Co-funded by the Erasmus+ Programme of the European Union

Advancing Circular Economy in Partner Countries by Development and Implementation of Master Programme "Waste Management" / UnWaste

project number: 618715-EPP-1-2020-1-DE-EPPKA2-CBHE-JP

IMPRINT

This booklet presents a comprehensive overview of the key achievements and sustainable impacts achieved through the development and implementation of the Master's Programme Waste Management: Advancing Circular Economy in Partner Countries as part of the Erasmus+ programme. The project, titled with the acronym "UnWaste," is part-financed by the Erasmus+ Programme of the European Union and aims to contribute to the key action – cooperation for innovation and the exchange of good practices. Three Kazakh and three Russian Higher Education Institutions (HEIs) were initially the key target groups to be supported in this action, alongside the participation of three EU partner universities. Due to conflict-related circumstances and changes in international relations, the Russian partners' participation in the project ended in 2022. The project was successfully implemented with the active participation and support of partner universities from Germany, Estonia, Latvia, and Kazakhstan.

The date of the project is 15 January 2021 – 14 January 2025.

The project budget amounted to € 864,625.

On behalf of the Grant Coordinator – Hochschule Wismar, University of Applied Sciences: Technology, Business and Design – we would like to express our gratitude to all project partners and researches from the EU and non-EU partner countries, who have worked together during the life of this Erasmus+ project and contributed to the development and integration of the Master's Programme in non-EU partner Higher Education Institutions.

Address: Philipp-Müller-Str. 14 23966 Wismar Germany

Website: www.hs-wismar.de

The main contact point is Prof. Dr. Gunnar Prause, E-mail: gunnar.prause@hs-wismar.de

The project was part-financed by the European Union, Erasmus+ Programme.
All questions and enquiries relating to this leaflet should be addressed to the Grant Coordinator of the project – Hochschule Wismar, University of Applied Sciences: Technology, Business and Design.

More information on the project is also available on the project website under https://www.unwaste-erasmus.com/en.

[1] cf. General Data Protection Regulation, https://gdpr.eu

CONTENT

PROJECT RELEVANCE

The Erasmus+ project “UnWaste” addresses urgent challenges in waste management within partner countries, where sustainable disposal and recycling practices are still evolving. The importance of this initiative is reinforced by several key EU policies that emphasize the need for enhanced waste management practices and collaborative actions with neighboring nations. The EU Circular Economy Action Plan, adopted on March 4, 2019, outlines vital actions across 54 subplans, focusing on waste reduction, reuse, and recycling as integral parts of sustainable development. Furthermore, the 7th EU Environment Action Programme provides a strategic framework for waste management in the EU, building on the 2005 Thematic Strategy on Waste Prevention and Recycling and the Waste Framework Directive. While these EU initiatives have significantly raised awareness and improved waste management practices within Europe, their broader impact relies on cooperation with neighboring countries that face similar challenges and generate comparable waste levels—around 6 tons per person, per 16 tons of annual consumption.

Kazakhstan and Russia, pivotal partners in the UnWaste project, exemplify shared challenges in waste management. Historically, limited household consumption during the Soviet era resulted in low waste generation, with landfill disposal becoming the dominant method. However, rising consumption over the past decade has increased waste generation to levels comparable to those in the EU, highlighting the urgent need for modern waste management solutions.

Despite differences in their environmental performance—Russia ranks 52nd, while Kazakhstan ranks 101st on the Environmental Performance Index—both face structural challenges in waste management infrastructure and expertise. Their similar scores in environmental vitality—Russia at 55.99 points and Kazakhstan at 53.35—highlight systemic issues that require urgent attention, particularly in developing sustainable solutions and building professional capacity.

In Kazakhstan, the need for waste management reform was brought to the forefront by a 2019 legislative initiative banning the disposal of untreated materials such as polyethylene, plastic, paper, glass, and metal. The implementation of this law revealed significant gaps in readiness, with only 130 companies across the country equipped to provide the necessary treatment.

Consequently, landfill overflow and waste accumulation posed major challenges in several regions, including Kostanay and Akmole, where waste treatment targets were missed by 45% and 44.5%, respectively. Additional challenges are evident in agricultural areas, where inadequate monitoring hinders effective agricultural waste management, further underscoring the necessity of a targeted, educational approach to waste management.

The map shows the location of Kokshetau in the region of Akmola. Source: https://www.mdpi.com/2071-1050/14/21/14368. accessed 15 Nov 2024.

PROJECT RELEVANCE

By partnering with leading universities in Kazakhstan, the project "UnWaste" addresses critical challenges in waste management: Akhmet Baitursynuly Kostanay Regional University, S. Seifullin Kazakh Agro Technical Research University and Kokshetau University named after Sh. Ualikhanov. These institutions, which are central to their regions, play a key role in the development of a Master's Programme that integrates practical regional waste management needs with international standards..

The programme aims to bridge the gap between theoretical knowledge and practical application, equipping graduates with the skills to implement sustainable waste management solutions. By introducing international best practice, it prepares a new generation of professionals to address both regional and global environmental challenges. These universities will be empowered to become hubs of innovation and sustainability, contributing to the environmental.

Meeting of the three project coordinators from the Kazakh universities, Astana, 2022.

Throughout the project, Kazakh universities demonstrated a remarkable commitment to collaboration, establishing a robust network of partnerships and knowledge-sharing.
Regular seminars, workshops, and joint meetings facilitated an ongoing exchange of experiences, enabling the institutions to address shared challenges and develop cohesive approaches to the programme's design and implementation. This active cooperation ensured the curriculum was aligned with both regional needs and national priorities, significantly enhancing the educational and professional outcomes of the project.

Through this programme, future professionals gain vital technical and managerial skills, preparing them to implement sustainable waste solutions and contribute to the circular economy. Collaboration with European partner universities supports the exchange of knowledge and adoption of best practices, enriching the curriculum with a balanced combination of technical expertise and soft skills essential for waste management professionals.

By fostering collaboration between Kazakh universities and their European counterparts, the project "UnWaste" advances waste management education, strengthens the capacity of local institutions, and establishes the professional foundations necessary to address pressing environmental challenges. By creating a sustainable educational pathway, the project lays the groundwork for long-term improvements in regional waste management systems, supporting both local and global environmental objectives.

Working meeting of representatives of three Kazakh universities, Astana, 2023.

INNOVATIVE ACHIEVEMENTS

By introducing an interdisciplinary Masters Programme, the project aims to transform higher education and equip students with the expertise and essential skills needed to tackle real-world environmental and industrial challenges.

THE PROJECT "UNWASTE" AIMS TO MAKE A SIGNIFICANT IMPACT BY:

- Developing an engineering-focused waste management curriculum at Masters level.
- Raising awareness of circular economy principles through the development of innovative higher education programmes.

THE PROGRAMME COMBINES:

- Soft skills: teamwork, communication, management and decision-making.
- Hard skills: technical expertise in waste management engineering.

This dual focus prepares graduates for leadership roles and equips them with the ability to solve complex waste management problems.

Co-funded by the Erasmus+ Programme of the European Union

SPECIFIC OBJECTIVES:

The specific objectives of the project "UnWaste" are strategically designed to achieve both immediate and long-term results:

1. Develop a Master's Programme:

Successfully establish an interdisciplinary Master's programme in waste management at partner universities, launched by September 2022.

2. Internship and Training Programmes

Enrol 50–70 students, 3–5 university instructors, and one industry mentor from each partner university by September 2022.

Ensure 7–10 students from each partner university begin the MSc programme by the academic year 2022.

3. Academic content development

Develop academic content for the MSc in Waste Management in line with EU standards and the Bologna process, ensuring high quality and international relevance by September 2022.

4. Knowledge transfer and cooperation

Organise "train the trainer" sessions led by EU universities to enhance the expertise of the teaching staff.

Facilitate transnational cooperation and exchange of experience through placements and exchanges involving teachers, students and industry professionals.

5. Integration of best practice

Use lessons learned from relevant ongoing and completed waste management projects (e.g. Erasmus+ and national initiatives) to strengthen and inform the programme.

6. Raising awareness

Raise public and political awareness of waste management challenges and circular economy solutions through roundtables, consultations and targeted communication campaigns on social media and the project platform.

7. Ensure sustainability and scalability

Effectively disseminate project results at regional, national and international levels to ensure sustainability, transferability and scalability of results.

INNOVATIVE ACHIEVEMENTS

Partner countries participating in the project "UnWaste" have traditionally offered a variety of Masters Programmes, but many of these replicated existing curricula and failed to address the evolving needs of the economy. This was particularly evident in waste management, where despite the growing importance of the sector, tertiary education had largely overlooked the need for tailored programmes. The project "UnWaste" successfully addressed this gap by developing an interdisciplinary Master's Programme that combines technical expertise (hard skills) with essential interpersonal and management skills (soft skills), ensuring scalability and a significant impact on the labour market.

A hallmark of the programme is its multi-dimensional approach, integrating sound technical training, modern teaching methods and the development of essential competences to create well-rounded professionals. Below are the core elements that define the programme:

HARD SKILLS DEVELOPMENT

The programme equips students with technical knowledge and practical expertise in waste management through innovative methods such as **learning-by-doing** and **intensive internships**. This hands-on approach ensures graduates are prepared to implement effective waste management solutions tailored to real-world challenges.

SOFT SKILLS ENHANCEMENT

To complement technical training, the programme develops students' abilities in key areas such as:

- Negotiation and collaboration.
- Multidisciplinary decision-making.
- Assessment of managerial decisions with a focus on sustainability.
- Understanding of circular economy principles.

By fostering these skills, the programme ensures graduates can navigate complex professional environments and contribute meaningfully to sustainable development.

INTERNATIONAL RECOGNITION

Aligned with **Bologna Process guidelines**, the programme ensures that students' ECTS credits are recognised across partner universities, enhancing their mobility and expanding career opportunities internationally.

SCALABILITY AND LABOUR MARKET IMPACT

The programme is designed to be scalable, allowing other universities in partner countries to adopt and implement the module. It also contributes to the labour market by fostering entrepreneurial careers in engineering and creating job opportunities in waste management sectors.

GENDER EQUALITY

The programme supports gender equality by promoting the active involvement of women in engineering and waste management. Its interdisciplinary approach encourages more women to participate in these traditionally male-dominated fields, contributing to greater gender balance and diversity in the sector.

PROJECT IMPLEMENTATION MAIN STAGES

The project "UnWaste" was implemented from January 2021 to January 2025. The project was originally scheduled to end in January 2024, but due to constraints related to the COVID-19 pandemic, the project was extended by one year. This allowed the activities to be adapted to an online format, including trainings, seminars and workshops, and successfully achieved all objectives.

UnWaste ONLINE kick-off meeting, February,2021.

PREPARATION STAGE
(Milestone 1st Project Year)

During the first year, the consortium focused on preparatory activities to develop and implement the Master's Programme in Waste Management. Key tasks included:

- Conducting an analysis of existing master's programmes in partner universities to identify gaps and integrate best practices.
- Comparing curricula in partner universities with those of EU universities to ensure alignment with Bologna Process principles.
- Evaluating the teaching methodologies of partner universities, with a focus on waste management education.
- Identifying courses that required updates and developing new ones to meet the demands of the labour market.
- Analysing obstacles to mutual recognition of ECTS credits and preparing recommendations to address them.
- Establishing technical requirements for upgrading educational equipment necessary for the programme.
- Organising group meetings involving all partner universities to develop a detailed project plan, define roles and responsibilities, and agree on timelines for each milestone.

IMPLEMENTATION STAGE
(Milestone 2 — 2nd and 3rd Project Years)

The implementation phase focused on launching the programme and ensuring its sustainability. Key activities included:

- **Infrastructure Modernisation**:
  - Upgrading equipment in partner universities to provide state-of-the-art learning environments.
  - Installing specialised software to support new courses and practical training.
- **Enrolment of First Students**:
  - In September 2022, the first cohort of students enrolled in the Waste Management Master's Programme at partner universities.
  - The programme was officially integrated into the academic curricula.
- **Training and Internships**:
  - Organising internships for faculty and students at local institutions and EU universities.
  - Delivering practical training sessions and guest lectures featuring industry professionals.
- **Monitoring and Adjustments**:
  - Evaluating the initial implementation results of the programme.

PROJECT IMPLEMENTATION MAIN STAGES

- Revising course content and methodologies based on feedback from students and faculty.
- **Scalability and Sustainability**:
- Developing recommendations for scaling the programme to other universities in partner countries.
- Creating long-term sustainability strategies, including support from industry partners.

COMPLETION STAGE
(Milestone 4th Project Year)

- The final stage focused on assessing outcomes, finalising the programme, and ensuring its long-term sustainability. Key activities included:
- **Equipment and Material Inspections**:
- EU university representatives conducted inspections of partner universities to evaluate the integration of equipment and educational materials.
- Monitoring the utilisation of laboratories and resources in the teaching process.
- **Evaluation of Objectives**:
- Analysing the programme's implementation across partner universities to assess achievements.
- Preparing reports to confirm alignment with the project's goals and objectives.
- **Final Review and Closing Conference**:
- Hosting a conference to present project outcomes.
- Sharing best practices and recommendations for other universities.
- **Long-Term Sustainability Strategies**:
- Developing final recommendations for scaling the programme nationally and internationally.

Verification of the equipment, Astana, 2024.

Three Kazakh universities received computers and notebooks to support the Master's Programme in waste management, ensuring efficient use of specialised software. Advanced tools like Webaspx Waste Manager and Waste Logistics were also provided for modelling waste management processes.

Verification of the equipment, Kokshetau, Kostanay, 2024.

UNWASTE – PROJECT CONSORTIUM

The developed Master's Programme was implemented at the following three Kazakh HEIs:

Akhmet Baitursynuly Kostanay Regional University

S.Seifullin Kazakh Agro Technical Research University

Kokshetau University named after Sh. Ualikhanov

Russian HEIs whose participation in the project was terminated in 2022:

University of Management "TISBI"

Rostov State University of Economics

Peter the Great St. Petersburg Polytechnic University

The development of the anticipated Master's Programme and the implementation process at the three partner HEIs was supported by the three partners from the European Union:

Hochschule Wismar, University of Applied Sciences: Technology, Business and Design

EKA University of Applied Sciences

Tallinn University of Technology

UNWASTE – PROJECT CONSORTIUM

P1: Hochschule Wismar, University of Applied Sciences: Technology, Business and Design

Wismar University of Applied Sciences, is based on an interdisciplinary and practice-oriented concept that integrates the three disciplines of technology, business and design under one roof. About 7,000 students are involved in study programmes at the University Wismar. Due to the cross-linking of key competences in teaching, research and innovation, Wismar University of Applied Sciences acts as an interface between theory and practice.

Wismar University of Applied Sciences, as the grant-holder of the project, has experience in implementing international initiatives. The university actively cooperates with academic, industrial and technological partners, focusing on the development of innovations and practical solutions for sustainable development. Particular emphasis is placed on promoting the concepts of circular economy and effective waste management.

P2: Tallinn University of Technology

Tallinn University of Technology (TalTech) provides education, research and innovation services in engineering and technology, ensuring international competitiveness and contributing to Estonia's sustainable development. The Department of Business Administration, which represents TalTech in the project "UnWaste", has extensive experience in research and project work, including initiatives focused on curriculum development, sustainability education and university-industry cooperation.

TalTech brings many years of experience in using open innovation learning platforms and conducting practical research in sustainability and engineering education to enhance the participation and innovation capacity of universities in transition and emerging economies.

P3: EKA University of Applied Sciences

The University of Economics and Culture (EKA) is a private higher education institution that provides formal education to learners in the form of face-to-face and distance learning. One of the university's strengths is its extensive experience in providing e-learning using modern e-learning tools. EKA staff are experienced in preparing e-courses and conducting webinars. EKA places great emphasis on international cooperation, including participation in Erasmus Plus projects.

As a private university, where a significant proportion of students are involved in entrepreneurial programmes (programming engineer, design and graphics of computer games) based on the university's own profit motive, EKA has experience in building entrepreneurial and collaborative skills.

P4: University of Management "TISBI"

Founded in 1992, TISBI University of Management was the first private university in the Republic of Tatarstan to receive state accreditation. In 2005, it became the only non-state institution in Russia to achieve university status, reflecting its commitment to excellence in education. Consistently ranked among the top 100 universities in Russia, TISBI is recognised for its high academic standards and professional training. With a strong emphasis on multilingual education and global engagement, TISBI is a major contributor to regional and international projects.

P5: Peter the Great St. Petersburg Polytechnic University

Peter the Great St. Petersburg Polytechnic University (SPbPU) is one of Russia's leading technical universities, renowned for its achievements in research, education and innovation. With 12 institutes and a highly

qualified faculty, it excels in interdisciplinary research and advanced technology development. Based on the key global trends in R&D, technology and education, the Polytechnic University has been included in the "Russian Academic Excellence Project 5-100", which aims to rank it among the top 100 universities in the world by 2020, thus taking a leading position in the world of education.

P6: Rostov State University of Economics

Rostov State University of Economics (RSUE) is a leading institution in southern Russia, recognised for its expertise in IT, information security and applied education.

As an active member of the Rostov ICT cluster, RSUE plays a key role in promoting innovation and developing interdisciplinary educational modules. Its strong focus on integrating academic knowledge with industry practice makes it a valuable contributor to the project, particularly in creating ICT-based solutions that address modern challenges in waste management and sustainability.

P7: Akhmet Baitursynuly Kostanay Regional University

Baitursynov Kostanay Regional University (ABKRU) is a key academic and research centre in Northern Kazakhstan, dedicated to fostering sustainable development in the region. With a strong emphasis on international collaboration and innovation, the university modernises its educational programmes through Erasmus+ projects and engages in partnerships with local industries ABKRU actively contributes to the region's growth by preparing highly qualified specialists and promoting interdisciplinary research to address contemporary challenges.

P8: Kokshetau University named after Sh. Ualikhanov

Sh. Ualikhanov Kokshetau State University (KokSU) is a key institution in Northern Kazakhstan, offering bachelor's, master's, and Ph.D. programmes across 65 specialties to over 7,000 students. With a focus on innovation and international standards, KokSU integrates the principles of the Bologna Process and ECTS into its education system.

The university is renowned for its cutting-edge research centres, including the Eurasian Centre for Sustainable Development and the Laboratory of Agro Innovation**,** supporting advancements in science and sustainability. Internationally recognised, KokSU is a member of the Magna Charta Universitatum and a recipient of the "European Quality" Award.

P9: S.Seifullin Kazakh Agro Technical Research University

S. Seifullin Kazakh Agro Technical Research University (KATU) is one of Kazakhstan's most respected institutions in agricultural and technical education. Known for its emphasis on research and innovation, the university prepares students for careers in agriculture, industry, and technology through 82 diverse academic programmes. With over 13,000 students and a globally recognised position in the QS World Rankings, KATU stands out for its commitment to international collaboration.

Partnerships with institutions in 30 countries and ongoing transformation into a Western-style research university highlight its role as a leader in advancing education and solving global challenges in agriculture and sustainability.

Akhmet Baitursynuly Kostanay Regional University

Akhmet Baitursynuly Kostanay Regional University, as a regional partner of the project "UnWaste", provided essential support and expertise to all the Kazakhstani universities involved, playing a key role in the development and implementation of sustainable waste management practices across the country.

In 2022, Akhmet Baitursynuly Kostanay Regional University introduced a new Master's programme in waste management as part of the educational group "Environmental Protection Technology." The programme aligns with the code and classification "Environment," focusing on advanced solutions for sustainable resource management.

Students have been enrolled in the Programme every year since 2022. The first cohort graduated in 2024, with all 6 students successfully defending their Master's thesis.

One of the key competences of the Programme is the ability to develop and apply waste management technologies, including hazardous waste, and to design effective waste management systems.

To meet these competencies, the Programme includes specialised courses focusing on modern waste management and sustainable development approaches:

- Recycling of waste - 5 ECTS,
- Processing and Use of Food Waste - 5 ECTS,
- Biological Treatment of Waste Water - 5 ECTS,
- Rational Energy Use of Waste Production and Energy Saving - 4 ECTS,
- Recovery of Hazardous Waste - 5 ECTS,
- Solid Waste Management - 5 ECTS,
- Cargo Transport and Green Logistics - 5 ECTS,
- Management of the Circular Economy - 5 ECTS.

These courses provide students with in-depth knowledge and practical skills in waste recycling, wastewater treatment, circular economy management preparing them to implement innovative environmental solutions.

Workshop for partner universities, Kostanay, 2023.

Akhmet Baitursynuly Kostanay Regional University actively conducted various training seminars and student competitions to raise awareness about sustainable waste management. In May 2023, the university hosted a gathering of all project partners to facilitate collaboration and knowledge exchange.

The programme featured expert-led workshops, site visits to leading regional enterprises, and knowledge transfer sessions focusing on waste management, energy efficiency, and environmental safety. Participants also engaged in interproject activities, fostering collaboration and practical application of UnWaste objectives.

Visit to the "Allur" Machine-Building Plant to study waste management practices. Kostanay, 2023.

Kokshetau University named after Sh. Ualikhanov

The project "UnWaste" has made a significant contribution to improving the quality of education at Sh. Ualikhanov Kokshetau State University through the integration of international expertise and the launch of the Master's Programme "Waste Management". This programme represents an important milestone in addressing pressing environmental challenges by promoting advanced skills and knowledge in sustainable waste management practices.

In May 2024, the programme underwent a thorough accreditation process to ensure that it meets the standards of professional accreditation for higher and postgraduate education. The evaluation, which took place between 27 and 29 May 2024, culminated in the programme being officially accredited on 21 June 2024 for a period of five years. This achievement underlines the programme's alignment with international standards and its key role in promoting sustainable development.

Accreditation Certificate of the Master's Programme "Waste Management", 2024.

As part of the project "UnWaste", the Centre for Waste Management has been established at the Agro-Technical Institute of Sh. Ualikhanov Kokshetau State University. Equipped with modern tools and software, the centre provides students with access to interactive learning methods and practical training, preparing them for careers in sustainable development and the green economy.

Opening ceremony of the Waste Management Centre with partners from Kazakhstan, including Professor Gunnar, Kokshetau,2024.

Teachers and students also benefited from knowledge exchange with European partner institutions, adopting advanced teaching methods and innovative waste management practices. Collaboration with local businesses strengthened the integration of practical solutions and circular economy principles, contributing to sustainable regional development.

Visit to LLP "GorMolZavod" to study waste disposal and recycling processes, Kokshetau, 2023.

Kokshetau State University, named after Sh. Ualikhanov, further strengthened its information initiatives by producing educational videos, articles, brochures and launching a dedicated project website. These efforts played a key role in increasing public understanding and engagement.

S.Seifullin Kazakh Agro Technical Research University

To advance the goals of the project "UnWaste", S. Seifullin Kazakh Agro Technical Research University (KATU) assembled an initiative group of highly qualified faculty members. This dedicated team played a key role in designing curricula, organising workshops and fostering collaboration with local and international partners to ensure the successful implementation of the project.

University working group at the meeting of the project "UnWaste". Astana, 2022.

Building on the achievements of the project "UnWaste", KATU launched the Master's Programme in "Sustainable Management of Natural Resources" in September 2022. Developed in line with national and European qualifications frameworks, the programme aims to equip students with the skills and knowledge necessary to address environmental challenges and contribute to sustainable resource management.

PROGRAMME OBJECTIVES:

- To develop advanced skills in sustainable resource management.
- To prepare students for independent scientific research and problem solving.
- To enhance analytical and organisational skills through exposure to international and national scientific resources.

By June 2024, the first students have successfully graduated and embarked on their professional careers, using their expertise to tackle pressing environmental issues.

First graduates of the Master's Programme in Sustainable Management of Natural Resources, KATU, 2024.

Lecture for students on sustainable waste management. Astana, 2023.

Through the project "UnWaste", S. Seifullin Kazakh Agro-Technical Research University implemented a number of high-impact activities aimed at enhancing the sustainable waste management competencies of its students and faculty, as well as those of partner universities in Kazakhstan.

These initiatives included engaging lectures on topics such as "Waste Problems in Kazakhstan and Their Solutions" and "Modern Recycling Technologies", practical team-based workshops on waste regulation, and seminars on agricultural waste disposal methods and innovative recycling approaches.

Wismar University of Applied Sciences

Wismar University of Applied Sciences played a central role in the implementation of the project "UnWaste", as coordinator. Wismar University was responsible for managing the project, maintaining regular communication with partners and ensuring that reporting deadlines were met. Through effective coordination, all participants successfully carried out their tasks in line with the project objectives.

Particular emphasis was placed on supporting the partner universities in Kazakhstan in the development of Master's Programmes. Wismar University shared its expertise, provided academic support and facilitated the integration of innovative approaches. These efforts enabled the adaptation and integration of modern European solutions in waste management and circular economy into Kazakhstan's educational processes, thus enhancing the competences and qualifications of future professionals.

Wismar University of Applied Sciences actively organised educational activities for partner universities in Kazakhstan as part of the project "UnWaste", with the aim of building competences in the field of waste management and circular economy. The coordinator, Professor Dr Gunnar Prause, played an important role in the educational aspect of the project. He led lectures and workshops, bringing together faculty and students to explore and implement innovative solutions. Other professors from Wismar also participated, which allowed for a broader range of topics and increased the practical value of the training.

In October 2023, delegations from partner universities in Kazakhstan visited Wismar University of Applied Sciences. As part of their visit, they attended training sessions on innovative teaching methods within the Bologna process. The sessions also focused on improving the quality of education by developing both 'soft' skills, such as communication and teamwork, and 'hard' skills, which are crucial for academic and professional success.
Participants also visited the Stadtwerke Schwerin and various laboratories where they explored biogas production processes, sustainable energy technologies and waste recycling practices, gaining valuable practical knowledge and opportunities to share experiences.

Excursion to Stadtwerke for partner university delegations from Kazakhstan, Schwerin, October 2023.

Lecture by Professor Dr Gunnar Prause at Kostanay Regional University, Kostanay, November 2024.

During the final phase of the project, Prof Gunnar Prause, together with project assistant Svetlana Saidensal, visited all three partner universities in Kazakhstan in November 2024.

The visit was used to inspect the delivered equipment, discuss key issues and assess the universities' implementation of the planned activities. This visit was a crucial step in reviewing progress and ensuring the successful completion of the project.

Tallinn University of Technology

Tallinn University of Technology (TalTech) was instrumental in advancing the goals of the project "UnWaste", which focused on incorporating sustainable development and circular economy principles into the academic programmes of Kazakhstani universities. As a European partner, TalTech not only provided its expertise but also supported partner universities at each stage of the project. This included developing instructional materials, adapting academic programmes to international standards, and substantially enhancing the quality and relevance of education within partner institutions. One of TalTech's primary contributions involved creating guidelines for the internationalisation of master's programmes, ensuring alignment with the Bologna Process.

An essential part of TalTech's role was to conduct on-site visits to Kazakhstan, where university representatives assessed the project's outcomes and made recommendations for adapting the programme to the regional context.

During their visit to Astana, TalTech representatives toured KATU's scientific and educational centres. They explored the Agricultural Biotechnology Scientific and Production Platform, the Agro-Ecological Testing Centre (laboratory), the collection of biological exhibits and the Soil Museum. These tours gave them a deeper understanding of KATU's modern initiatives, staff achievements and ongoing research in agriculture, biology, agrochemistry and ecology.

These visits not only strengthened the partnership, but also provided TalTech with valuable insights into the specific needs and challenges of Kazakh universities. This exchange of knowledge supported the development of a robust and context-appropriate educational programme.

In October 2024, TalTech organised the 8th seminar on "Partnership for Sustainable Development" focusing on "Circular Economy and Sustainable Development". At this event, TalTech's experts shared recent research and advancements in the field of circular economy with Kazakhstani and European colleagues. The seminar featured discussions on practical challenges and solutions, equipping participants with tangible tools for implementing sustainable practices within their academic programmes. To further solidify this knowledge, TalTech arranged excursions to innovative facilities in Tallinn, such as the Tallinn Strategy Centre and the Lilleküla Circular Economy Centre, allowing participants to observe sustainable solutions in action.

Delegates from Hochschule Wismar, Tallinn University of Technology, and three Kazakh universities participating in the 7th seminar, "Circular Economy and Sustainable Development," Astana, 2024.

Representatives from partner universities on a tour at Lilleküla Circular Economy Centre, Tallinn, October 2024.

EKA University of Applied Sciences

EKA University of Applied Sciences has played a crucial role as a European partner in the project "UnWaste", supporting Kazakh universities in developing and implementing a Master's Programme in Waste Management. Through hosting key events, providing training, and fostering collaboration, EKA has helped ensure the project's success and alignment with international standards.

Kazakh participants on an excursion to the URDA Nature and Technology Park. Riga, 2023.

Certificate award ceremony after lectures and seminars at EKA University of Applied Sciences. Riga, 2023.

In September 2022, EKA hosted a significant project meeting in Riga, attended by representatives from Wismar University of Applied Sciences (Germany), Tallinn University of Technology (Estonia), and Kazakh universities, including Sh. Ualikhanov Kokshetau State University. Discussions focused on reviewing project progress, adapting the action plan following the termination of Russian partnerships, and coordinating next steps. This meeting laid the foundation for effective collaboration and successful project execution.

In October 2023, EKA welcomed representatives from Kazakh universities, including A. Baitursynov Kostanay Regional University, Sh. Ualikhanov Kokshetau State University, and S. Seifullin Kazakh Agro Technical Research University, for a series of "Train-the-Trainer" activities. These sessions included lectures, practical workshops, and a virtual classroom demonstration on circular economy concepts. Participants also visited the "Daibe" waste management center and the "URDA" Nature and Technology Park, gaining hands-on experience in innovative waste management practices.

In March 2024, EKA representatives traveled to Astana, Kazakhstan, to collaborate with Kazakh universities on various project-related activities. The visit featured a "Train-the-Trainer" session, discussions on the Master's Programme's content and methodology, and planning for mutual recognition of modules across partner institutions. The team also addressed quality control, research integration, and strategies for disseminating project results, strengthening international partnerships and ensuring the programme's effectiveness.

Through its active involvement in these events, EKA University of Applied Sciences has demonstrated its commitment to advancing circular economy education and supporting sustainable development in Kazakhstan.

OUTLOOK – VALUES AND IMPACTS

The Erasmus+ project UnWaste has successfully launched the Master's Programme Waste Management at three leading Kazakh universities, effectively addressing key challenges in sustainable development and modern waste management practices. The project fostered collaboration between academia, industry and policy makers, laying the foundations for long-term impact and sustainability.

KEY ACHIEVEMENTS

Bridging theory and practice: The programme reduced the gap between theoretical knowledge and practical application by engaging regional businesses and policy makers. The curriculum incorporated practical training, industry visits and case-based learning to meet local and regional needs.

Collaborative activities: Joint conferences, workshops and training sessions brought together stakeholders from different sectors to exchange ideas and promote innovative practices in waste management and the circular economy.

Skills development: Academic staff were retrained in modern teaching methods and waste management technologies. Students gained practical experience through internships and project-based learning, enhancing their career prospects.

International knowledge exchange: Collaboration with EU universities enabled participants to learn about advanced waste management technologies and methodologies, while strengthening intercultural communication skills.

PROGRAMME IMPLEMENTATION

- The Master's Programme in Waste Management was accredited and launched at the participating universities through the following steps
- Development of a curriculum in line with the requirements of the Bologna Process and ECTS credits;
- Recruitment of students, faculty and stakeholders to ensure the effectiveness of the programme;
- Organising internships to provide hands-on experience of real-world waste management challenges.

IMPACT ON INDIVIDUAL LEVEL

- Enhanced Skills: 15 faculty members were retrained in advanced waste management techniques.
- Practical Experience: Students gained industry-relevant expertise through hands-on internships.
- Intercultural Competence: Project participants improved their English language and intercultural communication skills.

IMPACT AT INSTITUTIONAL LEVEL

- Academic curricula aligned with international standards, ensuring ECTS credit recognition.
- Institutional capacity enhanced through accreditation and the successful delivery of the Master's programme.
- Broader academic offerings in Waste Management and Sustainable Development introduced.

IMPACT ON THE INTERNATIONAL LEVEL

- Enhanced cooperation between Kazakh and EU institutions facilitated knowledge exchange and adoption of best practices.
- Dissemination of project results through international conferences, publications and expert round tables.

IMPACT ON THE HIGHER EDUCATION SECTOR

- Established multi-sectoral networks between universities, businesses and policy makers to jointly address waste management challenges.
- Promoted education in sustainable waste management and circular economy at regional and international level.
- A dedicated project website was created to support communication and dissemination efforts.

Disclaimer

This material was produced with the financial support of the European Union (Erasmus+ Capacity Building in Higher Education, 2020). Its contents are the sole responsibility of Wismar University of Applied Sciences and the project “UnWaste” consortium and do not necessarily reflect the views of the European Union.

Co-funded by the
Erasmus+ Programme
of the European Union