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## **WSX - EUROPEAN WASTE SERVICES EXCHANGE, INSTRUMENT TO START THE TRANSITION TOWARDS CIRCULAR ECONOMY\***

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### **Abstract**

The WSX BM project, developed under the Climate-KIC's Pathfinder Programme, aims to test and validate the basic assumption of the WSX project, namely the existence of a "market gap" of international scope to which to respond, in order to stimulate the circular economy, with the construction of an innovative platform that facilitates the meeting between supply and demand for services dedicated to waste recovery.

The integration of the stock exchange platform with the most advanced information technologies (rule engine, machine learning, blockchain etc.), will lead to the creation of an innovative expert system that facilitates the meeting between the demand and the complex and articulated world of supply and availability of services necessary for proper waste management. The system, designed to automatically create multi-service offer prices for each request, even by different operators for a single transaction and thus give rise to a complete multi-service response to market demands, will also allow the preparation of the documentation required by EU legislation, to trace the various stages of implementation for transparency and to communicate the mandatory data to the bodies responsible for control.

WSX BM Pathfinder project aims to test and validate the existence of the market gap identified by the WSX.

*Keywords:* block chain, circular economy, machine learning, raw material, rule engine, waste recovery, waste recycling, waste services regulated market

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## 1. Introduction

The WSX Project is an attempt to apply an idea born from over thirty years of knowledge about the market for industrial waste recovery/disposal. This peculiar and indispensable activity of the productive world, specifically industrial, arose in the second half of the twentieth century, but assumed a strategic importance at a time when international organizations dealing with the territory protection have perceived and scientifically proven that human action impact induces significant changes in the natural evolution of our planet, especially with regard to the climate.

This trend has generated the current theories/practices of the so-called Circular Economy, which constitute a first attempt to limit the damage caused by human action in the ecosystem that hosts us (Andretta et al., 2018; Oyelola et al., 2017). WSX intends to propose a reasoned regulation and compliance with the existing regulations of the services market that has been established in the last 50 years to address the problem of the correct start to industrial waste recovery/disposal. The WSX purpose is to encourage the Circular Economy activities and practices by expanding competition in the free market and producing savings in the implementation of its processes.

## 2. Objectives of the projects

**WSX Project main specific objective** is to develop a new and innovative technology, tested and validated, necessary to launch a new Business to Business (**B2B**) instrument aiming at **regulating the EU waste-management service market**, to be owned in part by a New Company named “WSX” and in part by strategic investors active in waste-industry, financial department and industrial sector.

**The final general and long-term objective is to run a pan-European Waste Services Exchange, or so-called WSX, managed through the WSX on line EU Platform, this latest to be developed during the first years of the WSX project running.** This will facilitate trade in waste, increase the transparency and liquidity of EU waste markets, reduce the cost of compliance with EU and member states regulations, improve the profitability of waste producers, optimise the use of EU waste treatment plants, improve waste-management practices in an ethical way aiming at illegal activities removal. Moreover, this initiative shall boost the recycling of raw materials coming also from the desirable new “end of life” processes of the artefacts. **The WSX implementation will accelerate a smoother transition to a circular economy in Europe.**

The *immediate objective* of the project is, therefore, to develop this new and innovative **EU Waste Service Exchange on-line interactive platform (WSX)** for the business and the services that, in the long-run, WSX will provide. Such a system can provide useful services to support the transboundary shipment of hazardous waste, as well as the local shipment of non-hazardous waste. *Our immediate goal*, however, is to *shorten the route-to-revenue for a new “WSX company” and optimise its chance of success* by focusing first on the market for services supporting the transboundary shipment of hazardous waste in Europe performing business towards a circular European economy.

**The real innovation foreseen by WSX is not only the expansion of a platform dealing with EU waste management but also the development of a new business model, and related services, that will allow transparent waste trading through an innovative on-line EU interactive platform**, which has previously been overlooked in some ways but only achievable with logical models such as the ones proposed by WSX.

WSX is innovative in the sense that no other existing system either in Europe or elsewhere is capable of handling such complex multi-party transactions. The WSX Project will employ an innovative WSX Engine, based on rule engine, machine learning and blockchain technology, to help users navigate the complexity of regulatory and compliance

requirements as well as the constraints this place on waste disposal options. The matching of WSX Engine technology with the consolidated one of the stock exchange platform will enable services exchanges as well as of shares and commodities, this is by far the main WSX project added value.

Fig. 1 best presents what WSX platform will try to achieve and what are the technological and business innovations foreseen on the EU waste market.

WSX PROJECT INNOVATIONS		INNOVATION ADVANTAGES	
TECNOLOGICAL		AS IS	TO BE
APPLICATION	Linking WSX Engine with Trading Platform	Non existent	Achieved
INTEROPERABILITY	Interoperability between WSX and MS/EU/Companies IT Systems	Non existent	Achieved
ECONOMICAL			
BUSINESS PROCESS	Timing	6-9 months	1-7 days
	Costs	€250/Ton	- 20-30%
OPERATING	Administration procedures	Manual path	Granted
	Transparency / Legality / Sustainability	Not assured	Assured
	Financial - Warranties	Not assured	Assured
	Increasing EU Circular Economy	To achieve	Aimed
ENVIRONMENTAL			
OPERATING	Transports concentrations	+ CO <sub>2</sub> emission	- CO <sub>2</sub> emission
	Enforcing "End of Life" regulatory	Not assured	Assured

Fig. 1. WSX Project innovations

A future new “WSX Company” in the long-run, will propose through the advanced WSX telematics platform, a services market for the proper disposal/recycling. The new business model will chair a market regulated by an open, transparent and international stock exchange system who will be enabling to:

- **Open access to the business model especially to SMEs, either directly or through brokers,**
- **Develop specializations recovery plants increasing turnover and promoting internationalization,**
- **Concentrate shipments favouring rail rather than by truck, obtaining a significant reduction of GHG,**
- **Regulate prices decreasing significantly the weight,**
- **Fostering a "circular economy" of raw materials recovered at end of life of the artefacts that contain.**

### 3. Relation to the market

WSX is fully in line with the spirit and the overall policy strategy set out by the EU Roadmap for a Resource Efficient Europe ([http://ec.europa.eu/environment/resource\\_efficiency/](http://ec.europa.eu/environment/resource_efficiency/)), as it can make a significant contribution to the development of what is referred to as a “circular economy”. According to the Roadmap, the EU vision for a sustainable economy is based in part on heading 3.2 “Turning waste into a resource” that refers to milestone “By 2020 waste is managed as a resource”. To carry out the vision of an increasing recycling market, the European Commission refers to future measures so as to stimulate the secondary materials market and

the demand for recycled materials through economic incentives and the development of end-of-waste criteria and artefacts end of life future regulatory.

WSX intends to facilitate administrative procedures involved in the waste shipment for treatment, making it easier, less costly and less time-consuming to comply with waste related regulations. It promotes a vision of the EU as a “circular economy”. This vision is defined particularly in the **European Resource Efficiency Platform's (EREP)**. Furthermore, at the international level, the **Ellen MacArthur Foundation** has defined the principles of circular economy

([http://ec.europa.eu/environment/resource\\_efficiency/re\\_platform/index\\_en.htm](http://ec.europa.eu/environment/resource_efficiency/re_platform/index_en.htm);

<http://www.ellenmacarthurfoundation.org/circular-economy>). It should be noted that most of the partners and members of the Ellen MacArthur Foundation could be the ideal users of WSX platform. If you were considering the entire existing artefacts as an immense mine of raw materials, as indeed it is, in order to reuse at the “End of Life” (EOL) moment of artefacts containing them, the issue would shift in the identification of the most economic, but also cleanest, methods for re-extracting these raw materials for later reuse.

In our opinion the “industrial symbiosis” and “closed loop processes” concepts will create increasing demand for services to support trade in waste. However, this market is not efficient, not transparent and it presents many opportunities for entrepreneurial development (Albino and Fraccascia, 2015; Fraccascia and Yazan, 2018). We believe that it is important to establish, develop and systematically evolve modern on-line trading systems that will make trade in waste easier, expanding the markets for existing large and small actors, lowering the barriers to entry for new actors, improving the margins for buyers and sellers, while reducing the cost of transactions through open market platform. Obviously, one should consider and evaluate primarily the convenience of these innovative industrial processes with full respect of human health and the environment integrity (Bridgewater et al., 2015). From this point of view, WSX intends to operate.

The project could be of direct relevance for the **European IMPEL Network** for the Implementation and Enforcement of Environmental Law (<http://impel.eu/>). Set up in 1992, it now has 47 members from 33 countries, including all EU Member States, Croatia, FYROM, Turkey, Iceland, Switzerland and Norway. It plays an important role in the implementation of the European Environmental Action Plan (EAP). Its activities are grouped under project clusters, one of which focuses on the **Trans Frontier Shipment of waste (TFS)** (<http://impel.eu/cluster-2/>). In August 2014, with a view to reinforcing its contribution to the implementation of the 7<sup>th</sup> EAP, IMPEL published a “new strategic program” for the period from 2016 based on 5 themes, one of which is “Waste and TFS” (Trans-Frontier Shipment) (<http://impel.eu/wp-content/uploads/2014/08/New-Strategic-Direction-for-IMPEL.pdf>). Last but not least, Interim report on the **IMPEL TFS Multi Annual Work Programme for 2011-2015** that reveals the **projects related to the enforcement of the Waste Shipment Regulation 1013/2006, found that there are still high levels of non-compliance with EU legislation and illegal waste shipment** (<http://impel.eu/wp-content/uploads/2013/07/IMPEL-TFS-MAP-2011-2015.pdf>). The **findings of the TFS IMPEL program underline the potential for innovations such as WSX, to catalyse the implementation of environmental legislation and accelerate the adoption of compliant behaviours.**

The “Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal” regulates the trans-frontier shipment of hazardous waste. This is only one of several international conventions governing the hazardous waste shipment. Other relevant conventions include the Stockholm Convention on Persistent Organic Pollutants (2004) and the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998) (<http://chm.pops.int/>); Further regulations specific to the EU law are based on:

- The Directive on Packaging and Packaging waste (EU, 1994)
- The Landfill Directive (1999/31/EC)
- The Waste Incineration Directive (2000/76/EC)
- The Directive on End-of-Life Vehicles (EU, 2000)
- The E-PRTR Regulation of the European Parliament and of the Council the establishment of a European Pollutant Release and Transfer Register (EC No. 166/2006 dated 18 January 2006)
- The Waste Shipment Regulation (EU, 2006)
- The Waste Framework Directive (EU, 2008)
- Industrial Emissions Directive (EU, 2010)
- The Directive on Waste from Electrical and Electronic Equipment (EU, 2002 and 2012)  
Depending on how the waste is shipped, the handling of waste may also be subject to:
- The ADR regulation for transport of dangerous goods by road
- The IMDG code for maritime transport of dangerous goods,
- The RID regulation on carriage of dangerous goods by rail, and
- The IATA regulation on transport of dangerous goods by air.

In this context, the EC DG Environment is pushing coordination among member states to advance towards a European system for the electronic data interchange, within the legislative framework of regulation 1013/2006. At present, a working table is in place between the Member States for the data exchange protocol definition.

#### 4. Concept and approach

The trading of “*waste services*” is a **complex multiparty transaction that starts with the identification of the complete range of services required to execute the physical transfer of waste from one location to another**. This represents a step-up in complexity compared to modern commodity exchanges. Systems have been developed to support such complex transactions. That is why WSX requires a mechanism to manage the presented transactions complexity. WSX proposes an approach based on the use of **WSX Engine**.

WSX Engine is a system capable of proposing matching between supply and demand using the “**Collective Intelligence**” created on the basis of the data entered by users of an on line market platform constituted by WSX platform and by previous data on transactions carried out and functional for the learning phase used by the Machine Learning algorithm at the base of the predictive process. WSX Engine is an innovative tool applied to the growth of the Circular Economy and destined to identify the supply chains of materials making available to large players, but also to SMEs, waste treatment plants destined for recovery in the entire European market.

The ability of WSX Engine to **automatically recognize certain affinities and peculiarities of waste**, combining them with those of plants capable of processing them, for the purpose of recovering secondary raw materials, will be the first step in the correct functioning of the telematic platform for exchange between supply and demand.

In this ability lies the technological innovation of the project and will be based on the construction and use of four elements in progress: (i) **a data dictionary** that will define **the words that can be used by users** to fill in questions and offers in order to make it easier and feasible the **matching**, (ii) **a database** that will be used by the automatic generation system of matching between supply and demand to produce its own results, which will be **based on previous results and on a reliability rating**, (iii) **big data type accesses** made on the **waste movements** carried out in the past by the same users as by other similar ones, (iv) **a data base of the waste data sheets** that specify the peculiarities for the purpose of their acceptability by the plants .

All these components are dynamic and will be built over time, gradually increasing the capabilities and reliability of the system thanks to the Machine Learning self-learning. The automatic matching between supply and demand will be generated by algorithms that are inspired by the theories of “Collective Intelligence” aimed at overcoming the limits of the individual and providing solutions based on the experience of multiple similar cases occurred and recorded in the past. WSX Engine will constitute an innovative process of digitalization of waste recovery marketing, especially aimed at **recovering second raw material in full compliance with the dictates of the Circular Economy**. The project will constitute a new business model for value-added services applied to the recovery of waste that, properly inserted in a telematic trading platform, will make the market more transparent, accessible to all and regulated by controlled transactions in full compliance with the regulations national and international regulations in force.

Moreover, the WSX engine component “knows” the complexity of the administrative and compliance procedures involved in the transactions needed to complete a transboundary shipment of hazardous and non-hazardous waste. It is able to cope with the fact that the user may not formulate a request correctly or that there may be ambiguity in the applicable legislation.

**Given the presence of existing systems described above, the WSX philosophy is to adopt an open architecture approach that will enable existing systems to integrate with the WSX platform so that their previous efforts and investment is not wasted, while creating integration pathways for fuller adoption of WSX over time.**

During the WSX Project development **it will be required an integral part, that is qualifying and essential to achieve conclusive test procedures for testing and validating the WSX Product/Platform, called as the "Trading Platform Exchange Regulation".** The WSX Project, through the study of the regulation and the development of integration components and interfaces (API-UI), will result in the creation of a working platform directly available by the Market.

A typical **use case** could be as follows:

- The waste producer and the brokers access the WSX platform and make a request for help finding a treatment plant with available capacity for a certain quantity of waste of a certain kind. The WSX engine identifies available plants and possible routes, the regulatory constraints that apply, the services needed to ensure compliance, as well as the authorities that need to be contacted to provide approvals. It generates this knowledge from its continuously updated database of actors, regulations, administrative procedures and workflows.
- The platform then generates a range of options available to the waste producer, allowing the producer to decide which ones are best either in terms of time, price or availability of capacity. The WSX will help to do it almost in real time.
- Finally, the WSX platform supports the waste producer in making contact with the various authorities and service providers, contracting with them, completing the paper work and organising the overall trade.
- The WSX platform keeps a record of the transaction, and progress in its completion, to support traceability requirements or for use in the event of an independent audit by relevant authorities,
- The WSX platform also keeps up to date and presents a listing of materials and services.

## **5. Target**

Today the paperwork for waste management procedures is done manually in 80% of cases. Anywhere from 3 to 9 months is required to complete pre-shipment procedures for trans-boundary shipments and several weeks if national (<http://ec.europa.eu/environment/waste/shipments/studies.htm>). WSX Project ambition is to

reduce the time required for processing by a factor of 10 compared with current performance. The aim is to develop a platform that will be transparent, secure, low-cost, dynamic and capable of supporting complex, near real-time, multiparty transactions. Our ambition is to see 55% to 60% of shipments treated electronically within 3 years of the formal launch of a functioning WSX exchange.

The aggregate cost of processing transboundary hazardous waste in Europe is about €1.5B for the processing of 6 Million Tonnes at an average cost of €250 per tonne. Of this 75% to 80% corresponds to real or justifiable costs incurred for services related to processing requests, securing bank clearance, organizing and executing shipment, and processing in appropriate plants. **We estimate that the WSX system can generate savings of the order of 25% to 30% on current expenditure levels. In the case of transboundary hazardous waste shipment this corresponds to potential savings of up to €240M per year.**

The entire market for good starting or recovering hazardous waste in Europe is 75 million tons per year, which can reasonably be expected to have an average cost of €150 per tonne. In domestic markets the savings introduced by the business model proposed by WSX will be lower but not lower than 10% - 15%. Fig. 2 shows the enormous differences between the actual and the new business model procedures.

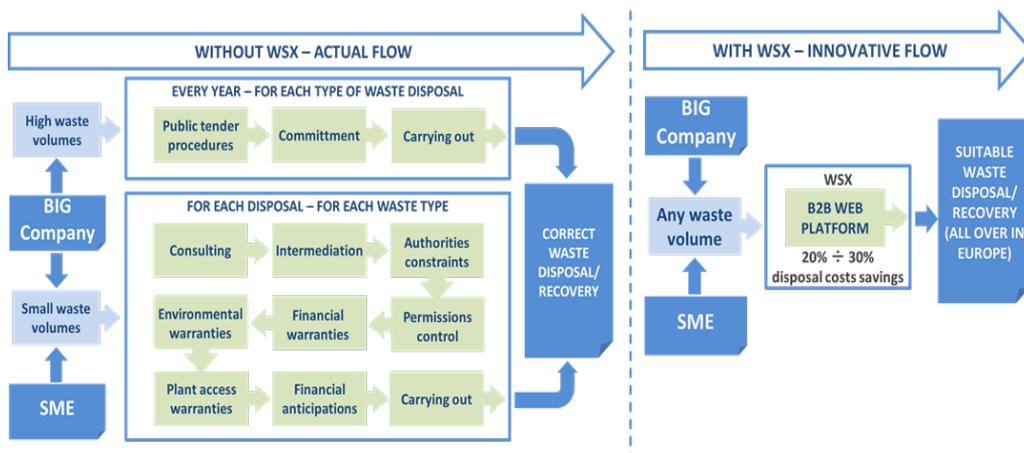


Fig. 2. Comparison between without and with WSX innovative flow

## 6. Market impact

According to the World Bank, waste generation rates are rising fast, on pace to exceed 11 million tons per day by 2100. The amount of garbage humans throw away is growing rapidly and won't peak this century without transformational changes in how we use and reuse materials (<http://www.worldbank.org/en/news/feature/2013/10/30/global-waste-on-pace-to-triple>). In Europe, we currently use 16 tons of material per person per year, of which 6 tons become waste. Although the management of that waste continues to improve in the EU, the European economy currently still loses a significant amount of potential 'secondary raw materials' such as metals, wood, glass, paper, and plastics present waste streams. In 2010, total waste production in the EU amounted to 2.5 billion tons. From this total only a limited (albeit increasing) share (36%) was recycled, the rest was landfilled or burned, of which some 600 million tons could be recycled or reused (<http://ec.europa.eu/environment/waste/index.htm>). This behaviour of Europe, the levels of

recovery and reuse of waste, offer large areas of possible progress: **WSX provide a new business model capable of catalysing the circular economy's recovery.**

WSX will make the market for waste more *transparent*, and *compliance less costly and less time-consuming*, contributing, moreover, to *increase the rate of recovery, both as the processing of waste into energy, both in the production of raw materials from the reuse.*

The main impact of WSX can be summarized in the word “*competitiveness*”. In this way WSX aims at achieving a “*systemic innovation*” in waste management in Europe, which **goes well beyond the adoption of single solutions of technologies, to actually bring about a substantial change in the “framework”, and current EU fragmentation, in which waste services are implemented.** Given the current situation, a “WSX Company” expects, with the creation of the new business model, to be developed during the running of the project, to create **new behaviour standards** more virtuous than the current situation; more profitable and more responsive to environmental regulations.

### 7. Market opportunity

The expected **overall impact on users and EU markets** is shown in Fig. 3. EUROSTAT publishes the annual figures of hazardous waste generation for the year 2012 in Europe amounts over 101 million *Metric Tonnes (tons)*. The average cost of treatment comes to €250 per metric Ton any services included, it totals more than €25B per year. We must stress that, despite a number of national, EU and international efforts to address the problem, Europe remains a patchwork of fragmented partial-solutions, and paperwork is done by hand for 80% of all shipments (<http://ec.europa.eu/environment/waste/shipments/studies.htm>). Processing paperwork in these cases can take anywhere from 3 to 9 months and accounts for 20% to 30% of the total cost of waste disposal. **This suggests that the WSX could create savings for the waste sector from €500M up to €700M per year, if all actors were to employ its services for the final destination of hazardous waste alone.**

WSX POTENTIAL MARKET				
	TONS	€/Ton	VALUE €	WSX SAVINGS TREND (20-30%)
European annual hazardous waste production	101.000.000	250	25.250.000.000	6.312.500.000
European annual hazardous waste cross border transportation (TFS) 6% of production	6.060.000	250	2.525.000.000	631.250.000
WSX annual TFS market (10% captured of total TFS)	606.000	250	151.500.000	37.875.000

Fig. 3. WSX potential market

European treatment plants suffer from an estimated 18% under-utilisation. For some plants this can be as high as 30% and seriously undermine the viability of their business. **We expect that with WSX, an open exchange will make the market more transparent, more circular, more liquid and more competitive, waste treatment plants will on average reduce their rates of under-utilisation by 50%, bringing un-used capacity to less than 9%. Consequently, systemic and cost-effective solutions will benefit from innovative ICT solutions for waste traceability, waste material flow management, and the estimation of the availability, composition and quality of waste.**

Producers and managing Companies of large amounts of waste or requiring services above a certain threshold value are required to advertise on the basis of public tenders. This

is independent of the nature of the waste, the nature of the service and whether it is shipped to final destination at regional, national, EU or international level (Hall and Nguyen, 2012). In other cases, in a system where no publicity is given to demand, practice and pre-existing relations mostly determine response, which of course hinders market openness and competitiveness. This has resulted in globally higher prices than processing shipments should cost, if **managed without an open, transparent and multiparty system. WSX alone can reduce the cost of disposal by between 20% and sometimes 30% due to competition.**

The Article 3 of the EU Directive 2008/98/EC, shows these definitions:

5. 'waste producer' means anyone whose activities produce waste...;
6. 'waste holder' means the waste producer or the natural or legal person who is in possession of the waste;
7. 'dealer' means any undertaking which acts in the role of principal to purchase and subsequently sell waste...;
8. 'broker' means any undertaking arranging the recovery or disposal of waste on behalf of others...;
9. 'waste management' means the collection, transport, recovery and disposal of waste...;

The Article 6 of the EU Regulation (EC) 1013/2006, shows these requirements for the shipment of waste:

*Financial guarantee - 1. All shipments of waste for which notification is required shall be subject to the requirement of a financial guarantee or equivalent insurance covering...*

Therefore, the main **waste market actors** are:

- **Waste producers & holders:** The savings which can be achieved, will lead the Companies producers of waste, in a short time, to become users of the WSX platform services.
- **Waste dealers & brokers:** The advanced trading capabilities available in the WSX platform will enable these operators to spend less time on customers and service suppliers research activities, and to focus its activities on high value-added services (expertise, notification, shipment arranging, regulations and environmental compliance, etc.)
- **Waste management companies:** The major waste companies in Europe are shown in table 2.1, in order of size of revenues from waste management in Europe. They will be the **main users of the WSX platform** where, through the Multi Service Proposal Generator, they will offer their waste services (collection, transport, treatment, disposal and recovery, etc.).
- **Power companies & raw materials recovering companies** (glass, wood, plastics, metals, paper, cloth, etc.), which often use large amounts of waste for their plants.
- **Insurance companies:** The Multi Service Proposal Generator, available in the WSX platform, will enable this companies to offer their guarantee services.
- **MS Countries Authorities:** in the WSX platform they can find all the functionality to easily provide the notification procedure documents.

About the waste management companies, the **FEAD, European Federation of Waste Management and Environmental Services**, in its Position Paper on a new Commission proposal on Circular Economy (March 2015), shows *«To achieve a circular economy, free and fair competition is needed throughout the value chain to stimulate customised services and solutions, and possibilities for innovation and investment (<http://www.fead.be/en/position-papers/>). **Market-based solutions are a key driver for investment and innovation**»,* and subsequently, in the introduction of its Position Paper Ensure open markets and fair competition to reach a circular economy (April 2015), shows: *«A circular economy and a more resource efficient society require major changes in the use of resources and new EU policy measures. To reach a circular economy, **market-based***

*conditions must be introduced in the whole value chain to incentivise all actors to take their responsibilities. Open markets and fair competition stimulate customised services and solutions, and possibilities for innovation and investment. They also help small companies to enter the market».*

**WSX provides the open and transparent market-based solutions to determine the conditions that the market itself demands.**

Fig. 4 summarizes the differences and the benefits of WSX Platform with respect to waste market operators, which initially could be its possible competitors, even though in the market there aren't similar systems.

	Dealer	Broker	Waste Management Company	Big Waste Producer Company	Waste Authority	Custom Authority	WSX
Waste purchasing	✓	✗	✓	✗	✗	✗	✓
Waste selling	✓	✗	✗	✓	✗	✗	✓
Waste arranging	✗	✓	✓	✗	✗	✗	✓
Waste digital dossier	✗	✗	✗	some ✓	some ✓	some ✓	✓
Market price setting	✗	✗	✗	✗	✗	✗	✓
Demand and offer matching	✗	✗	✗	✗	✗	✗	✓

Fig. 4. Comparison between principal operators activities and WSX Platform

## 8. WSX BM

Computer Solutions S.p.A. will lead the Pathfinder project WSX BM in the Climate-KIC's Pathfinder Programme in order to verify the feasibility of the idea of building a new WSX platform that facilitates the meeting between supply and demand of national and international services dedicated to waste recovery. The main idea at the basis of the innovative platform WSX is to stimulate the circular economy by identifying and promoting international chains of recovery initially intended for the main players in the market but later also for SMEs.

WSX BM aims to test and validate the existence of the market gap identified by the WSX through the preparation and dissemination of a questionnaire, built by experts in the field in order to collect relevant data for our survey, among the most representative interlocutors of this market on an international scale: large producers and large waste treatment plants, first interested in the benefits of using a platform that facilitates the meeting between supply and demand of services on waste. Companies and organisations representing the 5 most industrialised countries in Europe will be interviewed; the interviews will be conducted personally by our experts, who will then be able to answer any questions on the operation of the WSX. Consolidated our Business Idea, demonstrating the enormous advantages of a platform that multiplies the possibilities to meet the demand and supply of special waste, meets the needs of large waste producers or large plants, we will be ready to develop and implement the WSX. The innovative WSX Business Model envisages a new positive approach to the issue of waste management, both industrial and urban.

Starting from the latest guidelines of Ellen MacArthur Foundation, through WSX, it will be possible to predict which types and quantities of waste will be generated or collected at a time and separate them and accumulate them locally in large homogeneous lots of waste.

Through the WSX model it will be possible to carry out transactions that involve large quantities of waste, share transactions with all the actors in the supply chain, prepare railway trains (with less CO<sub>2</sub> emissions than occasional small road trains!), sending large

quantities of low cost and low environmental impact material impact even over long distances, reaching the large European treatment centers, normally more controlled, more efficient and more sustainable.

## 9. Concluding remarks

The team that is preparing the WSX project intends to explore the international market in advance through the WSX BM Project budget before making the substantial investments required to implement the WSX Project.

The survey results will be published on the website [www.wsxbm.com](http://www.wsxbm.com) so that anyone who has participated in the survey but has only accessed this publication can have an understanding of the impact that this initiative has encountered in the European manufacturing world through the answers that a significant sample has kindly provided.

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