%	9.8%	16.0%	24.0%

\* the statistics of Lubuskie voivodship do not take account of this sector.

Source: own work on the basis of *Statistical bulletin of Lubuskie voivodship*, Zielona Góra Statistical Office, Zielona Góra February 2006, June 2008.

In 2005-2008 in the industries under analysis, the highest, 23% increase in remuneration was in the engineering industry. A high rise in remuneration was also present in the field of 'Manufacture of medical, precision and optical instruments, watches and clocks' (electronics industry): an 18% increase. In the automotive industry the average monthly gross remuneration grew by 13.3%, whereas in the 'Publishing; printing and reproduction of recorded media', which is a part of the business services sector, increased by 16.5%. A 6.5% fall in the same sector concerned the 'Real estate activities'.

The results of an analysis carried out in selected sectors by the Enterprise Institute, indicate that the expected gross remuneration varies across the sectors and also among profession groups in specific sectors. In the aspect of the average remuneration in the analysed sectors in Lubuskie voivodship, it can be stated that they meet the level of expected remuneration in the profession group of the executive staff in the sectors under study. However in the business services sector (*Publishing; printing and reproduction of recorded media*) and in the engineering industry (*Manufacture of machinery and electrical equipments*) the average gross remuneration of the executive staff is higher than the level declared by the respondents.

**Table 9. Gross monthly remuneration in high technology sectors according to the opinion of respondents in Poland**

Sector	Profession group	Pay scale
Medical biotechnology	Management staff	3001 – 4000 PLN
	Executive staff	2001 – 3000 PLN
Engineering industry	Management staff	5001 – 6000 PLN
	Executive staff	2001 – 3000 PLN
Electronics sector	Management staff	3001 – 4000 PLN
	Executive staff	2001-3000 PLN
Automotive sector	Management staff	5001- 6000 PLN
	Executive staff	2001- 3000 PLN
Aviation sector	Management staff	5001 – 6000 PLN
	Executive staff	2001- 3000 PLN
Services for business	Management staff	2001 – 3000 PLN
	Executive staff	under 2000 PLN

Source: Analysis by the Enterprise Institute ‘Labour market in Polish regions in 2008’

## Conclusions

In 2005–2007 in Lubuskie voivodship the number of employed persons grew by 4% and this increase in the analysed sectors was three times higher than the total increase in the employment. The employment rate of persons at working age increased by 5.7 percentage points and reached the level of 63.9%. However, it was by 0,3 percentage point lower than the country average. The number of unemployed persons in Lubuskie voivodship in the period 2005-2008 decreased by 52.6%. The unemployment rate of 11.4% was by 2.5 percentage points higher than the country unemployment rate. Positive changes were reported in all the sectors under analysis. The employment level increased in the automotive industry by 121%, in the engineering industry by 34.5% and in the business services sector and the electronics industry where the employment grew by 22.9% and 19.6%, respectively.

As a result of changes in the labour market in Lubuskie voivodship in 2007, persons working in the analysed sectors made up 4.6% of the employed which is among others, a consequence of the structure of education in the region, in particular at post-gymnasium level. Students of technical specialisations in Lubuskie voivodship constitute 28% of all the persons studying vocational specialisations which is by 0.4 percentage points more than the country average. Most of the students, that is 42.2%, are trained in economic and administrative occupations. These persons can also potentially find employment in advanced technology sector, above all, in the business services sector. The demand for this type of employees in other high technology sectors is much lower than for technical specialised professions.

It is worth emphasising that in 2007 in Lubuskie voivodship, graduates of technical professions, useful for the sector of high technology, such as mechanics, fitters, electromechanics and electrical fitters also formed the group of unemployed persons.

Enterprises representing the analysed sectors can count on a lower number of university graduates of 2<sup>nd</sup> level courses at Master's degree and vocational courses of Engineer's degree level in Lubuskie region. However, there was an increase in the number of vocational courses graduates (Bachelor's degree). In the aspect of the demand for specialists expressed by the enterprises of high technology sectors, the fact that 61% of students cover economic and administrative specialisations, particularly useful for the business services sector, should be considered positive. The structure of higher education is more adequate to the demand structure than at post-gymnasium level which is reflected by a low unemployment rate (only 5%) in the group of persons with higher education in Lubuskie region.

In comparison to the country average, the number of persons employed in research and development activity in Lubuskie voivodship is low. It is over 2.6 times less than the country average per 1 thousand economically active persons. In this group, scientific and research workers prevail in the employment structure of research and development activity. Their representation in the regional structure is 16.5 percentage points higher than the country average. Another two groups that is technicians and equivalent workers and other personnel are relatively smaller in Lubuskie voivodship than the country average.

The potential of enterprises representing the sectors under study in Lubuskie voivodship shows a growing trend. The number of entities operating in the analysed sectors as well as the number of the employed in these entities is increasing.