Eco-innovation in Slovenia

EIO Country Profile
2014-2015
Eco-Innovation Observatory

The Eco-Innovation Observatory functions as a platform for the structured collection and analysis of an extensive range of eco-innovation information, gathered from across the European Union and key economic regions around the globe, providing a much-needed integrated information source on eco-innovation for companies and innovation service providers, as well as providing a solid decision-making basis for policy development.

The Observatory approaches eco-innovation as a persuasive phenomenon present in all economic sectors and therefore relevant for all types of innovation, defining eco-innovation as:

“Eco-innovation is any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle”.

To find out more, visit www.eco-innovation.eu and ec.europa.eu/environment/ecoap

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Commission.
Eco-Innovation Observatory

Country Profile 2014-2015: Slovenia

Author: Danijel Crnčec

Coordinator of the work package: Technopolis Group Belgium
Acknowledgments

The author would like to thank for their valuable support in the preparation of this report to:

Mr Hinko Šolinc, the Director of Eco Fund, Slovenian Environmental Fund,
Marina Vovk, Director, Reuse Centre Ormož,
Aleš Ugošek, Project Manager, M Sora,
dr. Maja Bučar and dr. Metka Stare, Centre of International Relations.

A note to Readers

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Union. A number of companies are presented as illustrative examples of eco-innovation in this report. The EIO does not endorse these companies and is not an exhaustive source of information on innovation at the company level.

This brief is available at https://ec.europa.eu/environment/ecoap/slovenia
# Table of contents

Summary...........................................................................................................................................1

Introduction.........................................................................................................................................2

1 | Eco-innovation performance...........................................................................................................4

2 | Selected circular economy and eco-innovation areas and new trends........................................7

3 | Barriers and drivers to circular economy and eco-innovation in Slovenia..............................13

4 | Policy landscape: towards circular economy in Slovenia.............................................................16

References..........................................................................................................................................24

ANNEX: Policy measures addressing circular economy and eco-innovations in Slovenia........27
Summary

Slovenia faces numerous opportunities and challenges in the transition towards a circular economy and in eco-innovation development. On one hand, it is the third most forested country in Europe, abundant with natural capital, and endowed with a high level of biodiversity and rich natural habitats. On the other hand, economic and systemic challenges still remain and do not facilitate and encourage the transition towards a circular economy.

The Slovenian Government supports the concept of circular economy, but the gap between declaratory support and real measures for the transition towards a circular economy remains. The main drivers currently represent private sector, non-governmental organisations and local communities that promote a more sustainable lifestyle and develop eco-innovative and circular economy products and solutions, most often solely with their own financial resources and/or EU funds.

In comparison with 2013, Slovenia’s rank in the EU Eco-Innovation Scoreboard (Eco-IS) has not changed significantly: in 2015, Slovenia ranked 16th, one place lower than in 2013. Nevertheless, Slovenia has improved its composite index score: in 2013 Slovenia reached only 74.3% of the EU average, but in 2014 and 2015 Slovenia reached 90.7% and 96% of the EU average respectively. In particular, Slovenia has improved in indicators on employment and turnover in eco-industries, but this must be balanced with the fact that in 2015 the country saw no green early-stage investments. Overall, Slovenia’s performance has improved and was close to the EU average in 2015, as indicated by the index of 96.

Slovenian companies in general are not highly competitive and do not have a very high value added per employee. Therefore it is crucial for them to join the transition towards a circular economy that has begun in the European Union. Even in some areas where Slovenian companies are only suppliers of raw materials or semi-finished products to foreign companies, the measures can provide incentives for entrepreneurs to invest in eco-innovation and environmentally friendly end products, where added value is higher. This is essential for Slovenia because of the low material productivity and high energy intensity of its economy (road traffic also contributes considerably to the negative picture).

The government has announced circular economy and green development as Slovenia’s strategic objectives and it has taken the first steps in creating the needed political framework. The leading areas for circular and eco-innovative development remain climate and automotive technologies, efficient electric equipment and mobility, eco-houses and energy efficiency in buildings, and sustainable construction.
Introduction

Slovenia, one of the smallest countries in Europe with 2 million inhabitants, is tucked between Italy, Austria, Croatia and Hungary. It is characterised by a great diversity in landscape, flora and fauna on account of the different climatic and geomorphologic features of the Alpine, Mediterranean and Pannonian regions. Its most important natural resources are water, forests, karst landscape and biodiversity, representing an important advantage and opportunity for the transition towards circular economy. Since the 1980s, national campaigns have been focused on this potential, resulting in political awareness and engagement for a positive development model. Various Slovenian companies have developed new products and solutions to their manufacturing processes that represent good practices in green business. Besides innovative private companies, non-governmental organisations and local public authorities, which increasingly promote a more sustainable lifestyle and eco-innovative development, are important drivers towards a circular economy.

Nevertheless, as in earlier EIO Country Profiles, Slovenia still faces numerous challenges in the transition towards a circular economy and development of eco-innovations. On one hand, economic indicators have improved since 2013, but on the other hand, companies, especially start-ups and SMEs, still find it difficult to aggregate funds for research and development (R&D), as well as for developing production and market penetration for green products and services. The banking sector is still not flexible enough in providing the efficient incentives and instruments that would encourage companies to change their business models towards more circular and eco-innovative solutions.

Government expenditure on R&D continues to decrease and, in addition to the funds from private sector (mainly several large leading innovative enterprises), important sources of funding for R&D in Slovenia were funds from abroad. For SMEs in particular, these sources, mostly EU funds, often represent the only financial driver in developing circular and eco-innovative products and business solutions (Ugovšek, 2016). SMEs also point out the gap between the declaratory support of the government to the transition towards circular economy and the lack of systemic solutions that would facilitate and encourage this transition, as well as the needed financial mechanisms.

Despite some positive developments, an important barrier remains inefficient transfer of knowledge from higher education to the private sector. The system of higher education in Slovenia remains insufficiently adapted to the needs of the private sector. Slovenia has an above-average number of employees engaged in eco-industries, but their activities and investments do not produce results in terms of successful eco-innovations. This discrepancy is largely based on the account of “bad connections between academic research and industry, and the poor transfer of developed technological solutions and products to the market” (Slovenian Industry Policy, 2013).

In contrast to the last EIO Country Profile on Slovenia, in 2013, it should be pointed out that some developments have taken place in creating a coherent political framework that would encourage the transition towards a circular economy and the development of eco-innovations. Slovenia has supported the integrated approach from the European Commission to “close the loop” of product lifecycles and stimulate the transition towards a circular economy. In October 2015, Slovenia adopted a similar approach with its framework programme for the transition to green economy (in Slovene). It has been set as a strategic guideline, and the government aims to design and implement measures to create conditions for more green and sustainable growth and development and to steer the process of transition to a green economy.
The circular economy is also one of the nine priorities of Slovenia’s Smart Strategy Specialisation (S4), which has been coordinated with the European Commission. This aims to concentrate development investments in areas where Slovenia has the critical mass of knowledge, capacities and competences and where there is innovation potential for Slovenia to position itself in global markets. The Slovenian Government has also set as one of its most important priorities the preparation of a new Slovenian development strategy. The document “Slovenia’s Development Strategy for the period 2006–2013” had expired, but a new strategy along with other relevant documents (expected in 2013) has not been adopted to date. A new strategy will define key development goals for 2030, followed by a medium-term action plan.

Finally, key barriers remain. Despite the issues mentioned above, the primary resource intensity of the Slovenian economy remains high, 50% above the EU average (Eurostat, 2016c), and dependant on substantial imports of raw materials, almost 45% in 2014 (Eurostat, 2016d), while domestic resources remain unused (wind) or underused (biomass, hydro, geothermal, etc.). In addition to long administrative procedures, an important systemic challenge remains in relation to the transport sector, where an unfavourable modal split, an extremely high volume of freight transport, a downward trend in public passenger transport, and an above-average share of transport in total energy consumption mean that it contributes 50% of all greenhouse gas (GHG) emissions.

Transition to a circular economy remains a long-term process and only coherent policies with concrete measures (including economic policies) will create a stable and predictable investment and development environment to facilitate and stimulate the continuation of the process that has begun. The transition towards a circular economy has been announced as a Slovenian strategic objective – active partnership and cooperation of all stakeholders will be of key importance in establishing a broader social consensus and an appropriate supportive environment.
1 | Eco-innovation performance

The analysis in this section is based on the EU-28 Eco-innovation scoreboard (Eco-IS) for the year 2015. Via its composite Eco-innovation index, produced by the Eco-Innovation Observatory (EIO), Eco-IS demonstrates the eco-innovation performance of a country compared with the EU average and with the EU top performers. Eco-IS is based on 16 indicators, aggregated into five components: eco-innovation inputs, activities and outputs, environmental and socio-economic outcomes.

Figure 1 EU-28 Eco-Innovation Scoreboard 2015, composite index

Source: EIO, 2016

The overall Eco-IS composite index 2015 for Slovenia is 96 (Figure 1), placing Slovenia 16th in the EU ranking of eco-innovative countries, with Denmark, Finland, and Ireland as the leaders. In comparison to the 2014 and 2013 scoreboard, Slovenia’s composite index has increased. Namely, in 2014 and 2013 Slovenia performed below the EU average but with an index of 74.3 in 2013 and 90.7 in 2014. Slovenia ranked 15th and 16th in 2013 and 2014 respectively (though caution must be used when comparing 2015 and 2014 indices with 2013 indices, as the scoreboard is being reviewed constantly, and potential new data sources to improve the indicators in the scoreboard are screened in every round of updates).

A detailed view of the five components of the Eco-IS composite index for Slovenia reveals that the component representing socioeconomic outcomes changed significantly, while Slovenia performed similarly in 2015 in the other four components of the composite index as in 2014 and 2013.

The eco-innovation inputs component reveals that Slovenia improved in government environmental and energy R&D appropriations and outlays (as a share of GDP). In 2015 (based on 2014 data), Slovenia reached 93% of the EU average, whereas in 2013 (2012 data) it had reached only 72%. One has to note...
that Slovenian government expenditure on R&D in absolute terms decreased, but the decrease on the EU level was even larger. Consequently Slovenia performed better (in relative terms) in 2015 than in 2013 compared to the EU average. Slightly worse was Slovenian performance in total R&D personnel and researchers (as a percentage of total employment) in 2015 (2014 data) compared to 2013 (2012 data). Nevertheless, in 2015 Slovenia reached 129% of the EU average, while in 2013 it had reached 138%. As in 2013 (data 2010-2013), Slovenia in 2015 (data 2012-2015) had no green early-stage investments. Despite this, Slovenian overall performance in the eco-innovation inputs component in 2015 (74%) was better than in 2013 (70%).

**Figure 2 Components of the eco-innovation composite index for Slovenia, 2015**

Source: EIO, 2016

The eco-innovation activities component of the composite index for Slovenia reveals that, while there are no data on firms having implemented innovation activities aiming at a reduction of material or energy input per unit output (the data from 2008 have not been updated respectively), the number of ISO 14001 registered organisations (per million of population) increased from 204 in 2013 (2012 data) to 206 in 2015 (2014 data). However, the Slovenian index slightly decreased from 98% of the EU average to 92%. Consequently, Slovenia performed a little worse in the eco-innovation activities component in 2015 (92%) than in 2013 (98%).

The eco-innovation outputs component of the composite index reveals, that Slovenia significantly improved in eco-innovation-related patents (per million of population) in 2015 compared to 2013. In 2013 (2010 data) Slovenia reached only 2.5 eco-innovation-related patents per million of population, while in 2015 (2012 data) Slovenia reached 10.3. Nevertheless, the Slovenian composite index in 2015 was still well below the EU average (55%). Meanwhile, Slovenia performed well in eco-innovation-related publications (per million of population). In 2013 (2012 data) it had reached 17 eco-innovation related publications per million population, or 193% of the EU average, while in 2015 (2014 data) it
reached 29.6, or 183% of the EU average. Eco-innovation related media coverage in Slovenia increased more than threefold (from 0.05 in 2013 to 0.18 in 2015 per number of electronic media). However, this increase was slower than in the EU as a whole, so the Slovenian index in this component fell from 72% of the EU average in 2013 to 55% in 2015. Overall, the Slovenian performance in the eco-innovation outputs component in 2015 was similar to 2013, i.e. 98% or 99% of the EU average respectively.

The environmental outcomes component of the index reveals that Slovenia has improved in material productivity, calculated as GDP relative to Domestic Material Consumption, and measured in euros per kilogramme (EUR/kg), according to 2013 data. In 2013 (2011 data), Slovenia reached 84% of the EU average, while its performance in 2015 (2013 data) increased to 91% of the EU average. In other environmental outcomes components of the index Slovenia in 2015 performed similarly to 2013.

Energy productivity, calculated as GDP relative to gross inland energy consumption, and measured in euros per tonne of oil equivalent (EUR/toe) (2013 data), with 77% of the EU average, remained similar to the score of 76% in 2013 (2011 data). GHG emissions intensity (measured as CO2/GDP) improved slightly. In 2015 (2013 data) Slovenia reached 83% of the EU average while in 2013 (2011 data) it reached 80%. The component on water productivity, calculated as GDP relative to Water Footprint, and measured in euros per cubic metre of water (EUR/m³) (data 1996-2005) has, however, not been updated – Slovenia remains at 60% of the EU average. Overall, Slovenia performed slightly better in the environmental outcomes component of the index in 2015, with 78% of the EU average compared to 75% in 2013.

In the socioeconomic outcomes component of the index a significant change occurred. Exports of products from eco-industries (as a percentage of total exports) in 2015 (2014 data) represented 0.59% of total exports, while in 2013 (2011 data) they had represented 0.57%. Nevertheless, Slovenia in 2015 reached 87% of the EU average while in 2013 it reached 98%.

A significant change occurred in the employment in eco-industries and turnover (revenue) in eco-industries components of the index. In terms of employment in eco-industries, Slovenia in 2013 reached only 15% of the EU average (i.e. 0.11% of total employment across all companies) and the turnover (revenue) in eco-industries represented only 21% of the EU average (0.09% of total revenue across all companies). In 2015, however, employment in eco-industries represented 4.63% of total employment across all companies and reached 183% of the EU average. Meanwhile, turnover (revenue) in eco-industries represented 3.42% of total turnover across all companies and reached 156% of the EU average. However, one has to note that different databases were used in 2013 and 2015 and caution must be used when comparing these indicators. Nevertheless, the database used for 2015 has far better coverage of companies and the results show that compared to other components this is the one in which Slovenia performs highest.

However, by comparing the components of the 2015 Eco-IS index for Slovenia, one can see that Slovenia performed above the EU average only in the socioeconomic outcomes component. Moreover, while Slovenia ranked second highest in the EU in this component, the country performed below the EU average in other eco-innovation components, which leads to the conclusion that in Slovenia there was an above-average number of employees engaged in eco-industries, but their activities and investments were not fully/proportionally realised in other eco-innovation components, such as new eco-innovation-related patents for technologies and products. As already pointed out in the Slovenian Industry Policy (2013) this discrepancy is mainly on account of “bad connections between academic research and industry, and the poor transfer of developed technological solutions and products to the market”.

6
By comparing the 2015 Eco-innovation scoreboard composite index for Slovenia with the results for 2013 one can conclude that Slovenia’s rank has not changed significantly (15th in 2013 and 16th in 2014 and 2015). Furthermore, Slovenia in 2015 still had no green early-stage investments. Nevertheless, Slovenia’s overall performance improved — in 2013 Slovenia reached only 74.3% of the EU average, whereas in 2014 and 2015 it reached 90.7% and 96% of the EU average respectively. Even though a certain impact could be assigned to a better performance in indicators on employment and turnover in eco-industries (change of databases used) it should be noted that Slovenia improved in two components: government environmental and energy R&D appropriations and outlays (from 72% in 2013 to 93% of the EU average in 2015) and eco-innovation-related patents in 2015 compared to 2013 (from 2.5 to 10.3 per million of population). Overall, Slovenia’s performance in 2015 improved and was close to the EU average (96%). Nevertheless, opportunities for further improvements remain.

2 Selected circular economy and eco-innovation areas and new trends

The circular economy presents an important opportunity for Slovenia to boost economic development and employment and decrease its environmental impact. Slovenia is an open economy, largely dependent on European and global economic developments. However, Slovenian companies in general are not highly competitive and do not have a very high value added per employee, or material and energy productivity. Therefore it is crucial for them to join the transition towards the circular economy that has begun in the European Union (Oblak, 2016).

In 2014 the Ministry for Economic Development and Technology published results of a survey that focused primarily on small and medium-sized companies (SMEs) and their attitudes towards eco-innovations and eco-design (Glasenčnik et al., 2014). The results of this survey demonstrated that more than half of participating companies systematically develop human resources in the area of eco-innovations and more than three quarters of companies follow the principles of eco-design. Where enterprises develop eco-innovations, they focus primarily on products and not services or business practices. Of the participating companies, micro- and small enterprises devote the largest share of their revenues to the development of eco-innovations. In general, participating companies demonstrated that they are familiar with eco-design and develop eco-innovations. Furthermore, they are willing to invest in eco-design and eco-innovations in the future.

Slovenian companies are mostly suppliers, and as such they are more sensitive to new trends, including the implementation of the circular economy principles, in large multinational companies. Therefore Slovenian economy and companies have to be proactive (Košir Godina, 2016). A good practice example of a circular economy development in Slovenian business is demonstrated by the companies Slovenian Steel Group and Petrol Energetika and their project of exploiting waste heat from industry for district heating in the commercial area and town of Ravne na Koroškem. Another good practice example of a circular economy development is the innovative regeneration system ECONYL® that is based on sustainable chemistry. With this process, the Nylon contained in waste, such as carpets, clothing and fishing nets, is transformed back into raw yarn for new textiles (carpets and garments) without any loss of quality. Both examples show that certain Slovenian companies lead the way towards a circular economy. However, a strategic systemic approach is needed (Košir Godina, 2016). Furthermore, in
order to transition to a circular economy, which is one of Slovenia’s strategic focuses, active partnerships between all stakeholders are vital. In this respect, political examples and support are crucial and the Slovenian Government is aware that all policies will have to be systematically adjusted, from tax and fiscal policy to public procurement and research (see more in the Policy Landscape chapter) (Government of the Republic of Slovenia, 2015).

Referring to innovation areas analysed and presented in previous EIO Country Profiles for Slovenia, the leading areas for eco-innovation remain climate and automotive technologies, efficient electric equipment and mobility, renewable sources of energy, eco-houses and energy efficiency in buildings, sustainable construction, and new materials (nanomaterials, biomaterials, etc.).

In the field of climate and automotive technologies, Hidria, an industrial conglomerate which provides integral solutions, continues to be a European and global innovative leader. Hidria, which was declared the most innovative company in Europe in 2013, won the CLEPA First Award for Best Innovation in Green Technologies for the Hidria Optymus Pressure Sensing diesel engine cold-start system. With this next generation diesel engine, judged most innovative solution in Europe in the “Green Technologies” flagship category of the awards, fuel consumption and poisonous gas emissions will be reduced by up to 30% (Hidria, 2016a). Hidria also won an award of the most Environmentally Friendly Company in Slovenia in November 2015 (Hidria, 2015a). In the sector of efficient home appliances Gorenje remains a leading Slovenian and European company with its focus on innovative user- and environment-friendly products.

Important eco-innovation areas in Slovenia remain energy efficiency in buildings and sustainable construction, with several leading companies such as Trimo, Lumar, Knauf Insulation, Riko and also SMEs seeking a breakthrough by developing innovative energy efficient products. Good examples are M SORA and SILVAPRODUKT, two Slovenian SMEs dedicated to wood products and wood preservation that in cooperation with the Biotechnical Faculty, University of Ljubljana, developed an eco-friendly passive window coated with an innovative preservative wax that significantly reduces cracking, which is the main cause for wood decay (see good practice example below).

The business sector remains to be the key generator of R&D in Slovenia. Its share in gross domestic expenditure on R&D (GERD) has been steadily increasing since 2010 (Eurostat, 2015). In 2014, the largest share of total gross domestic expenditure on R&D was contributed by companies (€608.8 million, or 68% of total funding). The next largest share of GERD was that of the government (€193.9 million, or 22% of total). Another important source of funding for R&D in Slovenia was funds from abroad. In 2014 they amounted to €82.5 million, or 9% of the total (Statistical Office RS, 2015). However, compared to 2013, companies contributed €11.8 million more, while government funds were lower by 23%, or €57.3 million. Slovenia thus remains alongside Germany and Finland as one of the countries where the business sector, mainly several large leading innovative companies, provides the largest share of gross domestic expenditure on R&D (Umar, 2015). SMEs, however, still find it challenging to acquire the funds needed for R&D or to set up large-scale production and promote new eco-products and/or technologies.

A more sustainable lifestyle and energy efficiency continues to be actively promoted by local authorities, non-governmental organisations and companies in order to raise public awareness on eco-food, waste management, and traffic emissions. An excellent good practice example represents the capital Ljubljana that has won the European Green Capital Award 2016 (see good practice example below).
**Hidria Optymus Pressure Sensing diesel engine cold-start system with pressure sensors**

**Description:** While the standard glow plug enables the efficient cold start of a diesel engine, Hidria's Optymus Pressure Sensor System is converting it into a core player in future diesel engines that constantly monitor the burn-off process in the combustion chamber and radically optimise it during the whole operating time of the engine. Optymus Pressure Sensor measures the pressure in the cylinder using a piezoelectric pressure sensor transducer and an integrated smart microelectronic ASIC to process the signal with accuracy, similar to reference laboratory pressure sensors. The level of accuracy is unprecedented for glow plugs technology. The result of its integration into a corresponding engine management system is the reduction of fuel consumption and emissions by up to 30% compared with today's standard solutions.

**Most important driving factors:** Optymus Pressure Sensing System radically cuts fuel consumption in diesel engines and significantly contributes to health and environmental protection.

**Impact it generates:** The reduction of fuel consumption and emissions of up to 30% compared with today's standard solutions.

**Keywords:** diesel engine, cold-start system, reduction of fuel consumption, reduction of emissions

**Internet links:**
- [Hidria won CLEPA First Award for Best Innovation in Green Technologies](#)
- [The Slovenia Times](#)

**Contacts for further information:**
- Erik Blatnik, Hidria d.o.o., Spodnja Kanomlja 23, SI-5281 Spodnja Idrija, Slovenia, T: +386 8 202 8265, E: pr(at)hidria.com

Source: The Slovenia Times, 2016
Modernisation of the electric arc furnace and the new vacuum ladle furnace in the steel plant

**Description:** This project represents the innovation of exploiting waste heat from industry for district heating in the commercial area and in the town of Ravne na Koroškem, developed jointly by the SIJ Group, or more exactly, by its company Metal Ravne and Petrol Energetika. It entails the use of waste heat from the cooling of the electric arc furnace at Metal Ravne, which up to now has been unexploited and released into the environment via cooling towers. The project is the first in Slovenia to exploit industrial waste heat for district heating. It is the winning project and recipient of the Environmentally-Friendly Service Award at the 2015 traditional Environmental Meeting of the magazine “Finance”. The project has great potential for further development and extensive implementation, since it is the first of its kind in Slovenia to successfully seek out and connect the users of waste heat and to develop the necessary technical and organisational solutions, which is the greatest challenge for such projects.

**Most important driving factors:** The project enables the utilisation of part of the waste heat for a district-heating scheme, which is used to heat hot water for industrial companies in the area and other consumers in the municipality.

**Impact it generates:** The project enables a long-term, reliable supply of heat, the beginning of a reduction in greenhouse gas emissions in the Ravne area, and makes a significant contribution to sustainable development and the quality of life in the municipality. The amount of greenhouse gas emissions will be reduced by 1500 tonnes per year, and Metal Ravne will also save some electricity, as the burden of the cooling system will be decreased.

**Keywords:** Modernisation of the electric arc furnace, waste heat, district heating

**Internet links:**
- [SIJ Group](http://www.sij.si)
- [Petrol.si](http://www.petrol.si) (in Slovenian)
- [oe.finance.si](http://www.oe.finance.si) (in Slovenian)

**Contacts for further information:**
- Samo Lečnik, [samo.lecnik@sij.si](mailto:samo.lecnik@sij.si), +386 1 242 98 84, Skupina SIJ d.d., Ljubljana, Gerbičeva 98, 1000 Ljubljana
- M.A. Aleksander Salkič, [aleksander.salkic@petrol.si](mailto:aleksander.salkic@petrol.si), +386 1 47 14 581, Petrol d.d., Ljubljana, Dunajska 50, 1527 Ljubljana

Source: [Sij.si](http://www.sij.si)
WINThERWAX – WIndow based on THERmally modified wood with high performance WAX coating

Description: M SORA and SILVAPRODUKT, two Slovenian SMEs dedicated to wood products and wood preservation in cooperation with the Biotechnical Faculty, University of Ljubljana, developed WINThERWAX, a passive window made out of Norway spruce (Picea alba). Thermally treated wood is processed through the unique SILVAPRO patented process, and coated with an innovative preservative wax. It is the winning project and recipient of the Environmentally-Friendly Product Award at the 2015 traditional Environmental Meeting of the Slovenian magazine “Finance”.

Most important driving factors: It is eco-friendly (including its innovative coating, which is a unique biocide-free wax that reduces cracking which is the main cause for wood decay), and with a high aesthetic value (the translucent wax allows this product to preserve the natural look of the wood, in contrast to current oils and varnishes).

Impact it generates: A cost-effective wooden passive window is highly durable (class 1, more than 25 years fully exposed in the environment) and it provides an excellent thermal insulation, being highly energy efficient (Thermal transmittance = 0,09 W/m²K).

Keywords: wooden passive window, thermal insulation, energy efficient

Internet links:
- Wintherwax.si
- Executive Agency for SMEs

Contacts for further information:
- M SORA d.d., dr. Aleš Ugovšek (project manager), ales.ugovsek@m-sora.si, +386 31 611 059, Trg svobode 2, 4226 Žiri, Slovenia
- Silvaproduct, Gregor Rep, gregor.rep@silvaproduct.si
- University of Ljubljana, Biotechnical faculty, Department of Wood Science and Technology, prof. dr. Miha Humar, miha.humar@bf.uni-lj.si

Source: Wintherwax.si
**ECONYL® Regeneration System**

**Description:** The innovative ECONYL® Regeneration System is based on sustainable chemistry. With this process, the Nylon contained in waste, such as carpets, clothing and fishing nets, is transformed back into raw material without any loss of quality. The creation of ECONYL® products is actually “waste positive”. This means the amount of waste removed from the earth is greater than the amount of waste resulting from production. On top of that, the production has a low environmental impact because the consumption of natural resources and energy is limited to a minimum.

The Slovenian company Julon that belongs to Aquafil Group and is the heart of the ECONYL® Regeneration System was awarded by the Slovenian magazine “Finance” in 2014. Aquafil also won the Italian Radical Green 2016 Award during the Green Week for its efforts in improving the sustainability of its process, especially for the ECONYL® Regeneration Process.

**Most important driving factors:** the regeneration of Nylon 6 waste into yarn for new textiles (carpets and garments) and the reduction of the amount of global waste by collecting it from landfills and oceans and feeding it back into production cycles.

**Impact it generates:** For every 10,000 tonnes of Econyl® Caprolactam 12,600 tonnes of waste is eliminated, 70,000 barrels of crude oil saved, 42,000 tonnes of CO₂-equivalent emissions avoided and 865,000 GJ of total process energy saved.

**Keywords:** waste regeneration system, nylon 6, caprolactam

**Internet links:**
- Julon awarded with Slovenian environmental award for the ECONYL® Regeneration System
- Econyl

**Contacts for further information:**
- Maria Giovanna Sandrini, Brand Manager, mgsandrini@econyl.com
- SAMARA CROCI, Project Manager, scroci@econyl.com

Source: Econyl.com
3 | Barriers and drivers to circular economy and eco-innovation in Slovenia

In 2013 manifold barriers to the development of eco-innovations in Slovenia were identified. On one hand, some of them were perceived as constraints deriving from the global economic recession and banking crisis. On the other hand, the majority of barriers were primarily derived from the current state of the economy and political developments in Slovenia. Since 2013 some important changes have taken place, however various systemic barriers to eco-innovation and transition towards a circular economy still have not been overcome.

Slovenia is a small and open economy largely dependent on the international economic environment. The European common market represents an important opportunity for eco-innovations that otherwise would not be realised due to the small national market, which often lacks sufficient eco-related demand. In the last two years, growth of the economy was positive and external trade in 2015 was the highest since Slovenia joined the EU in 2004 – compared to 2014 Slovenia’s exports increased by 4.4% and amounted to €23,942 million (SORs, 2015b). “Most Slovenian exporters are suppliers, and so they are forced to change in accordance with their main customers, while those companies less dependent on export, are not so opened to sustainable business models” (Košir Godina, 2016). The main drivers of circular economy and eco-innovation in Slovenia remain several large enterprise companies that have accumulated sufficient financial, technical, and human resources to invest in R&D and to promote and develop sustainable and eco-innovative products and services.

On one hand, the share of business enterprise sector in gross domestic expenditure on R&D has been steadily increasing since 2010, while on the other hand, government funds have tended to decrease (in 2014 they were lower by 23% compared to 2013). As the banking sector is not flexible enough in providing the efficient incentives and instruments that would encourage companies to change their business models, an important source of funding for R&D, especially for SMEs that often find it difficult to access much needed funds for R&D in general, are funds from abroad (largely EU funding). Moreover, for SMEs the EU funds and policies often represent the only financial and political driver for developing circular and eco-innovative products and business solutions (Ugovšek, 2016).

Private sector and some specific businesses, such as social entrepreneurship, have pointed out as the main barrier in the transition towards a circular economy a lack of financial incentives. They note a “huge gap between a declaratory and de facto support to circular economy (Vovk, 2016)”. Social and green entrepreneurship such as Re-use (see good practice example below) has an important social, environmental and financial impact. However, on account of its specificity it cannot create a stable business solely on the basis of market revenues. As its impacts go beyond the financial dimension the government should, in order to facilitate and encourage such good practices, promote and stimulate the efficient use of resources with adequate financial measures.

An important barrier for the development of circular and eco-innovative products and services has in many cases been the Slovenian “rule of the lowest price” in public procurement, which “favours price over quality and in majority of cases rules out green and sustainable solutions since they cannot compete solely on the basis of price”. In many cases “circular economy activities and eco-innovation are a result of solely enthusiasm and self-awareness of companies” (Ugovšek, 2016).
Another important barrier to a shift towards a circular economy has been a lack of information, knowledge and targeted communication. “Many companies, and even some government structures, still see the circular economy as a movement promoted by NGOs, primarily related to recycling” (Košir Godina, 2016). Furthermore, inefficient transfer of knowledge from higher education to private sector has already been noted as a barrier in the past. The system of higher education in Slovenia is, according to the private sector, insufficiently adapted to their needs. Slovenia has a high number of research and development personnel employed directly in R&D compared to the EU as a whole (1.46% of the labour force in 2014 compared to 1.14% in the EU average) (Eurostat, 2016b) and an above-average number of employees engaged in eco-industries. But their activities and investments produce below-average results (e.g. new patents for technologies and products) (see Figure 2.2). “This discrepancy is mainly due to bad connections between academic research and industry, and the poor transfer of developed technological solutions and products to the market” (SIP, 2013).

Nevertheless, one has to note that Slovenia increased eco-innovation-related patents in 2015 compared to 2013. It also performed well in the eco-innovation-related publications and eco-innovation related media coverage increased (though slower than in the EU), indicating a positive trend related to the development of knowledge and its general dissemination. As already reported in the EIO Country Profile for 2013, a baseline consensus on the green agenda in Slovenian society, and political and business communities continues to grow. The media (domestic and international) plays an important role in positively influencing Slovenian society in adopting a more sustainable lifestyle. Another important driver comes from non-governmental (environmental) organisations, local public authorities and private companies, which increasingly promote a more sustainable lifestyle and eco-innovative development. A good example is the capital Ljubljana, the Green Capital of Europe 2016 (see Good practice example). Its green policy is reflected in the city’s green purchases (representing more than 70% of all city investments), for example.

An important barrier that had been noted in previous country briefs has been the lack of an integrated policy or framework focusing on eco-innovations in Slovenia. Moreover, the adoption and implementation of the needed legislative and non-legislative acts has been lagging behind, along with the lack of any capacity to take collective political action towards more green and eco-innovative policies. Another important barrier pointed out by the companies in the past had been long and inefficient administrative procedures and the lack of financial incentives. However, with the election of a new government some developments have finally taken place (see Section 4 on the policy landscape).

In September 2015, Slovenia’s Smart Strategy Specialisation (S4) was adopted. The circular economy is one of its nine priorities and it should concentrate development investments in areas where Slovenia has a critical mass of knowledge, capacities and competences and where there is innovation potential for positioning Slovenia in global markets. In October 2015 “the Framework programme for the transition to green economy” was adopted – it represents a similar approach to the circular economy.

The government aims to design and implement measures to create conditions for a more green and sustainable growth and development and to steer the process of transition to a green economy. A working group led by the Ministry of Environment and Spatial Planning has invited all interested stakeholders (local communities, public sector, NGOs and universities) to join in monitoring and facilitating the implementation of the Framework programme. Various workshops and conferences have been organised to address challenges, represent good practices and promote the transition to a circular economy. Some Slovenian companies and especially local communities have been very active and have already initiated or proposed plans to cooperate or coordinate sustainable goals and projects.
Finally, the Slovenian Government has set as one of its most important priorities the preparation of a new Slovenia’s Development Strategy. The Slovenian Prime Minister Cerar noted that the concept of circular economy, if it becomes the foundation of Slovenia’s Long-Term Development Strategy, would “guarantee the needed social consensus and the establishment of an appropriate supportive environment”. Slovenia has at its disposal abundant natural resources, especially biomass, geothermal and hydro energy, which, however, remain underused or not used in a sustainable way.

If in the past the EU funds and policies often represented the only, or at least the decisive, impetus in “greening” of Slovenian policies, it could be optimistically noted that Slovenia has started to push forward some initial steps that could in future lead to a paradigm shift in Slovenia’s economy and politics. As stated already in the Slovenian industrial policy from 2013: “measures can provide incentives for entrepreneurs to invest in eco-innovation and environmentally friendly end products, where added value is higher. This is essential for Slovenia because we have a problem due to low material productivity (the ratio between GDP and use of resources) and the high energy intensity of the economy (road traffic also contributes considerably to the negative picture).” Initial developments have started, but policies and measures remain to be implemented in a long-term process that will last beyond the government currently in office, and many systemic obstacles specific for Slovenia, such as long and inefficient administrative procedures, remain to be challenged in future.

4 | Policy landscape: towards circular economy in Slovenia

A look back to the EIO Slovenia Country Profile in 2013 reveals that Slovenia was significantly influenced by political changes, the challenges of consolidating public finances and the search for short-term solutions regarding the effects of the persisting financial and economic crisis (OECD, 2013), which was posing serious challenges to catching up with the rest of the EU. The adoption and implementation of key strategic and operational documents was lagging behind and Slovenia was facing problems in adjusting its regulative framework to EU legislation, as well as in implementing it. Slovenia had also failed to adopt a specific policy to address eco-innovations. The policies aimed at promoting R&D had not had any dedicated focus on eco-innovation at that point. Moreover, some areas of environmental policy, eco-innovations in particular, were completely neglected.

Some positive developments have taken place since then. A new government was elected in autumn 2014 and the Slovenian economy has been growing in 2014 (3.0%) and 2015 (2.9%). Slovenia has welcomed the EU’s Circular Economy Package and action programme, which should stimulate Europe’s transition towards a circular economy. Slovenia agrees with the identified key areas and priority action sectors and in March 2016 the Minister for Environment, Irena Majcen, stressed at the EU Environment Council that in order to “establish a circular economy the existing legislative framework at the EU level should be improved or developed in certain fields. Through this clear and long-term signals should be given to the economy and other stakeholders for their future conduct and investments. In doing so, cost efficiency and national specifics for implementing individual measures should be considered. Slovenia believes that all proposed measures should provide feasibility in the given time frame, clarity (for example, harmonised definitions of waste, secondary data sources), and consistency among different policies. To increase the EU’s competitiveness at the global level, the secondary raw materials
market should be strengthened and the circular economy concept promoted at the global level” (Ministry of the environment and spatial planning, 2016).

However, general support does not automatically translate into support of all legislative proposals that will follow in future – “Slovenia will adopt its position in regard to future measures” (The Government of the Republic of Slovenia, 2016). These should take into account their impact on competitiveness, including additional administrative requirements, in particular for SMEs. Slovenia believes that all legislative and non-legislative measures should consider their feasibility in a given time frame, as well as clarity and consistency between various policies (i.e. balancing economic and environmental aspects), the principle “think small first” (meaning the smallest possible additional burden should be caused for SMEs) and how to maintain international competitiveness.

Slovenia supports the integrated approach from the Commission to “close the loop” of product lifecycles and stimulate the transition towards a circular economy. A similar approach was adopted by Slovenia in October 2015 with the Framework programme for the transition to a green economy (Framework Programme for The Transition to a Green Economy, 2015) (in Slovene). It was set as a strategic guideline representing an opportunity for the development of new green technologies, jobs and the promotion of Slovenian knowledge. Since the transition to a green economy requires a change of current production and consumption models, the government aims to design and implement measures set in the Framework programme to create conditions for a more green and sustainable growth and development and to steer the process of transition towards a green economy. The proposed measures cover the nine following areas: sustainable resource management, green growth, green jobs, green products and services, green tax reform, sustainable urban development, green public sector, green economy, and green practices in agriculture.

The circular economy is also one of the nine priorities of the Slovenia’s Smart Strategy Specialisation (S4). It is a common strategy of the government, the business sector, as well as industry, research organisations and civil society, which have defined for the first time that Slovenia should improve competitiveness on the global market by increasing the extent of knowledge and technologies in Slovenia’s exports, increase the share of high-tech intensive products in exports and the share of exported services with a high share of knowledge in all exports. That would halve the lag behind the EU average and increase entrepreneurial activity to at least the EU average (Ministry of Economic Development and Technology, 2015). Slovenia’s smart specialisation should concentrate development investments in areas where Slovenia has the critical mass of knowledge, capacities and competences and where there is innovation potential for placing Slovenia within global markets.

S4 is an implementation document related to the already-adopted strategic documents and it addresses all four objectives under the existing Slovenia’s Development Strategy (covering 2006-2013) for which Slovenia has already identified three key field-specific strategies (Research and Innovation Strategy of Slovenia 2011-2020, Slovenian Industry Policy (SIP) and Digital Agenda. 

In the Slovenian Industry Policy (2013) it has been recognised that “even in some areas where Slovenian companies are only suppliers of raw materials or semi-finished products to foreign companies, measures can provide incentives for entrepreneurs to invest in eco-innovation and environmentally friendly end products, where added value is higher.” This is essential for Slovenia because it has a problem due to low material and energy productivity (the ratio between GDP and use

---

1 On 10 March 2016 the Slovenian Government adopted the Information society development strategy until 2020 (in Slovenian) which aim is to develop and advance digital society and make Slovenia a referential country for innovative digital solutions (Ministry of Education, Science and Sport, 2016).
of resources) and the high energy intensity of the economy (road traffic also contributes considerably to the negative picture).

According to the document, the “S4 strategic objective is sustainable technologies and service for a healthy life on the basis of which Slovenia will become a green, active, healthy and digital region with top-level conditions fostering creativity and innovation focused on the development of medium- and high-level technological solutions in niche areas”. Slovenia should no longer act as a follower in priority niche areas but as a “co-creator of global trends”, which is, indeed, the mission of S4. The key S4 target variable is “raising the value added per employee”. The overall S4 implementation performance by 2023 should result in increased share of high-tech intensive products in export, increased share of export of knowledge-intensive services in total export and increased overall entrepreneurial activity.

S4 is designed as a nationwide document and it addresses “in a comprehensive manner a broad range of development policies related to innovation, in particular the policy of promoting research and innovation, industrial policy, entrepreneurship promotion as well as some parts of the education system, rural development policy, international relations, improved regulatory environment (procedures related to the issuing of permits), etc. Financial support to the identified priority areas will be provided as well as non-financial support providing services implemented in close cooperation with strategic partnerships”.

In identifying S4 priority areas of application great emphasis was given to strong empirical bases. S4 will address the following priority areas and the areas of application:

1) Healthy working and living environment (smart cities and communities; smart buildings and homes, including wood chain);
2) Natural and traditional resources for the future (networks for the transition to circular economy; sustainable food production; sustainable tourism);
3) “(S)industry 4.0” (factories of the future; health – medicine; mobility; development of materials as end products).

The second abovementioned priority area of S4 (Natural and traditional resources for the future) pertains to those areas of application which depend on the use of natural and traditional resources (e.g. cultural heritage, crafts, etc.) and which involve a number of stakeholders, usually without an obvious dominant actor.

The first objective in this priority area is to connect stakeholders – business entities, educational and research system, non-governmental organisations, the state and individuals – into value chains according to the principle “economy of closed material cycles” to develop new business models for the transition towards a circular economy. Slovenia has relatively well-preserved natural resources, but better and more efficient preservation and management of natural resources is needed. “Consequently, economic systems of linear economies have to transform to circular ones by eliminating the concept of waste, and thus provide conditions for long circulation period of products in use, their cascading use and the provision of clean and unpolluted materials which can be reused. For establishing such a system innovation at the level of business models and the establishment of adequate systems of the so-called reverse logistics are essential.”

The focus will be on technologies for sustainable biomass transformation and new bio-based materials; technologies for use of secondary and raw materials and reuse of waste; and production of energy based on alternative resources. In this regard the 2023 objectives are to (i) raise the material efficiency index (of 1.07 in 2011 to 1.50 in 2020) and to (ii) establish five new value chains with closed material cycles.
“Slovenia will focus on those segments of the market where companies are already represented in global markets or have a real potential for a breakthrough into global markets. The field of sustainable energy production demonstrates an already-established cooperation between companies as well as research institutions. During the entrepreneurial discovery process, 30 initiatives pertaining to the area of ‘Networks for the transition to circular economy’ were prepared, with an estimated investment value of over €950 million. In the field of ‘technologies for the use of secondary raw materials and reuse’, great potential is demonstrated in the building sector, paper industry, manufacture of rubber, agriculture, metallurgy and food industry. Using biomass does not only pertain to the production of energy; the initiatives build on the use of biomass for new biological materials and related products in papermaking and chemical industry” (S4).

Under the second priority field, “Natural and traditional resources for the future”, sustainable food production and sustainable tourism with IT-supported marketing and networking and investment in higher quality services, are also listed.

S4 will serve as a basis to draw EU funds in the 2014-2020 budget period. The document plans €656 million in development investments annually in the 2016-2018 period that will be earmarked for research, development and innovation in value chains and networks, investment incentives, research infrastructure, researchers' research potential and international mobility; employees' expertise and skills, youth and creativity, and optimising conditions conducive to business. Non-financial measures will target innovative and green public procurement, tax brakes, economic diplomacy and promotion, removal of regulatory obstacles, and effective judiciary (S4; The Slovenia Times, 2016).

In December 2015 a first tender was presented to the representatives of more than 500 companies and research institutions within the S4 framework (Government office for development and European cohesion policy, 2015). In January 2016, a special governmental working group was established to connect representatives from different ministries relevant for creating solutions that would stimulate the transition towards a circular economy. In February an abovementioned tender implementing the S4 has been launched with the aim to i) promote the implementation of research and development programs (€55 million in total) and ii) to give incentives to research and development projects (€12 million in total value). Another separate tender on “strategic development innovation partnerships” should follow in 2016 and then in 2017 a second tender to address the rest of the 2014-2020 period (SVRK, 2016).

A valuable tool for the attainment of circular economy objectives should be the policy of green public procurement, in particular when it includes requirements that take into account the key concepts of circular economy. Already in the above-mentioned Research and Innovation Strategy of Slovenia 2011-2020, green public procurement was expected to be one of the key elements stimulating eco-innovation. A decree on green public procurement was adopted already in 2011 and since then amended several times, most recently in December 2014 (PISRS 2016; Official Gazette of RS, no. 89/14). The Public Procurement Agency in Slovenia was established in 2010 and it should be responsible for carrying out joint procurements for Slovenian public authorities for a number of product and service groups. In 2012 it was even recognised as one of the good practice examples in the EU (European Commission, 2012), however, it never reached full operation and it ceased to exist in June 2012, as a part of measures aimed at the reorganisation of the public sector.

In 2012, the OECD (OECD, 2012) estimated that an obstacle to the more rapid adoption of green public procurement had been the lack of expertise and skills on the part of public procurements. Currently, green public procurement is obligatory for certain products in Slovenia and it aims to reduce the negative environmental impact of the public sector, and shape it as a role model for the private sector and citizens, in order to facilitate the development of environmentally more friendly products, services
and green technologies. Green public procurement as such is seen as an important opportunity for SMEs, which prove to be flexible and able to exploit green market niches.

The Slovenian Government has set as one of its most important priorities the preparation of a new Slovenian strategy of development. The document Slovenia’s Development Strategy for the period 2006-2013 had expired, but a new strategy, along with other relevant documents (expected in 2013), has not been adopted. ‘Slovenia’s Vision 2050’ project has been started, which will be the first and crucial step towards the preparation of the strategic document that will define key development goals by 2030, followed by a medium-term action plan (Slovenija 2050, 2016a). In March and April 2016 a number of workshops already took place around Slovenia to address and co-create the Slovenia’s Vision 2050 (Slovenija 2050, 2016b; CEP, 2016).

Finally, certain developments that address the concept of the circular economy have taken place in Slovenia. In addition to the adoption of the S4 and the Framework programme for the transition to a green economy, and the kick-off of the Slovenia’s 2050 Vision process, a working group has been created. The latter is led by the Ministry of Environment and Spatial Planning, which invited all interested stakeholders (local communities, public sector, NGOs and universities) to join in monitoring and facilitating the implementation of the Framework programme (MOP, 2015).

Energy efficiency has been recognised by the Slovenian Government as one of the most cost-effective measures to achieve reductions in greenhouse gas emissions and increase the share of renewable energy sources in gross final energy consumption. A project office for the energy renovation of buildings has been set up in order to facilitate the energy renovation of public buildings (Ministry of Infrastructure, 2016).

The Slovenian Government also created a separate work area for wood and furniture industry in 2015 that will try to revitalise the Slovenian wood industry. Slovenia is namely the third most forested country in Europe but, to date, has been unable to take advantage of its enormous natural biomass potential (Prime Minister of the RS, 2015). Biomass-based industries thus remain another promising circular and eco-innovation area.

In 2016 Slovenia also started the process to join the Ellen MacArthur CE 100 programme and various events and workshops were organised for different stakeholders in order to present the opportunities of the circular economy and stimulate the transition to it. Despite a “lack of information, knowledge and targeted communication” (Košir Godina, 2016) some Slovenian companies and local communities have been very active and have already initiated or proposed plans to cooperate or coordinate sustainable goals and projects. The capital Ljubljana has become the Green Capital of Europe 2016 (see good practice example below).

Finally, despite all the above-mentioned developments, a transition towards a circular economy remains a long-term process and only coherent policies with systemic and coherent measures and incentives will create a stable and predictable investment and development environment that will facilitate and stimulate the continuation of the process that has been started. “A broader social consensus is needed, as well as the establishment of an appropriate supportive environment”, as the Slovenian Prime Minister Cerar has put it (Ladeja Košir, 2016). “The best guarantee for this would be for the concept of a circular economy to become the foundation of Slovenia’s Long-Term Development Strategy.”
**LJUBLJANA – EUROPEAN GREEN CAPITAL 2016**

**Description:** Ljubljana is small by surface area, but huge in terms of hospitality and quality of life. The city has been following the idea of sustainable development since 2007 when a sustainable development vision up to 2025 and a list of related infrastructure projects important both for the environment and the quality of life were introduced. Less than a decade ago the city centre was choked with traffic, it was hard to get from one side of the river to the other, people spent a lot of time waiting for the bus and the riverbanks were a car park rather than a place of pleasant cafes. However, numerous changes have happened in a short period, which is one of the reasons Ljubljana has become European Green Capital 2016.

**Most important driving factors and impact it generates:**

- **Transport:** the city centre, which was once the domain of cars and buses, is now mostly dedicated to pedestrians and cyclists. The city's public transport is becoming ever more accessible and user-friendly to passengers.
- **Air:** 74% of housing in Ljubljana is already heated by district heating and natural gas distribution.
- **Traffic:** Public transport is becoming increasingly user-friendly and accessible.
- **Sustainable tourism:** Ljubljana is high on the list of the world's most sustainable tourist destinations, as shown by winning the Destination Award in the 2015 Tourism for Tomorrow Awards.
- **Waste:** Ljubljana is the European Capital, with a 63% share of separately collected waste, the highest in Europe in 2014.

**Keywords:** Ljubljana, European Green Capital 2016

**Internet links:**
- European Green Capital 2016
- The media centre of the European Green Capital 2016

**Contacts for further information:**
- green.capital@ljubljana.si

*Source: European Green Capital 2016*
Project office for the energy renovation of buildings

Description: Energy efficiency is one of the most cost-effective measures to achieve the reduction in greenhouse gas emissions and increase the share of renewable energy sources in gross final energy consumption. Therefore the Ministry of Infrastructure set up a project office that aims to facilitate the energy renovation of buildings, which will be implemented on the basis of an energy performance contracting model. Such a model will allow the investment of the energy service company's private funds in the renovation. For the energy renovation of public buildings, €115 million in grants and €50 million in repayable cohesion funds will be provided in the period 2016-2023. The cohesion funds will be combined with financial investments from dedicated funds and programmes of international financial institutions in grants and repayable funds. On the basis of national as well as the EU legislation, the Slovenian Government adopted the Long-Term Strategy for Mobilising Investments in the Energy Renovation of Buildings in October 2015.

Most important driving factors and impact it generates: The expected result is the renovation of 9.1 million m² of floor area, which includes: 6 million m² of floor area in residential buildings, 1.8 million m² of floor area in public buildings (including the mandatory annual renovation of 3% of public buildings owned by narrow sector), the renovation of 1.3 million m² of floor area in public buildings in the wider public sector in the period 2014-2023.

Keywords: energy renovation of buildings, energy efficiency

Internet links:

- [Ministry of Infrastructure](#)
- [Building Energy Renovation](#)
- [Project Office for the Energy Renovation of Buildings (slov. Pojektna pisarna za energetsko prenovo stavb)](#)

Contacts for further information:

Project office for the energy renovation of buildings:

- Branka Bugarin, Phone: +386 1 478 8267; Martina Gračner, Phone: +386 1 478 8991; Zdenka Šibelja, Phone: +386 1 478 8996 Fax: +386 1 478 8139
- E-mail: mzi.pp-eps(at)gov.si

Source: [Ministry of Infrastructure 2016](#)
LOCAL REUSE CENTERS

Description: Local reuse centres were conceived as social enterprises (business) that aim to solve environmental problems in an entrepreneurial way. They enable people to submit various products that could be reused with the help of minor repairs, improvements and/or innovative renovation. These products are then sold for symbolic prices. Local reuse centres organise presentations and workshops on the renovation of used products. They also promote craft professions and social responsibility and enable local residents to participate in their activities. To date, nine local reuse centres have been conceived (Ljubljana, Rogaška Slatina, Vojnik, Tepanje, Slovenske Konjice, Ormož, Trebnje, Kočevje, Miklavž na Dravskem polju). The Slovenian network of reuse centres is also a full member of the European RReuse network.

Most important driving factors and impact it generates: Local reuse centres not only decrease the amount of waste, but they also create new jobs and enable and increase the protection of natural resources, raw materials and water.

Keywords: reuse centre, social responsibility

Internet links:
- Slovenian network of Reuse centres

Contacts for further information:
- Center ponovne uporabe d.o.o., SO.P., Vrazova 9, 2270 Ormož, T: 08 205 61 56, E: ormoz@cpu-reuse.com

Source: Slovenian network of Reuse centres
References


**Government of the Republic of Slovenia**, 2016, *Green as the Slovenian development potential (Zeleno kot razvojni potencial Slovenije)*. Available at: [http://www.vlada.si/teme_in_projekti/prehod_v_zeleno_gospodarstvo/](http://www.vlada.si/teme_in_projekti/prehod_v_zeleno_gospodarstvo/)


PISRS, 2016, Decree amending the Decree on green public procurement. Available at: http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6685

Prime Minister of the RS, 2015, Prime Minister dr. Cerar at the exposition “the Magic of Wood” and on the great natural potential for the development of the Slovenian wood industry (Premier dr. Cerar na odprti razstave Čar lesa 2015 o velikem naravnem potencialu za razvoj slovenske lesne industrije). Available at: http://www.kpv.gov.si/nc/si/medijsko_sredisce/novica/article/225/7730/0acb19e04bd1ef063dbbd890d58c1774/


Slovenia 2050, 2016a, Vizija Slovenije 2050. Available at: http://slovenija2050.si/vizija-2050/

Slovenia 2050, 2016b, V ponedeljek se pričenja turneja dogodkov po Sloveniji. Available at: http://slovenija2050.si/v-ponedeljek-se-pricenja-turneja-dogodkov-po-sloveniji/


SVRK, 2016, Ministri Smerkolj in Makovec-Brenčič ter minister Počivalšek predstavili prvi razpis v okviru strategije pametne specializacije. Available at: http://www.svrk.gov.si/si/medijsko_središče/novica/browse/4/article/12447/6246/7a6225f9a78f6ade393e8ae44a78c345/


Ugovšek A., M-Sora, 2016, Interview on barriers and drivers to circular economy and eco-innovation in Slovenia.

Vovk M., Reuse Ormož, 2016, Interview on barriers and drivers to circular economy and eco-innovation in Slovenia.
### ANNEX: Policy measures addressing circular economy and eco-innovations in Slovenia

<table>
<thead>
<tr>
<th>Group of policy measures</th>
<th>Type of policy measure</th>
<th>Specific measure</th>
<th>Focus of policy measure [tick if relevant]</th>
</tr>
</thead>
</table>
| SUPPLY SIDE FOCUS        | Publicly co-funded venture capita funds | Slovene Enterprise Fund (SEF) is a national financial institution and the stimulator of the development of micro-, small and medium-sized enterprises (SMEs). It supports young enterprises, which due to the specifics of the development and no track record, have difficulties in obtaining the necessary financial resources on the market. However, no special focus is given to circular economy and/or eco-innovations. So-called “Seed capital” is intended for young enterprises (younger than 5 years) in the second development phase to enable their entry into the market. SEF alone and/or together with private investors directly invests in the form of a convertible loan or in the form of direct capital investment in young high-tech company:  
- Convertible loan for start up of innovative enterprises  
- Direct capital for growth of innovative enterprises  
SEF offers support in the form of venture capital for a rapid growth of young enterprises that includes the entry into the ownership structure and management of the enterprise in cooperation with capital investments from private investors (venture capital and mezzanine capital).  
SEF offers direct loans to micro- and small enterprises that represent direct credits of the Fund at an affordable contractual interest rate intended for young enterprises or specific target groups of enterprises that represent a specific market gap in Slovenia. | Circular economy |  |

<p>| Equiity/business support | Public guarantee funds | SEF offers Guarantees for bank loans with interest rate subsidy that allow young enterprises (younger than 5 years) to obtain bank loans. Its purpose is to enable young enterprises faster obtaining of bank loans to implement projects that facilitate a competitive market penetration, an improved market position and expansion of business and improve the financing of working capital. However, no special focus is given to circular economy. |  |  |  |  | Other relevant areas (e.g. renewable energy, etc) |</p>
<table>
<thead>
<tr>
<th>Support for R&amp;D in public sector and industry</th>
<th>R&amp;D funding</th>
<th>The Slovenian Research Agency (SRA) performs tasks relating to the National Research and Development Programme and creation of European Research Area. It supports R&amp;D in the public sector through manifold research programmes carried out by programme groups in public research institutions, universities, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative grants</td>
<td>Slovene Enterprise Fund (SEF) aims to provide the initial financial support and especially target enterprises with high share of own knowledge, innovation and potential of creating products or services with high value added. However, no special focus is given to circular economy and/or eco-innovations. “Start-up incentives” for special target groups are intended mainly for newly established enterprises that have potential for rapid growth and are at the most sensitive stage of their development: - Incentives for innovative start-ups - Incentives for business start-ups in the problem regions</td>
<td></td>
</tr>
<tr>
<td>R&amp;D infrastructure</td>
<td>Research Infrastructures Roadmap 2011-2020 prepared by the (former) Ministry of higher education, science and technology sets up and presents Slovenian priorities in the area of research infrastructure. It complements the Research and Innovation Strategy of Slovenia 2011-2020.</td>
<td></td>
</tr>
<tr>
<td>Fiscal measures</td>
<td>Tax incentives for R&amp;D and start-ups</td>
<td>Companies enjoy tax relief for their investments for R&amp;D and the Corporate Income Tax Act also introduced tax relief for investments in research and development (Article 55).</td>
</tr>
<tr>
<td></td>
<td>Tax incentives for R&amp;D personnel</td>
<td></td>
</tr>
</tbody>
</table>

| | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| x | x | x | x | x | x | x |
| Education, training and mobility | Tailored training courses for companies, entrepreneurs | Podjetniški portal (the Entrepreneur’s Page) run by SPIRIT (Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology) offers information and advice, how to start and develop a company and market products and services, *inter alia*:

- **Mladi**: advice and workshops for young people and entrepreneurs. However, no special focus is given to circular economy and/or eco-innovations. |

| Advice/consulting for start ups, companies, entrepreneurs | Podjetniški portal (the Entrepreneur’s Page) run by SPIRIT (Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology) offers information and advice, how to start and develop a company and market products and services, *inter alia*:

- **Mladi**: advice and workshops for young people and entrepreneurs;
- **Zagon** (Start-up): free information on how to start a company;
- **National innovation system**: free support activities to encourage and facilitate innovations, market entrance and the protection of property and intellectual rights

  - The website Imam idejo! (I have an idea!), a website of the Slovenian Centre for Competitiveness and Innovation (SCCI) (run by SPIRIT), is an interactive tool for innovative users, seeking financial, technical, legal and other support relating to their sophisticated invention or outline scheme. The website is designed for users, taking into account the problem they face within the innovation process. The website is a "one-stop shop" for inventors and tailor-made problem-solver with a substantial educational component

  - One Stop Business Points ([VEM](#) and [e-VEM](#)) run by SPIRIT) for companies and entrepreneurs enable free registration of a company or entrepreneur and free of charge simple legal changes on private limited companies

  - **Razvoj**: information on development of the company, products and services;

  - **Rast**: information on growth, marketing and internationalisation;

However, no special focus is given to circular economy and/or eco-innovations. |

| Placement schemes for students | Slovene Human Resources Development and Scholarship Fund as the central national management institution for scholarships and development |
of human resources, offers scholarships for study and research, increases international mobility of students and researchers, provides financial incentives to employers for development of human resources, awards excellence, provides up-to-date information and helps build a network for minimising obstacles to mobility of students, researchers and employees. However, no special focus is given to circular economy and/or eco-innovations.

<table>
<thead>
<tr>
<th>Networks and partnerships</th>
<th>Support for R&amp;D workers recruitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence centres, clusters, science-technology parks</td>
<td>The Slovenian Research Agency finances postgraduate study and research training for young researchers. The programme has been going since 1985. Currently, research programmes chose a candidate according to their aims and preferences. In the agency policy no special focus is given to circular economy and/or eco-innovation.</td>
</tr>
</tbody>
</table>

**S4 Public tender: Promotion of research and development programs implementation**

First S4 tender – Section 1 (€55m) aims to facilitate and encourage the creation and implementation of joint consortia research and development programs between knowledge institutions and private businesses. S4 has identified priority areas, where Slovenia has the long-term potential to enter global markets: smart cities and communities; smart buildings and wooden houses; networks for the transition to circular economy; sustainable food production; factories of the future; health-medicine; mobility; development of materials as end products.

**S4 Public tender: Promotion of research development programs**

First S4 tender – Section 2 (€12m) aims to facilitate research development and innovation activities in companies and consortia of companies by co-financing at least 24 research development projects (RDPs) that address new or enhanced products, processes or services with high value added and market potential.

**S4 tender on Strategic development innovation partnerships** (to follow in 2016) and the Second S4 tender that will address the rest of the 2014-2020 period (to follow in the beginning of 2017) (SVRK, 2016).

Podjetniški portal (the Entrepreneur’s Page) run by SPIRIT supports Technology parks and incubators (university incubators, entrepreneurial incubators) to encourage the development of start-ups and their competitiveness and value added in general. However, no special focus is
Eight centres of excellence and seven competence centres were selected by the Ministry of Higher Education, Science and Technology for support in 2009–2013. However, since 2013 no further support has been provided.

Six clusters exist in Slovenia, all privately funded and key innovative and circular economy promoters in Slovenia, inter alia: Automotive cluster of Slovenia, Wood Industry Cluster, Technological centre TECES, etc.

Podjetniški portal (the Entrepreneur’s Page) run by SPIRIT supports technology transfer and innovation of public research organisations to enable transfer of knowledge and technologies to private sector. So-called Technology transfer offices represent Universities in Ljubljana, Maribor and Primorska, and National Institute of Chemistry, Institut “Jožef Stefan” and National Institute of Biology. However, no special focus is given to circular economy and/or eco-innovations.

Chamber of Commerce and Industry of Slovenia provides market intelligence to companies and organises manifold seminars, workshops and conferences.

Implementation of the EU legislation.


Environmental and sustainability requirements are being introduced in public procurement procedures.

<table>
<thead>
<tr>
<th>DEMAND SIDE FOCUS</th>
<th>Regulations and standards</th>
<th>Performance standards, labelling, certification</th>
<th>Public procurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology platforms and innovation networks</strong></td>
<td>given to circular economy and/or eco-innovations.</td>
<td>Podjetniški portal (the Entrepreneur’s Page) run by SPIRIT supports technology transfer and innovation of public research organisations to enable transfer of knowledge and technologies to private sector. So-called Technology transfer offices represent Universities in Ljubljana, Maribor and Primorska, and National Institute of Chemistry, Institut “Jožef Stefan” and National Institute of Biology. However, no special focus is given to circular economy and/or eco-innovations.</td>
<td></td>
</tr>
</tbody>
</table>
## Services

| Technology Transfer | Advisory support for technology adopters | ENSVET | represents a program of free energy consultation for citizens. Eco-fund (in line with the Energy Law, EZ-1, Article 352) has set up the Network of ENSVET offices across Slovenia that offer energy consultation focusing on energy efficiency and use of renewable energy sources. |
| Financial or fiscal support for technology adopters (e.g. grants for purchasing new technology) | Slovenian Environmental Public Fund [Eco Fund] promotes development in the field of environmental protection. It is the only specialised institution in Slovenia that provides financial supports for environmental projects. The financial assistance is offered mainly through soft loans from revolving funds and since the year 2008 through grants. Eco Fund offers: Loans to legal entities (municipalities and/or providers of public utility services, enterprises and other legal entities) and sole traders for investments in environmental infrastructure, environmentally sound technologies and products, energy efficiency, energy saving investments, and use of renewable energy sources Loans to individuals (households) for conversion from fossil fuels to renewable energy sources, energy saving investments, investments in water consumption reduction, connections to sewage system, small waste water treatment plants, replacement of asbestos roofs |
| Support of private demand | Tax incentives for consumers (e.g. for purchasing environmentally efficient products) | | |
| Tax reductions for products and services (e.g. VAT | | | |
### Demand subsidies (e.g. eco-vouchers, consumer subsidies)

**Slovenian Environmental Public Fund (Eco Fund)** promotes development in the field of environmental protection. It is the only specialised institution in Slovenia that provides financial supports for environmental projects. The financial assistance is offered mainly through soft loans from revolving funds and since the year 2008 through grants. The Eco Fund offers:

- **Grants to individuals** (households) for investments in electric cars and for investments in residential buildings (energy efficiency and use of renewable energy sources);
- **Grants to legal entities** (municipalities and/or providers of public utility services, enterprises and other legal entities) for investments in electric cars and buses for public transport on compressed natural gas or biogas;
- **Grants to municipalities** for investments in buildings where public education takes place (schools, kindergartens, libraries etc.), newly constructed as low energy and passive buildings or renovated in passive standard.

### Awareness raising and information provision

**Ministry of the Environment and Spatial Planning** promotes awareness raising, and provides information on circular economy and various environmental and sustainable issues.

**Slovenian Environment Agency** provides information on air, water, environmental protection, nature, and climate change.

**Sustainable Energy Portal** has been set up in line with the Energy Law (Article 351) to gather and provide information in regard to efficient use of energy and renewable energy sources in Slovenia.

**ENSVET** represents a program of free energy consultation for citizens. Eco-fund (in line with the Energy Law, EZ-1, Article 352) has set up the **Network of ENSVET offices** across Slovenia that offer energy consultation focusing on energy efficiency and use of renewable energy sources.
About the Eco-Innovation Observatory (EIO)

The Eco-Innovation Observatory (EIO) is the initiative financed by the European Commission’s Directorate-General for the Environment. The Observatory is developing an integrated information source and a series of analyses on eco-innovation trends and markets, targeting business, innovation service providers, policy makers as well as researchers and analysts.

Visit EIO and DG ENV Eco-innovation Action Plan (EcoAP) website and register to get access to more information and to access all EIO reports, briefs and databases.

www.eco-innovation.eu
ec.europa.eu/environment/ecoap