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Action Plan to Accelerate Transition Towards a Circular Economy in the Danube Region

Prepared by MOVECO | April 2019

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EXECUTIVE SUMMARY

To implement the Transnational Strategy (TS) of the MOVECO project, three Cross-Country Road Maps were developed for the three innovation regions in the project countries. The Road Maps focused on waste streams and waste recovery with a special focus on waste packaging (WP), waste electrical and electronic equipment (WEEE) and waste batteries and accumulators (WBA). The Road Maps also included proposed measures and actions to help the transition to a circular economy.

The MOVECO project realized the challenges and the pressing needs of fostering the transition from a linear to a circular economy. It understood that circular economy approaches need to be implemented in strategic documents of national and regional public authorities. Responding to these needs, MOVECO developed this Action Plan that helps to improve policy framework and to promote understanding of circular economy in the Danube region.

Based on the analysis of the Road Maps, the Action Plan has not only been developed to summarise the outcomes of and prioritise the proposals of the individual Road Maps, but also to create clear messages towards the stakeholders in the waste management system to boost the process of changing to more sustainable forms of resource management.

During the analysis of the Road Maps, it became clear that the different regions face different problems in waste management and the problems are very similar within a region. Likewise, the proposed measures and actions are also quite homogeneous, apart from some differences that mostly arise from the variation in how national waste management systems are organised, such as the unique financing system in Hungary.

On the other hand, a comparison of regions within the scope of the project shows that the main themes of the problems are almost identical in all the regions. However, depending on the maturity of the waste management system, the actual problems can be classified into different levels within the same problem area, for instance the common issue of the cleanliness of collected materials. This is an overall problem, mostly associated with packaging materials that are collected separately, but is present in all the countries covered, although the actual quantity and quality of the materials collected are not the same.

There are several topics or problem areas that are generally present in all the Road Maps. Through the measures and action proposed, they create the main messages or action points of this Action Plan.

The region and country specific measures and actions also need attention. On the one hand, they can be placed on the country's waste management agenda. On the other hand, they can be present in other countries with waste systems of a similar level of maturity, and therefore a solution covering a wider geographical area could be implemented.

The most important common, systemic messages of the Action Plan are as follows:

Circularity starts at the productions stage.
If product design does not take reusability and recyclability into consideration, circularity cannot be achieved because the waste management sector is unable to cope on its own with the challenges of and dynamic changes to the production industry.

Research and development as part of waste management technology is the key to recycling and providing secondary materials of good quality.

The waste industry itself might not be able to keep up with technological developments on the production side; therefore it needs planned and supported investment solutions.

Functioning communication channels between the stakeholders should be implemented immediately, with special focus on continuous communication between producers and waste management operators.

This, together with the first two points, can ensure that the development of production technology is properly accompanied by the development of recycling technologies, through which circularity of resources can become a reality.

Secondary raw materials need to become competitive.

Good quality recycling is just one – albeit highly important – element of the competitiveness of secondary raw materials. A market needs to be created, wherein these materials are put into a position – through binding targets, subsidies and other measures - to be able to withstand dynamic changes in the open, global market.

Waste management terminology needs to be standardised.

Legally binding targets, quality criteria for waste and other materials and the system of responsibilities, obligations and rights can no longer lack the essential need to "be written in the same language". Definitions of waste management are unclear and not just differ from one country to another but vary even within a country. To control, assess, analyse and lead a system of such importance, the exact practical definitions of recycling, reuse, and end-of-waste should be developed internationally, but at least they must be common across the EU countries.

The waste management system needs to be given further consideration.

Production becomes global. The biggest producers (polluters) are global companies, even if their actual production is regional. On the other hand, waste recovery is not even national, but regional within a country. Regarding collection, opportunities should be created for end users to participate in collection schemes. However, small-scale industrial solutions in waste operations create a huge burden for recyclers from an economic perspective; small-scale recycling is disproportionately high in costs, needs subsidies, etc. They result in an unstable, economically weak and volatile waste sector.

A truly holistic approach to the Circular Economy is needed.

All the above points lead to one major conclusion, that circularity needs to be assessed in its entirety. It cannot be handled merely as a waste management issue, since it is not a waste management problem. To achieve a circular economy, a holistic approach is necessary. It must tackle all stages of the product life cycle simultaneously and in the same direction in order to achieve the anticipated results for all stakeholders acting in their own field.

A uniform data collection and processing system must be developed.

Based on the performance figures of collection and recovery against their targets, the state of the waste management systems is not comparable across countries since the data rely on different terminologies. However, data capture and processing also differ from country to country. Data needs to be collected in a uniform and timely manner in all countries in order to be able to measure and intervene in the system effectively. Data collection must be developed in a way that minimises the administrative burden of the sector and ensures transparency throughout all stages.

1. LEGAL SETUP OF WASTE MANAGEMENT IN THE EU

As already highlighted in the Executive Summary, the problem areas of waste management are very similar in scope between the regions. It is therefore possible to create suitable measures at EU or even at international level.

All the countries in focus, apart from Serbia, are EU member states. This means that their legislation relies on the acquis communautaire.

Serbia, being already in the accession stage of becoming a full member of the EU, is in the process of transposing the acquis in which environmental and waste management issues are of top priority[1].

The secondary environmental legislation in the EU is usually regulated by directives, which give more freedom for member states to constitute their own laws and systems. Directives set targets and goals to be achieved by member states, but it is up to each country to devise their own schemes to achieve those goals. Even the most important waste-related legislation, the Waste Framework Directive, has no direct binding power within the individual countries. Theoretically, the definitions and principles of EU strategies and in the legal acts shall be the same for each member state but they are usually not precise enough to result in a common understanding. Exceptions are rare (for instance, some secondary material and end-of-waste criteria have been developed by the EU), but since they are very much limited in their scope (only a small segment of materials, such as glass and steel, are regulated in this way) major decisions are taken in isolation by each country.

It is clear, even from the Road Maps, that current understanding of the basic terminology differs significantly, making the whole procedure of waste management, including the analysis of the data and results, difficult to compare.

Regarding the waste management legislation of the EU, as said, goals have been set to reach collection and treatment targets and to ensure that the waste hierarchy is implemented in such a way that priority is given to waste operations that promote better overall environmental outcomes. In 2018, new goals for several waste streams, including the three streams of the present project, were devised and ambitious new targets accepted to ensure the diversion of waste from landfills by setting higher separate collection and recycling targets. This is the so-called Circular Economy Package (CEP), which includes a huge set of modifications to already existing Directives.

On the other hand, the problem remains that new collection and treatment goals alone cannot solve a systemic failure which the EU still has not addressed regarding legislation and, in a broader perspective, circularity itself.

Definitions in waste management, especially definitions of the stages of the waste hierarchy, such as reuse and recycling, have not been formulated. Even the definition of waste and end-of-waste is unclear, which means that every member state decides on its own when something enters and leaves the waste status.

[1] Serbia 2018, Report, - Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. 2018 Communication on EU Enlargement Policy.

The various adaptations of the term "recycling" and the various associated technologies, for example, leads to inconsistent descriptions of out-coming secondary materials, let alone data submitted to the member states and through them to the EU on the member states' legislative compliance and their meeting the goals set by the EU.

The Road Maps indicate very clearly that member states not only have different levels of maturity in their waste management systems, as well as other systems, but also a difference in the application of the terms used and, as a result, in how they define waste and its processing stages.

As for a broader perspective, legislation has remained an end-of-pipe solution, trying to tackle the problem of the circular economy from the waste perspective, instead of handling it from the starting point, at the point of production. The only exception, and the first of such approaches, is the issue of single use plastics and the upcoming obligation of PET bottle producers to attach the caps to the bottles. Apart from these obligations and restrictions, neither the pace nor the subject-matter of EU legislation seems to be adequate for the size and the importance of the issue of the circular economy.

The Road Maps show this very clearly and, as such, the most important action to take might be that decision makers of the EU need to be informed of the consequences of an incomplete regulatory approach, and the need to make the relevant legal acts more practical and more accurate or detailed in order to create the necessary common understanding among the member states.

Waste management
Recycling

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2.   REGULATING AND INCENTIVISING THE PRODUCTION STAGE
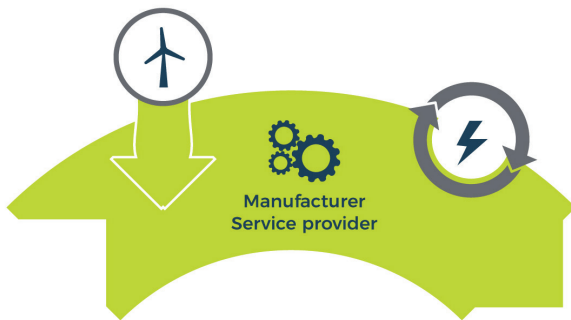
As explained previously, end-of-pipe legislation means that there are not only obligations but restrictions on producers with regard to taking part in building a circular economy from the resource perspective, by assuring the eco-design of products in any of the streams in focus.

All of the Road Maps have highlighted the importance of product design, naming it the root of keeping the product in the life-cycle for as long as possible and then recovering waste materials that are highly recyclable.

If we access this issue from the problem side, as was done in all of the Road Maps, waste operators face the problem of the uncontrolled production stage in the forms of:

• being impossible for recycling technology to follow the pace of product development;

• the lack of information regarding the likewise rapidly evolving composition of materials used during production;

• the absence of binding targets or incentives for producers to use secondary raw materials, and no binding targets or incentives to apply eco-design;

• national legislation's insignificant influence on the global design of products; the individual countries have no real influence on design, which takes place around the globe; and

• the total lack of communication between the recyclers and producers.

MOVECO has identified possibilities to harmonize requirements for PROs. It can be agreed that the solution - and with it the regulation which leads to a circular economy - must start by incentivising the producers to change their behaviours and take real and extended responsibility for their products, not only at the post-consumer stage, but also at the design phase of their work.

Incentives can take on different forms and content, depending on the different waste streams. The most effective measures need to be identified by taking economic, social and environmental aspects into consideration.

Here, it is also important to mention that globalisation in production means that producers need to meet certain criteria – both waste-related and, from now on, circularity-related - worldwide, and at present they are country-specific. Creating coherent measures to enforce responsibility, which are standardised at least at EU level, can influence the global production chain towards implementing effective compliance or even voluntary initiatives.

3. WASTE MANAGEMENT

3.1. RESEARCH AND DEVELOPMENT IN WASTE TECHNOLOGIES

With the increasingly rapid pace of product development, including the rate of change in the composition of materials used, the waste management sector at present is unable to keep up.

The investment spirit in the waste sector is based on just the same principles as in any other industry: computability, risk assessment and the possibility of long term planning.

As for the security of input materials, waste of various types is insecure at present due to the production problems already detailed and the waste collection challenges that will be presented later, and the investment spirit is therefore limited in the waste market.

Rapid changes in input material quality imply the obvious risk that there will never be a return on investment, let alone the profitability that is usually the ultimate aim of investments, as the technology implemented cannot be used with new materials.

To be able to accommodate or react to the dynamics of continuous input material modifications, the investment needs of the waste sector need to be subsidised or otherwise supported financially.

If the decision makers finally decide to intervene, at production level, in the system, and can guarantee that the composition and volume of input materials will be relatively stable then these external financing needs could be eliminated but, until then, they would be necessary.

Besides the financial side of waste technology related investments, information is key to proper waste recycling. The waste sector can only react to input quality changes in a timely manner if they are aware of the magnitude and the qualitative features of the changes ahead and if they have time – besides money – to come up with a suitable solution for certain materials, working together with the producers.

Such investment support could be addressed at an EU level, as technology and R&D are already supported by the EU, but the communication channels need to be worked out and start to operate as soon as possible.

In the start-up phase, an assessment needs to be done at EU level on available waste management capacities and technologies, in which a detailed analysis of the quality and quantity of input and output materials has to be performed.

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3.2. COMMUNICATION BETWEEN WASTE MANAGEMENT STAKEHOLDERS

The unquestionable need for establishing and operating one or more active communication channels between waste management stakeholders is presented in all of the Road Maps.

The rationale for the need for better communication between producers and the waste management industry and the operational problems of incomplete legislation (which is partially due to incomplete communication and feedback channels as well) has already been explained, but it is obvious from the Road Maps that the need for active communication to and from all the other players will be necessary as well.

Collection systems, for example in different waste/product streams, need to be worked out and designed in a way that makes it easier for inhabitants and other end users to provide clean materials for recycling. After the planning stage, communication with end users needs to be carried out in an organic and consistent manner.

Although the need for communication is a general issue raised in the Road Maps as detailed above, Region 2 and 3 countries also face the problem of the lack of reliable and long term planning and long term solutions in waste management, which cause confusion not only to professionals but most importantly to end users, the holders of the waste. Both regions reported the constant change of collection methods, legislation and other waste-related solutions as the major obstacles to reliable collection results, along with the lack of contributions from end users and an unquantifiable business environment. These are all partially communication problems, but they are also the consequences of an unsystematic approach.

The response to this point needs to be the establishment of a straightforward communication tool or methodology involving all stakeholders,with special focus on communication towards with end users based on long-term planning.

3.3. COMPETITIVENESS OF SECONDARY RAW MATERIALS

Waste

Energy and material resources are lost

As the Road Maps underline, the use of secondary raw materials that are generated from waste have no stable market at present. The quality of the secondary raw materials is indeed an important question in this respect, but even if the materials generated through recycling processes meet the quality criteria of the production stage, their price is not competitive with that of primary raw materials on the market.
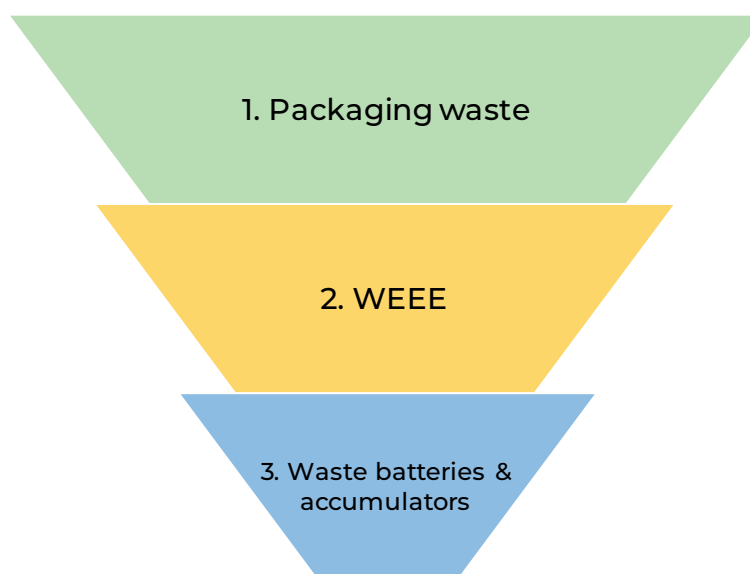
Recycling costs, together with the cost of collection, transport, sorting and other necessary processes, are making the price of secondary materials higher than primary ones. With regard to plastics for example, which are the most common packaging materials, the price of the primary material depends on oil prices, which have been at a low point for many years now. This means that secondary material plastics cannot compete on price, and the market will choose to work with primary materials unless they are otherwise obliged, regulated or incentivised.

It is especially true because trust in the quality of recycled materials has not yet been established in most waste streams. Glass and aluminium cans are exceptions, as studies show; good quality secondary materials are recycled into new material almost an unlimited number of times, but recycled plastics are mostly avoided in production for quality, price and trust reasons.

Several other legal obligations apply to the quality requirements for packaging goods that hamper the use of secondary raw materials, for example with regard to food packaging, and producers cannot risk being non-compliant due to using secondary materials.

Several actions need to be carried out to overcome these obstacles.

Illustration 1: *General waste hierarchy stated by the countries*

1. Packaging waste

2. WEEE

3. Waste batteries & accumulators

Source: **Cross-Country Road Maps. MOVECO project, 2019.**

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1. The development of end-of-waste criteria needs to be done as soon as possible, taking the obligations of the production industry regarding the quality of materials used into consideration, to ensure that the expected quality criteria are met by secondary materials as well.

2. The recycling industry needs to be developed so that it can produce marketable, high quality materials that are suitable for creating products – upcycled materials, instead of downcycling for the sake of the waste treatment processes itself.

3. The use of secondary materials in the production process needs to be obligatory to some extent and as a proportion and, in the case of some materials – such as plastics – in new products as opposed to just packaging.

4. The use of secondary materials must be incentivised by the EU and its member states, in order to mitigate their exposure to unstable market conditions and direct producers' attention to the market advantages lying in the use of such materials.

Producers can only by directed towards the circular economy with a united effort involving several legal, economic and marketing instruments working at the same time.

All the countries in scope have highlighted the lack of market for secondary materials as a major obstacle for development of recycling infrastructure.

# 4. WASTE COLLECTION AND TREATMENT
4.1. THE ISSUE OF RECYCLING

The recyclability of waste materials depends on the input material quality – besides the technology used, of course. Recycling clean and homogeneous waste streams is more cost effective as they do not need to be further sorted or cleaned if it is at all possible. The technologies of waste recycling are designed to use certain waste compositions and cannot handle materials with different chemical or physical properties.

Although the three groups of countries are at different stages in terms of their existing recycling capacities, and in some cases due to an immature waste system or economic barriers such as poor input material quality, they all have issues with recycling itself.

Diagram 1: *Packaging recycling rates by countries (%)*
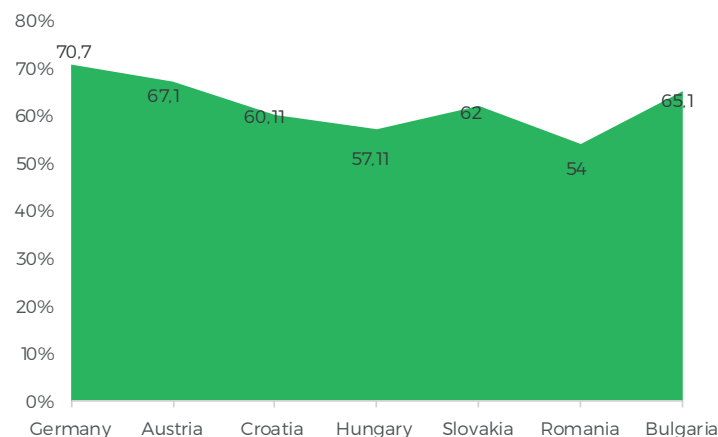
Source: **Cross-Country Road Maps. MOVECO project, 2019. Note: No comparative data are available for Slovenia and Serbia.**

As described above, the term recycling itself is unclear, as it includes several different mechanical and technological processes that would not be a problem if they were adequately described.

A categorisation of technologies has been carried out, and there is a non-exhaustive list of them in the Waste Framework Directive that can be implemented as the member states wish.

Indeed, it is impossible to create a full list of technologies, especially if technological development is to flourish in waste management, but there are still a lot of potential to make them more understandable and useful.

1. One option is to add and regulate the expected quality features of outcoming materials in a precise way.

By applying the end-of-waste criteria to more waste streams and setting recycling targets to the fact that those quality requirements are met, confusion over the meaning of recycling can be avoided.

2. These quality requirements must be based, as stated previously, on a thorough analysis of the input market for primary materials.

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3. Which primary materials could be replaced by which secondary materials, in which industries or even by producer group, must be made clear.

This market benchmark would guarantee the existence of a market for the secondary materials and direct the development of the recycling industry.

Benchmarking materials will also reveal those waste streams where recycling is not an adequate solution, whether for economic, environmental or technological reasons. The further use or processing of these secondary materials must also be taken into consideration, as a closed loop of resource flows can only be created if all the materials in it are dealt with.

As the limit of recycling is a factual limit, this also needs to be handled and solved on scientific grounds.

4.2. THE CONCEPT OF REUSE

The concept of the reuse of products, parts of products and materials has been a hot topic for years in the industry, and the Road Maps also include the concept of reuse in the proposed measures and actions.
The problem is again partially legal and partially practical.

Reuse is part of the waste hierarchy, as the second best solution after prevention. The problem lies again in the precise interpretation of reuse as a concept and as a practical activity.

Reuse "happens" before a used product reaches its waste status. It means that reuse is not a waste management issue, although the relevant legal acts somehow try to push it into the waste laws.

Waste management operators cannot be responsible for guaranteeing the reuse of used products, as they deal with waste. Producers offer guarantees and a service network for repairing their products – as they are obliged to – but it might not be appropriate to classify this as "reuse" as it usually happens within the life expectancy of the product itself.

Reuse itself is indeed within the life-cycle of a product, somewhere in between normal operations and waste status, but so far no firm and explicit line has been drawn between the stages of the life-cycle of the product and its reuse.

The regulation of reuse is vague and so reuse remains a concept that is tempting and appealing but has no real content. Aiming for reuse is present in all of the strategies and legal acts of the EU, in the environmental strategies of all major companies, etc., but without concrete actions as the actual meaning and practice of reuse is unclear.

1. Preparation for reuse needs to be the obligation of the waste sector.
The regulations state this, however, no procedure nor economic, social or environmental considerations are given for stipulating the cases, products and materials in which reuse is an appropriate option, or to determine what it actually means in practice for these materials.

2. Assuming reuse remains one of the most desirable methods of prolonging the lifespan of a product or material, what it actually means needs to be specified, using both quantitative and qualitative measures.

4.3. DATA COLLECTION, DATA CONTROL

Collecting data was part of the objectives during the preparation of the Road Maps. It has already been mentioned that the data system – if any – relies on the national legislations and national waste management system infrastructure.

Although an in-depth analysis or benchmarking of the data capture and processing systems was not the aim of the project, pointing out the lack of a unified system, which is apparent from the Roadmaps, is unavoidable.

There is no need to detail how the absence of common ground, namely a common understanding of definitions, technologies etc., is the basis of the problem of the data systems. Clear input "material" is also a fundamental of reliable data systems.
As emphasised in the Road Maps, data reporting is unclear, even within a country, not to mention at EU level.

Diagram 2: *Packaging put on the market (t)*
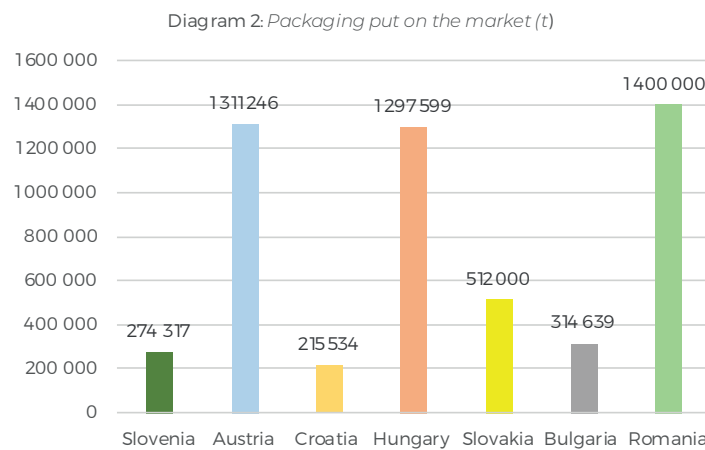
Source: **Cross-Country Road Maps**[2]. **MOVECO project, 2019.**

In some regions, data capture systems are not up-to-date, as they are not real-time systems, operated on online platforms, they are also neither accessible nor transparent and evident mistakes cannot be filtered out. In these cases, an analysis of the data is impossible, as the collection and processing of data is not fit for purpose.

Data is important for further planning as well; trends and shortcomings reflected in the data can determine the course and necessity for systematic and technological development, besides ensuring the results can be managed and that there can be a dialogue with stakeholders.

1. Setting up and operating a modern, unified, result-oriented data capture system can help to align the outcomes of waste recycling, and help set ambitious but realistic goals, as well as offer the tools for proper planning for optimising waste management operations on an EU level.

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[2] One of the most relevant data sets is one that shows the possible opportunities for recycling within a country, based on its generated packaging materials. Unfortunately, this information was made available only by the countries that are displayed in the diagram. In addition, we cannot mark any year as a reference year, as it differs from country to country. The most common conclusion we can make is that the data are the best available within the last five years.

2. A data system at EU level could be a tool for tracking and tracing the route of waste flows until standardised recycling takes place, so that no resource becomes out of scope, or even subject to uncontrolled downcycling in countries outside the EU that have lower standards of recycling.

Diagram 3: WEE collection per inhabitants (kg/inhabitant)
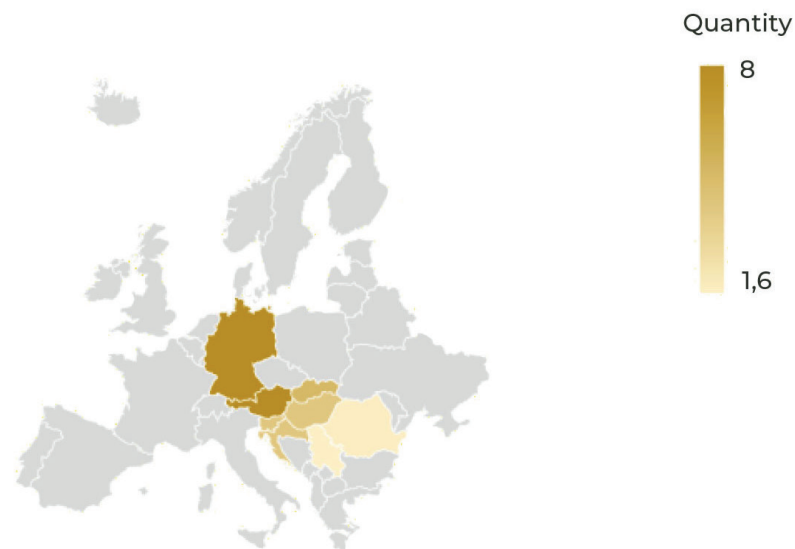
Source: Cross-Country Road Maps. MOVECO project, 2019. Note: No data is available for Bulgaria.

The implementation of such a data capture system should be smooth once the terminology and technological solutions have been standardised and a common understanding of waste management (such as the start and end of waste status, including the standardised classification of waste that is already in place) has been achieved.

Diagram 4: *Batteries & accumulators collection (t)*
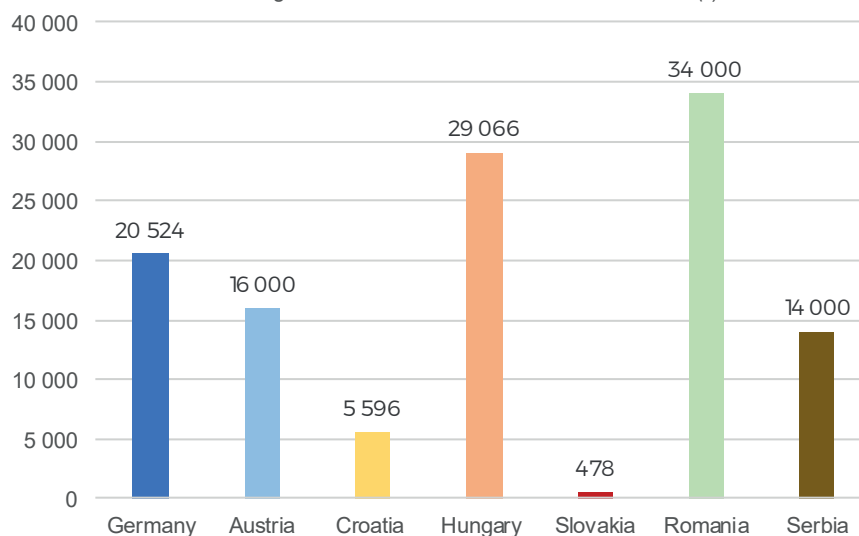
Source: Cross-Country Road Maps. MOVECO project, 2019. Note: No data is available for Bulgaria.

4.4. SEPARATE COLLECTION OF WASTE MATERIALS

Proper product design and accessible and state-of-the-art recycling technology have already been named as necessities for providing good quality secondary materials. However, it has also been mentioned that waste collection also plays a crucial role in ensuring that good quality secondary raw materials are produced.

As the Road Maps indicated, there are challenges in collecting waste that hinder any guarantee of quality input materials for waste treatment activities.

The major – although logically not the first - problem in all the countries is that the collected waste is not clean enough. This means on one hand that the waste is not homogeneous; end users do not separate it properly and instead put other, non-compliant materials into the bins, bags or other waste collection sites.

This can be due to miscommunication, when the end users are not properly informed or educated to use the collection systems appropriately. This might also be the easiest to solve, as adequate information can support the education of end users.

1. The most important issue in this case is that end users are given the same information in all communication channels used, and that they develop trust in them .

2. It is also important to provide feedback, using trustworthy communication channels, to end users that their efforts are beneficial to the creation of a circular economy, in order to boost their commitment .

Mixed quality collections can also be a result of a lack of interest by the end users. If they are not incentivised or obliged to do more than just take part in selective collection but also to commit to "quality requirements," the outcomes of collections will be questionable. Legal entities, such as end user companies, can be more easily incentivised, with both rewards and penalties, and can be held accountable for the proper sorting of waste.

3. Their obligations and rights need to be formulated and communicated and, later on, compliance must be monitored and supervised as part of the waste management supervision of each country – also in a systematic manner.

Involving natural persons, residents, on the other hand is more complicated. Education and communication have their own limits, as the Road Maps show, and they take much more time to convince.

4. If incentives to influence residents' behaviour are used, they should be easy to understand, proportionate and relevant or worthy enough to ring a bell.

5. Penalties can also be useful measures for residents, but their system and proportionality are key to being effectively used.

Consumer

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Unfortunately, especially in Group 2-3 countries, the system for incentivising inhabitants to provide clean selective waste is not in place or not efficient enough, as the Road Maps report.

For residents – and also legal entities – as end users, too much information can also cause a loss of commitment. An over-complex, too detailed collection system is one of the major causes of non-participation.

If too many types of waste are collected in too many ways or, as in some cases in the report show, collection procedures differ within the countries, end users become confused and they usually lose their hardly gained trust and willingness to participate.

6. This can be avoided with proper planning, by aiming to provide an easily understandable collection system that is also easy to be followed.

Besides the need to boost the efforts and commitment of end users to provide clean materials, there are other obstacles that influence the separate waste quality and cleanness, which are more the symptoms of non-existent or an unsystematic planning of collections.

Group 2 and 3 countries have added that the continuous changes in waste management legislation and, due to these changes, unreliable collection systems are causing a loss of trust and willingness among inhabitants to participate in separate collection.

As long term planning is key to success in waste operations in general, it is even more true with regard to collections, where the points of possible mistakes equals the number of participants – all residents and other end users. It is irresponsible to think that end users are willing to adapt time and time again to new information and new expectations. An imperfect system that is trustworthy results in better outcomes in terms of household contribution than the one that is in constant change with the aim of making it better.

7. Countries have to develop long term strategies with long term planning of collection networks, work out the details and, once that is ready, start to implement it together with organically informing end users of their expected contribution to it.

In some Road Maps, the total lack of the collection infrastructure has been reported.

8. In these cases, best techniques and best solutions need to be analysed, including failures of other collection solutions, and a strategy to build up and operate the separate collection networks based on the findings detailed above needs to be carried out.

Collection of waste will never be flawless, as the Road Maps show, but higher quality, homogeneous waste streams can be achieved to support recycling and waste management operations in order to create quality secondary raw materials.

4.5. RECYCLING ABROAD

Details on the proposed actions for recycling have been shared; however, yet another aspect of recycling must be stressed to complete the picture.

China's ban on waste imports has brought the issue of waste export and waste recycling in third countries into the spotlight. In 2018, China banned the import of certain waste streams into the country, including plastic waste.

The decision has caused the most dramatic and most revealing effects and results in the history of waste management. Systems of waste management have collapsed; millions of tons of waste have been stacked and piled up around the world, including in the EU countries.

The ban revealed that recycling does not really happen in a lot of countries for a lot of material streams, especially low value plastics from packaging and WEEE.

Countries around the globe have reported the collection and treatment of waste as done, and goals and targets achieved, while the waste has actually only been transported abroad into unknown conditions.

The transboundary movement of waste is not an illegal activity. It has its own roles and it has its own international rules in force, such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Other Wastes and their Disposal.

The Parties to the Convention are countries that apply strict rules for waste exports, including the requirement that shipments of waste can only happen if the standards for environmentally sound management of these waste materials are met in the receiver country and only those that the sender country has no capacity to recycle and that are recycled in the receiver country can be transported. Even the procedure of Prior Informed Consent (PIC) is in practice internationally based on the convention.

Even so, the China ban has revealed that the international community has "trashed" China, and the actual recycling of waste has not happened in the country.

In practice, it means that, for decades, several countries have collected waste streams that have low value or no recycling option within the country, and instead of developing a regulated and adequate recycling technology for it, they have just been exported under the umbrella of recycling abroad.

In the case of EU countries, the quantities exported to China – and other receiver countries similar to China – have been reported towards the Commission as having been recycled, so that the targets set by the EU are met.

In the Road Maps of the Group 1 countries, it is stressed that the uncontrolled and untraceable export of waste streams poses a threat to the waste management system. In the Road Maps of the countries from Group 2 and 3, the lack of domestic recycling capacity is emphasised.

Both of these mean that recycling lower quality and lower value wastes and materials is still not resolved within the EU counties.

1. Besides the technological development necessary in the EU countries to close the material loop within the region, the traceability of data on the movement of wastes – within a country, a region or outside of Europe - needs to be developed to avoid such issues occurring, and to reach a circularity of resources.

2. The transboundary movement of wastes must be closely monitored and supervised as China was only one of those countries that allowed large amounts of waste to be imported.

5.   THE CIRCULAR ECONOMY PACKAGE OF THE EU

As mentioned above, the EU is committed to the concept of the circular economy, and as such has modified its waste-related legislation in 2018 to move towards circularity. The revised legislative framework entered into force in July 2018 and already aims to set clear targets for the reduction of waste and establish an ambitious and credible long-term path for waste management and recycling.

The amended directives are:

  • Directive 2008/98/EC on waste
  • Directive 1999/31/EC on the landfill of waste
  • Directive 94/62/EC on packaging and packaging waste
  • Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment

The present Action Plan has underlined the need to handle the circular economy at all stages of the product life cycle, not only to focus on the waste management stage.

The CEP has again left the detailed regulations and establishing the infrastructure to the member states, which will face even bigger problems than they do today.

1. To bring about a change of attitude towards development and the requirements of the EU, region-specific development programmes could help member states to reach the CEP targets faster and most efficiently at a specific pace and in a prescribed manner.

As some countries are still dealing with the fundamental problem of not even having sanitary landfills, the diversion of waste from landfills and selective collection is a secondary priority.

2. At the same time, if too much landfill capacity is created – from EU funds – operations are bound to direct the waste streams towards landfills instead of diverting them from it.

3. It will therefore be essential to tailor the goals and targets of each region of each country, based on the analysis of the waste management development stages and the existing capacities, and to require long-term strategies that are put into the implementation phase of without major modifications.

If the EU still allows countries to delay solutions and the establishment of a waste infrastructure, if the funds provided are not controlled but compete with one another and technologically low-quality recycling is supported in some waste streams while no capacity is built up in others that seem less profitable, the targets set in the CEP are meaningless, as they will be out of reach, or be reached as they were before the China ban.

6. REGIONAL ASSESSMENT

After the general actions, we emphasise the importance of regional goals and regional development areas that can prove that regions are upgrading their waste management systems continuously and that regions with less mature waste management reach higher standards over shorter timescales.

To assure a broad development, we hereby set out the region-specific actions and measures to be taken.

6.1. Region 1

Austria, Germany and Slovenia are among the countries in the EU where a waste management infrastructure has been set up and operated for a longer period of time. The results of this are visible, as collection and treatment targets are not only met, but also exceeded in some cases for some waste streams.

Diagram 5: *Recycling of packaging waste in Germany, 2016 (%)*
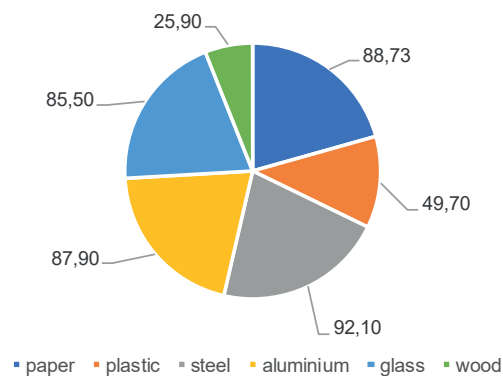
Source: **Cross-Country Road Maps. MOVECO project, 2019.**

This is the region that is closest to meeting the CEP targets, and that already has assessed its system to find the optimal solution that will result in meeting the new targets, although it has been stated that the new targets are even ambitious to them, and that the waste management sector of these countries cannot cope with the new targets without additional regulations.

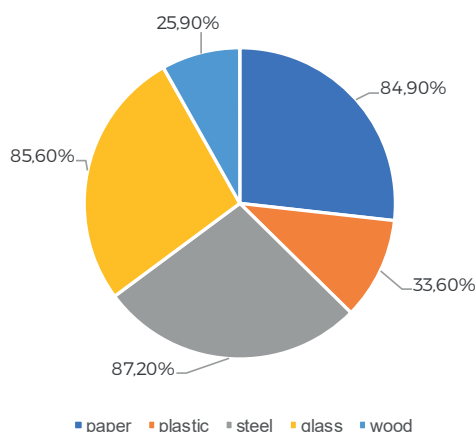Diagram 6: *Packaging put on the market (mT) and recycled (%) in Germany, 2016*
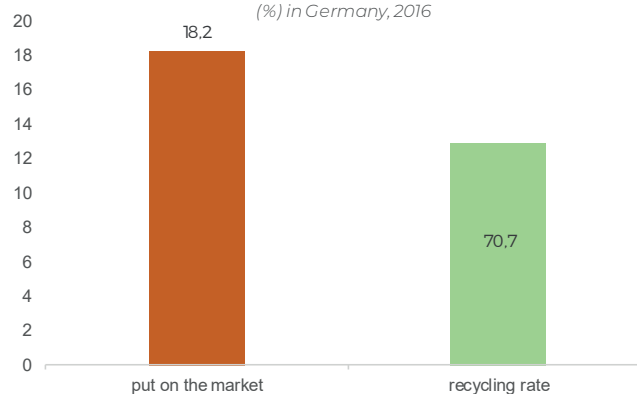
Source: **Cross-Country Road Maps. MOVECO project, 2019.**

All the above-mentioned measures and actions were emphasised in the Road Maps of this region, with product design, qualitative standards for recyclates, the R&D need in waste technology and the market need for secondary raw materials being the top priorities.

It was specifically in this region that the issue of planned obsolescence appeared. Although it has not been proved that producers build features into their products that render the product unusable after a while (only the IT industry uses software updates that require new products in some cases), planned obsolescence is the complete opposite of circular economy.

Diagram 7: *Recycling of packaging waste in Austria, 2015 (%)*

■ paper ■ plastic ■ steel ■ glass ■ wood

Source: **Cross-Country Road Maps. MOVECO project, 2019.**

Diagram 8*: Packaging put on the market (t) and recycled (%) in Austria, 2015*
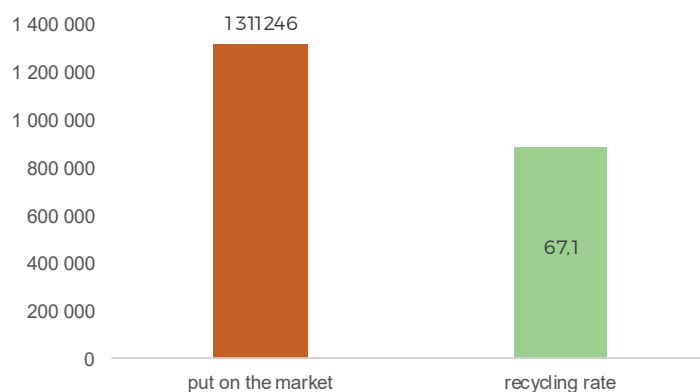
Source: **Cross-Country Road Maps. MOVECO project, 2019.**

1. Investigations need to be carried out to reveal the magnitude of this issue, and regulations can support the avoidance of this market-generating tool.

Waste export has been the other significant message from the region, which has its own recycling capacities but still exports some waste materials as solutions to meet EU targets.

Slovenia is an exception, in that, due to its size, it faces the problem of uneconomic quantities; it does not have enough input materials or waste to justify operating its own recycling plants.

6.2. Region 2

Croatia, Hungary and Slovakia are within this region, with a moderate level of waste management infrastructure. Collectións usually occur – though Croatia struggles with the solutions due to its islands and the results of its flourishing tourism industry, especially during the summer period.

On top of the measures and actions mentioned above, the most important challenge to the region is the continuously changing legislation. The inconsistent waste strategies of the countries result in such changes, and even if they seem like minor changes they have a huge influence on the overall waste management system.

Diagram 9: *Packaging put on the market (t) and recovered (%) in Croatia, 2015*
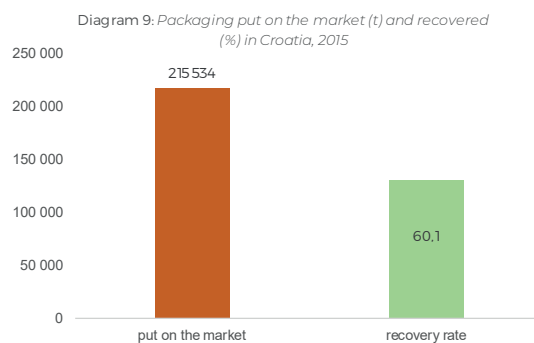
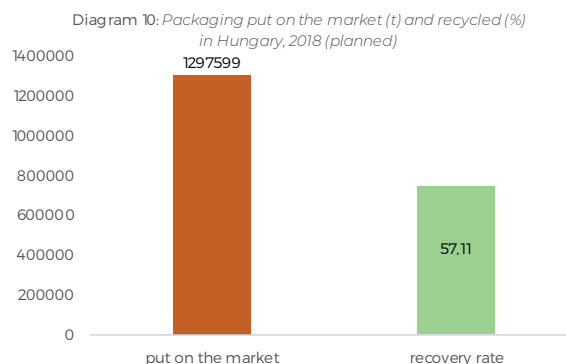*Source:* **Cross-Country Road Maps. MOVECO project, 2019.**

Residents' and other end users' confusion is at the core of the poor quality and quantity of separate collections.

Due to the constant changes and the lack of qualitative and quantitative improvement of the waste materials collected, the recycling industry struggles with an unpredictable and unreliable business environment. This makes investments from their side highly risky.

Changes happen not only in waste management but in the overall business environment, such as taxation, which has the effect of stifling any investment spirit.

1. A stable business environment, with stable waste legislation, goals, and transparent terms and conditions of operations that are based on long term planning would help these smaller sized counties to boost their waste industry.

The other issue in the region is illegal waste dumping. Although all of these countries have proper and countrywide waste collection networks, illegal waste dumping is a general problem .

Diagram 10: *Packaging put on the market (t) and recycled (%) in Hungary, 2018 (planned)*

Source: **Cross-Country Road Maps. MOVECO project, 2019.**

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2. Stable legal obligations on all stakeholders, adequate supervision of end users and the waste industry, and an effective data system, data control and law enforcement could help the region to overcome the problem of illegal waste activities.

6.3. Region 3

Bulgaria, Romania and Serbia are within this region. Serbia is an accession country at present; the other two counties are full members of the EU since 2007. In this region, the establishment of national waste management systems are at the planning stage or are just beginning.

1. The legal frameworks and the creation of a waste infrastructure need to occur in order to reach EU targets.

2. Serbia can use accession funds to boost its development, but it has to do it wisely, and not create an over-complex or too much capacity.

The latter was the case in many countries during the accession period – such as Hungary, with 72 landfill sites.

Diagram 11: *Municipal waste treatment by type of treatment in the EU-28, 1995–2017 (kg per capita)*
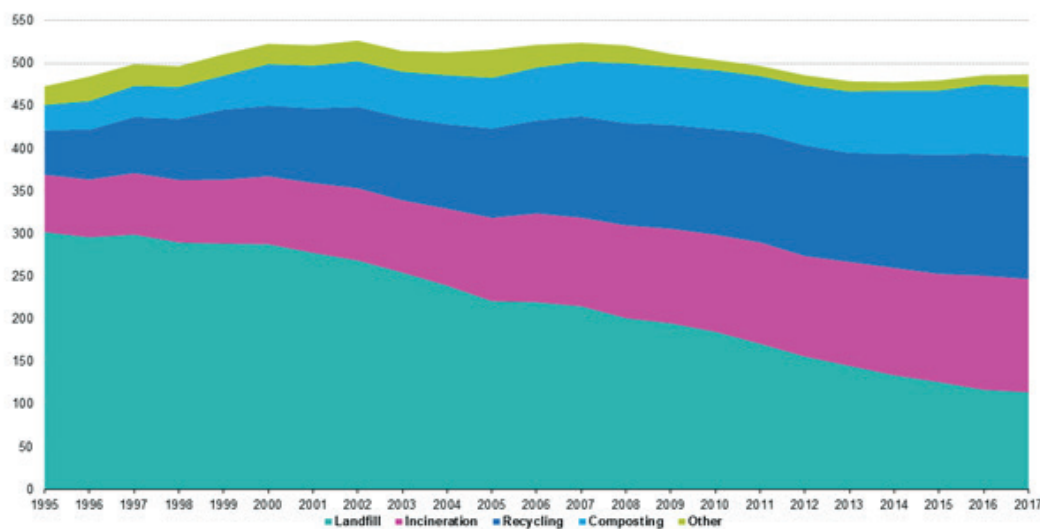
Source: **Eurostat.**

Law enforcement is an issue in these countries, with a lack of resources to supervise and monitor operations and end users.

Establishing waste infrastructure market conditions and ensuring the competitiveness of the recycling industry will be crucial points to deal with.

CONCLUSION - THE NEED FOR A SYSTEMIC APPROACH

The circular economy seems to be a new concept that needs new approaches and a significant change in attitude among all stakeholders, globally.

However, circularity is actually a natural process, which has been present not only in nature but in the everyday social life of human beings for centuries. Unknowingly, people used to live their lives more consciously. The last decades have changed the pace and the style of living without thinking of the impacts of these changes. It happens in all aspects of life, not only regarding waste management. Nevertheless, waste management is a mirror of our lives, which reflects clearly on how we live and what we really do, and also what we should not do.

Recklessness is no longer an option, as the magnitude of recklessness in the last decades resulted in the problems of today.

Real solutions must be found, as soon as possible, taking into consideration that the change from natural circularity has happened in all stages of our lives. Therefore our approach to turn back towards circular economy ust be systemic as well.

It is not enough to point out one or two aspects of our life where it seems easy to intervene and change the course of history or the economy.

A holistic approach is necessary, which leverages those points of change within the system in a way that maximises their cumulative positive effects.

In waste management, the Road Maps have highlighted the major errors in the present system, generally and regionally as well. The Action Plan proposed solutions.

The holistic solution of the circular economy shall mean that we end the practice of end-of-pipe solutions, and assess the problems, tasks and solutions at all stages of the product life-cycle.

We need to start at the production stage, by creating incentivised market conditions, in which producers must be responsible for eco-design. Based on this approach, collection and treatment solutions shall be re-drafted, re-organised, and invested in, in which resources shall be turned back into produced goods, and the leftovers are managed to the fullest extent. We need to consider low value or negative value materials as tasks to be solved by controlled conditions as well, and need to make market actors accountable for providing solutions to avoid the boomerang effect.

The circular economy can be a reality if we deal with it as a system. Keeping this in mind, the MOVECO project has forged a strong transnational partnership to prepare this Action Plan for the transition towards the circular economy within the Danube region. In doing so, MOVECO worked towards its ambition to close the loop and has built bridges between policy makers, research and development organisations, enterprises, and the public for the transition to a circular economy.

Policy maker
Developer
Researcher

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About Moveco
"Your trash is my treasure"

This is the motto of the EU co-funded project MOVECO – Mobilising Institutional Learning for Better Exploitation of Research and Innovation for the Circular Economy. Sixteen partners from ten countries of the Danube region want to promote transnational cooperation to accelerate the transition to a circular economy.

The MOVECO consortium is working on topics such as eco-design, producer responsibility and green innovation, supporting best practices in these areas.

Under the framework of the Danube Transnational Programme, MOVECO is an Interreg project, co-funded by the European Regional Development Fund (ERDF) and the Instrument for Pre-Accession Assistance (IPA). | A projekt a Duna Transznacionális Programból, az Európai Regionális Fejlesztési Alap támogatásával, az Európai Unió és a Magyar Állam társfinanszírozásával valósul meg.

The project duration is 12/2016–08/2019.

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