



European  
Commission

# Regional Innovation Scoreboard **2023** Regional profiles **Hungary**



*Innovation*

## Regional Innovation Scoreboard 2023 – Regional profiles Hungary

European Commission

Directorate-General for Research and Innovation

Directorate G – Common Policy Centre

Unit G.1 – Common R&I Strategy & Foresight Service

Contact           Alexandr Hobza, Chief Economist and Head of Unit G.1  
                          Athina Karvounaraki  
                          Alexis Stevenson

Email                RTD-STATISTICS@ec.europa.eu  
                          RTD-PUBLICATIONS@ec.europa.eu

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

Directorate A – Strategy and Economic Analysis

Unit A.1 – Chief Economist

Contact            Román Arjona, Chief Economist and Head of Unit A.1  
                          Xosé-Luís Varela-Irimia

Email                GROW-A1@ec.europa.eu

European Commission

B-1049 Brussels

Manuscript completed in June 2023.

This document has been prepared for the European Commission; however it reflects the views only of the authors, and the European Commission shall not be liable for any consequence stemming from the reuse.

© European Union, 2023



The reuse policy of European Commission documents is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Unless otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightsholders.

# **Regional Innovation Scoreboard 2023**

## **Regional profiles Hungary**

**The report was prepared by**

*Hugo Hollanders*

(Maastricht University – UNU-MERIT)

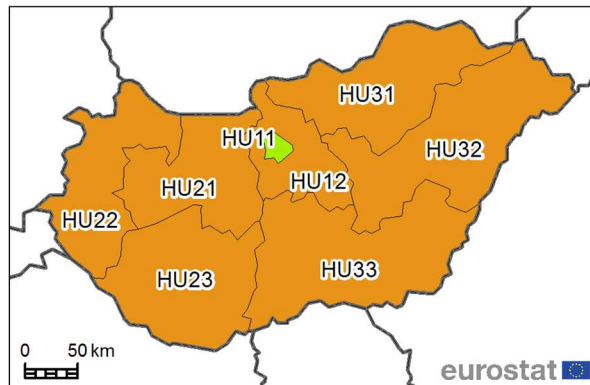
as part of the European Innovation Scoreboard project

for the European Commission, Directorate-General for Research and Innovation under

Framework Contract N° 2018/RTD/A2/OP/PP-07001-2018 Lot 2 (EDAR)



## HUNGARY



Map administrative boundaries: ©EuroGeographics ©UN-FAO ©Turkstat

| NUTS | Region             | RII   | Rank | Group                | Change |
|------|--------------------|-------|------|----------------------|--------|
| HU   | Hungary            | 70.4  | --   | Moderate Innovator   | 7.7    |
| HU11 | Budapest           | 101.4 | 100  | Strong Innovator -   | 7.7    |
| HU12 | Pest               | 67.2  | 184  | Emerging Innovator + | 6.5    |
| HU21 | Közép-Dunántúl     | 60.6  | 197  | Emerging Innovator + | 3.5    |
| HU22 | Nyugat-Dunántúl    | 59.8  | 198  | Emerging Innovator + | 9.0    |
| HU23 | Dél-Dunántúl       | 57.8  | 205  | Emerging Innovator + | 10.8   |
| HU31 | Észak-Magyarország | 58.4  | 203  | Emerging Innovator + | 15.2   |
| HU32 | Észak-Alföld       | 55.3  | 216  | Emerging Innovator + | 6.5    |
| HU33 | Dél-Alföld         | 59.4  | 200  | Emerging Innovator + | 4.9    |

Hungary is an Emerging Innovator and includes eight regions.

*Budapest* (HU11), the capital region, is the most innovative region and a Strong Innovator -. The other regions are all Emerging Innovators +.

Performance has increased for all regions, and most strongly for *Észak-Magyarország* (HU31) and *Dél-Dunántúl* (HU23). For three regions performance increased at a higher rate than that of the EU (8.5), for five regions performance increased at a lower rate.

Budapest (HU11)

|   | Data  | Normalised score | Relative to |       |
|---|-------|------------------|-------------|-------|
|   |       |                  | HU          | EU    |
| Tertiary education                          | 61.1  | 0.967            | 283         | 184   |
| Lifelong learning                           | 7.2   | 0.235            | 127         | 63    |
| International scientific co-publications    | 2733  | 0.661            | 365         | 216   |
| Most-cited scientific publications          | 625.5 | 0.310            | 107         | 57    |
| Above average digital skills                | 22.7  | 0.384            | 107         | 82    |
| R&D expenditures public sector              | 0.54  | 0.455            | 127         | 80    |
| R&D expenditures business sector            | 2.00  | 0.776            | 128         | 115   |
| Non-R&D innovation expenditures             | ±     | 0.355            | 85          | 88    |
| Innovation expenditures per person employed | ±     | 0.542            | 125         | 90    |
| Employed ICT specialists                    | 11.2  | 1.000            | 223         | 190   |
| Product innovators                          | ±     | 0.489            | 128         | 88    |
| Business process innovators                 | ±     | 0.364            | 130         | 56    |
| Innovative SMEs collaborating               | ±     | 0.624            | 150         | 128   |
| Public-private co-publications              | 619.9 | 0.830            | 199         | 212   |
| PCT patent applications                     | 1.62  | 0.436            | 122         | 71    |
| Trademark applications                      | 5.27  | 0.356            | 137         | 71    |
| Design applications                         | 0.87  | 0.271            | 105         | 47    |
| Employment knowledge-intensive activities   | 28.3  | 1.000            | 149         | 176   |
| Employment innovative enterprises           | ±     | 0.358            | 131         | 62    |
| Sales of innovative products                | ±     | 0.239            | 91          | 50    |
| Air emissions by fine particulates          | 16.2  | 0.354            | 80          | 59    |
| Average normalised score                    | --    | 0.524            | --          | --    |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --    |
| Regional Innovation Index (RII) 2023        | --    | 0.555            | --          | --    |
| Performance 2023 relative to EU in 2023     | --    | --               | 144.1       | 101.4 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 110.0 |
| Regional Innovation Index (RII) 2016        | --    | 0.516            | --          | --    |
| Performance 2016 relative to EU in 2016     | --    | --               | 149.2       | 102.3 |
| Performance change over time                | --    | --               | -5.1        | 7.7   |

± Scores are not shown as these would allow recalculating confidential regional CIS data.

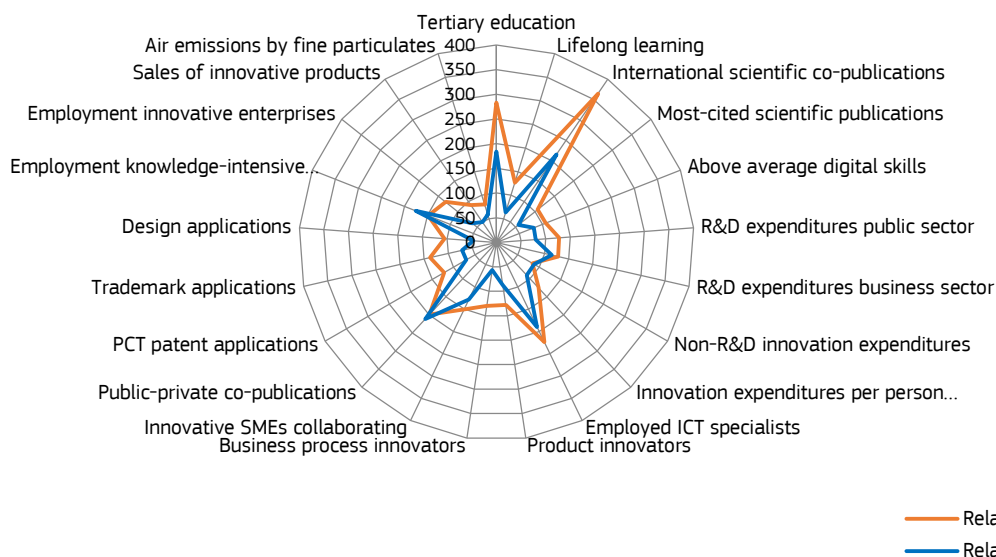
Budapest (HU11) is a Strong Innovator -. Innovation performance has increased over time (7.7%).

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (144.1) and the EU (101.4) in 2023, the RII in 2023 relative to the EU in 2016 (110), and the RII in 2016 relative to both Hungary (149.2) and the EU in 2016 (102.3). The last row shows performance change between 2016 and 2023 compared to Hungary (-5.1%) and to the EU (7.7%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. International scientific co-publications) and weaknesses (e.g. Design applications).

The table below shows data highlighting possible structural differences, e.g. Population density (above EU average) and Employment in Agriculture & Mining (below EU average).

|   | HU11   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 0.5    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 9.1    | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 6.5    | 9.9    | 8.3     |
| Services (G-N)                                    | 76.6   | 54.9   | 63.7    |
| Public administration (O-U)                       | 7.4    | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 5.0    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 50,600 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 5.3    | 4.6    | 2.5     |
| Population density                                | 3,283  | 105    | 106     |
| Urbanisation                                      | 100.0  | 71.6   | 75.8    |
| Population size (000s)                            | 1,720  | 9,730  | 447,210 |



— Relative to country  
— Relative to EU

Pest (HU12)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 36.3  | 0.417            | 122         | 79   |
| Lifelong learning                           | 4.2   | 0.121            | 65          | 33   |
| International scientific co-publications    | 264   | 0.062            | 34          | 20   |
| Most-cited scientific publications          | 611.0 | 0.300            | 104         | 55   |
| Above average digital skills                | 22.2  | 0.373            | 104         | 79   |
| R&D expenditures public sector              | 0.18  | 0.217            | 61          | 38   |
| R&D expenditures business sector            | 0.66  | 0.446            | 74          | 66   |
| Non-R&D innovation expenditures             | ±     | 0.398            | 95          | 99   |
| Innovation expenditures per person employed | ±     | 0.366            | 84          | 61   |
| Employed ICT specialists                    | 5.1   | 0.609            | 136         | 115  |
| Product innovators                          | ±     | 0.339            | 89          | 61   |
| Business process innovators                 | ±     | 0.277            | 99          | 43   |
| Innovative SMEs collaborating               | ±     | 0.316            | 76          | 65   |
| Public-private co-publications              | 89.8  | 0.316            | 76          | 81   |
| PCT patent applications                     | 1.62  | 0.436            | 122         | 71   |
| Trademark applications                      | 5.35  | 0.362            | 140         | 73   |
| Design applications                         | 1.12  | 0.308            | 120         | 53   |
| Employment knowledge-intensive activities   | 20.1  | 0.754            | 112         | 133  |
| Employment innovative enterprises           | ±     | 0.239            | 88          | 42   |
| Sales of innovative products                | ±     | 0.205            | 78          | 43   |
| Air emissions by fine particulates          | 14.6  | 0.433            | 98          | 72   |
| Average normalised score                    | --    | 0.347            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.368            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 95.5        | 67.2 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 72.9 |
| Regional Innovation Index (RII) 2016        | --    | 0.335            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 96.9        | 66.4 |
| Performance change over time                | --    | --               | -1.3        | 6.5  |

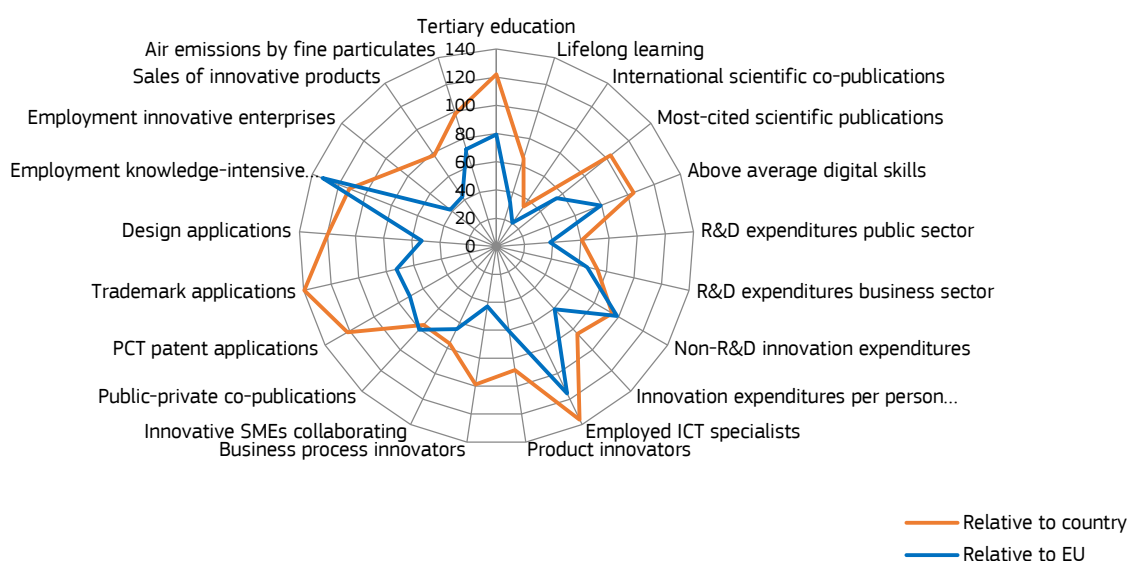
± Scores are not shown as these would allow recalculating confidential regional CIS data.

Pest (HU12) is an Emerging Innovator +. Innovation performance has increased over time (6.5%).

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (95.5) and the EU (67.2) in 2023, the RII in 2023 relative to the EU in 2016 (72.9), and the RII in 2016 relative to both Hungary (96.9) and the EU in 2016 (66.4). The last row shows performance change between 2016 and 2023 compared to Hungary (-1.3%) and to the EU (6.5%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Employment knowledge-intensive activities) and weaknesses (e.g. International scientific co-publications). The table below shows data highlighting possible structural differences, e.g. Population density (above EU average) and Employment in Agriculture & Mining (below EU average).

|   | HU12   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 2.4    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 18.3   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 10.9   | 9.9    | 8.3     |
| Services (G-N)                                    | 61.1   | 54.9   | 63.7    |
| Public administration (O-U)                       | 7.3    | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 3.8    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 19,800 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 5.5    | 4.6    | 2.5     |
| Population density                                | 205    | 105    | 106     |
| Urbanisation                                      | 85.7   | 71.6   | 75.8    |
| Population size (000s)                            | 1,310  | 9,730  | 447,210 |



Közép-Dunántúl (HU21)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 26.6  | 0.202            | 59          | 38   |
| Lifelong learning                           | 6.9   | 0.223            | 120         | 60   |
| International scientific co-publications    | 307   | 0.072            | 40          | 24   |
| Most-cited scientific publications          | 537.5 | 0.251            | 87          | 46   |
| Above average digital skills                | 21.9  | 0.365            | 102         | 78   |
| R&D expenditures public sector              | 0.18  | 0.217            | 61          | 38   |
| R&D expenditures business sector            | 1.60  | 0.694            | 115         | 103  |
| Non-R&D innovation expenditures             | ±     | 0.357            | 85          | 88   |
| Innovation expenditures per person employed | ±     | 0.329            | 76          | 55   |
| Employed ICT specialists                    | 2.3   | 0.240            | 54          | 46   |
| Product innovators                          | ±     | 0.375            | 98          | 67   |
| Business process innovators                 | ±     | 0.230            | 82          | 36   |
| Innovative SMEs collaborating               | ±     | 0.302            | 73          | 62   |
| Public-private co-publications              | 89.0  | 0.314            | 75          | 80   |
| PCT patent applications                     | 0.64  | 0.273            | 76          | 44   |
| Trademark applications                      | 1.77  | 0.118            | 46          | 24   |
| Design applications                         | 0.18  | 0.123            | 48          | 21   |
| Employment knowledge-intensive activities   | 20.9  | 0.791            | 118         | 139  |
| Employment innovative enterprises           | ±     | 0.270            | 99          | 47   |
| Sales of innovative products                | ±     | 0.324            | 124         | 67   |
| Air emissions by fine particulates          | 13.2  | 0.501            | 114         | 84   |
| Average normalised score                    | --    | 0.313            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.332            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 86.1        | 60.6 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 65.7 |
| Regional Innovation Index (RII) 2016        | --    | 0.314            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 90.7        | 62.2 |
| Performance change over time                | --    | --               | -4.6        | 3.5  |

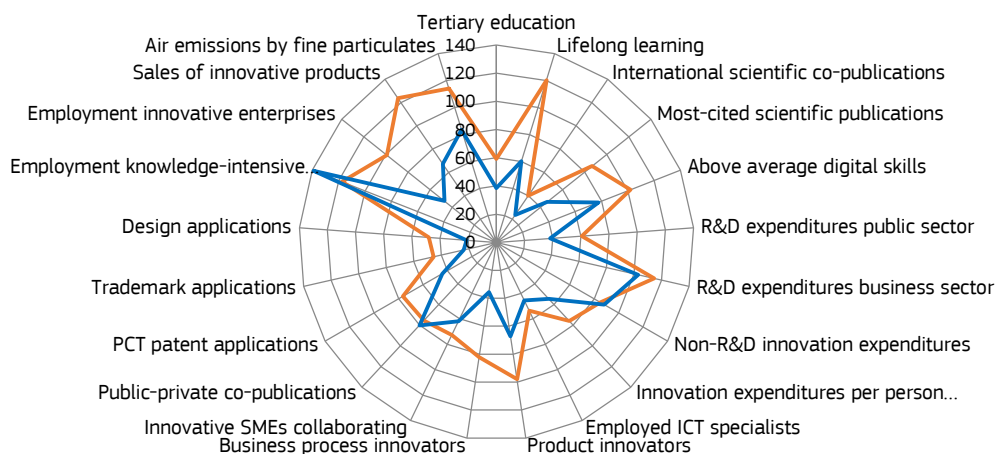
± Scores are not shown as these would allow recalculating confidential regional CIS data.

Közép-Dunántúl (HU21) is an Emerging Innovator +. Innovation performance has increased over time (3.5%). The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (86.1) and the EU (60.6) in 2023, the RII in 2023 relative to the EU in 2016 (65.7), and the RII in 2016 relative to both Hungary (90.7) and the EU in 2016 (62.2). The last row shows performance change between 2016 and 2023 compared to Hungary (-4.6%) and to the EU (3.5%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Employment knowledge-intensive activities) and weaknesses (e.g. Design applications).

The table below shows data highlighting possible structural differences, e.g. Employment in Manufacturing (above EU average) and Employment in Services (below EU average).

|   | HU21   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 4.4    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 32.7   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 10.4   | 9.9    | 8.3     |
| Services (G-N)                                    | 45.9   | 54.9   | 63.7    |
| Public administration (O-U)                       | 6.6    | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 4.3    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 22,700 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 4.7    | 4.6    | 2.5     |
| Population density                                | 96     | 105    | 106     |
| Urbanisation                                      | 61.8   | 71.6   | 75.8    |
| Population size (000s)                            | 1,060  | 9,730  | 447,210 |



— Relative to country  
— Relative to EU



Nyugat-Dunántúl (HU22)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 28.8  | 0.251            | 73          | 48   |
| Lifelong learning                           | 3.6   | 0.098            | 53          | 27   |
| International scientific co-publications    | 381   | 0.090            | 50          | 29   |
| Most-cited scientific publications          | 882.0 | 0.480            | 166         | 88   |
| Above average digital skills                | 21.8  | 0.364            | 102         | 77   |
| R&D expenditures public sector              | 0.14  | 0.178            | 50          | 31   |
| R&D expenditures business sector            | 0.63  | 0.436            | 72          | 65   |
| Non-R&D innovation expenditures             | ±     | 0.375            | 89          | 93   |
| Innovation expenditures per person employed | ±     | 0.290            | 67          | 48   |
| Employed ICT specialists                    | 1.2   | 0.090            | 20          | 17   |
| Product innovators                          | ±     | 0.341            | 89          | 61   |
| Business process innovators                 | ±     | 0.263            | 94          | 41   |
| Innovative SMEs collaborating               | ±     | 0.371            | 89          | 76   |
| Public-private co-publications              | 89.3  | 0.315            | 76          | 80   |
| PCT patent applications                     | 0.47  | 0.234            | 65          | 38   |
| Trademark applications                      | 1.66  | 0.111            | 43          | 22   |
| Design applications                         | 0.77  | 0.255            | 99          | 44   |
| Employment knowledge-intensive activities   | 19.6  | 0.730            | 108         | 128  |
| Employment innovative enterprises           | ±     | 0.231            | 85          | 40   |
| Sales of innovative products                | ±     | 0.445            | 170         | 93   |
| Air emissions by fine particulates          | 12.3  | 0.545            | 124         | 91   |
| Average normalised score                    | --    | 0.309            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.328            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 85.1        | 59.8 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 64.9 |
| Regional Innovation Index (RII) 2016        | --    | 0.282            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 81.5        | 55.9 |
| Performance change over time                | --    | --               | 3.6         | 9.0  |

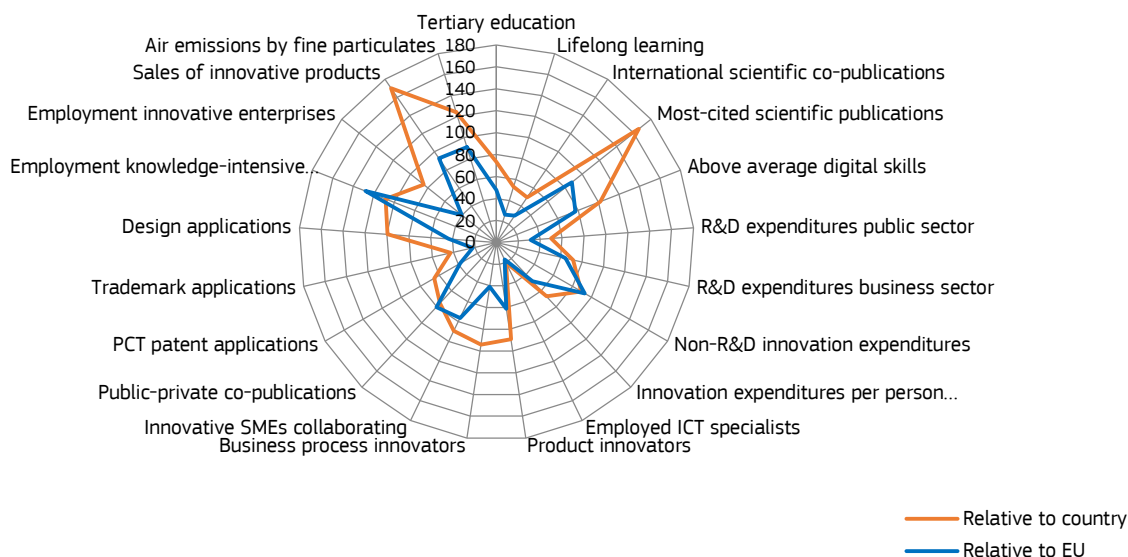
± Scores are not shown as these would allow recalculating confidential regional CIS data.

Nyugat-Dunántúl (HU22) is an Emerging Innovator +. Innovation performance has increased over time (9%). The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (85.1) and the EU (59.8) in 2023, the RII in 2023 relative to the EU in 2016 (64.9), and the RII in 2016 relative to both Hungary (81.5) and the EU in 2016 (55.9). The last row shows performance change between 2016 and 2023 compared to Hungary (3.6%) and to the EU (9%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Employment knowledge-intensive activities) and weaknesses (e.g. Employed ICT specialists).

The table below shows data highlighting possible structural differences, e.g. Employment in Manufacturing (above EU average) and GDP per capita growth (below EU average).

|   | HU22   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 4.9    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 29.2   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 10.0   | 9.9    | 8.3     |
| Services (G-N)                                    | 49.0   | 54.9   | 63.7    |
| Public administration (O-U)                       | 6.9    | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 4.1    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 22,100 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 0.9    | 4.6    | 2.5     |
| Population density                                | 88     | 105    | 106     |
| Urbanisation                                      | 59.7   | 71.6   | 75.8    |
| Population size (000s)                            | 1,000  | 9,730  | 447,210 |





Dél-Dunántúl (HU23)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 25.6  | 0.180            | 53          | 34   |
| Lifelong learning                           | 4.9   | 0.148            | 80          | 40   |
| International scientific co-publications    | 653   | 0.156            | 86          | 51   |
| Most-cited scientific publications          | 544.8 | 0.256            | 88          | 47   |
| Above average digital skills                | 21.1  | 0.348            | 97          | 74   |
| R&D expenditures public sector              | 0.38  | 0.364            | 102         | 64   |
| R&D expenditures business sector            | 0.46  | 0.372            | 61          | 55   |
| Non-R&D innovation expenditures             | ±     | 0.490            | 117         | 121  |
| Innovation expenditures per person employed | ±     | 0.355            | 82          | 59   |
| Employed ICT specialists                    | 1.3   | 0.104            | 23          | 20   |
| Product innovators                          | ±     | 0.340            | 89          | 61   |
| Business process innovators                 | ±     | 0.247            | 88          | 38   |
| Innovative SMEs collaborating               | ±     | 0.410            | 99          | 84   |
| Public-private co-publications              | 185.1 | 0.453            | 109         | 116  |
| PCT patent applications                     | 0.51  | 0.245            | 68          | 40   |
| Trademark applications                      | 2.93  | 0.197            | 76          | 40   |
| Design applications                         | 1.78  | 0.388            | 151         | 67   |
| Employment knowledge-intensive activities   | 11.3  | 0.336            | 50          | 59   |
| Employment innovative enterprises           | ±     | 0.204            | 75          | 35   |
| Sales of innovative products                | ±     | 0.199            | 76          | 41   |
| Air emissions by fine particulates          | 13.7  | 0.476            | 108         | 79   |
| Average normalised score                    | --    | 0.298            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.316            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 82.1        | 57.8 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 62.7 |
| Regional Innovation Index (RII) 2016        | --    | 0.262            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 75.7        | 51.9 |
| Performance change over time                | --    | --               | 6.4         | 10.8 |

± Scores are not shown as these would allow recalculating confidential regional CIS data.

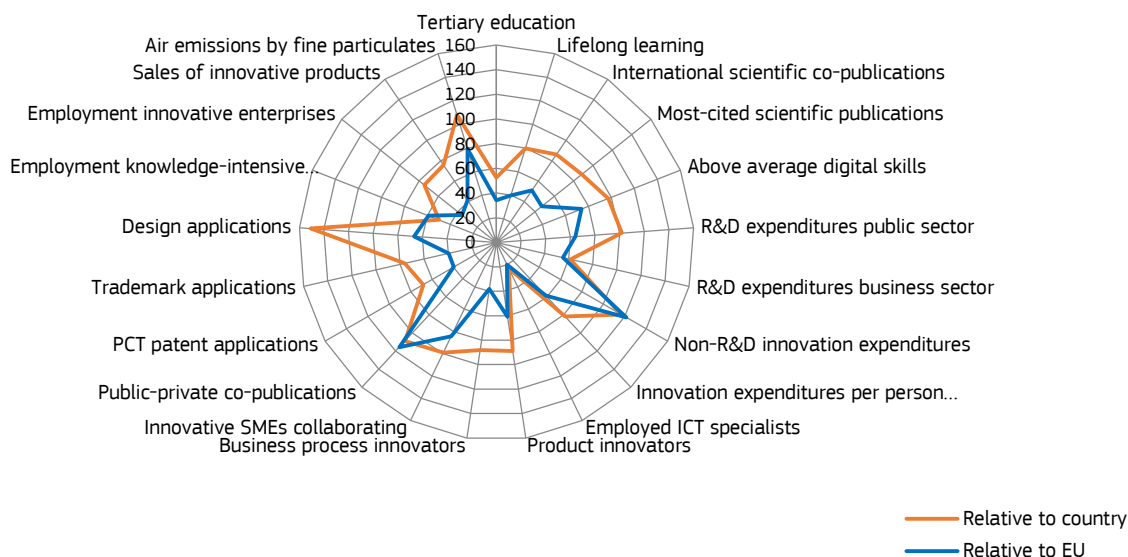
Dél-Dunántúl (HU23) is an Emerging Innovator +. Innovation performance has increased over time (10.8%).

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (82.1) and the EU (57.8) in 2023, the RII in 2023 relative to the EU in 2016 (62.7), and the RII in 2016 relative to both Hungary (75.7) and the EU in 2016 (51.9). The last row shows performance change between 2016 and 2023 compared to Hungary (6.4%) and to the EU (10.8%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Non-R&D innovation expenditures) and weaknesses (e.g. Employed ICT specialists).

The table below shows data highlighting possible structural differences, e.g. Employment in Agriculture & Mining (above EU average) and GDP per capita (below EU average).

|   | HU23   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 7.1    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 21.0   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 11.7   | 9.9    | 8.3     |
| Services (G-N)                                    | 49.4   | 54.9   | 63.7    |
| Public administration (O-U)                       | 10.8   | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 3.3    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 16,600 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 4.9    | 4.6    | 2.5     |
| Population density                                | 61     | 105    | 106     |
| Urbanisation                                      | 50.0   | 71.6   | 75.8    |
| Population size (000s)                            | 870    | 9,730  | 447,210 |



Eszak-Magyarország (HU31)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 19.2  | 0.038            | 11          | 7    |
| Lifelong learning                           | 6.2   | 0.197            | 106         | 53   |
| International scientific co-publications    | 318   | 0.075            | 41          | 24   |
| Most-cited scientific publications          | 302.6 | 0.096            | 33          | 17   |
| Above average digital skills                | 20.5  | 0.333            | 93          | 71   |
| R&D expenditures public sector              | 0.15  | 0.189            | 53          | 33   |
| R&D expenditures business sector            | 0.61  | 0.429            | 71          | 64   |
| Non-R&D innovation expenditures             | ±     | 0.857            | 204         | 212  |
| Innovation expenditures per person employed | ±     | 0.530            | 122         | 88   |
| Employed ICT specialists                    | 1.3   | 0.099            | 22          | 19   |
| Product innovators                          | ±     | 0.357            | 93          | 64   |
| Business process innovators                 | ±     | 0.269            | 96          | 42   |
| Innovative SMEs collaborating               | ±     | 0.350            | 85          | 72   |
| Public-private co-publications              | 69.0  | 0.277            | 66          | 71   |
| PCT patent applications                     | 0.52  | 0.247            | 69          | 40   |
| Trademark applications                      | 2.83  | 0.190            | 73          | 38   |
| Design applications                         | 0.40  | 0.184            | 71          | 32   |
| Employment knowledge-intensive activities   | 17.6  | 0.635            | 94          | 112  |
| Employment innovative enterprises           | ±     | 0.319            | 117         | 56   |
| Sales of innovative products                | ±     | 0.280            | 107         | 58   |
| Air emissions by fine particulates          | 15.5  | 0.387            | 88          | 65   |
| Average normalised score                    | --    | 0.302            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.320            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 83.0        | 58.4 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 63.3 |
| Regional Innovation Index (RII) 2016        | --    | 0.243            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 70.2        | 48.1 |
| Performance change over time                | --    | --               | 12.8        | 15.2 |

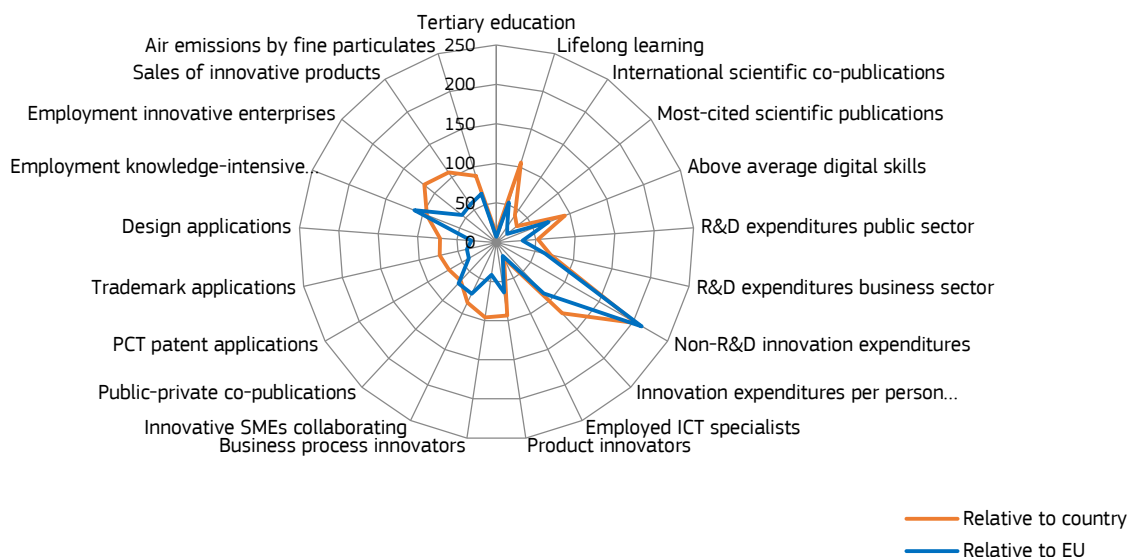
± Scores are not shown as these would allow recalculating confidential regional CIS data.

Észak-Magyarország (HU31) is an Emerging Innovator +. Innovation performance has increased over time (15.2%). The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (83) and the EU (58.4) in 2023, the RII in 2023 relative to the EU in 2016 (63.3), and the RII in 2016 relative to both Hungary (70.2) and the EU in 2016 (48.1). The last row shows performance change between 2016 and 2023 compared to Hungary (12.8%) and to the EU (15.2%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Non-R&D innovation expenditures) and weaknesses (e.g. Tertiary education).

The table below shows data highlighting possible structural differences, e.g. Employment in Public administration (above EU average) and GDP per capita (below EU average).

|   | HU31   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 4.7    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 26.5   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 12.6   | 9.9    | 8.3     |
| Services (G-N)                                    | 45.1   | 54.9   | 63.7    |
| Public administration (O-U)                       | 11.1   | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 3.8    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 16,900 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 4.8    | 4.6    | 2.5     |
| Population density                                | 83     | 105    | 106     |
| Urbanisation                                      | 54.3   | 71.6   | 75.8    |
| Population size (000s)                            | 1,110  | 9,730  | 447,210 |



Eszak-Alföld (HU32)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 23.6  | 0.135            | 40          | 26   |
| Lifelong learning                           | 6.7   | 0.216            | 116         | 58   |
| International scientific co-publications    | 710   | 0.170            | 94          | 55   |
| Most-cited scientific publications          | 593.9 | 0.289            | 100         | 53   |
| Above average digital skills                | 20.9  | 0.343            | 96          | 73   |
| R&D expenditures public sector              | 0.39  | 0.370            | 103         | 65   |
| R&D expenditures business sector            | 0.55  | 0.407            | 67          | 60   |
| Non-R&D innovation expenditures             | ±     | 0.491            | 117         | 121  |
| Innovation expenditures per person employed | ±     | 0.410            | 95          | 68   |
| Employed ICT specialists                    | 1.3   | 0.104            | 23          | 20   |
| Product innovators                          | ±     | 0.277            | 72          | 50   |
| Business process innovators                 | ±     | 0.193            | 69          | 30   |
| Innovative SMEs collaborating               | ±     | 0.268            | 65          | 55   |
| Public-private co-publications              | 132.0 | 0.383            | 92          | 98   |
| PCT patent applications                     | 0.41  | 0.218            | 61          | 35   |
| Trademark applications                      | 2.59  | 0.174            | 67          | 35   |
| Design applications                         | 0.77  | 0.255            | 99          | 44   |
| Employment knowledge-intensive activities   | 11.3  | 0.336            | 50          | 59   |
| Employment innovative enterprises           | ±     | 0.163            | 60          | 28   |
| Sales of innovative products                | ±     | 0.366            | 140         | 76   |
| Air emissions by fine particulates          | 14.6  | 0.433            | 99          | 72   |
| Average normalised score                    | --    | 0.286            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.303            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 78.6        | 55.3 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 60.0 |
| Regional Innovation Index (RII) 2016        | --    | 0.270            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 77.9        | 53.4 |
| Performance change over time                | --    | --               | 0.7         | 6.5  |

± Scores are not shown as these would allow recalculating confidential regional CIS data.

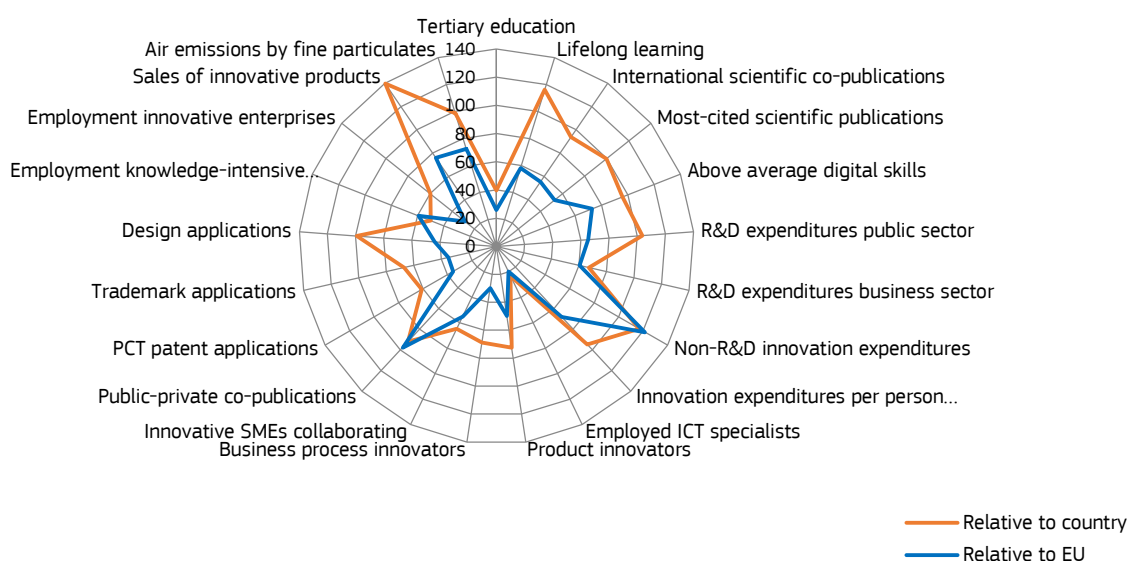
Észak-Alföld (HU32) is an Emerging Innovator +. Innovation performance has increased over time (6.5%).

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (78.6) and the EU (55.3) in 2023, the RII in 2023 relative to the EU in 2016 (60), and the RII in 2016 relative to both Hungary (77.9) and the EU in 2016 (53.4). The last row shows performance change between 2016 and 2023 compared to Hungary (0.7%) and to the EU (6.5%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Non-R&D innovation expenditures) and weaknesses (e.g. Employed ICT specialists).

The table below shows data highlighting possible structural differences, e.g. Employment in Agriculture & Mining (above EU average) and GDP per capita (below EU average).

|   | HU32   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 7.8    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 22.1   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 11.3   | 9.9    | 8.3     |
| Services (G-N)                                    | 46.9   | 54.9   | 63.7    |
| Public administration (O-U)                       | 12.0   | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 3.7    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 15,900 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 5.2    | 4.6    | 2.5     |
| Population density                                | 81     | 105    | 106     |
| Urbanisation                                      | 67.6   | 71.6   | 75.8    |
| Population size (000s)                            | 1,440  | 9,730  | 447,210 |



Dél-Alföld (HU33)

|   | Data  | Normalised score | Relative to |      |
|---|-------|------------------|-------------|------|
|   |       |                  | HU          | EU   |
| Tertiary education                          | 22.9  | 0.120            | 35          | 23   |
| Lifelong learning                           | 6.4   | 0.205            | 110         | 55   |
| International scientific co-publications    | 848   | 0.204            | 112         | 66   |
| Most-cited scientific publications          | 609.7 | 0.299            | 103         | 55   |
| Above average digital skills                | 20.6  | 0.335            | 94          | 71   |
| R&D expenditures public sector              | 0.47  | 0.417            | 117         | 73   |
| R&D expenditures business sector            | 0.77  | 0.482            | 79          | 71   |
| Non-R&D innovation expenditures             | ±     | 0.454            | 108         | 112  |
| Innovation expenditures per person employed | ±     | 0.357            | 82          | 59   |
| Employed ICT specialists                    | 1.8   | 0.175            | 39          | 33   |
| Product innovators                          | ±     | 0.325            | 85          | 58   |
| Business process innovators                 | ±     | 0.216            | 77          | 33   |
| Innovative SMEs collaborating               | ±     | 0.286            | 69          | 59   |
| Public-private co-publications              | 264.5 | 0.542            | 130         | 138  |
| PCT patent applications                     | 1.09  | 0.357            | 100         | 58   |
| Trademark applications                      | 3.61  | 0.243            | 94          | 49   |
| Design applications                         | 0.36  | 0.175            | 68          | 30   |
| Employment knowledge-intensive activities   | 11.4  | 0.341            | 51          | 60   |
| Employment innovative enterprises           | ±     | 0.233            | 86          | 41   |
| Sales of innovative products                | ±     | 0.219            | 84          | 46   |
| Air emissions by fine particulates          | 14.1  | 0.458            | 104         | 76   |
| Average normalised score                    | --    | 0.307            | --          | --   |
| Country EIS-RIS correction factor           | --    | 1.060            | --          | --   |
| Regional Innovation Index (RII) 2023        | --    | 0.325            | --          | --   |
| Performance 2023 relative to EU in 2023     | --    | --               | 84.4        | 59.4 |
| Performance 2023 relative to EU in 2016     | --    | --               | --          | 64.4 |
| Regional Innovation Index (RII) 2016        | --    | 0.300            | --          | --   |
| Performance 2016 relative to EU in 2016     | --    | --               | 86.7        | 59.5 |
| Performance change over time                | --    | --               | -2.4        | 4.9  |

± Scores are not shown as these would allow recalculating confidential regional CIS data.

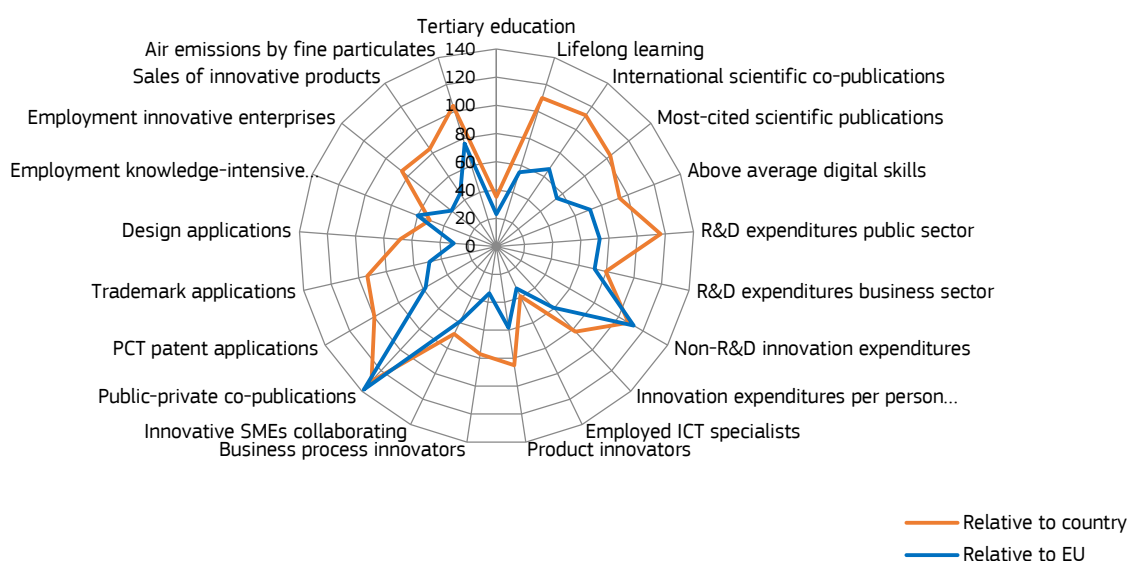
Dél-Alföld (HU33) is an Emerging Innovator +. Innovation performance has increased over time (4.9%).

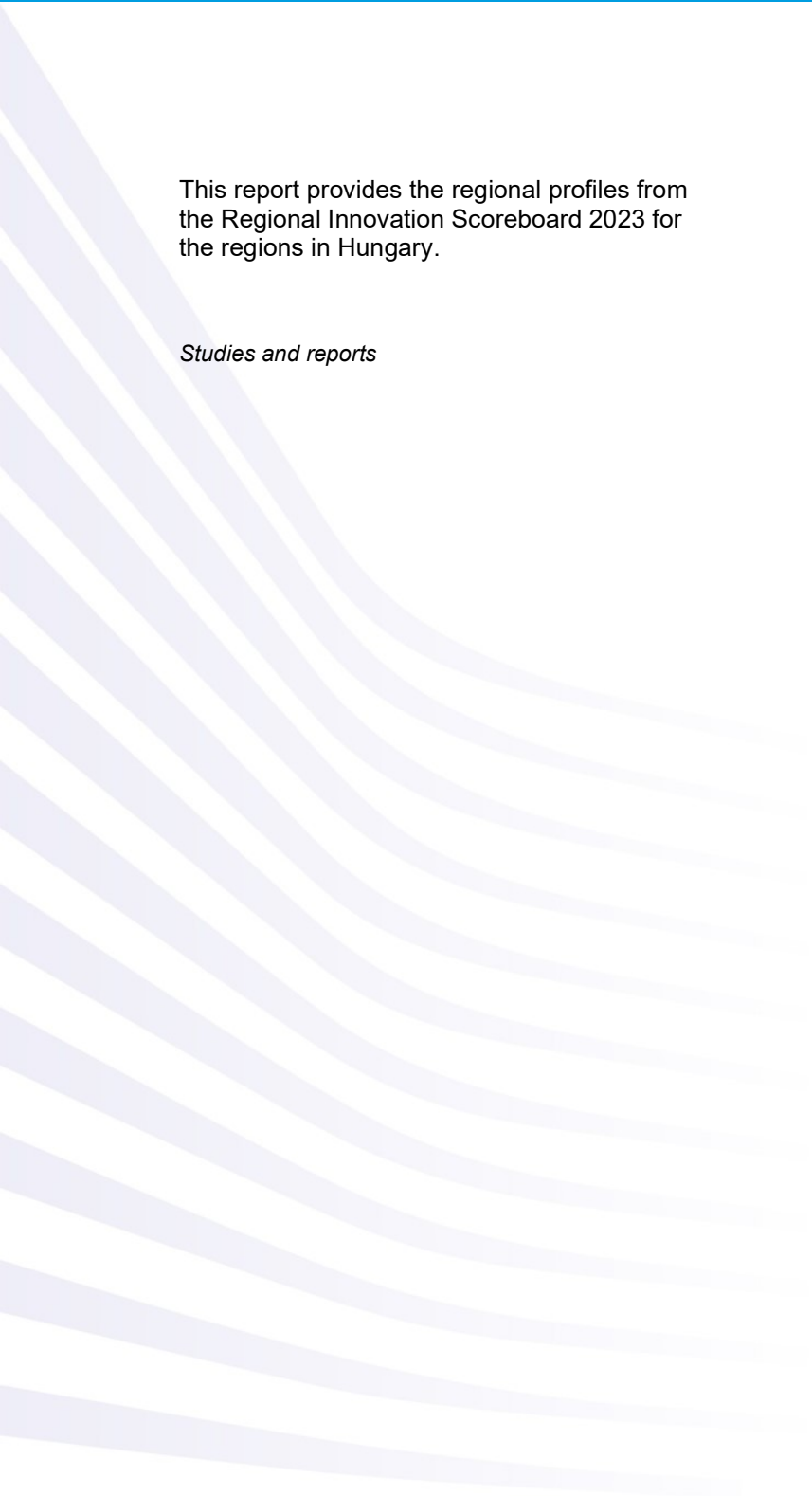

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Hungary and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Hungary (84.4) and the EU (59.4) in 2023, the RII in 2023 relative to the EU in 2016 (64.4), and the RII in 2016 relative to both Hungary (86.7) and the EU in 2016 (59.5). The last row shows performance change between 2016 and 2023 compared to Hungary (-2.4%) and to the EU (4.9%).

The radar graph shows relative strengths compared to Hungary (orange line) and the EU (blue line), showing relative strengths (e.g. Public-private co-publications) and weaknesses (e.g. Tertiary education).

The table below shows data highlighting possible structural differences, e.g. Employment in Agriculture & Mining (above EU average) and GDP per capita (below EU average).

|   | HU33   | HU     | EU      |
|---|--------|--------|---------|
| Share of employment in:                           |        |        |         |
| Agriculture & Mining (A-B)                        | 9.9    | 4.8    | 4.4     |
| Manufacturing (C)                                 | 23.8   | 21.7   | 16.4    |
| Utilities & Construction (D-F)                    | 8.7    | 9.9    | 8.3     |
| Services (G-N)                                    | 49.0   | 54.9   | 63.7    |
| Public administration (O-U)                       | 8.5    | 8.7    | 7.2     |
| Average number of employed persons per enterprise | 3.6    | 4.2    | 5.1     |
| GDP per capita (PPS)                              | 17,600 | 24,300 | 32,400  |
| GDP per capita growth (PPS)                       | 5.0    | 4.6    | 2.5     |
| Population density                                | 67     | 105    | 106     |
| Urbanisation                                      | 67.2   | 71.6   | 75.8    |
| Population size (000s)                            | 1,220  | 9,730  | 447,210 |





This report provides the regional profiles from the Regional Innovation Scoreboard 2023 for the regions in Hungary.

*Studies and reports*