Resources available to business to quantify and reduce the water impacts of their water use

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Executive Summary

Water is increasingly recognised as a key global environmental issue. Water use by businesses is coming under increasing scrutiny and there are currently a large variety of resources available to help businesses understand water issues, including use, impacts and risks (a water-related "resource" refers to any initiative, strategy, guidance, methodology, model and data analysis tool that helps businesses to target water management issues and include for example training modules, water footprinting, water stewardship and water accounting). However, identifying the resource which best suits the requirements of a particular business is not always straightforward. This study was commissioned by Defra to specifically inform businesses about the resources (including tools, risk assessment methods, stewardship programmes, etc.) that are available to them to assess and understand the impacts of their water use.

The study was divided into several steps. It first identified resources and drivers that lead businesses to engage with water issues. This led to a mapping exercise, where the identified resources were mapped against the drivers and the stakeholders they are targeted at if any (e.g. SMEs, specific sectors). Factsheets were also developed for each resource. Based on the mapping, ten resources were selected for further investigation, these were not deemed to be 'better' than the other resources but provide a representative sample of the different types of resource currently available. The assessment was based on the feedback from business users. In addition to individual assessments, a transversal analysis was performed to identify gaps, and propose recommendations.

The study found four main drivers and scenarios that lead business to focus on water management issues:

- Identify and assess water-related risks (physical or disruption risks, reputational risks, or environmental risks)
- Measure water use and assess water-related impacts (for regulatory or operational reasons, or sustainability assessment)
- Develop response options and/or risk mitigation strategies
- Communicate water risk/performance (to their stakeholders, investors or the general public)

Building on these, six categories of more specific objectives are used in this study to characterise and map the resources identified:

- High-level screening of corporate water impact
- Quantification of water use for corporate activities
- Quantification of water use in the supply chain
- Assessment of site-specific water impacts
- Assessment of product-based water impacts

- Identification of risks

A total of 34 resources were identified through literature review and expert comment out of which ten were selected for further investigation, based on feedback on the following issues: reasons for choosing and using the resource; availability of data; practicality of using the resource; assumptions used in the resource and data robustness and availability; suitability of the resource; costs and communication. In addition, a short literature review was performed to present the underlying principles of resources and provide some insights into their scientific robustness.

The main findings from the transversal analysis showed that different resources, but also the scale at which the resource is applied, will require different levels and types of data. Some may be directly available from the tool, but for greater accuracy more specific in-house or local data may be needed. Cooperation with local stakeholders and with suppliers and clients is key to gathering the relevant data and understanding issues adequately. Many resources were reported to be straightforward and intuitive to use and some offer advice or training for implementation. In terms of the assumptions used in the resource, business users reported they trust results, but a gap was highlighted that often uncertainty ranges are not given. The trade-off between adaptability and complexity was also recognised, as users want resources to be detailed enough to be specific to their business, but not too complex. This is particularly true for SMEs where the resource has to be simple enough to be used by a resource constrained user, but complex enough to cover a huge range of activities and businesses. Resources are also found to be well suited to the current needs of businesses. Most resources are openly available on-line, requiring staff resources rather than costly investments, and generally lead to cost savings, thanks to water (and related energy) savings. The results from the resources are mostly used internally at this stage, but are expected to be increasingly communicated externally too. Finally, the resources are currently subject to limited scientific scrutiny and criticism, but the report provides some information about underlying principles and the debates around the water footprint. While these findings provide interesting information from a business perspective, they must be taken with caution as they were gathered from a few interviewees only for each resource and may not be representative of all types of business users.

In conclusion, the study is considered to provide a good insight into what resources are available for which purpose and to help businesses that wish to deal with water issues ask the right questions to identify and select the resource that is adequate for their purpose. Indeed, an important finding of the study is also that businesses that are using resources do not consider that there are too many resources available, although this may be the first impression of a prospective business user. Each resource has a different purpose and is aimed at achieving different goals, requiring careful selection. However, something that would be required as a parallel action to this type of report, is to engage more actively with business users that are currently not aware of water issues, and are currently not in need of the information in this report as their awareness should first be raised. Several improvements are also needed with regards to the use of the tools, with improved data collection needed at many levels, including from businesses themselves about their activities but also at river basin level to contextualise information, and throughout the supply chain. Cooperation between stakeholders is key to improving the data availability and flows, but also to raise awareness and increase engagement.

Finally, as a follow-up to this report, it would be useful to develop a detailed decision-support framework, so that business managers can easily identify the resource(s) that best suit(s) their activities, by adopting a step-by-step approach that would consider their needs and their specific business characteristics. This recommendation was strongly supported by the Business Group during the course of this project.

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Chapter 1: Introduction

The UK is currently facing major choices about how to move towards a green economy, striving to address several environmental challenges. Water is increasingly recognised as one of the key environmental challenges. In this context, the European Commission has declared 2012 the European Year for Water, it is also the year of the 6th World Water Forum, and initiatives related to water are arising, founded on earlier similar initiatives related to carbon (e.g. high profile developments such as the Carbon Disclosure Project and carbon footprinting methods). These initiatives in the field of water are obtaining increased recognition. In its "State of the Nation – Water" report (2012[1]), the Institution of Civil Engineers recommends the reduction of water use by 30% in order to ensure water security in the UK by 2025. In addition, the drought and subsequent flooding in early part of 2012 in England highlighted the potential vulnerability of businesses to hydrological extremes.

Many initiatives to specifically encourage businesses to adopt water sustainability strategies are currently flourishing. Defra has publicly committed to developing an agreed approach to water footprinting. This study was commissioned to produce an evidence base to inform Defra's activity in this area.

While water availability and use is increasingly recognised by many businesses as a challenge for the (near) future, a full understanding of the issue, throughout the supply chain, is complex and data is often lacking. A variety of resources that help businesses understand water issues (e.g. water footprinting, water stewardship, water accounting, etc.) are available, however knowing which resource best suits the requirements of a particular business is not always straightforward. However, identifying suitable resources for responding to water issues is key to addressing the situation and building a relevant strategy.

The first step for a business when addressing water is to start measuring its direct use. Understanding the impacts that this consumption has and the risks that it may incur, is however a more complex task. Water impacts involve a range of factors such as local water scarcity, the season during which the water is used, social impacts and include both quantitative and qualitative issues. As water impacts are intrinsically complex, many questions arise for a business wishing to deal with its water impacts. There are also differences in capacity between different scales of business. The aims of this study are to help businesses to identify and assess the different resources that are currently available to them to understand their water impacts.

Definition

In the report, a water-related "resource" refers to any initiative, strategy, guidance, methodology, model and data analysis tool that helps businesses to target water management issues.

[1] Available at : www.ice.org.uk/getattachment/86d84a07-f7d6-4027-b477-e751b845aaa5/State-of-the-Nation-Water.aspx

1.1 Methodology

The study is based on both a literature review and feedback from stakeholders. The first step for the project was to set up a business group (BG) in which several sectors and types of businesses (SMEs, international companies) were represented (see the list of members in Annex 1). Initial contacts with the BG allowed the project team to identify key issues related to existing resources and throughout the study, the BG provided expert advice and guidance.

A literature review was undertaken in order to highlight the drivers and scenarios, which encourage businesses to engage with water actions (see Chapter 2:) and identify the water-related resources that are currently available to businesses (see Chapter 3:). Publications from several organisations that have extensive expertise in corporate water management - such as the Carbon Disclosure Project (CDP), the UN CEO Water Mandate and the World Business Council of Sustainable Development (WBCSD) - were first consulted (see the list of references). More specific documentation on the water-related resources were then reviewed to characterise more precisely the scope, objectives and methodologies of the resources. This includes self-explanatory reports and support spreadsheets that resource developers usually make available to users on their websites.

In addition, questionnaires were sent-out to a large panel of stakeholders in order to collect inputs from a user's perspective, cross-check and complement the information on drivers and scenarios, characterise the available resources and perform a mapping with regard to the covered scenarios.

One-to-one interviews (mostly over the phone) were also organised to identify and discuss the specificities of a selection of these resources, from a user's point of view, encompassing a range of businesses from multi-nationals to small and medium enterprises (SMEs).

1.2 Guidance for businesses

1.2.1 Understanding needs

A business's relationship to water is complex. Water may be used in different steps of the supply chain (e.g. direct water use, water embedded in raw materials, water used in the manufacturing processes, water consumption during customer's usage) and there will be different needs for business users (e.g. to identify water impacts and/or risks, communicate about corporate water management). Therefore, a business should analyse its needs related to water before selecting the resource(s) it will use.

Initially, corporate water management has focused on the amount of water used within a company's direct operations, focusing on ways to reduce use and mitigate induced costs and risks. However, businesses realised that water use must be considered in context, to understand what impacts it has led to. Recently there has been growing interest to extend the understanding of businesses to water risks associated with external factors such as water scarcity, pollution or inadequate water infrastructure, even if their internal water operations may be effective and

well-controlled. As a consequence, corporate water management may address the economic, social and environmental contexts of the watersheds in which companies operate. The different resources available address these different needs, but require prospective users of resources related to water to adequately identify their needs to select the relevant and most appropriate resource(s) to use.

In this report, four main drivers for businesses have been investigated (see Chapter 2:):

- Identify and assess water-related risks
- Measure water use and assess water-related impacts
- Develop response options and/or risk mitigation strategies
- Communicate water risk/performance

1.2.2 Choosing the appropriate resource(s)

Following the identification of business needs, the company proceeds to the selection of the resource(s) that is(are) most likely to bring useful outcomes. The study provides fact-sheets on 34 resources that were identified based on a literature review and discussions with expert contacts (see Annex 2). These factsheets and the summary table (see Table 2) aim to help prospective business users to undertake a preliminary screening of the available resources.

In order to provide further guidance to the company when selecting a resource, a more specific mapping and classification has been performed in this study, according to six key objectives:

- High-level screening of corporate water impact
- Quantification of (direct) water use for corporate activities
- Quantification of water use in the supply chain (indirect)
- Assessment of site-specific water impacts
- Assessment of product-based water impacts
- Identification of risks

Communication is not included as a separate objective as it overlaps with other areas - i.e. communicating the impacts, the risks, etc. - but is one of the criteria for the assessments performed in this study.

An additional relevant factor for prospective users is to know what resources similar companies (in terms of size and/or business activity) are using, as these resources are likely to be most useful to them too, and possibly to perform benchmarking and comparative analyses. Besides, any sector-specific resource ensures that the assessment is adapted to their activities. The summary table (Table 2) enables potential users to easily identify the resources that are best suited for size-specific or sector-specific applications.

1.2.3 Implementing the resource(s)

Assessment sheets for a selection of ten relevant resources[2] covering the six specific objectives were developed based on the practical feedback of current business users (see Annex 4) and provide valuable insight to support a prospective user's decision. The assessment covers seven specific aspects of each resource:

- Reasons for choosing and using the resource
- Availability of data
- Practicality of using the resource
- Assumptions used in the resource, data robustness and availability
- Suitability of the resource
- Costs
- Communication

Once the company has identified and selected the resource(s) to implement, the business managers may envisage a progressive approach, depending on the size of the company. It could include pilot testing, one-site implementation followed by multi-site implementation, as highlighted during discussions with some stakeholders.

A summary figure of the steps to be taken when choosing and implementing a resource and where information is provided in the report is illustrated in Figure 1.

[2] Please note that the selection aimed to provide a representative list of resources and does not imply any ranking amongst the tools. These sheets are thus only informative. Prospective business users may refer to the list of 24 tools and factsheets to select the most relevant for their purposes, and can then find further information about the 10 selected tools if required.

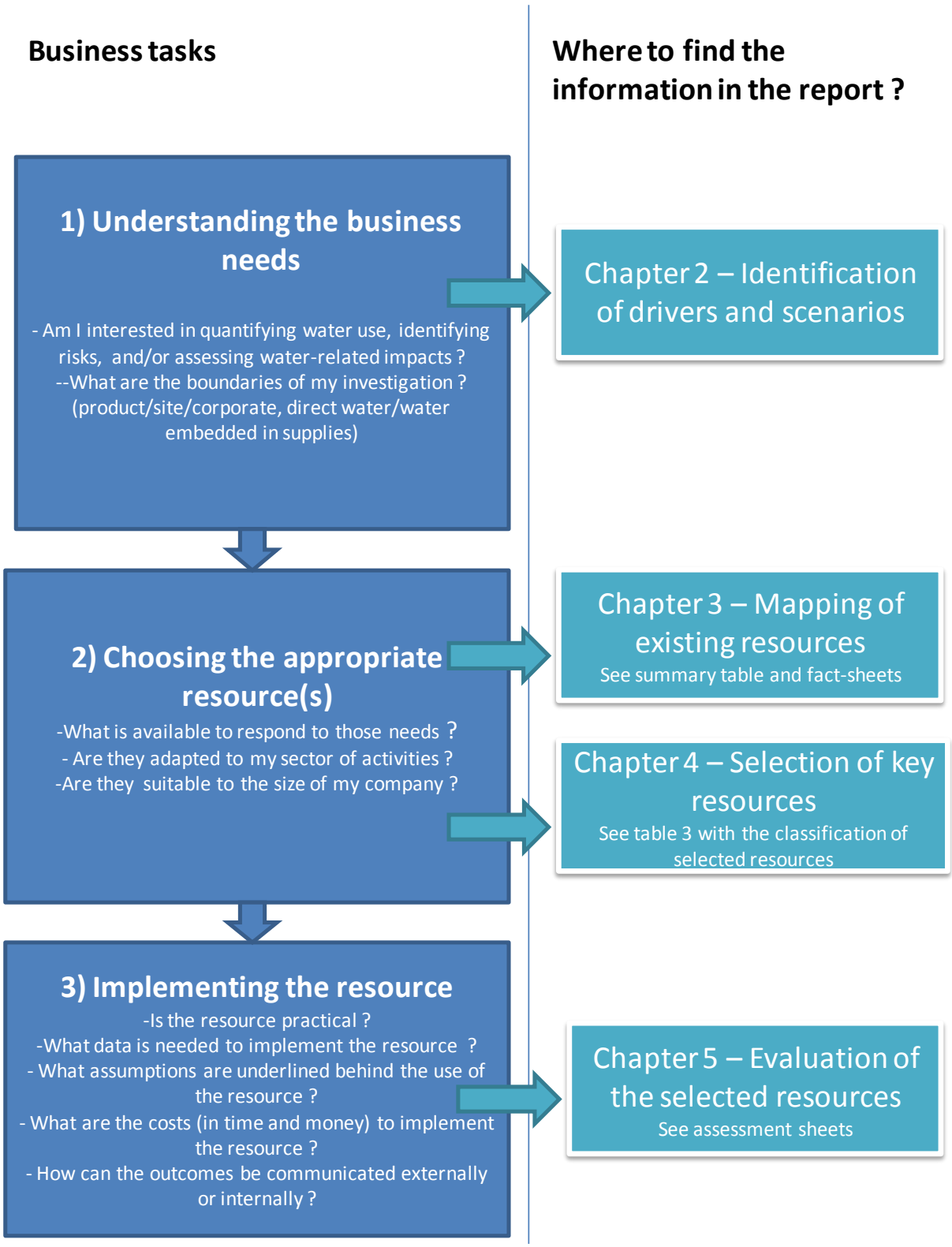

Figure 1 – Steps to take for selecting a resource and related information in the report

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Chapter 2: Identification of drivers and scenarios that lead business to assess water impacts

Water is increasingly recognised as a key issue for business, for a variety of different reasons and many businesses may have already been exposed to water-related impacts and risks as outlined in Figure 2. Indeed, the Carbon Disclosure Project (2011[5]) shows that up to 68% of the respondent companies in the materials sector[3] have suffered from water-related business impacts in the 2006-2011 period, while 80% of the utilities have acknowledged their exposure to water-related risks in direct operations or supply chain.

In addressing these issues, businesses may wish to prioritise their understanding of risks associated with their water use, others may want to reduce their water impacts and require methods to identify and manage these impacts, while others may wish to communicate internally or externally about water issues. Business drivers and scenarios are important to identify and understand, as they will also stimulate different types of questions to be answered. Different resources will address different components of the water issue and provide different answers. Identifying why a business wishes to engage with water issues helps in the selection of the appropriate resource(s).

Drivers and scenarios that encourage businesses to engage in water saving and/or management actions are presented in this section, based on the literature review and the feedback[4] of business stakeholders based in the UK. They were further discussed and analysed with the Business Group (BG), during a dedicated meeting.

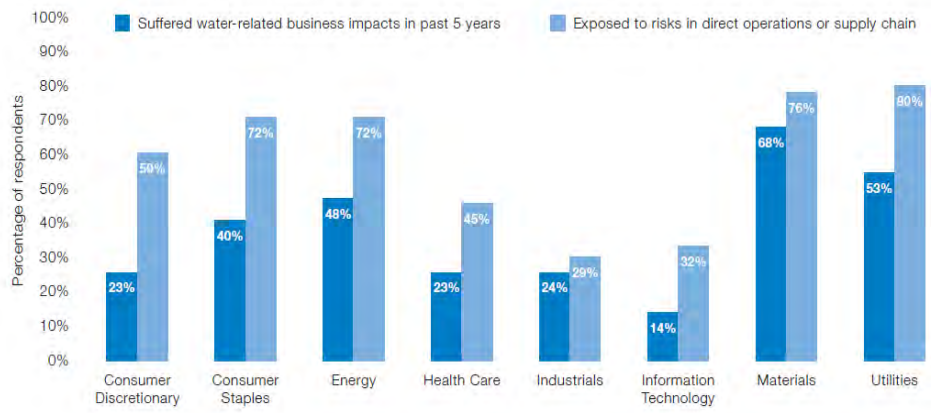

Figure 2 – Exposure to water-related impacts and risks (CDP, 2011)[5]

[3] Based on the Global Industry Classification Standard (GICS), see CDP Water Disclosure Global Report 2011.

[4] Which consists of around 20 replies to a questionnaire.

[5] Carbon Disclosure Project(2011) CDP Water Disclosure Global Report 2011.

2.1 The complexity of water issues for businesses

Many businesses have already engaged with water issues and are able to report the difficulties they faced / are facing or share the needs they have identified[6]. The following analysis of the complexity faced by businesses addressing water issues is based on interviews performed with the BG of this project, in which several sectors and types of businesses (SMEs, international companies) were represented (see Annex 1). All members have good knowledge of the water-related resources available to businesses, and of water issues (including use, impacts and risks).

- **Purpose of available resources and selection of the right resources**

In general, businesses recognise that accounting/measuring direct water use associated with product manufacture is a good first step when addressing corporate water management, but it does not provide all the answers. There is a need for resources that allow the user to identify impacts and risks in local areas, at river basin or catchment scale. For this purpose, spatially-explicit and temporally-explicit information is required. This may need to be complemented with information about cultural water habits (e.g. to understand what impacts the product's use will have) and allocation governance/policy (e.g. whether the distribution of water between sectors competing for water is regulated – for example if priority is given to drinking water over water used for agriculture).

The fact that a range of different resources are available is not seen as a problem, on the contrary, it enables businesses to address the different issues raised by water. However, guidance is needed to identify the available resources and to help select the most relevant ones. In certain cases, adapting the resource to a certain business sector or to a company may be required to refine the information produced.

- **Scale of the information**

When identifying impacts, information at the local scale is needed, ideally for all steps of the product life-cycle (also depending on what impacts the business is interested in understanding). However, gathering that information may be challenging, for example where agriculture is concerned, locating a field and its related risks is complicated. While companies usually decide to launch a product at national level, when considering the overall water consumption induced by the use of the product (e.g. washing powder, soap, etc.) they cannot exclude areas, which may present a higher risk e.g. areas of water scarcity.

- **Cooperation/Engagement with stakeholders**

Water is a shared resource. Understanding this is key to becoming good water steward which involves taking into account the local water management situation and considering the needs of other stakeholders using the same local water resources. Indeed, all water users in a watershed (e.g. river basin) need to act together to tackle water stress in that specific watershed.

As for many other environmental impacts, each business is responsible for water use at its section of the supply chain, but it can also export water impacts and risks to other businesses.

[6] In particular members of the BG and people interviewed for the assessments.

Engagement with suppliers and clients is needed to assess water impacts and risks throughout the supply chain. However, different business sectors and businesses of different sizes may not require the same resources to assess their impacts and/or risks, e.g. in the agri-food industry working with big suppliers or small-scale farmers involves different ways to collaborate.

- **Communication**

Common standards and benchmarking would allow communication in a transparent way as potential investors or customers could then compare businesses / products and adapt their investment / purchasing decision processes. However, it is important to identify for which purposes and audiences (e.g. consumers, business customers, investors and other stakeholders) the information is targeted. For example, product labelling may be a useful resource to inform consumers and customers on water, and certification or other standards may also be used depending on the audience. In addition, providing information only about water may not be the best solution, but rather to assess environmental impacts by identifying trade-offs (e.g. the water-food-energy nexus).

- **Gaps**

According to the project's Business Group, it would be beneficial to identify risks in a way that would allow businesses to compare water-related risks to other types of risks that managers may be more acquainted with, such as financial, or health and safety risks. This would allow better management and communication of water issues, at a higher corporate level. Currently, Business Group members feel that action is only taken when a crisis occurs (e.g. drought, restriction on use).

In a similar vein, resources that allow businesses to identify and implement actions, once a risk has been identified are still only emerging.

There is also a need for resources that allow businesses to engage with stakeholders, to identify their needs, concerns and requirements and meaningfully engage in a dialogue on the sustainable use of water.

Lastly, as identified above, the fact that multiple resources are available is considered an asset, as it allows businesses to consider different aspects of water issues, but guidance on how to identify and select the most appropriate resources would be useful.

2.2 Main drivers and scenarios

An important initiative that has been launched to address and help businesses understand their water issues is the UN CEO Water Mandate[7]. This online platform provides information on why and how businesses can better understand their water impacts.

In line with the guidance work of the UN CEO Water Mandate, four main drivers for companies to focus on water issues were identified:

- Identify and assess water-related risks

[7] For further information, see ceowatermandate.org

- Measure water use and assess water-related impacts
- Develop response options and/or risk mitigation strategies
- Communicate water risk/performance

The Business Group members confirmed this categorisation covers the most relevant drivers and scenarios that lead businesses to engage with water issues. Each category is considered further below.

2.2.1 Identify and assess water-related risks

Proactive companies may engage in water-related actions as part of a risk assessment process. Different risk categories are typically considered, as presented below.

- **Physical (disruption) risk**

This risk relates to any potential water shortages during the operation of a company's activities. Such a situation could hinder the performance of a process (e.g. lack of pressure in heating systems, limited hydraulic fracturing for the oil and gas sector, lower yields in the mining sector, or crop yields or failure in agriculture, etc.); or affect the availability of raw materials (e.g. reduced availability or quality of agricultural ingredients for the agri-food sector). Indeed, businesses may face the risk that their permanent access to water-dependent supplies may no longer be possible. Given the large geographic spread of supply production sites, large companies that have operations and suppliers in different countries may wish to have access to suitable water resources in the long-term and thus have to take into account the (precise) local conditions, as highlighted by UNEP (2011)[8]. This is particularly relevant for the food sector where companies strongly rely on the availability of agricultural products.

In the long term, unsustainable use of water induces a risk of local water depletion and may lead to the complete closure of the plant/facility/site.

- **Reputational risk**

A company may wish to assess its reputational risk, that is related to insufficient environmental conservation (e.g. depletion of groundwater, low environmental flows in rivers and lakes, etc.) or inadequate access to water services among local communities (e.g. due to strong competition, in water scarce periods or areas, between the municipal and the industrial sectors). This type of risk is considered more relevant in direct operations than in the supply chain, as highlighted by the Carbon Disclosure Project (2011)[9].

When a company is, or is perceived to be, inefficient, unsustainable, or even irresponsible, the following reputational damage could occur (UNEP, 2011)[8]:

- Decreased consumer loyalty,
- Reduced confidence from investors,

[8] UNEP, 2011, Water Footprint and Corporate Water Accounting for Resource Efficiency

[9] Carbon Disclosure Project, 2011, CDP Water Disclosure Global Report.

- Adverse regulatory issues (e.g. potential loss of legal license to operate).

In order to ensure these reputational risks do not occur, the business may wish to identify water-related issues upstream.

- **Environmental risk**

Corporate water use may have a negative environmental effect that leads to social and economic consequences on the local ecosystems and local communities. This risk may lead to a negative image, or to disruption risks (e.g. if priority is given to uses other than the business' use). Assessing such business risk implies the consideration of the local context (e.g. water availability for human purposes, water amount for minimum environmental flows, local water allocation governance / policy, etc.) which reflects the watershed's relative water abundance or scarcity.

This risk also includes regulatory risk or uncertainty. In particular, licence to operate may not be granted due to changes in regulation, e.g. if the UK Environment Agency determines that a catchment is over-licensed, a company may not be able to renew their time-limited abstraction licence for the same volumes or at all.

Using a lower amount of direct water must be balanced against the risk of contamination if the industrial facilities discharges more concentrated water outflows (as there is a reduced dilution effect). Water quality may not always be a priority aspect compared to water quantity, but is still important and needs to be addressed, as confirmed by the project stakeholders. The two aspects are intricately linked, as poor water quality can have an impact on water availability for a range of applications (e.g. low quality water cannot be used for drinking purposes, or requires high costs of treatment). In addition, the reduced quality of the watersheds may present a risk to the surrounding ecosystems, and low flows similarly may affect biodiversity and ecosystem services.

2.2.2 Measure water use and assess water-related impacts

The first step in engaging with water issues is often to start by evaluating the amount of water that businesses use and discharge directly at a facility. The UN CEO Mandate (2011)[10] shows that this initiative is driven by the enforcement of regulatory requirements at national level but also the desire to improve operational efficiencies in order to reduce the related costs and/or the amount of energy that is needed for production processes and/or wastewater treatment.

Companies usually look at direct water use in terms of volume of water withdrawn (per unit of production or unit of sales) and the amount (per unit of production or unit of sales) and quality of discharged water.

Understanding water impacts at a local scale is also a key driver for business users in order to evaluate the sustainability of their operations in the long-term. How much (in volume) water is used is partly responsible for impacts, but the consideration of the local water context is essential to assess the significance of a water-related impact. With this geographic "*hotspotting*",

[10] CEO Water Mandate, 2011, Corporate Water Accounting, An analysis of Methods and Tools for Measuring Water Use and its Impacts

companies can then prioritise the locations of sites/facilities in which to invest to improve operational efficiency, or setting up contingency plans. Potential water-related impacts include:

- Not meeting the needs for human consumption,
- Low environmental flows affecting biodiversity and ecosystem services,
- Seasonal/permanent water scarcity or droughts, or
- (Eco)toxicological effects of polluted water discharge on receiving ecosystems (with possible increase in water-related diseases)

Such impacts may lead to risks (see previous section) if no response/mitigation strategies are taken (see next section).

2.2.3 Develop response options and/or risk mitigation strategies

Once impacts and risks have been identified, businesses may wish to engage in strategies to mitigate these risks (e.g. through stewardship or identification of hotspots). Alternatively, when considering development options in new areas, investors and businesses may wish to identify if the business will be sustainable with respect to its water risks.

Some businesses may also identify the need to develop specific strategies as part of more global corporate or environmental strategies, through the evaluation of the business' environmental performance or in the context of preparatory measures to mitigate / adapt to climate change.

2.2.4 Communicate water risk/performance

Companies may wish to disclose their water performance to their stakeholders, investors or the general public. Adopting such a transparent initiative allows companies to be accountable for their water use and management and increase their customer loyalty and/or investor confidence (UN CEO Mandate, 2011)[11].

Depending on the driver, business may target different audiences and communicate different types of information:

- For the public/consumers, non-technical information is more easily understood. This information could be featured on the company's products (e.g. through a label, either displaying a certification, e.g. European Water Stewardship Standard (EWSS) or a number, e.g. product water footprint) to encourage an informed purchasing decision.
- For investors, more specific and technical information could be envisaged to support and strengthen a company's credibility when performing an investment risk assessment (e.g. CDP Water Disclosure project, WWF/DEG Water filter)

[11] CEO Water Mandate, 2011, Corporate Water Accounting, An analysis of Methods and Tools for Measuring Water Use and its Impacts

- For other businesses in the supply chain (as suppliers or customers), to encourage improved water management at all steps of the supply chain,
- For regulating authorities, to show compliance or e.g. prove low impacts if requiring a license for higher volumes,
- For internal staff, to highlight areas of improvement and engage in water saving initiatives (e.g.as part of the CSR strategy).

2.3 Scope of the assessment

Another important aspect to identify is what the scope of the water assessment should be. The scope of investigation may address the whole company, or each site/facility; and the direct operations, the supply chain (e.g. covering water embedded in supply materials or access to water needed to manufacture key inputs for production, as water risks from a supplier may be passed up to customers), water used by the customer when using the product (e.g. soap, shampoo) or the whole chain. Each resource either has a specific scope (e.g. certification will apply at site level) or can be applied to any scope (e.g. quantification of water use can be applied at site level, product level, corporate level, or throughout the supply chain). In some cases, the same resource can be applied at different scales or using different scopes (for example the Water Footprint methodology can be applied at corporate, product or site level) and each scale/scope may deliver different types of information (and require different types of inputs) depending on how it is applied. It is thus important to decide what scope the prospective business user wishes to have information on.

2.4 Business needs

Building on the four main drivers and the scope identified in the previous section, six categories of more specific objectives/business needs were identified for this study. These six objectives are used in the assessment, in order to more precisely characterise the resources:

- High-level screening of corporate water impact
- Quantification of water use for corporate activities
- Quantification of water use in the supply chain
- Assessment of site-specific water impacts
- Assessment of product-based water impacts
- Identification of risks

Such specification allows the prospective business user to have a more precise understanding of the resource's functionality and capacity and properly select the one(s) that will best fit its needs, by mapping the resource against these objectives (see section 3.3).

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Chapter 3: Identification and mapping of existing resources

3.1 Identification of available resources

In order to help businesses choose the resource that will suit their needs to start engaging in water management, an identification of available resources is required.

A list of 34 resources was identified based on literature review and expert contacts and is presented in Table 1

Table 1 – List of identified resources

Resources	Corresponding acronym used in the report
Alliance for Water Stewardship	AWS
Aqueduct	AQD
BIER Water footprint	BIER
BMA and Waterwise - Water Efficient Buildings Calculator	BMA
Business Stream water benchmark calculator	BS
Courtauld Commitment	CC
Cafédirect EcoToolkit for Foodservice Venues	CDE
CDP Water Disclosure	CDP
Ceres Water Gauge	Ceres
Corporate Water Gauge	CWG
Envirowise Indicator	EI
European Water Stewardship Standard	EWSS
Global Action Plan EMS Easy toolkit	GAP-EMS
GEMI - Collecting the Drops	GEMI-C
GEMI - Local Water Tool	GEMI-LWT
GRI	GRI
ISO 14046	ISO14046
Planet Positive Protocol	PPP
PROBE for Sustainable Business	PROBE
Resource Efficiency Tool	RE-Tool

Resources	Corresponding acronym used in the report
Rippleffect	RipplE
UK Federation House Commitment to Water Efficiency[12]	UK-FHC
UN CEO Mandate	UN-CEO
WAF in the Minerals Industry	WAF
Water Brief for Business	WaterBB
WaterSense	WaterS
WBCSD Global Water Tool	WBCSD-GWT
Water Footprint Network methodology	WFN
Water Footprint Neutrality and Efficiency umbrella project	WFN&E
Water Neutral Offset calculator	WNO
WRAP Benchmarking Tool[13]	WRAP
Watershed Sustainability Assessment	WSA
Life-cycle Initiative WULCA	WULCA
WWF/DEG Water Filter	WWF/DEG

3.2 Characterisation of available resources

In a second step, fact-sheets were developed (see Annex 2) in order to characterise the resources. The goal of the factsheets is to provide synthesised and comparable information for all the resources identified in Table 1 above. Each factsheet - as illustrated example in Figure 3 - is thus organised with the following characteristics:

- Drivers covered (based on the drivers identified in Chapter 2:)
- Targeted Audience
    - Type of user (e.g. corporate group, SME)
    - Business sector
- General objective (including guidance initiative, overarching environmental tool, etc.)
- Specific objectives
    - High level screening of corporate water impact

[12] This resource is managed by WRAP/FDF

[13] Note this resource is no longer active

- Quantification of water use for corporate activities
- Quantification of water use in the supply chain
- Assessment of site- specific water impacts
- Assessment of product-based water impacts
- Identification of risks

- Scope (Water quantity and/or quality)
- Methodological aspects
- Data needed (availability, granularity)
- Type of water (blue: volume of water use taken from surface waters and groundwater, green: volume of evaporative flows, grey: volume of water needed to dilute pollutants discharged to water bodies to the extent that they do not exceed minimum regulatory standards)
- Practicality / amount of effort to implement (potential need of any extra installation, expertise or training required to use the resource; complexity of the methodology)[14]
- Transferability / adaptability (to use a resource in a business sector for which it was not specifically designed) [14]
- Monitoring (to ensure that the performances of the resources can be assessed in the long-term) [14]

The series of factsheets provide preliminary background information and support to prospective business users. Indeed, this overview enables them to be introduced to the drivers, objectives and scope covered by the different resources so that they can appreciate whether the resource meets their business needs.

[14] For practicality, transferability and monitoring criteria, the assessments were made based on the project team's judgement.

Tool	Corporate Water Gauge
Year	2009
Website	http://www.sustainableorganizations.org/Corporate-Water-Gauge.pdf
Drivers and Scenarios	
Identify and assess water-related risks	
Measure water use and assess water-related impacts	x
Develop response options and/or risk mitigation strategies	
Others: (e.g. communicate, improve operational efficiency)	
Type of Business Users (SMEs, corporate group, etc.)	All
Key Business Sectors	All (US)
Overall objective	To measure and report water use in the context of local sustainability
Specific objectives	
High level screening of the corporate water impact	
Quantification of water use for corporate activities	x
Quantification of water use in the supply chain	
Assessment of site-specific water impacts	x
Assessment of product-based water impacts	
Identification of risks	
Scope	
Water Quantity	x
Water Quality	
Both quantity and quality	
Type of water (blue, green, grey)	blue
Water / Environment Focused	Water
Methodological Aspects	A watershed-centric approach
	(1) a spreadsheet-based measure of water use that compares the water consumption of an organisation or facility with an allocation of available renewable supplies,
	(2) a GIS technique for measuring and allocating renewable water supplies in watersheds,
	(3) a consulting service for teaching and/or assisting with the use of the whole package.
Data needed/data provided in the tool	Needed information: (1) organisation/facility name, location and geographic information, (2) related water sources and sinks and their respective volumes, (3) associated precipitation volumes in relevant watersheds, and (4) facility size in terms of employment and/or specific economic indicators.
Practicality (a) (1: easy, 2: moderate, 3: complex, N/A: not assessed)	N/A
Transferability / adaptability (b): (1: easy, 2: moderate, 3: complex, N/A: not assessed)	N/A
Monitoring (c) : (1: easy, 2: moderate, 3: complex, N/A: not assessed)	N/A
Business Involvement	
Registration required	Perpetual, non-exclusive licenses to use the CWG are granted free of charge to clients who first engage us to help them use the tool at a single site, or be trained (in-house) on how to use it themselves. (Minimum fees apply in either case.)
More info / Available document	http://www.sustainableorganizations.org/Water-Gauge-FAQs.pdf

na : not available

(a) Practicality : amount of effort to implement (potential need of any extra installation, expertise or training required to use the tool; complexity of the methodology)
(b) Transferability / adaptability : capacity to use a tool in a business sector for which it was not specifically designed
(c) Monitoring : capacity to ensure that the tool performances can be assessed in the long-term

Figure 3 – Example of a fact-sheet – Corporate Water Gauge (CWG)

3.3 Mapping of the resources

In a third step, the resources were mapped according to their main characteristics. This mapping aims to help prospective users of resources to identify those that best suit their needs, depending on their objectives for using the resource, their size and their business sector. The outcomes of the mapping exercise are presented in Table 2 and represented in Figure 4. The square boxes represent the 6 objectives and 2 overarching aims identified (titles in capital letters). Deep orange-coloured round boxes are resources targeted at SMEs, while light orange boxes represent resources open to all sizes of company. Borders of the round boxes (representing resources) that are blue refer to sector-specific resources and those that are orange are adapted to any sector. Resources with a star (*) are those that were selected for further investigation (see Annex 4).

It may also be noted that both the development of resources and the pathway used by companies that engage with water issues is generally similar. The first step involves investigating direct volumetric water use, and benchmarking this against other years, sites and/or other similar companies. The second step involves identifying where savings could be made. The third step requires putting the use in context, both in terms of location and timing (season). This step should arguably come as early as possible, as it is the step at which impacts are identified. Once these steps were followed for direct use, the assessment is often expanded to the supply chain. Risks are another issue, generally identified after these assessments, although risks may be an important factor to identify at corporate level. These steps also reflect an increasing recognition and understanding of the complexity of water issues.

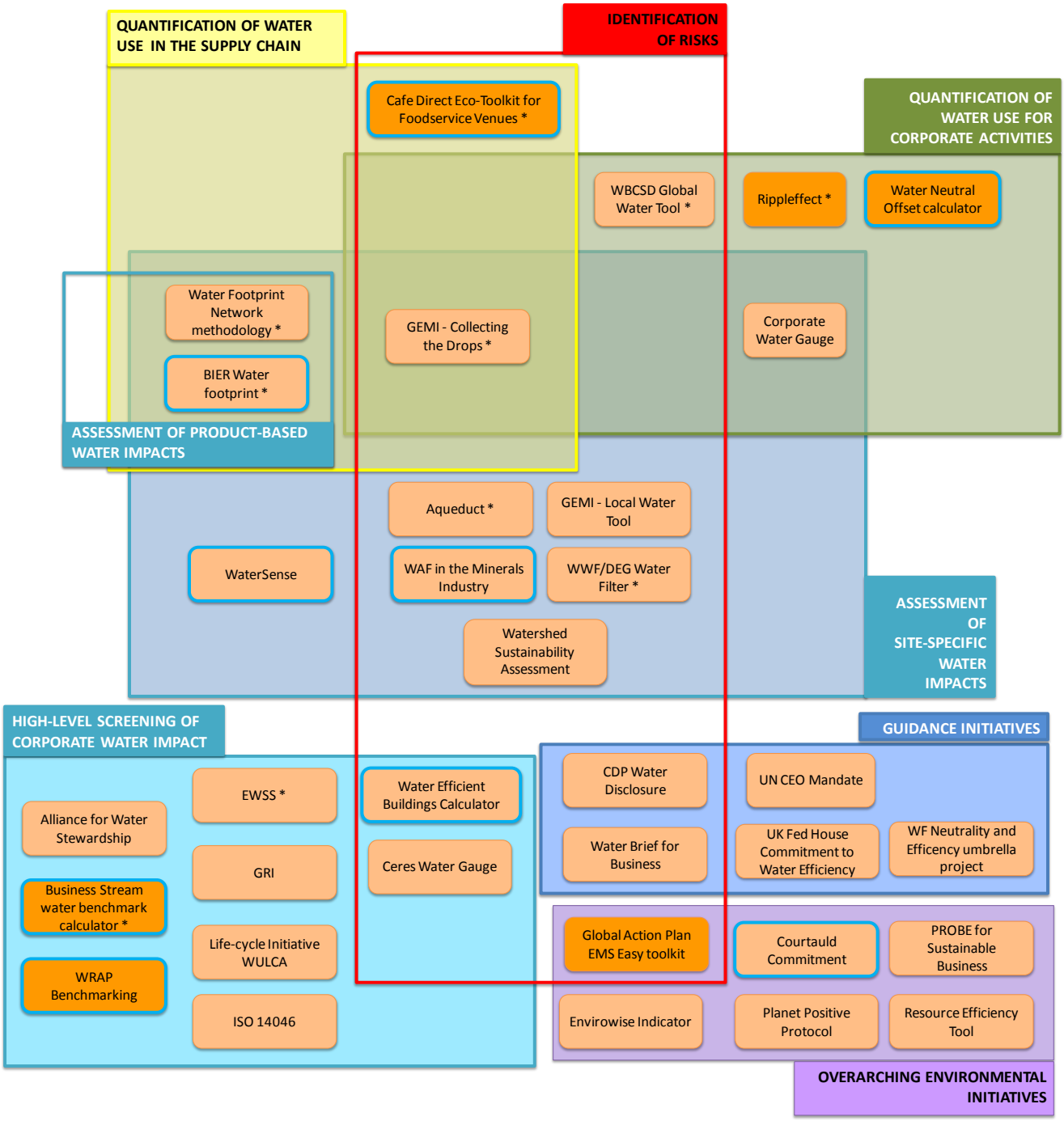

Figure 4 - Mapping of the resources identified

Table 2 - Summary mapping of resources (N/A: no resource was identified)

List of resources (Acronyms) *See full names in Table 1*	Type of users		Business sector		Objectives							
					Specific						Generic	
	SMEs	All types	Specific sector	All sectors	High level screening of their corporate water impact	Quantification of water use for corporate activities	Quantification of water use in the supply chain	Assessment of site-specific water impacts	Assessment of product-based water impacts	Identification of risks	Guidance initiative	Overarching environmental initiative
AWS		x		x	x							
AQD		x		x				x		x		
BIER		x	x				x	x	x			
BMA		x	x		x					x		
BS	x		x		x							
CDE	x		x				x			x		
CDP		x		x						x	x	
Ceres		x		x	x					x		
CWG		x		x		x		x				
CC		x	x									x
EI		x		x								x

List of resources (Acronyms) *See full names in Table 1*	Type of users		Business sector		Objectives							
					Specific						Generic	
	SMEs	All types	Specific sector	All sectors	High level screening of their corporate water impact	Quantification of water use for corporate activities	Quantification of water use in the supply chain	Assessment of site-specific water impacts	Assessment of product-based water impacts	Identification of risks	Guidance initiative	Overarching environmental initiative
EWSS		x		x	x							
GEMI-C		x		x		x	x	x		x		
GEMI-LWT		x		x				x		x		
GAP-EMS	x			x						x		x
GRI		x		x	x							
ISO14046		x		x	x							
WULCA		x		x	x							
PPP		x		x								x
PROBE		x		x								x
RE-Tool		x		x								x
RipplE	x			x		x						
UK-FHC		x	x					x			x	

List of resources (Acronyms) *See full names in Table 1*	Type of users		Business sector		Objectives							
					Specific						Generic	
	SMEs	All types	Specific sector	All sectors	High level screening of their corporate water impact	Quantification of water use for corporate activities	Quantification of water use in the supply chain	Assessment of site-specific water impacts	Assessment of product-based water impacts	Identification of risks	Guidance initiative	Overarching environmental initiative
UN-CEO		x		x							x	
WAF		x	x					x		x		
WaterBB		x		x						x	x	
WFN		x		x			x	x	x			
WFN&E		x		x							x	
WNO	x		x			x						
WaterS		x	x					x				
WSA		x		x				x		x		
WBCSD-GWT		x		x		x				x		
WRAP	x		x		x							
WWF/DEG		x		x				x		x		

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Chapter 4: Selection of key resources

A selected number of resources were chosen for further investigation in interviews with business users, to highlight the usefulness of the resources from a user's perspective. The selection process was developed to ensure a representative coverage of the resources to be further investigated. The goal was to include at least two resources for each of the specific objectives with, if possible, each resource targeting either different types of users or business sectors. It was also important to target the resources that are most commonly used/known by businesses. This is even more relevant as the study aims at accompanying businesses and therefore adopts a prospective user's perspective. However, no robust statistics were found with regard to the actual uptake of the resources. The resources were selected to ensure that it is possible to find experienced business users as the detailed assessment of the selected resources relies on the interviews of business users (see Chapter 5:).

Table 3 presents the resources classified according to their specific objectives, and to their type of user or business sector.

Where some resources were comparable in terms of coverage, their launch date and/or the possibility to gather feedback from stakeholders were taken into account, as explained in Annex 3. Likewise, priority was given to open resources that can be easily accessed.

Guidance initiatives and overarching environmental resources, identified as general objectives, were not proposed for a detailed evaluation as outlined in Annex 3.

Table 3 – Classification of the resources by specific objectives (N/A: none-identified))

Objectives		Type of users		Business sector	
		Specific to SMEs	All types	Specific sector	All sectors
Specific Objectives	High level screening of corporate water impact	BS WRAP	AWS BMA Ceres EWSS GRI ISO14046 WULCA	BS WRAP BMA	AWS EWSS Ceres GRI ISO14046 WULCA
	Quantification of water use for corporate activities	RipplE WNO	CWG GEMI-C WBCSD-GWT	WNO	CWG GEMI-C RipplE WBCSD-

Objectives		Type of users		Business sector	
		Specific to SMEs	All types	Specific sector	All sectors
					GWT
	Quantification of water use in the supply chain	CDE	BIER GEMI-C WFN	BIER CDE	GEMI-C WFN
	Assessment of site-specific water impacts	N/A	AQD BIER CWG GEMI-C GEMI-LWT UK-FHC WAF WaterS WFN WSA WWF/DEG	BIER UK-FHC WAF WaterS	AQD CWG GEMI-C GEMI-LWT WFN WSA WWF/DEG
	Assessment of product-based water impacts	N/A	BIER WFN	BIER	WFN
	Identification of risks	CDE	AQD BMA CDP Ceres GAP-EMS GEMI-C GEMI-LWT WAF WaterBB WFN WSA	BMA CDE	AQD CDP Ceres GAP-EMS GEMI-C GEMI-LWT WAF WaterBB WFN WSA WBCSD-

Objectives		Type of users		Business sector	
		Specific to SMEs	All types	Specific sector	All sectors
			WBCSD-GWT WWF/DEG		GWT WWF/DEG
General objectives	Guidance initiative (general objective)	N/A	CDP WaterBB WFN&E UN-CEO UK-FHC	UK-FHC	CDP WaterBB WFN&E UN-CEO
	Overarching environmental initiative (generic objective)	GAP-EMS	CC EI PPP PROBE RE-Tool	CC	EI GAP-EMS PPP PROBE RE-Tool

Based on the mapping exercise, a shortlist of 10 resources was generated for further investigation in this study.

Resources	Acronyms	Remarks
Aqueduct	AQD	Also addressed by CEO Water Mandate evaluation
BIER Water footprint	BIER	Focus on Beverage Sector
Business Stream water benchmark calculator	BS	Benchmark resource in Scotland
Cafédirect EcoToolkit	CDE	SMEs, food venues are targeted
European Water Stewardship Standard	EWSS	Certification scheme
GEMI-Collecting the drops	GEMI-C	Preferred to GEMI Local Water that has recently been

Resources	Acronyms	Remarks
		launched. Also addressed by CEO Water Mandate evaluation
Rippleffect	RipplE	SMEs are targeted
Water Footprint Network methodology	WFN	Also addressed by CEO Water Mandate evaluation
WBCSD Global Water Tool	WBCSD-GWT	Also addressed by CEO Water Mandate evaluation
WWF/DEG Water Filter	WWF/DEG	Just launched

One important remark is that the UN CEO Water Mandate has already focussed its work on evaluating the WFN Water Footprint, Life-cycle assessment (LCA), WBCSD Global Water Tool, GEMI "Collecting the drops" Tool, and WRI Aqueduct. The main findings on how the resources respond to the business needs have been used as basis for discussion with business users, and built upon for the assessment sheets (see Annex 4). They are also further discussed in the evaluation of the selected resources in Chapter 5:. Interested business users are invited to also consult the UN CEO Water Mandate work to complement the analytical information of this report. Other reports used for the assessment and which may be found useful by business users, include the WBCSD and IUCN 2010 report Water for Business, work from the Environment Council[15], presentation at the 2011 Stockholm World Water Week by the WBCSD[16], and reports on each of the selected resources (see references).

[15] Further information availble from: www.the-environment-council.org.uk/resources/water-engagement-alliance.pdf

[16] Corporate Water Risk Management – Seeking solutions, 23 August 2011, available from : www.worldwaterweek.org/documents/WWW_PDF/2011/Tuesday/K21/Corporate-Water-Risk-Management-Seeking-solutions/Corporate-Water-Risk-Management-Seeking-Solutions.pdf

Chapter 5: Evaluation of the selected resources

A more detailed evaluation of the selected resources was performed based on the feedback of two or three business users for each resource. The feedback was collected by phone interview, covering seven specific aspects for each resource:

- Reasons for choosing and using the resource
- Availability of data
- Practicality of using the resource
- Assumptions used in the resource and data robustness and availability
- Suitability of the resource
- Costs
- Communication

The individual assessment sheets for each selected resource are available in Annex 4. Key findings for each selected resources are summarised in Table 4.

Table 4 – Key findings from the assessment sheets

Resources	Key findings
Aqueduct	(+) Easy link between the company´s sites and local water dynamics (+) Added value of the predicative feature to communicate with investors (-) Limited geographical coverage
BIER Water footprint	(+) Practical and complementary guidance on water footprinting, adapted to the beverage sector (-) Limited uptake by businesses (as it is a very recent resource) (-) Need for data transparency to ensure a harmonised and consistent approach within the beverage sector
Business Stream water benchmark calculator	(+) Very straight-forward resource that enables budgeting aspects to be addressed (-) Transparency could be improved (urban/rural, old/recent data) (-) Potential for improved adaptation to specific sectors
Cafédirect EcoToolkit	(+) The EcoToolkit cater to a niche segment that has been largely ignored to date

Resources	Key findings
	(+) Designed for 'front end-users' (easy to interpret results) (+) Opportunity to promote water management efforts to customers and/or respond to customer queries
European Water Stewardship Standard	(+) Certification scheme for water management that provides investors and the general public with a global understanding of the water-related impacts (+) well-suited to a broad range of business sectors and provides additional value compared to ISO 14001 by focusing on water management (-) more communication needed in order to increase visibility, business uptake and consumer recognition
GEMI-Collecting the drops	(+) Suitable for internal assessments at the facility- and company-wide levels and provides good value for the time spent (-) The implementation of the water balance model directly depends on the availability of in-house data and data from the local watersheds (-) The (recently published) GEMI Local Water Tool is more robust (in terms of model building) and user-friendly
Rippleffect	(+) Rippleffect is considered user-friendly, with good instructions and additional support in the form of webinars (+) Those that had used the resource had not questioned the built-in assumptions, and trusted any hypotheses used (-) Mixed results were reported with regards to the impact of the resource, and it is suggested that it is most suitable for those organisations that were 'resource-hungry' and used vast quantities of water
Water Footprint Network methodology	(+) The resource enables an easy top-level water assessment (+) The resource is used as a complementary tool to other resources that allow a broader screening or mapping of water uses (such as the WBCSD Global Water Tool) (-) for specific hotspot analysis, the assessment becomes more complex (-) Business users from specific sectors may not find relevant data for their products and therefore have to investigate and develop their own databases in order to use the WFN methodology

Resources	Key findings
WBCSD Global Water Tool	(+) Good visibility and reputation (+) Effective communication tool that can be understood easily by non-technical audiences (-) Limited geographical coverage
WWF/DEG Water Filter	(+) It fosters understanding of the local context and the associated risks in terms of scarcity, pollution, regulatory risks and acts as a complementary resource to any water accounting resource (-) Although the resource is user-friendly, some type of introductory training to make best use of the resource would be beneficial, especially when interpreting results (+/-) The resource is very new, and some users may still be in the process of implementation

A transversal analysis based on the individual assessments is presented here to allow comparison of the resources and highlight some assets and limitations.

5.1 Comparison of the resources

Building on the information gathered for the assessment sheets and literature review – in particular support documentation published by resource developers (see section 1.1), a transversal analysis was performed to provide a comprehensive understanding of the resources that are available to businesses and help any prospective users to select the most appropriate resource(s) with regard to their business needs.

5.1.1 Analysis by main objectives

Different resources presented in this analysis have different objectives. Indeed, water issues are complex, and businesses may have different questions to be answered. Thus, these questions can be addressed by different resources, with different levels of precision. The first task for a prospective business user is thus to identify the question that expresses its needs. The analysis below is organised by type of need, as identified in Chapter 2: and further describes the selected resources in terms of how they answer these needs. In addition, Table 3 classifies all the resources identified (i.e. the list of 34 resources) according to these objectives.

- **High-level screening of corporate water impact**

Prospective users may wish to implement a resource to have an overall understanding of their corporate water impacts and therefore, a high-level screening enabled by WBCSD Global Water

Tool or, to a minor extent, EWSS would respond to their needs. It is highly likely that the new WWF/GED water filter will also fulfil this role.

The WBSCD Global Water Tool benefits from a higher visibility than the other resources (it seems many business users have heard about it) and was credited by the interviewed business users with positive appraisals. The resource stands as an effective way for a company to contextualise their water activities with local water dynamics and evaluate potential impacts. This initial approach can be complemented by the use of other resources (e.g. GEMI-collecting the drops, WFN methodology), which enable a more detailed assessment.

The EWSS awards a bronze/silver/gold certification to a company with regard to its water management and allows a very general appreciation that can be used for external communication as it will be easily understood by the customers. Part of the aims of the standard is to provide information on how the water impacts of a site are managed at a local level, considering the local situation and for example, the protection of high conservation value wetlands, lakes or riparian areas is a pillar of the EWSS methodology. Likewise the WWF/GED filter is designed to take into account local level issues including socio-political issues.

- **Quantification of water use for corporate activities**

While the WBCSD Global Water Tool enables a preliminary quantification of corporate water use, the GEMI-collecting the drops enables building a water balance and therefore a detailed understanding of sub-systems' water processes. The boundaries of this thorough assessment are defined by the environmental manager, according to the company's needs and the availability of data. Likewise, the WFN methodology addresses corporate water use but a proper definition of the scope of assessment (and required level of precision) is a key initial step to ensure an adequate and fruitful implementation of the resource.

Water quantification data alone may not provide businesses with a robust indication of how well they perform, as it will mainly depend on the size of the company and the business activities. In that regards, the Business stream water benchmark calculator is particularly appropriate for (Scottish) SMEs, by enabling the comparison of their corporate water use with companies from the same sector of activity. The WRAP Rippleffect is also well-suited for SMEs to guide them through the optimisation of their water use.

- **Quantification of water use in the supply chain**

Prospective users may wish to implement a resource to quantify not only the water they use directly, but also the water embedded in their supply chain. The WFN methodology, the BIER water footprint (for beverage sector) or Cafédirect EcoToolkit (for hospitality sector) allow for this quantification. As discussed earlier, the most critical factor is the ability to gather data from suppliers as suppliers are not always inclined to provide this kind of data due to confidentiality issues, or may not have engaged in identifying their water use or water-related impacts. Some specific sectors (e.g. construction, chemical sector, petroleum industry) may need to develop their own reference database.

- **Assessment of site-specific water impacts**

Several resources enable the assessment of site-specific water impacts. Potential contribution to local water scarcity and droughts is of particular interest. In that regard, Aqueduct and the

WBCSD Global Water Tool include mapping features that provide information on the water context related to the location of a company's site. GEMI-collecting the drops and WWF/DEG water filter also refers to local datasets to identify potential risks and impacts.

The WFN methodology and the BIER water footprint encompass a larger scope by considering water embedded in the supply chain. Watersheds that host the production sites of the supply materials are also part of the assessment in addition to the company's own site(s).

The EWSS awards a bronze/silver/gold certification to a company's site that can further communicate to its customers and partly aims to identify whether the business manages its water risks well.

- **Assessment of product-based water impacts**

The WFN methodology and the BIER water footprint can also be implemented for a full understanding of the water use related to the production and use of products. While for agricultural products, an increasing number of studies and datasets have been recently published, some specific sectors (e.g. construction[17], chemistry sector, packaging industry[18]) may lack some reference databases.

- **Identification of risks**

Overall, many resources enable a company to better understand its water use and its related impacts. This contextualisation facilitates the identification of water-related risks. This is particularly relevant for mapping water-related resources such as Aqueduct and WBCSD Global Water Tool as a direct comparison with local water dynamics provide contextual information and allow a risk assessment. For a more detailed investigation, the WWF/DEG water filter provides more specific and robust outcomes as the resource integrates more datasets and enables some risk prioritisation. This can be further exploited to develop a risk mitigation strategy.

5.1.2 Analysis by criterion

- **Reasons for choosing and using the resource**

While a direct comparison of reasons is not possible because the investigated resources serve different purposes, a rapid analysis of the criteria used by the business users when choosing the resource is proposed. The main reasons for using a specific resource were given as:

  - The resource is **widely known** and was interpreted as either the only one available or the best resource for water-related issues (e.g. WBCSD Global Water Tool);
  - The resource allows the user to go into more detail for investigating **water-related issues** (e.g. GEMI-collecting the drops, EWSS), after having used resources accounting for broader environmental risks (e.g. ISO 14001);

[17] However, some water footprint databases exist, see footnote 19.

[18] Note WRAP is expected to commission work which includes assessing the water footprint of packaging materials / systems

- The resource offers straightforward **mapping** functionalities (e.g. Aqueduct, WBCSD Global Water Tool), which directly inform on the local water context;
- The resource considers the concept of **virtual water** and therefore allows consideration of the whole chain of water impacts (e.g. WFN methodology);
- The resource **targets SMEs** with rather simple and well-defined actions (Rippleffect, Business Stream water benchmark calculator);
- The user was **encouraged** to use the resource or the resource was offered as part of wider services to clients (e.g. Cafédirect EcoToolkit; Business Stream water benchmark calculator); this was particularly true for SME-focused resources or for resources provided by NGOs or companies that work with organisations to assist them on wider sustainability issues.

- **Availability of data**

Three types of input data were usually required to enable a proper use of the resources, depending on the main objectives of the resource:

- In-house corporate data regarding the direct water use of the company/plant/facility/product;
- Local characteristics of the watersheds in which the plant/facility is situated; and
- Water data from the supply chain and/or users of the products.

Certain resources internally compute existing maps and databases, helping the user in finding data. These resources provide rough figures or broad identification of risks, but often require further specific data to obtain the more precise picture. In certain cases, precise data may be available for a limited geographic coverage (e.g. Aqueduct, WBCSD Global Water Tool) or sectors (e.g. agricultural data in WFN). For example, Aqueduct, WFN methodology, WWF/DEG Water filter and WBCSD Global Water Tool all integrate local water data to guide the business users, while users of GEMI-Collecting the Drops have to look for the relevant information (although some links to datasets are provided).

Potential users may face different levels of data availability when collecting **direct water use-related data**. In-house water use is usually relatively easy to gather at site level, based on water bills or amounts of water extracted by the site. For more detailed water balance (e.g. for GEMI resources), specific attention at process and product levels may require the installation of additional water meters or the estimations of water consumption in sub-systems, but the types of data that are needed to ensure a consistent water flow diagram are well-defined.

Data about the local watersheds are important when companies wish to address water-related risks and opportunities. Some information may be provided directly by the resource (such as for Aqueduct or WWF/DEG Water Filter), but complementary data may have to be gathered in collaboration with stakeholders from the basin (e.g. river basin authorities in the EU) (such as for GEMI-collecting the drops). Good collaboration and stakeholder participation is key to accessing the data, but also in identifying what data does not exist at the river basin level. It is important to

use time efficiently and rather than looking for data that do not exist, find other alternative methods.

Water data from the **supply chain** (to assess water embedded (virtual water) in products) is identified as the most difficult data to gather. Indeed, suppliers are not always inclined to provide this kind of data due to confidentiality issues, or have not engaged in identifying their water use or water-related impacts. In addition, the concept of virtual water is still very new and the selection of relevant reference data depends very much on the origin of the supply, the nature of water (blue/green/grey) and the production of the raw material that is investigated. Prospective users of the WFN methodology, the BIER water footprint or Cafédirect EcoToolkit would need to consult their suppliers in order to collect the relevant data. While for agricultural products, many studies and datasets have emerged in recent years, some specific sectors (e.g. construction[19]) may lack reference databases and rely on the availability of environmental product certifications (EPC) to address virtual water.

Some business users may have to **build their own database**, in line with their own and the suppliers' activities. Although the WFN developed the water footprint methodology and still provide updates and support to interested parties, they have a facilitator role and do not plan a fully centralised database, which would be suited for any business sector. It is expected that third parties (e.g. federations or academics) would independently develop sector-specific databases. Such databases would follow similar formats but the WFN would not be responsible for the dataset that the business users would choose (similar to LCA studies where businesses can choose between Ecoinvent[20] inventory, GaBi, or Umberto[21] software).

In general, the data required is proportionate to the level of analysis required by the resource or the size of the organisation using the resource. For the smaller SME-focused resources most of the required data was available through bills or meter readings.

- **Practicality of the resource**

Many resources are **straightforward and intuitive** to use. They have online support documentation that business users consider sufficiently self-explanatory and useful. Moreover, WBSCD Global Water Tool and WWF/DEG water filter provide Excel spreadsheets to guide the use of the resource.

Some resources benefit from **active support from the developers** who can provide tailored advice during the implementation (e.g. European Water Partnership for EWSS, WFN for the WFN methodology, Business Stream for the benchmarking tool). In addition, training could be organised for the user to become acquainted with the resource, as experienced with EWP's one-

[19] However, water footprinting databases are available from the University of Bath in the UK and Sustain relating to construction products. In addition, work by Sustain will begin in April 2012 to improve the coverage and quality of its water footprinting database, thanks to a grant from the Technology Strategy Board in the UK

[20] The Ecoinvent database provides access to unit processes as well as to cradle to gate inventories, addressing energy supply, resource extraction, material supply, chemicals, metals, agriculture, waste management services, and transport services.

[21] Software for life cycle assessment , energy management and eco efficiency developed by ifu Hamburg GmbH

day onsite training session. Such a training/introductory session (which could be physical, or online, as tutorial video) would be useful to ensure that the users understand the different functionalities of the resource (e.g. Aqueduct). Where resources may be interpreted differently in different sites, some businesses may consider developing their own training to ensure a harmonised implementation.

Several resources (e.g. WFN methodology, GEMI-collecting the drops, WWF/DEG water filter) can be applied to **different scopes**. The more locations, sub-systems and/or supply chains are included in the scope, the more complex the implementation of the resource is. This is the case because increasingly precise data is required, and a finer understanding of the system assessed. Therefore, it is important for prospective users to clearly define the level of analysis they aim for, and adopt a progressive approach to go further into details once they are more experienced with the resource and its outcomes.

- **Assumptions used in the resource**

Business users generally **trust the outcomes** provided by the resources and do not feel the need to fully understand what and how datasets are computed to deliver results. A full transparency on the data sources is often considered as a sufficient warranty, however this is not always immediately available. This may however depend on the resource used and the knowledge/expertise of the business user regarding water resources. Business users acknowledge the fact that the underpinning assumptions are important and are required to build a resource, however, it is not necessary for them to understand or go into the detail of these assumptions.

Some business users regret that **no indicator of uncertainty** is provided in the resources, to help them understand the results and focus their efforts. However, as recognised by several business users, the evaluation of water use and water impacts is a complicated task and uncertainty is intrinsically difficult to measure.

Business users appreciate having contextual information such as who else is using the resources and what limitations have been observed. Some resource developers (e.g. EWSS, GEMI-collecting the drops, Aqueduct) promote the fact that companies support the resource and have tested it in pilots and/or a working group with several well-known companies that contribute to the financing, development and/or testing of the resources, in order to strengthen the credibility of the resources. For prospective users, it might indeed be interesting to know which resources companies in the same sector, or companies of the same size are using (to have comparable information relevant to their sector/activity, as for the Business Stream benchmarking tool, or to identify resources that are easy-to-use/adapted to them). This objective may be more important than understanding what reference indexes or calculation factors are used (at least in the first stage).

There is a **trade-off between adaptation and complexity**, for users wanting resources to be detailed enough to be specific to their business, but not too complex. This is particularly true for SMEs where the resource has to be simple enough to be used by a resource constrained user, but complex enough to cover a huge range of activities and businesses. This is where users expressed a desire for more benchmarking and a better understanding of who else was using the resource (this was a particular issue with the Business Stream tool and is something that is being

addressed, because as the number of users increases the data availability increases, thus improving the benchmarking).

Moreover, the resource developers often provide updates/supplements to datasets and/or support in the initial steps of the implementation (e.g. EWSS, GEMI-collecting the drops, WFN methodology, WWF/DEG water filter) to help business users properly adjust the resources to their situation if needed. This contributes to building trust within the business users.

- **Suitability of the resource**

The analysis of suitability is not straightforward, as it is important to distinguish whether the resource was found to be unsuitable because the business user selected it for the wrong reasons (i.e. selected a resource that would not meet its needs) or because the resource was in fact not suitable, even if the business user selected the correct resource. Any prospective user must, before selecting a resource, be very clear about the results they want the resource to achieve.

Based on the interviews, business users are usually **satisfied** with how the resources respond to their needs. Some users have indeed qualified the WBCSD Global Water Tool, Aqueduct and the GEMI-collecting the drops as powerful resources. The resources are currently well suited to businesses, in particular companies that have little previous knowledge on water efficiency/risks.

With more exposure given to water risks - in particular with regard to climate change, it is expected that businesses may be more demanding in the future about what the resources can offer. The Aqueduct resource, which integrates forward-looking risk assessment features, is particularly suitable for such cases. Improvements in terms of spatial and time increments (e.g. large geographical coverage and shorter timescale) have also been identified (e.g. for WBCSD Global Water Tool, WWF/DEG water filter).

Some sector-specific resources (e.g. BIER water footprint, Cafédirect EcoToolkit, Business Stream water benchmark calculator) have been developed to closely fit the company's activities. This could reflect a growing interest for businesses to implement sector-specific resources to set grounds for a benchmarking / comparative analysis within their sector.

Also, resources such as the WWF/DEG water filter are sophisticated enough to be tailored to the level of detail required and are now able to consider socio-political aspects.

- **Cost**

Most resources are **openly available online** (e.g. Aqueduct, GEMI-collecting the drops, WBCSD Global Water Tool) so any costs are mainly related to the time/person-days that are required to understand the resource, collect the inputs, and exploit the outcomes and will depend on the size, location(s), availability of data and objectives of the company.

Direct costs could be introduced with the installation of water meters to monitor water flows within a facility at precise stages (e.g. for GEMI-collecting the drops or WFN methodology applied to a product). The collection of data from suppliers is considered as a major time-consuming task, in particular for resources that target virtual water (e.g. WFN methodology, Cafédirect EcoToolkit).

The EWSS certification scheme generates implementation costs, as external auditors are required to grant the certification at site level. The cost will depend on the size of the company

(and the number of certified sites) but are currently considered reasonable by the users (e.g. 2,000€ for a paper plant). With a growing public recognition of the EWSS certification, prospective users may expect shorter returns on investments.

Most costs identified were related to the **time** it takes for business users to collect the data and compute the results. This time depends very much on the expertise of the user, the data availability and the scope of the assessment. For example, the WBCSD is estimated to take between half to two person days for the assessment of direct water use, but much more if the supply chain is included; GEMI could take three days if the data is available, the EWSS took one man-month to be implemented in the paper company, and the WFN can take up to 5 months for a product assessment, and 1 year for a corporate assessment if the time for all data collection is included.

Since the use of the resources generally results in identifying water savings, the consensus was that the cost-effectiveness of the resources investigated is good.

- **Ease of and suitability for communication of outputs**

Results from the resources can be used for communication purposes at two different levels: **externally and/or internally** and to **different types of stakeholders**: investors, shareholders, wider public. When choosing a resource, similarly business users must ascertain that the resource allows them to communicate to the audience they wish.

Based on the feedback, the results from the resource are generally communicated **internally**, addressing people that are more knowledgeable and with the possibility to explain the results in more detail. Discussions on corporate water-related risks and opportunities are still recent (and less common than for climate change) but are emerging and increasingly communicated at the board level (57% of Global 500 respondents, against 94% on climate change, according to the CDP Water Disclosure Global Report 2011). The WBCSD Global Water Tool, GEMI-collecting the drops, WWF/DEG water filter are relevant to identify 'hotspots', raise awareness internally about them and incentivise adapted water management strategy actions at site/facility/company levels. Some resources can be used to support environmental claims or be part of the company's environmental strategy (e.g. EWSS). It is important however that the context and meaning of claims are clear to the recipients.

Some resources provide information targeting **specific users**. For example the WWF/DEG Water filter targets investors, to let them analyse water risks of the companies, and Aqueduct has predictive features considered a strong asset when communicating with investors.

The EWSS can be quite easily communicated to the wider public and customers as it provides simple information about corporate water management. The fact that environmental certification is already relatively well known by the public makes that communication easier.

Awareness about water impacts and water risks is growing within the wider public. With the launch of various water-related resources, public interest for water issues and its understanding of results provided by the resources is expected to continue to rise. External communication is thus expected to be easier in the future, and could be a stronger driver for businesses to use such resources in the future.

5.1.3 Analysis by sector

- **Sector-specific resources**

As discussed earlier, one main interest for prospective users is to know what resources similar companies (in terms of size and/or business activity) are using. Any sector-specific resource ensures that the assessment is adapted to their activities. The BIER water footprint, Business Stream water benchmark calculator and Cafédirect EcoToolkit resources address this issue, although they do not provide information for the same objectives of a company in terms of scope (i.e. direct water use, virtual water or both).

- **Generic resources**

Most resources are not sector-specific. This enables prospective users to adopt a more general approach to corporate water issues. As acknowledged by many stakeholders, the assessment of corporate water use and its related impacts is intrinsically complex and a resource covering all scenarios and responding to all business' needs is not appropriate. The businesses agree that they may need to implement an adaptation phase to better adjust the generic resource to their specific activities, as seen with GEMI-collecting the drops and the EWSS (which for example has specific criteria for specific sectors).

5.1.4 Analysis by size of the company

- **SMEs**

Compared to large companies, SMEs usually have limited means to investigate the possible resources, ensure a proper selection, and implement a thorough water management strategy to improve their water efficiency and/or mitigate their water impacts. Guidance is required to provide them with sufficient information about what is available and what would meet their needs. The first time a resource is used it is time-consuming but SMEs can expect higher returns on investments once they are familiar with a resource and keep using it. Moreover, as many environmental initiatives target energy savings, a competition between the water and energy sectors can take place in terms of prioritising saving measures and SMEs may then favour energy over water actions as the returns on investment are shorter in the energy sector (partly due to a low water pricing).

SMEs are less likely to have different production/ exploitation sites, which would make the water assessment complex at corporate level – although it also depends on the business sector. Therefore, the use of resources, which feature mapping functionalities or integrate local watershed data (e.g. WBCSD Global Water tool, Aqueduct), can be relatively easy to use for an SME, if the location of the company's site is geographically covered by the resource.

In practice, many SMEs use water in a way that is very similar to domestic households. For example, SMEs may be single shop/restaurant/café owners whose water use is based around basic washing and sanitation purposes. These businesses may be more likely to engage with, and respond to, the same sort of information that domestic households are given on water usage and consumption, in particular with regard to water-saving devices.

- **Large companies**

Large companies have the possibility to gradually implement resources to address their water uses and related impacts, extend the scope of investigation (direct water use / embedded water in the supply chain, product/process/site) and integrate the best functionalities of the resources to foster the optimisation of their water management and possibly identify the related risks and opportunities.

Some companies choose to launch pilot studies on specific sites to test the practicality and the suitability of a resource (e.g. for EWSS, Aqueduct, GEMI-collecting the drops). Given the recent development of these resources, the business users also expect updates and further tailored adjustments of the resources to be made, before full-scale implementation (i.e. in each company's site) could be envisaged, as highlighted by several interviewed users. With such pilot / preliminary studies, the environmental manager can also ensure that a consistent approach will be set up in the different company's sites.

Large companies can also contribute to helping SMEs engage with a specific resource. For example, a large company may be using a resource (or developing one) to assess the virtual water from its supply chain. It thus has to gather data from suppliers including SMEs. The large business may in that case ask the SME to use the resource for its own assessment, and could even train its suppliers in using the resource.

5.2 Overview of the scientific robustness of the resources

As presented in section 5.1, business users usually trust the outcomes of the resources while recognising the complexity of the water-related issues. This section further explores the scientific robustness and the underlying concepts of the resources.

Many water-related resources have been developed to help business users, by specialised NGOs, consultants or authorities and set the basis for initial screenings and preliminary assessments. Therefore, they are subject to limited scientific scrutiny and little criticism has been reported so far on several of the selected water-related resources. However, as for any methodology or calculation, the resources have shortcomings. For example, indicators are always developed to respond to a specific question, but may then be used (wrongly) by new users to explore other questions. Criticism will then arise because the indicator is not suited to the latter questions. In addition, most attempts to quantify issues involve a simplification of the problem (this is in particular the case for water issues, which are intrinsically complex). This means that the choices made may neglect some aspects, which can then be criticised. In addition, for water-related issues, and as seen above, the data used is most relevant if both locally and seasonally precise. However, this data is not available everywhere or for all facilities and may require some effort to gather. Lastly, certification schemes use indicators, and are thus a reflection of the indicators that are used. Understanding the messages provided by the certification requires knowledge about the certification scheme.

For some resources however, or concepts that the resources are using, it may be useful to explain further the underlying assumptions and potential issues raised by the resources. Three main scientific concepts are discussed in this section: **water footprint, water balance and mapping functionalities** and a short overview of the ten selected resources in terms of what they entail follows.

5.2.1 Concept of water footprint

With regard to the range of resources that are covered in the report, the main scientific debate relates to the concept of water footprint. The WFN methodology was developed in a scientific way and many results have been published in peer-reviewed academic literature[22]. This shows that the method has been developed with strong scientific underpinnings. However, the choices made and the underlying reasoning behind the method are still actively discussed within the water community. Indeed, there are several methodologies referring to water footprint, which are not necessarily exactly using the WFN methodology, and which may make communication about the resource less clear. With carbon footprint gaining more exposure, the use of water footprint may become more popular although it may not be well-defined and/or understood by users/consumers in the same way in many cases.

The study for the European Commission on water footprinting, labelling and certification schemes[23] identifies three approaches for the calculation of a water footprint, 1) a volumetric, 2) a stress weight and 3) a life cycle assessment approach. The volumetric approach differentiates blue, green and grey water, but does not reflect whether the abstraction risks causing environmental impact. There does not seem to exist a generally agreed methodology to use water footprinting in LCA methods (e.g. Jeswani & Azapagic, 2011[24]; Berger & Finkbeiner, 2011[25]). The study for the European Commission concludes that there are some outstanding key concerns (conceptual, methodological and interpretation related) in the use of water footprinting methodologies. Therefore, users should be careful in communicating about the use of the resource, to ensure that the methodology they are using is clearly referenced, and that the assumptions used are clear to serve their purpose.

5.2.2 Development of a water balance

Some resource developers have successively upgraded the functionalities and the scope of the resources, such as the series of GEMI resources: GEMI-connecting the drops, GEMI-collecting the

[22] See the Waterfootprint.org website for a list of peer-reviewed journal publications.

[23] RPA and Cranfield University (2011) Assessment of the efficiency of the water footprinting approach and of the agricultural products and foodstuff labelling and certification schemes, Report for the European Commission reference ENV.D.4/SER/2010/0051r

[24] Jeswani HK and Azapagic A (2011) Water footprint: methodologies and a case study for assessing the impacts of water use, Journal of Cleaner Production, Vol. 19, Issue 12,pp. 1288-1299

[25] Berger M & Finkbeiner (2011) Water footprinting: How to address water use in life cycle assessment? Sustainability, Vol. 2, Issue 4, pp. 919-944

drops and GEMI-Local Water Tool, which guide the business user through corporate water management.

A full understanding of the direct water use requires the set-up of a comprehensive water balance with the implementation of an input/output modelling. As shown in Figure 5, GEMI-collecting the drop enables a systematic identification of water flows for a specific site/facility. Water can be obtained from on-site wells, water purchased from/distributed by the municipality, as well as from rainfall events. The output streams include:

- water that is evaporated from the facility (e.g. from cooling towers),
- water that is contained in the facility's products (e.g. a beverage),
- water that is discharged to the ground or leaks from the facility's water distribution system (piping),
- the effluent from the facility's on-site wastewater treatment facility which is discharged to a surface water,
- sanitary wastewaters which are sent to an off-site wastewater treatment facility operated by the municipality,
- storm water runoff (following a rainfall event).

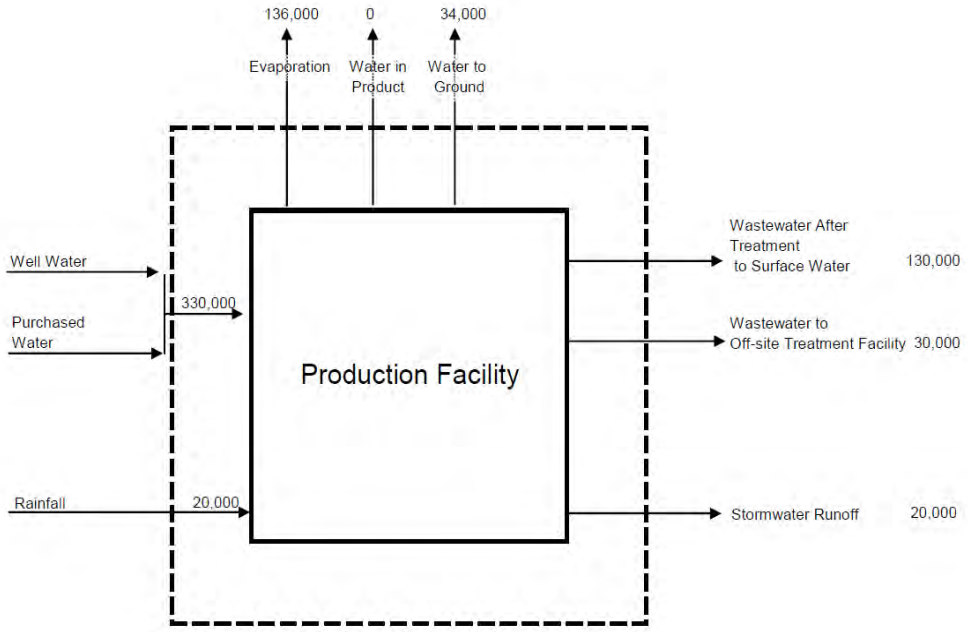

Figure 5- Example of a water balance at facility-level

After identifying the inputs and outputs, the business user has to quantify these flows. To meet any water reduction target at site-level, the facility manager may implement a water balance to help prioritise his/her efforts to save water. It is important to understand that the final purpose of the water balance may not be to achieve a 100% closure of the water balance (where the water inputs equal the water outputs) but rather to understand where the largest shares of water are used. There are many ways to quantify the input and output flows including, metering, engineering calculation, process knowledge and engineering judgment. Some calculating tools

are provided in module 1 of GEMI-collecting the drops, to support site operators and help them understand fluid flow fundamentals, friction loss and pump hydraulic horsepower. This contributes to improving the robustness of the assessment.

5.2.3 Development of mapping functionalities

Water scarcity can have a devastating impact on local communities and mapping projects have sprung up all over the world to better inform on this issue. Techniques range from simple hand-drawn maps to using global positioning systems (GPS), geographic information systems (GIS) and other digital technologies.

Mapping resources such as Aqueduct or WBCSD Global Water Tool directly compute some clearly identified external databases for global maps. The resource developers make efforts to be transparent (e.g. origin of the database), and to update and document the resource. This tends to build trust within the users of the resource and strengthen the robustness of the resource.

However, these mapping resources present some limitations: although they cover local aspects, social and political factors are difficult to integrate in the resources. Indeed, the mismanagement of water utilities, governance deficits and the attitude of local communities can represent risks as relevant as wasteful water use or physical water scarcity. There are some concerns (e.g. from International Rivers[26]) that mapping resources will enable companies and investors to make more money without taking local people's needs into account.

5.2.4 Selected resources

- **Approaches**

As identified above, any indicator, quantification and certification resource may be criticised as having taken certain choices, considered more or less adequate by other stakeholders. The following compiles some information about the methodology, resource development and data required for using the resources.

Several of the resources use **indicators**, that are more or less transparent, and more or less widely used. Aqueduct and the WWF/DEG Water Filter all compute (different) indicators of risks, based on several components. The methods used are quite transparent, and are based on expert advice. The WBSCD Global Water Tool also computes indicators, that are well-known such as the GRI water indicators, etc. The Cafédirect EcoToolkit computes very simple indicators. The EWSS uses indicators that are then combined to assess the level reached by the site. The development of the standard was based on pilots to test the adequacy of the indicators and their adaptation to specific sectors.

The WFN methodology attempts to **quantify** water use, using indicators. The methodology was developed with robust scientific background and several peer-reviewed publications exist that

[26] Article published on 24 July, 2012. www.trust.org/alertnet/news/water-maps-spark-concern-about-liquid-gold-rush

have used this method. However, different ways of calculating a footprint exist and what should be included in the scope of a footprint is the subject of continued debate (see Annex 4).

Other resources **categorise** businesses, such as the Business Stream Water benchmark calculator. How relevant the categories are and whether water issues is well reflected by these categories is arguable.

Another approach taken by resource developers is to **provide information** rather than calculations. This is the case of the Ripple Effect, which is organised as a training module with no datasheets or algorithm; and module 3 of GEMI Collecting the drops also provides case studies and examples to help business users find adequate solutions.

- **Data**

In terms of the data used, resources also widely differ, between resources that require a **lot of input and assessment** from the user, and resources that use external databases; and in terms of the **type of information** that the user has to input.

GEMI Collecting the drops **requires the user** to perform a risk assessment based on local information and his own expertise. While the assessment is guided, and some information to access global data is made available by the resource, this means the expertise from the user may change results. The uncertainty that this provides is recognised in the methodology. As the outputs are a ranking of water risks, this may limit the risks of inaccurate information. All resources require some input that must be collected by the business user, WBCSD Global Water Tool requiring one of the least demanding inputs, while a detailed implementation of the WFN methodology at product or site level, including supply chain information, may require quite some data. However, there is a **trade-off between the amount of data required as input and the preciseness of the results**, as the use of global information will necessarily provide less detailed information than site-specific or company-specific information.

Aqueduct, the WFN methodology, the WBCSD Global Water Tool and the WWF/DEG water filter all use **external databases** that are publicly available and considered by the developers as credible. This allows in particular mapping of risks, and is quite relevant but depends on whether the granularity of the available data matches the need for preciseness of the user. The developers have in general used expert review to assess the credibility of the data and use best information available. The Business Stream Water benchmark calculator partly uses external data based on the expertise of the developers, but mostly uses data from other users, for the benchmark, thus relying on the preciseness and adequacy of reported information.

Chapter 6: Conclusions and recommendations

This report investigated the reasons why businesses may be interested in assessing the impacts of their water use and identified water-related resources that are available to help businesses to identify, understand and deal with these impacts.

With the cooperative support of a Business Group composed of UK water stakeholders, the study:

- Identified the different drivers and scenarios that lead businesses to identify and monitor the impacts of, and risks related to, their water use.
- Mapped 34 resources on water that tackle the issue of corporate and supply chain water impacts of business.
- Evaluated in depth ten of the above resources on the basis of whether they respond to the expected needs of a business, the cost of implementing / using them, the availability and robustness of the data and the ease with which they can be communicated.

This final section includes four parts:

- The presentation of the key findings of the study,
- The limitations of the study,
- The identification of potential barriers for the implementation of the resources,
- Recommendations for next actions.

6.1 Key findings of the study

Water is a complex issue, and business users recognise that the large number of resources available to understand water issues is desirable to cover all aspects, even if it requires guidance to help prospective users identify resources adapted to their needs. Water includes quantitative and qualitative issues (that are linked, as less water also reduces dilution of pollutants), and requires an understanding of different aspects, from water use to water impacts, through water risks. High water use does not necessarily lead to increased water risk or impact, as the local water context must be taken into account (i.e. where water is abundant, high use does not necessarily lead to increased impact). In addition, climate change is expected to impact water resources, and thus business activities, in the future.

Water is a rapidly emerging topic for businesses, who increasingly understand water-related risks and impacts. A wide range of resources exist to help them identify, understand and deal with their water-related issues. The fact that many resources are available may be confusing for businesses not yet engaged in water issues, but is actually considered by those businesses engaged as very positive, as it allows addressing the various aspects of water-related challenges.

However, the need to help businesses that engage in considering their water use, impacts and risks has been identified as a strong demand.

Six categories of specific objectives/business needs were identified for this study and enable to classify and map the identified resources:

- High-level screening of corporate water impact
- Quantification of water use for corporate activities
- Quantification of water use in the supply chain
- Assessment of site-specific water impacts
- Assessment of product-based water impacts
- Identification of risks

The report provides many insights into a number of resources from a user's perspective. The results show that generally business users are satisfied with the water-related resources they have been using, and find them cost-effective.

The data to be gathered can be an issue, as data is not always available at the right level of detail, and thus data may require further investigation and collaboration at local level before the water-related resource can actually be implemented. While users recognise that assumptions are included in the resources they use, they accept the decisions taken by the developers without necessarily feeling a need to understand assumptions in detail, although some demand for better assessing uncertainty was underlined. Indeed a better evaluation of uncertainty would help assessing with more certainty the actions that need to be taken as priority.

Lastly, some resources are more suitable than others as a basis for communication, which is an important aspect to consider when choosing the resource to implement. Some resources will be more suitable for internal communication, others for external communication, and some adaptable to both. In all cases, better understanding of the consumers/broad public about water issues would be needed to fully take advantage of the information provided by the water-related resources.

In addition, the study identified that the resources that identify water risks have emerged quite recently (the WWF/DEG Water filter for example). Currently, while information on identifying use, impacts and to a lesser extent risks are available, resources that help businesses identify what they could do about them are still lacking. Developing resources that serve this function would be an important improvement potential for future resources, so that efficient actions are taken by businesses.

This report helps businesses find the information on appropriate resources to address different situations (see Figure 1). In particular, the classification table (Table 3) enables potential users to easily identify the resources that are best suited for smaller vs. larger companies, or specific sectors. Assessment sheets for a selection of ten relevant water-related resources covering the six specific objectives have been further elaborated based on the practical feedback of current business users (see Annex 4) and bring valuable input to support a prospective user's decision.

6.2 Limitations of the study

The report gives an overview of the drivers and scenarios to address corporate water management and details the assessment of ten specific resources. The ten resources were selected to cover and address the different objectives identified, and are specific to certain sectors or size of businesses and do not indicate any specific preference over resources that have not been assessed in detail. Prospective business users can use the filtering function (Annex 2) of the summary table (also as Table 2) to identify potential resources that fit their requirements. The short factsheets in Annex 2 may already help them identify whether a particular resource is appropriate to fulfil their needs. Further assessment sheets could be developed in the future to cover additional resources.

Due to the scope of the study, the number of interviewees was limited for each resource assessment (two to three business users). The feedback on each resource, which is the basis of the assessment sheets, is therefore rather limited and should be considered with caution as it may not be fully representative of all types of business users. In the future and based on this first analysis, more business users could be interviewed or a survey implemented to gather further information on the resources. A questionnaire with further questions on the resources used by businesses had a very low response rate in the course of this study. This can be partly explained by the fact that corporate water management is still an emerging issue and some businesses may need more time before evaluating the implementation of water-related resources. Interviews led to more fruitful information exchanges as the questions could be adapted according to the business's engagement (e.g. in the process of implementation of the resource, experienced user, user of several resources). Another issue is that some business users are also identified as financing and supporting entities of the resource presented, which has given a better understanding of the development of the resource than a user perspective alone, but may also introduce some bias.

6.3 Gaps, improvements and recommended actions

Based on the analysis performed in this study, four main levels of improvement to existing resources are identified to help businesses understand and manage the impacts of their water use. They consist of:

- Raising awareness and encouraging businesses to engage with corporate water issues
- Helping businesses identify and select the adequate resource
- Improving the data flows and data collection to use the available resources efficiently
- Further developing the available resources and the induced methodologies

Stakeholder cooperation is key to delivering these improvements, by raising awareness of other businesses, increasing the exchange of data between stakeholders, and improving the exchange of best practices with regards water management in the watershed.

- **Raising awareness and encouraging businesses to engage with corporate water issues**

The resources assessed in this report will help cover different business needs (e.g. risks, quantification, etc.), but it may be difficult to **attract the businesses' interest** in the first instance. As discussed with stakeholders, some preparatory actions to educate businesses and raise awareness on corporate water management would be useful and complementary to this study. Indeed, this report may be useful to businesses seeking to engage with and address their water use, impacts and risks, but is unlikely to reach the businesses that do not engage. These businesses would need to be targeted specifically to ensure higher uptake and thus more sustainable use of water by businesses in general.

Proposed actions:

By Government, advisory bodies and NGOss:

- Organise campaigns targeted at businesses that are currently not engaged with water issues, that raise awareness about issues and business risks associated with lack of water management.

By businesses already engaged:

- Involve suppliers and clients in water management issues and raise awareness to reduce own risks at the same time.

- **Helping businesses identify and select the adequate resources**

Another gap identified, that had already been identified by Defra in launching this study and was confirmed during the research, is the lack of knowledge about the existence of resources, about where to find the resource, and how to choose the appropriate resource. An important finding of this study is that the number of resources available is not considered an issue by businesses, as each corresponds to a different need. However, this means that there is a need for guidance to select the resource(s) that is/are most suitable to a business' corporate needs.

Proposed actions:

- Development of a decision-support framework with regular updates

The guidance to businesses could have the form of an online decision-tree for instance. In addition, complementary guidance with tutorial and practical case studies could be published at a later stage. However, this would require a fuller assessment of more than 10 resources. An ongoing project is needed to assess all existing resources in detail (in a similar fashion to the 10 assessed here) and then assess new resources when they are produced.

- Development of a web portal

A web portal for businesses enabling them to find information about the available resources, providing elements to help businesses choose the most appropriate resources, would be an interactive and easily updated form of information. A 'Wiki' could enable users to make comments and update the review of the resources as they use them, and users could rate the

tools they are using. Currently, the CEO Water Mandate has already set up an internet forum providing information on a selection of tool. This type of web portal could potentially be linked to the actions of the CEO Water Mandate and/or attract support from the European Commission. A coordinated approach working with one of these parties may be an option which could have the benefit of wider exposure. A more specific page specific to UK businesses could be envisaged to tackle issues that are specific, including maybe specific data.

- **Improve the data flows and data collection to use the resources efficiently**

While the presented resources are effective in addressing certain business needs, some limitations may prevent a business from fully implementing the resource and assessing its water use and its related impacts. This includes the lack of capacity among the company's human resources, insufficient water management and/or infrastructure (e.g. no water meters), the lack of cooperation and harmonisation between stakeholders (e.g. suppliers, customers), inadequate communication and engagement with local water authorities and/or lack of data at the relevant location/scale. It must also be recognised that all businesses do not have the same responsibilities in terms of water issues, and cannot solve water issues alone, but may require the contribution from other water users.

With regard to **data collection**, three main issues can arise:

- Lack of available data at site/company level

Collecting data at site level, or company level, can be based on water bills from water companies and be relatively straightforward, but it can also require the installation of water meters at different steps of the production chain to identify the quantities of water used for different products, parts of the facilities, or types of uses.

- Low availability of external watershed data

Generic databases that provide regional/national characteristics are very convenient, but **local water contextualisation** with river basin information is often needed to ensure a comprehensive water assessment of a business site/facility. Improved cooperation and adequate dialogue with local water managers and NGOs could be fostered when implementing resources.

- Low availability of supply chain data

Although many business sectors recognise that their supply chains represent a key aspect of their water use and impacts - as highlighted in the CDP 2011 reporting[27] , they may face the difficulty in collecting reliable and sufficiently accurate data from a various network of suppliers at international level, as well as the fact that many companies purchase their supplies on global commodity markets that do not allow a clear traceability on the origin (e.g. including the involved watershed(s)) and the production scheme(s) of certain goods makes this even more difficult.

[27] Carbon Disclosure Project, 2011, CDP Water Disclosure Global Report

Proposed actions:

For corporate managers:

- Set up of an internal reporting system (with key indicators) that requires the installation of a suitable water-metering infrastructure
- Traceability guidelines - in complement to suppliers guidelines - can be developed to encourage the supply chain characterisation

As a collaboration between stakeholders:

- Identification and use of effective and harmonised metrics for business operators and local water authorities to foster a dialogue between involved parties
- Set up of common databases that collate data from a certain sector, or at river basin levels

Such actions would also save time and possibly compensate the lack of capacity among the company's human resources to implement any water-related resources.

- Improving the available resources and the induced methodologies to suit the businesses' needs

The study shows that most business users interviewed currently trust the outcomes of the resources. There is also recognition of the complexity of the water-related issues and needs for robust resources. A **higher scientific scrutiny** and discussions about the underlying concepts of the resources may arise in the future, with further debates and improvements in the methodology, thanks to the advancing scientific discussions.

For water-related issues, the data used is most relevant if both locally and seasonally precise. As discussed earlier, this data is not available for all river basins at a relevant scale or for all types of sectors and may require some effort to gather. Currently, efforts are made to integrate **complementary databases** within the resources. In that regard, a continual improvement needs to be maintained, possibly in collaboration with business users that also collect data.

In addition, a gap identified by some businesses was the need to **appreciate the uncertainty of the outcomes** of the resources, which may be an area for improvement.

The potential implementation of water-related resources could also lead to sustainable actions on broader environmental issues by highlighting the **links between water and energy** and encouraging the efficient use of resources to a larger extent. Indeed, identifying trade-offs between water and energy benefits in related resources to also cover energy saving, or the optimisation of industrial heating systems (as heating water may represent a high share of the energy requirements) could help businesses choose more sustainable options.

Further inclusion of water quality aspects is expected in the future development of water-related resources. Water quality has been addressed by environmental legislation such as the Water Framework Directive (WFD) and companies are subject to regulatory requirements in

terms of what substances they are allowed to release in the environment (and to which thresholds) for some time now. Companies are however increasingly recognising the links between water quantity and quality and water-related resources are currently developing to address corporate wastewater discharge and evaluate the local impacts on ecosystems and communities (e.g. the WWF/DEG water risk filter). The further inclusion of water quality aspects in corporate water management may also be driven by the development of water recycling and water reuse schemes that have gained more exposure in the last years.

Proposed actions: (for resource developers)

- Integration of uncertainty components in the resource functionalities
- Further developments to strengthen the scientific robustness of the resources.
- Continual integration of updated and extended databases (in terms of geographic and seasonal characterisation)
- Integration of potential trade-off schemes between water and energy
- Development of water quality indicators and methods, in particular with regard to water recycling and reuse
- Integration of local environmental regulation (e.g. the Water Framework Directive in the European Union) within the implementation of the resources

- **Stronger cooperation between stakeholders**

A **strong cooperation and transparency** between all stakeholders would be a means to achieve many of the objectives stated above. In particular, B2B cooperation would incentivise sustainable practices for businesses in the same sector, or at different levels of the supply chain, and potentially create synergies in terms of **shared efforts** (both in terms of financial investment and in time). In addition, businesses could share best practices and work together on improving practices.

At local scale, companies that operate in the same catchment(s) could also benefit from cooperation. As businesses are exposed to similar water-related risks and locally contribute to the same type of water impacts, they would learn from each other and **discuss best practices**, effective implementations of suitable policies and innovative technologies that can help them reducing their water impacts and/or their vulnerability to water crises. In addition, they can engage in fruitful collaboration with local water authorities.

Proposed actions:

- Coordinated action between businesses of the same sectors, via sector-specific forums
- Exchange of best practices and engagement of businesses throughout the supply chain
- Coordinated actions at local scale between neighbouring businesses to exchange best practices

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Chapter 7: List of references

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Annex 1: List of BG members

The project team thanks warmly the whole Business group for their expert support, constructive comments, and kind feedback throughout the study.

Organisation	Name
CDP Water Disclosure	Marcus Norton Karina de Souza
IGD	Alan Hayes
WWF	Dave Tickner Ashok Chapagain
Pacific Institute (Secretariat for UN CEO water Mandate)	Jason Morrison
FDF	David Bellamy
Unilever	Donna Jefferies
Akzo Nobel	Emma Harper
British Hospitality Association	Camilla Woods
Sab Miller	David Grant
Asda	Chris Brown
Balfour Beattie	Jonathan Garrett
BIER	John Stier
Sainsbury's	Mary Salmon
Anglian Water	Lee Shipsey
P&G	John Bailey
WRAP	Josephine Millar Mark Barthel

Annex 2: Fact-sheets on the identified resources

Fact-sheets on each of the identified resources are presented in the accompanying Excel file.

Annex 3: Rationale for the selection of resources

The selection process was developed to ensure a representative coverage of the ten resources to be further investigated. That includes at least 2 resources for each of the specific objectives (see Chapter 2:) and if possible targeting either different types of users or business sectors.

Where resources were found to be comparable in terms of coverage, their launch date and/or the possibility to gather feedback from stakeholders was taken into account, as explained in the next section. Likewise, priority was given to open resources that are can be easily accessed.

Guidance initiatives and overarching environmental resources, as too generic objectives, were not proposed for a detailed evaluation as their aim is to inform about specific issues, not to evaluate those issues.

- Rationale for the list of selected resources :

High level screening of their corporate water impact

EWSS and the Business Stream water benchmark calculator were proposed to be selected for this category of resources, as they cover SMEs, large companies and all types of business sectors.

AWS and ISO 14046 were still under development and were therefore not proposed to be selected. Likewise, the life-cycle initiative WULCA had not evolved in an operational resource and will serve as basis for the definition of ISO 14046.

GRI was found to be less relevant for high level screening of water impact, as it is not focused enough on water issues. The WRAP Benchmarking tool was expected to be discontinued and was therefore also not relevant for further investigation.

Quantification of water use for corporate activities

For this category of resources, the WBCSD Global Water Tool and the Rippleffect were proposed to be selected for further investigation, as they cover SMEs, large companies and all types of business sectors.

The Water Neutral Offset calculator was considered too specific to South African water consumption, to be further investigated in this study. Moreover, the Corporate Water Gauge requires the purchase of a license and was therefore not suggested for further evaluation.

It can be noted that the Ceres Water Gauge and GEMI-Collecting the drops resources are relevant for this category, but were investigated as resources addressing water issues in the supply chain (see below).

Quantification of water use in the supply chain

For this category of resources, the GEMI - Collecting the Drops was found to be relevant for further investigation, although SMEs or specific sectors are not specifically-covered. The use of GEMI-C is expected to decrease in favour of the newly-launched GEMI Local Water Tool.

Therefore, the project team proposed to select the Cafédirect EcoToolkit as it would cover the specific sector of small and medium foodservice venues.

Moreover, the BIER Water Footprint and the Water Footprint Network that are relevant for this category, were also investigated as resources providing detailed product-based assessment (see below).

Assessment of site- specific water impacts

Aqueduct and the WWF-DEG Water filter were proposed for further investigation for this category of resources, although SMEs or specific sectors were not specifically targeted.

The WAF in the Minerals industry and WaterSense were not proposed for further analysis as they were very sector specific and their geographic coverage (i.e. respectively Australia and the US) were less relevant for the scope of the study.

The Watershed Sustainability Assessment and the GEMI Local Water Tool were considered promising but due to their recent launch, the available information and feedback would not allow a detailed evaluation. It was proposed that the WWF-DEG water filter that has also been launched very recently but for which members of this project's Business Group have expressed high expectations should be investigated.

Assessment of product-based water impacts

For this category of resources, the BIER Water Footprint and the Water Footprint Network methodology were proposed for further analysis.

Identification of risks

Several resources allow the identification of water-related risks, although they may not always lead to a direct quantification of impacts. Based on the proposed selection of resources for the other categories of resources, this objective will be covered by Aqueduct, WBCSD Global Water Tool, WWF/DEG Water Filter and the Cafédirect EcoToolkit.

Summary coverage

Objectives		Type of users		Business sector	
		Specific to SMEs	All types	Specific sector	All sectors
Specific objectives	High level screening of their corporate water impact	BS	EWSS	BS	EWSS
	Quantification of water use for corporate activities	RipplE	WBCSD-GWT		WBCSD-GWT RipplE
	Quantification of water use in the supply chain	CDE	BIER WFN	BIER CDE	WFN
	Assessment of site-specific water impacts		AQD WWF/DEG		AQD WWF/DEG
	Assessment of product-based water impacts		BIER WFN	BIER	WFN
	Identification of risks	CDE	AQD WBCSD-GWT WWF/DEG	CDE	AQD WBCSD-GWT WWF/DEG

Annex 4: Assessment sheets for the selected resources

7.1 Aqueduct

About the resource

Aqueduct, under development by the World Resources Institute (WRI), is an online resource that provides the local context needed to understand, manage, and mitigate water-related risks at site level. The resource creates maps that illustrate the variations in water risk across different sites, and reflects the particular water-related risks that different companies and investors might be exposed.

Aqueduct analyses water risk at two different scales: (1) Global maps and (2) Basin maps, by mapping an overall water risk. In a first version (December 2011) the components were Access and growth constraints (including supply, demand and access), Cost risks (including influent, effluent and productivity) and Disruption potential (including social risks and water resource governance). The latest version (February 2012) considers Physical risk – quantity, Physical risk – quantity and Regulatory and reputational risks. These risks include 14 indicators that are calculated by WRI using the most robust and widely accepted datasets in the public domain, and with support from external expert consultation. Once the data are validated, the indicators are calculated by WRI following a quite transparent methodology, which is expected to be further explained and reviewed in the near future[28]. By design, the methodology entails many assumptions, and is thus debatable, but aims to be as robust as possible, within the limits incurred by data limitation and choices of methodology.

Assessment based on interviews

This resource assessment is based on feedback from three users from large (US-based) companies, obtained through telephone interviews in May/June 2012. The resource is also part of the scope of the UN CEO Water Mandate.

Key findings and expert assessment:

- Easy link between the company´s sites and local water dynamics
- Added value of the predicative feature to communicate with investors
- Limited geographical coverage

[28] The methodology is explained in the following document: docs.wri.org/aqueduct/aqueduct_summary_methodology_document.pdf

- **Reasons for choosing and using the resource**

According to the three users, the resource is very simple to use and enables a link to be made between the company´s sites and local water dynamics. As mentioned by one specific business that runs highly technical hydraulic operations (e.g. hydraulic fracturing), it is very important to have a comprehensive understanding of local water dynamics because critical operational risks can be involved (e.g. groundwater contamination via hydraulic fracturing) and public concern may rise.

Another user highlighted the relevance of the *predicative feature* of the resource (in relation to climate change and population growth). This asset is particularly attractive for investors who can prioritise river basins according to future business developments. These potential projections can influence *"the choice of the location of a new facility"*. This consideration of geographical risk is also of interest to clients as stressed by a third user, as the resource informs about the water-related risks of the river basins where customers would potentially use the company´s products (e.g. water-using systems such as membranes). However, based on two users' feedback, organisational interest in monitoring and improving water management often occurs when crises have already been experienced and, in these cases, the Aqueduct resource (and its predicative feature) has less relevance. Moreover, for two users, this mapping resource is used to complement a more detailed in-house water management programme that addresses direct water use.

The users' feedback shows that the WBCSD Global Water Tool emphasises local water metrics that contextualise corporate water use and that serve as the basis for understanding risks. Its predicative feature is a key aspect when communicating with investors and complementary resources are usually used to address direct water management and face potential water shortages.

- **Data**

Although all three users acknowledge that efforts have been made to integrate more river basins within the resource database, they would appreciate a larger geographical coverage to foster the uptake of the resource, which *mainly concerns China and North America* at this time. One business user also states a desire that specific groundwater data be included in the resource (and not only water stress index).

According to one business user, recent improvement with regard to the list of water indicators (*"less indicators but more relevant ones"*) contributed to a better understanding of the resource.

Based on this feedback, it is expected that the resource would be improved and databases could be more rapidly set up, if more users were to use the resource. Due to its limited geographical coverage, the resource may not consistently respond to all business needs, as a comprehensive comparison between river basins cannot always be performed when choosing a site location.

- **Practicality of using the resource**

Three business users appreciate how easy-to-use and self-explanatory the resource is. One user would still recommend a *thirty minute to one hour demonstration* of how to use the resource. This could be provided via *an online tutorial video*.

Although the list of indicators has been reduced recently, the available information may still appear complex or too technical when looking at all 13 possible outcomes. One user states that it could be useful to have more guidance on which water indicators are more relevant and, in that regard, *have the opportunity to calibrate selected indicators*.

This feedback has revealed that this resource is very user-friendly and powerful. However, the best use of the resource outcomes may require a bit of experience. In particular, the choice of an IPCC (Intergovernmental Panel on Climate Change) scenario (B1, A1B or A2) for projected changes in water stress requires some knowledge background.

- **Assumptions used in the resource, data robustness and availability**

For the different indicators, the resource provides interpretive guidelines[29] and presents the related data sources (see examples for two of the main indicators in the Table below):

Main indicators	Data Sources
Baseline Water Stress	UNH/GRDC Composite Runoff Fields V1.0 (Fekete and Vörösmarty, 2002). Regional estimate of consumptive use ratios by sector (Shiklomanov and Rodda, 2003). AQUASTAT Information System on Water and Agriculture: Review of World Water Resources by Country (FAO, 2003). Global Rural-Urban Mapping Project (GRUMP): Urban/Rural Population grids (CIESIN, 2004). Version 2 DMSP-OLS Nighttime Lights Time Series (NGDC, 2006). Global map of irrigated areas version 4 (Siebert et al., 2006).
Socio-economic Drought	Chronic water stress (see previous section) (ISciences, 2007). Precipitation (*Tropical Rainfall Measuring Mission (TRMM) Monthly (3B-43 V6)* (NASA, 2005). Precipitation (CPC PRECipitation REConstruction over Land (Chen, M., P. Xie, J. E. Janowiak and P. A. Arkin, 2002) as downscaled and distributed by NOAA "Leaky Bucket" model project. Mean monthly temperature AIRS *Level 3 Monthly Gridded Retrieval Product* (JPL 2007). CPC Global Land Surface Air Temperature Analysis - GHCN+CAMS (Fan, Y. & H. van den Dool, JGR 2008). Soil water holding capacity. (FAO, 2003 and Batjes, 2005). Soil moisture (Fan & van den Dool, 2004 JGR). Monthly Snow Melt and Accumulation. *Derived from AMSR-E/Aqua 5-Day L3Global Snow Water Equivalent* (Tedesco et al., 2004). Seasonal Temperature and Precipitation Forecasts (IRI, 2011). Mean Monthly Climatology (New et al., 1999, Climate Research Unit, University of East Anglia). World Development Indicators, 2008-2011 (The World Bank Group, 2008-2011).

[29] Available at: www.docs.wri.org/aqueduct/freshwater_sustainability_analyses.pdf#page=5

All three business users acknowledge that the resource is transparent as it is based on the direct compilation of clearly identified external databases for global maps (see Table above) and for river basins (e.g. Murray Darling Basin Authority, Yellow River Basin Commission, Orange-Senqu River Commission). One user stated that more detailed (on demand) investigations on specific water indicators could be useful, if they are particularly interested in certain key results, but this has not been envisaged yet.

Based on the previous information, it can be seen that the mapping and predicative features are the main assets of the resource and make it intuitive for users. With one click, potential business users have access to comprehensive guidelines that present definition, interpretation, caveats, computational approach and data sources. This builds trust in the robustness of the resource.

- **Suitability of the resource**

All three users think that Aqueduct is a powerful resource that usually responds to the business's needs but the geographical coverage is currently limited and they expect the database to be populated with new river basin information in the future. In addition, a specific business user highlights some *translation issues (especially for Chinese river basins)* that if addressed would optimise the use of the resource.

The Aqueduct resource is still in the implementation phase and usually receives positive appraisals from users due to its straightforward functionality. Further development in terms of geographical coverage and as a consequence, broader exposure, would help the resource live up to its full potential.

- **Costs**

The resource is free and accessible online.

One user appreciates that results can be downloaded into an Excel format, which facilitates corporate reporting tasks (and gains time). Another business user mentioned that one or two people are involved in using the resource (although not on a full-time basis), but it is difficult to assess if the time investment is cost-effective, as the resource is still *at an early stage of development*.

The Aqueduct resource is attractive as it is openly accessible but it is difficult to assess its costs in terms of time. For large companies, it is expected that the benefits outweigh the costs as the resource allows investors to better select the locations for future facilities, thus highlighting the consideration of long-term returns on investments.

- **Communication**

Two users state that the primary objective of the resource is to communicate risk identification with investors as part of *in-depth feasibility studies of investments*. However, the resource could also be used for external communication purposes (two users), to raise awareness of the general public about water scarcity issues.

More generally, all three business users agree that more promotion of the resource is needed as many businesses are not aware of it.

Therefore, the Aqueduct resource can respond to internal and/or external communication purposes. This will depend on the size, the activity (in particular, if any critical hydraulic operation

is processed) and the location(s) of the company. The objective to communicate on the resource outcomes is expected to become more important when the resource gains more visibility and more recognition from public and investors.

7.2 BIER Water footprint

About the resource

In 2010, Beverage Industry Environmental Roundtable (BIER) formed a working group to evaluate and address the increasing global efforts to develop water footprinting methodologies. A "*Practical Perspective on Water Footprinting in the Beverage Sector*" report[30] has been created by BIER members to guide beverage companies in the implementation of existing and developing water footprinting approaches. Although it is currently still under review, it provides clarification and consistency in the quantification of a beverage water footprint and introduces a screening methodology to identify and prioritise water impacts from a beverage business perspective. This initiative is considered as complementary to the existing efforts to develop water footprinting methodologies, not as competing or conflicting. Indeed, it encourages beverage companies to consult these methodologies and use them where applicable.

Assessment based on interviews

The assessment of this resource is based on feedback from the BIER group moderator as well as one member of the working group (from a large company), although they are not active of the resource.

Key findings and expert assessment:

- Practical and complementary guidance on water footprinting, adapted to the beverage sector
- Limited uptake by businesses so far (as it is a very recent resource)
- Need for data transparency to ensure a harmonised and consistent approach within the beverage sector

Reasons for choosing (and using) the resource

Water footprinting is the third component of the BIER Water Stewardship core activities, along with benchmarking and best practice sharing. Beverage companies have indeed gathered to discuss sector-specific water issues in order to develop and implement consistent approaches in these three activities. Indeed, the BIER identified the need for further guidance that is adapted to the beverage sector, since water used in drinks is an ingredient and can be considered differently by different companies using a water footprint methodology without clear guidelines. Work under the BIER will help streamline and clarify good practices. While BIER benchmarking actions have been successfully implemented and annually reported since 2007, water footprinting is still

[30] BIER report, 2011, Available at: http://bieroundtable.com/files/BIER%20Water%20Accounting%20Sector%20Perspective.pdf

an emerging concept and no related reporting from BIER members was published at the time of writing (Summer 2012).

One member of the working group explained that the publication of the "*practical perspective*" was a first milestone towards a better understanding of the water footprint principles and it will foster a higher uptake of the resource by beverage industries, although it will require some time to implement. BIER members are indeed aware of the growing discussions on water footprinting and wish to be informed on the recent developments, even if they are not currently implementing any water footprinting resources. The interviewed BIER member reported that its company is developing its internal water-related resource. Its main interest in participating in the BIER activities is for prospective purposes. Thereby, he can make sure that the internal tool and the BIER methodology remain compatible.

- **Data**

The BIER 'practical perspective' lists the data that is required for the water footprint assessment, to guide a potential business user.

First, the *practical perspective* raises the question of the boundaries of the assessment and suggests starting at a high level by preparing an initial inventory and evaluating the major water consumption activities in the beverage value chain. It is considered that any individual activity that accounts for less than 1% of the total value chain water consumption can be disregarded in the assessment.

Direct and indirect water use and consumption related to the beverage sector are then identified, as presented in the following tables.

Direct water use and consumption	Indirect water use and consumption
Incorporated into the beverage product	Energy
Evaporated from the beverage facility	Beverage Ingredients
Wastewater discharged from the beverage facility	Packaging materials
Embedded water in physical assets	Warehousing/ Distribution
Landscaping	Retail and Consumption
Once through and recycled cooling water	Waste Disposal, Reuse

- **Practicality of using the resource**

The BIER *practical perspective* is well-documented and further guides the business users by highlighting:

- The definition of blue, green and grey waters and the differentiation between water use and water consumption.
- The need for transparency with regard to the river basin size and the timing of data used for each activity in the supply and production chains.

However, the collection of data remains the business users' main tasks and the resource does not provide links and access to available databases.

- **Assumptions used in the resource**

As the intention of this sector-specific initiative is to achieve a harmonised and consistent methodology for the beverage industry to account for and report water use and consumption, it is critical that companies are transparent in their reporting, as highlighted by the BIER group moderator. Transparency includes describing any exceptions to the adopted methodology and where primary and/or default data are used. The business user should clearly list any data limitations and state reasons for disregarding data entries in the company's water inventory and reporting.

- **Suitability of the resource**

Based on the limited uptake of the resource, it is currently difficult to assess the suitability of the resource as no experienced feedback was collected, although all BIER members were invited to contribute to the assessment. However, as shown by the interview of the BIER member and that of one stakeholder using other resources but following the developments of the BIER, there are expectations and prospective interest in the BIER water footprint developments. Thanks to the collaborative approach, it can be expected that the resource will be used by stakeholders in the future, as a useful resource considering the needs of the beverage sector.

Given the growing interest in water footprinting, it is expected that more businesses will be willing to implement such methodologies, and the sector-specific BIER resource is likely to be attractive to the beverage sector as it provides guidance specific to that sector, which is also using water as an ingredient. In the future, databases providing detailed information on water use of ingredients could also be organised at sector-level to help potential users gain time when collecting data.

- **Costs**

The *practical perspective* is openly available on the BIER website. Implementation costs will mainly consist of the human resources to collect the data and perform the assessment.

- **Communication**

As for the BIER Benchmarking annual publication, the BIER group moderator expects a similar report to be formalised once several BIER members have implemented the BIER water footprint to highlight achievements in terms of uptake and water efficiency as well as progress over the years.

7.3 Business Stream water benchmark calculator

About the resource

The Water Benchmark Calculator was developed by Business Stream, a water and waste water supplier in Scotland that serves over 96,000 customers. The objective of the resource is to allow users to compare their business's water usage against others in their sector. The calculator is designed to show customers how they can save water and save money.

The resource is web-based using information from business customer's bills and details about their business type to determine their performance against other businesses within the same category. It then provides information on how the business can improve performance.

This type of benchmarking is an effective way of categorising water use in a way that is directly relevant to businesses. The calculator is not complex, using databases of business water use for different categories. These databases and comparators are based on the data from other users and from Business Stream's experience and expertise in working with different business sectors. However, generally it is very difficult to determine water use based on business classification due to variations between businesses in size, site, water consumption, etc. More information on the uncertainty associated with water use in each sector and more detail on how many other businesses are in the comparator information may be useful for users, however this should perhaps be optional as extra complexity may not be beneficial to some users who value a simple approach.

Assessment based on interviews

This assessment is based on three in-depth interviews from a variety of businesses, performed in May/June 2012.

Key findings and expert assessment:

- Very straight-forward resource that enables budgeting aspects to be addressed
- Transparency could be improved (urban/rural, old/recent data)
- Potential for improved adaptation to specific sectors

Reasons for choosing and using the resource

The respondents cited several different reasons for using the resource. While two customers signed up because they wanted more information on their water consumption, the third signed up in order to assess the resource itself and the value businesses could get out of it. The former users had not used such a resource previously while the latter mentioned that such resources were often provided by many utility companies, for instance gas service providers who offer equivalent services. One respondent said that the Water Benchmark Calculator had not only

helped in managing their water consumption but had also proven to be a useful 'budgeting tool'. Instead of the normal practice of merely assigning a budget based on the previous year's figures, it enabled the business to look at what they should be using, identify the problem and try to lower the costs. In this particular case, the resource flagged up some issues for them because they learned that the average consumption for a business their size should have been 14 cubic metres per day. However, their consumption as per their most recent bill was over double that. So they knew they had a 'massive, massive problem there and it was a push towards getting more involved'. Another respondent reported that they had signed up in order to find out how their business fared in comparison to other businesses in the area.

- **Data**

The data required in order to use the resource was 'very straight-forward' and was site specific information that can be obtained from meter readings or bills or relates to the type of business. Two of the three respondents reported that the Water Benchmark Calculator required very little time in order to use it while the other stated that it took them a couple of days to pull the information together since they did not have accounts in their location and they had to get the figures from their London Office. The data requirements for The Water Benchmark Calculator are clearly not too burdensome, assuming the user has direct access to the water emitters of water bills.

- **Practicality of using the resource**

All three users felt that the Water Benchmark Calculator was user-friendly and required no training whatsoever unless the user was not computer literate. The email looked '*nice and colourful*', and was '*straight-forward and easy to understand*'.

- **Assumptions used in the resource, data robustness and availability**

There were mixed responses with regard to this question. While one respondent felt that a general user did not need to know the hypothesis and assumptions behind the resource because the results were likely to be 'based on the average across the sector', the other two respondents admitted that they would have liked to know more. The reasons given varied. One was interested in knowing why the resource had been put together while the other felt that they were not given a chance to do the analysis for themselves. As a result, it made them feel that the decision had already been made for them and also made the resource appear to be a marketing ploy for selling gadgets and services. For instance, it did not provide them with the consumption of similar businesses in their area, instead stating that their water consumption was high. The respondent stressed the need for better transparency on the benchmark used to judge, whether it was based on urban (considerably smaller and closely spaced) or rural (relatively larger and dispersed) properties, as well as whether it was based on a new build or on old properties.

The experiences of the business users suggests that for this resource it may be useful to provide further information for those that would like to understand the assumptions and data included within the resource. However, understanding the background information should not be a requirement of using the resource as some users are happy to just accept the results.

- **Suitability of the resource**

One respondent felt the Water Benchmark Calculator was appropriate for the business but could be adapted further to better suit their specific sector. For example, for a leisure club the size of the pool was relevant, while in a hotel an in-house laundry would have an impact. A different respondent felt that the resource needed to be far more transparent (as mentioned above). In addition, they also felt the recommendations needed to reflect an understanding of the specific business sector in question. For instance the devices suggested in their recommendations would result in reduced pressure in the showers, which they were concerned could lead to complaints from customers and therefore did not think was an appropriate suggestion. The benchmark could also be made more insightful for the business if the results offered a comparison with similar businesses in terms of the sector and size within a 5 mile radius for urban areas and a 15-20 mile radius for rural customers.

As far as practical, users would find it useful to be able to include business specific details within the resource. Recommendations provided by the resource also need to be sensitive to sector specific concerns.

- **Costs**

The resource was offered for free over the internet. Operational costs were reportedly low. One respondent felt that the cost was minute compared to what they were spending on their water bills; 'Oh it helps save a lot of money. Because we knew there was a problem (a leak) *'what the resource did was help us identify the extent of it, because otherwise I had no way of knowing what I should be using. I had nothing to benchmark against'*. So while the cost of using the resource is minimal, there are potential financial savings to be made through its use.

- **Communication**

It was 'very easy' to interpret results from the resource because 'it was a very nicely laid out email'. Two businesses had not used the results for communication purposes at all while the other had used it for internal communication with the directors of the organization. One respondent felt that it might increase usage if the benefits were flagged up more prominently. For instance, it would be useful to introduce the resource as particularly relevant to specific sectors with statements such as 'If you are in <type of business>, we have saved on average x for these types of customers by doing <this>'.

7.4 Cafédirect EcoToolkit

About the Resource

The Cafédirect EcoToolkit was designed and tested in 2011. The objectives of the EcoToolkit are:

- To support food service venues to reduce their environmental impact in four key areas related to hot drinks: procurement, energy use, waste, and water, irrespective of whether they are Cafédirect customers or not.
- To seek out opportunities to link cost saving to environmental improvements.
- To build the reputation of venues as sustainable businesses, boosting customer appeal and sales.

The Cafédirect tool supports all foodservice venues (not restricted to Cafédirect stockists) to reduce their environmental impact in four key areas related to hot drinks: procurement, energy use, waste and water. It is based around a simple eco-assessment which provides a report-card and list of recommendations for each business, this is provided via email, PDF and browser. Ongoing support is also provided from Cafédirect for questions and advice. The eco-assessment has been developed with expert advice from WRAP, Waterwise, the Carbon Trust, Loop and Keepcup. The tool is underpinned by simple calculations and is aimed at providing guidance rather than detailed assessment.

The tool provides recommendations for how to understand current water impacts, how to measure progress and how to communicate water issues to staff, management or customers. The recommendations include tips on how to track consumption against internal metrics.

As a large number of the users are likely to be SMEs the simplicity and the focus on guidance rather than analysis is appropriate. Users requiring additional information or support are able to contact Cafédirect or, where necessary, the specific experts in the partner organisations (for the water strand of the tool this is Waterwise).

Assessment based on Interviews

This assessment is based on three in-depth interviews with users from a range of organisations, which were contacted by phone in May/June 2012.

Key findings and expert assessment:

- The EcoToolkit cater to a niche segment that has been largely ignored to date
- Designed for 'front end-users' (Easy to interpret results)
- Opportunity to promote water management efforts to customers and/or respond to customer queries

- **Reasons for choosing and using the resource**

The EcoToolkit appears to cater to a niche segment that has been largely ignored thus far. The organisations interviewed were not necessarily looking for such a resource. They were approached by Cafédirect, and subsequently found value in using the Toolkit. Two of the three organisations have been involved in helping Cafédirect refine the resource further. At the time of this research they were pilot testing the EcoToolkit in one of their UK outlets (out of 19 and 78 outlets respectively), and had used the resource for six to eight months. Both believed they were close to the point of deploying the resource in other outlets, or making it a part of standard procedure. The resource lent itself to being a 'reference tool' and businesses appear to have used it to build awareness. The primary reason cited however was to understand where they could improve in terms of consumption of water, energy and production of waste. Two of the three organisations indicated cost-savings as a factor. One already had a very ambitious Carbon Reduction Programme in place, led by a dedicated senior management team, and found that the resource provided more impetus and direction. It helped them work out a cost/benefit analysis and justify actions such as replacing inefficient equipment and talk to suppliers about the efficiency of products. Although being tested in only one outlet, elements of the resource had been applied elsewhere. For instance, one user stated that "we're looking at all our combination ovens that use dry heat and wet heat and have talked to suppliers about how they can be made more efficient about the water and power they are using." At the other end of the scale, a different user admitted that this was the first time they had heard of such a resource, "so this is quite a novelty in some ways". None of the respondents had used other resources. All three organisations used the results from the resource to promote their efforts to their customers and/or respond to customer queries.

- **Data**

The EcoToolkit requires fairly simple site-specific data and process related information that can be easily obtained. It collected information on processes within the organisation related to water, energy and waste, as well as purchase practices and how products in the range were chosen. The use of the resource however is dependent on how the organisation is structured. This factor alone has knock-on effects on access to data, ease of data gathering, time required and the number of people involved in using the resource. For instance, one of the organisations reported that they measured water usage at a building level and not at the level of specific locations within the building such as food and beverage outlets. Since the buildings in question were 'significantly large', it was very difficult to gather such data in isolation.

The business users interviewed had found gathering the required data fairly straight forward, although not all had been able to access data to the level of detail they would have liked. All reported that gathering the data was a quick process.

- **Practicality of using the resource**

All three organisations reported that the Cafédirect EcoToolkit was very user-friendly and was 'ever so easy to use'. The number of people involved in using the resource from input of data to generating/communicating results ranged from one person to nearly ten people. It did not require any sort of prior training. The Toolkit had a pleasing layout with simple checkboxes and was easy even for people who did not necessarily consider themselves IT-literate. 'It gives you a

red-amber-green - about things you need to do immediately and then things that you need to do in the future. So that is ideal because some of the sites might not understand what is more important than the others'. A noteworthy element that significantly improved the practicality of the resource was that the end-report not only offered very detailed assessment but also provided links to more than one external organisation that could help fix the problem. 'It depends on how your company works, what is best suited for you. So that is ideal.' One respondent felt that this really aided change because the Cafédirect EcoToolkit facilitated people to follow through and correct inefficiencies in the system.

The Cafédirect EcoToolkit is simple to use, even for those who are not too familiar with computers. This factor will help the tool appeal to as wide an audience as possible. The EcoToolkit also helps users follow through with recommendations, lifting potential barriers to further action.

- **Assumptions used in the resource, data robustness and availability**

All three respondents felt that as 'end-users', they did not need to know the hypothesis and assumptions used in the resource. They felt that the resource was designed for 'front end-users' rather than for experts. As one respondent said, 'I don't think it is necessary to know anything beyond what we see and what we use because it is that straight-forward and that simple'. Another respondent felt that 'the suggestions came from a person who knew more' and so they 'trusted what it said'.

- **Suitability of the resource**

Two of the three organisations felt that the EcoToolkit was very appropriate for their business. However, one admitted feeling they were not the 'core audience' for the resource although they found it useful and interesting. They believed the resource was designed more for food and beverage outlets and on-site catering or unit managers, rather than for their business, which involved supplying equipment to such outlets. Despite the resource's simplicity however, assessing overall suitability of the resource was more complex than it first seemed, since the implementation of the results could be affected by the structure of the organisation. To elaborate further, one respondent felt the resource was designed exactly for someone in his role. However, since it was a large organisation, certain things were outside his jurisdiction. He was thus unable to implement all the recommendations whereas a small, independent cafe/restaurant would be able to implement the suggestions end-to-end. As an example, rainwater harvesting, as suggested by the resource, would typically fall under the remit of the Facilities Management team. Implementation of the results could also be impacted by other factors. For instance, one respondent said that they could not implement the recommendation on using reusable cups rather than disposable cups because there were health and safety issues involved.

The recommendations given by the Cafédirect EcoToolkit are sometimes unrealistic, and may not be deemed appropriate by the user. However, as long as a range of recommendations are made, then there should be some actions that are acceptable and realistic for each user.

- **Costs**

The Cafédirect EcoToolkit is freely available to use over the internet. One respondent felt that the only investment was primarily 'computer time' and that this was an easy cost for an organisation because the resource would help it move forward and would also offer savings on bills. Another respondent however admitted that there could be significant costs if they were to implement all the recommendations from the resource such as replacing ageing equipment with more water and energy efficient ones. They admitted to investing wherever they can, for example replacing regular taps with those with timers 'rather than using taps that are twisted on and left on, as chefs tend to do. These taps will time out and thus save water'. This respondent also felt that the resource had added 'an extra-push' to review pieces of kit that they knew were inefficient. 'We were already looking at replacing equipment but instead of focussing on depreciation costs, maintenance costs and projected lifespan only, what we've now added into that is how efficient is that piece of equipment and is there an advantage for us to replace that piece of kit? '. All three organisations felt that the resource was 'definitely value for money'.

- **Communication**

As mentioned before, the results from the resource are very easy to interpret. The EcoToolkit has been used both for internal decision-making as well as for external communication purposes. One respondent said that while they did not actively publish the results of the resource, they found the resource very useful to answer customer queries. The second respondent said that they used the results to communicate to a large target audience, both within and outside their organisation. Internal communication was relatively simple and it happened primarily through committee meetings and signage. In addition, information from the EcoToolkit had been applied to wider organisational policies. For instance, the organisation's Sustainable Food Policy now mirrored recommendations that came out of the EcoToolkit, since this information was presented as a part of the wider messaging, it was received very well by the target audience. The third respondent said that their organisation invested significant time and energy into communicating these results with various stakeholders. They believed their customers liked to be kept up to date so they used a variety of media such as information boards, customer forums and social media in order to communicate with their customers. In addition, they also communicated with other stakeholders such as councils (because they would need items such as new recycling bins), the water company and even the coffee company if it was to do with the efficiency of the coffee machines.

The results of the EcoToolkit have been communicated internally, where they have helped to stream line sustainability strategies, and externally to customers and stake holders.

7.5 European Water Stewardship Standard (EWSS)

About the resource

EWSS, under development by the European Water Partnership (EWP), was launched in 2011. The target audience of the resource is broad, encompassing all water users and industries likely to affect the availability and/or quality of water. The scope of the resource focuses on a specific site/facility and considers the characteristics of the river basin in which the site/facility operates. The main objective of the resource is to ensure that the businesses follow some guidelines to improve their management practices. The EWSS lists 54 indicators covering the following four main principles:

- Achieve and maintain sustainable water abstraction in terms of quantity of water.
- Ensure the achievement and maintenance of good water status in terms of chemical quality and biological content.
- Restore and preserve water-cycle related High Conservation Value Areas.
- Achieve equitable and transparent water governance.

The standard is currently the basis for an international equivalent that is under development by the Alliance for Water Stewardship. The resource was pilot-tested in certain sectors, e.g. beverage, chemistry, agriculture, golf courses, and additional indicators have been specifically developed for some sectors. Since early 2012, certification bodies have officially been accreditation to audit and deliver the EWSS.

The resource is based on indicators, that have been defined and specified following pilot projects, in collaboration with the industry. As for any other certification scheme, understanding what the assessment means requires knowledge of the indicators used. As the certification aggregates indicators, some indicators with relatively low scores could be counterbalanced by higher scores. However, this last issue is limited since the standard requires minimum thresholds to be met for all requirements.

Assessment based on interviews

This resource assessment is based on the feedback from the organisation developing the standard and three business users (a large paper company, a large beverage company and an airport operator), obtained through telephone interview and email exchanges in May/June 2012.

Key findings and expert assessment:

- certification scheme for water management that provides investors and the general public with a global understanding of the water-related impacts
- well-suited to a broad range of business sectors and provides additional value compared to ISO 14001 by focusing on water management

- more communication needed in order to increase visibility, business uptake and consumer recognition.

Reasons for choosing and using the resource

According to two business users, the main reason for choosing EWSS is having a recognised certification scheme for water management that provides investors and the general public with a global understanding. As a follow-up to the ISO 14001 certification for environmental management, both companies expressed the need for a water-specific scheme to strengthen their image, especially for the paper company, whose specific activity is usually considered as a significant user of water. In that regard, EWSS is simple, easy to understand (awarding either bronze, silver or gold certification) and fosters a corporate water management strategy with an aggregated scoring while increasing visibility to consumers. One business user particularly appreciated that the resource could be adapted to assess an airport, as opposed to other water-related resources that are more targeted to industries.

For another business user, the main value of EWSS is its connection to EU policy. With the implementation of EWSS, the company better understands and integrates the requirements of the Water Framework Directive (WFD) in a local business context, in addition to their internal Water Protection programs.

As discussed with the organisation developing the standard, current standard implementations are still at pilot scale. Although certification bodies have been able to gain accreditation in 2012, more time and potential adjustments are needed to consider the implementation of EWSS across all the sites of the company (one user). With the launch of the standard and its international equivalent, it is expected that the knowledge of the standard will build in time. It is important to stress to prospective users that the information provided by a certification is quite different from that provided by a calculation tool (see below on communication), and the objectives for using one resource or another must be identified for choosing the approach suited to the business needs.

Data

No data is embedded in the resource. It mainly consists of definitions and calculation methods that characterise indicators. The resource mainly requires a good knowledge of local water use and availability, rather than detailed understanding of calculation methodologies.

According to the business user, in-house parameters on water quantity and quality are relatively easily to gather. Another business user still mentioned that specific data (e.g. on dangerous products) can be difficult to find. However, all interviewed users agree that the required data from suppliers and at the river basin level, are more challenging to collect. Some information may not even exist, which could lead to unfruitful research and waste of time. This stresses the importance of cooperation with stakeholders in the river basin, to have access to relevant data and be informed of what information exists.

- **Practicality of using the resource**

Two users think that the resource is clear and easy-to-understand while another one mentions that the current implementation of EWSS is not fully self-explanatory as some inconsistencies in the implementation may exist. This is progressively being addressed as part of the pilot programmes, according to one business user. One-to-two-day, on-site training can be provided by EWP to ensure good understanding of the indicators and offer practical support. In the future, with the development of the certification scheme, the definitions may evolve to reduce potential misinterpretations. In addition, with the standard having to be updated regularly (with the certification body auditing the site/facility again), a better understanding will be developed within each site/facility.

- **Assumptions used in the resource, data robustness and availability**

When implementing the resource, the business user highlights the importance of clearly specifying the boundaries of the assessment, as launching the resource could be a confusing task without this step. For prospective users, it is important to understand that the EWSS applies to a specific site. One business user suggests that the scope could be discussed and defined with EWP trainers during the on-site training session. Another user insists that it is important to refer to the guidance documentation, which explains the assumptions to consider.

- **Suitability of the resource**

The resource is well-suited to a broad range of business sectors and provides additional value compared to ISO 14001, by focusing on water management (2 business users). In fact, certification provides specific information to identify issues and aims to achieve continuous improvement.

However, one business user reveals that some of the gathered information was too detailed and not useful for them.

- **Costs**

The costs in money and time will depend on the size of the site under assessment and the complexity of the operations performed at the site, as highlighted by two users. For the third user, the implementation of the resource is too early to evaluate its good value.

According to one business user, implementation costs around 2,000€ for a paper plant site, involving three people (for a total of one man-month). These costs are not considered excessive by this business user, although it is acknowledged that when a company has several sites to certify, the costs could be a deterrent factor. In such case, a global certification of the company (and not of a site) could be more appropriate when considering large-scale implementation.

- **Communication**

According to one business user, EWSS resource is primarily used for external communication, to highlight a business's compliance to standardised water management practices. However, to exploit the full potential of EWSS, this business user encourages more communication in order to increase visibility, business uptake and consumer recognition.

Given the recent launch of the EWSS (2011), it is understandable that the standard is not yet well-known by corporate sustainability management. More certification case studies are expected in

the next months, and are likely to contribute to raise awareness to potential business users and the general public.

It is important to stress to prospective users that a certification scheme is quite different from a resource that provides information on the amounts of water consumed, as it compares the performance of the site/facility to a set of criteria that are considered good indicators of how well water is managed. Similarly, to a calculation tool, the criteria of the certification and the calculation method can be discussed, but the important difference is how results can be communicated, certification providing an award, and calculation providing a number, meaning that communication will be very different.

7.6 GEMI-Collecting the drops

About the resource

GEMI-Collecting the drops has three modules that guide a business user through:

- the process of assessing the facility's specific water uses/needs in comparison to the availability of water in the region;
- the impacts that these operations pose on the available water resources; and
- the identification of factors that may pose a risk to the operation's ability to produce.

Module 1 includes guidance for preparing a facility water block flow diagram and a Water Balance Programme, to develop data and generate an understanding of the facility's usage of water, water losses, and final wastewater discharge. Tips for water engineering calculations and rules of thumbs are included to help the user. The guidance includes the relevant inputs, losses and discharge types and adequately guides the user to identify the data it needs to collect to understand its own water balance.

Module 2 is a Water Management Risk Assessment Questionnaire that requires input of facility water considerations and input for levels of risk (6 types of risks are included). Links to mitigation options are provided. The result of the questionnaire is a level of risk. If data is not available at the facility, links to global data are available (but this may reduce the precisions of the results). The questionnaire is divided into seven categories: general information, watershed, supply reliability, efficiency, supply economics, compliance and social context. The webtool then computes the results to rank the risks from high to low, and identify what questions risks relate to, and provide case examples of possible measures to be taken by the businesses. The methodology recognises that the risks entered are subjective and surrounded by uncertainty, but rely on the experience of the user and its knowledge of the functioning of the site.

Module 3 is more solutions-oriented, and helps the user identify case examples and links to reference information that could be applied in specific operations to use water more efficiently, to reduce water use and to promote conservation. Case studies and links to organisations are provided.

The business user can then develop a strategic water management programme under which the site can address risks and move forward with identified opportunities.

Assessment based on interviews

This resource assessment is based on the feedback of two business users from large companies, which were contacted by phone in May/June 2012. The resource is also part of the scope of the UN CEO Water Mandate.

Key findings and expert assessment:

- The implementation of the water balance model directly depends on the availability of in-house data and data from the local watersheds and provides good value for the time spent.
- Suitable for internal assessments at the facility- and company-wide levels but not for external communication
- The (recently published) GEMI Local Water Tool is more robust (in terms of model building) and user-friendly.

Reasons for choosing and using the resource

For one business user from the food sector, the use of the *GEMI-collecting the drops* resource is mainly driven by the wish to better understand the water balance in its manufacturing sites. Indeed, the company *has adopted water reduction targets within its global sustainability plans* and it aims at optimising its operational (direct) water use. Therefore, the business user only uses the module 1 of *GEMI-collecting the drops,* which guides the development of a comprehensive water flow diagram. This was found to be the *most valuable* feature of the resource (modules 2 and 3 were not used by the business user).

For the second business user, the module 2 and its approach on risk management is actually the main reason to choose and use the resource but it requires a good on-site knowledge, so that the methodology can be customised to the business's (internal) activities.

One business user was not aware of any other water-targeting resources at the time they learned about the *GEMI-collecting the drops* resource. Since this initial interest, the business user extended their interest to the recently-published *GEMI Local Water Tool* and the WBCSD Global Water Tool as a complementary water screening resource. According to this business user, the former resource provides a more thorough support to the construction of the water balance (with Excel spreadsheets) but is currently still under investigation at the corporate environmental management level before it can be further communicated to site operators.

In addition, both business users appreciates that the WBCSD provides complementary information to the GEMI resources by allowing mapping features. Based on this feedback, the technical guidance on water-balance and the methodology on risk assessment are both considered useful, depending on the business needs. *GEMI-collecting the drops* allows a robust understanding of direct water use by providing the basis for an input/output analysis at site level and it brings some local contextualisation with the risk assessment.

Data

The *GEMI-collecting the drops* resource neither integrates input data into a water balance model or local watershed data. It still provides a water balance methodology including reference calculations.

Therefore, building the water balance model (module 1) and evaluating water-related risks (module 2) directly depend on the availability of in-house data and data from the local

watersheds, as highlighted by both business users. In comparison, the business users recognise that the *GEMI Local Water Tool* better guides business users through implementation of their water balance and provides an Excel spreadsheet, with links to the US Environmental Protection Agency (EPA) or State agencies. However, for both GEMI resources, the business user has to search for the required data.

Thus, the operational use of *GEMI-collecting the drops* requires the collection of in-house water flow data and local characteristics of the watersheds. The latter task is further facilitated in the recent *GEMI Local Water Tool* but it still leaves some efforts for the site operators to build and complete their water balances.

- **Practicality of using the resource**

Although module 1 of the *GEMI-collecting the drops* presents directions for building a water balance, an adaptive phase is needed to complete the water balance diagram, according to one business user. After this initial harmonisation step, this user distributes the model to the different company's environmental managers, so that a *consistent approach is conducted across different sites*. In comparison, one business user states that the *GEMI Local Water Tool* is more robust (in terms of model building) and user-friendly, although they have not distributed it to the different site operators at the moment (due to the recent launch of the resource).

The second business user recognises that the resource is a good introducing tool to water-related risks, but some knowledgeable operators are usually appreciated as external sources of data are required.

This feedback reveals that some preparatory work is required before the GEMI resources can be broadly implemented at the different sites or locations of a company. This can be perceived as impractical and time-consuming.

- **Assumptions used in the resource, data robustness and availability**

No database is included in the resource, so the business user is required to find the data needed to calculate the water balance and assess local water-related risks. According to one user, the model building process is *very transparent but very basic*, as the user tends to use data that they have easy access to.

However, water systems can be very complex and can have a number of water inputs, losses and outputs. As facilities generally do not have separate water meters covering the different operations, the site operators may have to make educated estimates of water uses in the various sub-systems. Therefore, the robustness of the water balance will strongly depend on these estimates. This can be done by a combination of methods including engineering calculations, process knowledge and the specific installation of water meters. Some calculating tools are provided in module 1 to support site operators and help them understand fluid flow fundamentals, friction loss and pump hydraulic horsepower. This contributes to improving the accuracy of the results.

- **Suitability of the resource**

According to both business users, the *GEMI-collecting the drops* resource is well-suited for high-level assessment and fosters further understanding from a corporate perspective. Besides, it can be used for a broad range of industrial sectors.

However, modules 2 and 3 of the resource have not been implemented yet by one interviewed user, revealing that the identification of water-related risks is not a strategic priority of this company when implementing the resource.

Based on the collected feedback, the resource responds well to the business needs in terms of understanding and evaluating the corporate direct water use, and - to a lesser extent- identifying risks.

- **Costs**

The GEMI resource is openly available. One business user states that it is also less time-intensive than undertaking water footprinting approaches but he acknowledges that accurately assessing the time and money that are required is a difficult task, as the resource focuses on building a corporate understanding of water issues rather than specifically assessing water use. Overall, both business users believe that the use of the resource provides good value for the time spent.

A study undertaken by UNEP (2011[31]) found that reading the guidance is estimated to take approximately one day, while completing the planner's risk assessment questionnaire (module 2) is more time-consuming but could be performed within two person-days if the company already has quantitative data on their operations and local watersheds.

Based on the collected information, it is difficult to assess the costs related to the time spent for implementing the *GEMI-collecting the drops* resource as it would depend on the company's primary objective (e.g. the business user interviewed was only interested in module 1) and the availability of data (in-house and local watersheds). The launch of the *GEMI Local Water Tool* is expected to better guide users and therefore help them gain time.

- **Communication**

According to both business users, the GEMI resource is suited for internal assessments at the facility- and company-wide levels but is not currently used as a means to communicate externally on water management practices. This might be related to the reliance on highly technical water flow diagrams, that a common audience might not be familiar with.

[31] UNEP, 2011, Water Footprint and Corporate Water Accounting for Resource Efficiency

7.7 Rippleffect Tool

About the Resource

The Rippleffect Tool has been developed by the not-for-profit company WRAP (Waste & Resources Action Programme). The resource aims to provide businesses with a straightforward and structured approach to:

- understand how much water the business uses,
- identify simple ways to start saving water and money,
- measure the water and cost savings made and,
- learn about 'quick win' water saving devices.

This resource primarily provides guidance and advice to business. It requires online registration which then enables access to a set of online training modules, accompanied by videos and case studies. This enables businesses to access advice that reflects their type, size and requirements. There is additional on-line support and telephone helpline.

The five online modules cover; data collection, developing an action plan, implementing an action plan, securing buy-in, and reporting and recognition. Each module provides information and tools to enable businesses to make effective water and cost savings.

The emphasis on providing businesses with advice and guidance on how to manage water, rather than providing specific calculations means that there are effectively no 'moving parts' in this resource. There are no underlying datasheets or algorithms and all the information is available to the user. This simplicity combined with the reputation of WRAP and associated organisations means that in our view this resource is very robust.

Assessment based on the Interviews

This assessment is based on two in-depth interviews with medium to large businesses.

Key findings and expert assessment:

- Rippleffect is considered user-friendly, with good instructions and additional support in the form of webinars.
- Those that had used the resource had not questioned the built-in assumptions, and trusted any hypotheses used.
- Mixed results were reported with regards to the impact of the resource, and it is suggested that it is most suitable for those organisations that were 'resource-hungry' and used vast quantities of water.

- **Reasons for choosing and using the resource**

Both organisations interviewed were medium - large businesses with operations primarily based in the UK. Cost saving was the primary motivating factor for both organisations. However, while one had a goal of 'saving 200 k this year', the driving factor for the other was a 'horrendous' water bill. The familiarity with resources varied. The former organization had used similar resources for waste reduction and thus appreciated 'having a point of reference' and being able to 'go to someone who could answer questions, provide directions'. The other organization had never used such a resource, only trying the Rippleffect because they were invited to use it as a part of the local framework within the water company. The resource then helped them identify a 'massive leak' in their system before the water bill arrived. However, they shared that they would have probably identified the leak when their next bill came in since the price had drastically increased from 'less than 100 pounds a quarter to about 2000 pounds'.

- **Data**

The respondents felt that the Rippleffect was fairly straight-forward. It primarily required details from water bills. Time required varied depending on the organisation's goals. While one organization spent 2-3 weeks in preparation, the other spent only a couple of days.

- **Practicality of using the resource**

Both organisations felt the resource was user-friendly and the instructions provided were more than adequate. The organisation which was implementing lean projects in order to save £200k particularly found the webinar (30 minutes) very useful. In addition, they also appreciated having tailored support and advice from WRAP.

- **Assumptions used in the resource**

The respondents felt that it was not necessary to know the hypothesis behind the resource because it is laid out in a very user-friendly format. The Rippleffect tool was clearly explained; 'It is all there for it to be picked up and utilised as wanted really'.

- **Suitability of the resource**

The Rippleffect tool was found to be suitable for businesses looking to save water and associated costs. However, the general view was that it was most suitable for those organisations that were 'resource-hungry' and used vast quantities of water. One organization admitted that the Rippleffect tool had helped them identify that 80% of their water usage was to manufacture specific products. They felt that the resource could be adapted further if required, depending on the particular project manager's requirements within an organization and how they wished to use the resource. The other organization felt that although the resource was useful, it was limited in its impact since they did not consume large volumes of water in their operations.

- **Costs**

The resource was freely available over the internet. The primary cost involved was the user's time. One organisation felt that the resource was in fact used more because it was free compared to if one had to pay for it. They also shared that they were very pleased with the results; 'We've got about 20% of savings.' Added to this, they anticipated a savings of about £50 - 60k if they implemented some of recommendations from the audit. They felt that Rippleffect helped them

become aware of water meters and how to use water more efficiently, different procedures within their processes, reuse of water such as how they could reuse our washout water from one of the processes. As a result, it was perceived to be very good value for money.

- **Communication**

While one organisation had not used the results from the resource for the purpose of communication, the other had used it in several different ways. They had communicated the results to their customers and had received very good feedback from them; 'We're probably one of the first suppliers to do this without being told, so yeah it is going well. When you get feedback from your customer that they are very happy with what is going on, then it is good'. They also felt that buy-in from senior management was a crucial differentiating factor in the success of the resource within an organization. The effort involved in communicating the results was perceived to be minor since it was a full-time role within their organization. However, it was recognised that businesses without similar organisational structures could find it more difficult.

7.8 Water Footprint Network Methodology

About the resource

The Water Footprint Network (WFN) methodology was launched in December 2008 by a number of major global stakeholders from business, civil society, multilateral organizations and academia. It measures the total (direct and indirect) volume of freshwater used to produce goods or services consumed by any well-defined entity (e.g. company, site facility, group of consumers). It differentiates between 'green water' (rainwater available for plants), 'blue water' (surface and groundwater) and 'grey water' (freshwater that is required to assimilate the load of pollutants based on natural background concentrations and existing ambient water quality standards).

The methodology has been developed by a team of scientists and has led to the publication of many results in peer-reviewed journals (see below). The WFN methodology was underpinned by strong scientific information, although it is debated and several methodologies called 'water footprint' have been developed, that do not all use the same method. As for any methodology that provides quantitative assessments, underlying assumptions and data can be debated and must be updated regularly. In addition, as the methodology can be applied to different scopes, the result will depend on the level of detail and preciseness of the data used (see further below).

Assessment based on interviews

This resource assessment is based on three interviews from users in large businesses, which were contacted by phone in May/June 2012. The resource is also part of the scope of the UN CEO Water Mandate.

Key findings and expert assessment:

- The resource enables an easy top-level water assessment but for specific hotspot analysis, the assessment becomes more complex.
- The resource is used as a complement to other resources that allow a broader screening or mapping of water uses (such as the WBCSD Global Water Tool).
- Business users from specific sectors may not find relevant data for their products and therefore have to investigate and develop their own databases in order to use the WFN methodology.

Reasons for choosing and using the resource

One user said that businesses have shown interest in water footprint due to the increasing exposure that was given to carbon footprint and life-cycle assessment (LCA) in the recent years . It may be expected that the methodology is used further in the future as more people become aware of the methodology and of water-related risks within their business.

The WFN methodology is currently a well-established approach that is available for managers, planners and policy-makers, as identified by three users. In fact, the methodology enables management and accounting of water resources and introduces the concept of "virtual water" (the water quantity that is used to produce goods or services throughout their different life-cycle phases, e.g. irrigation water embedded in tomatoes traded between countries).

Businesses can choose this resource to assess both their direct and indirect water use. Indirect water use is particularly relevant for businesses that are interested in understanding the water use in their supply chains and the water embedded in the raw materials or ingredients of a product.

Since the concept of water footprinting is relatively recent, some businesses choose to launch pilot studies (two users); it is unknown whether these assessments will be replicated (and monitoring organised), or if the scale of the assessment will be enlarged.

Some businesses (two users) use the WFN methodology as a complement to other resources that allow a broader screening or mapping of water uses (such as the WBCSD Global Water Tool). In fact, the methodology may be applied to a country (a UK case study is available[32]), a product, an individual, a business, or globally. Since the data requirement will vary depending on the scope selected (see below), other resources may help identify the priority scope to implement the WFN methodology, or select the products or plants where the methodology will be applied.

- **Data**

Since the early stages of its development in 2002, the WFN methodology has been refined, incorporating more reliable, and spatially and temporally explicit data, in order to better account for water quality and impacts (UNEP, 2011)[33].

In recent years, significant effort has been observed by business users (reported by two users) to integrate calculation factors for clean water and wastewater as well as more complete datasets on agricultural products. However, business users from specific sectors may not find relevant data for their products and therefore have to investigate and develop their own databases in order to use the WFN methodology. This has been the case for example in the construction sector (reported by one user). Depending on their sector, prospective users may thus have more or less detailed data available for using the methodology and may have to find further specific data for some products. For example, to collect the data required to use the resource, businesses may have to contact their suppliers directly and ask for Environmental Product Declarations (EPD) as well as refer to data from the Environment Agency (UK) in order to implement the WFN methodology (the way to gather the information was reported by two users). However, as the resource develops, and continues to be improved (as mentioned above users already recognise improvements), more data will be available to users.

- **Practicality of using the resource**

Based on business users' feedback (three interviews), the resource is well-documented and generates an easy top-level water assessment. However, once the level of detail that is required

[32] See www.waterfootprint.org/?page=files/UnitedKingdom

[33] UNEP, 2011, Water Footprint and Corporate Water Accounting for Resource Efficiency,

increases – e.g. for a specific hotspot analysis – the water use assessment gets more complicated and the use of the WFN methodology may be challenging, as the business users would have to spend more time to understand and complete the supporting Excel sheets. In this case, the relatively rough data included in the resource are not precise enough to make the assessment with the required level of detail, a level of detail that can only be obtained by gathering local data (possibly at the level of the factory). For prospective users, this means that the scope selected for applying the methodology will very much impact the level of information that needs to be provided, and that applying it at a broader scope first will may be an easier way to get engaged with the resource. To use the resource to its full potential and provide the best granularity to understand a business' water consumption will require more expertise and time.

To harmonise implementation, some businesses (one user) provide a training session (two hours) to ensure that their site operators understand the methodology and implement it in the same way. For prospective users, this may mean some involvement at the corporate level to develop the common understanding to be used by site operators and perform the training.

- **Assumptions used in the resource, data robustness and availability**

Business users generally agree that the intrinsic nature of the water footprinting task is complex and recognise that some assumptions need to be integrated (three users). In fact, the WFN methodology was developed in a scientific way and many results have been published in peer-reviewed academic literature[34]. This shows that the method has been developed with strong scientific underpinnings. However, the choices made and the underlying reasoning behind the method are debated by stakeholders. Indeed, there are several methodologies called water footprint, which are not necessarily exactly using the WFN methodology, which may make communication about the resource less clear. The study for the European Commission on water footprinting, labelling and certification schemes[35] identifies three approaches for the calculation of a water footprint, a volumetric, a stress weight and a life cycle assessment approach. The volumetric approach differentiates blue, green and grey water, but does not reflect whether the abstraction risks causing environmental impacts. Some factors have been introduced by Ridoutt and Pfister (2009[36]) to incorporate such elements. There does not seem to exist a generally agreed methodology to use water footprinting in LCA methods (e.g. Jeswani & Azapagic, 2011[37]; Berger & Finkbeiner, 2011[38]). The study for the European Commission concludes that there are key concerns outstanding (conceptual, methodological and interpretation related) in the use of water footprinting methodologies. Therefore, users should be careful in communicating about

[34] See the Waterfootprint.org website for a list of peer-reviewed journal publications.

[35] RPA and Cranfield University (2011) Assessment of the efficiency of the water footprinting approach and of the agricultural products and foodstuff labelling and certification schemes, Report for the European Commission reference ENV.D.4/SER/2010/0051r

[36] Ridoutt BG and Pfister (2009) A revised approach to water footprinting to make transparent the impacts of consumption and production on global freshwater scarcity, Global Environmental Change, Vol. 20, Issue 1, pp. 113-120

[37] Jeswani HK and Azapagic A (2011) Water footprint: methodologies and a case study for assessing the impacts of water use, Journal of Cleaner Production, Vol. 19, Issue 12,pp. 1288-1299

[38] Berger M & Finkbeiner (2011) Water footprinting: How to address water use in life cycle assessment? Sustainability, Vol. 2, Issue 4, pp. 919-944

the use of the resource, to ensure that the methodology they are using is clearly referenced, and that the assumptions used are clear to serve their purpose.

Currently, the methodology does not allow any clear appreciation or measure of the uncertainty of either the data that is used or the outcomes. However, the activities of the WFN, in terms of updates and improvements, are improving transparency and trust amongst business users (according to two users).

- **Suitability of the resource**

The WFN methodology is particularly useful when a global screening of the water uses is required (according to two users). Based on the feedback from a construction company (one user), the distinction between 'blue' and 'green' water is a useful feature of the resource, although it could still be improved. This is also particularly relevant for businesses from agriculture-based industries due to their reliance on green water supplies, as stated by one user. Indeed, the two types of water pose different potential risks. Blue water use directly depletes aquifers and surface waters, thereby potentially contributing to water scarcity and droughts and highlighting a possible corporate operational risk. Green water use does not increase pressure on water resources but can raise issues in terms of land use and impacts on ecosystems. However, another business user took the view that blue water aspects are more relevant than green and grey water elements. In addition, one aspect to be aware of in the WFN methodology is that it assesses the amount of water used, not whether that amount has negative impacts on the surface and groundwater resources. Depending on the location (water-rich or water-poor), the same amount of water withdrawn can indeed have very different impacts.

Although business users did not explicitly express a need to integrate sector-specific methodological adjustments or supplements, gaps in product data (e.g. construction materials) as well as processes (e.g. agricultural processes are better covered than industrial ones) have been highlighted.

- **Costs**

The WFN methodology is an open resource that any business user can access for free. However, the time and related resource requirements for implementing it will vary, depending on whether the water use is measured using available company data and/or external databases, and whether the assessment relates to the whole company, a specific factory or a specific product. Based on the feedback from three business users, it provides good value for the associated costs of implementation.

In terms of time requirements, it may take around five months to assess a product and one year for a company-wide assessment if a company has to collect its production data. For follow-up assessments, required periods for investigation tend to be shortened to a couple weeks (UNEP, 2011)[39].

[39] UNEP, 2011, Water Footprint and Corporate Water Accounting for Resource Efficiency

Communication

Water footprint outcomes can be used as a reporting communication tool, but it remains difficult to make generic or aggregated water-use claims. There is a high risk that the information is misleading, as the local context and the nature of water (blue/green/grey) are essential to ensure a full traceability. Therefore, currently, the WFN methodology is not used for external communication. It is commonly used for internal communication purposes, to build knowledge and raise awareness within the company, in particular of decision-makers, as confirmed by two interviewed users. As outlined above, the methodology is quite detailed and is very valuable for a quite precise understanding of products or plants water use, and to communicate internally. As knowledge about the resource expands within policy-makers, business managers and the wider public, external communication may be envisaged in the future, maybe when better communication frameworks are available to ensure that the communication is not misleading.

7.9 WBCSD Global Water Tool

About the resource

WBCSD Global Water Tool is a free online platform that couples corporate water use, discharge, and facility information with watershed- and country-level data. It enables businesses to map their water use and assess risks related to their global operations and supply chains. There are in fact three tools available mid-2012: the Global Water Tool 2011, the Global Water Tool for oil & gas and the Global Water Tool for power utilities.

The tool helps businesses to understand their water risks, based on the number of facilities located in water-scarce areas, which are at most risk, and where future risks may occur, water risks from suppliers, and production share located in water-risky areas. The tool is aimed at companies and organisations operating in multiple countries who need to better understand the water issues in their operations and that of their extended supply chain.

The tool consists in an input sheet, with the company's site location (lat/long) and water use information. Using external datasets (considered by the WBCSD credible and publicly available), the tool computes indicators that are used widely, including the GRI water indicators, Bloomberg, CDP Water and Dow Jones Sustainability Index, some metrics combining company information with country and watershed data; maps the information, providing key metrics based on data available from external sources.

The resource is quite easy to use, with relatively few information required from the user, but provides only high-level data, that can then be refined using other resources. The resource uses data available from external sources, that are considered credible and computes indicators that are globally agreed. One issue is the low preciseness of the information obtained as output, as the input data are relatively few and the external data used are quite high-level, but the outputs are similarly high-level.

Assessment based on interviews

This resource assessment is based on three interviews with users from large businesses, which were contacted by phone in May/June 2012. The resource is also part of the scope of the UN CEO Water Mandate.

Key findings and expert assessment:

- Good visibility and reputation
- Limited geographical coverage
- Effective communication tool, that can be understood easily by non-technical audiences

- **Reasons for choosing and using the resource**

The three users agree that the WBCSD Global Water Tool was chosen due to its visibility and reputation. Indeed, they can easily access this *powerful resource* that provides a useful and robust initial screening and mapping of their water uses. However, they acknowledge that the resource does not provide specific guidance on local situations, which would require more in-depth systematic analysis.

While the three businesses expressed their interests in addressing their operational water uses when choosing the resource, two users also aim at identifying their water-related risks for specific sites (e.g. manufacturing factories).

All three users use complementary water-targeting resources to further assess their water management practices (two users also run the Water Footprint Network Methodology and one user implements the GEMI resources). This supports the hypothesis that large companies have more flexibility and means to investigate different water aspects.

Based on this information, the overall screening and mapping of a company's water use stands as the main asset of the WBCSD Global Water Tool, which also allows a preliminary understanding of corporate water-related risks. Further investigations would then require the use of more powerful resources.

- **Data**

Several external databases are integrated in the resource. They were selected from the wide range of available water data in the public domain to meet all of the following criteria (according to the resource developer):

- Data must have global coverage
- Data must be in the public domain
- Data must be considered valid by the global community of water stakeholders including academics, NGOs, government organisations and industry.
- Data must be recent
- Data updates are planned

Thus, country-level datasets are provided by the Food and Agriculture Organisation (FAO) AQUASTAT, the World and Health Organisation and UNICEF Joint Monitoring Programme, and the United Nations Population Division (UNDESA) while watershed-level data come from the University of New Hampshire, the World Resources Institute (WRI), the International Water Management Institute (IWMI) and the Conservation International (CI). Detailed information on these data sources are provided online[40].

In addition, according to three users, the data required to use the Global Water Tool is straightforward and accessible (e.g. the GIS coordinates of each factory is an input), which allows rapid and efficient implementation.

[40] Available at : www.wbcsd.org/web/gwt/GWT_Datasets_2011_Upgrade.pdf

- **Practicality of using the resource**

All three users agree that the resource is very user-friendly, intuitive and that no specific training is required.

- **Assumptions used in the resource, data robustness and availability**

All three users recognise that this is a delicate issue, as several external databases are integrated in the resource and it is difficult to develop a sense of the level of uncertainty associated with the data used and how the resource computes the outputs. Two users acknowledge that efforts to be transparent (e.g. origin of the database), and to update and document the resource, tend to increase the transparency and strengthen the robustness of the resource. In general, the resource receives positive appraisals.

- **Suitability of the resource**

Two users state that the resource responds to their business' expectations but is currently limited by its geographical coverage. They encourage the inclusion of more watersheds. Moreover, although the resource gives valuable information on a screening basis (i.e. annual averages), seasonal differentiation is identified as a potential improvement , as mentioned by one user.

Based on this information, the resource is well-suited for water screening purposes but margins of improvement in terms of spatial and time characteristics have been highlighted by users.

- **Costs**

As a free online resource, the WBCSD Global Water Tool is less expensive and requires less time to implement than (the more complex) water footprinting approaches, as stated by two users. The latter also mention that the use of the resource does not require training or any specific expertise, so only human resources will need consideration.

However, the amount of time and money required depends on the size of the company and on the objectives that the resource is used to achieve. According to UNEP (2011)[41], for the most common application - mapping a company's facilities against local water stress maps - half to two person-days are usually needed to assess direct water use, whereas several days may be required when companies have extensive supply chains to take into account.

- **Communication**

All three users agree that, although its geographical scope is limited, the WBCSD Global Water Tool can serve as an effective communication tool, as it can be easily understood by non-technical audiences. One user specifically mentions the relevance of the resource when companies include brief summaries of the proportion of their operations in water-stressed areas and water-abundant regions in their corporate sustainability reporting.

Moreover, the resource converts the water use and discharge input data into Global Reporting Initiative G3 indicators for total water withdrawals, total recycled water use and total water discharge. This allows business users to easily quantify and report their water use in a harmonised manner, in a format that is comparable across many businesses and industry sectors.

[41] UNEP, 2011, Water Footprint and Corporate Water Accounting for Resource Efficiency

7.10 WWF / DEG Water filter

About the Resource

The Water Risk Filter (WRF) has been developed by the environmental NGO WWF in partnership with the German Development Finance Institution DEG. It was launched in April 2012 with the aim of providing companies and investors worldwide an online tool to calculate their water-related risks in a simple manner. The instrument aims to point out water risks in the supply chain and in an investment portfolio as well as offer a number of practical approaches for risk mitigation.

Designed for non-water experts, this tool provides a highly structured set of risk indicators with very limited information required from the user. The Water Risk Filter covers all relevant elements of water risks, all industries (standard classifications) and all countries of the world. It interprets the best available scientific data from a range of external sources and translates it into risk numbers based on the questionnaire. Then, it enables mapping of facilities or investments on numerous water related map overlays. Finally, a structured set of responses and up-to-date case studies provides some options for mitigating risk and developing a water stewardship strategy. It uses underlying databases of information drawn from other tools or sources, such as the detailed river scarcity data from the Water Footprint Network. It is likely that the tool will be updated as new information sources become available. The user is not automatically given details of information sources, but they are available if required. In our opinion the level of detail about the underlying assumptions and data is appropriate to the level of use, and the tool is designed to incorporate the best existing methodologies and information.

Assessment based on Interviews

This assessment is based on two in-depth interviews with large businesses, which were contacted by phone in May/June 2012.

Key findings and expert assessment:

- It fosters understanding of the local context and the associated risks in terms of scarcity, pollution, regulatory risks and stands a complementary resource to any water accounting resource.
- Although the resource is user-friendly, some type of introductory training to make best use of the resource would be useful, especially when interpreting results.
- The resource is very new, and some users may still be in the process of implementation.

Reasons for choosing and using the resource

Both organisations interviewed were large businesses with operations in several different countries. They seemed to be well versed with the concept of water stewardship and had a good

understanding of the potential business risks with regard to water. In addition, both appeared to have considerable exposure to such resources. A key reason cited for using the WWF-DEG Water Risk Filter was that both organisations had entered into a special partnership with WWF to assess and manage their global water risk, making it natural to use this particular resource. One of the organisations had used the World Business Council for Sustainable Development's (WBCSD) Global Water Tool (GWT) for two years before moving on to the Water Risk Filter. They were also familiar with the Local Water Tool from Global Environmental Management Initiative (GEMI), though they hadn't actually used it. The main difference cited between the GWT and the WRF was the summary of risk results in an easily understandable format; 'The Global Water Tool was useful in the beginning, but it was hard to get one big picture from there. It provides nearly 60 different maps and you do not get a summary of risk results'. This particular business had hundreds of sites globally and many more in the supply chain across the world. Since their primary purpose in using the resource was to know where the greatest water risks lay and then concentrate their actions around these locations, the Water Risk Filter had 'helped a lot' to meet the primary objective. 'The resource gives a consolidated risk value. You don't need to create a matrix yourself'. They had used the resource not only to assess their own production and end-of-life stages but also that of their supply-chain. In addition, even though it had not been used actively yet, the mitigation proposals offered by the WWF-DEG Water Risk Filter were thought to be promising. The second organisation also used the Water Risk Filter? in conjunction with the Water Footprint Assessment. Each served as a 'measurement tool' that was helping the business 'set the baseline' and understand where they were in terms of their water footprint as well as their global water risk. The organisation expected to construct a strategy for improvement based on the results obtained. They believed that others in the business had done Water Footprint assessment but not more. However, they felt that particularly with water, merely understanding what was happening with one's own facilities was not enough. Water was a complex topic and it was important to understand the bigger picture and the broader dimensions. Both the resources were said to be complementary. The Water Footprint Assessment helped to understand the water footprint (quantitative as well as qualitative) during production of a particular product whereas the WRF looked at the various countries of operations, assessing the state of water in each region. This offered a much broader understanding of the context in which they operated and helped them understand the risks associated with each location in terms of scarcity, pollution, regulatory risks.

- **Data**

The WRF is a very sophisticated resource, however it allows for different levels of data complexity which enables wide-scale use. The resource can be used with very little data based on site location, but it is also able to use very detailed socio-political and quantitative data.

The respondents felt that the WRF allowed for different levels of analysis. The basic analysis was very easy and simply required location of sites (not necessarily specific coordinates). If there was a need to drill deeper, the resource allowed very detailed information gathering at the facility level too. At this level, it examined issues such as amount of water used, conflicts with local governments and many other topics related to physical, reputational and legislation risks. Since the first respondent was responsible for facility related environmental global data reporting and was also part of the internal group creating the water strategy and water roadmap for the

organisation, data gathering took less than ten minutes and involved three people globally. Conversely the process took two months for the second organisation in question because it was still putting a system in place. In addition, they had chosen to put in place a secondary mechanism to capture site-specific data through a risk assessment questionnaire for a select sample. The purpose was to be able to compare and see if there was consistency between the local site-specific perspective and the global database of the WRF. This process was said to be quite challenging and about 22-25 people globally were involved in the data mining.

The WWF/DEF Water risk filter is a flexible resource, which can be used at different levels of detail which require corresponding levels of data.

- **Practicality of using the resource**

Both organisations had received extensive support from WWF because of the framework agreements and the water strategy work partnerships between their organisations. While one respondent found the resource very user-friendly and did not require any demo training, the second respondent admitted that although the resource was user-friendly, it would be useful to have at least some type of introductory training to make best use of the resource. However, they expected to become autonomous fairly quickly because it was a 'relatively intuitive approach'.

- **Assumptions used in the resource, data robustness and availability**

The first level of screening did not require any prior knowledge of the hypotheses or assumptions embedded in the resource. However, both respondents felt that as they dug deeper, there was a definite need to understand further, especially if they wished to communicate to their senior management in a 'compelling and confident' manner. For example, as one interviewee reported, statements such as 'over 200% blue water scarcity in 9 months of the year' were hard to understand for a lay person. The robustness of the information provided by the resource was also said to be 'fairly good but more improvement was needed'. One respondent reported that there were some challenges in the beginning of the resource implementation when one of the sites in Mexico which was quite close to the border showed up in the maps as if it was in the US. In addition, some watershed information was said to be missing (Boston in the USA and also some European locations). This respondent felt that results provided at a country-level could be 'somewhat misleading' because there were 'quite big local differences'.

The second respondent too felt it was a very important point and there was a need for 'better transparency' in the resource. For instance, it was important to understand the assumptions and criteria used in the rating of risk. The respondent also felt that quoting aggregates without mentioning the criteria behind it could lead to misleading conclusions. For instance, in the case of pollution, it would be critical to know all the criteria (names of pollutants and pollution levels) of each even if the overall aggregate were low. This was because specific pollutants could pose a threat to certain sectors such as the agricultural sector.

Further details outlining the assumptions used by the resource, would be beneficial and would increase the confidence of the user as well as those to which they communicate the results to.

- **Suitability of the resource**

Both organisations felt that the resource was appropriate for their business. The first respondent considered that it would be very useful to adapt the resource to allow for 'multi-upload via Excel'.

The current process was said to be time-consuming because users were expected to add data on their sites 'one-by-one'. The second respondent felt that the resource was a 'good starting point' and appropriate for their current needs. They felt that they might require something closer to their operations as they learned to work with it more. However, they would not necessarily expect this from the resource itself but would make it a part of their operations.

- **Costs**

The resource was freely available over the internet. Perceptions on the overall cost ranged from low to medium. The first interviewee felt the only costs were that of the working hours of a couple of people in the team, whereas the second interviewee adopted a more wait-and-watch approach. They recognised that they were in a different situation compared to the average user of the resource. The framework agreement with WWF meant that they received support such as having a dedicated team to help gather the data, put them in the resource, analyse the data, formulate a business case and a strategy. The respondent regarded this cost as medium, as 'it still needs to be demonstrated that based on this collaboration, we will be able to build a compelling business case for change that will move our management to consider water as an important strategic issue.

- **Communication**

The big picture from the resource was very easy to understand since there were traffic light colours that allowed the ranking of facilities in the order of risk magnitude. It was also said to be presented in a visually appealing manner. The details were complicated; however, this was attributed to the nature of the topic and not the resource per se. The first organisation had not published the results of the resource directly but had used them in communicating to the sustainability team, specialists, facility organisation, supply chain and also within the organisation's sustainability report, and some stakeholder questionnaires like the CDP (Carbon Disclosure Project) water. It was also used in high level communication to all employees as part of larger messaging. As mentioned earlier, the second organisation was still in the middle of using the resource because they were trying to translate the data obtained from the resource into a compelling business case for change. The intention was to present this to the senior leadership to demonstrate that it was a 'critical risk as well as a serious opportunity to address water in a strategic way'.

The results of the WRF have been communicated internally, particularly in order to make a case for focusing on water, as well as externally in one users sustainability report.

Annex 5: Interviewee Guidance for the in-depth assessment

The Department for Food, Environment and Rural Affairs (Defra) is carrying out a study to help businesses understand the different tools and methods available to them for assessing their water use and to help them identify which methods best suit their needs.

As part of this study, Bio Intelligence Service and Waterwise have been appointed by Defra to conduct interviews with businesses that have experience in using such tools. As you or your organisation have experience in using [*name of the resource*], I would like to invite you take part in one of these interviews. The interview will be conducted over the telephone, may be recorded and it will last between 30 minutes and one hour.

The aim of the interviews is to gather information on your experience of using water tools and what you think of the tools. The topics to be discussed in the interview will include the following:

- Reasons for choosing the tool – Including why did you select this particular tool? What stages of the lifecycle of your production/service are you assessing with the tool?
- Reason for using the tool - Why do you use the tool? What do you aim to achieve?
- Is the tool what you need? - Did the tool meet your needs? If not, why? Do you use other tools? If so, to what extent are they complementary?
- Data – Including what data is needed to use the tool? How easy is it to have access to such data?
- Practicality of using the tool – Including would you consider the tool user-friendly? Does it require training?
- Assumptions used in the tool - Do you know/need to know which assumptions that were made during the tool development? Are the hypotheses used within the tool clearly explained?
- Suitability of the tool - Do you think the tool is appropriate for your business? Do you think it would be beneficial to adapt the tool?
- Costs - How much does it cost to use the tool? Does the tool provide value for money?
- Communication - How did you find the task of interpreting the results from the tool? Are results from the tool(s) used for communication? How is the communication received and understood by the target audience?

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