

Bioenergy in Slovakia

OVERVIEW

The Slovak Republic is a relatively small landlocked country of Central Europe. It is one of the two countries that emerged after the extinction of Czechoslovakia in 1993. Slovakia is an EU-MS since 2004 and is part of the Eurozone since 2009. Its economy is among the fastest-growing in Europe. Slovakia completed the transition to a market economy based on services and industry, which currently accounts for approx. 28% of the GDP. Building on a long-standing tradition and a highly skilled labour force, the primary industries are Electronics, Mechanical and Chemical engineering, and, owing to massive foreign investments, the automotive, which makes Slovakia the first producer of automobiles per capita globally. Alike some other countries of the region, the growth of manufacturing owes particularly to a supplying function for more advanced EU economies, primarily Germany. The growth of bio-based industry could efficiently compensate for the intrinsic risks of such dependency. With 0,7% GDP invested in R&D, Slovakia ranks among the last in EU-27.



Slovakia is primarily mountainous, with the highest ranges of the Carpathians extending across most of its territory. Smaller stretches of lowlands concentrate to the extreme E and S-W. Approximately 40% of the country is covered by forests, while another 50% is agricultural land, of which more than 1/2 is arable. The agricultural sector still plays a significant role in the Slovak economy, accounting for 3.6% of GDP. The primary cultures are cereals, oil and sugar crops grown on rather large farms compared to the EU average. However, as some studies point out, the sector is low added value with an impoverished food processing value chain and a tendency to export raw agricultural products. Water resources are abundant and currently seem not to be significantly affected by climate change, even though concerns that this might become an issue in the future exist. Moreover, the sector can rely on solid HR (currently, it employs approx. 4%) and substantial knowledge base and R&D capacities, notwithstanding the undeniable difficulties in engaging younger generations and lack of investments in dedicated research and innovation. The latter affects the entire bio-based value chain, including the food processing sector and – perhaps to a more limited extent – materials. Slovakia's agri-food sector needs fundamental support and incentives for farmers to remain in the market through enhancing ecosystems related to agriculture. The food processing industry is underdeveloped, and the bio-economy, except for the pulp and paper industry, lags far from its potential. According to some estimates, the automotive sector alone weighs more than double the entire bio-economy in terms of contribution to GDP.

Owing to the weight of agriculture and forestry, Slovakia accounts for relevant residual biomass that could be channelled into bio-based value chains, including the production of biofuels and intermediates. According to recent estimations delivered by the CELEBio project (www.celebio.eu), residual biomass from agriculture totals to approx. 2.1 MtonDM/year, of which 50% is cereal straw. An equal amount could be available from primary forestry residues, to which 1.6 MtonDM/year of secondary wood residues shall be added. Unused lands show a potential of approx. 0.5 MtonDM/year, yet with all the caveats regarding

the actual collectability. Currently, competing use is more evident regarding woody biomass that is being partially absorbed by the pulp and paper industry and bio-based materials production. The potentials of waste streams are decidedly untapped, as separation is lagging.

From the point of view of the energy sector, Slovakia does not differ substantially from other countries of the region: while coal has played a critical role during planned economy industrialisation, it has been steadily declining in the past three decades and now accounts for approximately 17% of TES and 8,3% in TFC, while the weight of nuclear is still significant (approx. 25% in TES and above 30% in TFC, owing to a contribution to electricity generation of more than 50%). The contribution of renewables is growing and reached 12,8%, while the trends in TFC show a distinct growth of the transport sector versus a stable absorption of industry and slightly declining use by the residential and commercial sectors. While there is a marked policy orientation towards electromobility, the trends show good prospects for advanced biofuels.

BIOFUELS POLICY, REGULATIONS, MARKET DEVELOPMENT

Slovakia	
Population	5.5 million
GDP (per capita)	\$21.500
TFC	11.5 Mtoe
Transport in TFC	2.8 Mtoe
Biofuels in TFC	0.1%

In the recent past, Slovakia has been in focus for the announced deployment of advanced biofuels production, with what was prospected to be a key role at the regional and European levels. However, these endeavours seem to have been stuck in a dead-end, at least presently. As of now, there are three conventional biofuel producers in the country, the major one being Enviral that annually transforms about 400ktonDM biomass sourced in Slovakia and Hungary to output approx. 145.000 m³ of ethanol that is then blended with

gasoline at the Slovak National Refinery. Two smaller companies (Biorafineria SK and Glortex) focus on biodiesel and wastes.

The relevant regulatory framework is consistent with EU regulations and focuses on decarbonisation in the 2030/2050 perspective. In the transport sector, quite some emphasis is made on electromobility, yet there are encouraging provisions regarding biofuels. For instance, the recent Low-carbon Development Strategy sets mandatory blending targets at 7,6% in energy contents in 2020 with a trajectory towards 8,2 in 2030, of which a minimum of 0,5% rising to 0.75% is represented by advanced biofuels. On the other hand, the country did not yet develop a comprehensive bioeconomy strategy, which would foster a more coordinated development of value chains.

ADVANCED BIOFUELS DEMO AND R&D PROJECTS

Slovakia is in the focus of BIOSKOH project, a large H2020 flagship funded through BBI JU that aims at establishing a first-of-its-kind commercial flagship biorefinery at Energochemica. The project went through some implementation problems, so that it is unclear whether all objectives will be reached. It shall be completed by 2022 (<http://www.bioskoh.eu>)



LINKS

- Bioeconomy Cluster - <https://bioeconomy.sk>
- Association of Biofuels Producers - <https://www.zvzb.sk/>
- Slovak Innovation and Energy Agency - <https://www.siea.sk/en/>
- Ministry of Agriculture and Rural Development - <https://www.mpsr.sk/en/>
- Slovak University of Agriculture - <https://www.uniag.sk/en/main-page/>
- Slovak Investment and Trade Development Agency - <https://www.sario.sk/en>