



D4.2

An Adaptive Business Model for Water Reuse Schemes



The project "Innovation & Demonstration for a Competitive and Innovative European Water Reuse Sector" (DEMOWARE) has received funding from the European Union's 7th Framework Programme for research, technological development and demonstration, theme ENV.2013.WATER INNO&DEMO-1 (Water innovation demonstration projects) under grant agreement no 619040

Deliverable Title		D4.2. An Adaptive Business Model for Water Reuse Schemes
Related Work Package:	WP4: Business models and pricing strategies	
Deliverable lead:	CAD	
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Dissemination level:	Public	
Due submission date:	01/07/2015 (M12)	
Actual submission:	20/07/2015	
Grant Agreement Number:	619040	
Instrument:	FP7-ENV-2013-WATER-INNO-DEMO	
Start date of the project:	01.01.2014	
Duration of the project:	36 months	
Website:	www.demoware.eu	
Abstract	<p>Water reuse face numerous global barriers, including lack of sustainable business models to commercialize properly its products, pricing properly the resource while taking into account other economic factors; tackling regulatory challenges; or even overcoming public perception due to lack of public education.</p> <p>This report falls under the first sub-task, “Task 4.1 Designing business models for relevant markets for water recycling systems”. Through this process, the aim is to help companies define what new markets show opportunities for the services which have been identified and how to best capture such opportunities for future frameworks for reused water and also provide business model strategies promoting technologies linked to water reuse. Thus, the main objective of this report responds to the final deliverable D4.2 of providing recommendations to improve business models in the water sector adapt these to local considerations. Following an extensive analysis of business models and three specific case studies, three adapted Water Reuse Business Model Canvas are presented.</p>	

Versioning and Contribution History

Version	Date	Modified by	Modification reason
1	15/07/16	Fernando Casado	First draft
2	14/01/16	Fernando Casado	Addressed comments from external reviewer
3	28/01/16	Fernando Casado	Addressed comments from QCM

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1 Introduction

1.1 Contextual background

The water sector is plagued by a long history of under-pricing or free water or wastewater services, with opposition to full cost pricing not being popular for ethical and social reasons. These factors have contributed to the unwillingness of many governments to acknowledge water as a finite natural resource and an economic good – a commodity that needs a market price reflecting the cost of provision and its true value to society.

Current water management takes place at a single sector level (urban, industrial or agricultural) and seldom at larger spatial levels with interactions at river basins in terms of quality as well as quantity. Similarly, when referring to water reuse from urban side treated wastewater these three sectors are used for ease of understanding of the final use application. When designing operational business models for water reuse, knowing the sector in which the water will be reused is essential as the water quality for each of these sectors varies. For example, the final water quality required for reuse in agricultural lands would potentially be sufficiently treated by conventional wastewater treatment without the need for further treatment technologies or steps, meanwhile wastewater treatment for reuse in industrial processes should require further treatment steps with potential technology investment. This assumption is based according to *The Integrated Pollution Prevention and Control (IPPC)*, where the Directive (96/61/EC) sets out requirements on the operation of water reuse in industry in order to ensure a high level of environmental protection. According to the Directive, industries have to operate according to permit conditions based on Best Available Techniques (BAT). The BAT Reference Documents adopted by the Commission set out what is considered BAT at EU level (Klemeš (2012)).

Market-based approaches advocate traditional “business” based investments in which the revenues cover the costs and generate profits. Unlocking private investments allows the water sector to become more independent of governmental subsidies. In addition by building on and innovating in current water sector business models to the water reuse sector, these market-based approaches for the water reuse sector will be able to change the awareness of people from getting something for “free” to receiving something “valuable”. When people pay for goods and services, they become aware of their value, which, in turn, motivates them to use and maintain them more carefully.

Wastewater treatment operations are currently financed in the following ways. In broad terms three principle models exist for financing the construction, operation and maintenance of wastewater treatment:

- 1) Public financing
- 2) Private financing or
- 3) Joint Ventures - Public Private Partnerships (PPP)

Within these principle models of financing the following variances exist:

Public Responsibility:

- Fully Public Provision
- Passive Private Investment
- Design and Construct Contracts

Private Responsibility

- Fully Private Provision

- Service Contracts
- Build, Operate, Transfer
- Concession Contracts
- Passive Public Investment

Joint Ventures (PPPs)

However, not only is it important to finance the water sector, but indeed cost recovery for long term sustainability is also a crucial issue in market based approaches for the water sector and principally in this case, the water reuse sector.

The most common models for recovering operational costs for wastewater treatment operations are:

Water Pricing for Cost Recovery

Water pricing can have two functions. The first is cost recovery, aimed at paying for the costs of management, maintenance and renewal of public water supply and wastewater networks. The second function is to influence the behaviour of users to induce a more water-efficient use of the resource (CEPS, 2012). The design of the pricing system plays a particularly important role in areas under water stress, and therefore can play a vital role in ensuring cost recovery for wastewater treatment operators looking to introduce reuse schemes.

Water Rights Trading

If trading is possible, one sector can trade water with another sector where the user value or the value of output per unit of water is higher. There are two levels of water markets from simple ones between two users to complex ones that can involve all water users. A successful case of water markets for reuse can be taken from the EPI Water project of the Llobregat river basin near Barcelona which shows an inter-sectoral water trading (EPI Water, 2012). Farmers have agreed through a voluntary system to reduce the use of freshwater for irrigation in exchange for treated wastewater, thereby releasing more freshwater for other uses. The system is self-financing. The cost of regenerating the water is paid by domestic users, in application of the polluter-pays principle, and the cost of distributing the recycled water is paid by farmers since they profit from its use. The greater availability of freshwater reduced the need to curtail irrigation in drought seasons, thus increasing farm production and farm incomes.

Water markets and water trading are, in principle, efficient and effective in allocating scarce water resources to the most productive uses and therefore can be an attractive scheme for wastewater treatment operators. However, water trading can become a complex instrument, burdened by heavy transaction costs. It often does not address political issues such as equity concerns, socially problematic trade-offs (e.g. with food security) and environmental considerations.

Payment for Ecosystem Services (PES)

The distribution of costs and benefits among water users and other stakeholders can take the form of financial transfers between them. PES can be used to compensate for the direct costs or loss in economic benefits incurred by water resources protection. It has been argued that PES can also include payments for pollution avoidance, when pollution is linked to the provision of a public good (CEPS, 2012). In this case, the payments would help polluters to invest in water protection measures, especially when they lack the financial means to do so themselves. Payment schemes such as agreements to ensure certain volume flows have been advocated in order to manage water scarcity issues. Therefore PES schemes could potentially be used in water reuse schemes for wastewater treatment for higher level water quality delivery.

Financing

In terms of water reuse there is a potential for water treatment works to be financed in order for them to implement water reuse schemes (for e.g. construction of new pipes to deliver treated wastewater to where it is needed). Additional funding for water infrastructure could be introduced in the form of loans channelled through intermediary national banks and backed up by the European Investment Bank (EIB). According to (CEPS 2012) other tools could include a European Water Efficiency Fund comparable to the European Energy Efficiency Fund, possibly combined with water efficiency targets, such as exist for example in the Common Agricultural Policy.

1.2 The Reason for this Report

Water reuse faces numerous global barriers, including a lack of sustainable business models to properly commercialize its products, pricing properly the resource while taking into account other economic factors; tackling regulatory challenges; or even overcoming public perception due to a lack of public understanding. Work within WP4 of the Demoware project aims to respond to these challenges by:

- Helping companies define new markets that present opportunities for the services which have been identified and how to best capture these opportunities for future frameworks for reused water
- Providing business model strategies promoting technologies linked to water reuse.
- Demonstrating the full benefit of water reuse schemes based on a Cost Benefit Analysis and assessment of externalities.
- Exploring options for “innovative financial engineering” of water reuse schemes (through pricing, taxes, incentives etc.).
- Providing simplified tools for water reuse stakeholders to perform a Cost Benefit Analysis of water reuse schemes and their appropriate financing structures
- Developing a strategy to make the most of the finance solutions of new and innovative financing mechanisms.

These initiatives are being performed under a series of sub-Tasks. This report falls under the first sub-task, “Task 4.1 Designing business models for relevant markets for water recycling systems”. Through this process, the aim is to help wastewater treatment companies define new water reuse markets that show opportunities for the services which the wastewater treatment plants have identified and how to best capture opportunities for future applications for reused water. This report will allow wastewater treatment operators to design their own innovative business model through a step-by-step guide, which will be adapted to their local conditions.

Thus, the main objective of this report responds to the deliverable D4.2.of providing recommendations to improve business models in the water reuse sector and to adapt these to local considerations.

1.3 Methodological approach

The methodological approach followed to achieve these objectives was based on three general phases addressing analysis of innovative business models, application of these processes to the water reuse market and business models analysed from selected sites. The sites identified and selected for the implementation process were the following: Braunschweig, Tarragona, OFWRP and Sabadell (see Figure 1). These four sites were specifically chosen as they represent different final uses for the treated wastewater, namely agricultural, industrial and urban uses.

In order to articulate the conceptual approach to analyse the innovation potential of the business models, the following aspects have been considered for each site:

- 1) Analysis of the business model value chain from the identified sites
- 2) Positioning strategy for the near future (up to 2017) and the core mission strategy up to 2017; desired markets taken into consideration; and the expansion goals for products/services
- 3) The level to which inclusive and sustainable business management concepts are relevant to the companies analysed: relevance of inclusive and sustainable business management; major initiatives on sustainable management and major initiatives on inclusive business management

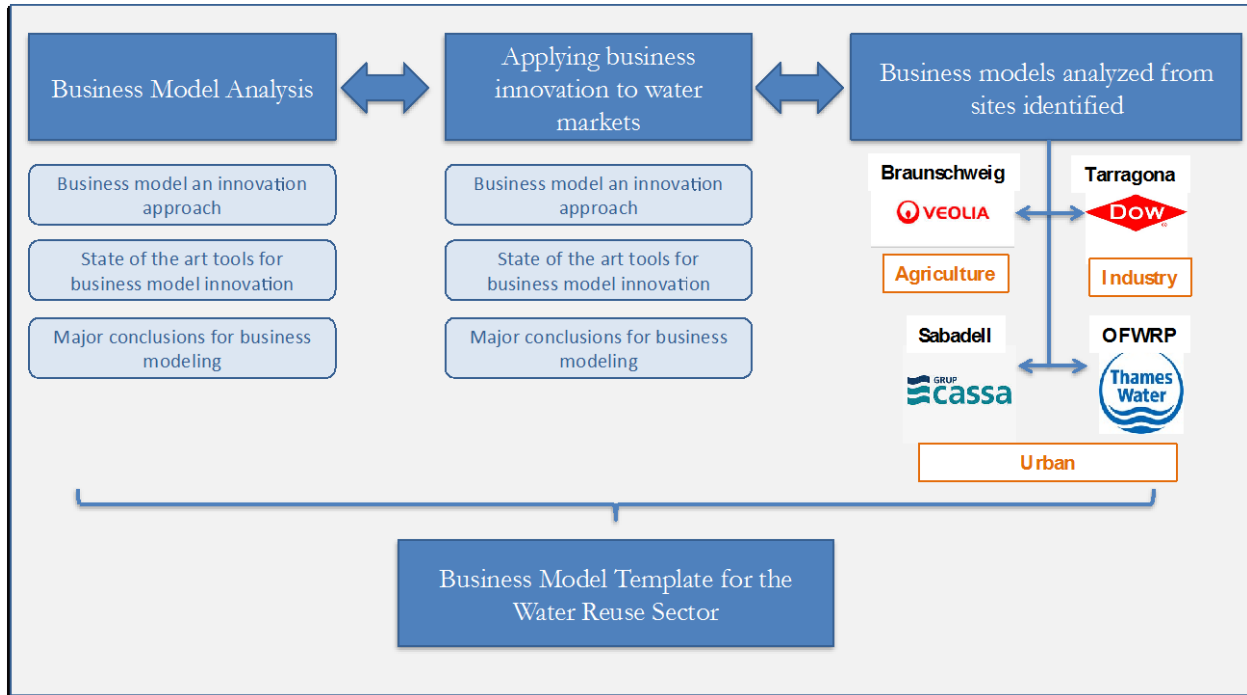


Figure 1 Methodological approach aimed at promoting innovative business model for the water sector

In terms of the data collection process for the business model definition, the following tools and processes have been used:

- Secondary research around the business innovation models and value chains
- Survey designed to be applied to the four sites
- Specific interviews to plant managers and operators at each site
- Specific visits to the three target sites (see Annex II for agenda of site visits and WP site alignment)
- Workshops organized with the principal site managers and key stakeholders

Major highlights through the research process have identified weaknesses that current tools have when offering solutions to improve the business model, specifically for the wastewater treatment plants for the water reuse sector, and major recommendations to the sites analysed on how to improve the business model implementation of their specific services:

2 Business Models

2.1 Business models and innovation

2.1.1 Conceptual analysis of a business model

The number of publications on business models, both scientific and practice-oriented, has grown significantly over the past 15-20 years (Zott et al. 2011). The business model as the unit of analysis is a relatively young field of research, which means that the use of a common language and terminology, a universal definition and set of components that define business models, and a clearer understanding of the role of business models for the success or failure of products and services on the market have only started to emerge. Two main factors are regarded as drivers for the sharp rise in business model studies. First and foremost, the internet has allowed firms and entrepreneurs to experiment with new business models; second, the appreciation that one can only successfully enter the huge untapped market at the base of the pyramid (BoP) by creating specific business models that make products and services accessible to the poorest, while making profits (Massa and Tucci 2013).

There are various definitions, and different people understand the concept of a business model development still quite differently, e.g. as a framework, a method, a strategy, or a process (Zott et al. 2011). Margetta (2002) describes business models as being essentially stories that answer questions such as “Who is the customer? And what does the customer value? How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?” According to Teece (2010), “the essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit”; hence, the business model being a conceptual, rather than a financial model of a business. The work of Alexander Osterwalder and Pigneur on Business Model Generation (2009) is today regarded as a major reference when it comes to business model development, both in research as in practical application. A business model, according to the authors, “describes the rationale of how an organization, creates, delivers and captures value”.

Chesbrough and Rosenbloom (in Chesbrough 2010) define a business model through 6 functions it performs:

- 1) Articulate the value proposition, that is, the value created for users by the offering
- 2) Identify a market segment, that is, the users to whom the offering is useful and for what purpose
- 3) Define the structure of the value chain required by the firm to create and distribute the offering, and determine the complementary assets needed to support the firm’s position in this chain. This includes the firm’s suppliers and customers, and should extend from raw materials to the final customer
- 4) Specify the revenue generation mechanism(s) for the firm, and estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen
- 5) Describe the position of the firm within the value network (also referred to as an ecosystem) linking suppliers and customers, including identification of potential complementaries and competitors
- 6) Formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals

2.1.2 Business model innovation

An innovation is distinguished from an invention by value creation for customers and a successful market introduction. Therefore, a business model is needed which is designed and tested in such a way that the product or service on offer (the “value proposition”) corresponds to a real demand by a critical mass of potential customers – i.e. the “product/market fit” has to be right. In other words: a good product or service without a well-designed business model will eventually fail in the market, whereas a less sophisticated product or service with an innovative business model may succeed.

The relationship between business models and innovation is twofold: On the one hand, business models are considered as a vehicle for innovation, as a way of successfully introducing innovative ideas and technologies in the market. On the other hand – and increasingly – business models become a dimension of innovation itself (Massa and Tucci 2013).

Thus, business model innovation means both designing new business models in order to create value through a new product; as well as to innovate in business models in order to create more value from existing products (see Boons et al. 2013; Clinton et al. 2014):

- New business model for a new product: A company develops a business model to create value through a new product. This is the common setting in the case of new enterprises and start-ups that are being created around a new product or service.
- New business model for an existing product: A company modifies (innovates) its business model to create more value through an existing product or service. This is a common setting for established companies that need to innovate due to competition or a changing context in which they do business (change of government regulations, change in costs for natural resources they depend on, changing customer demands, etc.)

In the same line, Massa and Tucci (2013) distinguish the terms business model design and business model reconfiguration, which both can lead to business model innovation, but take place in different contexts and settings, and deal with different challenges.

2.1.3 Business Model Archetypes with relevance for the water re-use industry

In this section, we take a closer look at three conceptualizations of business model archetypes identified in literature, and how they relate to business model innovation in the water re-use sector. The approach of looking at archetypes is used to bring out the fundamental characteristics of each business model and thus help to understand and classify different models. It is highlighted that classifying a firm’s business model is not a purely intellectual or diagnostic exercise, but an important step in business model innovation. Through exploring the different business models described here, companies can identify new opportunities to diversify, modify or even shift to other revenue streams, clients and markets.

2.1.3.1 MIT Business Model Archetypes

The MIT Business Model Archetypes (Malone et al. 2006) classify business models according to two dimensions, namely what rights are being sold, and what assets are involved. From distinguishing four asset rights models and four types of assets, the framework derives 16 business model archetypes, into which, according to the authors, any existing business model can be classified as shown in Figure 2:

		<i>What type of asset is involved?</i>			
		Financial	Physical	Intangible	Human
<i>What rights are being sold?</i>	Creator	Entrepreneur	Manufacturer	Inventor	Human Creator*
	Distributor	Financial Trader	Wholesaler/Retailer	IP Trader	Human Distributor*
	Landlord	Financial Landlord	Physical Landlord	Intellectual Landlord	Contractor
	Broker	Financial Broker	Physical Broker	IP Broker	HR Broker

* These models are illegal in the US and most places today because they involve selling human beings. They are included here for logical completeness.

Figure 2 MIT Business Model Archetypes (Malone et al. 2006)

Taking these given categories, companies that treat and sell water would be classified as *Manufacturers*, as they “buy raw materials or components from suppliers and then transform or assemble them to create a product sold to buyers” (*Creators*), and the asset involved (water) is *physical*. Hence, the definition of the business model archetype is: “A Manufacturer creates and sells physical assets” (Malone et al. 2016: 9).

It may, however, seem odd to classify companies that recycle water in the same category as companies that manufacture cars, furniture or food. In fact, combinations of different business models in the revenue stream are common in many companies, with usually one of the archetypes being the dominant one. Hence, business models of water treatment companies may well include aspects of other business models depending on the types of activities undertaken, such as *Inventor* (*creates and then sells intangible assets such as patents and copyrights*, in this case elements of water treatment technology) or *Physical Landlord* (*sells the right to use a physical asset*). In the latter case, one could imagine a case where the business model is a lease (and operation) of a treatment plant for a client (e.g. PPPs, municipality, industry), but without transferring the ownership of the plant and not selling the treated water as a product. The income stream would then be different. The business model *Physical Landlord* also applies in the case where the company does not consider to sell the right to “own” the asset water to its client, but to “use” it (and hence to return it as wastewater). Of course, also, the *Contractor* business model (*sells a service provided primarily by people, such as consulting, construction, etc.*) can apply for companies in the water re-use sector, and even the *Physical Broker* business model (*matches buyers and sellers of physical assets*) can play a role.

2.1.3.2 Smarter Startup Business Model Archetypes

The authors of *The Smarter Startup* (Cabage & Zhang 2013) propose seven abstract business model archetypes (“fundamental personalities”), being derived from the 3 primary archetypes *Product*, *Service* and *Trade*, and the four secondary archetypes *Brokerage*, *Subscription*, *Marketplace* and *Ecosystem*, which are derived from a combination of primary archetypes as illustrated in Figure 3:

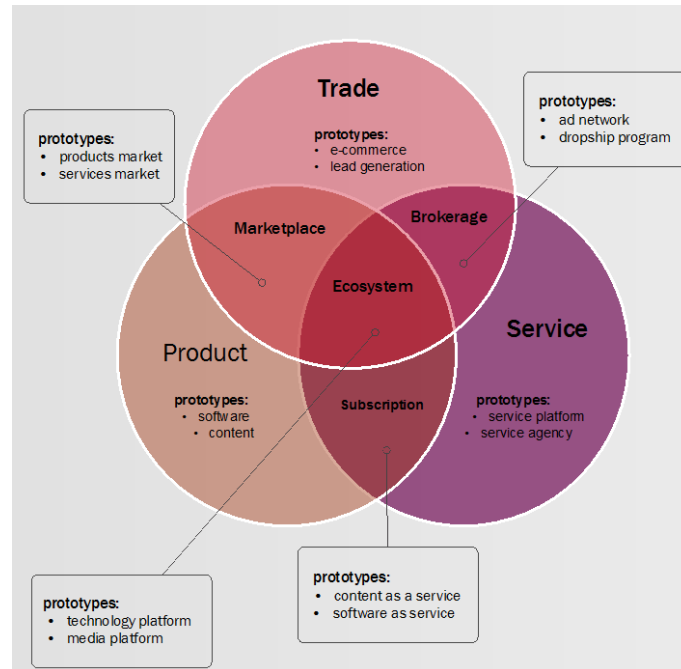


Figure 3 Smarter Startup Business Model Archetypes (Cabage & Zhang 2013)

The Business Model Archetypes were developed with a clear focus on the internet economy, and the given examples stem from this sector. However, the basic concepts are applicable to any sector, including the water re-use industry. Most of these companies' business model would fall into the primary archetype *Product*, and to a certain extent *Service*, or the secondary archetypes *Subscription* and *Ecosystem*, the latter including aspects of all three all primary archetypes. These are described as follows:

- **Product:** Develop a tangible good and sell on a one-time fee basis (purchase or license). Requires high up-front sunk capital but is able to leverage economies of scale.
- **Service:** Intangible work for a client, monetized on a per-use basis. Low sunk costs but high float cost requirements. Professionals or technicians with expert knowledge and limited capital prefer it.
- **Subscription:** Building, maintaining and supporting ongoing use of a product, rather than one time sell. Customers pay a monthly subscription service and benefit from continued improvements.
- **Ecosystem:** A mature market leader may expand as a result of success. They develop a marketplace and/or community for customers and/or support vendors to offer augmented solutions.

2.1.3.3 Sustainable Business Model Archetypes

One important element of the business models in water re-use industry that is not considered in the archetypes and typologies above is the fact that the value that these companies create is not only manufacturing and selling a product (water) or a technology, but it is the aspect of sustainability, a value creation beyond the firm through transforming wastewater into a usable product. The Sustainable Business Model Archetypes (Bocken et al. 2014, and adapted in the tool *Business Model Innovation Grid*) all in one way or another contribute to building a sustainable economy.

According to the categories of Sustainable Business Model Archetypes (Figure 4), the business activities of companies in the water re-use sector would naturally fall into the *Technology* grouping, and be repre-

representatives of a business model archetype called *Create Value from Waste* (*Closing resource loops* or *Circularity*) is another naming), as the “re-use, re-cycle, re-manufacture”:

Figure 4 Sustainable Business Model Archetypes (Bocken et al. 2014: 48)

Bocken et al. (2014) define business model archetypes according to the value proposition, value creation & delivery, and value capture (Figure 5).

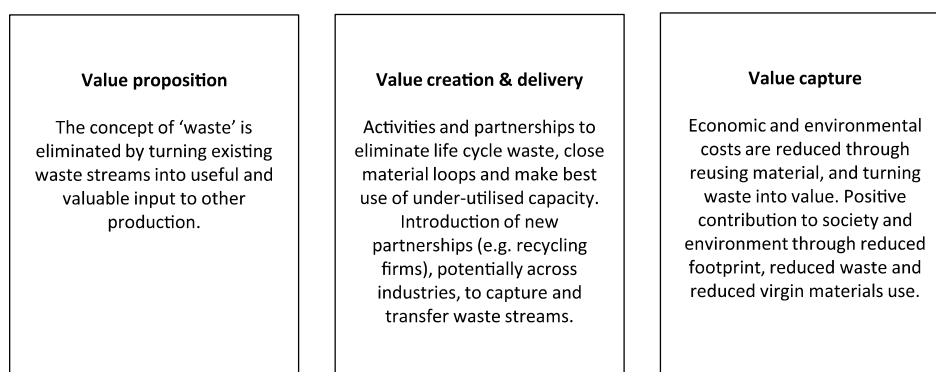


Figure 5 Definition of the business model archetype “Value from Waste” (Bocken et al. 2014)

Depending on a company’s activities and environment, there may well be aspects of other archetypes within the Technology, Social or Organisational domains that are worth to be explored in order to innovate their business model

2.2 State-of-the-art tools for Business Model Innovation

Building on academic research as well as on business practice, a growing number of frameworks, tools and methodologies to support business model development and innovation have become available. According to the level of abstraction from reality, Massa and Tucci (2013) categorize existing tools for business model innovation into Narratives, Typologies/Archetypes, Graphical frameworks/Ontologies, Meta models, and Activity Systems.

Based on an Internet research, this section provides a non-exhaustive overview of existing frameworks, tools and methodologies for business model development and innovation. The selection of frameworks, tools and methodologies took into account an overall representation of the broad spectrum of existing tools, as well as the relevance of the tools, based on its online prevalence. The crux of each tool is described briefly, and the different tools will be compared against a few selected parameters, such as the focus region or market, funding structure, the services offered and their costs, as well as the segments of innovation along the value chain that are supported by each tool. It must be noted that this section builds only on information that is freely available, and no direct application or testing of the tools was performed. However, in section 5, adapted business model templates are developed for their implementation by wastewater treatment companies

As business model development and innovation processes are not only driven by sector-specific developments, including the water re-use industry which can benefit from a wide perspective on innovative business model thinking from outside its own sector, the identified frameworks, tools and methodologies are generic, i.e. they are not specific to water re-use schemes. Hence, at this stage of the research, a broad perspective on the state-of-the art tools in business model development and innovation shall enrich and stimulate the thinking within the water re-use sector, where in section 5, adapted innovative business model templates are developed to allow innovative thinking to take place.

For the categorization of the frameworks, tools and methodologies, the following three areas of business model dimensions are used:

- Comparative analysis of tools for business model innovation
- Application of tools for business model innovation
- Tools for business innovation along the value chain

2.2.1 Comparative analysis of the tools for business model innovation

Based on the approach followed, the following specific tools for business model innovation have been identified and analysed (see Figure 2):

- Strategyzer/Business Model Canvas
- Business Model Kit;
- Business Model Innovation Tool Kit For Emerging Markets;
- SME Toolkit;
- SustainValue;
- Business Model Architect
- Start-up Strategy Framework;
- The Lean Start-up Methodology;
- The LaunchPad for Enterprise

Table 1 Comparative analysis of the tools for innovative business models

Name and brief description of the tool	Country and focus markets	Ownership Funding structure
<p>Strategyzer is a business modelling toolbox built around the Business Model Canvas (BMC). The BMC is a strategic management tool that provides a structured template to systematically map out, describe, design and innovate business models. The template comprises of the following nine building blocks:</p> <ul style="list-style-type: none"> • Value Propositions • Customer Segments • Channels • Customer Relationships • Revenue Stream • Key Resources • Key Activities • Key Partners • Cost Structure <p>Due to its generic design and adaptability, the BMC is probably the most widely used tool for business model innovation, and a variety of adaptations of the BMC exist, tailored to specific sectors, markets etc.</p> <p>A web app allows easy use of the BMC including tutorials, multi-user collaboration and features to test different pricing strategies etc. Apart from the BMC, a Value Proposition Canvas exists, to specifically work on this aspect of the BMC.</p> <p>http://www.businessmodelgeneration.com/</p>	<p>Strategyzer AG is a private company based in Switzerland.</p> <p>The Business Model Canvas was designed by Alexander Osterwalder, building on to a large extent his PhD work at the University of Lausanne</p> <p>The focus is global, with application mostly in developed countries</p>	<p>Privately funded and run</p>
<p>The Business Model Kit is a tool for brainstorming, designing, visualizing, comparing and presenting business models. The kit comprises of the following 16 building blocks:</p> <ul style="list-style-type: none"> • Your Organization • The Company • The Consumer • Supplier • Non-profit • Government 	<p>Board of Innovation is a company based in Belgium, specialised in entrepreneurship & business model innovation.</p> <p>The focus is global.</p>	<p>Privately funded and run by Board of Innovation</p>

Name and brief description of the tool	Country and focus markets	Ownership Funding structure
<ul style="list-style-type: none"> • Product • Service • Experience • Money • Less Money • Reputation • Exposure/Attention • Credits • Data • Right <p>According to its developers, the kit it is compatible with the BMC. http://www.boardofinnovation.com/business-model-templates-tools/</p>		
<p>The Business Model Innovation Tool Kit For Emerging Markets is a guide for business model innovation specifically tailored to emerging markets. It provides an analytical framework that can serve as a practical tool for exploring market opportunities in developing countries. The guide's structure is based on the Business Model Canvas, highlighting key issues to consider in emerging markets and providing guiding questions for each of the 9 building blocks. The guide suggests to use the BMC in three phases:</p> <ul style="list-style-type: none"> • Mapping of assumptions • Data collections • Business model innovation <p>The guide was developed as part of the "Emerging market Innovation Camp program" for Nordic companies. http://www.innovationcamps.net http://www.innovationcamps.net/wp-content/uploads/2014/06/Innovation-Tool-Kit.pdf</p>	<p>The programme's purpose is to assist Nordic companies in identifying concrete market opportunities in emerging markets.</p>	<p>Public initiative funded and run by Nordic Innovation, an institution working to promote cross-border trade and innovation, under the auspices of the Nordic Council of Ministers.</p>
<p>The SME Toolkit is an online platform that helps entrepreneurs and small and medium enterprises (SMEs) to learn and implement sustainable business management practices and to increase their productivity, efficiency, and capacity, as well as to improve their access to finance and new markets. SME Toolkit provides SMEs with free online key business management information, interactive tools, and training resources. This includes over 5,000 free business forms, tools, and how-to-articles, as well as a global business directory, multilingual community forums, and a host of other interactive features. The thematic areas are accounting & finance, human resources,</p>	<p>The SME Toolkit is hosted by the International Finance Corporation (IFC) in the USA</p> <p>The focus is on emerging economies</p>	<p>The SME toolkit is a public-private initiative of the IFC and IBM</p>

Name and brief description of the tool	Country and focus markets	Ownership Funding structure
<p>international business, legal & insurance, marketing & sales, operations, exporting and technology. The SME toolkit is operated in 17 languages. http://smetoolkit.org/</p>		
<p>SustainValue (Sustainable Value Creation in Manufacturing Networks) was a collaborative project in which a set of tools and methods for sustainable and value-adding business-modelling and network analysis was developed and tested, including:</p> <ul style="list-style-type: none"> • Value Mapping Tool • Sustainable Value Analysis Tool • Sustainable Business Model Archetypes/Business Innovation Grid <p>http://www.industrialsustainability.org/tools/ http://www.sustainvalue.eu/</p>	<p>A research project implemented by a consortium comprised of 10 European institutions lead by VTT Technical Research Centre of Finland The focused on the European manufacturing sector</p>	<p>Research project (2011-2014) funded by the European Commission under the 7th Framework Programme</p>
<p>Business Model Architect is the alphabet of business model creation. It turns your business development into a game of Scrabble or Wordfeud. With 147 cards in 13 categories you can build your business model visually at the kitchen table, in the classroom or at your clients meeting desk anywhere.</p> <p>The cards make it simple and easy to:</p> <ul style="list-style-type: none"> • Build business models even if you don't know what a business model is – whether by yourself, with your team or with your clients or students. • Facilitate creative thinking in the business modelling process. <p>The Business Model Architect was designed to be compatible with the BMC. http://businessmodelarchitect.eu/</p>	<p>Business Model Architect was developed by Jan Bendtsen, in Denmark.</p>	<p>Privately funded and run</p>
<p>Strategy Tools for the Next Generation is a toolkit to enable visual strategy tools for innovation in management and business modelling that was identified and/or developed based on action research and active experiments. The tools are all available online. They include:</p> <ul style="list-style-type: none"> • Strategic Innovation Canvas • The Innovation Pyramid • Innovation Thinking Modes • The Innovation Pyramid: key questions to ask • The Innovation Pyramid (Blank) • Action Road Map • Two Lenses on Strategy 	<p>Engage // Innovate, a strategy & innovation consulting company based in Norway</p>	<p>Privately funded and run</p>

Name and brief description of the tool	Country and focus markets	Ownership Funding structure
<ul style="list-style-type: none"> • The Innovation Challenge • Innovation vs. Reaction • The Change Stairs • The Six Steps of Strategy • A Holistic View on Innovation • 30/30 Rule • Three Levels of Business Models <p>http://strategytoolsforthenextgeneration.com/</p>		
<p>Startup Strategy Framework is an online collection of conceptual tools for improving odds of a start-up & new product success. It includes 3 core concepts and 3 applied tools:</p> <p>Core concepts:</p> <ul style="list-style-type: none"> • Business Model Archetypes - The 7 fundamental types of business “personalities” that underpin every business model. • 6 Market Dynamics - The 6 market dynamics that must be considered to evaluate opportunity and difficulties. • Value Creation Plane - An analysis tool for understanding the spectrums of value and identifying opportunity to create new value. <p>Applied tools:</p> <ul style="list-style-type: none"> • Opportunity Discovery - A systematic approach to evaluating start-ups and new product opportunities. • Start-up Scorecard - A simple applied scorecard for rating start-up and new product concepts against the 6 market dynamics. • Vision Definition - An applied tool for clarifying and articulating a targeted value statement (elevator pitch). <p>http://smarterstartup.org/</p>	<p>The book “The Smarter Startup” on which the framework is based was written by Neal Cabage and Sonya Zhang, both based in the USA</p> <p>The focus is on (tech) start-ups</p>	Privately funded and run
<p>The Lean Start-up Methodology is a method specifically for startups, to reduce the overall time of product and business development and market introduction by adopting a “scientific” and iterative approach of product/service releases and validation by customers. It is based on 5 principles:</p> <ul style="list-style-type: none"> • Entrepreneurs are everywhere • Entrepreneurship is management • Validated Learning • Innovation accounting 	<p>Developed and published as a book by Eric Ries (US); the focus is on start-ups, especially in the digital technology industry</p>	Privately funded and run

Name and brief description of the tool	Country and focus markets	Ownership Funding structure
<ul style="list-style-type: none"> • Build-measure-learn <p>The Lean Start-up Methodology considers itself as a global “movement” for start-ups http://theleanstartup.com/</p>		
<p>The LaunchPad for Enterprise is an online tool that helps large organizations to adopt the agility of start-ups with the scale of the existing enterprise. It is based on ideas of the Customer Development Methodology and the Lean Startup Methodology. The Customer Development methodology describes a process of customer development that needs to complement a company’s product development in order to find the product-market fit. The LaunchPad Methodology consists of 3 steps:</p> <ul style="list-style-type: none"> • Find: Identification of early stage projects • Filter: Rigorous testing and validation to filter ideas • Fund: Market ready initiatives <p>An 8-step cycle is applied, designed to systematically transform initiatives into customer-tested products/services:</p> <ul style="list-style-type: none"> • Clarify customer archetypes and value propositions • Chart ecosystem: buyers, partners, channels • Size the market and refine economics • Competitive mapping & cross-industry insights • Define metrics that matter • Test minimum viable product: iterate or pivot • Establish product-market fit • Assess investment readiness <p>Besides companies, the LaunchPad also offers tools for governments, accelerators and education institutions. https://www.launchpadcentral.com/enterprise</p>	<p>Private company based in San Francisco, USA, co-founded by Steve Blank, the founder of the Customer Development Methodology, who lectures entrepreneurship at various US-based universities and business schools.</p> <p>The LaunchPad for Enterprise focuses on big established companies</p>	<p>Privately funded and run</p>

The main observations based on such analysis are the following:

- The majority of the tools are operated privately as a profit generating business for consulting firms – at the same time, many of the basic tools are freely available, whereas the use of additional features (such as tutorials/workshops/books/web application) are charged
- Besides the privately run tools, there are some public, and public-private initiatives funded under research and development grant programmes
- A number of tools have their origin in academics, and many are described as methodologies or frameworks with an almost scientific conception
- Many tools are linked to (best selling) book publications
- There is a number of tools available that target start-ups, especially in the digital technology industry
- All of the tools identified are developed and run by organizations or individuals either in Europe or the USA
- No tools designed within or for the water re-use sector have been identified; however all of the described tools could potentially be applied by companies in the water industry

2.2.2 Application of tools for business model innovation

Similarly, for each one of the tools for business model innovation identified, an in-depth analysis has been made to define their beneficiaries, tools provided and estimated costs (see Table 2).

Table 2 Application of tools for business model innovation

Name	Beneficiaries	Tools and services provided	Costs
Strategyzer	All types of companies	Canvas templates for download (PDF/Word) with instructions for use; WebApp for the application of the canvas including online tutorials; Online courses, public masterclasses and in-house training are also provided	Canvas: free Strategyzer App: approx. 300 USD/year per project 2-day public masterclass: approx. 2000 USD/person
Business Model Kit	Established companies	Board of Innovation offers 2-day in-company trainings on business model innovation, in which the application of Business Model Kit is trained and own business models are generated; other trainings on intrapreneurship and innovation are available	Business Model Kit: 99€ (digital version for free) Trainings: n/a
Business Model Innovation Tool Kit For Emerging Markets	Nordic (established) companies	Guidance document (PDF); The programme consists of a 1-day innovation workshop, a 1-week on-site innovation camp (in an emerging economy country), peer-networking, as well as post-programme business development support	Guide: free download Programme free for Nordic companies
SME Toolkit	SMEs in emerging economies	Key business management information, interactive tools, and training resources, including over 5,000 free business forms, tools, and how-to-articles, as well as a global business directory, multilingual community forums, and a host of other interactive features. The thematic areas are accounting & finance, human resources, international business, legal & insurance, marketing & sales, operations,	Free subscription for SMEs from developing countries

Name	Beneficiaries	Tools and services provided	Costs
		exporting and technology.	
SustainValue	Companies in the European manufacturing industry	Developed and tested methods/frameworks are available as research outputs for download on the project's website.	Free
Business Model Architect	All types of companies	The Business Model Architect is a board game-type tool to generate business models. An online version is available with additional features such as multi-user collaboration and commenting.	Business Model Architect: 39€
Strategy Tools for the Next Generation	All types of companies	Visual strategy tools such as road maps, score cards, canvases for download (PDF) with short explanations on how to use them; Workshops on the use of the tools ranging from three hours to five days are offered, as well as train-the-trainer programmes.	Download of tools for free (creative commons licence); book for sale, workshops against fee
Start-up Strategy Framework	Start-ups	The framework offers a presentation and a worksheet on each of the three core concepts and three applied tools, for download from the website.	Download of tools (presentations and a worksheets) for free (creative commons licence); book for sale
The Lean Start-up Methodology	Start-ups	Basic information on the Lean Start-up Methodology is provided on the website; additional resources are: Lean Start-up Meetup Groups The Lean Start-up Wiki The Lean Start-up circle, an online community of practice Lean Start-up Conferences A book series	n/a
The LaunchPad for Enterprise	Established companies, governments, education institutions, accelerators; It is the mandated commercialization framework for the National Science Foundation Innovation Corps (NSF I-Corps), and the National Institutes of Health in the USA.	LaunchPad offers, among others: Experiential workshops designed for corporate groups to rethink how they bring ideas to market Innovation ecosystem design, an end to end system for continuous innovation that looks at the process, the partners, the structure, the technology, the culture Team immersion programs: Teams combine in a group setting to engage in an 8-step cycle designed to transform ideas/initiatives into customer-tested products Software for project tracking, process transparency, task accountability, and progress toward market viability & investment readiness	n/a

Main considerations of this analysis are the following:

- It is in the very nature of the tools that they are designed in a rather generic way, in order to serve a variety of application cases. The real value of each tool can thus only be validated through its application in the specific case.
- Given the diversity of tools, there is a remarkable level of commonality of concepts and language used; this is due to the fact that a number of the tools are conceptualized as a compilation of existing good practices, or refer to the Business Model Canvas as a common denominator.
- While most tools are designed to serve all types of users, a few are designed for specific cases, i.e. specific markets (emerging economies) or sectors (the manufacturing industry). A few tools are specifically designed to support start-ups and entrepreneurs, and a few apply start-up-type methodologies to established companies (intrapreneurship).
- There is a broad range of services offered among the tools, they include:
 - Generic rules, templates, worksheets, methods; case studies and typologies
 - Workshops and trainings, seminars
 - Online portals and platforms, communities-of-practice
 - Software-based support such as web applications
 - Manuals and guide books
- Issues of long term sustainability of a business model’s viability are not considered strongly
- Only a few tools focus on the financial aspects
- A common approach is to provide basic graphical tools for free, and to offer additional features through online platforms, books or workshops that support the application of the tools in practice.
- The suitability of each tool will primarily be dependent on the specific business case of the company, and not by the sector as a whole (e.g. new service in a new market vs. expansion of existing service to new markets vs. new customer segments in the existing market vs. new pricing strategies for existing customers)

2.2.3 Tools for business innovation applied along the value chain

Furthermore, in order to complete the analysis and for each one of the tools, an identification process has been made to associate each tool to the main phases of the value chain (see Table 3).

Table 3 Tools for business innovation along the value chain

Research & Development		
Exploration / Identification	Feasibility / Design	Articulation / incubation
<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • Business Model Toolkit for Emerging Markets • Business Model Architect • Strategy Tools for the Next Generation • Start-up Strategy Framework • Lean Start-up • LaunchPad 	<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • Business Model Toolkit for Emerging Markets • Business Model Architect • Strategy Tools for the Next Generation • Startup Strategy Framework • Lean Startup • LaunchPad 	<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • Business Model Toolkit for Emerging Markets • Strategy Tools for the Next Generation • Startup Strategy Framework • Lean Startup • LaunchPad
Production Development		
Procurement / Supplier of product	Product & Service Development	

and services		
<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • SME Toolkit • SustainValue • LaunchPad • 	<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • SustainValue • SME Toolkit • Lean Startup • LaunchPad • 	
Distribution and post-user services		
Sales and Distribution Strategy	Post-user services and management	
<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • SME Toolkit • SustainValue • 	<ul style="list-style-type: none"> • Strategyzer • Business Model Kit • SME Toolkit • SustainValue 	

This clustering has been done based on the publically available information on the tools (websites) only, the main observations are the following:

- The majority of tools focuses on the early stages of business model development, i.e. generating ideas, testing and bringing those to the market, and less on the practical implementation or “running of the business”
- Those tools that cover all phases of the value chain do so on a conceptual level rather than through specific tools for each phase
- The selection of a tool for use will depend on the current stage of business model development and the concrete challenges a company faces, rather than on the sector or market.

2.3 Major conclusions of tools and business model analysis

There is no doubt about the fact that business models are a key factor for innovation for any type of company. Innovations in the business model can take place at each step of the value chain.

There is a variety of frameworks, methodologies and tools available that are focused on helping entrepreneurs and companies to identify, design and test their business models in a structured approach.

Common issues in business model development and innovation, which are addressed by the tools are the following:

- The process is key: Business models are not figured out in isolation by a few people in one day, but need to be constantly tested and improved in collaborative effort
- The value proposition is key to any successful business model: it must be clearly defined what a company has to offer and what it distinguished from its competitors
- Good ideas or good technologies do not create value as long as they do not correspond to a customer demand. Product development and customer development therefore must go hand in hand in an iterative process of learning and validating, in order to identify the product-market fit
- Data und numbers matter: key assumptions on all relevant parameter (such as customer preferences, resource requirements) need to be based on real data and be reliable and tested

Many of the tools on business model innovation have been developed in the wave of the Internet economy and focused on start-ups. There are, however, valuable features that are applicable to any industry. Also, entrepreneurial/start-up type approaches and tools are increasingly being offered to large and es-

tablished companies in order to boost their innovative capacity. There are fewer tools available to support the implementation (business management) in the long term.

A company may use a range of different tools along the process of developing and implementing an innovative business model. Exploring the different business model archetypes and their specific features is an important step of business model innovation, and new opportunities to diversify, modify or even shift to other revenue streams, clients and markets can be identified.

With a significant number and diversity of available tools, methodologies and frameworks offered, it may be a challenge to find the right tool to use can, especially for SMEs with limited resources available. A central and accessible platform that guides through the variety of available tools could not be identified.

3 Business Models from the Study Sites

3.1 Veolia's plant in Braunschweig

3.1.1 Contextual background

Since 1894 irrigation fields were used for the recovery of wastewater in the area of Braunschweig. Since World War II, the amount of inhabitants and wastewater increased drastically in the region (wastewater discharge problem), so capacities of existing irrigation fields were not able to cope with the increased amount of wastewater anymore. Hence, the Sewage Board (see below) was formed in 1954 and in 1979 plant Steinhof was built (financed by the Sewage Board). Due to the continuous water need of the highly sandy ground in the area (sandy ground is not able to store water), irrigation fields are key in the area as they constantly provide the soil with water.

The plant itself belongs to the Sewage Board; however, the plant is operated by Stadtentwässerung Braunschweig (SE BS), the service provider for wastewater for the City of Braunschweig. SE BS is 100% part of BS Energy. 75% of BS Energy belongs to Veolia 25,1% of BS Energy belongs to the city of Braunschweig (see governance structure below).

3.1.2 Operational costs and Governance structure

Operating costs of the plant are about 20 million € per year and usually costs are paid first by Veolia. However, the Sewage Board pays Veolia the occurring costs back, and the Sewage Board in turn receives the amount paid to Veolia by the City of Braunschweig. Citizens pay about 2.50 € per cubic meter, covering costs for the canal system and operating costs.

It is also worth mentioning there exists an "Optimierungsentgelt" for Veolia, i.e. when Veolia bought the plan in 2006, 2004/5 was taken as the base year. If Veolia manages to reduce the costs of the respective year compared to the costs of 2004/5, Veolia receives 75% of the costs that have been saved (This is calculated annually). Problem: costs in 2004/5 were higher than usual due to investments taken.

In terms of governance, the organization is structured through the following stakeholders (see Figure 6).



Figure 6 Governance Structure of Veolia's plant in Braunschweig

- 1) **Sewage Board Braunschweig** (in German: Abwasserverband Braunschweig): Is formed by the City of Braunschweig (wastewater provider); Waterboard Gifhorn, includes communities north of Braunschweig: Papenteich, Wendeburg, Meinerse, Hilleburg (wastewater provider); 434 farmers (buyer of wastewater; farmers are provided with treated water with sludge for fertilizer from the plant); and the Executive board: City of Braunschweig. The Sewage Board owns the plant.
- 2) **City of Braunschweig:** Receives sewage fee from citizens and it's the major decision maker on investments of the plant
- 3) **SE BS** (Wastewater Services Braunschweig - in German: StadtEntwässerung BraunSchweig): Service provider for wastewater for the City of Braunschweig. It actually belongs 100% to BS Energy. It's the main operator of plant and of the canal system.
- 4) **BS Energy:** It's the energy provider: 74,9% belong to Veolia and 25,1% to the City of Braunschweig
- 5) **Veolia:** In 2006, Veolia bought 74,9% of BS Energy. As an interesting fact: Veolia is currently not member of the Sewage Board

There exists a contract ("Betriebsfuehrungsvertrag") between the City of Braunschweig and the Sewage Board defining responsibilities of each entity

3.1.3 Business Model Value Chain

The Braunschweig business model process is also called the water-nutrient-energy-cycle. It is structured as is seen in Figure 7.

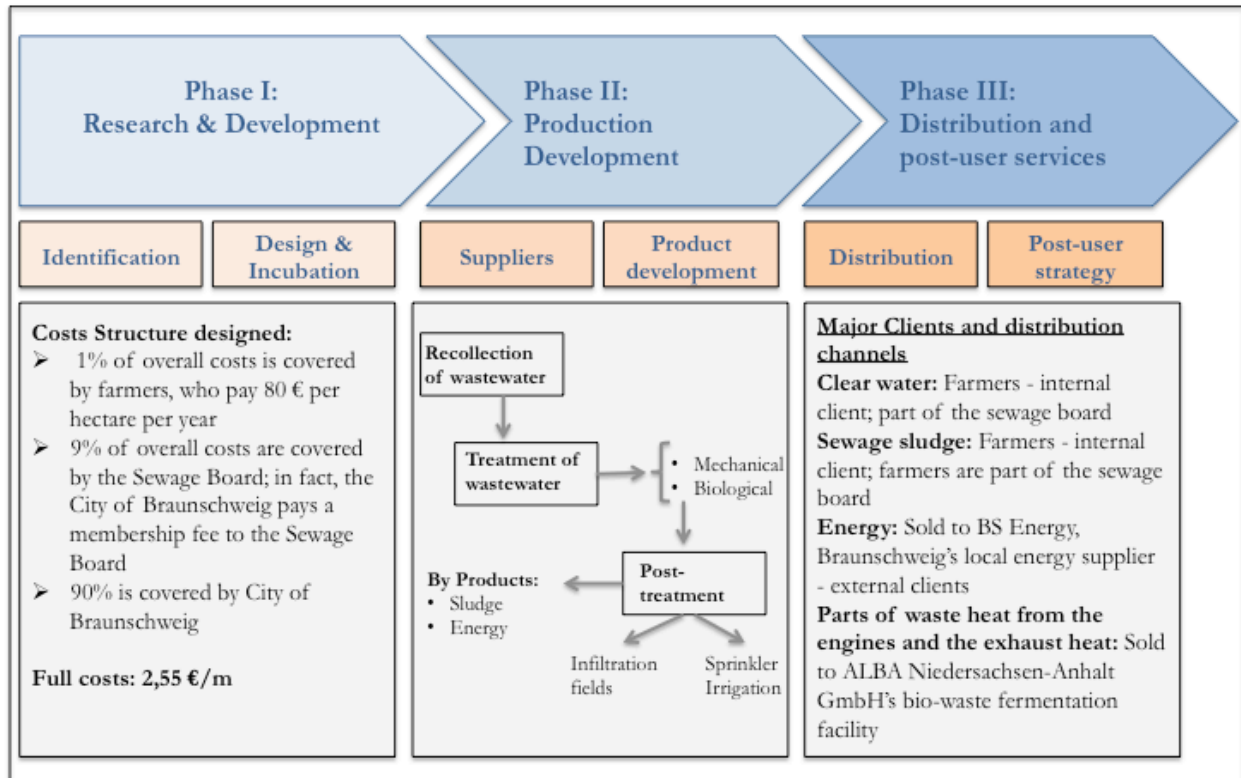


Figure 7 Business Model Value Chain of Veolia's Braunschweig plant

I. Service Design

In terms of water treatment and the quantity treated on a daily basis, the plant is currently producing a total of 55,000 cubic meters per day and basically everything is re-used with no water loss.

The designed structure of costs for the plant as it is divided by different stakeholders is the following:

- 1% of overall costs is covered by farmers, who pay 80 € per hectare per year
- 9% of overall costs are covered by the Sewage Board; in fact, the City of Braunschweig pays a membership fee to the Sewage Board
- 90% is covered by City of Braunschweig

Full costs per litre including the chemical, energy, overhead and transportation costs is 2,55 €/m per wastewater. This covers from the collection of wastewater to irrigation. Furthermore, there is an additional discharge of rainwater of 6,17€ per 10 m² of land area and both fees are evaluated each year. On the other hand, wastewater is not sold per litre; farmers pay a yearly fee of 80 € per hectare.

In terms of setting the price, it is the City of Braunschweig that sets the sewage fee, covering treatment of wastewater and canal system; also, the sewage fee is determined by the costs City of Braunschweig pays to the Sewage Board. The City of Braunschweig is not interested in making profit, only in covering costs.

II. Production process

In relation to the production process, the model is structured through different input and output phases

- **Input phase of value chain:** Recollection of wastewater
- **Process phase of value chain:** Treatment of wastewater, which is based on mechanical and biological processes

- **Output phase of value chain:** Post-treatment. Based on process for infiltration fields and sprinkler Irrigation (old and new irrigation fields)

In terms of byproducts, the production process generates the following outputs:

Sewage sludge by products

- **50% of sewage sludge:** Clear water is mixed with digested sewage sludge and is used on the irrigation of agricultural land, especially during the period in which the plants are able to absorb nutrients; in fact, the combination of wastewater with sludge as fertilizer makes the clear water a very attractive product to farmers. Moreover, the sandy grounds in the region are poor in nutrients; this is why fertilizers are even more important to the farmers.
- **50% of sewage sludge:** The sewage sludge which is not used for irrigation is dehydrated at the treatment plant and is used on agricultural surfaces outside of the Association's area, also serving in this form as fertilizer.

Energy byproducts

- **From energy crops:** About 38% of the irrigation fields/agricultural area plant energy crops: maize, rye and rape). This is then processed to biogas in the biogas plant Hillerse (built in 2006); as the plant belongs to the City of Braunschweig, BS Energy buys energy from the plant. The energy from the biogas plant serves households in Braunschweig (6,000-7,000 households with electricity and 1,000-1,500 households with heating per year). Energy laws determine which type of energy crops are built on the fields; moreover, subsidies are provided by the government for the cultivation of energy crops.
- **From sludge gas:** Sludge gas is used in the treatment plant's power station to produce electricity and heating for the plant.

III. Distribution and local market considerations

In relation to the distribution and post-user strategy, the plant has the following major clients for each one of the specific services (Table 4).

Table 4 Major clients per each one of the products and services provided

Type of Product/Service	Major clients
Treated wastewater	Farmers (internal client; farmers are part of the sewage board)
Sewage sludge	Farmers (internal client; farmers are part of the sewage board)
Energy	Sold to BS Energy, Braunschweig's local energy supplier (external clients)
Parts of waste heat from the engines and the exhaust heat	Sold to ALBA Niedersachsen-Anhalt GmbH's bio-waste fermentation facility

3.1.4 Future challenges and adaptation to local considerations

The core mission strategy up to 2017 for Veolia's Braunschweig plant is to promote the implementation of new technologies: MAP Crystallization and Ammonium Stripping + High Pressure High Temperature Hydrolysis. This will allow the amount and quality of fertilizer to be increased and the amount of sewage sludge to be disposed decreased.

Furthermore, the amount of energy to be won by sewage sludge will be increased; thus, more energy can then be sold to BS Energy and nearby waste disposal site.

Some of the main challenges for the future are the problems with increased amount of micro pollutants in the water (from cosmetics; demand for fourth step on wastewater treatment); the disinfection of

wastewater (bacteria, etc.); and the sludge. In this sense, one of the main concerns from plant manager is the consideration that sewage sludge for agriculture is not permitted anymore. Especially with regards to the organic material, which is only in sewage sludge and which is highly important for the sandy grounds. As requirements of fertilizers in Germany become stricter; the consideration that sludge cannot be used as fertilizer anymore is a concern.

In relation to sustainability, the major initiatives on sustainable management are the following:

- Treatment of wastewater per se
- Re-use of wastewater on irrigation fields
- Irrigation fields serve as biotopes for birds
- Renewable energy produced in biogas plant via energy crops on irrigation fields
- Use of sewage gas to compensate electricity and heating of plant

In terms of expanding markets and provide incentives for future markets for its products and services, the two main areas of diversification are the following two:

- Increase energy production for BS Energy and for nearby waste disposal site
- Provide farmers with high quality fertilizer from the WWTP; however, this might be dependent on price

3.2 Cassa, Sabadell

3.2.1 Contextual Background

Historically, Sabadell suffered frequent water shortages during the first half of the last century. Due to this, an organization was created with the aim to obtain sufficient volumes of water to supply the city. In 1949 the parent company of the Group CASSA was created. First, it began to spread to the Vallès, and then expanded to other regions to consolidate its position as the second largest sector in Catalonia. Today, CASSA has over 60 years of experience in the field of water, energy and the environment and is the second operator in Catalonia, while also present in Spain and abroad.

In addition, CASSA manages water service in 50 municipalities of Catalonia and Aragon, has built and manages seawater desalination plants and sewage treatment plants, along with several business reuse of reclaimed water and production and distribution of electricity.

3.2.2 Business Model Value Chain

The business model value chain of the CASSA plant is structured under the following phases (see Figure 8).

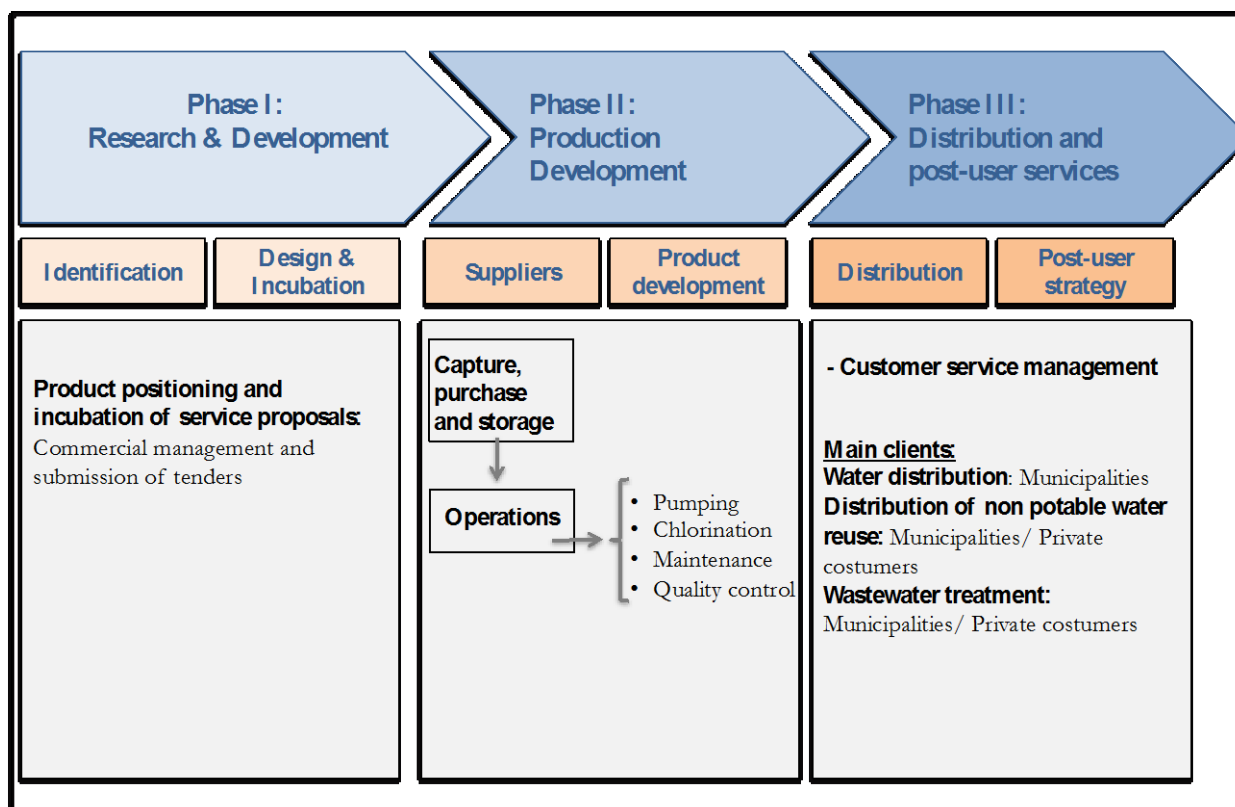


Figure 8 Business model value chain of CASSA

I. Service Design

Commercial management and submission of tenders: Consists in presenting products to customers through visits, trade shows and dissemination of company activity. The goal is to be awarded new services and retain existing services. Services offered by the area of sanitation and new water uses are fully adaptable to customer needs, with different modalities:

- Design and construction of all types of sewage, both urban and industrial, with tertiary treatment
- Operation and maintenance of the treatment plants, with input from specialist staff (chief plant operator and maintenance technician)
- Managing customer needs as part
- Technical management and analytical control
- Turnkey construction and operation of facilities
- Research funding for the entire project, customized for each client
- Technical consulting, legal and environmental
- Application of advanced treatment

II. Production phase

Capture, purchase and storage: Involves the acquisition of the water in terms of raw materials and have it available to provide the service distribution. In the area of wastewater treatment, this phase involves driving through wastewater interceptor sewers to the WWTP.

Operation. Involves the operation and maintenance of the water distribution system. It covers aspects such as pumping systems to maintain the service pressure, chlorination systems to ensure the presence of disinfectant throughout the network control protocol analytics to verify quality. This phase also in-

cludes preventive maintenance facilities to avoid service interruptions. In the case of sanitation, involves the operation and maintenance of WWTP, which bought control of the process, monitor its quality analytics, waste management, preventive and corrective maintenance.

III. Distribution and local market considerations

Customer Service. Involves the payment of service management, customer complaints as economic and quality of service, fault repairs and management of non-conformities among others. In the case of wastewater treatment, is responding to complaints from the public or the administration, reporting of results and maintenance performed.

Major clients according to the different products and services provided are the following (see Table 5).

Table 5 Major clients according to products and services

Type of Product/Service	Major clients	% client representation
Water distribution	Municipalities	89%
Distribution of non potable – water reuse	Municipalities/ Private costumers	1%
Wastewater treatment	Municipalities/ Private costumers	10%

3.2.3 Next steps and future challenges

The core mission strategy up to 2017 is to provide and ensure the people all kinds of services related to the water cycle, with maximum quality and efficiency and preserving the most of the environment in which it operates; promoting career and professional development of its employees and partners and ensuring maximum return for its shareholders in dividends. In short, creating added value around.

In this sense, the desired markets taken into consideration for market diversification are the distribution of drinking water, wastewater and water reuse in the area of Catalonia and Cape Verde.

In relation to the expansion of goals for products and services, one of the main objectives is to increase the presence in water reuse and management of new technologies (such as management systems, MBR).

3.3 DOW Chemical Iberica

3.3.1 Contextual Background

Dow has a long history working in the Iberian Peninsula since its introduction in the region in 1960. Since then, Dow Chemical has become a key point in the development of technological innovation providing sustainable solutions based on science. It operates in the following markets: agriculture and food; building and construction; electronics; leisure; medicine and health; home furniture; personal care; industry; oil and gas; packaging, paper and publishing industry; plastics; transport and public services.

Globally, the Dow Chemical Company achieved annual sales of US \$60,000 million in 2011 and currently employs approximately 52,000 employees worldwide.

3.3.2 Business Model Value Chain

Dow Tarragona does not formally have a wastewater treatment plant, as they send their wastewater to external facilities for treatment paying a fee for it. The plant is currently managed by REPSOL (in Dow North) and BASF (in Dow Derivatives). Both are Chemical Companies established in the Tarragona Petrochemical Cluster (ChemMed). In this sense, the owners of those WWTP facilities are responsible for in-

vestments, although in some cases, as long term users of the facilities, DOW also contributes with a part of the investment (in relation with the volume / use to be utilized by the company).

Dow Water and Process Solutions (DW&PS) offers a broad range of sustainable and quality component technologies to help communities make the most of every drop of water that is available for reuse. In relation to water management, Dow develops technologies to address challenges in making water safer and more accessible. Thus, their core value in this sense is being an innovator in water purification and separation technologies, known for a number of industry firsts—including the world’s first spiral-wound membrane technology for water treatment. Among them, they provide a portfolio of Ultra filtration (UF) and Reverse Osmosis (RO) Membranes, Fine Particle Filtration (FPF) and Electrodeionization (EDI) products.

Dow expressed its commitment to maximizing the vast potential in the world’s reusable water—working with any kind of industries and communities to recover water, energy, nutrients and other valuable components of wastewater streams. Dow treated wastewater is being reused in such applications as industrial processes, agricultural and landscape irrigation, toilet flushing gardening and groundwater replenishment. Its major clients are distributors, original equipment manufacturers and end users of UF and RO membranes (see Table 6).

Table 6 Major clients for DOW Chemical clients

Type of Product/Service	Major clients	% client representation
UF and/or RO membranes and technical support	Distributors	20
	Original Equipment Manufacturers (OEMs)	50
	End Users	30

3.3.3 Future challenges and adaptation to local considerations

Considering that the demand for water is growing exponentially and with the world population expected to grow from 6.5 billion in 2010 to 9.5 billion in 2050—and the steadily increasing demand for food and manufactured goods—the pressure on limited freshwater resources is rapidly becoming unsustainable. Dow sees wastewater reuse and seawater desalination as the only currently significant alternatives to address the challenge of addressing population growth and the steadily increasing demand for food and manufactured goods.

Their core mission strategy up to 2017 in this sense, is promoting technology development to make recycling and reuse of industrial or municipal wastewater is an even more economical and reliable way to help preserve the environment. The desired markets taken into consideration by their core strategy are the following:

- **Industrial:** Dow technology is helping these industries turn their wastewater streams into a valuable resource by allowing the specific removal of pollutants and treatment of wastewater to high purity standards for reuse in industrial processes, boilers, cooling or utilities.
- **Municipal:** Dow technologies can be used to treat wastewater and reuse it in applications as industrial processes, agricultural and landscape irrigation, toilet flushing gardening and groundwater replenishment.

3.4 Old Ford water Recycling Plant (OFWRP)

3.4.1 Contextual background

The Old Ford water Recycling Plant (OFWRP) was constructed by Black and Veatch, commissioned in November 2011 and hand over to Thames Water in February 2012. The plant started to supply reclaimed water to the Queen Elisabeth Olympic Park (QEOP) on the 5th April 2012 for non-potable usage: irrigation, toilet flushing, pond filling and rainwater harvesting system top-up. The OFWRP was built to reduce water consumption by 40% on the QEOP, one of many targets that the Olympic Delivery Authority (ODA) had for the London 2012 Olympic Games. OFWRP is supplying reclaimed water to 12 customers.

Currently, entities involved in managing the plant are private companies (Thames water). LLDC (London Legacy Development Corporation – Legacy Company from the ODA) is not directly involved in managing the plant. However, Thames water is contractually obliged to provide a quarterly report to LLDC (and customers), which includes water quality, plant availability and plant and network issues. Furthermore, TW owns the assets. OFWRP are contractually obliged to run the plant up to 2019, after which a new contract might be signed or the plant stopped. In terms of costs, the costs of treatment plant construction and commissioning: ~£5 million [2012]. Operational Cost are estimated at ~£500k/year – however the majority of these costs reflect contractual water quality monitoring and sampling.

3.4.2 Business Model Value Chain

Based on this information, the business value chain of the OFWRP is outlayed as follows (see Figure 9).

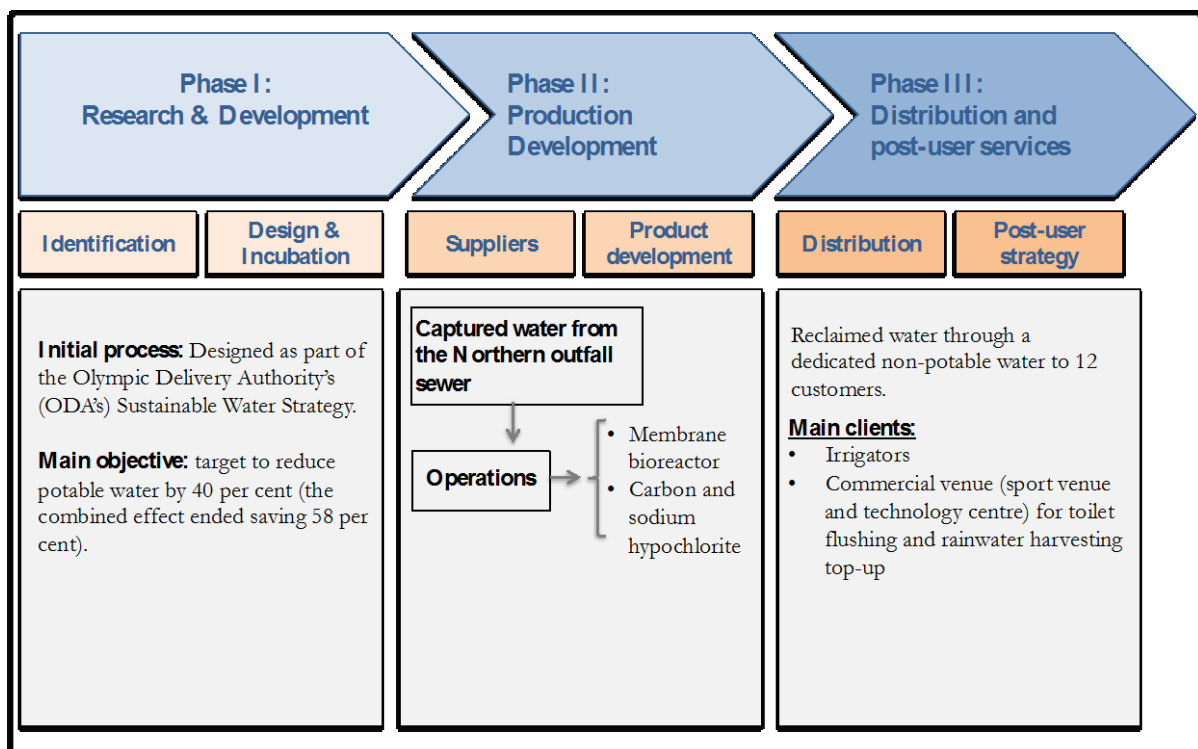


Figure 9 Business model value chain of OFWRP

I. Design phase

The Old Ford Water Recycling Plant (WRP), located next to the main site of the London 2012 Olympic and Paralympic Games, is the UK's largest community wastewater recycling scheme. It treats wastewater from the Northern Outfall Sewer and feeds in to a non-potable network that connects to the Olympic Park for toilet flushing and irrigation, and to the Energy Centre for cooling water. The scheme was designed as part of the Olympic Delivery Authority's (ODA's) Sustainable Water Strategy, which had a target to reduce potable water by 40 per cent. The combined effect of all water saving measures achieved 58 per cent, clearly exceeding the target. The project structure and design required extensive consultation and development of bespoke standards for: – water quality; – distribution network design and component/ancillaries; and – demarcations for the pipework, sleeves and fittings.

II. Production phase

OFWRP production phase is structured under three main phases and has a defined water reclamation system which processes the wastewater and surface water run-off from communities in North London and ends being distributed through a non-portable water distribution network of 3.65 kilometers long that ends up contributing to irrigation of parklands, toilet flushing and rainwater harvesting as well as cooling process water system at the energy centre (see Figure 10).

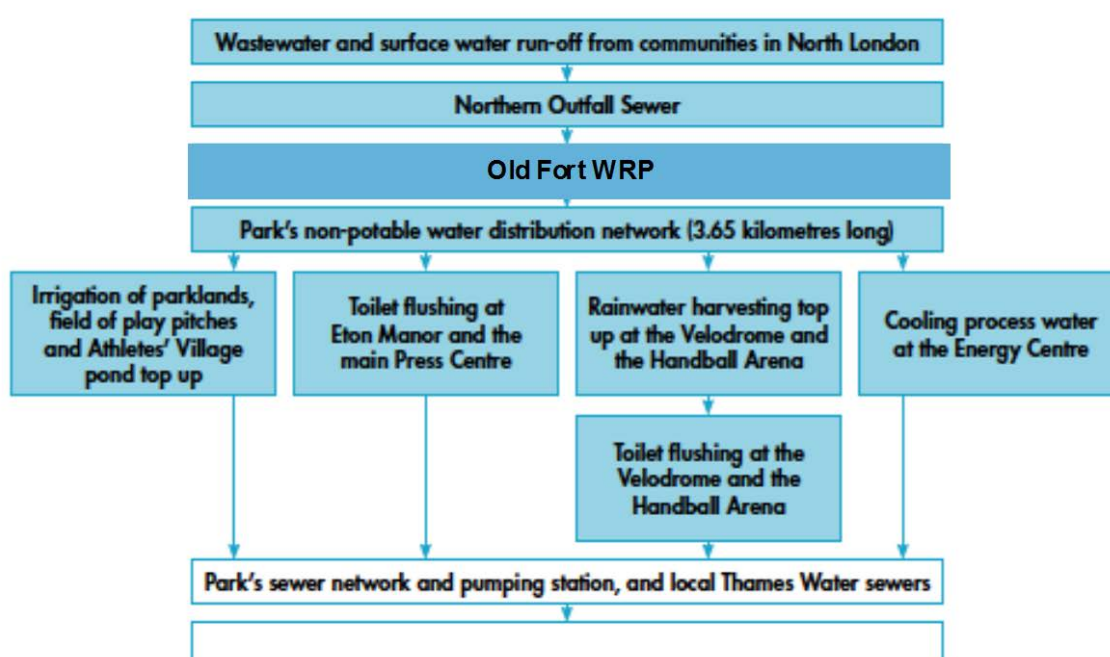


Figure 10 Water reclamation system of OFWRP

Based on this approach, the core phases of the business model value chain are the following:

- **Phase one of value chain:** Wastewater is abstracted from the Northern outfall sewer
- **Phase two of value chain:** Wastewater is treated to required quality standards, through membrane bioreactor, activated carbon and sodium hypochlorite for final disinfection. PACl is dosed on return activated sludge to reduce phosphorus concentration requirement from irrigators.
- **Phase three of value chain:** Distribution of reclaimed water through a dedicated non-potable water to 12 customers.

In terms of by-products, OFWRP produces sludge and wastewater. Both are collected by tankers and/or discharged at the inlet of a wastewater treatment works (septic tank sludge) or discharged to the sewer downstream of the plant. From the responses obtained, it is understood that the quantity produced is quite small and studies performed have concluded that gas production from sludge is not worth it.

III. Distribution and local market considerations

Major clients from water reclaimed are irrigators and commercial venues (see Table 7).

Table 7 Major clients for OFWRP

Type of Product/Service	Major clients	% client representation
Reclaimed Water	Irrigators	80 (in terms of total consumption)
Reclaimed water	Commercial venue (sport venue and technology centre) for toilet flushing and rainwater harvesting top-up	20 (in terms of total consumption)

3.4.3 Future challenges and adaptation to local considerations

The core mission strategy up to 2017 for OFWRP will be to continue to provide non-potable water to the QEOP up to 2019 as contracted with the LLDC. According to their priorities, they are interested in diversifying and providing reclaimed water to sites such as the Energy Centre. First attempts, however, have not been successful and the Energy Centre has expressed their concerns using reclaimed water due to legionella growth in their system.

It is known that legionella is not present in the reclaimed water, although the nutrient concentration in the reclaimed water could increase legionella growth. Another area of service diversification and new markets is expanding reclaimed water use in housing development.

3.5 Recommendations to improve business models of the sites analysed

Recommendation 1: Expand the identification phases of the services delivered: work through partnerships in order to expand services delivered and identify new wastewater reuse applications (from an input driven process and output approach)

Recommendation 2: Improvement of the production phases: Although the level of technological maturity from the sites analysed is quite high and advanced compared to the general market, some areas of further exploration and improvement were identified through the research process, specially addressing emerging contaminants in water and improving further the disinfection of wastewater sludge processes and sludge management.

Recommendation 3: Improving the sustainability impact: Most sites positioned sustainability as a core value on their mission, although efforts to further improve impact and reduce externalities are still needed. Thus, it is important to aim to produce with maximum quality and efficiency while reducing the environmental impact and maximizing the re-use of by-products.

Recommendation 4: Expanding the access to markets: R&D and technology investment need to be leveraged with real demand and market driven growth. Some sites focus on very specific markets with limited awareness on how to expand and increase value (service value and economic value). Some plant managers are concerned that sewage sludge for agriculture might no longer be permitted or that further limitations from a legal perspective are implemented due to restrictive policies.

Recommendation 5: Expand the use of strategic tools to improve the business model value chain: As it has been revealed through the study performed, there are several toolkit platforms that could be relevant to improve the management and impact of products and services of the sector. However, those considered valid are not broadly used and the design of some specific tools are lacking. Such void will be addressed through DEMOWARE deliverable D.8.4. Online tool to help SMEs develop business.

Recommendation 6: Developing awareness for building in mentality changes: Expanding demand use is key in order to justify technological and research and development in the wastewater treatment sector. In this sense, it is a must to work on engaging all stakeholders through an interactive approach to work jointly to change mentalities for a broader acceptance of wastewater use. Therefore, one important aspect in this regard would be to engage the civil society in a proactive way in an open debate around broader acceptance of water reuse, with quantitative and reliable data, will be one of the success factors for this process.

4 The Adapted Business Model Template for the Water Reuse Sector

Through the analysis of all the business models that can potentially be adapted to the water reuse sector, the *Business Model Canvas* is the model that has the ability to bring innovative thinking to the water reuse sector. As the final application of urban treated wastewater is divided into either urban, agriculture or industry, we have produced three business model canvases for the three sectors as the final clients and market will be different for each case and therefore the questions that each operator would need to ask in order to design their tailor-made business model for their specific case would be different depending on the final application of the water.

Business models are highly dependent on local markets, local conditions, local and global laws and regulations, distribution networks, key resources and distribution channels, customer behaviour and purchasing power, costs and prices, etc. Therefore a business model designed and implemented in one wastewater treatment works that has just implemented a water reuse scheme, will not necessarily work for another treatment works in another country or even within the same country. Therefore we have to create the environment and tools for the operators to build their own site-specific business model adapted to their local conditions. The modified *Business Model Canvas* presented below for the three final reuse sectors allows for that innovative environment to be created where the wastewater treatment plant operators are forced to channel their thinking into the creation of a site specific business model and their value position.

4.1 Why the Business Model Canvas was chosen

As it can be seen in section 2 above, there are a number of business model archetypes that can be adapted for municipal wastewater reuse. However, after the analysis of all of these business models and after the analysis of the three industries currently running water reuse schemes, the Business Canvas (BMC) was chosen. The reason for this was:

- The Business Model Canvas is the most widely used tool that is freely available
- The BMC can be used in combination with other tools, and some of the other tools presented in this report refer to the BMC as a basis
- In its development, the BMC had taken into account a the state-of-the art in both the science and practice of business model innovation, including methodologies and practical tools
- The BMC is generic enough to be adapted to each sector and market and yet it can be adapted and innovated upon to make it more in-line with a certain sector, such as water reuse

- The BMC is easy and intuitive to use, making it the most obvious choice for its implementation in a sector that is not accustomed to working with or innovating in business models.

4.2 How to use the Adapted Business Model Canvas for Water Reuse Applications

The modified Business Model Canvas will help operators map, design, discuss and invent new business models for their specific situation and local conditions.

The step-by-step process of how to use the modified Business Model Canvas

Step 1: Customer Segments

The first step in designing a business model for water reuse, no matter the final reuse application, is the Customer Segments. These are all the people, organisations, associations etc. for which the water reuse treatment plants will be creating value. This will include the final users and the paying water, nutrient, energy and sludge users whether public or private..

Step 2: Value Proposition

Once the operators know for whom the reused water will be of value, they should then look at the value proposition. This is the product or service that creates the value for these customers. In the water reuse case the value to the customers is delivering water of a high enough quality to ensure its safe use for its final application (Agriculture, Urban or Industrial)

Step 3: Channels

In this step, the water reuse operators need to know how they are able to deliver their value to their customers. In other words, how do they distribute the water reuse product to them? Would there be a need to construct a new piping system, is this cost effective? Would the farmers be able to transport the sludge to their lands? Would customers interested in recovered nutrients be able to channel these products to where they are needed?

Step 4: Customer Relationships

In this step, the water reuse operators will be describing the type of relationships that they will be establishing with their customers (those identified in Step 1).

Step 5: Revenue Streams

In this step the water reuse operators will make clear how and through which pricing mechanisms the business model is capturing value. The water reuse operators will be able to use the results of Deliverable 4.7 *Cost, pricing and financing of water reuse against natural water resources* to assist them in getting the pricing strategy correct in order to ensure that the correct value is captured for all of the products that comes out of the treatment plant.

Step 6: Key Resources

In order to complete this step, the water reuse treatment plant operators have to describe the infrastructure that they require in order to create, deliver and capture value. The key resources show the assets that are indispensable in the business model. For example, if a wastewater treatment operator wants to move into the water reuse sector with industry as the final application, an indispensable asset from that treatment works would be the tertiary technology that will allow the final water quality to be such that the final users would pay for this product.

Step 7: Key Activities

The step on Key Activities allows the water reuse operators to describe all the activities that they have really need to be able to perform well.

Step 7: Key Partnerships

The key partnerships step gives the water reuse operators the opportunity to describe all the partnerships that can help them leverage their business model. For instance, if a wastewater treatment plant wants to move into the water reuse sector, the partnerships (both public and private) would be vital to ensure not only the introduction of the treatment plant into this new sector but to ensure its sustainability within this sector. This is because in most cases the water treatment operators would not own all key resources themselves and nor would they be able to perform all key activities by themselves.

Step 8: Cost Structure

Once the operators know the business model infrastructure, they will be able to detail the cost structure of the business model, where they can describe all the costs associated with the value chain.

The advantage of the *Adapted Water Reuse Business Model Canvas*, is that it allows the water reuse operators, either existing operators or those wanting to move from wastewater treatment to wastewater treatment for reuse, to detail the entire business model on one sheet of paper, which can also be presented to potential investors.

4.3 The Adapted Water Reuse Business Model Canvas

Top of Form

The Business Model Canvas:

Team or Company Name:

COMPANY NAME

Date:

MM/DD/YY

- Primary Canvas
- Alternative Canvas

<p>Key Partners</p> <ul style="list-style-type: none"> Who are our Key Partners through the value chain? Which are the Key Resources that we require from our partners? Which Key Activities do our partners perform? What M&E framework we use to evaluate partnership performance? 	<p>Key Activities</p> <ul style="list-style-type: none"> What are our Key Activities based on revenue %? What are our Key Activities based on diversification and long-term goals? 	<p>Value Proposition</p> <ul style="list-style-type: none"> What is the value our company provides: For our clients For our shareholders For our community For our employees For the environment 	<p>Customer Relationships</p> <ul style="list-style-type: none"> Define the typology of customer relationships we adopt? Define costs per type of customer relationship What M&E framework we use to evaluate customer relationships? 	<p>Customer Segments</p> <ul style="list-style-type: none"> Define all the potential customers for urban water reuse Of these, who are our most important customers? Categorize clients by % of type of customer relationship Define strategy to engage priority clients
	<p>Key Resources</p> <ul style="list-style-type: none"> What Key Resources do our Value Propositions require? Are we missing key resources to provide water reuse value to the sector? Our Distribution Channels? Customer Relationships? Revenue Streams? 		<p>Channels</p> <ul style="list-style-type: none"> Which Channels are we using to reach the clients in the urban setting? Define each of these channels per product (water, energy, sludge etc) What is the performance success ratio from each channel? How do we integrate the Channel distribution into our customer strategy? 	
<p>Cost Structure</p> <ul style="list-style-type: none"> Define all costs associated to the value chain of activities What are the most relevant costs based on the key activities? Define how the costs are aligned to value generation per each activity phase 			<p>Revenue Streams</p> <ul style="list-style-type: none"> What value are customers really willing to pay for water reuse and associated products (energy, nutrients etc)? How much does each Revenue Stream contribute to overall revenues? 	

5 Major conclusions and recommendations

Developing a successful business model requires articulating correctly the value proposition. This involves identifying the market segment, defining the structure of the value chain required by the organization to create and distribute services, specify the revenue generation mechanism(s) for the organization, describe the position of the organization within the value network (ecosystem) linking suppliers and customers, including identification of potential partners and competitors and formulate the competitive strategy by which the innovating firm will gain and hold advantage over its rivals

There are a variety of frameworks, methodologies and tools available that are focused on helping entrepreneurs and companies to identify, design and test their business models in a structured approach. Analysing the most widely used tools for business model innovation, the following conclusions are highlighted:

The main observations based on the Business Model tools analysis

- No tools designed within or for the water re-use sector could be identified; however all of the described tools can be potentially applied by companies in the water industry
- The majority the tools are operated privately as a profit generating business of consulting firms – at the same time, many of the basic tools are freely available, whereas the use additional features (such as tutorials/workshops/books/web application) are charged
- Given the diversity of tools, there is a remarkable level commonality of concepts and language used; this is due to the fact that a number of the tools are conceptualized as a compilation of existing good practices, or refer to the Business Model Canvas as a common denominator.
- While most tools are designed to serve all types of users, a few are designed for specific cases, i.e. specific markets (emerging economies) or sectors (the manufacturing industry). A few tools are specifically designed to support start-ups and entrepreneurs, and a few apply start-up-type methodologies to established companies (intrapreneurship).
- The suitability of each tool will primarily be dependent on the specific business case of the company, and not by the sector as a whole (e.g. new service in a new market vs. expansion of exist-ing service to new markets vs. new customer segments in the existing market vs. new pricing strategies for existing customers)
- There is a broad range of services offered among the tools, they include:
 - Generic rules, templates, worksheets, methods; case studies and typologies
 - Workshops and trainings, seminars
 - Online portals and platforms, communities-of-practice
 - Software-based support such as web applications
 - Manuals and guide books

Weaknesses identified through the business model tools analysis

- The majority of tools focuses on the early stages of business model development, i.e. generating ideas, testing and bringing those on the market, but there are not so many addressing practical implementation or “running the business”
- Issues of long term sustainability of a business model’s viability are not considered strongly and generally lack applications in toolkits
- Only a few tools focus on the financial aspects and developing thorough business plans
- Those tools that cover all phases of the value chain do so on a conceptual level rather than through specific tools for each phase
- A central and accessible platform that guides through the variety of available tools could not be identified. At the same time, a survey results show that awareness on and the use of tools and methodologies for business model innovation is very low among the companies in the sector.

Analyzing the use of business models applied to companies in the water sector, an in-depth analysis was done to understand its use and to what extent companies were using tools and what were the needs assessments highlighted by them. The following strategic areas were considered for the study:

- Potential areas/phases of the value chain for the business model where companies need more assistance with
- Structure of funding activities in different phases of the value chain
- Tools and methodologies for business model innovation used by companies
- Analysis of new tools used by companies

Conclusions related to business model development and innovation approach

- The process is key: Business models are not figured out in isolation by a few people in one day, but need to be constantly tested and improved upon in collaborative effort
- The value proposition is key to any successful business model: it must be clearly defined what a company has to offer and what it distinguished from its competitors
- Good ideas or good technologies do not create value as long as they do not correspond to a customer demand. Product development and customer development therefore must go hand in hand in an interactive process of learning and validating, in order to identify the product-market fit
- Data and numbers matter: key assumptions on all relevant parameter (such as customer preferences, resource requirements) need to be based on real data and be reliable and tested

Conclusions related to addressing needs identified by companies from the water sector:

- Companies are used to providing very specific product and/or service (whether technological device or reused water) and do not invest significantly in exploring and identifying future markets.
- There are significant investments in innovation in product development and improving the production process of water re-use applications. A big degree of such investments rely on technological upgrades and innovative technological devices.

- One of the areas that have been identified as the biggest needs for companies in the sector is improving the distribution strategy and diversifying access to new markets.
- R+D and innovation in the sector are considered to be primarily technological issues, with systematic market research, customer development. However, business model innovation is very understated

Applying assumptions to the improvement of business models of the sites analysed, some recommendations have been highlighted to take into consideration.

Recommendations to improve business models of the sites analysed

Recommendation 1: Expand identification phases of services delivered: work through partnerships in order to expand services delivered and identify new applications of wastewater treatment reuse (from an input driven process and output approach)

Recommendation 2: Improvement of production phases: Although the level of technological maturity from sites analyzed is quite high and advanced compared to the general market, some areas of further exploration and improvement were identified through the research process, specially addressing micro-pollutants in the water and improving further the disinfection of wastewater sludge processes.

Recommendation 3: Improving sustainability impact: Most sites positioned sustainability as a core value on their mission, although efforts to further improve impact and reduce externalities are still needed. Thus, it is important to aim to produce with maximum quality and efficiency reducing environmental impact and maximizing the re-use of by-products.

Recommendation 4: Expanding access to markets: R&D and technology investment need to be leveraged with real demand and market driven growth. Some sites worked for very specific markets with limited awareness on how to expand them and increase value (service value and economic value). Plant managers are concerned about sewage sludge for agriculture might not be permitted anymore or running into further limitations from a legal perspective due to restrictive policies.

Recommendation 5: Expand the use of strategic tools to improve the business model value chain: As it has been revealed through the study performed, there are several toolkit platforms that could be relevant to improve the management and impact of products and services of the sector. However, those considered valid are not broadly used and the design of some specific tools are lacking. This void will be addressed through DEMOWARE deliverable D.8.4. through the online tool to help SMEs develop business.

Recommendation 6: Developing awareness building for changes of mentality: Expanding demand use is key in order to justify technological and research and development in the wastewater treatment sector. In this sense, it is a must to work engaging the ecosystem through an interactive approach to work jointly changing mentalities for a broader acceptance of wastewater use. The capacity of engaging civil society in a proactive way in an open debate around these issues, with quantitative and reliable data, will be one of the success factors for this process.

Final Reflections

Through the analysis of the four sites studied and an exhaustive review on innovative business models that could potentially be adapted to the water reuse sector, the business model canvas

was chosen and modified. The modifications were based on the analysis of the four sites and their subsequent recommendations. The Water Reuse Business Model Canvas is a tool that can be used by existing wastewater treatment operators looking to move into the reuse sector or for virgin water reuse schemes.

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7 Annex I – Questionnaire to Wastewater Operators

WP4: Business Models and pricing strategies

- Questionnaire on Business Models for WasteWater Operators -

1. General information

1.1 Briefly outline the wastewater treatment plant’s historic background

This information shall at least include the following: which year was the plant built? Why? Was the plant privatized since then? If so, which year?, etc.)

1.2 Please outline the governing structure of your wastewater treatment plant

- Which entities are involved in managing the plant (local government, sewage board, citizens, private companies, etc.)?
- Please explain what is the role of each entity?
- Who owns the assets? Is the plant publicly or privately owned and/or managed? What is the duration of concession?

1.3 Depending on your answers in 1.2, please answer the following questions on the wastewater treatment plant’s cost structure:

- What are the overall costs of the plant?
- Who is covering operating costs (incl. HR) of the plant?
- Who is paying for investments of the wastewater treatment plant?
- Do you receive any public funds? If so, what percentage of the overall operating costs is covered by public funding?

2. Business Model Value Chain

2.1 How would you define the different phases of your business model value chain?

Please describe the process from the reception of water to the final “output”.

Name and describe at least four phases. (the phases can be divided into abstraction/reception of wastewater, treatment and distribution including other phases if there are other markets such as sludge sales, energy sales, recovered compound sales etc)

Phase one of value chain:

Phase two of value chain:

Phase three of value chain:

Phase four of value chain:

2.2 Do you produce any by-products (such as sludge, energy, recovered compounds, etc.)? If so, how do you use those by-products (e.g. sales)?

2.3 What are the final costs incurred for treating the wastewater (cost per litre)? (this final price should include the chemical, energy, overhead and transport costs etc)

2.4 If treated wastewater is sold, what is its sales price(price per litre)?

2.5 Who sets the price of the treated wastewater? Which actors are involved in setting this price (government, other private companies, community based organisations etc)?

2.6 How much water is treated on a daily basis? Of that treated water how much is re-used by the local community (farming community, local businesses, community use in golf courses etc)

2.7 How do you control the usage of the water (for e.g. do you lose any water on a daily basis in the re-use network?)

3. Main markets & clients

3.1 What would you consider to be your main markets? (Please name most relevant product/services and type of clients)

We are interested in what type of product and/or service your WWTP is offering and who uses those products and/or services. For example, one of your products could be treated wastewater and your major client could be farmers, local government (golf course watering) or local businesses. Please add any type of product/service you offer as well as the respective client. Moreover, we would like to know which proportion of your overall client base make up these clients, for example farmers make up 30% of your client base).

Type of Product/Service	Major clients	% client representation

3.2 What is your positioning strategy for the near future (up to 2017) related to water reuse? What are your target markets and how would you define your expansion goals for your product/services? Explain why!

Core mission strategy up to 2017:

Desired markets taken into consideration:

Expansion goals for products/services:

3.3 Up to what point is the “inclusive and sustainable business management” concept relevant to your company? What have been the major initiatives taken so far on this behalf?

Inclusive and sustainable business management refers to any activity leading to creating a more reliable and (energy and cost) efficient water reuse scheme; delivering water to end-users at affordable costs: enhancing sustainable water management practices; and reducing the vulnerability of European communities to climate change and drought

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Relevance of inclusive and sustainable business management:

Major initiatives on sustainable management:

Major initiatives on inclusive business management: