ETF Working together Learning for life

European Training Foundation

THE EU AGENCY SUPPORTING COUNTRIES TO DEVELOP THROUGH LEARNING

SKILLS FOR TECHNOLOGY TRANSFER IN MONTENEGRO

Disclaimer

This summary was prepared by Jan Otero, ETF.
The contents of the summary are the sole responsibility of the ETF and do not necessarily reflect the views of the EU institutions.

PREFACE

This report highlights the importance of “skills-related services” in supporting technology transfer in Montenegro. The report is part of a research aiming at analysing innovation systems in the Western Balkans economies, analysing skills related services, needs and gaps faces by enterprises accessing necessary sills for technology adoption, innovation and market expansion. Skills-related services encompass information, training, and consulting services offered by various public and private organizations to assist individuals, employees, and employers in developing and implementing technology transfer.

The report defines technology transfer in two ways: Vertical Technology Transfer (VTT) and Horizontal Technology Transfer (HTT). VTT involves the transfer of technology from basic research to applied research and development, often with the involvement of external partners such as public research organizations. HTT, on the other hand, refers to the transfer of established technology from one operational environment to another, often across international borders and through foreign direct investment.

Through an online survey, a comprehensive analysis was carried out to gain valuable insights into the technology transfer-related services and practices in Montenegro. The survey encompassed a sample of 23 institutions, ranging from public and private to not-for-profit sectors. Furthermore, to complement the quantitative findings, qualitative data was collected using semi-structured interviews (SSI) and moderated focus groups (FG).

Main Results

A number of service providers in Montenegro indicate that they offer different types of skills based services that support innovation, but close examination suggests that the services are more aligned with business development than with technology transfer. Overall, current provision of skills related services to support TT was confirmed through interviews to be almost non-existent – a result of the nascent state of the environment. There is a lack of understanding about the overall topic and what technology transfer entails.

Moreover, no clear plans have been identified to change this situation. Improving the framework conditions is seen to be the major priority for most stakeholders.

The clear sector priorities of the adopted Smart Specialisation (S3) strategy do offer a starting point for establishing Vertical Technology Transfer (VTT) services as do the planned new infrastructure and support units (Centralised Technology Transfer Offices and the Science Technology Park). Support for Horizontal Technology Transfer (HTT) services could be improved by provision of more information and this could begin through the new Digital Innovation Hub (DIH). Expansion of HTT services to other sectors needs to be tied strongly to competitiveness and industrial policy for the country. The small size of Montenegro does tend to limit the number and diversity of support service providers. Small initiatives linked to priority sectors (S3) may be a useful stating point to explore the need for and benefit from HTT services with the technology adopters themselves.

Science, Research and Innovation Capacity

Montenegro's research capacity is hindered by its small human resources research base, which has been stagnating. The country has a limited number of researchers, with only 2,330 individuals engaged in R&D in 2019, being 1,586 researchers. The proportion of R&D staff in Montenegro is less than 1% of total employment, compared to 2.27% in the EU-27. The country also experiences a brain drain, with highly productive researchers leaving permanently, resulting in a loss of research talent.

Despite these challenges, Montenegro has achieved a commendable percentage of highly cited scientific publications and a good share of open-access publications, indicating the effectiveness of academic advancement policies at universities. Montenegro has made significant progress in increasing the share of young people obtaining higher education, with the proportion of people aged 25-34 with tertiary education reaching 40.4% in 2020.

Moreover, efforts to bridge the gap between academia and the business sector have been initiated through innovation policy measures, the reformed legal framework, and the growth of new innovative companies. However, the impact of these measures on knowledge diffusion, utilization, and collaboration between academia and business is yet to be fully realized.

Skills related services for technology transfer in Montenegro

This report aimed to analyse the skills-related services, actions, and practices implemented by education and training providers and other technology transfer actors to support technology transfer in Montenegro. Data was collected through an online survey targeting different groups, with the majority of respondents being public higher education institutions (HEIs) and public sector bodies. The survey focused on services and actions supporting innovation in enterprises. Over half of the respondents stated that they currently provide services to enterprises supporting innovation, while the remaining respondents had plans to introduce such services within the next 12 months. Although most services provided were not specifically related to VTT (Vertical Technology Transfer), 30% of respondents identified this as a development opportunity and planned to introduce VTT services in the near future.

Regarding skills development for VTT/HTT, 50% of respondents reported already offering training and consulting services in this area, and an additional 30% planned to do so in the future. However, detailed analysis of the free text responses revealed some uncertainty and confusion regarding the nature of these skills, often mixing them with general business skills and digital competencies. The survey also highlighted the specialization of services among respondents, with a focus on sectors identified as priority areas in Montenegro's smart specialization strategy, such as agriculture and food, tourism, and information and communication technologies (ICT).

Needs and gaps in skills-based services for technology transfer in Montenegro

The qualitative data analysis conducted through semi-structured interviews and a moderated focus group provided valuable insights into the provisions, gaps, needs, barriers, and improvement actions related to skills-based services in technology transfer in Montenegro. The participants, representing different organizations from the business, academic, public, and NGO sectors, emphasized the importance of strengthening the education system and the availability of new professionals in the field of technology transfer. They recognized the need for formal education at both undergraduate and postgraduate levels, focusing on knowledge and competencies related to technology transfer. Additionally, they highlighted the significance of informal education and training, calling for longer and standardized programs to develop skills related to technology transfer.

In terms of infrastructure and institutions, the participants expressed the expectation for the first Technology Transfer Office (TTO) in Montenegro, emphasizing the need for more places and platforms for focused technological collaboration and skill development through practical work. They suggested the establishment of technology campuses, VET training centres, digital platforms for information and collaboration, and the open use of public laboratories as essential services for technology transfer purposes. The lack of clear intellectual property (IP) rules and access to finance for technology upgrading and investment were identified as major barriers. The participants stressed the importance of comprehensive technology policies that promote collaboration among various sectors and provide leadership for change in the technology transfer domain.

Awareness about technology transfer and its modalities was highlighted as a fundamental starting point. The participants recognized the importance of aligning major technology transfer actions with the smart specialization strategy (S3) and emphasized the need for expertise in the green transition.

The qualitative evidence revealed that the provision of technology transfer services, both for vertical and horizontal technology transfer, is currently sporadic and lacks institutionalization in Montenegro. However, there are some notable initiatives such as the Innovation Fund's funding schemes, networking and consultancy services offered within a Digital Innovation Hub (DIH), and the establishment of cluster-specific technology transfer services. The participants also pointed out the importance of advisory services in agriculture, training programs, and mentoring schemes to support technology transfer through education.

The participants identified several gaps, needs, and barriers in the policy, legislative, institutional, and educational frameworks for technology transfer. They emphasized the lack of vision, institutional settings (especially the absence of a TTO and Science-Technology Park), strong clusters, collaboration platforms, and structured, certified training programs. The need for leadership from the government, municipalities, and universities to promote change and create awareness about the opportunities and benefits of technology transfer was also highlighted. Barriers such as misconceptions, slow pace of policy changes, lack of institutional communication, administrative barriers, and unstable infrastructure were identified as hindrances to effective technology transfer.

Improvement Actions

To improve Vertical and Horizontal Technology Transfer, the following key actions are suggested, based on the results of the interviews and focus groups:

Vertical technology Transfer	Horizontal Technology Transfer
• Establish a supportive legal framework with clear Intellectual Property (IP) rules to facilitate academia-business collaboration and protect stakeholders' interests. • Develop specific funding schemes to support VTT-related education, training, and technology upgrading initiatives through initiatives like a Youth Guarantee Fund. • Ensure VTT actions align with the priorities of Montenegro's Smart Specialisation Strategy, focusing on strengthening services in underrepresented sectors. • Develop a comprehensive technology policy integrating education, science, innovation, industry, SME development, investment, and employment policies to support VTT activities. • Raise awareness about VTT through education, information sessions, and promotional events, emphasizing opportunities and good practices. • Conduct a comprehensive service needs analysis to prioritize specific VTT services required at different stages of technology transfer for various types of enterprises. • Establish professional teams with interdisciplinary expertise to provide effective VTT services. Encourage collaboration among service providers and institutions for better coverage. • Offer structured capacity-building programs for existing service providers, focusing on specific skills required for delivering VTT-related services. • Analyse successful digital innovation hub models and replicate them to cover other sectors, facilitating technology transfer both vertically and horizontally. • Improve marketing and visibility of existing VTT services to increase their impact. Enhance communication efforts to reach potential technology adopters and providers.	• Establish a central institution to coordinate and provide a system perspective in the HTT environment, facilitating collaboration among different actors, networks, and institutions involved in HTT. • Strengthen the connection between HTT support schemes and the priorities of the Smart Specialisation Strategy to ensure funding aligns with focus areas. • Address technology upgrading related to the green transition by developing expertise to support sustainable and environmentally friendly technology adoption. • Conduct a comprehensive market needs analysis to identify the specific skills and services required for horizontal technology transfer. • Enhance the visibility and impact of existing service providers, such as the Enterprise Europe Network (EEN) and Digital Innovation Hubs (DIHs), through effective labelling and marketing strategies. • Focus on capacity building and training programs to develop professionals in technology transfer, offering formal education and standardized training programs. • Strengthen the capacity of cluster organizations to play a central role in HTT, supporting technology upgrading and innovation in sectors related to smart specialization. • Analyse successful HTT models, learn from good practices, and consider replicating them to cover other sectors to accelerate technology transfer activities.