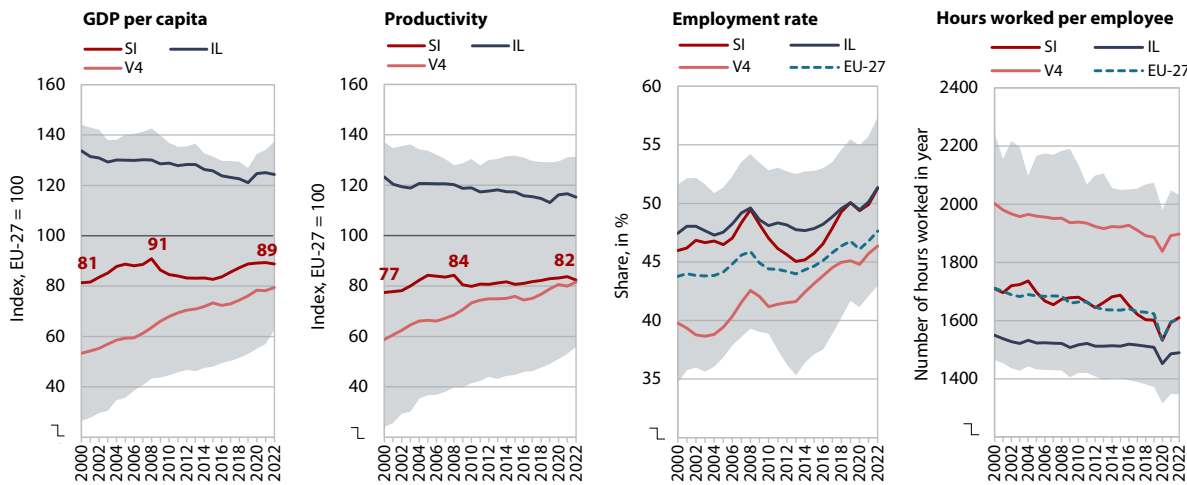


Key messages

Slovenia’s long-standing development gap with the EU average did not narrow in 2022. GDP growth was mainly driven by increased labour participation, while real productivity growth remained modest. The latter averaged 1% over the last five-year period and was therefore significantly lower than before 2009, when Slovenia improved the conditions for increasing material prosperity relatively quickly, with productivity growth of around 3%, and also narrowed the gap with the more developed EU Member States. Slovenia thus reached 84% of the EU average in productivity (in purchasing power parity) per person employed in 2008, compared to just 82% in 2022. This is almost 30% below the level of the innovation leaders, which stand out even more in terms of productivity if the GDP generated per hour worked is taken into account. The demographic trend of a shrinking population in the most active age group (20–64 years) is also driving the need to accelerate productivity growth, particularly growth in productivity per hour worked.



Source: Eurostat (2023); calculations by IMAD. Note: The GDP per capita and productivity (GDP per employee) indicators are expressed in purchasing power standards (PPS). The employment rate is the ratio of employment to population; hours worked show the annual average number of hours worked per employee. The shaded field shows the range between the EU Member States with the lowest and the highest indicator values. Luxembourg and Ireland are excluded for better transparency but are included in the EU average. IL – innovation leaders; V4 – Visegrad countries.

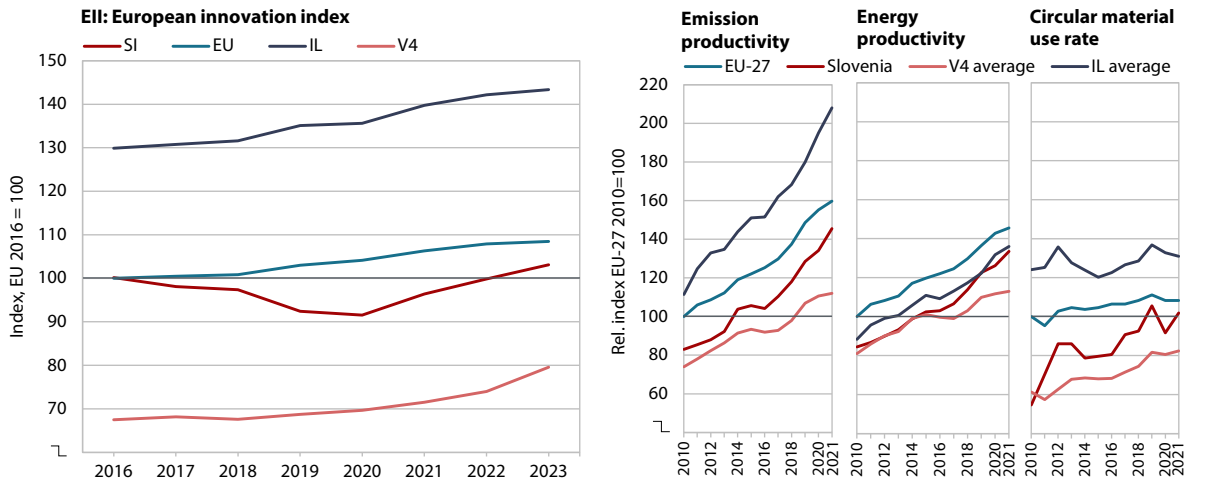
Despite modest shifts in productivity at the macro level, Slovenia continues to have a strong position for accelerated development in a number of areas:

1. **The financial situation in the corporate sector remains favourable.** Although the financial situation in some parts of the economy deteriorated in the period 2020–2022, it is still favourable in the corporate sector as a whole. Slovenia also ranks relatively high on the Economic Resilience Index at 9th place in the EU. This is due to Slovenia’s high degree of social cohesion, economic independence and financial resilience.
2. **The economy is successfully integrating into global value chains, among other things by improving its functional and technological specialisation.** Slovenia is moving up the production chain and, compared to other competing countries, is more successful in upgrading production with other functions, of which research and development are particularly important. It is positive that it is utilising expertise from more and more domains to develop new products. This is reflected in the increasing economic complexity, where Slovenia has risen

from 12th to 5th place. It also ranks 5th in the EU in terms of the share of exports of medium- and high-technology intensive products.

- 3. **The educational structure of the labour force is improving, as is the share of the knowledge-based economy.** The share of tertiary-educated people (especially experts) in the working-age population rose sharply in 2010–2020 and was well above the EU average (and even more above the V4 average). Slovenia thus no longer lags far behind the innovation leaders and has the eighth-highest proportion of employees in knowledge-based activities.¹
- 4. **There have also been some positive developments in the acceleration of innovation and investment activity.** In both areas, Slovenia has made more progress than the EU average in recent years. In 2018–2020, the share of innovation-active companies (55%) was above the EU average for the first time in a decade, and investment accelerated in machinery and equipment in particular. At the same time, positive trends can also be observed in some other areas, such as investment in branding, with companies also significantly increasing their climate-related investments.
- 5. **Slovenians have a positive attitude towards entrepreneurship and digital transformation.** Although Slovenia has not yet succeeded in improving its attitudes towards new ideas, change and risk-taking, which are important for a smart and green transition, attitudes towards entrepreneurship have improved significantly and the impact of digital transformation on the economy and society is also viewed positively.

The main challenge is thus not the direction but the pace and intensity of smart and green transformation, especially compared to the innovation leaders. Slovenia's progress in innovation performance (according to the European Innovation Scoreboard) is too slow, despite some advancement, as it would take more than 30 years for Slovenia to catch up with the innovation leaders. The same is true for emissions and energy productivity and for the share of recycled materials in total consumption, i.e. circular use of resources, where, in addition to the sluggish pace of progress, companies still have an overly defensive attitude, in the sense that they are primarily reacting to the challenges of sustainable transformation rather than seeing the opportunities.



Sources: Eurostat (2023), European Commission (2023d); calculations by IMAD. Note: "EII" means European Innovation Index. Emissions productivity is expressed as GDP per unit of GHG emissions, energy productivity as GDP per unit of energy consumption and the circular material use rate as the share of recovered material in total material consumption.

¹ Activities in which at least one-third of employees has completed tertiary education.

Skilled labour is of key importance for a successful smart and green transition...

Like other developed countries, Slovenia lacks skilled labour for both cyclical and structural reasons. Among the structural reasons, the most important are demographic changes and the slow adaptation of the content and organisation of education and training to changes in the demand for labour and skills. There is already a shortage of personnel for the green and smart transformation as well as in education, health and social services, where demand is expected to increase in the future. The technological developments that are accelerating change in the economy and society are also changing the nature and organisation of work and require a shift in the understanding of the working life cycle, as individuals will move through several careers over the course of their lives, need to participate in lifelong education and training, and may remain active after retirement.

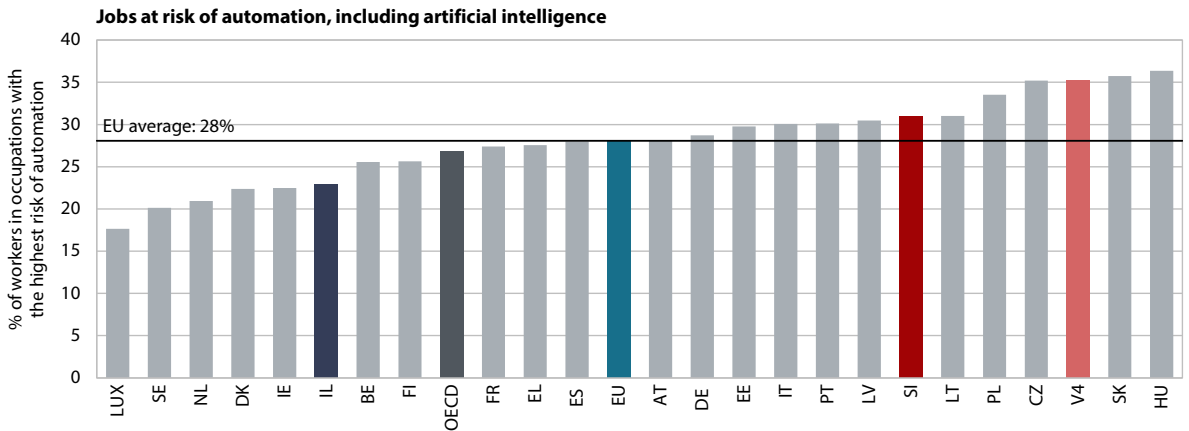
... upgraded by an accelerated transformation of the business sector, which currently relies too much on traditional comparative advantages.

Slovenia must go beyond its production focus, where it is highly competitive and even a leader when it comes to large companies (e.g. in the use of industrial robots, the Internet of Things or the integration of internal processes). At the same time, it is not yet unleashing its full potential when it comes to strengthening other high value-added functions (R&D, sales, logistics, management) and is also struggling to move from traditional to data-driven companies with strengthened focus on value-creation for the customer. This type of transformation, which should comprehensively address technological, digital, sustainability and organisational/marketing aspects, must be promoted across all activities. At the same time, development in activities where opportunities have so far been underutilised, particularly in the context of the rapidly growing global shift towards knowledge-based services, should also be enhanced in the future.

The speed and intensity of smart and green transformation will become even more important in the future due to external factors or megatrends, with the following standing out:

1. **Demographic trends:** over the last decade, the population aged 20–64 has declined by 67,000, an average of 7,000 per year, and projections based on moderate net migration show that it will decrease by a further 43,000 by 2030 and by 119,000 by 2050, compared to 2022. Demographic trends are therefore **one of the main reasons for the severe labour shortages, which will become even more pronounced in the future and therefore represent our new reality.** The ability to ensure and strategically manage human resources will therefore be one of the most important structural factors for Slovenia's competitiveness in the future.
2. **Digital transition:** The potential risk of job automation has increased further in Slovenia, as in other countries, taking into account the impact of artificial intelligence. With 31% of jobs potentially at high risk of automation, Slovenia ranks sixth among EU Member States in this regard. On the other hand, **new enabling technologies**, including generative artificial intelligence, **represent an opportunity**, as not only estimates for the future but also empirical studies of past trends increasingly confirm that they have a **positive impact on productivity when introduced: (i) in a comprehensive manner**, using more complementary technologies and supported by appropriate training, and **(ii) at an accelerated pace**, as the estimated benefits are higher in more ambitious and developed countries. At the same time, under the right conditions, when performing the same tasks, new technologies can be of greater benefit to the less experienced, skilled or successful employees (OECD, 2023f; Dell'Acqua et al., 2023), which, in

addition to the risks that such technologies can entail, also points to the potential qualitative benefits of their accelerated implementation in practice.



Source: OECD (2023f), based on Lassébie and Quintini (2022); presentation by IMAD.

3. **Green transition:** The consequences of climate change, such as floods, droughts and fires, are becoming more pronounced, frequent and intense. This not only has a catastrophic impact on people’s lives and well-being, but also has a direct effect on the performance of many economic sectors, with the loss for the EU already estimated at around one-tenth of GDP. The ecological footprint, which measures the impact on the environment, is still high in Slovenia (similar to the European average), which indicates a continuation of unsustainable development in the last decade. The green transition must therefore be **accelerated in the coming years**. This will change the inter- and intra-sectoral structure of the economy, phasing out brown technologies and activities, moving to a low-carbon circular economy, and strengthening activities that contribute to improving the environment. The latter will thus become an **opportunity for innovation and development and, consequently, a source of new competitive advantages**, where mainly those who are more ambitious in their green transformation will benefit most.

Policy recommendations

To join the ranks of the most advanced countries, Slovenia needs a strategic shift, focusing on measures that accelerate the transition to a smart and green economy and primarily have a long-term impact, which requires ensuring the right conditions, i.e. a predictable, efficient and responsive business environment and a strategic approach to human resource development.

A. A predictable, efficient and responsive business environment:

1. In order to achieve a high level of productivity in the business sector, the **productivity of the public sector must be improved also**, in particular with regard to:
 - a. improving the quality of public services (health, education, resilience and emergency response, etc.);
 - b. enabling predictable yet agile and responsive public services, both in terms of de-bureaucratisation, flexibilisation and digitalisation and in terms of strategic policy coordination.
2. Creating a more **favourable environment for highly productive** activities and workers, in particular by:
 - a. accelerating the reallocation of economic activities and workers from less productive to more productive enterprises (improving allocative efficiency);
 - b. restructuring taxes in order to reduce taxation on labour on the one hand and increase revenue from other sources and restructure expenditure on the other;
 - c. focusing economic policy measures on supporting the healthy core of the economy, especially the development-oriented niche parts of the economy with high growth potential.

B. A strategic approach to human resources development where every individual counts:

1. Measures to ensure a **sufficient labour force**, with the following priorities:
 - a. creating the conditions for a longer working life, including earlier entry into the labour market for young people and a longer working life for older people. In addition to pension reform, this also includes adapting workplaces to older workers and promoting new approaches to human resources management in companies (e.g. age management, i.e. taking full advantage of the strengths and talents of different age groups to achieve optimal results);
 - b. an active migration policy to attract labour, especially skilled labour, from abroad and to encourage the return of Slovenian professionals, i.e. establishing a circular migration system. Without high net migration, it will not be possible to ensure further employment growth, which could hinder economic growth. At the same time, if we were able to attract more educated immigrants, the positive impact on GDP per capita would more than double over a 30-year period, i.e. it would be 3.4% higher than in the baseline scenario;

- c. appropriate policy for the social integration of labour migrants and their families by creating conditions for interaction between nationals and foreigners.
2. **Further strengthening of education and training for all workers and developing a culture of lifelong learning** are crucial to ensure the right skills, with the following priorities:
 - a. increased investment by companies and the state in the education and training of all employees and the improvement of working conditions, especially for highly qualified people (e.g. researchers), as the demand for new skills is high and without them it is not possible to utilise new technologies and increase productivity;
 - b. human resource development in companies by promoting a culture based on a positive attitude towards learning, including by identifying skill and competence needs among workers and planning their training and development accordingly;
 - c. creating a flexible adult education and (re)training system that responds quickly to the needs of the economy (e.g. setting up a system of micro-certificates for short-term training), including by raising individuals' awareness of the need for lifelong learning;
 - d. improving access to training for the green and digital transitions, including for the unemployed and inactive, which requires the design and strengthening of active employment policy programmes.
 3. **Improving the responsiveness of the education and training systems to the changing needs of the economy in the medium term**, linked to the green and digital transformation, demographic change, and other development trends. The development of a comprehensive system for recognising and forecasting personnel and skills needs remains a challenge. A strategic approach to human resources development planning will also need to take into account the rapidly changing skills needs, which will require even greater involvement of social partners, including companies and other institutions.

C. Measures to accelerate the transition to a smart and green economy

These represent the top of the hierarchy of the necessary package of measures to increase productivity growth, where sustainability aspects need to be promoted horizontally, especially when it comes to technological development and sustainable entrepreneurship.

1. Improvement of the **framework conditions**:
 - a. the quality of the ecosystems for research, innovation and entrepreneurship, including for the promotion of start-ups, must be raised from mediocrity to the level of the innovation leaders;
 - b. infrastructural conditions must be further improved, especially for digital connectivity, to eliminate grey areas on the one hand and to improve access to and use of high-capacity fixed and mobile networks on the other.
2. Further **acceleration of investments**: Slovenia has had one of the lowest contributions of investment to productivity growth in the last decade, in terms of both tangible (buildings, machinery, equipment) and intangible (R&D, knowledge, ICT, organisation) capital. It is particularly important to narrow the

gap with the innovation leaders in R&D investment, especially (i) in the so-called valley of death,² (ii) in the corporate sector, where the state must also play its role, and (iii) in relation to technologies that are considered priorities and are also related to the environment, with additional attention also being paid to investment in software and data and in other forms of soft capital (e.g. design and organisational capital).

3. Promoting business transformation

While Slovenia has recently made significant progress in the educational structure of the labour force, there is still considerable room for improvement in resource efficiency (i.e. total factor productivity), which is directly linked to the slow pace of business transformation towards a smart and green economy.

On the one hand, this should be promoted through the **broadening of the transformation processes**, not just by enabling a more efficient functioning of markets (see recommendation A.2.a) but also:

- a. in medium-sized and small companies, which lag far behind the same group of companies in innovation leaders in terms of both innovation activity and digital intensity, which is not the case for large companies;
- b. by further promoting co-operation and business integration that help to better exploit synergies between (i) large and other enterprises, including start-ups, (ii) different business functions (e.g. between production and other functions and consequently between high- and medium-educated workers), (iii) manufacturing and service enterprises, and (iv) enterprises on the one hand and knowledge institutions and the state on the other.

On the other hand, **smart and green transformation processes must be deepened** in all parts of the economy through:

- a. even more intensive automation;
- b. further strengthening of high value-added functions (research and development, sales, management);
- c. greater emphasis on breakthrough innovation, including green innovation, and even greater product differentiation that creates value for the customer;
- d. upgrading business practices in terms of:
 - (i) introducing data-driven management;
 - (ii) innovation of sustainable business models;
 - (iii) organisational upgrade by introducing more flexible forms of work and management;
 - (iv) accelerating the introduction of an open, innovation-friendly culture.

² Investment in the high-risk R&D development phases (development from proof of concept to prototype), where the availability of funding sources is often limited due to the need for complementary government and corporate funding.