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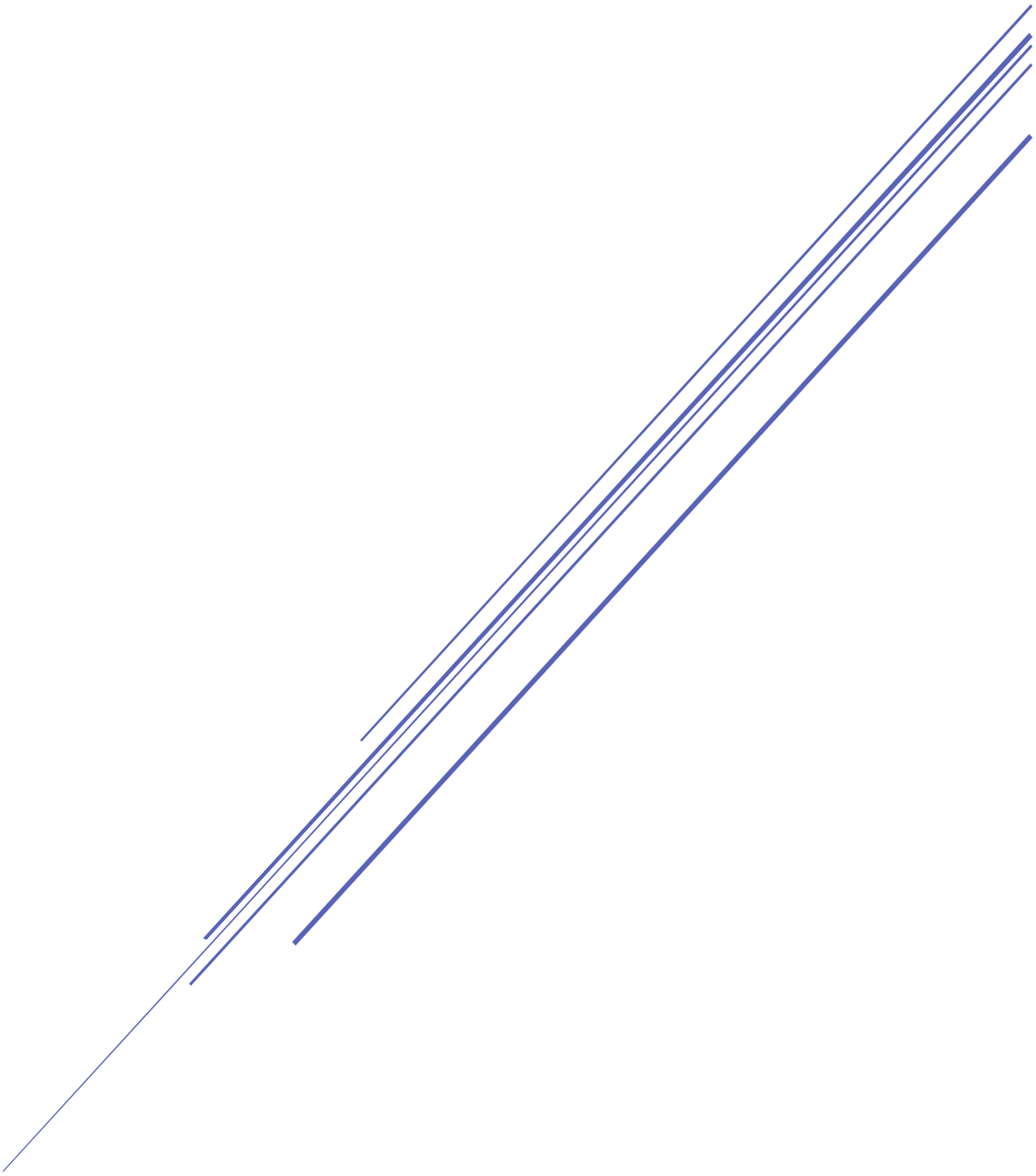
EE-LV00063 Possibilities for Public Private Partnership in upgrading harbours for offshore developments (Harbours and PPP)

ANNEX 3 POSSIBILITIES FOR UPSKILLING



2024

EDUCATIONAL OPPORTUNITIES AND POTENTIAL FOR WORKFORCE DEVELOPMENT IN OFFSHORE WIND FARMS

This strategic annex compiles and evaluates information on the current education system within the renewable energy sector, with a particular focus on the requirements of offshore wind energy projects. It identifies key challenges and proposes solutions to ensure the preparation of qualified specialists needed for the sector's development.

Over the past two decades, the renewable energy sector in Latvia and Estonia has experienced rapid growth, playing a critical role in achieving both energy independence and sustainability goals.

In line with the European Union Renewable Energy Directive (EU/2023/2413), a target has been set to increase the share of renewable energy in total energy consumption to at least 42.5% (with an ambition to reach 45%) by 2030, compared to the previous target of 32%. This goal drives investment attraction and promotes the utilisation of regional potential to develop the renewable energy sector, with particular emphasis on the construction of offshore wind farms in the Baltic Sea region.

By 2033, Latvia and Estonia plan to develop offshore wind energy projects with a combined capacity exceeding 3 GW.

In Latvia, the key offshore wind project is ELWIND—part of a joint Estonian-Latvian state-run, cross-border offshore wind energy initiative and included in the European Union's priority cross-border renewable energy projects (CB-RES2) list. The offshore park is designated in the Baltic Sea, off the west coast of Latvia near Pāvilosta and Jūrkalne, providing up to 1 GW of capacity.

In Estonia, ELWIND will be implemented along the Hiiumaa coastline, with a similar capacity ranging from 700 MW to 1 GW. Additionally, the Saare Wind Energy project, planned for Estonia’s western coast, is expected to deliver up to 1.5 GW of capacity.

Beyond ensuring the sustainability and independence of energy production, these projects will create new opportunities for local businesses and the workforce. Offshore wind energy projects will significantly boost employment, particularly during the operations and maintenance (O&M) phase. Research indicates that the O&M phase of a 1 GW offshore wind farm generates approximately 45 direct jobs[1].

[1] https://www.4coffshore.com/news/rwe-receives-go-ahead-for-denmark92s-largest-offshore-wind-farm-nid30499.html?utm_source=chatgpt.com

Moreover, each 1 GW offshore wind energy project indirectly supports an additional 90–120 jobs through the development of supply chain businesses, such as port services, shipping, and IT solutions[2]. This means that the operation of 3 GW wind farms will create approximately 135 direct jobs (technical specialists, administrative staff, etc.) and up to 270 indirect jobs, resulting in a total of around 405 new jobs in the coming years.

Based on projections that offshore wind farms will become operational by 2033, educational institutions should plan for specialist training, with an average increase of approximately 45 positions per year over the next nine years (see Table 1).

Table 1. Planned Achievements by 2033

Indicator	Latvia	Estonia	Total
Planned Capacity (GW)	1	2	3
Number of Specialists to be Trained Annually	20	25	45
Total Number of Trained Specialists	200	250	450
New Jobs	135 Direct, 270 Indirect	270 Direct, 540 Indirect	405 Direct, 810 Indirect

Summarising the existing educational opportunities and outlined objectives, it becomes clear that the education systems in Latvia and Estonia must adapt to the growing demands driven by the development of the offshore wind energy sector. To achieve the planned outcomes—3 GW of capacity and over 400 new jobs—it is essential to implement modern, sustainable educational programmes.

Close collaboration between educational institutions and industry players, combined with the exchange of experience between the two countries, will enable the efficient utilisation of existing infrastructure and resources. Latvia and Estonia have a unique opportunity to become regional leaders in this field, laying a strong foundation not only for training local specialists but also for meeting the needs of the international market.

The effective adaptation of the education system will not only support labour market development but also enhance both countries' competitiveness in the global wind energy market."

[2] https://northseawindhub.com/wp-content/uploads/OW-Employment-NL-Report-TKI-Wind-op-zee.pdf

CURRENT STATE OF EDUCATION IN THE RENEWABLE ENERGY SECTOR IN LATVIA AND ESTONIA

The rapid development of the renewable energy sector in the Baltic region has created a need for a targeted, high-quality education system capable of preparing highly qualified specialists for the construction and maintenance of offshore wind energy projects.

In Latvia and Estonia, vocational and higher education institutions, alongside private training centres, play a crucial role in workforce preparation, aligning with both global standards and local needs. This section analyses the current situation in both countries, highlighting key differences, opportunities, and challenges in the development of educational offerings. See Table 2.

Table 2. Vocational and Higher Education Opportunities in Latvia and Estonia

Category	Latvia	Estonia
Vocational Education Standards	A unified education standard for the profession of Renewable Energy Technician has been developed, serving as a foundation for the development of vocational education in the renewable energy sector[3]. The standard promotes a unified approach to preparing professionals in the sector and provides opportunities to acquire skills for working in various renewable energy technology fields. Programmes offer foundational knowledge for working in onshore wind farms; however, there is a lack of specialized training tailored to the specific requirements of offshore wind energy. The professional standard needs to be updated to align with current technological advancements and specific requirements, particularly those related to offshore wind energy projects.	A unified education standard for the profession of Electrical Wind Turbine Technician[4] has been developed, ensuring harmonized professional training in compliance with the international standards of the Global Wind Organisation (GWO)[5]. The standard integrates essential technical knowledge and safety requirements necessary for working with wind turbines, particularly in the maintenance of onshore wind farms. The programmes lack specialized training tailored to the specific requirements of offshore wind energy. The professional standard needs to be updated to reflect current technological advancements and specific demands, especially those related to offshore wind energy projects.

3 https://registri.visc.gov.lv/profizglitiba/dokumenti/prof_kval_pamatprasibas/2017/PKP-012.pdf

4 https://www.kutseregister.ee/ctrl/et/Standardid/vaata/10693342

5 https://www.globalwindsafety.org/

Vocational Education	In the 2024/2025 academic year, five vocational education institutions offer programmes for the profession of Renewable Energy Technician: Riga State Technical School[6], Valmiera Technical School[7], Vidzeme Technology and Design Technical School[8], Daugavpils Technology and Tourism Technical School[9] and in Kurzeme Liepāja State Technical School[10,] which also performs the methodological supervision function for Renewable Energy Technician programmes. The existing educational programmes focus on the fundamental skills required for Renewable Energy Technicians, including servicing electrical equipment, mechatronics, maintaining technical equipment, and basic safety requirements. The curriculum also includes foundational knowledge of wind energy technologies to prepare specialists for work in onshore wind farms. However, the current offerings lack specialized training tailored to the specific needs of offshore wind energy. There is a need to develop and update educational programmes to address these requirements.	In the 2024/2025 academic year, two vocational education institutions offer programmes for the profession of Electrical Wind Turbine Technician: Kuressaare Ametikool[11] , Pärnumaa Kutsehariduskeskus[12]. Kuressaare Vocational School is set to achieve significant advancements in vocational education development in the upcoming semester by offering innovative training programmes for wind turbine technicians. A turbine simulator will be introduced, providing students with practical training to prepare them for real-world work scenarios. The institution will become the first education centre in the Baltic region to offer training in two new specializations: • Electrical Wind Turbine Technician, focusing on turbine maintenance and troubleshooting. • Wind Turbine Blade Technician, specializing in the repair and maintenance of turbine blades at heights using safety equipment. Ida-Virumaa Kutsehariduskeskus (IVKHK) [13] offers vocational education in the field of engineering and technology, including the basics of renewable energy, such as wind energy.

6 https://www.rvt.lv/iegusti-profesiju/energetikas-nodala/

7 https://valmierastehnikums.lv/programa/atjaunojamas-energetikas-tehnikis/

8 https://www.vtdt.lv/atjaunojamas-energetikas-tehnikis

9 https://www.dttt.lv/atjaunojamas-energetikas-tehnikis-dttt/

10 liepajastehnikums.lv

11 https://www.ametikool.ee/et

12 https://www.hariduskeskus.ee/

13 Tehnika ja Tehnoloogia - kutsehariduskeskus.ee

Higher Education	Riga Technical University (RTU)[14] and Latvia University of Life Sciences and Technologies (LBTU)[15] offer bachelor's and master's degree programmes in the fields of energy, environmental engineering, and mechanical engineering. These programmes provide technical and engineering education necessary for the design, management, and research of energy systems. RTU also offers specialized study opportunities in renewable energy technologies, including both theoretical and practical training in wind energy.	Tallinn University of Technology (TalTech)[16] offers bachelor's and master's degree programmes in the fields of energy and engineering. These programmes include specialized courses on renewable energy systems, wind energy technologies, and innovations, focusing on the development of sustainable solutions. The University of Tartu[17] supports research in environmental sciences and technologies, including renewable energy and climate impact studies, which are essential for wind energy projects. The university's collaboration with the energy sector focuses on sustainable development solutions, making it an important partner in education and research related to wind energy.
Private Education Centres/Professional Development	BOTC Training[18] offers a wide range of GWO-certified courses, including "Basic Technical Training in Hydraulics" and "Advanced Rescue Training," as well as industrial safety training and online courses tailored to the needs of various industries. Novikontas Energy[19] provides GWO, OPITO[20] and IRATA (Industrial Rope Access Trade Association)[21] accredited training, including courses on working at heights, confined spaces, and personal protective equipment inspection.	Kuressaare Ametikool also offers professional development courses. The Estonian Renewable Energy Association (Eesti Taastuvenergia Koda) [22] organizes training and seminars to enhance the qualifications of industry professionals in renewable energy technologies, including wind energy.

14 https://www.rtu.lv/

15 https://www.lbtu.lv/lv

16 https://taltech.ee/

17 Home | Tartu Ülikooll

18 https://lv.botctraining.com/courses/kurss-tehniska-pamatapmaciba-hidraulika-gwo-btth/?utm_source=chatgpt.com

19 https://novikontas.org/energy/catalog?utm_source=chatgpt.com

20 https://opito.com/about

21 https://irata.org/

22 https://www.taastuvenergeetika.ee/

	Both centres stand out with modern training methods, advanced technologies, and an innovative approach, placing particular emphasis on safety standards and internationally recognised certifications. They make a significant contribution to preparing a qualified workforce for the needs of the renewable energy sector and other industries.	

In Latvia and Estonia, education systems have initiated workforce preparation for the renewable energy sector. However, updates to educational standards are necessary - both countries need to review and enhance existing standards to address specific requirements of offshore conditions, including marine engineering and the management of complex technologies. To promote regional competitiveness and sustainable growth, collaboration between Latvia and Estonia in the field of education should become closer.

Estonia's experience in specialized education could serve as a valuable resource for improving Latvia's education system. Conversely, initiatives from Latvia's private sector could become a significant partner in developing flexible training opportunities tailored to market demands in both countries.

The following section will analyse how the potential of the education sector can be effectively utilized to ensure high-quality and adaptable workforce preparation for the construction and operation of offshore wind farms.

THE POTENTIAL OF THE EDUCATION SECTOR FOR SUPPORTING THE CONSTRUCTION AND OPERATION / MAINTENANCE OF OFFSHORE WIND FARMS

Kurzeme and Estonia are home to several vocational and higher education institutions with significant potential to train specialists for the construction, operation, and maintenance of offshore wind farms. However, to fully meet the industry's demands, a targeted approach to improving educational programmes is essential.

Table 3. Recommendations for Improving the Education System in the Renewable Energy Sector in Latvia and Estonia

Recommendation	Description	Impact	Funding Sources	Collaboration Between Latvia and Estonia	Potential Challenges
Development of Modular Training Programmes	Create flexible, modular programmes integrating technical, engineering, and digital skills.	Enhances specialist qualifications and alignment with labour market needs.	State budget allocations, private sector co-financing.	Cooperation with vocational education institutions and private training centres.	Insufficient infrastructure or funding availability for the development of educational programmes.
Sustainability and circular economy	Develop training modules on the circular economy, resource life cycle, and the principles of the blue and green economy.	Sustainable resource management, lower CO2 emission levels.	EU (European Union) funds, private sector, state budget.	Joint development of course programmes and materials.	Insufficient scientific and technological support for sustainability issues.
Regulatory framework of the energy sector	Provide training modules on EU and national regulations, legal aspects, and industry standards.	Improved compliance with regulations, market competitiveness.	State budget, EU technical assistance.	Share experience on the implementation of the GWO standard.	Frequent changes in regulations.

Digital transformation in the energy sector	Implementing training in IT solutions and data analytics, particularly in SCADA system management.	More efficient wind farm management, lower costs.	EU digital development funding, private sector.	Joint implementation of IT solutions in educational programmes.	Shortage of IT specialists in the region.
Safety standards and skills	Include safety training for working at heights, on water, and in extreme conditions, with simulations for practical exercises.	Reduced workplace accidents, improved employee safety.	Support from GWO and other international certification organizations.	Opportunities for joint implementation of certification courses.	High costs of acquiring safety infrastructure.
Work-based learning (WBL)	Ensure close collaboration with companies for acquiring practical skills in wind farms.	Better prepared specialists who can start working immediately.	Co-financing from the public and private sectors.	Collaboration between companies and educational institutions in organizing internships and programmes. Joint internship programmes at the international level.	Limited involvement of companies or shortage of internship placements.
International collaboration	Strengthen collaboration with Scandinavian and other countries, establish exchange programmes for students and lecturers.	Increased specialist qualifications and access to the best practice examples.	Nordplus, Erasmus+ programmes, EU funds.	Mutual exchange of experiences with regional partners.	Differences in education systems and language barriers.
Promotion of career opportunities	Promote youth interest in wind energy through career days and informational campaigns.	Increased interest in industry professions.	State and EU funding, company sponsorship.	Joint career days and events in both countries.	Lack of youth awareness about the potential of the industry.

Reskilling and skill development	Offer shorter programmes for adult professional qualification or reskilling, in line with the latest technologies.	Ensures flexibility in the labour market and improves the competitiveness of industry specialists.	EU and national-level programmes to support adult education.	Collaboration with vocational education centres and private companies.	Difficulties in attracting adults to education or reskilling programmes.

he educational systems of Latvia and Estonia have significant potential to become a major support for the development of offshore wind energy projects in the region. However, the current situation highlights the need for systematic improvements to educational offerings to align with both global technological trends and regional specific needs. It is particularly important to focus on adapting educational programmes to prepare for work in challenging maritime conditions, integrating opportunities for digital transformation, safety standards, and practical training.

To enhance the education sector's ability to adapt flexibly to industry requirements, close collaboration between the public and private sectors, as well as international partners, is essential. Latvia and Estonia must work together to develop new programmes, implement innovative solutions, and establish joint internship initiatives. This approach will not only ensure regional competitiveness but also enable a swift and effective response to the evolving demands of the industry.

The following section will analyse the priority professions that need to be developed within the education system to effectively support the construction and maintenance requirements of offshore wind farms.

PROFESSIONS TO DEVELOP IN EDUCATIONAL INSTITUTIONS IN LATVIA AND ESTONIA IN CONNECTION WITH WIND FARM CONSTRUCTION AND MAINTENANCE

In response to the growing demand for a qualified workforce in the wind energy sector, educational institutions in Latvia and Estonia must adapt their curricula to prepare specialists with the necessary skills and knowledge. Professions related to wind farm construction and maintenance encompass a wide range of technical and managerial competencies. Table No. 4 summarises the key professions that need to be developed within the education system, providing detailed descriptions and examples from international experience to ensure the preparation of a competitive and sustainable workforce.

Table 4. Identified Professions for Wind Farm Construction and Maintenance

Profession	Description	International experience and examples [23]
Wind turbine technician	Ensures the installation, maintenance, and repair of turbines, manages SCADA systems, and diagnoses technical issues. Skills for working at heights and knowledge of safety standards are required.	In Denmark, GWO certification is the industry standard used as a basis for the development of technical education.[24]. A similar approach is used in the USA, where, in addition to training, cybersecurity and remote system management are included. [25]
Hydraulics and mechanics technician	Works with the mechanical and hydraulic systems of turbines, including participating in the diagnosis and replacement of worn-out components.	In the Netherlands, training for mechanics technicians includes practical sessions on maintaining hydraulic systems, adapting to offshore conditions. [26]
Electrician / Electrical technician	Responsible for the installation, maintenance, and fault repair of electrical systems in wind	In Norway, courses are integrated that include electrical system training with a focus on green technologies and automation. [27]

23 https://windeurope.org/intelligence-platform/

24 https://danishwpa.com/wind-turbine-training/?gad_source=1&gclid=Cj0KCQiA0--6BhCBARIsADYqyL8nK3p0PUSfNW8tSMZdUOxN_aM7LHUtmgbodHrnb9BRNPjJF_PuCH4aAj0fEALw_wcB

25 https://safetytechnologyusa.com/

26 https://www.hollandcollege.com/programmes/wind-turbine-technology.php

27 https://www.windcluster.no/

	turbines, including generators and distribution systems.	
Blade technician (composite materials)	Specializes in the repair and maintenance of turbine blades, applying the latest methods for working with composite materials.	In Spain, training includes simulation technologies that help understand composite material wear and address aerodynamic issues. [28]
SCADA system specialist	Works with digital control and monitoring systems of wind farms. Conducts data analysis to improve the efficiency and maintenance of the parks.	In Germany, SCADA (Supervisory control and data acquisition) specialist training is integrated into master's programmes, with an emphasis on automation and data analysis.
Project Manager	Coordinates wind farm projects from planning to construction and operation. Skills in managing financial, legal, and engineering aspects are required.	In the United Kingdom, an integrated approach is emphasized, where project managers also participate in the analysis of technical aspects, based on the principles of sustainable development.

To ensure the acquisition of these competencies, educational institutions in Latvia and Estonia must adapt existing programmes and develop new ones based on internationally recognised standards, such as GWO, and best practices from countries with highly developed wind energy industries.

Collaboration between educational institutions and industry representatives from both countries will foster innovation and technology transfer, while expanding the Baltic region's potential to become a global leader in training wind energy specialists. This strategic approach will not only strengthen the local economy but also ensure sustainable development and international competitiveness

28 https://creatingthefuturefidamc.es/en/

CONCLUSIONS

Based on the analysis of the education systems in Latvia and Estonia within the context of the renewable energy sector, particularly offshore wind energy projects, the following conclusions and recommendations are presented:

- Necessity to modernise education standards: The current standards in the Latvian education system do not align with modern global requirements, especially regarding offshore wind energy. It is crucial to update vocational and higher education standards by introducing internationally recognised certifications.
- Collaboration between Latvia and Estonia: A successful example is Estonia's educational approach, which includes innovations such as the turbine simulator introduced at Kuressaare Ametikool. Latvian educational institutions need to establish closer cooperation with Estonian partners to adopt best practices, develop joint programmes, and training modules.
- Integration of the private sector into the education process: Private educational centres in Latvia, such as BOTC Training and Novikontas Energy, are crucial resources for providing specialized training. The experience of these centres in safety and technical innovations should be integrated into national educational programmes to increase flexibility and meet labour market demands.
- Strengthening reskilling and lifelong learning: To ensure labour market flexibility and sustainable growth in the renewable energy sector, it is essential to develop targeted adult education and reskilling programmes offering short yet intensive courses for mastering the latest technologies.
- Quality specialist training as a regional competitiveness advantage: By 2033, Latvia and Estonia's shared goal is to prepare at least 450 qualified specialists to implement and maintain 3 GW offshore wind energy projects. On average, preparing 45 specialists annually, Latvia must strategically develop educational infrastructure and programmes to effectively respond to the demand for qualified labour.
- Sustainability and green economy in education: Educational programmes should integrate principles of blue and green economy, as well as resource lifecycle management. This will not only enhance industry competitiveness but also promote a responsible and sustainable approach to energy production and consumption.

Proposals for further action:

- Ensure additional funding for the modernisation of educational programmes and the improvement of infrastructure by attracting EU structural funds and private sector investments.
- Establish a national coordination mechanism for cooperation between educational institutions in Latvia and Estonia, the private sector, and public administration.
- Develop a strategic plan for the development of reskilling and adult education systems to respond to the dynamic demands of the industry.
- Create informational campaigns to raise awareness among youth and the public about career opportunities in the renewable energy sector.

The cooperation between Latvia and Estonia and the targeted actions in adapting educational programmes to the needs of the wind energy sector will be crucial for ensuring the region's sustainable development and international competitiveness. Educational reforms and investments in this area will enable an effective response to the growing demand for qualified labour and strengthen the position of the Baltic states in the development of the green economy.