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Servitisation as a Mean of Restoring Environmental sustainability in Europe

Prof. Dr. Janja Hojnik
Associate Law Professor, Jean Monnet Centre of Excellence
University of Maribor Faculty of Law, Slovenia

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Prof. Dr. Janja Hojnik
Associate Law Professor, Jean Monnet Centre of Excellence
University of Maribor Faculty of Law, Slovenia

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Abstract

This working paper presents servitisation – that is considered as the most recent economic megatrend of fusing services and products in order to provide customers with a more rounded solution – upon environmentally sustainable economic development of Europe from a legal point of view. The first part of the working paper presents servitisation and some similar business concepts as defined by leading business scholars. The second part of the working paper then concentrates upon certain aspects of EU law that support servitisation as a means to increase resource efficiency of the EU economy, both within the EU and globally. It is found that since present trends in economic and population growth continue and the natural environment is increasingly being stressed, servitisation may be perceived as a business phenomenon that contributes to the aim of the EU to bolster sustainability.

Keywords: servitisation, resource efficiency, sustainability, extended product principle, waste management, EU law.

1. Introduction

The EU and other developed countries witness decades long decline of manufacturing and orientation of the economy towards services. Nevertheless, the financial crisis convinced policy makers that overreliance on services needs to be balanced with manufacturing in order to prevent future economic crises. However, to achieve this aim manufacturing needs to be modernised. This modernisation (also called reindustrialisation or industrial renaissance) is reflected in the so-called servitisation trend

that refers to services being offered by manufacturing companies in addition to the pure product in order to increase the value of the overall solution for the customer. Servitisation is increasingly popular in business practice and it is also a trend that has gained enormous attention by scholars in different domains, from marketing and management to information technology and ecology.

This working paper aims to show the impact of servitisation upon environmentally sustainable economic development of Europe from a legal point of view. In this respect, the first part of the working paper presents servitisation as defined by leading business scholars as well as highlights some concepts that are similar to servitisation and are also important from the perspective of environmental sustainability. The second part of the working paper then concentrates upon certain aspects of EU law that support servitisation as a means to increase resource efficiency of the EU economy. In this respect, EU rules that enhance energy services as a supplement to mere fuelling, as well as various directives that oblige the manufacturer of certain products to provide waste management services are pointed out. Additionally, public procurement perspective of solution orientation of EU manufacturing is emphasised, as well as EU endeavours to add the services' dimension to the future Environmental Goods Agreement that is being negotiated by certain Member States of the World Trade Organisation. It is found that since present trends in economic and population growth continue and the natural environment is increasingly being stressed, servitisation may be perceived as a business phenomenon that contributes to the aim of the EU to bolster sustainability.

2. Servitisation as a new economic megatrend

2.1. Defining servitisation

The term servitisation was coined nearly three decades ago by two management scholars, who wrote about 'the increasing offering of fuller market packages or 'bundles' of customer focused combination of goods, services, support, self-service and knowledge in order to add value to core corporate offerings'.¹ Later definitions of servitisation explained it as 'the emergence of product-based services which blur the traditional distinction between manufacturing and traditional service sector enterprises',² as 'a trend in which manufacturing firms adopt more and more service components in their offerings',³ as well as 'a change process wherein manufacturing companies embrace

¹ Sandra Vandermerwe and Juan Rada, 'Servitization of Business: Adding Value by Adding Services' (1988) 6 European Management Journal 314.

² Allen L. White, Mark Stoughton and Linda Feng, 'Servicizing: The Quiet Transition to Extended Product Responsibility' (Tellus Institute 1999).

³ Bart van Looy, Paul Gemmel and Roland Dierdonck, *Services Management: An Integrated Approach* (Pearson Education 2003), p. 40.

service orientation and/or develop more and better services with the aim to satisfy customer's needs, achieve competitive advantages and enhance firm performance'.⁴

Vandermerwe and Rada describe that companies initially considered themselves to be in goods or services and then moved to offering goods combined with closely related services, and finally to a position where companies offer 'bundles' consisting of customer focused combinations of goods and services. Other business literature explains that traditionally the tendency has been for managers to view services as unavoidable in the context of marketing strategies – here, the main part of total value creation was considered to stem from physical goods, and services were assumed purely as an add-on to products.⁵ From this beginning, it is now believed that a dramatic change has occurred in the way services are produced and marketed by manufacturing companies. The provision of services has now turned into 'a conscious and explicit strategy' with services becoming a main differentiating factor in a totally integrated products and service offering.⁶ In this situation, the services are considered as fundamental value-added activities and the product to be just a part of the offering.⁷ This continuum from traditional manufacturer where companies merely offer services as add-on to their products, through to service providers where companies have services as the main part of their value creation is called 'product-service continuum'⁸ and is often used as a starting point for the categorization of different types of servitisation in management research.⁹

Servitisation is nowadays considered as omnipresent in manufacturing companies in developed economies.¹⁰ Whereas some (traditional) services support the supplier's

⁴ G Ren and MJ Gregory, 'Servitization in Manufacturing Companies: A Conceptualization, Critical Review, and Research Agenda', *Frontiers in Service Conference, San Francisco 2007*.

⁵ Heiko Gebauer and Thomas Friedli, 'Behavioral Implications of the Transition Process from Products to Services' (2005) 20 *Journal of Business & Industrial Marketing* 70.

⁶ Tim S Baines and others, 'The Servitization of Manufacturing: A Review of Literature and Reflection on Future Challenges' (2009) 20 *Journal of Manufacturing Technology Management* 547, 556.

⁷ Rogelio Oliva and Robert Kallenberg, 'Managing the Transition from Products to Services' (2003) 14 *International Journal of Service Industry Management* 160.

⁸ *ibid*; Heiko Gebauer and Thomas Friedli (n 6); Heiko Gebauer, 'Identifying Service Strategies in Product Manufacturing Companies by Exploring Environment-strategy Configurations' (2008) 37 *Industrial Marketing Management* 278.

⁹ Accordingly, Tukker has developed a model of three main forms of business models: product-oriented services, use-oriented services and result-oriented services - Arnold Tukker, 'Eight Types of Product-service System: Eight Ways to Sustainability? Experiences from SusProNet' (2004) 13 *Business Strategy and the Environment* 246. See also Laura Smith, Roger Maull and Irene C.L. Ng, 'Servitization and Operations Management: A Service Dominant-Logic Approach' (2014) 34 *International Journal of Operations & Production Management* 242.

¹⁰ David Opresnik and Marco Taisch, 'The Value of Big Data in Servitization' (2015) 165 *International Journal of Production Economics* 174, 174.

product (e.g. maintenance), other (more advanced) services support the client's action in relation to the supplier's product (e.g. IT consulting). While the former ensure the proper functioning of the product, the latter enable the supplier to explore how services support particular client's initiatives and advance the operation of customer's company.¹¹

Accordingly, the most commonly provided service in practice is still delivery of products, followed by the provision of spare parts and consumables, a customer helpline or support desk, and product or systems training.¹² Moreover, servitisation transactions may include renting cars instead of buying them; contracting services of irrigation instead of acquiring irrigation systems; or securing server capacity instead of procuring computers.¹³ One of the most archetypal examples of a successful strategy of mixing the supply of goods and services is Rolls-Royce. The Economist reported in 2009 that *'instead of selling airlines first engines and then parts and service, Rolls-Royce has convinced its customers to pay a fee for every hour that an engine runs. Rolls-Royce in turn promises to maintain it and replace it if it breaks down. They aren't selling engines, they are selling hot air out the back of an engine. (...) It is sometimes necessary to be good at making things to sell the services connected with them. At Rolls-Royce it is difficult to see where one begins and the other ends'*.¹⁴ In addition to this model of renting airplanes (called *Power-by-the-Hour*), Rolls Royce has also adopted sensors that are able to monitor 24/7 the airplane engine status (*TotalCare* programme) that is considerably simplifying the maintenance process.¹⁵ Rolls Royce has thus succeeded in transition from being a pure manufacturer to being an integrated solutions provider.¹⁶ Moreover, Volvo is essentially manufacturing cars, but they are today in the entire scale of activities associated with the automobile transportation from insurance to gas stations and roadside assistance networks.¹⁷ More recently, however, Volvo announced that they are developing a range of 'self-filling' cars that would never

¹¹ Valérie Mathieu, 'Product Services: From a Service Supporting the Product to a Service Supporting the Client' (2001) 16 *Journal of Business & Industrial Marketing* 39, 40.

¹² Bruce Tether and Elif Bascavusoglu-Moreau, 'Servitization: The Extent and Motivations for Service Provision amongst UK Manufacturers' (2012) 17.

¹³ 'Project Proposes Policy Packages for Servitisation - Eco-Innovation Action Plan - European Commission' (*Eco-innovation Action Plan*).

¹⁴ Editor's Note, 'Britain's Lonely High-Flier' *The Economist* (8 January 2009).

¹⁵ See Marco Ardolino, Nicola Sacconi and Marco Perona, 'The Impact of Digital Technologies and Ecosystems on the Servitization of Companies: A Preliminary Analysis' (Aston, Spring Servitization Conference 2015), pp. 51-58.

¹⁶ Charlotta Windahl and Nicolette Lakemond, 'Integrated Solutions from a Service-Centered Perspective: Applicability and Limitations in the Capital Goods Industry' (2010) 39 *Industrial Marketing Management* 1278; Tim Brady, Andrew Davies and David M Gann, 'Creating Value by Delivering Integrated Solutions' (2005) 23 *International Journal of Project Management* 360.

¹⁷ Vandermerwe and Rada (n 2) 318. More in Björn Remneland Wikhamn, Jan Ljungberg and Alexander Styhre, 'Enacting Hard and Soft Product Offerings in Mature Industries: Moving Towards Servitisation in Volvo' (2013) 17 *International Journal of Innovation Management* 1.

need to visit a petrol station. When the tank is close to empty, the car would send a message via smartphone to a mobile fuel supplier to come and top it up. The supplier would have a secure one-off code to open up the fuel cap, freeing the owner to park the vehicle and be elsewhere.¹⁸

Moreover, AB Electrolux installs a washing machine in a customer's home, maintains and repairs it when necessary and charges customers by the laundry load.¹⁹ It is now also common for car dealers to offer loans or leasing services to their customers, so they are not just selling products but also services – much the same as Amazon is now offering easier and more comfortable services around the book.²⁰ While Uber is offering cheaper and more environmentally sustainable ways of transporting people, by connecting car owners and those in need of a drive over an online platform (i.e. ridesharing), there are many companies and cooperatives (such as Zipcar or Modo Co-op) offering a membership based system of car sharing, where people pay annual membership fees and price per kilometre.

2.2. Product-service system and extended product as synonyms of servitisation

'Product-service system (PSS)' is a concept originated in the north of Europe at the end of the 1990's that describes companies offering solutions aimed at increasing market share and consumer satisfaction, but also with a parallel objective of reducing the consumption of products through alternative scenarios of product use instead of acquiring it.²¹ The leading scholarly authority on PSS is Goedkoop, who defined it in 1999 as '*a combination of products and services in a system that provides functionality for consumers and reduces environmental impact*'.²² Correspondingly, Mont highlights that PSS offers a system of integrated products and services that are intended to reduce the environmental impact through alternative scenarios of product use.²³ The PSS embodies a transition from 'well-being based on the product' to 'well-being based on the access to the product'.²⁴ In this

¹⁸ Rupert Steiner, 'Self-Filling Cars That Never Run out of Fuel' *Daily Mail* (1 February 2015) <<http://www.dailymail.co.uk/sciencetech/article-2935700/Self-filling-cars-never-run-fuel-Volvo-develops-vehicle-alert-mobile-suppliers-tank-car-parked-driver-elsewhere.html>> accessed 5 February 2016.

¹⁹ Michael W Toffel, 'Contracting for Servicizing' 2008 Harvard Business School Technology & Operations Mgt. Unit Research Paper 8 <<http://papers.ssrn.com/abstract=1090237>> accessed 29 December 2015.

²⁰ Louis V Gerstner Jr, *Who Says Elephants Can't Dance?: Leading an Enterprise through Dramatic Change* (Harper Business 2002). For a number of other examples across various industry sectors see Gunter Lay, *Servitization in Industry* (Springer 2014).

²¹ Fernanda Hänsch Beuren, Marcelo Gitirana Gomes Ferreira and Paulo A Cauchick Miguel, 'Product-Service Systems: A Literature Review on Integrated Products and Services' (2013) 47 *Journal of Cleaner Production* 222.

²² Mark J Goedkoop, *Product Service Systems, Ecological and Economic Basics* (Ministry of Housing, Spatial Planning and the Environment, Communications Directorate 1999).

²³ OK Mont, 'Clarifying the Concept of Product-service System' (2002) 10 *Journal of Cleaner Production* 237.

²⁴ Ezio Manzini, Carlo Vezzoli and Garrette Clark, 'Product-Service Systems. Using an Existing Concept as a New Approach to Sustainability' (2001) 1 *Journal of Design Research* 0.

respect, PSS is sometimes interchangeably used with the so-called ‘dematerialization’ that stands for services being used to reduce the amount of materials that go into the product.²⁵ The difference between servitisation and PSS thus arises in the motivation of the process, considering that the PSS is closely coupled to the debates on sustainability and emphasizes the use of the function of a product without necessarily owning it with the aim of reducing the environmental impact.²⁶ Nevertheless, although servitisation and PSS have emerged from differing perspectives on the world, they are converging towards a common conclusion that manufacturing companies should be focusing on selling integrated solutions.²⁷

Moreover, the concept of an ‘extended product’ has been designed to describe situations where the supplier bundles additional accessories and services around the core product to make the sale more attractive to the customer, who is the end user.²⁸ Extended product includes a combination of a physical product and associated services, like maintenance, engineering, software etc.²⁹ and was coined predominantly for the purposes of the principle of extended producer responsibility (EPR) that is pursuing objectives of lower life-cycle environmental impacts for product systems. The concept is thus sometimes used as a synonym for both PSSs and servitisation, since all require manufacturers or service providers to extend their involvement with, and responsibility for, the product to phases in the life-cycle outside the traditional seller-buyer relationship.³⁰

2.3. Access-based consumption as a new business orientation

In this respect it is important to note that the PSS philosophy is the basis of access-based consumption, where instead of buying and owning things, consumers want access to goods and prefer to pay for the experience of temporarily accessing them. Ownership is

²⁵ MingSheng Li and others, ‘Economy-Wide Material Input/output and Dematerialization Analysis of Jilin Province (China)’ (2009) 165 *Environmental Monitoring and Assessment* 263; Joost G Vogtländer, Han C Brezet and Charles F Hendriks, ‘Allocation in Recycling Systems’ (2001) 6 *The International Journal of Life Cycle Assessment* 344.

²⁶ Beuren, Gomes Ferreira and Cauchick Miguel (n 22) 224; Tukker (n 10); Arnold Tukker and Ursula Tischner (eds), *New Business for Old Europe: Product-Service Development, Competitiveness and Sustainability* (Greenleaf 2006); Baines and others (n 7).

²⁷ Baines and others (n 7) 554; Tukker and Tischner (n 27).

²⁸ Thomas Lindhqvist, *Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems* (Lund University 2000); Klaus-Dieter Thoben, Jens Eschenbächer and Harinder Jagdev, ‘Extended Products: Evolving Traditional Product Concepts’ [2001] 7th international Conference on Concurrent Enterprising. Bremen.

²⁹ Thoben, Eschenbächer and Jagdev (n 29) 437.

³⁰ Allen L. White, Mark Stoughton and Linda Feng (n 3) 21.

no longer the ultimate expression of consumer desire.³¹ In this way consumers are able to access goods which they could otherwise not afford or which they choose not to own due to concerns such as space limitations or the environment, thereby paying for usage rather than ownership.³² While public access to goods, such as books in public libraries or public transportation, has been known for centuries, the Internet (coincided with the global economic crisis during which consumers reconsider their values and spending habits) has fuelled new business models of access-based consumption. Indeed, we have seen a proliferation of consumption models in which access is enabled through sharing or pooling of resources/products/services redefined through technology and peer communities. Examples of access models vary from car- or bike-sharing programs (Zipcar, Hubway) to online borrowing programs for DVDs, bags, fashion, or jewellery (Netflix, Bag Borrow or Steal, Rent the Runway, Borrowed Bling).³³

Access-based business models may be found in Rolls Royce's 'Power-by-the-Hour' model, as well as in models adopted by BMW and Daimler which, in addition to car production, also offer membership based systems of car sharing (called Drive now and Car2Go respectively) with annual membership fees and prices per kilometre for users.³⁴ Such car sharing services are nowadays broadly offered also by companies that do not produce cars (such as Zipcar and Hertz). Moreover, companies such as Uber and Lyft offer cheaper and more environmentally sustainable ways of transporting people by connecting car owners and those in need of transport over an online platform (i.e. ridesharing or carpooling). Uber is the leader in the so-called sharing or collaborative economy,³⁵ which has been described to include renting, loaning and swapping of assets that are typically underutilized, including a variety of tangible and intangible assets.³⁶ Consequently, while some shops nowadays not only sell tools but also offer short term tool rentals,³⁷ Uber-like platforms, such as Snap-Goods, enable rentals of tools and other household items directly from their owners. All these models that are introducing an alternative capitalist system

³¹ Durgee and O'Connor, 'An Exploration into Renting as Consumption Behavior' (1995) 12 *Psychology and Marketing* 89; Lovelock and Gummesson, 'Whither Services Marketing? In Search of a New Paradigm and Fresh Perspectives' (2004) 7 *J. of Service Research* 20.

³² Bardhi and Eckhardt, 'Access-Based Consumption: The Case of Car Sharing' (2012) 39 *J. of Consumer Research* 881; Walker Smith, 'The Uber-All Economy of the Future' (2016) 20 *Independent Rev.* 383, 385.

³³ Bardhi and Eckhardt (n 33).

³⁴ Gardiner, 'Big European Players Embrace the Car-Sharing Trend' *The New York Times* (19 November 2013).

³⁵ Sometimes even called 'Uber-All Economy' (Smith, 'The Uber-All Economy of the Future' (2016) 20 *Independent Rev.* 383) or 'on demand' economy (Botsman and Rogers, *What's Mine Is Yours: How Collaborative Consumption Is Changing the Way We Live* (Collins London 2011)).

³⁶ Felländer, Ingram and Teigland, 'Sharing Economy—Embracing Change with Caution', *Näringspolitiskt Forum rapport* (2015) 13.

³⁷ Sustainable Brands, 'Kingfisher, IKEA Talk Evolution Into Circular, Service, Sharing Business Models' (sustainablebrands.com, 29 October 2015).

are considered to be a part of the servitisation trend.³⁸ In economic terms it is astonishing that some of the start-up companies providing these services have, with the assistance of ICT, received outstanding market valuation previously reserved for a few large companies, thereby contributing to a true social revolution.³⁹ Internet platform services for ridesharing or home sharing have caused a great turmoil across sectors and it is being envisioned that what is ahead is *‘a shift in the dominant business model, one in which all consumer goods will be available as a service and all consumer services will be available on demand’*.⁴⁰

3. Servitisation as a mean of restoring environmental sustainability in Europe

3.1. Servitisation as a cornerstone of sustainability

It may be held that servitisation has been very generously accepted in the domain of environmental law. It is broadly acknowledged that since present trends in economic and population growth continue, the natural environment is increasingly being stressed.⁴¹ As already evident from the previous sections, it is one of the cornerstones of servitisation that in addition to strengthening alliances among the parties involved in the business it may also aim to bolster sustainability.⁴² It can provide an incentive for suppliers to increase the durability of the products by changing their business models and redesigning products. Practical examples include business models such as bike and car sharing, ride sharing, systems for renting cars, aircrafts, machines or irrigation systems instead of buying them etc. Consequently, servitisation has a strong potential to reduce environmental impacts associated with linear production-consumption systems based on product sales, ownership, and disposal models and thereby enabling businesses to compete in a relatively regulated market.⁴³

Servitisation could thus play a major role in a more circular economy in the future and result in resource savings because if products are provided per use rather than sold, the vendors and manufacturers have an interest in prolonging the life of the product as long

³⁸ Cusumano, ‘How Traditional Firms Must Compete in the Sharing Economy’ (2015) 58 Communications of the ACM 32, Dyal-Chand, ‘Regulating Sharing: The Sharing Economy as an Alternative Capitalist System’ (2015) 90 Tulane L. Rev. 241.

³⁹ Uber for example has 41 billion USD valuation – see Felländer, Ingram and Teigland (n 37) 11.

⁴⁰ Walker Smith (n 53).

⁴¹ Oksana Mont, ‘Editorial for the Special Issue of the Journal of Cleaner Production on Product Service Systems’ (2003) 11 Journal of Cleaner Production 815.

⁴² Craig A Hart, *Climate Change and the Private Sector: Scaling Up Private Sector Response to Climate Change* (Routledge 2013); Beuren, Gomes Ferreira and Cauchick Miguel (n 22) 225.

⁴³ Andrius Plepys, Eva Heiskanen and Oksana Mont, ‘European Policy Approaches to Promote Servicizing’ (2015) 97 Journal of Cleaner Production 117, 118.

as possible to get the maximum use from it.⁴⁴ On the other hand, consumers are provided with the economic incentive to use products in a more efficient way⁴⁵ and manufacturers adopting the servitisation strategy may increase consumer's interest in environmental issues.⁴⁶ Moreover, many sustainable solutions improving the quality of the global environment are offered by the digitising industry, where the expansion of smart objects enables introduction of smart cities with smart infrastructure, where sensors observe continuing safety of a bridge by monitoring data on vibration and pressure; smart public lighting that can allegedly cut a city's energy costs up to 80 percent; smart waste management with sensors on garbage collection; or even smart farms with smart irrigation (that supposed to lead to 60 percent decrease of water consumption).⁴⁷

Private customer-oriented solutions include smart homes with energy efficient ovens, thermostats and refrigerators that adjust power consumption to cheaper rates of electricity during the nights.⁴⁸ This way, servitisation can help minimizing the consumption of scarce resources and environmental degradation.⁴⁹ UN Programme for Environment thus sees servitisation as having *'the potential to re-orient the current standards of consumption and production, thus enabling a move towards a more sustainable society'*.⁵⁰

3.2. Regulatory incentives for environmentally friendly aspects of servitisation

Consequently, it is important for policy makers and regulators to promote these positive aspects of servitisation – be it on voluntary or mandatory basis. This is more so, considering that the shift from products to services cannot be assumed to be eco-

⁴⁴ 'Project Proposes Policy Packages for Servitisation - Eco-Innovation Action Plan - European Commission' (n 26); Frank Tietze and Erik G Hansen, 'To Own or to Use? How Product Service Systems Facilitate Eco-Innovation Behavior' (2013) SSRN Scholarly Paper ID 2244464.

⁴⁵ Commission Communication (n 14).

⁴⁶ Manzini, Vezzoli and Clark (n 25).

⁴⁷ Michael Miller, *The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World* (Que 2015) 263–280.

⁴⁸ Miller (n 48). Additionally, Miller (at p. 290) mentions CO2 sensors that monitor automobile emissions, pollution from factories and even toxic gases generated on farms; water sensors that monitor water quality in oceans, rivers, and lakes, and determine whether water is suitable for fish and plant life; radiation sensors that monitor radiation levels etc.

⁴⁹ TS Baines and others, 'State-of-the-Art in Product-Service Systems' (2007) 221 Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture 1543.

⁵⁰ UNEP - United Nations Environmental Programme, 'Product-Service Systems and Sustainability: Opportunities for Sustainable Solutions' (INDACO Department, Politecnico di Milano, Milan) 2002.

efficient and there are a number of rebound effects.⁵¹ Particularly powerful players in the market may thus oppose servitisation solutions because their specific competitive advantage lies in mass production.⁵² Policy makers have essentially two forms of enhancing sustainable manufacturing. At one hand, there are direct policy instruments addressed to the manufacturers, who are encouraged through regulatory or other policy instruments to incorporate mechanisms of sustainability into its production and service system. At the other hand, however, there are more indirect instruments that are addressed to the consumer to achieve the aim of sustainable consumption and thus a reduction in the usage of scarce natural resources.

Servitisation is consistent with the goals defined in the EU Commission's Communication entitled '*The Roadmap to a Resource Efficient Europe*'⁵³ that outlines how we can transform Europe's economy into a sustainable one by 2050. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact. Although the vision is an ambitious one the practical tools to directly steer this development are currently fairly limited.⁵⁴ While there is no specific policy focus on supporting servitisation by the EU Commission, several EU strategies are targeting the aims of sustainable consumption and production as well as resource and energy efficiency.⁵⁵ In this respect, servitisation is occasionally mentioned.

Consequently, there are several projects both at the EU and national level supporting the development of a better understanding about the potential of servitisation; these projects range from resource efficient economy,⁵⁶ to optimising bike sharing⁵⁷ and car

⁵¹ Matteo Bartolomeo and others, 'Eco-Efficient Producer Services—what Are They, How Do They Benefit Customers and the Environment and How Likely Are They to Develop and Be Extensively Utilised?' (2003) 11 *Journal of Cleaner Production* 829.

⁵² Plepys, Heiskanen and Mont (n 44) 119; Kai Hockerts and Rolf Wüstenhagen, 'Greening Goliaths versus Emerging Davids—Theorizing about the Role of Incumbents and New Entrants in Sustainable Entrepreneurship' (2010) 25 *Journal of Business Venturing* 481.

⁵³ Communication from the Commission, Roadmap to a Resource Efficient Europe, COM(2011) 571 final.

⁵⁴ Susanne Fischer and others, 'Leasing Society' (European Parliament, Economic and Scientific Policy 2012).

⁵⁵ Plepys, Heiskanen and Mont (n 44).

⁵⁶ SPREE project (Servicizing Policy for Resource Efficient Economy) that officially ended in July 2015 concluded that servitization *"has an unprecedented potential to radically modify production and consumption patterns and to achieve absolute decoupling of economy, ecology and societal change."*

⁵⁷ Optimising Bike Sharing in European Cities (OBIS) is a project of the European Commission to advance the role and the opportunities of bike sharing as a valuable instrument to foster clean and energy efficient sustainable modes of mobility in urban areas. See also Paul DeMaio, 'Bike-Sharing: History, Impacts, Models of Provision, and Future' (2009) 12 *Journal of Public Transportation*.

sharing services in European cities.⁵⁸ Nevertheless, EU competences in these fields are limited to supporting, coordinating or complementing the action of the Member States;⁵⁹ hence, it is for the latter and often particularly for the regional or local authorities to effectively promote sustainable production.⁶⁰ Local authorities are particularly well positioned to assist in practical success of sustainable servitisation models, e.g. by supporting an efficient system of parking places or parking discounts for car-sharing system or to backing smart solutions for waste management or lightning in a particular town or city.

Member States, on the other hand, may promote sustainable production *inter alia* through taxation. Examples of good practices come from Sweden and Denmark, which applied burdensome long-term taxation schemes to reduce pesticides and introduce alternative pest-control measures that have stimulated the emergence of new servitisation-based business models.⁶¹ Taxation also proved to have high impact on the application of car-sharing schemes that are understandably more used in the countries with above-average overall taxes on car ownership. Conversely, in the Member States that guarantee fiscally preferential treatment to private car owners, low incentive for car-sharing will exist.⁶²

In this respect it is noteworthy, however, that the EU Court's judgment in *Commission v Luxembourg and France*,⁶³ where the Court held that the reduced VAT rate is applicable only to transactions consisting of the supplying of books found on a physical medium, has counter-sustainable effect. By rejecting the argument that the supply of electronic books constitutes a supply of goods, the ruling in essence effectively declared that the VAT Directive excludes any possibility of a reduced VAT rate being applied to 'electronically

⁵⁸ More Options for Energy Efficient Mobility through Car-Sharing (MOMO CAR-SHARING) projects sought to establish and increase car-sharing as part of a new mobility culture and is considered as a more intelligent and resource-efficient transport solution than car ownership. MOMO Car-sharing project was raising awareness about car-sharing and made recommendations on how to develop and establish new car-sharing offerings - <<https://ec.europa.eu/energy/intelligent/projects/en/projects/momo-car-sharing>> accessed 9 January 2016. More on car sharing: Simon Hazée, Cécile Delcourt and Yves Van Vaerenbergh, 'Sharing a Car? Yuck, No! An Investigation of Consumer Contamination in Non-Ownership Services' <<https://lirias.kuleuven.be/handle/123456789/476732>> accessed 2 January 2016; Bardhi and Eckhardt (n 33); Richard Katzev, 'Car Sharing: A New Approach to Urban Transportation Problems' (2003) 3 *Analyses of Social Issues and Public Policy* 65; Franz E Prettenhaler and Karl W Steininger, 'From Ownership to Service Use Lifestyle: The Potential of Car Sharing' (1999) 28 *Ecological Economics* 443.

⁵⁹ See Article 6 TFEU.

⁶⁰ Daniel E Rauch and David Schleicher, 'Like Uber, but for Local Government Law: The Future of Local Regulation of the Sharing Economy' (2015) 76 *Ohio St. LJ* 901.

⁶¹ Plepys, Heiskanen and Mont (n 44) 120.

⁶² Momo project, 'The State of European Car-Sharing, Final Report D 2.4 Work Package 2' 107.

⁶³ Cases C-479/13 and C-502/13, *Commission v France and Commission v Luxembourg*, ECLI:EU:C:2015:141.

supplied services’ although the latter may be perceived as a more environmentally sustainable ‘product’ than paper books.

3.3. EU regulatory support for servitisation in the energy and waste policies

Service business model is most concretely visible in the recent Energy Efficiency Directive,⁶⁴ which calls for a common framework that *‘should give energy utilities the option of offering energy services to all final customers, not only to those to whom they sell energy. This increases competition in the energy market because energy utilities can differentiate their product by providing complementary energy services.’*⁶⁵ Energy services that include a variety of activities, such as energy analysis and audits, energy management, maintenance and operation, monitoring and evaluation of savings etc.,⁶⁶ are thus a response to the constantly increasing criticality of energy-related issues that lead to the situation, where a mere fuelling is no longer considered as equivalent to energy supply.⁶⁷ The EU Energy Efficiency Directive may hence be perceived as direct instruments in support of servitisation.

Additionally, the EU has a broad policy on waste management. This policy is based on the so-called *principle of extended producer responsibility (EPR)* requiring manufacturers of products containing toxic or environmentally unsustainable materials⁶⁸ to take responsibility for management throughout key parts of their lifecycle, especially for management of post-consumer waste.⁶⁹ According to Thomas Lindhqvist, who first introduced EPR,⁷⁰ it refers to *‘an environmental protection strategy to reach an*

⁶⁴ Directive 2012/27/EU on energy efficiency, OJ L 315, 14.11.2012, p. 1–56.

⁶⁵ Ibid., preamble, rec. 20. Additionally, the Directive obliges the Member States to set up national energy efficiency obligation schemes for energy utilities or other alternative policy measures that achieve the same amount of energy savings.

⁶⁶ Paolo Bertoldi, Silvia Rezessy and Edward Vine, ‘Energy Service Companies in European Countries: Current Status and a Strategy to Foster Their Development’ (2006) 34 Energy Policy 1818. More on energy services in: Thorsten Helms, ‘Asset Transformation and the Challenges to Servitize a Utility Business Model’ [2015] Energy Policy; Miriam Benedetti and others, ‘A Proposal for Energy Services’ Classification Including a Product Service Systems Perspective’ (2015) 30 Procedia CIRP 251; Yudi Fernando and Sofri Yahya, ‘Challenges in Implementing Renewable Energy Supply Chain in Service Economy Era’ (2015) 4 Procedia Manufacturing 454.

⁶⁷ Benedetti and others (n 67) 252. For public procurement aspects of energy services see Colin Nolden, Steve Sorrell and Friedemann Polzin, ‘Innovative Procurement Frameworks for Energy Performance Contracting in the UK Public Sector’ <<http://www.sussex.ac.uk/spru/documents/2015-31-swps-nolden-et-al.pdf>> accessed 24 January 2016.

⁶⁸ E.g. paint, batteries, beverage containers, pesticide containers, electronics, packaging, cell phones, sharps, radioactive devices, motor oils, plastic bags and smoke detectors.

⁶⁹ Clifton Curtis and others, ‘Extended Producer Responsibility and Product Stewardship for Tobacco Product Waste’ (2014) 4 Int J Waste Resources 2, 2.

⁷⁰ Lindhqvist (n 29) ii.

*environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product’.*⁷¹ The concept thus implies that responsibilities, which were traditionally assigned to consumers and authorities responsible for waste management, are to be shifted to the producer of the products and is thus consistent with the polluter pays principle. The environmental benefits deriving from widespread application of EPR potentially include more efficient use of resources, cleaner products and technologies, more efficient manufacturing, increased recycling and greener consumption.⁷²

Lindhqvist reported already in 2000 that by then, almost all OECD countries have formulated EPR policies. At the EU level, several directives are forcing product manufacturers to assume a physical or a financial responsibility of post-consumer waste management. In this respect, the Packaging Directive⁷³ provides in the preamble that *‘it is essential that all those involved in the production, use, import and distribution of packaging and packaged products become more aware of the extent to which packaging becomes waste, and that in accordance with the polluter-pays principle they accept responsibility for such waste’*. Additionally, the Directive on Waste Electric Equipment (WEEE Directive)⁷⁴ provides for the creation of collection schemes where consumers return their WEEE free of charge, however, *‘in order to give maximum effect to the concept of producer responsibility’*, each producer is responsible for financing the management of the waste from his own products.⁷⁵ The third directive specifically referring to the principle of EPR is the Batteries Directive,⁷⁶ providing that financing schemes for the management of waste batteries and accumulators should *‘help to achieve high collection and recycling rates and*

⁷¹ The definition was published in English for the first time in: Thomas Lindhqvist, ‘Extended Producer Responsibility as a Strategy to Promote Cleaner Products’ (Lund University).

⁷² Allen L. White, Mark Stoughton and Linda Feng (n 3) 20. See also Dorothy Maxwell and Rita Van der Vorst, ‘Developing Sustainable Products and Services’ (2003) 11 Journal of Cleaner Production 883.

⁷³ Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, recently amended by the Directive (EU) 2015/720 as regards reducing the consumption of lightweight plastic carrier bags, OJ L 115, 6.5.2015, p. 11-15.

⁷⁴ Directive 2002/96/EC on waste electrical and electronic equipment (WEEE), OJ L 37, 13.2.2003, p. 24-39.

⁷⁵ Ibid., rec. 20. More on this in: M Altvater and C Brandmann, ‘Extended Producer Responsibility: The EU WEEE Directive Goes Global - Strict Law and Order Required or Self-Regulating Market Power a Promising Alternative?’, *Electronics Goes Green 2012+, ECG 2012 - Joint International Conference and Exhibition, Proceedings* (2012); Grit Walther and others, ‘Implementation of the WEEE-Directive — Economic Effects and Improvement Potentials for Reuse and Recycling in Germany’ (2010) 47 International Journal of Advanced Manufacturing Technology 461.

⁷⁶ Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators, OJ L 266, 26.9.2006, p. 1.

to give effect to the principle of producer responsibility'.⁷⁷ Moreover, the Euratom Radioactive Waste Directive⁷⁸ provides in Article 7 that 'Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder.' Although critics say that the implementation of EPR is not always successful in practice⁷⁹ or that the collection targets stipulated by the directives are not always as high as they could be,⁸⁰ the directives encourage manufacturers to add corresponding services to the products. Although they are offering recycling services due to the legal requirements for waste handling, these have become for many companies a source of income and have increased customer loyalties since taking care of waste for customers.⁸¹

Finally, servitisation is also one of the motivations for the Circular Economy Package, proposed by the Commission in March 2016. In this respect, the proposed regulation on organic fertilisers emphasises that there is an improving servitisation trend in the business, with increasing product customisation based on analysis of the soil where the fertiliser will be used.⁸²

3.4. Implications of servitisation for the environmentally-friendly oriented public procurement

Servitisation is increasingly relevant also to business-to-government (B2G) relationships.⁸³ Servitisation may in this respect considerably change the solutions public bodies get for the taxpayers' money. In the EU, solution-oriented approach in public procurement was made possible by the directives explicitly providing not only the lowest price as the basis for the award of tenders, but also for the most economically advantageous tender. The

⁷⁷ Ibid., rec. 19. More on this in Thomas Lindhqvist, 'Policies for Waste Batteries' (2010) 14 Journal of Industrial Ecology 537.

⁷⁸ Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, OJ L 199, 2.8.2011, p. 48-56.

⁷⁹ Kieren Mayers and others, 'Implementing Individual Producer Responsibility for Waste Electrical and Electronic Equipment through Improved Financing' (2013) 17 Journal of Industrial Ecology 186; Noah Sachs, 'Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States' (2006) 30 Harvard Environmental Law Review 51.

⁸⁰ Lindhqvist (n 78).

⁸¹ Emilie Aner and Magnus Rentzhog, 'Everybody Is in Services - The Impact of Servicification in Manufacturing on Trade and Trade Policy' (The National Board of Trade, Stockholm 2012) <Everybody is in Services - The impact of Servicification in Manufacturing on trade and Trade Policy> accessed 21 December 2015.

⁸² Proposal for a Regulation of the European Parliament and of the Council laying down rules on the making available on the market of CE marked fertilising products, COM (2016) 157 final, p. 2 of the Explanatory Memorandum.

⁸³ Jens K Roehrich and Nigel D Caldwell, 'Delivering Integrated Solutions in the Public Sector: The Unbundling Paradox' (2012) 41 Industrial Marketing Management 995.

latter implies that other award criteria may also be taken into account, in addition to the price (e.g. technical merit, environmental characteristics, running costs, after sales service and technical assistance etc.).⁸⁴ Despite this legal foundation, public procurement is in practice still too focused on lowest cost tenders, rather than outcomes, through life cost, value for society, quality and innovation. This was found as a central limitation for innovation and validation of creative solutions by the EU High Level Group on Business Services.⁸⁵ Nevertheless, the list of cases focusing on integral solutions is increasingly long. For example, in France, companies such as Flander Artois and Manger Bio have specialised in supplying organic products to schools as well as in assisting public canteens in designing seasonal menus.⁸⁶ In this respect, servitisation may be perceived as a driver to foster innovation through public procurement.⁸⁷ Moreover, many EU Member States have so far already developed criteria for sustainable (ecological) procurement aiming at fostering innovative sustainable products that save energy. Environmentally friendly criteria thus come before price.⁸⁸ Several smart technologies will in the future enable more efficient use of resources, not just by private, but also public customers, such as smart water management, where it is no longer necessary for cities to employ meter readers to walk through neighbourhoods and take manual meter readings. Digitising industry is thus a basis of projects for developing smart cities and intelligent regions.⁸⁹

Whenever public bodies purchase product-service systems the 2014 Public Procurement Directive emphasises assessments on the basis of the best price-quality ratio, thereby advocating the life-cycle costing approach.⁹⁰ The latter is one of the foundations of servitisation philosophy; however, in the past, failure to distinguish between direct purchasing cost and overall cost proved to be one of the most important barriers to innovative procurement.⁹¹ It is hoped that the emphasis on life-cycle costing will lead to a different behaviour in the future, where not just private companies and consumers, but also public bodies will adopt a more holistic approach to purchasing products and

⁸⁴ Katriina Parikka-Alhola, Ari Nissinen and Ari Ekroos, 'Green Award Criteria in the Most Economically Advantageous Tender in Public Purchasing', *G. Piga and K.V. Thai (eds), Advancing public procurement*, vol 2006 (PrAcademics Press, Boca Raton 2006) 257–258. See also Christopher Bovis, *EU Public Procurement Law* (Edward Elgar Publishing 2012).

⁸⁵ European Commission, High-Level Group on Business Services, Final Report, April 2014, p. 14.

⁸⁶ Kevin Morgan and Roberta Sonnino, 'Empowering Consumers: The Creative Procurement of School Meals in Italy and the UK' (2007) 31 *International Journal of Consumer Studies* 19, 21.

⁸⁷ Jakob Edler and others, 'Innovation and Public Procurement—Review of Issues at Stake' [2005] ISI Fraunhofer Institute Systems and Innovation Research, Karlsruhe 8. See also Directive 2014/24/EU on public procurement, OJ L 94, 28.3.2014, p. 65–242, rec. 95 and 123.

⁸⁸ More in Beate Sjøfjell and Anja Wiesbrock, *Sustainable Public Procurement Under EU Law: New Perspectives on the State as Stakeholder* (Cambridge University Press 2015).

⁸⁹ More on this in chapter 3.5.

⁹⁰ Directive 2014/24/EU, rec. 89-92.

⁹¹ Edler and others (n 88) 10.

services, advocating outcome-based contracting⁹² by defining the result and then asking a ‘*solution provider*’ to deliver it for them. In this respect, Neely states that in the UK, the government has recently privatised some of its prisons. An incentive scheme is included in the contract, which means the providers are paid more if the reoffending rates of prisoners leaving their care are lower than the national average. The advantage of this approach is that the solutions’ provider and the customer share the same incentive – they both want to reduce reoffending rates.⁹³ Innovative contracting (out-come based or contracting for availability) is particularly important for the post-financial-crisis austerity programmes that are compounding plans to cut public spending. Budget pressures mean that the traditional in-house approach is unaffordable, mandating a new approach – partnering with industry on long-term, output based incentivised contracts to achieve projected cost savings.⁹⁴ As an illustration, in the UK, the Ministry for Defence is already using contracts for availability across the RAF fast-jet fighters with a prime contractor promising guaranteed outputs (e.g. aircraft availability, flying hour levels etc.),⁹⁵ while Terminal 5 at London’s Heathrow Airport was built by the British Airport Authority using incentivised contracts with payments for saving made based on a share of a reward fund.⁹⁶

3.5.Servitisation implications for trade with environmental goods

Moreover, in respect of EU regulatory response to the servitisation trend it is essential to emphasise that since July 2014 the EU and 16 other WTO members have been negotiating an Environmental Goods Agreement (EGA), whose aim is to remove barriers to trade in environmental or ‘green’ goods. ‘Green goods’ are seen as a vital component in sustainable development and cover areas as diverse as tackling air pollution, managing waste, or generating renewable energy like wind or solar, e.g. carbon dioxide scrubbers, recycling machinery, heat pumps, thermostats, measuring equipment, wind turbines,

⁹² Irene C.L. Ng and Sai S. Nudurupati, ‘Outcome-based Service Contracts in the Defence Industry – Mitigating the Challenges’ (2010) 21 *Journal of Service Management* 656.

⁹³ Andy Neely, ‘Making the Shift to Services’ (2014) 2014 *Institute for Manufacturing Review* 12, 12. Such contractual incentives for performance have a long history, considering that some 18th century ships transporting prisoners from England to Australia were already incentivised on an outcome, i.e. number of prisoners delivered alive, which deterred those responsible for transportation from excessive speeding, consumption of the food and drink intended for the prisoners etc. - Nigel D Caldwell and Vince Settle, ‘Incentives and Contracting for Availability: Procuring Complex Performance’ in Irene Ng and others (eds), *Complex Engineering Service Systems* (Springer London 2011) 150.

⁹⁴ Nigel Caldwell and Mickey Howard, ‘Contracting for Complex Performance in Markets of Few Buyers and Sellers: The Case of Military Procurement’ (2014) 34 *International Journal of Operations & Production Management* 270, 279.

⁹⁵ *ibid.*

⁹⁶ Nigel D Caldwell, Jens K Roehrich and Andrew C Davies, ‘Procuring Complex Performance in Construction: London Heathrow Terminal 5 and a Private Finance Initiative Hospital’ (2009) 15 *Journal of Purchasing and Supply Management* 178, 181–182.

solar panels etc.⁹⁷ According to the Commission, at the first stage the talks will focus on removing tariffs on a broad list of environmental goods. The negotiators build on a list of 54 products on which the member countries of Asia-Pacific Economic Cooperation (APEC) have agreed to reduce their tariffs to 5% or less by 2015. In addition, the intention is for the EGA is to become a 'living agreement' which would allow the addition of new products in the future. As a world leader in import and export of environmental goods, the EU's ambition is also to include services related to exports of environmental goods (e.g. repair and maintenance of wind turbines) and to tackle non-tariff barriers, such as local content requirements or restrictions on investment. At this stage, only some WTO members have chosen to take part in the talks. This is why they are described as 'plurilateral'.⁹⁸ Once it is adopted its benefits will be applied to all WTO members using the Most Favoured Nation (MFN) principle⁹⁹ and will thus liberalise international trade with the environmental product-service systems.

The initiative shows how trade policy can positively contribute to environment protection and tackling climate change. It can boost global trade in green goods and services; support green industry globally, help meet climate and energy targets to be agreed in the new Climate Agreement end 2015 in Paris; provide cheaper access to these technologies worldwide as well as to create an impetus for talks on green goods and services in the World Trade Organisation. Moreover, the initiative is also in line with the Commission's 2015 trade strategy that *'the rise of services embedded in manufacturing calls for still greater focus on liberalising services both within the EU and with the rest of the world'*, underlining that it is increasingly essential to improve market access for manufacturing and services in conjunction with each other, thereby moving beyond traditional separation of liberalisation commitments for goods and services in trade negotiations.¹⁰⁰

4. Conclusion

Servitisation is a recent economic megatrend that covers a variety of new business models that are premised upon the assumption that customers are no longer satisfied by buying products alone. They want more than that, they want the whole solution for their problem or need. In this respect Levitt famously claimed: *'People don't want quarter-inch drills, they want quarter-inch holes'*.¹⁰¹ A more recent version of this statement, also employed by the EU Commission, is that people don't want light bulbs, but light. All this

⁹⁷ EU Commission, EU in joint launch of WTO negotiations for green goods agreement, Press Release, 24 January 2014.

⁹⁸ Australia, Canada, China, Costa Rica, Chinese Taipei, the European Union, Hong Kong (China), Japan, Korea, New Zealand, Norway, Switzerland, Singapore, United States, Israel, Turkey and Iceland. Together, these countries account for the majority of the world trade in environmental goods.

⁹⁹ Commission, The Environmental Goods Agreement (EGA): Liberalising trade in environmental goods and services, News archive, 8 September 2015.

¹⁰⁰ Commission Communication, Trade for all, COM (2015) 497 final (n. 271), p. 11.

¹⁰¹ Freeman, 'Buying Quarter Inch Holes: Public Support Through Results' [2000] *Archival Issues* 91.

reflects the idea that a goods-dominant logic to value creation has been replaced by a service-dominant logic and producers have been replaced by solution providers.¹⁰²

From the perspective of environmental sustainability of the economic system, servitisation covers a variety of business models, from those where products are fused with separate services, such as waste management of electronic equipment and energy services provided by energy suppliers, to smart products, like smart thermostat, smart lightning system for private houses or public buildings and even streets, where service is based on sensors connected to Internet. Moreover, a new revolution is happening with the new business models that are based upon access based consumption, where customers pay for the time with a product, without needing to own it. Similar revolution may be witnessed in respect of sharing economy. Access based business models have an enormous impact on reduced consumption, because they refer to better usage of underutilised resources like swapping clothes we do not use anymore, carpooling, using a neighbour's car, renting a room in someone's house for the weekend, bartering, bike sharing, and so on. Regulation has crucial role to play in protecting and enhancing those servitisation models that are at the same time positive for the European economy and the environment, while restricting those business activities that have the opposite effects. While servitisation at one hand highlights those services of manufacturers and suppliers of goods that are environmentally sustainable, it may in some aspects also have a rebound effect upon the environment. It is the role of regulation, both at the EU and national level, to curtail those effects.

¹⁰² Smith and others, 'Servitization and Operations Management: A Service Dominant-Logic Approach' (2014) 34 *Int. J. of Operations & Production Manag.* 242; Vargo and Lusch, 'Evolving to a New Dominant Logic for Marketing' (2004) 68 *J. of Marketing* 1; Schnürmacher and others, 'Providing Product-Service-Systems - The Long Way from a Product OEM towards an Original Solution Provider (OSP)' (2015) 30 *Procedia CIRP* 233.

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