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**SLOVENIAN INDUSTRIAL STRATEGY 2021–2030**

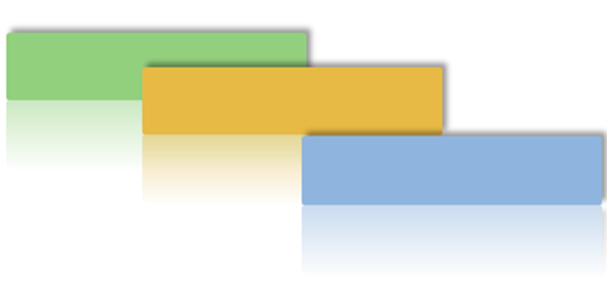


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# INTRODUCTION

Through export orientation and innovation, industry represents the foundations of welfare and the development of Slovenia and is the essential part of the country’s economy. Therefore, it needs proper attention. In the narrow sense, industry refers to the manufacturing and processing activities that employ over 201,722 people in 19,671 companies in Slovenia. Slovenian processing activity in 2019 contributed a total of 23.2% to the added value of the economy, ranking it in third place in the EU-27, behind Ireland and the Czech Republic. The EU-27 average is 16.7%. Slovenian processing companies create almost one third of total sales and two thirds of total exports. Processing activities contribute to 75% of the investments in R&D in the business sector. More than one fourth of service activities are connected to industry. The borders between manufacturing and services have become blurred and the interaction between services and manufacturing is increasing in all branches. Therefore, this Industrial Strategy shows a wider view of the industry and includes industry-related services.

The Industrial Strategy connects various industrial chains, large enterprises, micro, small and medium-sized enterprises, including start-ups (hereinafter referred to as SMEs), academic and research institutes and other stakeholders. More than ten employees work in an average industrial unit. On the other hand, there are some large enterprises that employ over a thousand workers. The co-habitation of small and large enterprises in the economy is the precondition for success. Their cooperation with the research sphere and the creative and cultural sector (CCS) is also very important. The main engine of growth is creativity, research, development and innovation. One of the key tasks of this strategy is to create the conditions for connecting various stakeholders and to learn about as well as derive new innovative projects that expand the limits of development. New technologies, the life cycle of products, the necessity of exploiting local materials and raw materials from waste as well as increasing global competition enhance the importance of innovation not only for the future development of enterprises, but also for their long-term survival. Due to the interaction and co-dependence of those challenges, we need to look for systemic solutions in the direction of comparative advantages of Slovenia.

Industry in Slovenia has constantly changed through time: from labour-intensive to technology-intensive, from raw material processing to production of exacting high technology products, from less demanding markets to more demanding ones, from large emission-intensive factories to the modern low-carbon smart factories of the future, thereby enabling technological progress, including digitalisation.

This transformation is far from complete. Industry in Europe is experiencing profound changes in the direction of a green and digital transformation and is striving to regain technological sovereignty and autonomy. Slovenia has to provide for a new developmental breakthrough that will enable its industry to preserve its position as the essential part of the economy. This breakthrough will, as shown in the strategy, be based on green, creative and smart development. Trends such as digitalisation and the transfer to a low-carbon circular economy are profoundly changing the environment and the way in which the economy works. They bring many opportunities but also challenges that we need to face. The rhythm of development set by new technologies and social challenges such as globalisation, the fight against climate change, the need for an effective use of raw materials, demographic change and health challenges, is becoming faster and faster.Considering the expected trend in the increase of prices of raw materials and energy sources, there must be a stimulation of those economy sectors that in the long-term will demand fewer raw materials, regardless of whether they originate from renewable or non-renewable sources, i.e. to generate (new) added value. The conditions that will allow the existing economic systems to address the required changes for achieving the green and digital transition must be introduced.

The industry should follow and co-create trends and be constantly updated to remain competitive and boost productivity. This also applies to traditional industries that are being digitalised, becoming “smart” and focussing on lowering the environmental footprint. If we want to achieve climate neutrality by 2050 and transform into a low-carbon circular economy, the habits of consumers must be changed, but this cannot be achieved without the proactive role of industry and the proper state policies. This will consequently contribute to the increase of social responsibility and the international reputation of Slovenian enterprises. The Slovenian Industrial Strategy will contribute to the achievement of the global sustainable development objectives that have been determined in the 2030 Agenda.

The aim is to form a sustainable industrial strategy that is harmonised with the Slovenian Smart Specialisation Strategy (S4), the European Green Deal and other developmental guidelines, to stimulate innovative solutions, the introduction of modern technologies, digital transformation of the economy and the transition to a low-carbon circular economy.It’s time for a new industrial strategy that will consider the comparative advantages of Slovenia and the changed situation in the world, a result of the increasing challenges involved in the management of climate change and the pandemic, including the need to strengthen technological sovereignty and autonomy. The measures should enable the industry to more easily manage and adapt to change as well as to technological progress, which is a key performance factor in the 21st century.

A proactive and harmonised approach of the country and enterprises, public research and education institutions as well as other stakeholders is important. With a diligent design of new products that considers circular and digital aspects, with new sustainable technologies, the usage of domestic renewable raw materials, new jobs and re-qualification, change must be envisaged, adapted to and managed. The challenge is to establish a system that will enable constant learning and adaptation to change. Innovation, investment and strengthening of acquired knowledge and competences as well the development of new ones are of significant importance.

The EU Industrial Strategy, presented by the European Commission in 2020 and updated in 2021, is putting forth the strengthening of the single market, which is the basis for the EU’s competitiveness in the global market. The objective of the updated industrial strategy is to strengthen Europe’s leading role as a global industrial force to ensure competitive advantage in digital and green technologies. The long-term EU strategic guideline is, in accordance with the European Green Deal, to achieve climate neutrality by 2050 by acquiring a reliable supply of raw materials and clean as well as affordable energy. Digital technologies, following the industry’s image and method of operation, have been emphasised and they enable the transition to a low-carbon circular economy. Digitalisation is the driving force of a circular economy. Digital technologies enable new business models and enable industry to become more productive, ensure workers acquire new skills and support the decarbonisation of our economy. The digital sector will also contribute to the realisation of the European Green Deal, i.e. as a source of clean technological solutions and by reducing its carbon footprint. The economy’s digital transformation is horizontal with regard to all other activities and all three developmental areas of this strategy, because it enables the realisation of the commitments regarding a low-carbon circular economy and creative, innovative and development-oriented smart industry.

With the aim to generate and strengthen the EU single market as well as to guarantee the competitiveness of Slovenian enterprises in the European and global arena, Slovenia is creating the national industrial strategy by considering the guidelines of the EU Industrial Strategy and other relevant documents.

# PURPOSE, VISION, INDICATORS AND ACTION FRAMEWORK

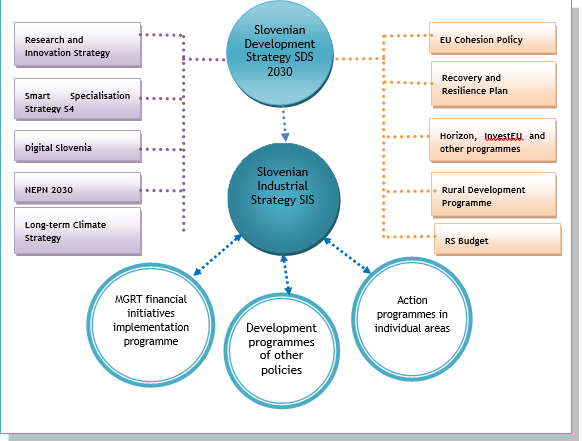
[In 2013, the Government of the Republic of Slovenia adopted the “Slovenian Industrial Policy – SIP” document](https://www.gov.si/assets/ministrstva/MGRT/Dokumenti/DIPT/Industrija-spodbujanje-inovativosti-in-tehnologija/Dokumenti/SIP-vladni-dokument.pdf) that set the priorities of the development of the industry and economy for the 2014–2020 period. It contained guidelines to enhance business environment competitiveness, to strengthen the entrepreneurship and innovation abilities of the economy as an effective response to social challenges and activities for the sustainable development of Slovenian industry. By improving the business environment, supporting entrepreneurship and innovations, developing propulsive technological and industrial sectors able to react to social challenges, SIP’s vision in the past period was to create conditions for the continuous restructuring of existing industry into an energy, resource, environmentally and socially sustainable industry of knowledge and innovations capable of creating new, long-term and quality jobs and being strongly integrated into international business flows.

We estimate that the realisation of the Slovenian Industrial Policy was partially successful because it was greatly connected to the EU 2014-2020 financial perspective funds and conditioned with the good cooperation of all line ministries. We have found that a systematic approach and the coordination of the measures that arise from the provided guidelines was lacking. We have also found that the strategy must be upgraded with new know-how and guidelines and must accelerate its implementation in practice. Special emphasis will be placed on the coordination of the economy, knowledge institutions and all ministries within the scope of innovation activity and in cooperation with the Research and Innovation Strategy. Strong connection to the priority areas of the Slovenian Smart Specialisation Strategy (S4) will also be emphasised. Additional coordination to prepare measures between ministries will be needed as their measures are supplemented and upgraded. Only such coordination along with the implementation of the industrial strategy will successfully identify the opportunities for Slovenia’s inclusion in global value chains as well as strengthen the strategic autonomy of the Slovenian and EU economy. The evaluation of the operation of Strategic Development and Innovation Partnerships (SDIP[[1]](#footnote-2) shows that they should be more intensively included in the formation of industrial and research policy. Further strengthening of the support environment is important from this aspect, which has been emphasised within the “Creative Development” section.

This **Slovenian Industrial Strategy** for the period to 2030 represents an **upgrade** in accordance with the current European and domestic strategic documents and guidelines with the common denominator **“green, creative and smart development”**. The key objective still remains to strengthen the competitiveness, productivity and innovation of the economy, which is reflected in a larger proportion of high technology products and high added value services, greater inclusion in international value chains and better positioning of Slovenian enterprises within these value chains.

By stimulating a green and digital transformation, the Slovenian Industrial Strategy will contribute to the implementation of the European Green Deal and Slovenia’s Recovery and Resilience Plan after the COVID-19 Pandemic in accordance with EU recommendations and measures in this area.[[2]](#footnote-3)

**Figure 1: Inclusion of SIS into development planning documents**



*Source: Ministry of Economic Development and Technology.*

## Purpose

The purpose of the Slovenian Industrial Strategy (hereinafter referred to as the SIS) is to set the guidelines for future development of Slovenian industry in the wider context for the period from 2021 to 2030. In the wider context, industry also includes related services. The borders between industry and services are becoming blurred. The areas that were separated before are now intertwining, and the services in value chains are creating greater added value for production processes. Various knowledge-based services are very important here because they impact the efficiency and competitiveness of the entire economy (e.g. development, design, digital and information services). Services are contributing a large share of added value to exports of industrial products (up to 50%).

Industrial policy has been strengthening in the past few decades in the developed countries. The systemic approach to industrial policy is strengthening, thus emphasising the generation of markets (e.g. for low-carbon technologies and products), following strategic objectives and connecting structures, institutions and policies.

As with the entire European Union, Slovenia faces many challenges: technological change, digitalisation, social and political change, migrations, globalisation, accumulation of (non-processed) waste, aggravated access to strategic raw materials, climate change, loss of biodiversity and health-related challenges. All these challenges are a threat and an opportunity, depending on how successfully we face them. Slovenia needs a strong industrial base capable of facing international competition as well as the above-mentioned challenges.

The European Observatory for Clusters and Industrial Change has determined ten mega trends that are very important for industrial development in Europe[[3]](#footnote-4). We would also like to emphasise the aspect of the uncertainty of predicting future development, which has been revealed by a global crisis, i.e. the current one connected to the COVID-19 pandemic. There is a need for a mechanism to increase the speed and responsiveness to such challenges. The mega trends discussed in the European Observatory for Clusters and Industrial Change study are categorised in three categories that carry special threats and opportunities (Appendix 3):

1. **Technological mega trends** including automation, integration of subjects and objects, quantum technology, cyber security.
2. **Socio-political mega trends** that comprise globalisation, geopolitics and demographic movements.
3. **Mega trends in the environmental and smart economy** that are more specific to the EU context, including green and circular economy, urbanisation and smart cities as well as smart mobility.

In accordance with the trends and challenges, the SIS addresses:

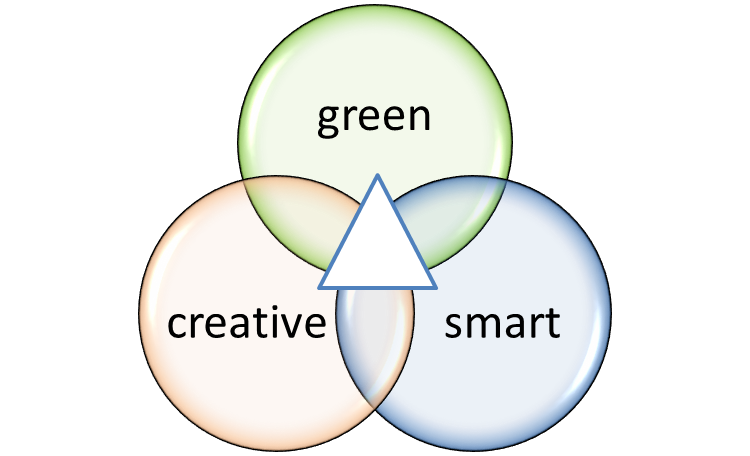
1. The horizontal aspect of industrial policy and the need to improve framework conditions and business environment;
2. A themed approach that is a response to social challenges (managing climate change, pollution, transition to a low-carbon circular economy, digital transformation);
3. The strengthening of strategic value chains, especially in the priority areas of the Slovenian Smart Specialisation Strategy (S4) and
4. The increase of resilience and responsiveness to external factors brought by global mega trends and unexpected disturbances (i.e. black swans).

## Vision and mission

**Vision:**

**Slovenian industry is green, creative and smart.**

Figure 2: The presentation of how these three areas are interconnected



Green, creative and smart development are interconnected and supplemented. We will not achieve the transition to a low-carbon circular economy without understanding the comparable advantages in the area of raw materials, introducing a systemic approach and without a high rate of creativity and smart solution support brought by digitalisation. Therefore, the development guidelines must be considered and also implemented through coordination. Each of the implementing solutions that will be designed on the basis of the proposed strategy will rationally include all three components and aspects thus contributing to the achievement of synergy effects and a more effective spending of public and private sources.

**Mission**:

**With a balanced promotion of all three components of sustainable development (society, environment, economy), the Slovenian Industrial Strategy will ensure the competitiveness of the economy and create the conditions for industrial restructuring by strengthening knowledge, creativity and innovation for new and more quality jobs with greater added value and a transition to a green, creative and smart economy.**

## Objectives and indicators

The indicators below are value objectives that reflect the attainable target values for 2030.

**Umbrella indicator**

Labour productivity, measured with added value per employee as per working hours, is the key umbrella indicator, on the basis of which we will monitor the success of the Slovenian Industrial Strategy. It reflects the financial results of operation and all supporting activities. At the level of processing activities as a whole, after a 3.7-percent growth in labour productivity in the 2009–2018 period, it will stagnate in the 2019–2020 period due to the country’s measures to protect jobs. In the subsequent 10-year period, we expect an above average growth of this indicator caused by the growing automation and digitalisation of operation, which will be the necessary precondition to maintain Slovenian export competitiveness. By 2030, labour productivity, measured by added value per employee, will have achieved EUR 66,000.

In most business sector activities, the growth in productivity in the past year was comparable or higher than the EU average, but there is a delay in construction and ICT services. Considering the fact that digital transformation is one of the key strategy’s elements, productivity is lagging behind in this sector, so we should pay special attention to it (UMAR, PoR 2020).

|  | 2018 | 2020 | 2030 | 2019–2020, average growth evaluation | 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| Labour productivity | 43,679 | 43,711 | 65,832 | 0.0% | 4.2% |

*Sources: Statistical Office of the Republic of Slovenia (Structural Statistics, Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**Other general financial operation indicators**

Key performance indicators are also indicated among other general performance indicators which were determined in the forecast section. Exports will continue driving growth of sales, but its importance in sales (e.g. export orientation) will not increase as in the past period because we expect the demand for industrial products in the domestic market to stabilise.

|  | 2018 | 2030 |
| --- | --- | --- |
| Sales (EUR billion) | 31.2 | 41.8 |
| Export (EUR billion) | 21.8 | 29.8 |
| EBITDA (EUR billion) | 3.4 | 4.7 |
| Investment (EUR billion) | 2.0 | 2.3 |
| Expenditure of processing activities for R&D (EUR billion) | 0.49 | 0.80 |
| Rank on WEF scale | 35th place (2019) among 141 countries | 30th place |

*Sources: Statistical Office of the Republic of Slovenia (Structural Statistics), Analitika GZS, EIS, The Global Competitiveness Report 2019, World Economic Forum. Note: Year 2018 – last known data during the analysis; year 2030 – forecast.*

**Sub-indicators**

1. “Green development” area

In green development, the key indicator is resource productivity, measured by the ratio between GDP and consumed raw materials and other materials. This is also the indicator of success in carrying out Goal 8 of Slovenia’s Development Strategy 2030, transfer to a low-carbon circular economy.

|  | Slovenia, latest known data | EU, latest known data | 2030, objective |
| --- | --- | --- | --- |
| Resource productivity (SKM/kg)[[4]](#footnote-5) (UMAR, PoR 2020) | **1.9 (2018)** | **2.2 (2018)** | **3.50** |
| Circular (secondary) consumption of material\* | 10.4 (2019) | 11.9 (2019) | EU average in 2030 |
| Proportion of employees in the circular economy, considering the total number of employees, in %\* | 2.02% = 2018 | 1.71% = 2018 | 3.5% |
| % of SME offering green products or services\*\* | 23% = 2017 | 24% = 2017 | Above EU average in 2030 |
| % of SME, adopting the measures for efficient use of resources\*\* | 52% (2017) | 57% (2017) | EU average in 2030 |
| % of SME, adopting the measures for efficient use of energy\*\* | 47% = 2017 | 63% = 2017 | EU average in 2030 |
| Total greenhouse gas emissions (NEPN) | No goal in 2020 with regard to 1990 | –20% in 2020 compared to 1990 | –36% compared to 2005 |
| Share of energy from renewable resources (Eurostat) | 22% = 2019 | 19.7% = 2019 | 27% |
| “Eco-innovation” index | 94 (2019) | 100 | 110 |
| Emission productivity, SKM/mio. kg CO2 (UMAR; PoR, 2020) | 3.2 (2018) | 3.4 (2017) | EU average in 2030 |
| Number of environmental certificates ISO 14001 per million people (UMAR, PoR 2020) | 209 (2018) | 172.5 (2018) | 250 in 2030 |
| Quantity of processed round wood in Slovenia for non-energy consumption in m3 | 1.82 million in 2019 | / | 3 million |

*Sources: NEPN, Eurostat, SURS, UMAR, Eco-Innovation Scoreboard.*

* *Indicators marked with \* refer to methodology arising from monitoring the implementation of the EU 2015 Action Plan for Circular Economy[[5]](#footnote-6).*
* *Indicators marked with \*\* refer to Flash Eurobarometer 456: SMEs, resource efficiency and green markets, Fieldwork September 2017, Publication January 2018.*

1. “Creative development” area

In creative development, the key indicator is the selected innovation index that includes different aspects of creativity and innovation.

|  | Latest known data | 2030, objective |
| --- | --- | --- |
| Innovation index (considering EU development) | **84.9% = 2020** | **110.0%** |
| Number of valid national labels | 24,599 (July 2020) | 26,000 |
| Number of researchers in business sector | 8,285 (2018) | 12,000 |
| Share of innovation-active enterprises | 48.6% (2016–2018) | 55.0% |
| Inclusion in entrepreneurship (% of population)\* | 7.8% = 2019 | 10.0% |
| Identifying business opportunities (% of adult population from 18 to 64 years of age)\* | 3.6% = 2019 | 4.0% |
| Identifying business opportunities (% of adult population from 18 to 64 years of age)\* | 47.6% = 2019 | 55.0% |
| Number of emerging companies in the past five years | 5,347 (2014–2018) | 7,000 (2026-2030) |
| Share of employees in creative economy (considering all employees) | 7% = 2017 | 10% |
| Gross added value per employee in CCS (GAV) in % | EUR 45,527 (2017) | 5% above average in RS |

*Sources: GEM (indicators, marked with \*, refer to GEM methodology), European Innovation Scoreboard 2019, Ajpes, Statistical situation analysis of CCS in Slovenia 2008*–*2017, Tm View, forecast: Analitika GZS, URSIL.*

1. “Smart development” area

In smart development that includes the introduction of advanced technologies, we emphasise the DESI index as the key indicator, measuring the level of digitalisation in the economy and society.

|  | Latest known data | 2030, objective |
| --- | --- | --- |
| DESI index | **51.2 points (16th place), 2020** | **9th place** |
| Share of expenditure for RDA in GDP in the business sector | 1.40% = 2018 | 2.00% |
| Number of patent applications by Slovenian applicants at the European Patent Office | 121 (2019) | 150 |
| Number of robots per 10,000 employees in industry | 174 (2018) | 250 |
| Digital index (high and very high in enterprises with more than 10 employees) | 26% = 2018 | 35% |
| DESI – 2 Human capital | 48.3 (15th), 2020 | 8th place |
| DESI – Digital technology integration | 40.9 (15th) 2020 | 8th place |
| Share of high technology products in export | 19.5% = 2018 | 25% |
| Share of processing enterprises which have a digital strategy for reforming enterprise operations | 8% = 2019 | 15% |

*Sources: DG Connect, EPO, ARRS, International Federation of Robotics, 2019, Ajpes, Statistical Office of the Republic of Slovenia, forecasts: Analitika GZS, UMAR (Development Report, 2020).*

The Slovenian Industrial Strategy will contribute to the achievement of the global sustainable development objectives that have been determined in the 2030 Agenda (“Sustainable Development Goals – SDGs”), especially the following goals:

* 8: Decent work and economic growth
* 9: Industry, innovation and infrastructure
* 11: Sustainable cities and communities
* 12: Responsible consumption and production
* 13: Climate action

The monitoring of progress in achieving sustainable development goals through selected indicators that are relevant for Slovenia are recorded by SURS on the website [stat.si](https://www.stat.si/Pages/cilji).

## The scope of measures and institutional framework

The scope of measures that differ by meaning with regard to development area is available for the implementation of SIS. These standard measures are used to promote green, creative and smart development, but these measures must be appropriately designed and guided. Guidelines are reflected in individual chapters of green, creative and smart development, and they are jointly and connectively indicated in the framework of the chapter “Guidelines for a connected green, creative and smart development”, in which the carriers of implementation and the evaluation of necessary funds are stipulated.

Scope of measures/instruments by areas

|  | Measures/instruments |
| --- | --- |
| RDI | 1. Research, development and innovation  2. Demonstration and pilot projects  3. Inclusion in international research and development as well as innovation projects and programmes  4. Networking and cooperation in RDI |
| ENTREPRENEURSHIP | 5. Supporting environment for enterprises  6. Promotion of entrepreneurship and innovation  7. Promotion of startups and enterprises with rapid growth potential  8. Support to SME growth and development  9. Non-technological innovation and business models  10.10. Promotion of investments |
| INTERNATIONALISATION | 11. Support to internationalisation |
| HUMAN RESOURCES | 12. Strengthening competences, training, requalification, adaptation to demographic change |
| BUSINESS ENVIRONMENT | 13. Infrastructure  14. Legislation and business environment |

A systematic approach that connects all three development areas is necessary, but at the same time, an appropriate institutional framework for SIS implementation must be provided. The carriers of SIS implementation must be empowered from the HR and expert aspect.

The institutional framework of SIS implementation is created by all line ministries to which the guidelines of individual areas refer. The following institutions have an important role in individual areas:

* Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology – SPIRIT Slovenia, public agency,
* Slovenian Enterprise Fund – SPS,
* Slovenian Regional Development Fund – SRSS,
* **Slovenska izvozna in razvojna banka d.d.**  – SID,
* Slovenian Research Agency – ARRS,
* Ekosklad etc.

# PROCESSING ACTIVITIES IN SLOVENIA AND EU

## Processing activities in Slovenia in 2008–2018

After the economic crisis in 2008, it was proven that industry is a source of resilience, innovation and even social stability. As already mentioned, Slovenian processing activity in 2019 contributed a total of 23.2% to the added value of the economy, ranking it in third place in the EU-27, behind Ireland and the Czech Republic. The EU-27 average is 16.7%. The current average added value per employee in processing activity is EUR 44,000. The EU is aware of the need for “re-industrialisation”, therefore, in 2012 it planned to achieve a 20-percent share of industry in GDP by 2020. Processing activities make up almost one third of sales revenue (EUR 31.3 billion) and around two thirds of total exports (EUR 21.7 billion of total EUR 30.9 billion in 2018). [According to the data of the Statistical Office of the Republic of Slovenia](https://www.stat.si/StatWeb/News/Index/8156) for 2018, there were 21,158 enterprises active in industry in Slovenia. 93% of industrial enterprises (19,671 enterprises) were registered for processing activities and they employed approximately 201,722 people.

The comparative indicators in the last available year (2018)[[6]](#footnote-7) and a comparison with 2008 are described below. A detailed analysis of Slovenian processing activity in the past decade is presented in **Appendix 1**. Business entities in processing activities in 2018 generated EUR 31.3 billion **sales revenue** on the basis of the sales value of products or merchandise sold and charged to buyers as well as material and implemented services. In 2018, processing activities generated EUR 5.4 billion more revenue than in 2008, or they nominally grew by 21% or by 11.4% in real terms[[7]](#footnote-8).

| Key groups of processing activities | Sales  revenue,  EUR mio | Export,  EUR mio | Added value,  EUR mio | Number of employees | Gross business surplus (EBITDA), EUR mio | Added value per employee |
| --- | --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **31,279** | **21,764** | **8,811** | **201,896** | **3,436** | **43,679** |
| Food | 2,385 | 630 | 593 | 16,247 | 229 | 36,324 |
| Textile | 898 | 661 | 263 | 9,166 | 83 | 28,741 |
| Wood | 1,413 | 777 | 439 | 13,169 | 168 | 34,238 |
| Paper | 1,297 | 743 | 300 | 5,705 | 100 | 36,556 |
| Chemical | 5,991 | 4,762 | 2,051 | 24,712 | 972 | 64,109 |
| Non-metal | 1,014 | 589 | 336 | 6,967 | 150 | 48,051 |
| Metal | 6,433 | 4,293 | 1,748 | 42,712 | 642 | 40,933 |
| Electrical | 4,387 | 3,525 | 1,115 | 28,024 | 375 | 39,804 |
| Machine-building | 6,978 | 5,479 | 1,795 | 41,193 | 642 | 43,593 |
| Other | 484 | 304 | 170 | 4,315 | 71 | 39,440 |

*Source: SURS, structural enterprise statistics, Analitika GZS, data for 2018.*

**Sales revenue in the domestic market** in 2018 amounted to EUR 9.4 billion and was by EUR 682 million lower compared to 2008, which is a 6.8% drop. The drop in sales was characterised mostly by bankruptcies of some major enterprises in the wood, textile and non-metal industries, as well as the restructuring of those industries. In the past 10 years (2018/2008), revenue in the domestic market reduced only in the machine-building industry (EUR 27 million), in other processing activities (EUR 16 million) and metal industry (EUR 44,000).

In 2018, processing activities recorded EUR 21.7 billion **exports** and by 43.8% or EUR 6.6 billion exceeded the exports recorded for 2008. In the past ten years (2018/2008), exports mostly increased under processing activities, i.e. in the machine-building, metal, chemical and electrical industries. In 2018, only the textile industry did not manage to reach the levels of exports of 2008.

In 2018, there were 201,896 people **employed** **[[8]](#footnote-9)** in processing activities, which was 20,000 or 9% fewer than in 2008. **Added value in factor costs[[9]](#footnote-10)** in 2018 in processing activities amounted to EUR 8.8 billion, or EUR 2.1 billion (30.7%) more than in 2008. **Gross margin[[10]](#footnote-11)** in the past eleven years remained at a level between 25.6 and 29%. Compared to 2008, gross margin in 2018 was 2.1 percentage points higher. **Added value per employee** in 2018 in processing activities amounted to EUR 44,000 or EUR 13,200 (43.5%) more than in 2008. For comparison: GDP per person in that period increased by 17.7%:

Business entities earmarked less than EUR 2 billion in 2018 for **investments in tangible fixed assets,[[11]](#footnote-12)** or 14% more than in 2008. The last two years were quite intensive with regard to investments, which is connected to high utilisation of capacities in processing activities, growth of available income and beneficial availability of financial sources.

**Gross domestic expenditure for research and development**[[12]](#footnote-13) amounted to EUR 488.6 million in 2018, or EUR 159.3 million more than in 2008 (48.4%). In the entire business sector, expenditure for research and development amounted to EUR 662.4 million. R&D expenditure in processing activities therefore presented as a 73.8% expenditure of the entire business sector. The state sector in 2018 held a 6.2-percent share among sources of financing in R&D in the business sector. At the state level of Slovenia, the total gross domestic expenditure for R&D in Slovenia in 2018 amounted to EUR 892.7 million or 2.0% GDP. The country’ share of financing was 0.5%. The 2030 goal envisages an increase in investment in R&D by 2020 to at least 3% of GDP.

## Processing activities in Slovenia, EU-27 and CEE-4 in 2008–2017

Processing activities in Slovenia in 2017 recorded significantly lower revenue per employee (EUR 152,000) than in EU-27 (median) (EUR 191,000) and slightly higher than in the group of comparable central European countries (CEE-4[[13]](#footnote-14)) (median) (EUR 151.7 thousand). Processing activity in Slovenia created the highest **added value per employee** (EUR 43.3 thousand) than the median in CEE-4 countries (EUR 32.5 thousand) and slightly lower than the median of EUR-27 (EUR 43.7 thousand).

Processing activities in Slovenia in 2017 recorded a higher **gross margin** than the median in EU-27 countries and the median in CEE-4 (SLO 28.5%, EUR 23.8%, CEE-4 22%). Processing activities in Slovenia in 2017 recorded a higher **EBITDA margin** (business surplus/revenue) than the median in EU-27 countries and the median in CEE-4 (SLO 11.7%, EU-27 10.2%, CEE-4 10.8%). In the 10-year period (2008–2017) the highest EBITDA margin was recorded by the CEE-4 countries (median), which was higher than the recorded margin in Slovenia.

**The share of gross investments in tangible fixed assets compared to revenue** was slightly higher than in CEE-4 countries and higher than in EU-27 countries (SLO 5.6%, EU 4.2%, CEE-4 5.2%). Processing activities in Slovenia in 2017 recorded higher labour costs in added value than the median value in EU-27 countries (60.5%) or the median value in CEE-4 (50.7%).

**Slovenia's deviation[[14]](#footnote-15) by sectors of processing activities compared to indicator median with EU-27, 2017**

| Key groups of processing activities | Gross margin  in p. p.[[15]](#footnote-16) | Investment/revenue  in p. p. | EBITDA margin  in p. p.[[16]](#footnote-17) | Labour  cost in added value  in p. p. | AV/employee | Revenue/employee |
| --- | --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **4.7** | **1.5** | **1.5** | **2.3** | **-379** | **-38,048** |
| Food | 3.0 | 0.0 | 0.4 | 3.8 | 2,714 | -4,797 |
| Textile | -0.1 | 2.0 | 1.8 | -6.9 | 3,316 | -1,271 |
| Wood | 2.8 | 2.4 | 0.8 | 0.0 | 2,096 | 0 |
| Paper | -2.6 | -2.7 | -2.4 | 2.0 | -2,310 | 0 |
| Chemical | 8.8 | 1.6 | 4.0 | 2.6 | -7,668 | -56,751 |
| Non-metal | 2.1 | -0.3 | 1.7 | -4.7 | -1,538 | -23,168 |
| Metal | 0.0 | 1.6 | 0.5 | -0.7 | 0 | -1,113 |
| Electrical | -0.8 | 1.6 | 0.8 | -0.3 | -3,419 | -45,981 |
| Machine-building | 0.2 | 2.1 | 0.6 | -2.1 | 0 | -32,280 |
| Other | 2.5 | 0.3 | 4.7 | -9.3 | 13,999 | 30,145 |

*Source: Eurostat, structural statistics of enterprises, Analitika GZS*

In most indicators, Slovenia exceeded the CEE-4, while compared to EU-27 and despite the higher gross margin, it lags behind in labour productivity. Nevertheless, the EBITDA margin in Slovenian processing activities is mostly due to the importance of pharmaceuticals within chemical industry or processing activities higher than in EU-27.

A detailed comparison is presented in **Appendix 2**.

## European Framework

In 2020, the economy of Slovenia, the EU and the rest of the world faced the COVID-19 pandemic, which had a strong impact on business. It caused disturbances in supply chains, industrial production, foreign trade and capital flow. The shock that the economy is experiencing is much worse than that of the last economic and financial crisis in 2008. Vulnerability arises from the strong integration of Slovenia and the EU in the global value chains. Due to the apparent economic co-dependence of Europe, it is important that recovery will run in the direction of strengthening European industrial and strategic autonomy. From the aspect of updating and restructuring the economy, we should consider diversifying the economy so that it will be better prepared for the risks that are connected to the integration in global value chains. As demonstrated during the COVID-19 pandemic, it makes sense for enterprises to prepare for uninterrupted operations even during times of crises by identifying risks and planning measures to manage them.

Slovenia and the entire EU are preparing and carrying out the measures necessary to mitigate the crisis and enable the recovery of the economy. To make the recovery sustainable, comprehensive, inclusive and just for all member states, the European Commission has prepared the **Recovery and Resilience Facility**[[17]](#footnote-18), within which it has proposed the formation of a new instrument, the so-called “NextGenerationEU” that also brings extensive financial funds to Slovenia. EU member states are preparing their national recovery and resilience plans in which at least 37% of funds are to be dedicated to green measures and 20% of funds are to be dedicated to the digital transformation of the economy. This enables the realisation of the European Green Deal and the acceleration of digital transformation.

**European Green Deal[[18]](#footnote-19)** (hereinafter referred to as the EGD), presented at the end of 2019, is used as a signpost for EU measures, addressing the environmental and climate challenges of modern society through different social sectors with the aim for Europe to become the first climate neutral continent in the world by 2050. This is the EU’s contribution to fulfilling the Paris Agreement on Climate Change, Convention on Biological Diversity and other international commitments. The Paris Agreement commits countries to limiting the rise in average global temperature to well below two degrees Celsius by the end of the century compared to the pre-industrial period and encourages them to take measures to limit it to 1.5 degrees. Achieving a climate neutral and circular economy requires a timely and comprehensive mobilisation of industry and the wider society. Most attention is dedicated to the economy and joint strategies that provide the guidelines for its future development. A part of the EGD is the so-called Just Transition Mechanism that will promote social inclusion in the transition to a climate neutral economy in the most vulnerable coal-mining regions and in regions with a carbon intensive economy. The transformation of the industrial sector and all value chains is long-term and will take 25 years, an entire generation. To achieve the climate neutrality vision by 2050, the necessary decisions and measures must be adopted in the next five years. This is especially important in the context of the strengthening climate ambitions of the EU, as the European Commission proposes at least a 55-percent net reduction of greenhouse gas emissions at the EU level by 2030 as compared to 1990.

In 2020, the National Assembly of the Republic of Slovenia adopted the **National Environment Protection Programme with programmes of measures until 2030** (ReNPVO 2020–2030), which determines the guidelines, goals, tasks and measures of environment protection stakeholders as well as the measures for achieving the goals of Slovenia’s Development Strategy 2030, which also recognised a preserved healthy natural environment among its strategic guidelines for achieving quality of life. ReNPVO 2020–2030 also provides the guidelines for planning and carrying out the policies of other sectors that impact the environment.

The priorities of the industrial strategy shall be planned by considering the funds that are available within the scope of the **Multiannual Financial Framework for 2021–2027** and the **EU Recovery and Resilience Facility.** EUR 10.5 billion have been earmarked for Slovenia. EUR 4.5 billion have been earmarked within the Multiannual Financial Framework for 2021–2027 – EUR 2.9 billion under the European Cohesion Policy and EUR 1.6 billion under the Common Agricultural Policy. Within the scope of the EU Recovery and Resilience Facility, EU 2.1 billion subsidies and EUR 3.6 billion repayable funds are planned for Slovenia.

**Just Transition Fund**[[19]](#footnote-20), which is part of the Just Transition Mechanism, will support economic diversification in the most vulnerable coal mining regions. This means support to productive investments in small and medium-sized enterprises, new enterprises, research and innovation, environment rehabilitation, clean energy, training and re-qualification of workers, support in job seeking and active inclusion in programmes for job seekers, and the transformation of existing carbon intensive plants, if investment is to achieve a substantial reduction of emissions and protect jobs. Planning the Just Transition Fund programmes for the 2021–2027 period will help Slovenia to address some challenges brought by the transition to a climate neutral economy. The beneficiaries in Slovenia are the Savinjsko-Šaleška region and Zasavje.

Investments in green transition, as are determined in the **National Energy and Climate Plan of the Republic of Slovenia 2030 (**with prospects by 2040) will increase the current low proportion of renewable sources of energy, strengthen the energy infrastructure, and the measures for reducing air pollution, which is above the EU average in Slovenian towns and cities, will be implemented, the transition to a circular economy will be strengthened, and support will be given to strengthening social entrepreneurship and promoting efforts to limit the potential effects on the regions and sectors most impacted by the transition.

The following documents were presented in 2020: **New Industrial Strategy for Europe[[20]](#footnote-21)**, **Strategy for SME for a Sustainable and Digital Europe[[21]](#footnote-22)** and **the new Circular Economy Action Plan [[22]](#footnote-23)**. The strategy for sustainable and smart mobility was presented at the end of 2020. Common agricultural policy will also become green. Considerable attention will be given to replacing hazardous substances with less or non-hazardous chemicals or other alternatives in accordance with the Sustainable Strategy for Chemicals. The measures to reduce pollution from major industrial devices will follow.

The **New Industrial Strategy for Europe** follows three key priorities for Europe to hold its leading position in industry, i.e.:

1) to maintain the global competitiveness of European industry and the same competitive conditions in the domestic and global market,

2) to ensure the climate neutrality of Europe by 2050, and

3) to form the digital future of Europe.

In 2021, the European Commission updated the industrial strategy[[23]](#footnote-24) due to the need to adapt the planned measures to new circumstances connected to the Covid-19 pandemic. The updated strategy confirms the current priority tasks and is focused on strengthening the competitiveness of EU industry and helping as well as encouraging SME in facing the key challenges of climate neutrality and digitalisation. It focuses on strengthening the resilience of the single market, considering strategic dependencies of the EU and accelerating dual transition. The Industrial Strategy of the EU emphasises the need for comprehensive measures to update and de-carbon energy intensive industries, to support sustainable and smart mobility industries, to promote energy efficiency and ensure a sufficient and permanent supply of low-carbon energy at competitive prices. Initiatives known as industrial alliances have brought good results in the area of batteries, plastics and microelectronics. Clean hydrogen and low-carbon alliances are followed by alliances for industrial clouds and platforms and the raw material alliance.

The **New Strategy for SME for Sustainable and Digital Europe** emphasises that SMEs are key for Europe’s competitiveness and welfare. On the basis of the new strategy for SMEs, the EU will support those enterprises by:

1. Promoting innovation with new funds and hubs for digital innovation within sustainable and digital transition;
2. Reducing bureaucracy by eliminating obstacles in the single market and opening access to financing;
3. Simplify access to financing by establishing the fund for initial public offerings of SME (whereby investment will be implemented via the new public private fund) and the ESCALAR initiative (mechanism for increasing venture capital funds and attracting more private investment).

The new **Circular Economy Action Plan** as part of the New Industrial Strategy for Europe and the European Green Deal envisages measures through which sustainable products will become the rule and will be more easily re-used, repaired and recycled, with a greater inclusion of recycled materials instead of primary materials, with the exception of wood. Industrial symbiosis is an important element that is deserving of more attention in Slovenia, as a by-product or waste of one product becomes a raw material for another producer. Measures will focus on sectors that use the most resources and where the possibilities for their circularity are great, especially in electronics and ICT, batteries and vehicles, packaging by reducing its overuse; plastics with new requirements for the content of recycled materials and measures to reduce micro plastics in the environment, and promoting the use of biodegradable plastics (European Strategy for Plastics in a Circular Economy). A new strategy for strengthening competitiveness and innovation in the reuse of textiles is envisaged in the area of textile products. A comprehensive strategy for a sustainably built environment that promotes the principles of circulation for buildings will also be prepared. The conditions for a well-functioning European market of secondary materials within the “Recycled in the EU” brand, planned by the EU, must be created. A circular economy will have net positive effects on GDP growth and the creation of jobs because GDP in the EU can be increased by implementing ambitious circular economy measures in Europe by 0.5% by 2030 and approximately 700,000 new jobs can be created.

The **aspect of raw material use** must also be emphasised. European industry faces a high import dependence on raw materials, instability of their prices and difficult access to raw materials because they are limited, especially the so-called critical raw materials. From 1970 to 2017, the global scope of acquiring raw materials tripled and is still increasing, which has led to the lack of some critical raw materials. Approximately one half of all greenhouse gas emissions and more than 90% of the loss in biodiversity as well as pressure on water sources arise from acquiring natural resources and processing materials, fuels and food. EU industry started the transition to a low-carbon circular economy but still generates 20% of the greenhouse gas emissions in the EU. It is still too “linear” and depends on the flow of newly acquired raw materials, their trading, processing and finally, their deposit in the form of waste or emissions. Just 12% of the material it uses originates from recycled materials. A green and circular transition is an opportunity to expand sustainable economic activities, oriented in creating jobs. But the transformation is too slow. The European Green Deal will support and accelerate the EU’s transition of industry to the sustainable model of inclusive growth.

In September 2020, the European Commission presented the new **EU Action Plan on Critical Raw Material**[[24]](#footnote-25) in which it proposes measures to reduce the dependence of the EU on third countries by diversifying supply and improving the efficiency of resources and the principles of a circular economy. It has updated the list of critical raw materials. The list contains 30 raw materials critical to the EU. For the first time, lithium (Li) has been added to the list. This material is essential in the transition to e-mobility. The European Commission has found that, just for e-vehicle batteries and energy storage, the EU will need up to 18 times more lithium by 2030 and 60 times more by 2050. The action plan will contribute to a sustainable strengthening of key markets for e-mobility, batteries, renewable energy, defence and digital applications.

**Investment in research and innovation** is the key instrument for productivity and added value growth, as well as being an important part of the strategy for recovery and resilience after the COVID-19 pandemic. Before the crisis, Slovenia was evaluated as a moderate innovator, meaning that it will be important to promote its efforts to equal the most successful countries. The business sector accounts for 75% of R&D expenditure. The decline in economic growth now endangers R&D as well as business innovation. A relatively low level of innovation[[25]](#footnote-26), especially at SMEs, is slowing down the development and the expansion of the innovative business processes and solutions that are necessary conditions for overcoming the crisis arising from the epidemic. Investments in innovative SMEs are important, including start-ups, whose activities include emerging technologies and breakthrough innovation, and new models to support their growth and development will have to be developed to strengthen production. Cooperation between the academic sphere and enterprises is too often limited to medium and high technology sectors. The efficiency of the environment to transfer knowledge within research organisations and higher education institutions is quite unequal and insufficient. The situation in this area will have to be improved by collaboration between universities and public research organisations as well as enterprises, which will be of key importance for a successful transfer of knowledge into innovation, improving the success of research and innovation and for promoting economic growth. To achieve the goals in research, innovation and competitiveness, investment in research and development will have to be increased by 2030. Enterprises will be guided towards financing and inclusion in research and development programmes as well as demonstration projects, including through an active tax policy (tax relief for research and development).

**Digital transformation** will also be one of the key elements for economic recovery after the crisis. On 9 March 2021, the European Commission in its document “**The EU digital decade: A new set of digital targets for 2030[[26]](#footnote-27)**” presented the vision, goals and possibilities for a successful digital transformation of Europe by 2030, which is of key importance for the transition to a climate neutral, circular and resilient economy. The aim is to achieve digital sovereignty in an open and connected world, and to form digital policy that enables people and companies to take advantage of a digital future that is oriented in people, sustainability and success. With this purpose, the European Commission proposed the foundation of a **digital compass** to specify the digital ambitions of the EU by 2030. It is comprised of four main points referring to knowledge and skills, digital transformation of enterprises, digitalisation of public services and ensuring a safe and sustainable digital infrastructure.

Slovenia’s potential in digital transformation has been shown with the fast introduction of remote work and schooling systems and the solution of sales via online shops which were introduced by some Slovenian enterprises at the beginning of the crisis. Greater digitalisation of business models and production processes will expand those changes to a larger part of the economy. Slovenia can build on the current knowledge and excellent capacities in robotics, artificial intelligence and blockchain technology to support the expansion of digitalisation to less advanced and traditional sectors. The reuse of a wide range of public sector and economy data will, in accordance with the EU Joint Data Strategy, support the development of innovation and economy on the basis of the use of mega data. Data is key for enterprises. The data economy in Slovenia presents a completely unexploited potential. The strategy must encourage and enable the development of solutions in all dimensions (horizontally, vertically and chronologically), i.e. The connectivity of systems on the basis of structured data in current ICT systems (Analytics and optimisation of processes, cybersecurity, ioT, connectivity of installed industrial and business systems, platforms, digital twins, etc.), which will also be safe for individuals and enterprises.

The economy’s recovery after the crisis is not the only reason for digital transformation, but it also increases productivity, competitiveness and strengthens the resilience of the economy and society. It also contributes to process safety – preventing accidents and major industrial accidents (sophisticated systems for detecting and eliminating process errors, alarming, acting, etc.). Digital transformation has for a long time not been only an option, but a necessity that Slovenia has to adopt at all levels – not only in industrial policy, but also at all other levels of life. A great delay due to inappropriate consideration and consequently due to a slow digital transformation would present a delay at all levels of the industry, especially in the area of positioning Slovenia in the international environment. The inclusion of digital technologies in enterprises has been carried out in a way similar to that of the EU. Further efforts are needed to effectively follow the rapid progress in the introduction of advanced ICT technologies to break through among the more successful EU countries, in particular to meet the increased need for staff with relevant digital skills. The educational system and lifelong education policies must be adapted. To fully exploit the potential of digital technologies, legislation must also be adapted. The introduction of a digital test that will verify the suitability of legislation from the digital aspect is also important.

## Forecast 2021–2030

**Methodology**

The forecasts for processing activity were made according to the **bottom-up approach** that envisages the forecasts for sales, export, added value, EBITDA, employees and investments. Forecasts are based on trends in the last decade, the deviations of margins of Slovenian sectors with regard to the EU-27 and evaluations of the competitive advantages of some sectors in Slovenia. Forecasts were made for two periods, i.e. for a two-year period (2019–2020)[[27]](#footnote-28) and ten-year period (2021–2030). These periods were divided because we estimate that the COVID-19 epidemic will have a negative impact on all key economic aggregates of enterprises. In the basic scenario of the Slovenian Chamber of Commerce Analysis, the COVID-19 epidemic will not have a major negative impact on the operations of the processing activities. With regard to the potential of growth of certain activities that mostly enable the consideration of circular economy goals, greater positive movements from the below indicated projections can be expected if appropriate measures are taken.

**Sales**

| Key groups of processing activities | Sales, 2018  (EUR 000) | Sales, 2020  (EUR 000) | Sales, 2030  (EUR 000) | Annual change in sales in % 2019–2020 | Annual change in sales in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **31,279,103** | **29,905,518** | 41,806,234 | **-2.2%** | **3.4%** |
| Food | 2,384,590 | 2,505,310 | 3,175,858 | 2.5% | 2.4% |
| Textile | 898,293 | 827,867 | 1,009,165 | -4.0% | 2.0% |
| Wood | 1,413,409 | 1,302,598 | 1,587,859 | -4.0% | 2.0% |
| Paper | 1,296,843 | 1,245,488 | 1,518,243 | -2.0% | 2.0% |
| Chemical | 5,990,623 | 6,232,644 | 8,791,760 | 2.0 % | 3.5 % |
| Non-metal | 1,014,271 | 954,328 | 1,186,333 | -3.0% | 2.2% |
| Metal | 6,432,627 | 5,928,309 | 7,813,794 | -4.0% | 2.8% |
| Electrical | 4,387,114 | 4,085,390 | 6,654,670 | -3.5% | 5.0% |
| Machine-building | 6,977,697 | 6,363,834 | 9,420,029 | -4.5% | 4.0% |
| Other | 483,629 | 459,750 | 648,523 | -2.5% | 3.5% |

**Sales** of processing activity will drop to around EUR 30 billion in 2020, or EUR 1.3 billion less than in 2018. The food and chemical industries are among the activities in which growth is expected. Growth in the food industry will originate from beneficial trends resulting from COVID-19 (increase in food prices, increase in national stock and stock of households), while the chemical industry will mostly prosper due to generic drugs. Cyclic activities such as textile, wood, metal, machine-building and the electrical industry will be more strongly affected.

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

In the second 10-year period we estimate that the average growth in sales will be at 3.4% annually, while it will be above average in the electrical, machine-building and chemical industries. In activities subject to global competition and in which Slovenia has weaker competitive advantages (textile, paper industry), growth in sales will be below average. In sectors that are based on natural resources (wood), the measures for establishing the conditions for development will reach a higher growth than envisaged, which will be determined in chapter “3.4 – Industry, based on wood and other natural renewable materials”. Total sales in 2030 will be EUR 12 billion higher than in 2020 and will rise to EUR 41.8 billion.

**Example of structural changes within an activity: paper and paper products production**

Paper and paper products production is separated into production of fibres, paper and cardboard (including all major paper companies) and the production of products made from all the above materials. The second group includes enterprises that mostly deal with printing, which is an area in which business restructuring will be present to increase productivity and reduce the number of employees. These enterprises are also subject to greater international competition, including from the Asian countries. According to Ajpes data, labour productivity in the first activity in enterprises amounts to over EUR 70,000 (2019), in the second activity to EUR 38,000. Sales in the first activity presented 60% of the sector in 2019, while added value amounted to 50%. Therefore, in the forecast period we can estimate that the segment of paper enterprises within the paper industry will strengthen by importance, while the printing segment will record a lower growth in business categories, even a negative one in some categories (employment).

**Export**

The COVID-19 epidemic will have a greater impact on the decline in exports value in 2019–2020 than on a decline in domestic sales. Consequently, processing activities exports in 2020 will drop by EUR 1.1 billion compared to 2018. Subsequent growth in the next 10-year period (3.7%) will contribute to exports strengthening to around EUR 30 billion by 2030. The share of exports in total sales will increase to 71% (70% in 2018). Exports will most rapidly (from a nominal aspect) increase in the machine-building, electrical and chemical industries, which will together contribute to a 75% total increase in exports in the 2021–2030 period (+EUR 4.8 billion). The exports orientation in the wood (from 55 to 58%) and chemical industries (from 79 to 81%) will strengthen the most.

| Key groups of processing activities | Export, 2018 (EUR 000) | Export, 2020 (EUR 000) | Export, 2030 (EUR 000) | Annual change in export in % 2019–2020 | Annual change in export in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **21,764,371** | **20,666,631** | **29,804,170** | **-2.6%** | **3.7%** |
| Food | 630,020 | 642,683 | 830,751 | 1.0% | 2.6% |
| Textile | 661,489 | 603,294 | 749,960 | -4.5% | 2.2% |
| Wood | 777,082 | 708,718 | 916,109 | -4.5% | 2.6% |
| Paper | 743,025 | 706,338 | 878,055 | -2.5% | 2.2% |
| Chemical | 4,762,391 | 4,974,242 | 7,084,749 | 2.2% | 3.6% |
| Non-metal | 588,995 | 548,486 | 688,529 | -3.5% | 2.3% |
| Metal | 4,293,021 | 3,939,981 | 5,295,004 | -4.2% | 3.0% |
| Electrical | 3,525,488 | 3,269,429 | 5,427,868 | -3.7% | 5.2% |
| Machine-building | 5,479,127 | 4,986,641 | 7,524,632 | -4.6% | 4.2% |
| Other | 303,581 | 286,819 | 408,512 | -2.8% | 3.6% |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**Added value and gross margin**

Added value will change similarly to sales or will slightly lag behind it, which is the result of our estimate that the starting gross margin in the Slovenian economy in 2018 was above average both in terms of the EU-27 median and the historical average. Therefore, we estimate that an ambitious goal is, with the predicted growth in sales and export, that the gross margin remains at the level from 2018 (28.2%). In activities in which added value will increase more quickly than sales, the gross margin will also strengthen. Relative to the year 2018, it will be higher by 2030 in the paper (+1.6%), textile (+1.9%), wood and metal industries (+0.6%), and it will be lower in the chemical industry (-0.7%) due to the pressure on the prices of generic drugs, and in the electrical industry[[28]](#footnote-29) (-0.4%).

| Key groups of processing activities | Added value, 2018  (EUR 000) | Added value, 2020  (EUR 000) | Added value, 2030  (EUR 000) | Annual change in added value in % 2019–2020 | Annual change in added value in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **8,811,030** | **8,477,406** | **11,798,624** | **-1.9%** | **3.4%** |
| Food | 593,469 | 617,445 | 790,382 | 2.0% | 2.5% |
| Textile | 263,356 | 245,244 | 304,864 | -3.5% | 2.2% |
| Wood | 438,515 | 404,135 | 502,384 | -4.0% | 2.2% |
| Paper | 300,052 | 291,118 | 376,307 | -1.5% | 2.6% |
| Chemical | 2,050,654 | 2,133,500 | 2,951,861 | 2.0% | 3.3% |
| Non-metal | 336,260 | 317,693 | 394,927 | -2.8% | 2.2% |
| Metal | 1,747,775 | 1,614,107 | 2,169,225 | -3.9% | 3.0% |
| Electrical | 1,115,439 | 1,043,035 | 1,666,908 | -3.3% | 4.8% |
| Machine-building | 1,795,365 | 1,647,721 | 2,415,679 | -4.2% | 3.9% |
| Other | 170,145 | 163,407 | 226,086 | -2.0% | 3.3% |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**Employment**

The increase in automation and drop in exports in 2020 due to the COVID-19 epidemic will contribute to the reduction of employment in the 2019–2020 period. The situation will be similar later, when the pressure to increase competitiveness will require greater investment and lean, innovative business models. Bright exceptions will be the machine-building and electrical industries, in which a high growth in added value will prevent a drop in employment. By 2020, the number of employees will have dropped by 7,000 people in comparison to 2018, and by 2030, the number will drop by another 15,000. The nominal growth in added value (which best reflects the organic growth of operations), will prevent a quicker reduction in the number of employees that will primarily be the result of increasing the level of production automation as well as more intensive collaboration of the industry with other parts of the economy[[29]](#footnote-30).

| Key groups of processing activities | Employees, 2018 | Employees, 2020 | Employees, 2030 | Annual change in employees in % 2019–2020 | Annual change in employees in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **201,722** | **193,943** | **179,222** | **-1.9%** | **-0.8%** |
| Food | 16,338 | 16,338 | 14,046 | 0.0% | -1.5% |
| Textile | 9,163 | 8,800 | 6,624 | -2.0% | -2.8% |
| Wood | 12,808 | 12,051 | 9,847 | -3.0% | -2.0% |
| Paper | 8,208 | 7,883 | 6,441 | -2.0% | -2.0% |
| Chemical | 31,987 | 31,668 | 27,226 | -0.5% | -1.5% |
| Non-metal | 6,998 | 6,721 | 5,778 | -2.0% | -1.5% |
| Metal | 42,698 | 40,590 | 34,896 | -2.5% | -1.5% |
| Electrical | 28,023 | 26,913 | 29,729 | -2.0% | 1.0% |
| Machine-building | 41,185 | 38,751 | 40,733 | -3.0% | 0.5% |
| Other | 4,314 | 4,228 | 3,902 | -1.0% | -0.8% |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**Changed structure of the modern economy**

The dynamic of decreasing the number of employees in most processing activities will be followed by a parallel growth of employment in service sectors that are connected to processing activity, especially in employing a referred labour force, installation, creative industries, legal, tax, business consulting, cleaning and other types of support functions. The trends of excluding support functions from parent companies will be the result of optimising business models in accordance with the role models of the most successful enterprises abroad. In other words, this means that the processing activities employment multiplicator will increase by 2030 (every job in processing activities will greatly contribute to a new job in the service sector).

**Investments**

According to our estimates, investment will drop by one fifth in the first period, then gradually increase at an average annual rate of 3.7%. In the first period, investment will mostly decrease in the machine-building, metal, textile, wood and paper industries. In the 2019–2020 period, investment will amount to 5.4% of annual sales, which is slightly less than in the 2008–2018 period (5.5% of annual sales). In the second period, an average of 5.6% of annual sales will be earmarked for investment in processing activities by 2030. Initially, investment will mostly increase in the chemical and metal industries, in which half of the total investments will be realised. Relatively, they will increase the most in the textile industries because they will be needed to achieve a proper increase in labour productivity.

| Key groups of processing activities | Investments, 2018, in EUR 000 | Investments, 2020, in EUR 000 | Investments, 2030, in EUR 000 | Annual change in inv. in % 2019–2020 | Annual change in inv. in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **1,975,153** | **1,612,974** | **2,348,692** | **-9.6%** | **3.8%** |
| Food | 117,578 | 103,892 | 149,406 | -6.0% | 3.7% |
| Textile | 38,245 | 30,978 | 49,037 | -10.0% | 4.7% |
| Wood | 133,871 | 108,436 | 152,959 | -10.0% | 3.5% |
| Paper | 60,432 | 48,950 | 69,718 | -10.0% | 3.6% |
| Chemical | 437,150 | 386,266 | 588,477 | -6.0% | 4.3% |
| Non-metal | 67,746 | 59,860 | 82,821 | -6.0% | 3.3% |
| Metal | 423,567 | 343,089 | 512,760 | -10.0% | 4.1% |
| Electrical | 203,590 | 172,319 | 245,431 | -8.0% | 3.6% |
| Machine-building | 468,673 | 338,616 | 468,502 | -15.0% | 3.3% |
| Other | 24,301 | 20,568 | 29,579 | -8.0% | 3.7% |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**EBITDA and EBITDA margins**

In 2020, EBITDA will be 6% lower than in 2018, by 2030 it will increase with a 3.7-percent growth to EUR 4.7 billion. In the first period (2019–2020), the nominal drop will be largest in the machine-building (40% drop) and metal industries (31% of total drop), while in the chemical industry it will increase by EUR 40 million due to a greater demand for generic drugs. In the second period (2021–2030), the chemical industry will contribute 27% to EBITDA growth, the machine-industry 23% and the electrical industry 18%. By 2030, the EBITDA margin in processing activity will increase from the 11.0% recorded in 2020 to 11.3%.

| Key groups of processing activities | EBITDA, 2018, in EUR 000 | EBITDA, 2020, in EUR 000 | EBITDA, 2030, in EUR 000 | Annual change in EBITDA in % 2019–2020 | Annual change in EBITDA in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **3,435,310** | **3,282,032** | **4,721,170** | **-2.7%** | **3.7%** |
| Food | 228,978 | 231,274 | 304,830 | 0.5% | 2.8% |
| Textile | 83,271 | 78,350 | 105,295 | -3.0% | 3.0% |
| Wood | 167,568 | 141,830 | 181,554 | -8.0% | 2.5% |
| Paper | 100,046 | 95,106 | 134,157 | -2.5% | 3.5% |
| Chemical | 971,961 | 1,011,228 | 1,399,112 | 2.0% | 3.3% |
| Non-metal | 150,270 | 137,050 | 170,368 | -4.5% | 2.2% |
| Metal | 642,121 | 594,247 | 814,262 | -3.8% | 3.2% |
| Electrical | 374,832 | 345,445 | 607,066 | -4.0% | 5.8% |
| Machine-building | 642,159 | 579,548 | 908,671 | -5.0 % | 4.6 % |
| Other | 70,756 | 67,954 | 95,856 | -2.0 % | 3.5 % |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

**Expenditure for research and development**

In accordance with the expenditure forecast for R&D, we have followed the target guideline that R&D expenditure in the private sector will reach 1.8% GDP in 2030. Despite the below average growth in expenditure for R&D (5.4%), the chemical industry will in the 2021–2030 period contribute to a 43 percent increase in total expenditure for this purpose in processing activity. The electrical industry will follow with 26 percent and the machine-building industry with an 18 percent share. At the national level, the goal of increasing investment in R&D by 2030 is to at least 3% of GPD, of which at least 1% of GDP will come from public funds.

| Key groups of processing activities | Expenditure for R&D, 2018, in EUR 000 | Expenditure for R&D, 2020, in EUR 000 | Expenditure for R&D, 2030, in EUR 000 | Annual change in expenditure in R&D in % 2019–2020 | Annual change in expenditure in R&D in % 2021–2030 |
| --- | --- | --- | --- | --- | --- |
| PROC. ACT. TOTAL | **488,636** | **446,144** | **800,364** | **-4.4%** | **6.0%** |
| Food | 7,616 | 6,169 | 11,580 | -10.0% | 6.5% |
| Textile | 7,026 | 5,076 | 9,091 | -15.0% | 6.0% |
| Wood | 4,215 | 4,215 | 8,292 | 0.0% | 7.0% |
| Paper | 4,642 | 3,760 | 6,734 | -10.0% | 6.0% |
| Chemical | 212,255 | 220,830 | 373,649 | 2.0% | 5.4% |
| Non-metal | 4,090 | 4,090 | 8,046 | 0.0% | 7.0% |
| Metal | 21,073 | 17,069 | 40,409 | -10.0% | 9.0% |
| Electrical | 128,820 | 116,260 | 208,204 | -5.0% | 6.0% |
| Machine-building | 79,647 | 64,514 | 126,909 | -10.0% | 7.0% |
| Other | 4,610 | 4,161 | 7,451 | -5.0% | 6.0% |

*Source: Statistical Office of the Republic of Slovenia, forecast by Analitika GZS. Note: Year 2018 – last known data during the analysis; year 2020 – estimation, year 2030 – forecast.*

# GREEN DEVELOPMENT

A green, sustainable and circular development of the economy is becoming a trend and a necessity for preserving long-term international competitiveness. The transition to a low-carbon circular economy was integrated among the strategic developmental priorities in Slovenia. At the end of 2017, the Government of the Republic of Slovenia adopted **Slovenia’s Development Strategy 2030** (hereinafter SDS 2030), which determines 12 key goals, including a low-carbon circular economy. This goal will be achieved by promoting innovation, new business models, digital transformation, efficient use of raw materials by closing material flows and energy as well as by adapting to climate change. All policies, from research and innovation to education and employment policy will have to be adapted accordingly. Adaptation and formation of new skills at all levels of education and training as well as ensuring the appropriate number of qualified staff is of key importance.

The implementation of measures from the **National Energy and Climate Plan 2030** (hereinafter referred to as the NECP 2030) is also important in this context. The key goals of NECP 2030 are:

* **reducing total greenhouse gas emissions by 36%**, of which 20 % will be in the non-ETS sector (which is 5 percentage points above Slovenia’s adopted commitment);
* **min. 35-percent improvement of energy efficiency**, which is higher than the goal, adopted at the EU level (32.5%),
* **min. 27-precent renewable energy resources**, where Slovenia had – due to relevant national circumstances, especially environmental restrictions – to agree with a lower goal than the goal at the EU level (32%) with the aim to increase the ambition at the next update of NECP (2023/24),
* **3-percent investment in research and development**, 1% of which is from public funds.

The improvement of energy and material efficiency in all sectors and the consequent reduction in the use of energy and other natural resources is the first and key measure on the way to a climate neutral society. The fulfilment of NEPC leads to reducing the dependence on fossil fuels, with NEPC we are also supporting sustainable solutions in transport (public sustainable transport), in buildings (heating and cooling, comprehensive renovation) and in industry (due to ensuring competitiveness). NEPC also determines the goals to reduce and abandon the use of coal by 30% by 2030. By 2021, the strategy for abandoning the use of coal and restructuring coal mining regions in accordance with the just transition principle will be adopted and will determine a more specific time plan for abandoning the use of coal in Slovenia. NEPC determines the study of the use of new nuclear energy, and it also determines that the decision on the second block of the Krško Nuclear Power Plant (NEK) will have to be made by 2027 at the latest. NEPC also determines a gradual reduction of subsidies for fossil resources of energy and their termination. NEPC also determines the strengthening of investment in R&D and more investment in staff that will be important in the transition to a climate neutral society. One of the key areas highlighted by the NEPC is also the transition to a circular economy.

## Transition to a low-carbon circular economy

The new investment cycle must be based on green principles of a more resilient and inclusive climate neutral model for preserving and improving biodiversity and quality of living for all, which is the umbrella goal of the SDS 2030. This involves a change of the linear economic model that operates according to the “take-make-consume-throw away” principle into a **circular economic model** that is based on extended preservation of the value of materials and products, replacing products with services, transition from ownership to co-use and digitalisation usage.New technologies that are based on digitalisation, renewable energy sources and developing hybrid technologies such as applied technologies (3D printing) with new and alternative materials are the supporting technologies for a transition to a circular economy. The circular concept (also called the “3R – reduce, reuse, recycle) focuses on closing material flows by minimising the quantity of waste or using it as a source. The products are designed to be repaired, upgraded, restored and reused and recycled in the last phase. Therefore, the integration of eco-design into the search for solutions in products, services or business models is an essential building block of the transition to a low-carbon economy. Nature itself is a circular system in which everything circles and there are no losses or waste. Positive impacts of CO2 sinking in the material emergence phase must be considered in the introduction of a circular economy. The cascade use of wood is especially efficient, because we can even achieve a negative carbon footprint.

The transition to a low-carbon circular economy presents an opportunity for the development of the economy because it brings concrete financial benefits to companies and the economy, promotes innovation and reduces negative environmental impacts in the supply chain. The elimination of waste from industrial chains via reuse of materials creates savings in production and lower dependence on primary, especially critical, materials. Special attention should be dedicated to municipal waste, the support environment should be improved with infrastructure, and the country’s self-sufficiency for proper waste management must be increased in accordance with the waste management hierarchy.

Figure 3: Schematic presentation of a circular economy

Picutre KG5

The transition to a low-carbon circular economy demands better resource management and should focus on preventing the occurrence of waste from the product design (circular and digital by design) as well as improved collection for enhancing/preserving the purity of flows for their improved processing or recycling. The entire product life cycle through the entire value chain must be considered.

By introducing low-carbon circular economy principles, we will improve energy and material self-sufficiency and reduce dependence on foreign markets. The infrastructure for energy supply, especially electricity for waste processing and better supply of raw materials and energy sources from waste flows, will also be important. Optimisation with digitalisation and artificial intelligence, gradual electrification of various procedures, from heat electrification and technological procedure electrification to hydrogen production as well as carbon collection and storage is of key importance for a transition to a circular economy, whereas the legislative framework must also be adapted to the technological development. All the technologies of the future are based on low-carbon and renewable sources of energy.

A bio-economy that also strengthens the world is also an important part of a circular economy. According to the definition of the European Commission, the bio-economy comprises all sectors and systems that are based on acquiring and processing biological resources (genetic resources, animals, plants, microorganisms and acquired biomass, including organic waste), their functions and principles. Besides primary production, the bio-economy also includes other industries in which the sources and procedures of producing food, feedstuffs, medicines and other products, energy and services are based on natural resources of biological origin. Therefore, improving the accessibility and the sustainable use of biomass as a primary, natural, renewable raw material resource, which increasingly conditions the international competitiveness of a large part of manufacturing, is crucial. The future trend in the plastics processing industry is bio-based plastics acquired from bio-polymers. These components are the product of biorefineries. The importance of the bio-based chemical and pharmaceutical industry must also be mentioned within this scope.

Slovenia is preparing a plan for the transition to a circular economy in accordance with the initiatives at the European level. This involves a **comprehensive strategic decarbonisation project via the transition to a circular economy** which is one of the key national projects that will bring positive effects to the economy's competitiveness, the environment, employment and other social aspects as well as a higher quality of life. The project is systemic and focuses in all areas that are key for the transition to a low-carbon circular economy. The project is being prepared in partnership with the leading European institutions in this area[[30]](#footnote-31). European know-how in the area of transitioning to a low-carbon circular economy will be transferred to Slovenia and connected with domestic knowledge as well as upgraded.

The project also includes support for establishing start-up companies that will work in low-carbon circular solutions and support innovation and the transition of SME to low-carbon circular business models. Systemic conditions for increasing the qualifications of various groups of stakeholders (primary and high schools, higher education institutions, companies, public administration) will be introduced at the same time to design and carry out the appropriate solutions necessary for a transition to a low-carbon circular economy. In this context, enhancing competences and the need for requalification and exploiting opportunities to create new green jobs is of key importance. Supporting decarbonisation in key value chains is also envisaged within the project: **in processing industry, forest-wood chain, food chain, built environment and mobility.**

The transition to a low-carbon economy and the European Green Deal will demand certain adjustments in various industries. Chemicals have a fundamental role in most industrial sectors and will become the builders of low-carbon and efficient technologies, materials and products. The new European strategy in chemicals for sustainability will promote the innovation and adaptations of the chemical industry (including the rubber, plastics and pharmaceutical industries) as well as all its consumers along the distribution chain. Increasing the investment and innovative capacity of the chemical industry in providing safe and sustainable chemicals, reducing pollution and the burden on health and the environment, and achieving the EU's strategic autonomy and self-sufficiency in the supply of basic chemicals will be crucial for a successful green transition.

To transition to a low-carbon society and circular economy, the country must promote investment in necessary fixed assets as well as introduce appropriate legislation and other conditions.

## Decarbonisation of energy intensive industry

Energy intensive industry - EII (metal, non-metal, chemical and paper) is an important part of Slovenian industry. Annually, EII consume less than one sixth of the final used energy in Slovenia. These activities employ around 27,500 people and create 2.5% GDP. They are also important from an export point of view, as they export most of their products. A relatively low number of companies use the majority of energy in industry. In 2016, only 20 companies used half of all energy in industry. From 2005 to 2016, industry reduced direct greenhouse gas emissions by more than 35%, while process emissions were reduced by more than 20%. Nevertheless, a high share of EII in the Slovenian economy structure means the greater vulnerability of Slovenia due to greater exposure to changes arising from climate energy policies. Therefore, a timely and efficient renovation and restructuring of the Slovenian economy and companies in EII is important.

Energy intensive industry in Slovenia is very effective in Slovenia compared to plants in the EU and mostly uses the best available technologies (BAT). From this point of view, a major transition to a low-carbon circular economy is highly dependent on the development of new breakthrough technologies that are not yet on the market or are just beginning to be developed in the field of heat, electrification and production processes. Certain developed technologies, from production to the use of hydrogen and the collection, storage and use of carbon still await an affordable and proper integration into the production processes of energy intensive industry.

We need to avoid closing the most efficient companies because emissions at the global level would increase as products from less efficient plants and other parts of the world were imported (carbon leakage). Industry must be encouraged to further reduce energy intensive activities and manage energy as well as reduce process emissions with optimisation, digitalisation and the use of artificial intelligence. This industry needs a reliable supply of clean energy and a supply with raw materials which is conditioned by a proper infrastructure for energy supply and waste management. According to the European Commission, regardless of the already implemented and expected measures to reduce electricity consumption in the EII, electricity consumption in energy-intensive industry in the EU will increase from 2.98 to 4.43 TWh. The issue of EII vulnerability from the aspect of affordability of energy must also be addressed. In the future, industry will face a more demanding situation in the energy market due to the expected movements in international markets and the investment needed to restore production and transmission or distribution capacities in Slovenia.

The importance of EII is also recognised by the European Green Deal, which states that the energy intensive industry is an indispensable part of the economy because it provides raw materials for other value chains that are important for the EU economy. Another important aspect is access to raw materials (especially critical raw materials that must be excluded from the existing waste flows). All opportunities that are available at the EU level must be used for technological breakthroughs and the renovation of energy intensive industry (e.g. Innovation fund, Horizon). At the domestic level this should be exploited via the recovery and resilience mechanism and the just transition mechanism. The measures will be used to promote research, development and innovation and transfer advanced technologies, investments in the introduction of technology and infrastructure for affordable clean energy, energy efficiency and replacement of energy sources, increasing material efficiency and promoting the introduction of circular solutions in the industry of basic materials (the use of secondary raw materials, replacing carbon or energy intensive raw materials and materials with substances that have a smaller footprint). We will strengthen international cooperation for the development of breakthrough technologies and introduce options to optimise production using automation, digitalisation, quantum technologies and artificial intelligence.

Current production has been especially significantly rationalised from the aspect of reducing energy consumption per unit and increasing material production. In accordance with wider European forecasts, breakthroughs and greater affordability of new low-carbon technologies are expected in the coming years that will fundamentally transform production in energy-intensive industry. These technologies are, specifically:

* use of climate-neutral hydrogen (heat and/or processes);
* use of biomass and biotechnologies;
* further heat electrification;
* further process electrification (electrolysis, electrochemistry);
* capture and utilisation of carbon (CCU);
* capture and storage of carbon (CCS);

Therefore, we need to accelerate developmental and innovation activities as well as pilot and demonstration activities (e.g. production of synthetic methane and hydrogen), and the investment incentives for this purpose. The integration of industry in local energy communities with digitalisation and the implementation of smart platforms, exploiting waste heat and increasing self-supply from renewable sources of energy, is also important. Improving energy efficiency is necessary also by promoting the introduction of energy management in enterprises, e.g. via the introduction of systems that are harmonised with ISO 50001 (or appropriate alternatives) in energy intensive enterprises and in less energy intensive companies (in those where the cost of energy sources comes third or later on the cost scale). Enterprises must be motivated to invest in energy reviews.

## Sustainable mobility

In the future, mobility will remain the foundation of society and the economy. However, at the same time, greenhouse gas emissions from traffic can endanger the achievement of climate goals if the current trend continues. Traffic in Slovenia represents the largest source of GHG emissions, i.e. 52.9% in 2018. The share of this sector in 2005 was 38%. Most emissions originate from road traffic. Traffic is also the only sector in which emissions increased in the 2005–2018 period, i.e. by 31.9% (source: Climate Action Mirror 2020). Green and digital will be the key areas of mobility development in the next decade, if we want to manage the emissions from traffic.

Clean transport and logistics are emphasised in infrastructure, including the setup of e-charging stations, initiatives for railway transport and clean mobility in towns and regions. Sustainable forms of mobility must be promoted, and the construction of transport infrastructure should be adapted to preferentially encourage the deviation from road transport of passengers and cargo. This segment is closely connected to smart cities and communities, which is further discussed in the Slovenian Smart Specialisation Strategy (S4).

It should be emphasised that the Slovenian car industry represents approximately 10% of Slovenian gross added product and approximately 20% of Slovenian imports. Around 285 enterprises employing 16,000 people operate in this segment. Slovenian exporters and suppliers for the car industry have all the international standards and are competent suppliers in the global market with key buyers in Germany, where the Slovenian car industry exports 40% of its production, followed by France, Italy, Austria, Great Britain and the USA.

The fact is that the COVID-19 pandemic has strongly affected the car industry. Slovenia has strong developmental suppliers with a log of accumulated knowledge and development potentials, but the situation is difficult in large part due to the termination of supply chains. This is also true of the car industry as it will have to continue to upgrade in the direction of a green and digital transition. It will have to follow market trends in the direction of car electrification and business model change (car-sharing). Due to the accumulated knowledge and potential, opportunities and developmental projects can be sought outside the industry.

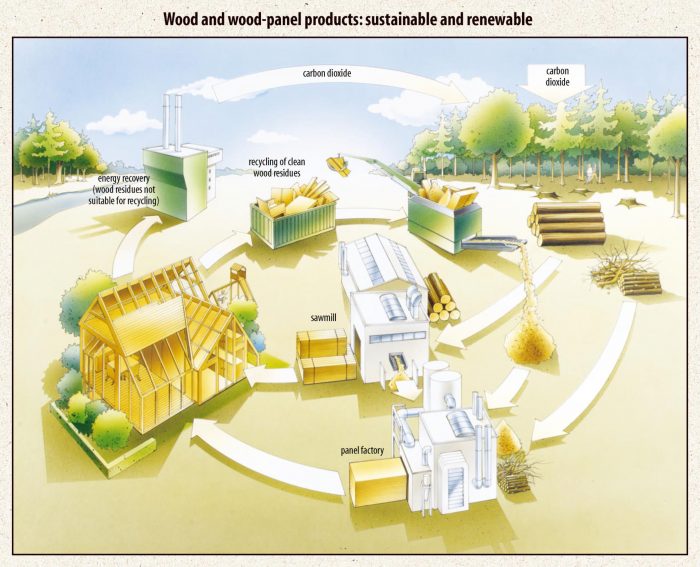
## Industry based on wood and other natural renewable materials

On its way to the basic goal from the European Green Deal (transition to a clean society without net greenhouse gas emissions by 2050), Slovenia will utilise the developmental potential enabled by domestic natural renewable materials, which ensure an uninterrupted supply of raw materials, short supply routes and a positive impact on climate change mitigation. By increasing the awareness of the importance of environment conservation, alternatives to fossil sources are sought as their use has major, long-term negative effects on our living space. One of the ways is the increased use of products made from natural renewable materials that represent CO2 sinking.

Wood is the key strategic raw material and industrial material in Slovenia and is a natural and renewable source. Annual natural growth of wood in Slovenia is 9 million m³, while annual felling accounts for approximately 6 million m³[[31]](#footnote-32), of which only 1,82 m³ of round wood is processed at home (data for 2019), together with cut wood and wood waste 2.87 million m³ is exported abroad (data for 2019, source: SURS, Forest Service of Slovenia[[32]](#footnote-33)), then semi-products or wood products are imported, while the remaining amounts are used for energy. From the aspect of CO2 created from 1 m3 of some materials, wood has quite an advantage in comparison with other raw materials. While in the processing of other materials CO2 is released into the environment (the quantity depends on the type of material), with growth, CO2 is stored and, until its destruction (burning – rotting), it represents a negative value of created CO2 for the environment. The ‘Climate effect of the forest-based sector in the European Union’ study from 2020 determines that European forests and wood-based sectors together lower the balance of CO2 created in the EU by 20%. Nature-based solutions should also receive more attention in the area of forest management. The ‘Solution is in Nature’ from 2021 highlights the great importance of forest management in a way that has a positive impact on biodiversity protection.

Wood is a material with at least two or three useful cycles, the so-called cascading use of wood. First, it is used as a product (cut wood, building component, furniture), secondly as material in the recycling process (panels or paper) and lastly for acquiring energy as is shown on the image below. Wood is primarily recognised as material for industrial processing and not as energy source. Only wood that is not suitable for further industrial processing or waste wood is used as an energy source.

Figure 4: Presentation of cascading use of wood



Source: EPF – European Panel Federation; SGLP – Tackle climate change, use wood, 2010.

In the segment of using natural renewable materials that store carbon, there are great opportunities in wood processing as Slovenia has large quantities of it (58% of the territory is covered in forest), which means that with sustainable forest management and improving the preservation of biodiversity, there is sufficient potential for long-term development based on domestic raw materials. Climate change impacts tree composition, therefore, the wood industry must adapt to the new situation. We should also think about alternative raw materials (biowaste in agriculture, forestry and municipal management). To adapt to climate change in forest management planning, we should consider nature-based solutions, including the prevention of entry and spreading of foreign species, especially invasive species. Slovenian forests are also an immense pool of gene sources for research and development in various segments (e.g. pharmaceutical and food industry, biofuels, synthetic components industry, pest control, etc.).

The construction and furnishing of smart wooden buildings is an exceptional market opportunity that will only grow. If the proportion of newly built wooden houses in the EU were to increase by 10%, this would contribute to a 25% annual reduction of CO2. The redirection to wood construction within public procurement is important in this context. Our vision joins that of forest and wood associations in the EU vision written in the Forest-Based Industries 2050 (CEI Bois, 2019) that envisages that the proportion of construction wood will grow from the current 10% to 30%, meaning that the amount of wood construction will triple. The amount of wood in forests in both the EU and Slovenia makes this possible. Greater processing of wood felled in Slovenia can additionally contribute to reducing emissions or increasing carbon sinks in forests in accordance with the LULUCF (EU 2018/841) Regulation.

The vision of the wood processing industry is to increase the level of wood construction with developmental activities and by building demonstration (pilot) buildings. New business models will thus form to enable a competitive performance of consortia with investors in Slovenia and in foreign markets. In this way, the Slovenian wood processing industry will also secure a market for the sale of large quantities of wood with high added value. In addition to the material use of wood, wood can be used to acquire bio components (bio derivatives), the products of which can replace synthetic chemicals. A lot of inferior quality wood in Slovenia is also processed in paper factories which currently still import more than 60% of their required wood. Inferior quality wood and wood waste thus achieve higher added value than if such wood is used for energy purposes.

With the aim of increasing wood processing in Slovenia, investment will have to be made in primary wood processing and other wood processing areas which is directly connected to strengthening the so-called soft capital – research, development, innovation, human resources, etc.

In addition to wooden construction, which also includes joinery, the furniture industry is still very prominent in Slovenia. The key emphasis is on new technologies and business models in production and development processes, whereby it is necessary to take into account the principles of circular and digital development ("creative and digital by design").

The wood processing industry in Slovenia is important from the aspect of a high number of SMEs, in which there are almost 1,500 sole entrepreneurs, for whom the key is to strive for a friendlier business environment and to promote consumption from renewable sources. It should be emphasised that there are more than 400,000 forest owners in Slovenia. They should be mobilised and connected to intensify forest management and increase wood use in Slovenia.

Wood is the output material for many technologically advanced co-natural materials and products (composite products, modified wood, insulation and polymer materials, fibres, solvents, liquefied wood, carbon fibres, medicines, pyrolysis – wood gas, etc.). Education and biomaterial research must be strengthened to utilise all opportunities in this area (e.g. in architecture, construction and machine-building). As other sectors such as forestry, the cellulose and paper industry, some construction, and the creative industry (design, architecture, research art ...) are connected to wood, the development of the wood processing industry has great potential that must be used.

The basic goals by 2030, connected to wood exploitation, are to increase the amount of round wood in Slovenia for non-energy use to 3 million 3 per year, to reach a 30-percent share of wood in all new public buildings, to develop new ways to use wood, to increase the number of employees in wood-connected industries (in which the increase of employees in services connected to these branches must be considered as these are not considered in the general analysis and include repairs, installations ...) and to increase the realisation of sales in the wood industry to EUR 2.5 billion per year.

The realisation of green a breakthrough and sustainable development will be achieved by forming an encouraging environment for activities that contribute to achieving the goals of a green Europe. Wood processing is therefore tackled systematically by considering the potential carried by micro, small and medium sized enterprises.

# CREATIVE DEVELOPMENT

Research, development and innovation (RDI) are one of the main pillars of modern society. All three are largely based on connecting knowledge, industries and organisations which mutually develop creative innovation. These increasingly arise from the problem of the individual, society and/or environment and offer a solution to a specific problem. Different organisations enter the successful and open RDI cycle differently than in the past, i.e. from enterprises of different sizes and sectors, knowledge institutions, NGOs to creative industries (CI) that are the source of incentives for the development of the economy and society as a whole. Cooperation of enterprises with knowledge institutions, NGOs and CI increase the creativity of individuals and innovation in enterprises, enables their improved performance in domestic and foreign markets and increases revenue and added value.

Creativity and innovation are the key features and skills that improve the country’s economic and social indicators, and connections and cooperation present great potential for finding solutions to today's major societal challenges, including population ageing, environment, health, food and safety.

International analyses show that enterprises which connect with CI in their business processes create higher profits and achieve quicker growth. Enterprises that invest in design (compared to enterprises that do NOT invest in design):

* Their revenue increases at a 22% quicker rate (Danish Design Centre (The Economic Effects of Design, 2003));
* Are more than 50% more productive (Swedish Industrial Design Foundation, 2008) and
* Achieve 200% higher stock prices (British Design Council, 2007).

The Innobarometer, the 2016 European Commission research into innovation processes in SME shows that the Slovenian economy has a lot of unexploited potential in the area of including design and creativity in the innovation processes of enterprises. Based on a sample of 501 Slovenian enterprises, the research has shown that the share of Slovenian enterprises for which design is of key importance for their business strategy is only 5% (Denmark, Austria: 21%, Great Britain: 17%). The share of enterprises that do not use design, according to their own statements, is 43% in Slovenia, the average in the EU 27 is 37%.

The use of digital tools such as tools for industrial design, product development, production devices and objects, technological tools (CAD/CAM, 3D printing) and simulations (materials, tools, installations) strongly strengthen the efficiency of creative and innovation activity.

* 1. Concern for a creative, entrepreneurial and innovation support environment

The entrepreneurial and innovation support environment in Slovenia is very diverse and lively, but also dispersed, lacking in transparency and unfocused. Various entities operate in this environment whose activities are often duplicated and do not create the desired and expected value. Therefore, Slovenia needs a platform that will create a healthy, stimulating and connected ecosystem that will be based on creativity, entrepreneurship and connection. Groups that will carry out programmes in (I) the economy, (II) the academic and science and research sphere, (III) the public sector and (IV) the wider society, must be established within such an ecosystem. Groups must carry out structured programmes that are based on key areas and follow specific goals for every segment, and which will operate as a platform and as a connected entity and be complementary. With this approach, the main challenges of modern society and the country can be structurally and effectively addressed.

An ecosystem designed as a platform needs an independent, correct and connective coordinator that will manage the umbrella programme and connect the main subjects and consortia, which will carry out specific programmes to increase innovation and entrepreneurship in every area.

Programmes and the entities that carry them out should complement, connect, inform and educate each other. They should provide for a creative, entrepreneurial and innovative supporting environment to make Slovenia an attractive place for the prosperity of talent, growth and other enterprises, which will create high added value, new jobs and at the same time renew the economy in the direction of a circular and digital transition.

An entrepreneurial and innovative supporting environment must represent an inclusive environment that is based on the cooperation of companies with suppliers, buyers, competition, universities, scientific and research organisations, institutes, CI, NGOs and other public and private organisations. Such a network helps enterprises to overcome obstacles that refer to the sources of financing, human capital, social capital and other sources, connected to the specifics of a certain enterprise or market. Social economy subjects must be emphasised and dealt with the same as other subjects in the support environment, while the implementers of individual measures should be qualified to work with them.

The quality of the support environment is essential to transfer knowledge that generates development. Therefore, we should build on entrepreneurial and innovation infrastructure that will enable, promote and expand a system of open innovation in enterprises and organisations of all forms, to cooperate, connect, exchange knowledge, experience and inventions, license foreign solutions and promote the foundation of new enterprises.

Despite many indicators and innovation analyses (e.g. European Innovation Scoreboard, Global Innovation Index ...) these analyses do not show the real situation of innovation in the Slovenian economy because they comprise a wide range of indicators that are not significantly connected to the economy. An innovation analysis among Slovenian enterprises of all sizes should be developed and implemented annually to gain an actual and real insight into innovation in the Slovenian economy which will provide an understanding of the individual parts of innovation and innovation culture, thus enabling the addressing of significant deficiencies that should be drawn to the country’s attention, and which would also support enterprises with various financial and non-financial measures.

We will design, introduce and strengthen a **comprehensive and connected support environment** for innovation that will have a platform built from subjects/consortia that will carry out innovation programmes in key areas of the innovation ecosystem: (I) the economy and its representative chambers/associations, (II) academic, scientific and research sphere, (III) public sector and (IV) society. The key role of the SPIRIT Slovenia public agency as stakeholders of the supporting environment at the national level is of key importance.

Within this framework, we shall strengthen:

1. **The Slovenian Business Points Network (SPOT),** whose purpose is to offer free support services for entrepreneurs and potential entrepreneurs, and offer services of business consulting, providing information and training as well as a rich scope of services in internationalisation and foreign investment. SPOT will contribute to those three areas of the industrial strategy (green, creative and smart development).
2. **Innovative Environment Subjects (SIO**) for effective services for entrepreneurship and innovation, and designing a balanced programme of support to drive, grow, develop and preserve enterprises. Thus, we will contribute to:

* Increasing the number of new enterprises, especially those that create higher added value compared to the Slovenian average.
* Increasing the level of survival of newly founded enterprises.
* Overcoming the obstacles of rapidly growing enterprises.

1. **A supportive environment in the field of creativity** that will be based on supporting creativity in the sense of developing cultural and creative sectors (CCS) and connecting those CCS with the rest of the economy. Currently, the latter is supported within the Creativity Centre, Network of Research Art and Culture Centres.
2. **Supporting environment for start-up and scale-up enterprises (so-called Startup Plus Programme):**  the programme comprises all key support needed by innovative start-up companies for rapid global growth. In addition to the financial incentives of the fund (subsidies, convertible loans, ownership investment), the programme also includes an intensive mentorship programme and training in several quality and specialised content programmes.
3. **Innovation hubs:** we will strengthen digital and other innovation hubs intended for innovation cooperation and connecting the public and private sectors which are the platform for the cooperation of various stakeholders and groups that want to achieve the best innovation results with a significant emphasis on concrete content. Innovation cooperation and connection in the East Slovenia cohesion region must be strengthened. Modern internationally comparable innovation hubs offer both content and infrastructural support to developmental and research projects of SMEs with the aim of successful international commercialisation of knowledge and technologies.
4. **Knowledge transfer offices:** their purpose is to connect public research organisations and the economy. Their activity includes the preparation, mediation and adaptation of a technologically suitable and market-appropriate offer prepared by researchers from public research enterprises on the basis of identifying the technological, research and development needs of the economy. Offices direct researchers to meet the needs of the economy, raise awareness in enterprises about the availability of research capacities, and direct enterprises to use the services that research organisations can offer. Researchers must be qualified with knowledge about the market, buyers and entrepreneurship.

Strategic development and innovation partnerships or so-called SRIP are important within the supporting environment and these are discussed further later in this document.

## Promotion of creativity, entrepreneurship and innovation

Initiatives to strengthen the culture of creativity, entrepreneurship and innovation must be made to create a positive innovation micro-climate in Slovenia. The programme for motivating young people to develop creativity, entrepreneurship and innovation (hereinafter referred to as CEI) has brought certain results. This programme aims to develop qualities in young people that are important for entrepreneurship – from creativity, initiative, and accepting risks and responsibilities to self-confidence and performing in public. We will strive to introduce the culture of a creative, entrepreneurial and innovative way of thinking and understanding intellectual property in all parts of the educational system (across the curriculum), i. e. in kindergartens and higher education facilities as well as in enterprises for the education of suitable staff.

Efforts should be made to **promote entrepreneurship and carry out measures to encourage entrepreneurship** among special target groups (e.g. youth, women, families). The promotion and internationalisation of industry through the coherent operation of supporting networks and organising conferences, consultations, seminars and workshops in Slovenia and in the international environment are key.

For more than twenty years, the **granting of awards and promotion of the best Slovenian innovation** has been in progress in Slovenia, based on regional selection of the best innovation, a process which ends in the selection of the best national innovation. Awards for innovation not only bring a confirmation to award winners and promotion in Slovenia and abroad, but they are also interconnected, therefore the project should be continued, accelerated and upgraded with additional content activities.

## Support to start-up, growth, development and preservation of enterprises

In this framework, innovative start-ups and scale-ups, the development of other enterprises and a successful transfer of ideas of entrepreneurial individuals and groups in successful cooperation must be promoted because this has a positive economic and social meaning. Initiatives will focus on niche markets and support a green and digital transition.

It is of key importance that enterprises, especially SME, in both cohesion regions have access to proper financing sources as this is one of the most difficult obstacles to overcome for all enterprises. Debt and ownership sources of financing should be strengthened respectively. From the aspect of growth, development and preservation of enterprises, small value initiatives (e.g. vouchers) are also important, since enterprises have access to services in digitalisation, intellectual property protection, certificates, training and outsourcing in other areas, as well as major development and innovation projects that are strategically important for the country.

It is important to support research, development and investment via tax relief; enterprises must be actively motivated to invest in new products that have to be competitive at the global level. It is important to promote patents and brand protection applications as well as support the introduction of concrete new technologies that promote creativity and competitiveness (e.g. AI, VR).

One of the important pillars of knowledge and technologies transfer contributing to economic growth is the so-called spin-out and spin-off enterprises of public research organisations. These enterprises create new jobs and have great potential to become innovative and rapidly growing, therefore a normative environment that is comparable with the EU must be introduced in Slovenia for the foundation of such enterprises.

## Strengthening non-technological innovation

While enterprises, especially SME, deal with the challenges of green and digital transition, they require a wider understanding of the term innovation, which cannot only be limited to technology, but must also include all types of innovation, from the most common product and process innovation to marketing, organisational and social innovation. The existing SMEs are not necessarily innovative start-ups in the classical sense. Measures must be taken in such enterprises to promote innovative business and management solutions and creativity in the wider sense.

Non-technological innovation that is based on innovating processes, services and business models is often that which makes the difference between individual products and creates added value. Innovation often does not arise from R&D, but is based on the user’s problem and the use of existing technologies and products. Innovation can be a new business model that arises from considering user experience, the use of digital technologies (e.g. sharing platform) or including services (after-sales services, repairs etc.).

**Social innovation** is essential because it mostly involves new ideas (products, services, models) that effectively respond to society’s needs and create new social relationships and cooperation. This involves innovation that also enhances society’s ability to act. The key difference between an innovation and social innovation is that, in addition to having economic value, social innovation also addresses the needs and challenges of society, thus creating a social effect. In this sense, social economy should also be strengthened as it has the key role in creating jobs and social inclusion.

Connecting with CCS is of key importance, especially through design, architecture and design management, as well as other processes that promote the development of non-technological innovation. **Design management** is an example of strengthening creativity and improving competitiveness in enterprises, and it has proven to be exceptionally successful. In Slovenia, this was supported via two design management competence centres (DMCC) (2013–2015 and 2017–2019). In a DMCC 2.0 project that lasted 2.5 years (2017–2019), 37 enterprises and a total of 1,433 employees were included in training. The results after the end of the project were very good. By improving business processes and products, profit growth in enterprises within the project increased by 104%, while added value per employee increased on average by 12%.

# SMART DEVELOPMENT

Smart industry, which can also be called Industry 4.0, has become a trend that is a strategic priority in many industrial enterprises. Enterprises combine advanced connectivity, automation, cloud technologies, sensors, different production processes, intelligent algorithms, IoT (Internet of Things) and artificial intelligence. The essence is complete control of the entire business process via a digital platform. This can involve production, logistics, resource management, material tracking and similar. Like technology, business processes are also important because they change with the introduction of digitalisation. The same applies to value chains.

For smart industry that must adapt quickly to the common EU digital market, the strengthening of digitalisation of operations, services, products and business models, accelerated investment in research, development and innovation, networking and connecting various stakeholders, strengthening competences and also promoting international connection of enterprises are very important. The key issue here remains understanding the market, the product and user problems that can be resolved with advanced technological solutions. Societal challenges must be resolved with modern technologies and products that will help society and consequently be successful in the market must be developed. Enterprises should be encouraged to create their own digital strategies that supplement business strategies and implement them.

Accelerated automation also brings a lower need for traditional jobs. From this aspect, we should address the re-qualification of workers, creating competences for the jobs of the future, potentially adapted work forms and working hours (shortened working hours, work from home, sharing ...), and changes that arise from circular business models (increasing the reuse services, remanufacturing ...). Digitalisation should support a green and creative transition.

The resilience of a digitalised industry to cyber threats and attacks is of key importance for its long-term success and survival. Therefore, a high level of cyber security should be ensured in a smart industry through appropriate systems and procedures, training and awareness-raising.

In January 2021, the EC published a report entitled **Industry 5.0: Towards a sustainable, human-centric and resilient European industry,**[[33]](#footnote-34) which focuses on the industrial worker as a human being. Industry 5.0 complements the current paradigm of Industry 4.0 by emphasising research and innovation as the driving force for a transition to European industry that is sustainable, focused on the human being/individual and resilient.

Industry 5.0 seeks to capture the value of new technologies for achieving prosperity that surpasses the goals of jobs and growth while respecting planetary boundaries and placing the well-being of the industrial worker at the heart of the production process. The purpose is to consider the current social restrictions and not leave anyone behind. This assumes a series of appropriate measures to respect human rights and ensure a safe digital working environment. The industrial worker receives a new role in which they are not considered as a cost, but as an investment that will enable the development of the company and of the worker. Employers must be interested in investing in the skills, abilities and well-being of the employee. An important precondition for Industry 5.0 is that technology must serve the people and not vice versa. In the industrial context this means that technology is used, and production is adapted to the needs and diversity of industrial workers instead of workers adapting to the constantly developing technology. Workers must be empowered, and their working environment must be inclusive. Therefore, every worker must be closely included in the co-designing and introduction of new technologies, including robotics and artificial intelligence. To enhance safety at work, robots would assume a large number of repetitive and simple tasks.

## Digitalisation and smart solution strengthening

The economy should be renewed by using modern technologies, the highest process safety, increasing the level of automation and robotisation, and the use of digital technologies and artificial intelligence, consequently contributing to a more effective use of resources and energy. Introducing smart factories would increase productivity by a factor of 10, at the same time it would enable the personalisation of products and solutions. Introducing digital solutions must be carried out at several levels. At the EU and national level, legislation, cyber security rules and consumer safety should be adapted along with the introduction of digital technologies in the operations of enterprises in all areas. New legislation must also have an estimated impact on the digital legislation. These processes are changing the image of industry and the method of operation. This is proven by Slovenian enterprises that also cooperate with the leading enterprises in the global market by introducing smart automated production and the use of artificial intelligence. The empowered person – worker must be placed at the forefront in accordance with the developing concept of Industry 5.0.

Measures in digitalisation enable enterprises to have a simple and rapid breakthrough in the foreign market, and an expansion of operations in the existing foreign market, shorter time of certain operations, processes, optimisation and more effective search for resources and effective purchasing, lower administration costs, enhanced transparency over business processes and enhanced sales in foreign markets, the improvement of the competitive position, simplification of distribution channels, expansion of the market and business reach, consequently higher income, improvement of interaction with clients, more accurate and easily accessible information about the enterprise, suppliers, buyers, target markets, increasing the speed of operations, increasing market share and the rationalisation of the business model. Therefore, we will need a strong digital infrastructure that includes the active collaboration of various stakeholders with the aim of putting Slovenia on the map of successful and reference countries in smart and green industry. Fast and reliable broadband connections (fixed and mobile), including rural areas, are necessary for the development of key online social and economic services. Introduction of 5 G depends on the timely allocation of the 5G spectrum.

We do not wish to address only the digital transformation of ordinary enterprises, but we want to offer support to the faster development of digital enterprises. Improving the digital knowledge and skills of workers could relatively quickly enhance their employability and support the economic recovery after the COVID-19 pandemic crisis. Introducing user-friendly e-administration services and digital public services would help to reduce the administrative burden on enterprises. Although numerous public online services are already available, efforts to enhance the trust of people in online transactions and their safety will be needed by individuals and enterprises (e.g. introduction of the national electronic identifier, ensuring cyber security and protecting privacy).

Smart industry will also consider the National programme on encouraging the development and use of artificial intelligence (AI) by 2025 (NpAI), which has been harmonised with the SDS 2030. The NpAI includes the industrial 4.0 revolution among the global challenges to establish new economic operation models and overall social and environmental development.

Digital transformation also represents the industry’s transformation into Industry 4.0, in which Slovenia will be able to compete on a European and global scale. Digital transformation and digitalisation in the production enterprise will have to be defined on two levels, at the level of digitalisation of products, services and creating digital business models (smart) and the digitalisation of processes and operations. This will present savings at all levels of operation and increase productivity and competitiveness in the global market. The principles of installed cyber security must be considered in development.

In addition to updating the economy by digitalising operations and introducing smart solutions in own operations, we need to promote the development of operations of the economy by using new technologies such as IoT, artificial intelligence, digital platforms and similar, for new digitalised services, products and business models. This must be based on an understanding of the market, competition, own buyers and users and focus on a modern user experience. A successful and fast development in this direction, which is necessary for competitiveness, can be encouraged by developing the digital competences of employees in enterprises and by gaining inclusion in new development partnerships and value chains through ICT sector enterprises and knowledge institutions to develop higher added value products or a higher level of integration. In this way we can connect multidisciplinary knowledge for creating modern digital services, products and business models, which will be, in addition to productivity, the second necessary condition for economic competitiveness, the increase of added value and successful internationalisation or increasing exports to demanding markets by increasing the share of high technology products. In this way, Slovenian industry can expand export markets and become more resilient.

## Promoting the development, research and innovation cycle

Together with the Research and Innovation Strategy, the Industrial Strategy directs measures into promoting a comprehensive developmental, research and innovation cycle from TRL 1-9 by emphasising priority areas that arise from the Slovenian Smart Specialisation Strategy (S4), which will be systemically steered via the new Act on Scientific, Research and Innovation Activity. We will also achieve the redirection of industry from supplying components to a niche-focused co-creator of technologically developed products. Circular and digital by design concepts should be considered in product design. It is essential that priorities are not defined ‘from the top down’ but on the basis of partnership between the economy, knowledge institutions, the state and other stakeholders.

It is important to establish a system of research equipment use that encompasses the supplementation of the introduced list of available research equipment and the introduction of a connection between the users and owners of equipment.

Investment in research and development will also emphasise, in addition to supporting a green and digital transition, resolving other social challenges (e.g. pandemics). Funds that arise from the EU Fund for Recovery and Resilience and Horizon programmes.

We should also promote the use of the European patent with unitary effect when the system enters into force. Through its use, SMEs would protect their inventions at a lower price in those EU countries that cooperate in the European patent with unitary effect.

## Networking and cooperation

Networking and cooperation in research, development and innovation is of key importance. Therefore, the development of Strategic Development and Innovation Partnerships (SDIP), which in every S4 priority area combine the key stakeholders in the economy, research sphere and others, will continue. Together with the state, they not only co-design the development policy but also organise a comprehensive development and innovation ecosystem by individual S4 areas. In practice, this means introducing various organisational bridges (round tables where different stakeholders cooperate in designing strategies and development programmes) and value chains in Slovenia and, by inclusion in international chains and international development and innovation platforms by preparing demanding development projects, establishing joint performances and international promotion.

Ambitious goals for internationalising knowledge and solutions should be set, for which Slovenian enterprises would use the support of the ecosystem (country, research sector, non-governmental sector) to offer comprehensive high technology solutions for larger environments.

Other forms of connecting and networking, i.e. clusters, digital innovation hubs, competence centres and other informal forms of connecting are also important.

Digital innovation hubs (DIH) and similar subjects are exceptionally important for creating an entire ecosystem for the cooperation of different stakeholders and target groups. This has been recognised by the European Commission, which dedicates a considerable amount of attention and funds within the Digital Europe Programme (DIGITAL)[[34]](#footnote-35) as it wants to introduce a network of European Digital Innovation Hubs (EDIH). In accordance with the EC guidelines, Slovenia has determined this area in the Digital Innovation Hubs guidelines in Slovenia after 2020[[35]](#footnote-36). The key purpose of such cooperation between the stakeholders of private, public, research, academic and local environment is the digital transformation that must reach all areas of everyday life. The recognition of advanced digital technologies must be strengthened, advantages and risks must be identified, and individuals must be qualified, enterprises must also obtain access to the infrastructure for testing advanced digital technologies (laboratory equipment or a testing environment is too expensive for SMEs). The key guideline is that such services should be close to the user, which is an advantage in Slovenia due to the small size of the country. International cooperation and searching for new business opportunities will also be an important added value of the EDIH network, as well as the transfer of best practices, transfer of knowledge and searching for joint solutions.

## Strengthening and developing new competences, re-qualification, new forms of work

The realisation of smart industry must focus on strengthening employee competences. The platform for predicting needs by competences has an important role here because it will enable the timely training and education of employees on the basis of monitoring trends and market needs for the upcoming new tasks dictated by continuous industrial development. Appropriate training and education programmes will be designed on the basis of monitoring the gaps in employee competences. They will strengthen the competences necessary for work and green, smart, digital and creative development. The measures must enable the acquisition and strengthening of interdisciplinary and soft skills.

Through re-qualification and additional qualifications of employees who will need new competences due to the digitalisation and introduction of Industry 4.0, the number of unemployed in the labour market will reduce. Measures must be comprehensive, and they should include the entire vertical structure, beginning in primary schools with appropriate educational content and quality career orientation to qualify pupils, students and adults for development and career planning. Measures should promote the acquisition of competences in smart and digital areas (job shadowing). Employees should also be enabled to do various types of jobs, considering the trend of job personalisation, where this is appropriate. New work methods and forms require a higher level of job development, which enables the cooperation and effective performance of jobs. The transition to digital is possible only if workers have developed digital competences[[36]](#footnote-37) and if they perform work effectively with the help of these.

Furthermore, measures must cover the retention of existing highly educated staff and attract them from abroad and allow for a flexible transition of workers from knowledge institutions and the education system to the economy and vice versa, which also promotes connecting knowledge and practice as well as interdisciplinarity. The timely discovery and preservation of talent in the economy, knowledge institutions and education institutions, and the development of the careers of employees with the purpose of re-qualification and additional qualification are of key importance for development.

One of the most important and most successful instruments from the aspect of networking in the area of joint and targeted investment in the knowledge, skills and competences of employees are competence centres for HR development (CCHR). At the beginning of 2010, the CCHRs were the first example of a successful connection of enterprises and investment in employee knowledge. By adopting the S4 in 2015, they became the main instrument of support for investment in the knowledge and skills of employees for the needs of smart specialisation. CCHR supplement the work of SDIP in HR development of knowledge and skills to achieve a comprehensive approach in the triangle of HR development, promotion of innovation and competitiveness and investment in R&D.

CCHR ensure professionally specific training and education that is recognised as necessary for the development and competitiveness of an individual sector or business. An important advantage of CCHR implementation is that enterprises design their education and training content and are flexible in choosing education courses providers. A total of 600 enterprises via more than 50,000 inclusions in training programmes cooperated in the implementation of CCHR, designed as networks of enterprises, in the 2014–2020 period (327 enterprises were supported within the 2019–2022 tender, 22,352 inclusions in various training programmes designed to strengthen the competitiveness of Slovenian enterprises by developing key competences are planned). Competence centres will serve the upgrade of the knowledge and skills of employees, developing competency models, strengthening business networking and exchanging best practices in HR development, with a special emphasis on the development of knowledge in smart specialisation with the purpose of supporting enterprises in the digital transformation and transition to Industry 4.0.

## Internationalisation

The purpose of internationalisation is to promote greater openness for the international environment. Fast progress demands constant adaptation, increasing of effectiveness, reducing costs and searching for new opportunities in the domestic and foreign markets. Internationalisation is necessary for the survival of enterprises, especially SMEs. The preparation of the Programme for the promotion of investments and Slovenian business internationalisation is in progress. The programme sets three strategic areas in the centre: sustainability, innovation and digitalisation. The measures will aim to mitigate the consequences of the COVID-19 pandemic and to work in the direction of a dynamic, resilient and competitive Slovenia. The main objectives of the programme are to diversify exports, increase the number of exporters (SMEs), gain positioning in global value chains, reduce the backlog of incoming foreign direct investment behind other EU countries, effect target orientation and improve the efficiency of the ecosystem.

Internationalisation in research, development and innovation is also important. Therefore, it is necessary to:

* Speed up the inclusion in European and global development and research as well as technological projects, initiatives and programmes (e.g. Horizon, Eureka, European Space Agency, European Defence Agency, CERN, FAIR, CTA, Life+ programmes),
* Promote cooperation with different European and international institutions (e.g. European Institute of Technology - EIT/ Knowledge and Innovation Communities - KICs, Biobased industry Joint Undertaking - BBI JU),
* Strengthen cooperation with the current and new networks of the support environment and other stakeholders abroad (e.g. European Enterprise Network – EEN, EU DIH network),
* Identify and monitor technological achievements/trends in the European and global market, and transfer from and to Slovenia best practices which encompass international economic events, the Innovation Radar Network, a network of economic representatives abroad, international network in CCS and entrepreneurship, such as European Creative Business Network (ECBN), Creative Business Network and others.

The option to carry out pilot and demonstration projects in internationalisation will be studied with the purpose of exporting knowledge and services in foreign markets and diversifying the Slovenian economy faster. A feasibility study will be carried out in the first phase (whether an individual product/service is appropriate for an individual foreign market); if the study proves feasibility, the enterprise can be included in the selection of the pilot and demonstration project in an individual foreign market in the second phase.

# GUIDELINES FOR CONNECTED GREEN, CREATIVE AND SMART DEVELOPMENT

As indicated in section 2.4, the scope of measures for the implementation of SIS has been greatly standardised. But it is of key importance for individual measures to have proper guidance and to support green, creative and smart development in the execution phase. Examples of measures include research, development and innovation, which are the main drivers of economic growth, but where and how they are guided to support the desired direction of development is important. The tools of economic policy for achieving goals are material and non-material initiatives. Those that direct consumption and thus determine market behaviour that is based on responsible demand are also crucial. A review of the implementation of SIS 2021–2030 guidelines will be monitored by the MGRT as the responsible line ministry every two years.

| GUIDELINES by individual sets of measures | Responsible line ministries | Evaluation of financial assets[[37]](#footnote-38)  2021–2030 |
| --- | --- | --- |
| 1. Research, development and innovation (RDI):    1. Increasing the share for RDI to 3% of GDP, of which the public part will be 1%.    2. Preservation of 100-percent tax relief for investments in RDI.    3. Connecting the entire development cycle from TRL-1 to TRL-9.   – Harmonised consecutive financing of projects from early development phases to launch.   * 1. Development and strengthening of research infrastructure.   2. Introducing the system of research equipment use that encompasses the supplementation of the introduced list of available research equipment and the introduction of networking between equipment users and owners. Promoting open innovation.   3. Accelerating the transfer of technology and knowledge for fast commercialisation of results and development.   4. Strengthening the number of (young) researchers in the economy and supporting researchers at the start of their careers.   5. Considering circular and digital by design concepts – inclusion of this demand in public tenders.   6. Strengthening RDI in new and alternative as well as naturally renewable materials, products, services and technologies, by considering the modern approach (life cycle analysis LCA, digital twins etc.).   7. Development of modern technologies and products in accordance with the guidelines of the new Resolution on the National Research and Development Programme and Slovenian Smart Specialisation Strategy (priority investments in niche areas with the greatest potential for growth and breakthrough to international markets). | MGRT, MIZŠ, SVRK | EUR 4 billion (including tax relief for RDI and return resources) |
| 1. Demonstration and pilot projects    1. Support for pilot and demonstration projects (e.g. for production of synthetic methane and hydrogen) and demonstration centres, contributing to green, creative and smart transition, which will enable the promotion of solutions and knowledge.    2. Demonstration and pilot projects in internationalisation, the purpose of which is to export knowledge and services to foreign markets and to speed up the diversification of the Slovenian economy.    3. Introduction of pilot examples of cascaded use of wood and naturally renewable materials for closing material flows and improving the use of waste: return logistics, sorting, monitoring flows, etc.    4. Demonstration and pilot projects in energy intensive industry for introducing new low-carbon technologies for improving energy and material efficiency, maintaining competitiveness and preventing carbon leakage.    5. Demonstration and pilot projects for promoting the replacement of fossil raw materials (biorefineries that will support the development of bio-based materials on the basis of biomass). | MGRT, MIZŠ, MOP, MZI, MJU | EUR 250 million |
| 1. Inclusion in international research and development as well as innovation projects and programmes    1. Accelerating the inclusion in European and global research and development as well as innovation projects, initiatives and programmes, international research infrastructure.    2. Promoting cooperation with various European and international institutions and supporting environment networks.    3. Identifying and monitoring technological achievements/trends in the European and global market, transfer of best practices. | MGRT,  MIZŠ | EUR 30 million |
| 1. Networking and cooperation in research, development and innovation    1. Upgrading strategic development and innovation partnerships (SDIP) and introduction of new technologies and best practices in various fields, speeding up the cooperation and development of stakeholders by individual areas.    2. Speeding up other forms of cooperation of business entities with research and development institutions and other stakeholders.    3. Introduction of a platform for accelerating cooperation of existing and new stakeholders of the quadruple helix within S4 by introducing or upgrading infrastructural, research and development as well as content conditions for an innovation support environment.    4. Accelerating development partnerships for strengthening digital products, services and business models. | MGRT, MIZŠ, SVRK, MJU | EUR 25 million |
| 1. Support environment for enterprises    1. Introducing a connective, inclusive and complementary platform ecosystem that will be built from entities and programmes in the fundamental areas of society (economy, academic, scientific and research sphere, public sector, local communities and the wider society).    2. Strengthening the support environment for a circular economy and digitalisation, including support for developing a digital economy by creating new value chains, product innovation, innovation of solutions and new business models.    3. Further development and upgrade of services of supporting entities, especially in the direction of green, creative and smart development. | MGRT, MJU | EUR 50 million |
| 1. Promotion of entrepreneurship and innovation    1. Promotion of innovation and entrepreneurial culture as a positive value (e.g. via public media, cooperation at events, business meetings and fairs with regard to entrepreneurship, craft and innovation, selection and upgrade of the best Slovenian innovations, etc.).    2. Comprehensive promotion and awarding of creativity, entrepreneurship and innovation (CEI).    3. Promotion of strategic development and innovation partnerships and smart specialisation (promotion of development breakthroughs that are the result of introducing smart specialisation).    4. Promotion of entrepreneurship in special target groups.    5. Promotion and opening of new market paths in the domestic and foreign markets.    6. Strengthening of brands, including the positioning of Slovenia as a green, creative and smart country (green.creative.smart ambassadors). | MGRT | EUR 10 million |
| 1. Promotion of start-ups and enterprises with rapid growth potential    1. Promotion of the foundation of new innovative enterprises (start-ups) and fast growing (scale-up) enterprises. Special emphasis will be given to starting circular and digital enterprises.    2. Promotion of connection of enterprises with mentorship systems and business mentors.    3. Promotion of connection of start-ups with “mature” enterprises. | MGRT | EUR 40 million |
| 1. Support for the growth, development and preservation of enterprises, especially SME    1. Strengthening debt financing sources (subsidising interest rates, micro loans, micro warranties, loans and mezzanine loans, guarantees, etc.).    2. Strengthening ownership financing sources (strengthening and effectively managing seed and risk capital) and developing new modern forms of financing.    3. Introducing small value initiatives (e.g. vouchers) for special content that supports green, creative and smart development.    4. Accelerating the digital and circular transformation of enterprises: encouraging the introduction of modern digital technologies into operations of enterprises, creating new products, services and business models and creating development partnerships for these purposes.    5. Initiatives for strengthening the wood processing sector.    6. Improving energy efficiency in enterprises, also including the introduction of energy management, introducing the ISO 50001 system and other important standards and certificates in environment and energy. | MGRT, MOP, MZI, MJU | EUR 150 million + repayable funds |
| 1. Non-technological innovation and business models    1. Support for non-technological innovation and innovative business models (process and organisation innovation, new business management solutions, new business models and innovative methods of enterprise internationalisation on the basis of joint investments of knowledge, technologies and capital).    2. Development and restoration of business models and process improvements for speeding up the transition to a circular and digital economy, also by using modern technologies (optimising business flows, optimising material flows and their usage, line automation, sharing ...).    3. Support for design management and connecting cultural and creative sectors and enterprises. | MGRT | EUR 60 million |
| 1. Promotion of investments    1. Promotion of strategically important initial investments of domestic and foreign investors.    2. Support for investment for introducing Industry 4.0 and a low-carbon circular economy.    3. Green procurement in investments. | MGRT | EUR 300 million |
| 1. Internationalisation    1. Promotion of internationalisation in accordance with the Programme for the promotion of investments and Slovenian business internationalisation.    2. Enabling and enhancing internationalisation via digitalisation.    3. Promoting joint performance of enterprises in value chains in the global market. | MGRT, MZZ | EUR 100 million |
| 1. Strengthening competences, training, requalification, adaptation to demographic change    1. Development of platforms to strengthen the competences of employees and management staff in all branches of industry and in the circular and digital transformation of the economy in general.    2. Strengthening the competences necessary for green, creative and smart development, considering global trends. | MGRT, MDDSZ, MIZŠ | EUR 30 million |
| 1. Infrastructure    1. Development of necessary infrastructure that enables the development of green, creative and smart industry (modern fixed and mobile connections, 5G, blockchain, development of facilities to enhance material and energy efficiency and use, open standardised data platforms, e-identity, infrastructure for e-business among companies, etc.).    2. Connecting industry in local energy communities and utilising waste heat.    3. Investing in infrastructure to enhance self-supply with regard to waste management.    4. Support for energy self-supply industries. | MGRT, MOP, MZI, MJU | EUR 300 million |
| 1. Legislation and business environment    1. Promotion of sustainable production and consumption; raising the awareness of the public regarding the positive effects of using natural renewable resources.    2. Creating a stimulating economic environment (clear, consistent and feasible legislation, fast procedures for acquiring permits, encouraging a fiscal framework, etc.) for investment in a low-carbon circular economy.    3. Creating and strengthening markets for secondary materials and accelerating industrial symbiosis.    4. Green or circular public procurement to support the use of natural/renewable resources (e.g. supporting wood construction through green public procurement).    5. Promoting standardisation (active inclusion in co-designing and supporting the use of international standards), use of international certificates and intellectual property protection.    6. Introduction of a normative environment, comparable at the European level, to establish spin-offs. | All line ministries | - |

**REVIEW OF FUNDS OF THE MGRT FROM 2020 TO 2022**

The envisaged integral funds for the 2020–2022 period for the implementation of measures through the MGRT account for more than EUR 91 million, which is supplemented with repayable funds measures. Other ministries also contribute to the implementation of individual measures (MIZŠ, MOP, MJU, MZI) from their budget funds.

We will especially promote RDI, investments, entrepreneurship and the circular economy through European cohesion funds in the 2020–2022 period, and will earmark more than EUR 265 million from OP ECP 2014–2020. A very important segment of initiatives are repayable funds as loans, guarantees and capital inputs.

In the 2021–2027 period, we will provide funds for measures under the Recovery and Resilience Fund in the planned amount of EUR 427 million and from the Multiannual Financial Framework (around EUR 450 million) as well as the Just Transition Fund (approx. EUR 235 million). All these EU funds have not been confirmed by the EC; therefore the final value is still unknown.

There is a risk that not all activities will be implemented on a scale that would ensure achievement of the set goals, if sufficient incentives from the state are not ensured. Most measures are based on the envisaged funds from the MGRT; however, they are tied to the multiannual funds, plans and programmes of the ECP. Individual or additional funds from other ecosystem stakeholders (especially private ones) are not included in those envisaged funds.

The funds envisaged for the implementation of measures (national budget - realisation 2020, adopted 2021 and 2022, OP ECP – realisation 2020, rights of use 2021, 2022)

|  | FUNDS 2020 (IN EUR) | FUNDS 2021 (IN EUR) | FUNDS 2022 (IN EUR) | SOURCE |
| --- | --- | --- | --- | --- |
| 1. Research, development and innovation (RDI) | 20,512,122 | 21,352,629 | 15,049,437 | ECP |
| 1. Demonstration and pilot projects | 23,969,999 | 23,369,594 | 15,221,773 | ECP |
| 1. Inclusion in international research and development as well as innovation projects and programmes | 9,810,346 | 13,152,217 | 11,725,663 | ECP and Integral |
| 1. Networking and cooperation in research, development and innovation | 1,947,220 | 3,922,838 | 3,453,106 | ECP and Integral |
| 1. Supporting environment for enterprises | 11,165,308 | 12,289,594 | 12,019,780 | ECP and Integral |
| 1. Promotion of entrepreneurship and innovation | 323,191 | 270,000 | 270,000 | Integral |
| 1. Promotion of start-ups and enterprises with rapid growth potential | 1,980,559 | 2,160,000 | 2,160,000 | ECP |
| 1. Support to growth, development and preservation of enterprises, especially SME | 28,421,058 | 26,498,677 | 4,582,939 | ECP |
| 1. Non-technological innovation and business models | 3,638,858 | 3,081,470 | 4,066,820 | ECP |
| 1. Promotion of investments | 7,803,120 | 12,325,891 | 15,000,000 | Integral |
| 1. Internationalisation | 14,965,086 | 17,813,082 | 14,413,600 | ECP and Integral |
| 1. Strengthening competences, training, requalification, adaptation to demographic change | 36,210 | 550,000 | 553,346 | Integral |
| TOTAL | 124,573,077 | 136,785,992 | 98,516,464 |  |

# REVIEW OF CONTRIBUTIONS BY INDIVIDUAL SETS OF MEASURES TO INDIVIDUAL GOALS

A review of the contributions of individual sets of measures has been made on the basis of the table in section 6 and on the basis of individual goals under section 1.3.

| KEY selected goals 2030  Sets of measures | Labour productivity (the goal in 2030 is EUR 66 thousand added value per employee) | Export (goal in 2030, EUR 29.8 billion) | *GREEN*  Resource productivity (goal in 2030, 3.50 SKM/kg) | *Creative*  Innovation index and rise on scale EII among leading innovators (goal in 2030, 110% in EU) | *Smart*  DESI Index (goal in 2030, 60 points, 10th place) |
| --- | --- | --- | --- | --- | --- |
| INVESTMENTS IN RESEARCH AND TECHNOLOGICAL DEVELOPMENT |  |  |  |  |  |
| 1. Research, development and innovation (RDI): Tax relief for R&D and financial incentives with an emphasis on projects that express the option for speedy commercialisation of innovation in the form of new products, services or patents (TRL 6-9). | x | x | x | x | x |
| 1. Demonstration and pilot projects RDI: Incentives for supporting the most promising projects that contribute to the development of new technologies with an emphasis on green and digital. | x | x | x | x | x |
| 1. Inclusion in international research and development as well as innovation projects and programmes: promotion of design and inclusion in international research and development as well as innovation projects and programmes with the aim to break through to foreign markets. | x | x |  | x |  |
| 1. Networking and cooperation in research, development and innovation: managing and connecting established networks of innovation ecosystem stakeholders in Slovenia with certain measurable success parameters (new products, new patents, new international cooperation). | x | x |  | x |  |
| PROMOTING ENTREPRENEURSHIP |  |  |  |  |  |
| 1. Supporting environment for enterprises: measures for promoting start- and scale-ups, access to key information in one place, measures for digital transformation, measures for developing new business models. | x |  | x |  | x |
| 1. Promotion of entrepreneurship and innovation: communication campaigns, support for conferences, meetings and exhibitions, award programmes for entrepreneurship and innovation, entrepreneurship ambassadors. | x |  | x | x | x |
| 1. Promotion of start-ups and enterprises with rapid growth potential: initiatives for new enterprises, mentorship schemes, connection. | x | x |  | x | x |
| 1. Support for growth, development and preservation of enterprises, especially SME: beneficial debt financing (loans, guarantees, interest rates), seed and risk capital, initiatives for wood processing sector and energy transformation. | x | x | x | x | x |
| 1. Non-technological innovation and business models: support in introducing alternative business models (digital operations, sustainable operations ...), new internationalisation methods, automation of production processes. | x | x | x | x | x |
| PROMOTION OF INVESTMENTS AND INTERNATIONALISATION |  |  |  |  |  |
| 1. Promotion of investments: initiatives for strategic investments and investments with greater added value growth potential and an emphasis on green and digital. | x | x | x | x |  |
| 1. Internationalisation: performances in foreign markets, establishing representative offices, strengthening delegations, promotion of joint performance of enterprises in foreign markets. | x | x |  |  | x |
| INVESTMENTS IN HUMAN RESOURCES |  |  |  |  |  |
| 1. Strengthening competences and training: supporting models for predicting competences and strengthening knowledge and education needs for professions of the future with an emphasis on green, creative and smart development. | x | x | x | x | x |
| BUSINESS ENVIRONMENT |  |  |  |  |  |
| 1. Infrastructure: support to the construction of 5G, e-services, local energy communities. | x | x | x | x | x |
| 1. Legislation and business environment: stability and predictability, normative regulation comparable at the European level. | x |  | x |  |  |

# CONCLUSION

The Industrial Strategy sets the guidelines for the economy’s transition to a green, creative and smart economy and thus to an increase in competitiveness. During the preparation of this strategy, the world has been facing the coronavirus pandemic, thus making the challenge even greater than ever before. The biggest challenge of this moment is most certainly an economic, social and general recovery of countries. All this demands changes in the way of thinking and functioning in all areas. Thinking outside the box has become a necessity. Without a structural restoration of the European and Slovenian economy in the direction of a sustainable, inclusive and regionally balanced development, this will not be possible. We need to catch the wave of the fourth industrial revolution. Slovenia has the opportunity to use available European funds to ensure the needed investments in research and development, innovation, digitalisation, education and training for various professions of the future. The priority in the investment of European funds is to ensure the long-term competitiveness of the Slovenian economy.

The new 2021–2031 strategy determines the goals for the developmental break-through of Slovenian industry and the path to achieving those goals. The goal of the Industrial Strategy to 2030 is to achieve EUR 66,000 added value per employee, to transition to a circular economy and to strengthen the innovation drive of enterprises. Many measures that will focus on strengthening green, creative and smart development and help enterprises to change their business processes and reinforce their long-term position in the global market will be available for the implementation of the strategy in the coming years. This strategy aims to integrate into the wider context of the EU Industrial Strategy, which highlights the joint commitment of the EU, its member states and regions, industry, SMEs and other interested parties to a renewed partnership. Europe will be able to exploit industrial transformation in the direction of a green and digital transition, and at the same time increase the strategic autonomy of the economy.

The Think Small First principle has been in place in the EU for many years, meaning that when adopting laws, we first need to think about the micro enterprises that do not have enough resources to adapt to change. This Industrial Strategy aims to introduce the Think Green, Creative and Smart First principle, meaning that we want every measure, every development of a new product, service or business model, start-up of a new enterprise, new investments to initially think about how and in what way we can contribute to green, creative and smart development. In this way, we will strengthen our position and the international competitiveness of our industry and ensure that it remains a vital part of the Slovenian economy.

# LIST OF MOST COMMONLY USED ABBREVIATIONS

ARRS Slovenian Research Agency

BAT Best available technologies

GDP Gross Domestic Product

GAV Gross Added Value

CCS Carbon Capture and Storage

CCU Carbon Capture and Utilisation

CEE – 4 Group of 4 central European countries – Czech Republic, Hungary, Poland, Slovakia

DESI index The Digital Economy and Society Index (DESI)

DMC Domestic Material Consumption

AV Added value

EBITDA Earnings before interest, taxes, depreciation, and amortisation

EII Energy Intensive Industry

EC European Commission

ETS Emission trading system

EU European Union

EGD European Green Deal

GZS Chamber of Commerce and Industry of Slovenia

ICT Information and communication technologies

IoT Internet of Things

PRO Public research organisations

DMCC Design Management Competence Centre

CI Creative industries

CCS Cultural and creative sector

LCA Life cycle assessment

LULUCF Land Use Land Use Change and Forestry

MDDSZ Ministry of Labour, Family, Social Affairs and Equal Opportunities

MF Ministry of Finance

MGRT Ministry of Economic Development and Technology

MIZŠ Ministry of Education, Science and Sport

MJU Ministry of Public Administration

MOP Ministry of the Environment and Spatial Planning

SME Small and medium enterprises

MZI Ministry of Infrastructure

NECP National Energy Climate Plan

NGO Non-governmental organisations

RRA Research and developmental activity

RDI Research, development and innovation

R&D Research and development

S4 Slovenian Smart Specialisation Strategy

SID **Slovenska izvozna in razvojna banka d.d.**

**SIO Innovative Environment Subjects**

SIP Slovenian Industrial Policy

SIS Slovenian Industrial Strategy

PPS Purchasing Power Standard

SPIRIT Public Agency of the Republic of Slovenia for the Promotion of Entrepreneurship, Internationalisation, Foreign Investments and Technology

SPOT Network of Slovenian business points

SPS Slovenian Enterprise Fund

SRIP Strategic development and innovation partnership

SRSS Slovenian Regional Development Fund

SDS 2030 Slovenian Development Strategy 2030

SURS Statistical Office of the Republic of Slovenia

SVRK Government Office of the Republic of Slovenia for Development and European Cohesion Policy

GHG Greenhouse gases

TRL Technology Readiness Level

CEI Creativity, entrepreneurship and innovation

1. Interim monitoring and evaluation of the operation of SDIP in the 2017–2019 period, IER, FDV, FM UP, August 2019. [↑](#footnote-ref-2)
2. Recommendation of the EU Council COM (2020) 524 final and Recommendation of the EC COM (2020) 456 final, both of 27 May 2020. [↑](#footnote-ref-3)
3. Source: “How to tackle challenges in a future-oriented EU industrial strategy” on the basis of the European Observatory for Clusters and Industrial Change (2019). [↑](#footnote-ref-4)
4. The indicated goal arises from SDS 2030. Resource productivity is gross domestic product (GDP) divided by domestic material consumption (DMC). [↑](#footnote-ref-5)
5. [Eurostat - Circular Economy Indicators](https://ec.europa.eu/eurostat/web/circular-economy/indicators),

   [Eurostat - Circular Economy Indicators - Monitoring framework](https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework). [↑](#footnote-ref-6)
6. The sums by individual activities of processing activities in some data do not match the data for processing activities due to data confidentiality; in such cases, we have only considered data for enterprises within processing activities. [↑](#footnote-ref-7)
7. Deflator, considered for deflation, included the joint industrial product price index with producers in processing activities. [↑](#footnote-ref-8)
8. In legal entities, sole entrepreneurs and other registered natural persons. [↑](#footnote-ref-9)
9. In costs of factors, added value is calculated as gross income from business activities after adjustments for subsidies for operations and indirect taxes. Added value is charged “gross” in costs of factors, but value adjustments (such as amortisation) are not deducted. Since 2010, subsidies, grants, holiday pay, compensations and other income connected to business effects are considered in the calculation of added value. [↑](#footnote-ref-10)
10. Share of added value in revenue. [↑](#footnote-ref-11)
11. Investments in new and existing tangible fixed assets (buildings, machinery, patents, licences, etc.) with useful life longer than one year, including non-produced tangible fixed assets such as land. [↑](#footnote-ref-12)
12. Total internal expenditure for R&D, implemented in the territory of the Republic of Slovenia. [↑](#footnote-ref-13)
13. This group includes Poland, the Czech Republic, Hungary and Slovakia, which have a similar economy structure as Slovenia and are at a similar level of economic development. [↑](#footnote-ref-14)
14. The amount by which the indicator value in Slovenia is higher than the indicator median in the EU-27. [↑](#footnote-ref-15)
15. Calculation of added value in revenue. [↑](#footnote-ref-16)
16. EBITDA margin is the calculation of operating surplus in revenue. [↑](#footnote-ref-17)
17. [Recovery Plan for Europe](https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe_sl). [↑](#footnote-ref-18)
18. COM(2019) 640 final. [↑](#footnote-ref-19)
19. COM(2020) 460 final. [↑](#footnote-ref-20)
20. COM(2020) 102 final. [↑](#footnote-ref-21)
21. COM(2020) 103 final. [↑](#footnote-ref-22)
22. COM(2020) 98 final. [↑](#footnote-ref-23)
23. COM (2021)350 final. [↑](#footnote-ref-24)
24. COM(2020) 474 final. [↑](#footnote-ref-25)
25. [Innovation activity of enterprises 2016-2018](https://www.stat.si/StatWeb/News/Index/8769). [↑](#footnote-ref-26)
26. COM(2021) 118 final. [↑](#footnote-ref-27)
27. *The latest available data during the analysis preparation are for 2018.* [↑](#footnote-ref-28)
28. Margin reduction in some industries will be the result of margin convergence to the EU average. [↑](#footnote-ref-29)
29. This means that there should be more collaboration with the domestic service sector, outsourcing of certain high added value activities (marketing, design, PR). [↑](#footnote-ref-30)
30. With KIC – Knowledge and Innovation Communities within the European Institute of Innovation and Technology and Joint Research Centre of the European Commission. [↑](#footnote-ref-31)
31. The number applies to average felling from 2015 to 2019, when there were major natural storms, while the actual annual felling rate is lower, at around gross 5 million m³. [↑](#footnote-ref-32)
32. Export of round industrial wood (according to initial unofficial data in 2020) amounted to 1.4 million m3. [↑](#footnote-ref-33)
33. https://ec.europa.eu/info/publications/industry-50\_sl. [↑](#footnote-ref-34)
34. [Digital Europe Programme](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2406). [↑](#footnote-ref-35)
35. [Digital Innovation Hub Guidelines in Slovenia after 2020](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwifnM7f4Y7wAhUZ7aQKHY_-CvkQFjAAegQICRAD&url=https://www.gov.si/assets/ministrstva/MJU/DID/Strateski-okvir-DIH-2020.docx&usg=AOvVaw2aPjHhHm1rJZK-fwFDoPDI) . [↑](#footnote-ref-36)
36. Digital competences are of key importance for education, work and active participation in the digital society. The EC has in cooperation with member states prepared the Digital Competence Framework for Citizens [DigComp 2.1.](https://www.zrss.si/pdf/digcomp-2-1-okvir-digitalnih-kompetenc.pdf) and constantly updated), which contains 21 competences in the following areas: information literacy, communication and cooperation, preparation of digital content, security and problem solving. [↑](#footnote-ref-37)
37. Evaluation of financial assets based on the needs and envisaged sources from the Multiannual Financial Framework (Cohesion Policy 2021–2027), Recovery and Resilience Facility, Climate Change Fund and the budget of the RS. [↑](#footnote-ref-38)