Research, Development & Innovation in Hungary

NIH
NATIONAL INNOVATION OFFICE

This publication was made under the auspices of the National Innovation Office, Department of RDI Observatory.

The report, together with any data and indicators published therein, can be downloaded from the Kaleidoszkóp website: http://kaleidoszkop.nih.gov.hu/en

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What is RDI?

Research and development (R&D):

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new application. R&D is characterized by the following fundamental elements: creation, novelty, adoption of scientific methods, creation of new knowledge. Types of R&D are: basic research, applied research, experimental development.

Innovation:

A word of Latin origin. Points to something new, something's renewal or alteration. Innovation can be:

- developing a new product (production of new kinds of consumer goods and services),
- introduction of a new production process (or transportation method),
- entering into a new market, or using new allocation methods,
- using new raw material, or
- inventing a new business model, establishing a new enterprise's or industrial organisation.

R&D unit:

Every enterprise, organisation is an R&D unit, whose main activity is R&D or the company's R&D is connected to its main activity, and its R&D activity is conducted by its own employees and its own infrastructure.

R&D expenditure:

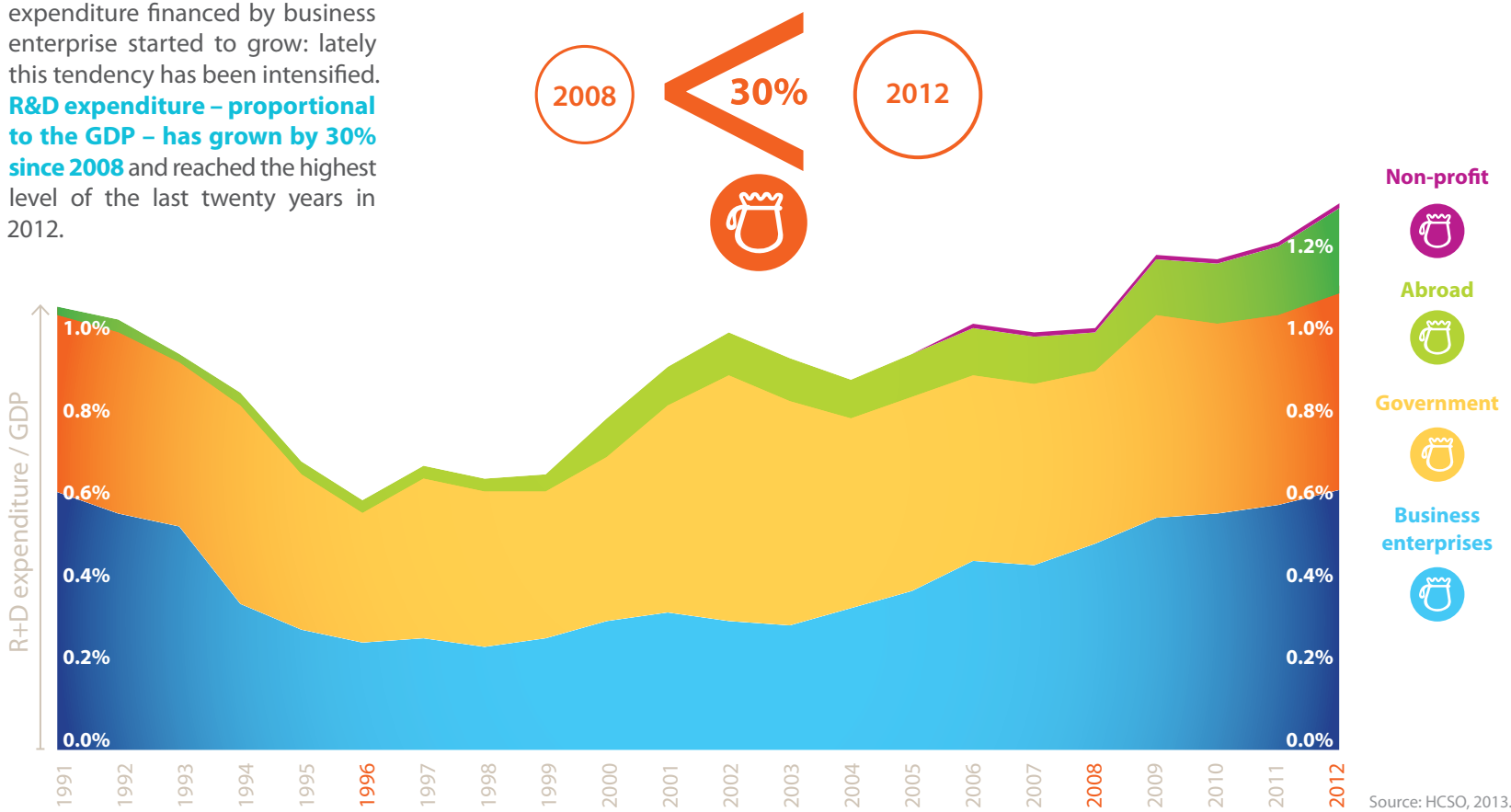
It includes the total amount of current costs and capital expenditure, from any kind of domestic or foreign sources and irrespective of the fact whether the financial source was originally assigned for research, development or any other purpose. R&D current costs are composed of labour costs and other current costs excluding depreciation. Capital expenditure is composed of expenditure on land and buildings, instruments, equipment and computer software.

Sources: Hungarian Central Statistical Office (HCSO); Investment in the Future: National Research, Development and Innovation Strategy (2013–2020)

How is R&D financed?

Sources of R&D expenditure (% of GDP; 1991–2012)

From the end of the 1990s, R&D expenditure financed by business enterprise started to grow: lately this tendency has been intensified. **R&D expenditure – proportional to the GDP – has grown by 30% since 2008** and reached the highest level of the last twenty years in 2012.

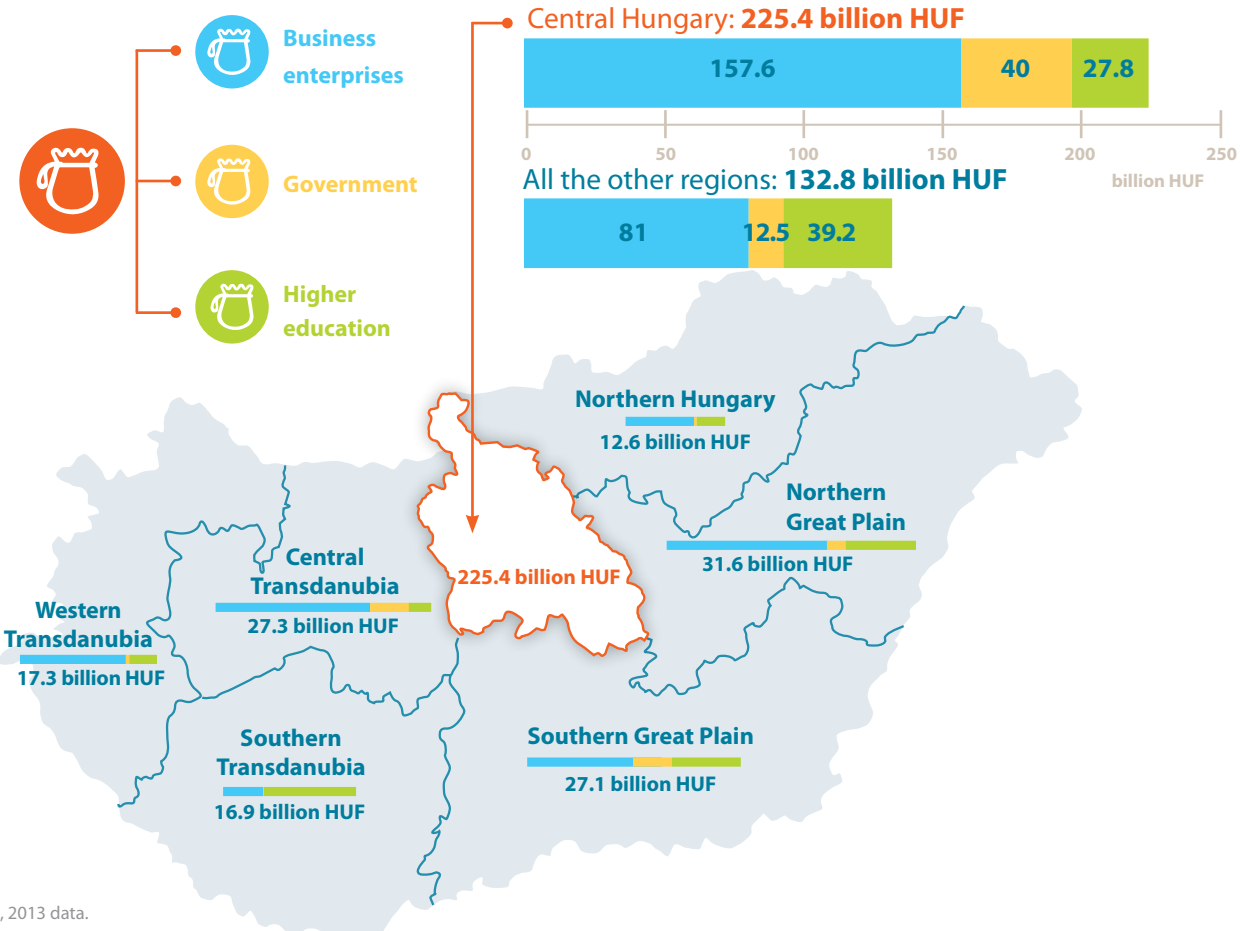


Source: HCSO, 2013.

How much is spent on R&D in Hungary?

R&D expentiture by regions

Lately, the concentration of R&D expenditure decreased, but it is still high: **out of every 100 HUF 59 is used in Budapest.** The predominance of the region is even larger in the government sector: ¾ of the government R&D expenditure is used in the Central Hungary region.

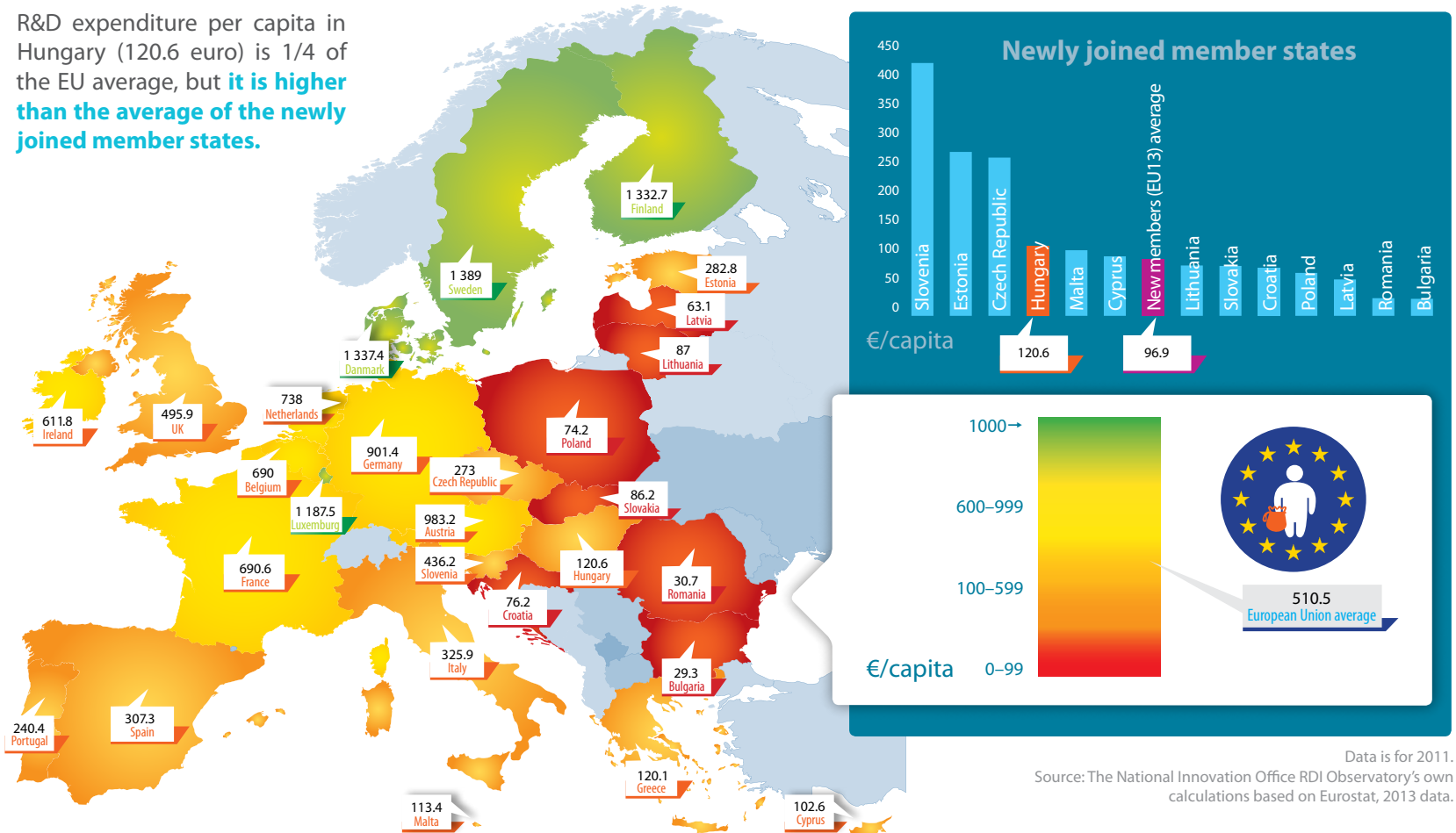


Data is for 2012.
Source: The National Innovation Office
RDI Observatory's own calculations based on HCSO, 2013 data.

How much is spent on R&D in the EU?

R&D expenditure per capita in the EU

R&D expenditure per capita in Hungary (120.6 euro) is 1/4 of the EU average, but **it is higher than the average of the newly joined member states.**

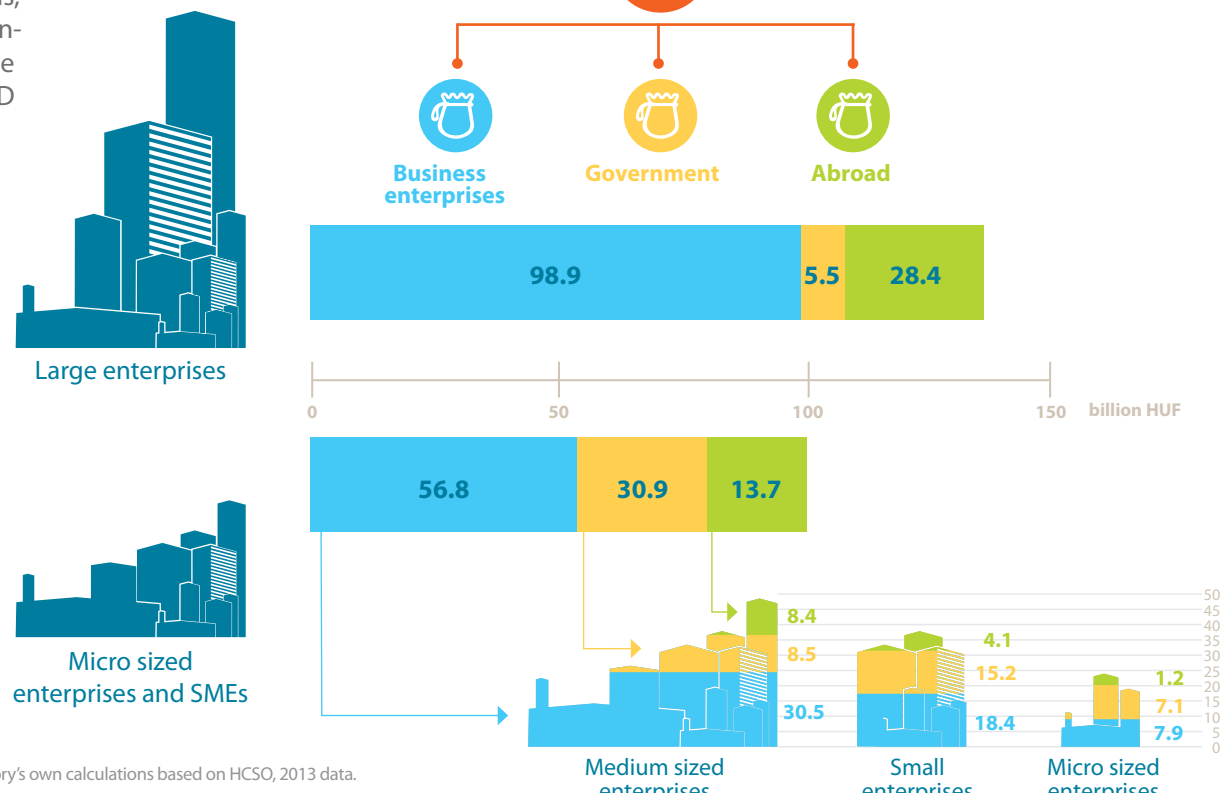


Data is for 2011.
Source: The National Innovation Office RDI Observatory's own calculations based on Eurostat, 2013 data.

From what sources the enteprises finance their R&D?

R&D expenditure by size of the enterprises

The large enterprises spend 30% more on R&D, compared to all the SMEs. The smaller an enterprise is, the bigger the share of the governmental and the smaller that of the foreign sources' are in their R&D expenditure.

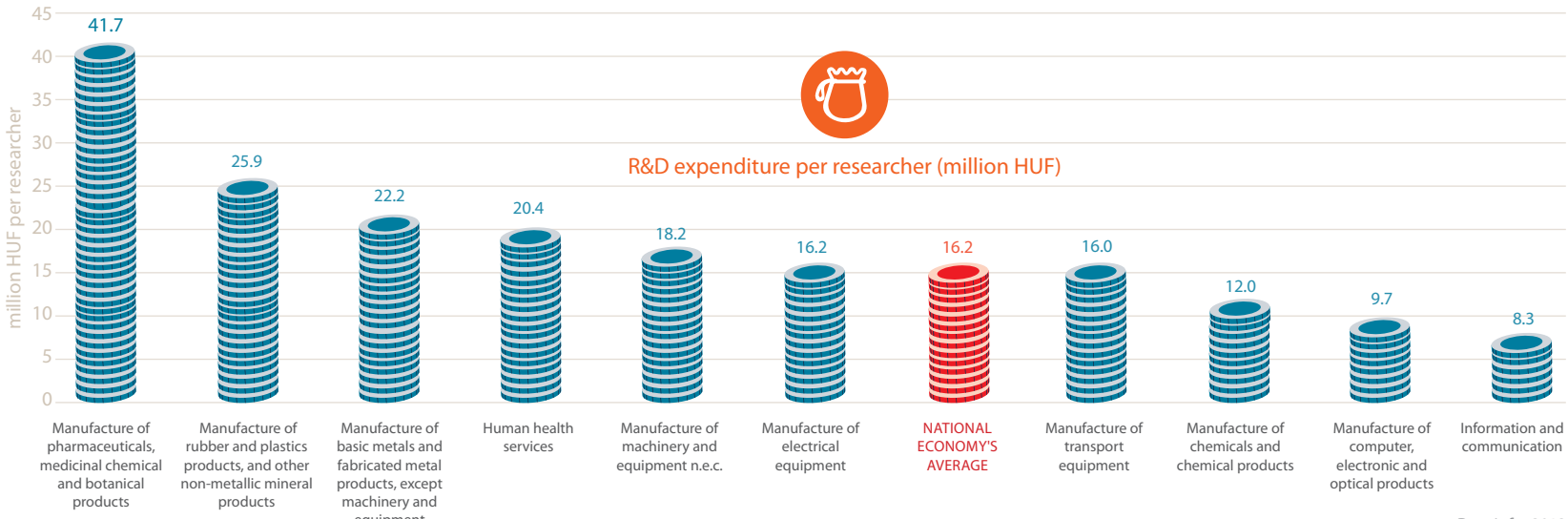


Data is for 2012.
Source: The National Innovation Office RDI Observatory's own calculations based on HCSO, 2013 data.

How much is R&D spending per researcher?

Some sector's R&D expenditure per researcher

The R&D expenditure per researcher is the highest in the pharmaceutical sector. However, other sectors considered to have large shares of GDP (such as manufacture of transport equipments and information and communication services) are below the national average in this respect.



Data is for 2012.

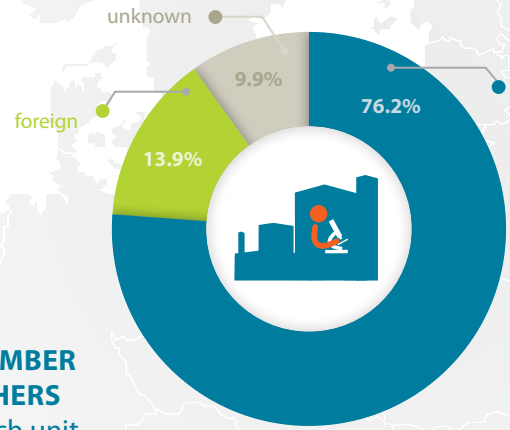
Source: The National Innovation Office RDI Observatory's own calculations based on HCSO, 2013 data.

What is the share of the foreign owned enterprises in R&D?

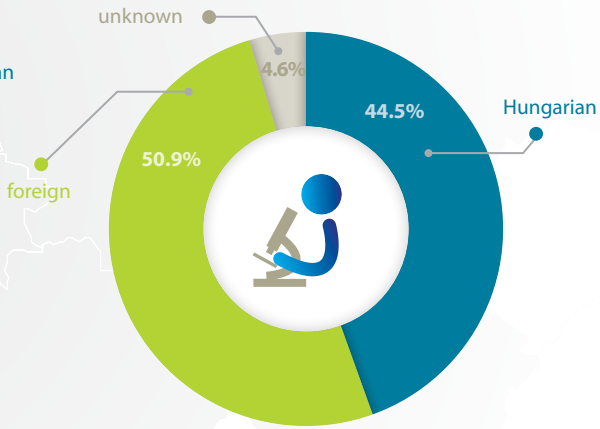
Corporate sector research units and number of researchers at Hungarian and foreign owned enterprises

More than half of the researchers work at foreign owned enterprises.
There are nearly five times more Hungarian owned research units in the corporate sector than foreign owned.
Hungarian research units employ an average of five researchers; a foreign owned research unit employs six times more.

NUMBER OF RESEARCH UNITS
(1 583 total)



R&D PERSONNEL
(14 742 total)



AVERAGE NUMBER OF RESEARCHERS
capita / research unit

5.4
Hungarian owned corporate research units

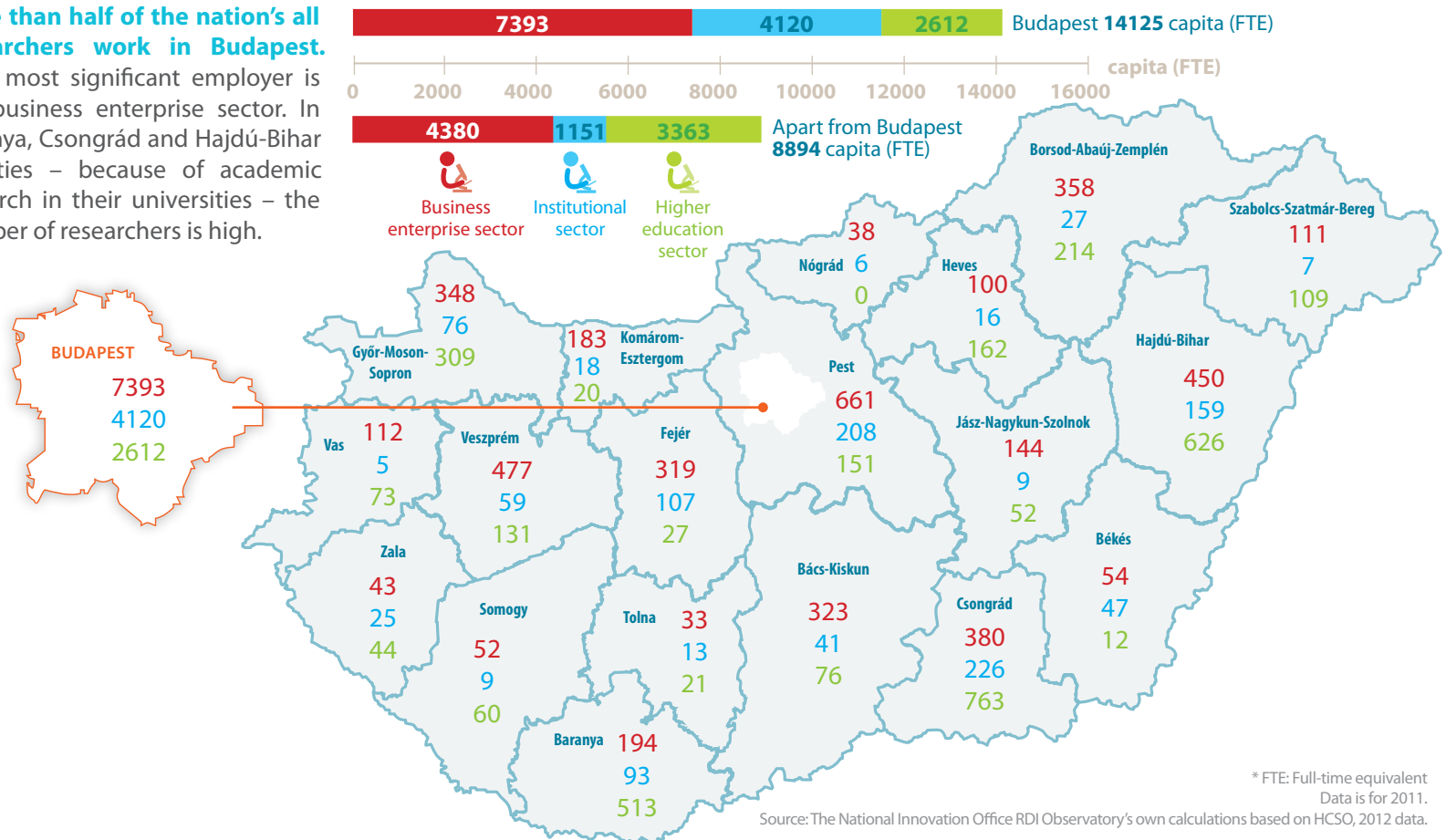
34.1
foreign owned corporate research units

Data is for 2012.
Source: The National Innovation Office RDI Observatory's own calculations based on HCSO, 2013 data.

How many researchers can be found in Hungary?

FTE* number of researchers by county

More than half of the nation's all researchers work in Budapest. Their most significant employer is the business enterprise sector. In Baranya, Csongrád and Hajdú-Bihar counties – because of academic research in their universities – the number of researchers is high.

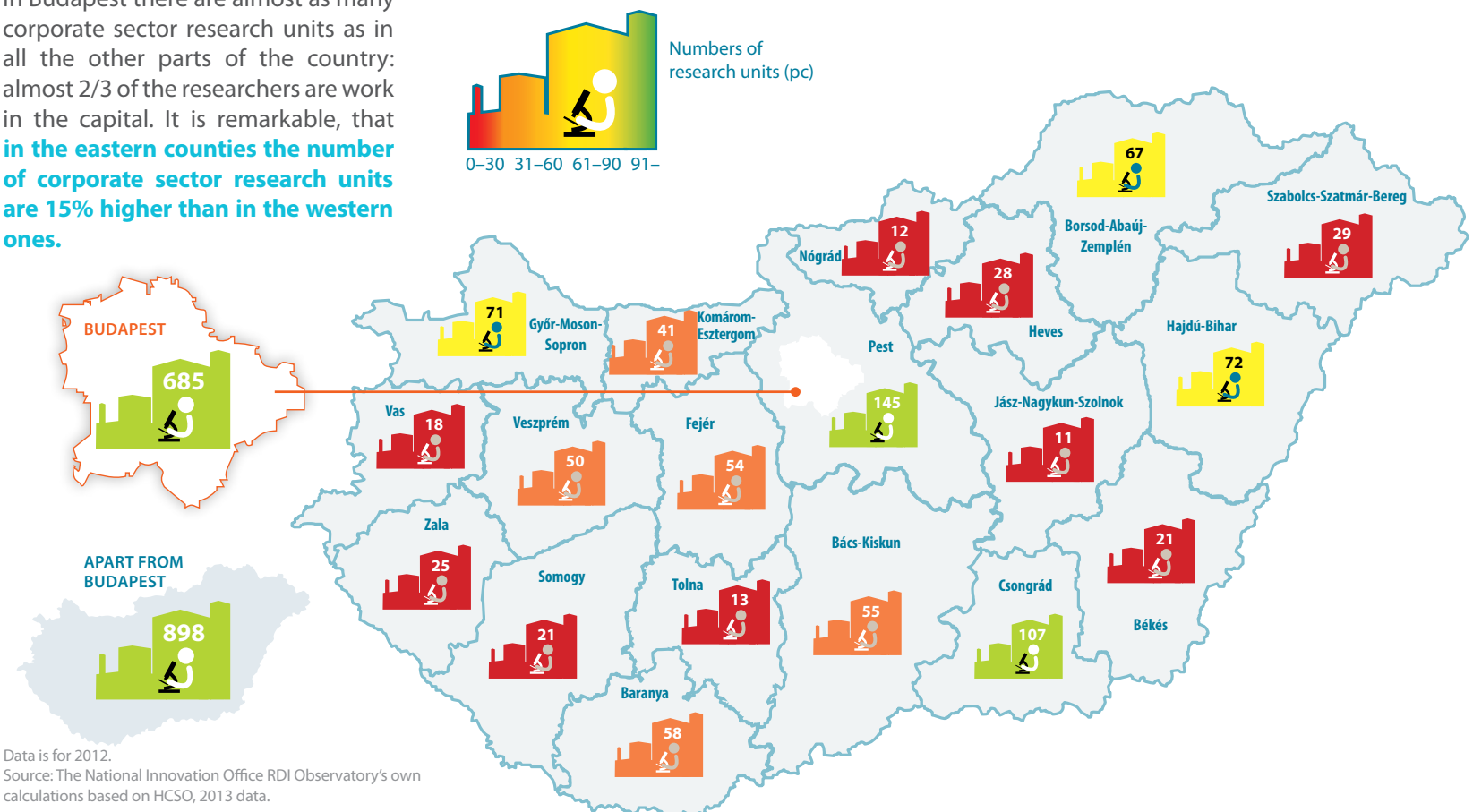


* FTE: Full-time equivalent
Data is for 2011.
Source: The National Innovation Office RDI Observatory's own calculations based on HCSO, 2012 data.

Where are the corporate R&D units?

Corporate sector research units and number of researchers by county

In Budapest there are almost as many corporate sector research units as in all the other parts of the country: almost 2/3 of the researchers are work in the capital. It is remarkable, that **in the eastern counties the number of corporate sector research units are 15% higher than in the western ones.**

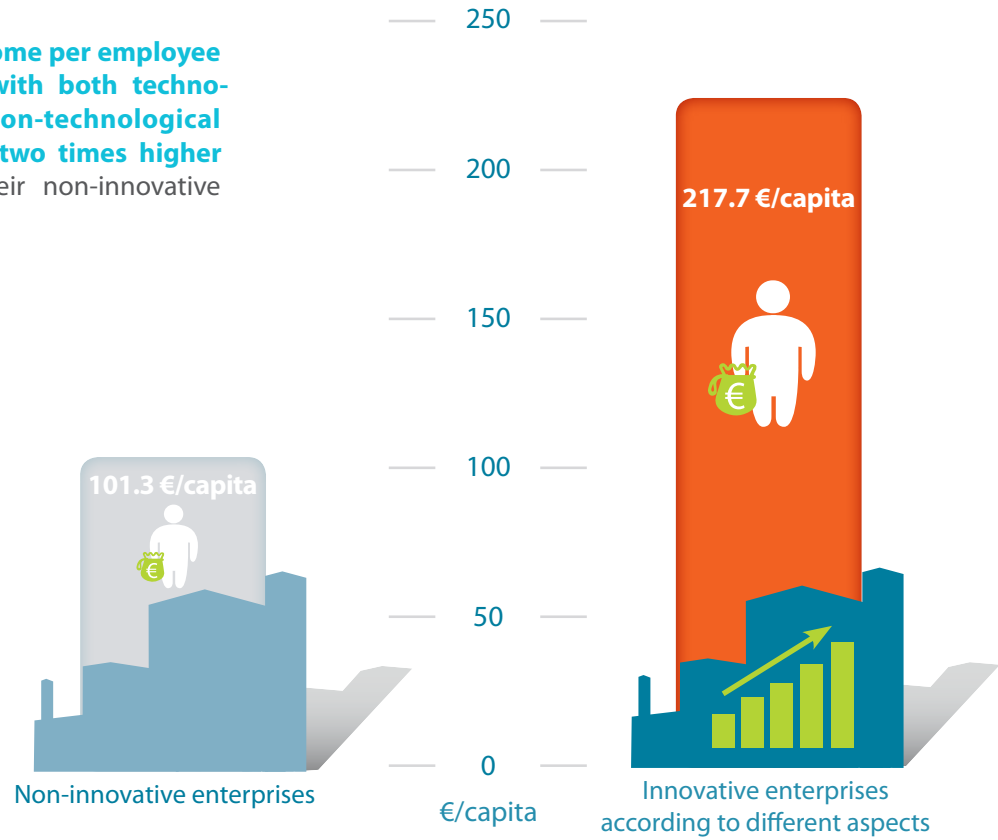


Data is for 2012.
Source: The National Innovation Office RDI Observatory's own calculations based on HCSO, 2013 data.

INNOVATION = MONEY?!

Income per employee of innovative and non-innovative enterprises in Hungary

The average income per employee of enterprises with both technological and non-technological innovations* is two times higher than that of their non-innovative competitors.



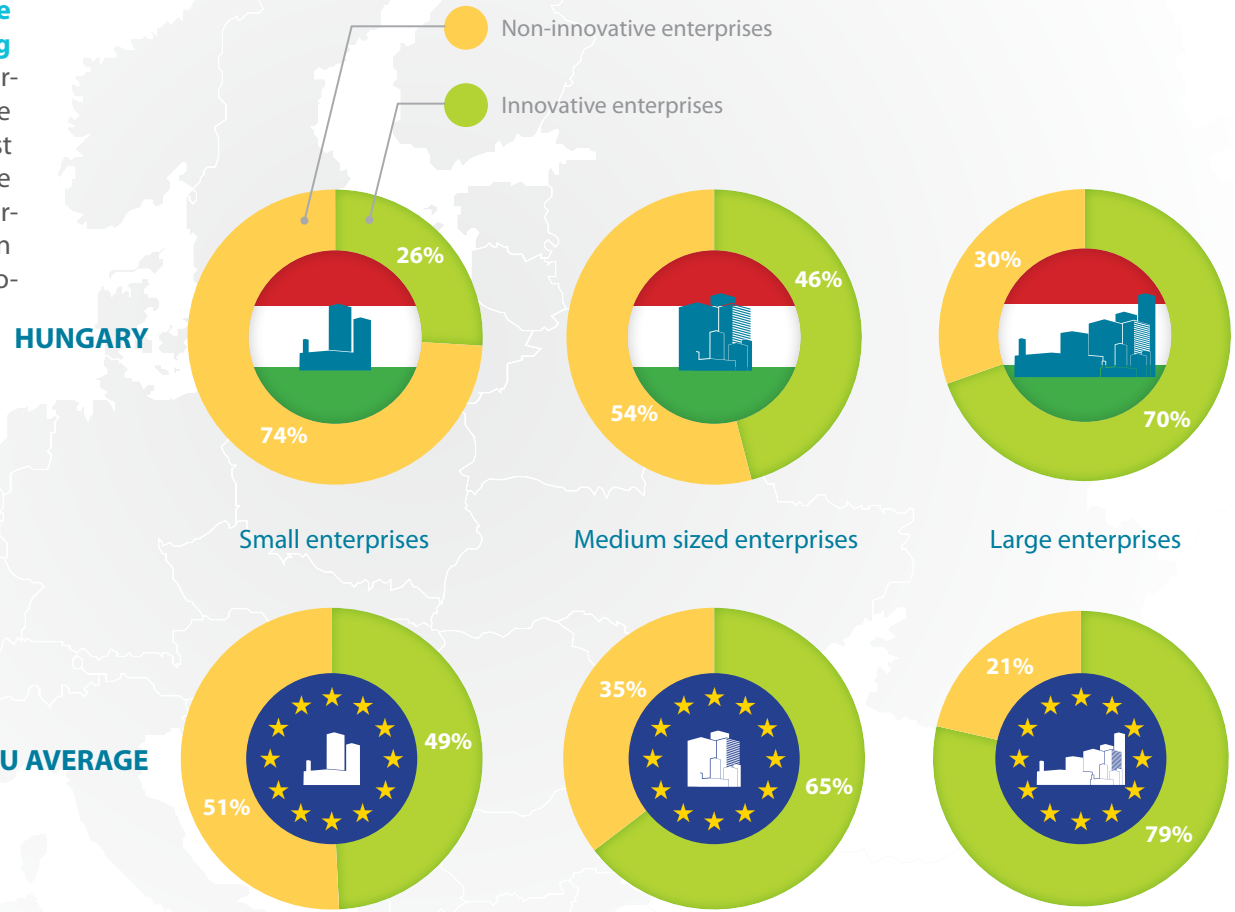
*The company introduced both technological and non-technological innovations to the market. Technological innovation is the introduction of a new or significantly improved product (or service) to the activity of the enterprise. Non-technological innovation is a new kind of marketing method or a new organizational structure.

Data is for 2010. Source: Eurostat, 2012.
CIS Community Innovation Survey: the survey is fully comprehensive for the companies working with more than 100 employees in the industry and service sectors, and based on a sample in respect of the ones working with less then 100 (but min. 10) employees.

Is innovation determined by size?

Share of innovative enterprises in Hungary and in the EU

The larger an enterprise is, the greater the chance of it is being innovative. In Hungary one-quarter of the small enterprises are innovative, which number is almost two times higher if we consider the medium sized enterprises. Furthermore, seven out of ten Hungarian large enterprises are active in innovation.

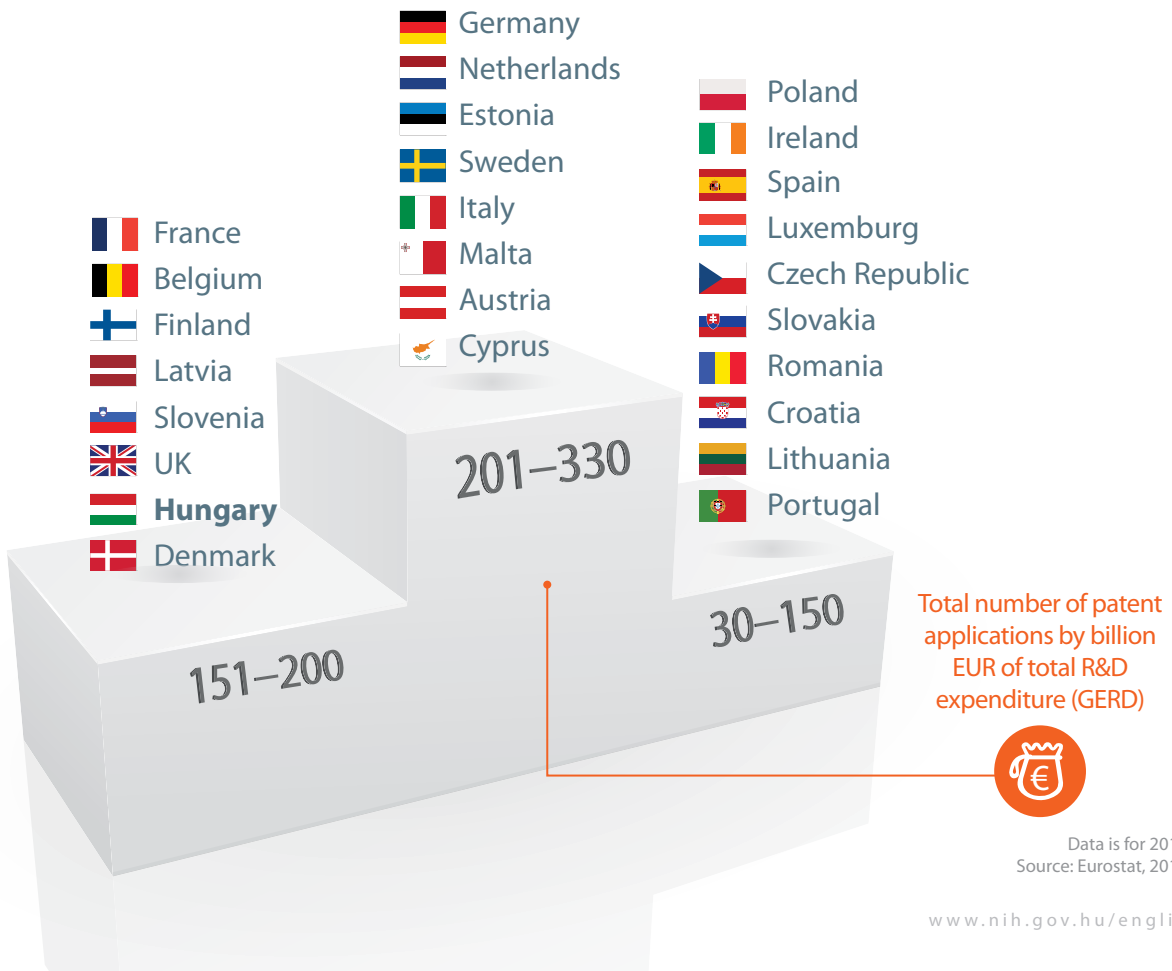


Data is for 2010.
Source: Eurostat, CIS, 2012

What is the result of R&D?

Number of international patent applications* per one billion euro of R&D expenditure

In Hungary every 5.9 million euro of R&D expenditure resulted in one international patent application, which places the country in the middle of the range of the EU countries.



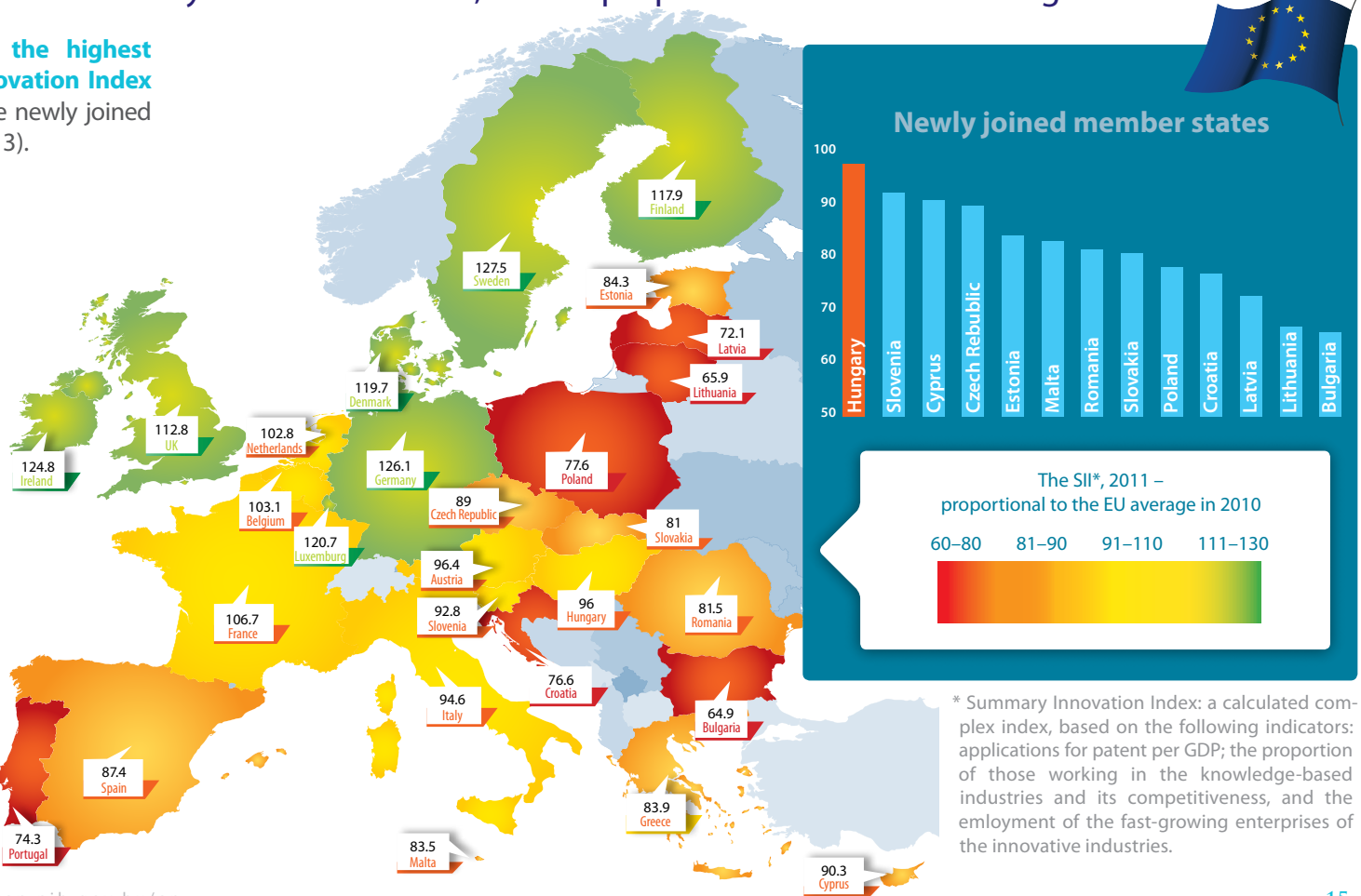
*The patent ensures legal protection of inventions. The owner of invention has an exclusive right to exploit the solution of invention. The patent protection is valid up to 20 years started from the day on that the patent application was filed and solely in the countries where the protection was granted.

Data is for 2010.
Source: Eurostat, 2012.

Where stands Hungary in the innovation field?

The Summary Innovation Index, 2011 – proportional to the EU average in 2010.

Hungary has the highest Summary Innovation Index (SII) among the newly joined members (EU13).



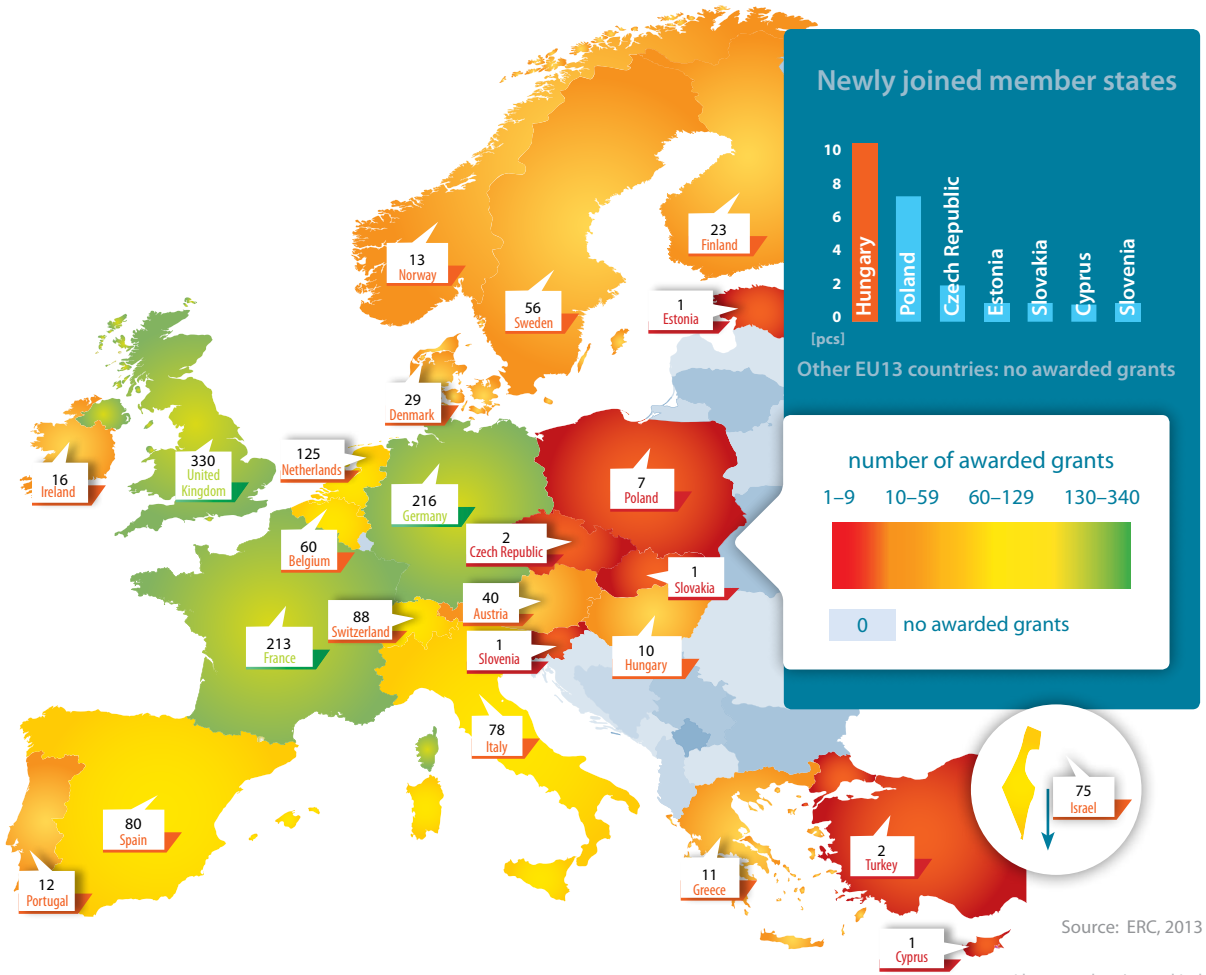
* Summary Innovation Index: a calculated complex index, based on the following indicators: applications for patent per GDP; the proportion of those working in the knowledge-based industries and its competitiveness, and the emloyment of the fast-growing enterprises of the innovative industries.

Source: European Commisssion, 2013.

How do our researchers perform in Europe?

Participation in ERC* projects (2010-2012)

Considering the ERC* program of the EU, **Hungary is the first among the newly joined members,** in respect of the awarded grants and subsidies between 2010 and 2012.



Source: ERC, 2013

*The European Research Council (ERC) is part of the EU's Seventh R&D Framework Programme (FP7). The ERC has been established by the Council of Europe in February of 2007. In the period 2007-2013 the ERC has the budget of 7.5 billion Euro. In the Horizon 2020 (for the period 2014-2020) this source will rise.

National Innovation Office

National Innovation Office (NIH) is the governmental body responsible for research, development and technological innovation.

Main activities of the National Innovation Office are as follows:

- RDI strategic analysis and planning
- provides innovation management services
- operates the Kaleidoszkóp system, a comprehensive register of domestic RDI actors
- is involved in the development and application of RDI policy
- coordinates and facilitates international RDI cooperation
- attracts foreign investments to Hungary
- harmonises international and EU RDI policies
- coordinates bilateral scientific and technological cooperation
- provides SME-support activities
- provides easier access to domestic RDI results for market players
- supports research-related cooperation and promotes networking between RDI players
- boosts the innovation activity of SMEs

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KALEIDOSZKÓP

Kaleidoszkóp (the name refers to the multifaceted nature of RDI) is the name of the information system used by the National Innovation Office. Kaleidoszkóp's objective is to create an integrated RDI database of the relevant institutions and companies of the sector, as well as data and analyses supporting RDI policy related decision-making.

Kaleidoszkóp's main objectives:

- promote networking within the RDI sector
- assist facts-based decision-making
- assist national and international statistical activity
- provides solid foundations for RDI strategy-making

Kaleidoszkóp's services:

- generic and specific sectorial RDI analyses and statistics
- information analysis based on qualitative data sources
- information on public funded RDI projects
- maintaining register of Hungarian research infrastructure facilities
- map-based search engine of RDI organisations and businesses
- finding project partners and mapping project opportunities

Kaleidoszkóp is operated by the National Innovation Office RDI Observatory Department.
Kaleidoszkóp's homepage: www.kaleidoszkop.nih.gov.hu/en

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