

# The Water Margin

*How Strategic Management of Water can Grow Business Value*



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# Executive Summary

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The term 'water margin' reflects the dual impact water has on today's business.

Water continues to be a vital input for nearly every industry and since the industrial revolution, water use has increased dramatically. Increased variability in the quantity and quality of water available is making day-to-day operations in the 21st century more challenging. And the future looks even more daunting.

Like carbon, water is closely connected with the long-term sustainability of the global economy. At the same time, the two have quite different characteristics and impacts. Water is more immediate in terms of both space and time. It has a more direct and identifiable socioeconomic impact. It needs to be handled on a regional basis, with solutions tailored to circumstances.

Nonetheless, water and carbon require an integrated, strategic response at Board level in order to ensure optimum management of the challenges they present – water security, regulation, supply chain risks, expectation and local vulnerabilities – and to avert the danger of reduced corporate performance through financial losses, higher costs or suppressed growth.

Development of water management as a key element of business strategy requires recognition of the forces for change impacting the business together with management of the associated risks and opportunities to optimize value. Surveys of risks associated with water necessarily go beyond the company itself to include the whole value chain.

The aim must be to develop a response that adds value to the business while protecting water as a regional resource. Parameters that need to be included range from the company's water footprint and 'water pedigree' for specific products to the way its water vulnerability varies across the portfolio of operations, the costs of potential investment options, and how best to engage stakeholders concerning the strategic response.

Examples of companies in a range of sectors globally are included to showcase best practice and highlight important potential pitfalls. Key parameters governing a company's strategic response are explored, and an indication is given of how the cost/benefit factors of water-related actions and innovations are translated into strategic decisions with maximum rate of return.

# Forces for Change

Behind the increasing number of news stories devoted to storms, hurricanes, droughts and floods lies a sobering fact for business. Water is a vital input for nearly every industry in the 21st century and increased variability in the quantity and quality of water available is making day-to-day operations more challenging. As we look to the future, the situation is set to become even more demanding.

In a report of the 2008 “Top Risks” investment conference organized by Goldman Sachs, resource scarcity – including water – came first. According to the UN Environment Programme (UNEP)<sup>1</sup>, a combination of economic and demographic trends is pushing global water consumption upward at twice the speed of population growth. Further pressure on water resources comes from pollution and changing climate patterns. It is estimated that, by 2025 up to two-thirds of the world’s population could be facing serious water shortages, with one-third of those in situations of absolute water scarcity. Meanwhile, and within the same timeframe, volumes of waste water generated by industry are likely to be around double those recorded today.

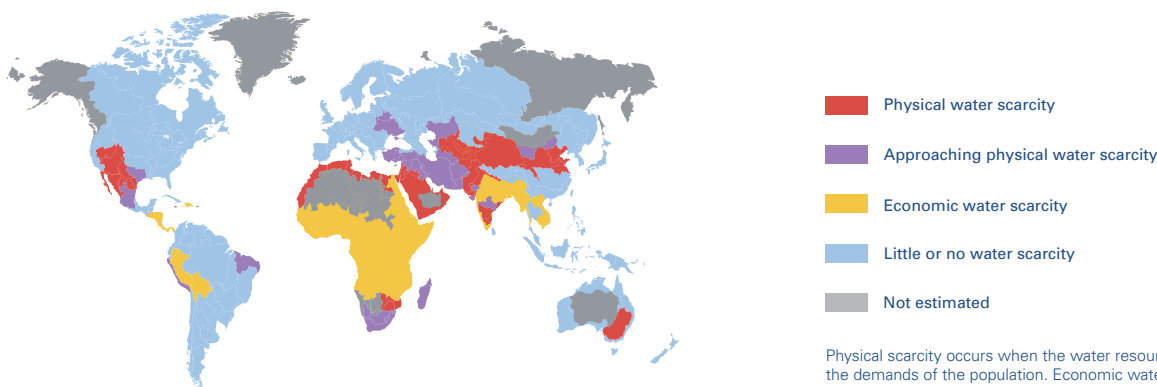
The consequences of this crisis are already being realized. Many regions globally are already facing water scarcity (see Figure 1 below).

More and more companies are finding that water is an immediate issue of concern. At Arthur D. Little, we believe that water management should receive priority status; failing to do so could leave a company exposed to serious challenges over water security, regulation, supply chain risks, expectations and local vulnerabilities.

- **Water Security** – Water security is necessarily one of the biggest forces driving management decisions in many industries. Strategies and plans need to be able to accommodate the possibility of there being too much, too little or of poor quality. Given current climatic events, in some regions it is necessary to be able to respond to all scenarios. Some companies have already borne the brunt of such water related risks. Electricité de France suffered losses in the region of €300 million when it had to shut down a quarter of its 58 nuclear plants due to water shortages<sup>2</sup>.

As water demand and scarcity increases, water price will rise and companies will be exposed to increased operating costs, varying across regions. Companies that do not anticipate these changes are exposed to higher costs and suppressed growth. The economics of certain industries are already being noticeably distorted by the link between water security and the price of core products.

Figure 1. Areas of current physical and economic water scarcity



Source: International Water Management Institute

Physical scarcity occurs when the water resources cannot meet the demands of the population. Economic water scarcity occurs due to a lack of investment and is characterized by poor infrastructure and unequal distribution of water.

<sup>1</sup> Half Full or Half Empty? UNEP Finance Initiative, October 2007

<sup>2</sup> Watching Water – A Guide to Evaluating Corporate Risks in a Thirsty World, JP Morgan, March 2008

- **Regulation** – Regulation on water use and disposal – especially in regions with severe drought – is becoming more stringent as expectations continue to rise in society and among politicians that businesses need to play their part to preserve and care for the environment. Regulatory responses include permits, prices, user fees, penalties, expansion restrictions and higher transaction costs. As water scarcity increases, companies need to understand how these will affect their value chain to avoid costly pitfalls.
- **Supply Chain** – In our experience companies often overlook the supply chain<sup>3</sup>. We believe, however, that focus on suppliers is essential as water use is often highest upstream of a company's own processes. A recent drought in the Pacific Northwest of the USA negatively affected Anheuser-Busch's brewing operations and increased production costs, mainly by affecting the supply chain. Supplies of barley decreased owing to reduced irrigation in Idaho. Aluminium production – a highly energy-intensive process supported by supplies of hydroelectric energy – slowed down, resulting in higher costs of packaging<sup>4</sup>.
- **Awareness and Expectations** – Awareness and expectations of both consumers and investors continues to grow. How businesses are dealing with water is achieving global attention and shareholders are becoming increasingly demanding. A group of PepsiCo shareowners recently filed a resolution asking the company to report on the business risk of water use throughout its supply chain. The resolution also asks the company to disclose its "current policies and procedures for mitigating the impact of operations on local communities in areas of water scarcity"<sup>4</sup>.

Additionally, awareness amongst consumers is rising and debates about product air miles will soon start to include the virtual water embedded in imported products.

Companies like Starbucks – pilloried in the UK media in 2008 for its global policy of washing utensils in a dipper well with continuous running water – are realizing that recognized good practice (in this case, meeting health standards) is not enough: consumers need to feel comfortable with the means used to achieve it as well. Disclosure of water related activities is therefore likely to come under increasing scrutiny over the next 3 years.

- **Local Vulnerabilities** – Water is a local issue. The direct regional socio-economic impacts of a company's business therefore need to seriously consider local vulnerabilities with respect to water. In areas where water security is low, competition for water will be high. Perrier Group (a subsidiary of Nestlé) were challenged by local communities regarding their water consumption. Fears that local wells, wetland and streams will dry out ignited action against the company with lawsuits raised regarding their pumping and bottling operations for bottled water. A Mecosta County Court ruled against Nestlé Waters North America resulting in four springwater wells shutting down. Companies that apply a global "one size fits all" policy across all operations in all regions are exposed to significant risk.

As ever, change on such a scale presents business with opportunities as well as challenges. In our view, dealing with the challenges and harnessing the opportunities in any company is only made possible by taking a whole-business, strategic approach that starts at Board level. Prefaced by a thorough investigation of relevant internal and external realities, such an approach will incorporate the best available options to balance investment costs against business benefits in smart decision-making for short, medium and long term gain.

One thing is certain: water – as both a constraint and a stimulus for business, social and political activity – is not going to go away.

<sup>3</sup> Green Purchasing Power, Arthur D. Little 2008

<sup>4</sup> Social Funds (SRI World Group)

# Preparing to Respond

Having established that water needs a strategic response, the question is how to respond in a way that adds value to your business while protecting water as a regional and local resource.

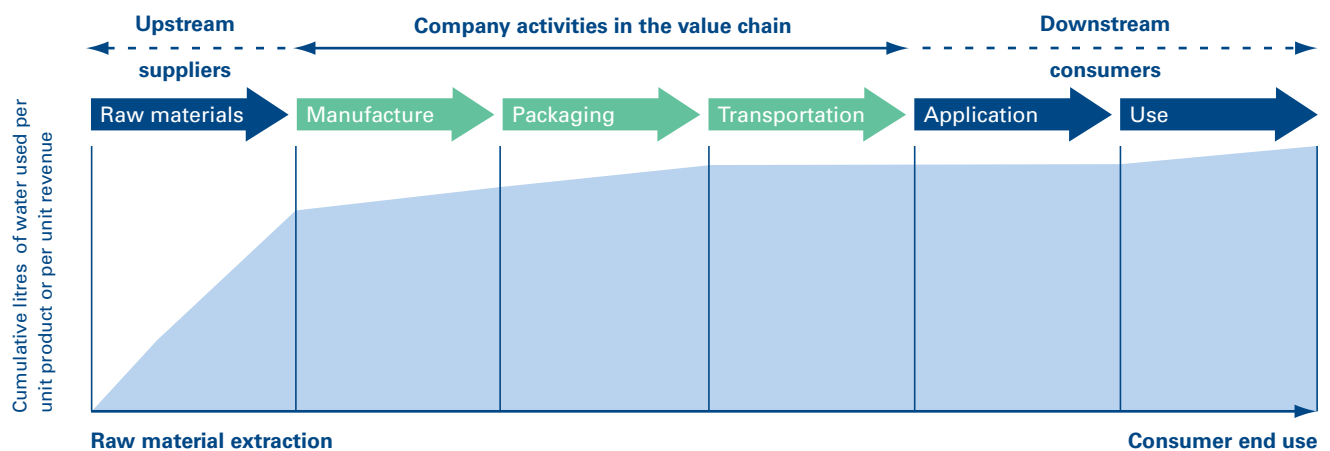
The first step towards developing a robust answer is to consider and understand a number of relevant parameters:

- Your company's direct and indirect water footprint.
- The sector-specific water characteristics of your value chain – collectively known as your 'water pedigree'.
- How vulnerability varies across regions in your operations portfolio.
- The threats and impacts of water scarcity on the long term business strategy of your business portfolio.
- The costs and return of potential investment options.
- How best to engage investors, suppliers, community groups, potential alliance partners and other stakeholders concerning your response.

To achieve a quantified water footprint that includes the entire value chain, some companies are forming strategic alliances. Borealis, for example, a leading provider of innovative value creating plastic solutions and Uponor, a leading supplier of plumbing and heating systems, announced at the 2008 World Water Week in Stockholm a joint initiative to pilot for the first time the concept of water footprinting to the manufacturing of a plastic application. The initiative will investigate water use across the entire plastics industry value chain from raw materials to a full system installed at home<sup>5</sup>.

Forward thinking companies are building these considerations into their competitive positioning. BASF, for example, offers information on the overall 'ecological footprint' of its products rather than simply the 'carbon footprint' including the entire lifecycle of a product, beginning with extraction of raw materials through to its disposal or recycling.

Figure 2. Water pedigree of a typical Food and Beverage company value chain



<sup>5</sup>World Water Week: Borealis and Uponor launch first water footprint initiative in the plastics industry, press release, August 2008

Of paramount importance at the outset is the creation of a water ambition that matches the business strategy. For example, the Foster's Group of breweries in Australia has set itself the challenge of minimizing water consumption without affecting product quality and workers' safety<sup>6</sup>. This has led to an ongoing programme of measurement, reduction target setting, process innovation, behavioral change and collaboration with external organizations. Foster's Yatala Brewery, the most water efficient brewery in the world, uses just over 2 litres of water for every litre of beer which is less than half the international standard of 5 litres. Following a \$14 million water management project (implemented as part of an expansion) the brewery doubled its brewing capacity, yet only increased its consumption of water by 10-15 percent. Yatala only uses drinking water in the direct production of its products. Virtually all other processes use recycled water – that is captured and treated on site.

The experience of Foster's and other 'water leaders' shows that, like carbon or any combined sustainability plan, water management needs to be embedded throughout the organization. This may require behavioral change, process innovation, systems innovation, skills development and more. Product innovation may also need to be reviewed and reworked to yield products that use less water in their development as well as in their use. For example, consumer products giant Procter & Gamble has used water to drive its innovation for competitive advantage, embedding water efficiency within the business strategy to create new product ranges. For example, the company has announced that it will convert its entire portfolio of liquid laundry detergents to a '2X' concentrated formulation. Improved efficiency across the entire value chain will result in up to 44% reduction in water use.

### Balancing act

Water has been dubbed by some commentators "the next carbon" in the sense that strategic carbon management has dominated the sustainable business agenda over the last few years, and now a similar kind of attention is – perhaps belatedly – turning to water.

The two are undoubtedly closely connected with the long-term sustainability of the global economy. However, whereas the impact of carbon dioxide and other greenhouse gases have come under the spotlight relatively recently, water security has been a priority issue for people throughout history.

There are also significant differences in the nature and impact of water and carbon. Where water is a resource and waste product, carbon is usually only considered as a waste product.

Moreover, carbon is a global issue with a long time horizon. Whilst the effects of poor water security may be felt globally through a failure of a supply chain, the immediate impact of water scarcity is within the regional economy, with more direct and identifiable socioeconomic impacts.

The difference in the scale of the impact and mechanisms by which those impacts may be felt (for example, policy versus physical constraints caused by natural resource availability) makes the drivers for addressing water very different. The water management challenge, therefore is about building a comprehensive strategy across all operations that is flexible and – very differently to carbon<sup>7</sup> – focuses on the regional impacts of water demand.

Ultimately, dealing with a company's water and carbon issues requires a balancing act, recognizing the differences but also the synergies that can be derived from addressing both in a strategic, coordinated way. Optimal results emerge from linking the company's water management strategy with its carbon management strategy – for instance, recognizing that a decision to position the company as a water leader may have adverse consequences for energy consumption and emissions.

<sup>6</sup> Current, Perceived Future, and Action taken on Water Challenges at Fosters – An Industry Perspective, April 2008

<sup>7</sup> The Carbon Margin, Arthur D. Little 2008



# Strategic Options, New Concepts and Smart Choices

There are many emerging concepts for sustainable water management. These include water footprinting, water neutrality, water offsets, fair water stewardship, virtual or embedded water, water labelling, and pollution offsetting. You need to know how to position your business against this rapidly evolving backdrop, and how to select the best options for moving forward.

Choosing the right suite of strategic options depends partly on knowing how much business value will be generated by different actions. But more so, you need to understand how this varies by sector, and by location.

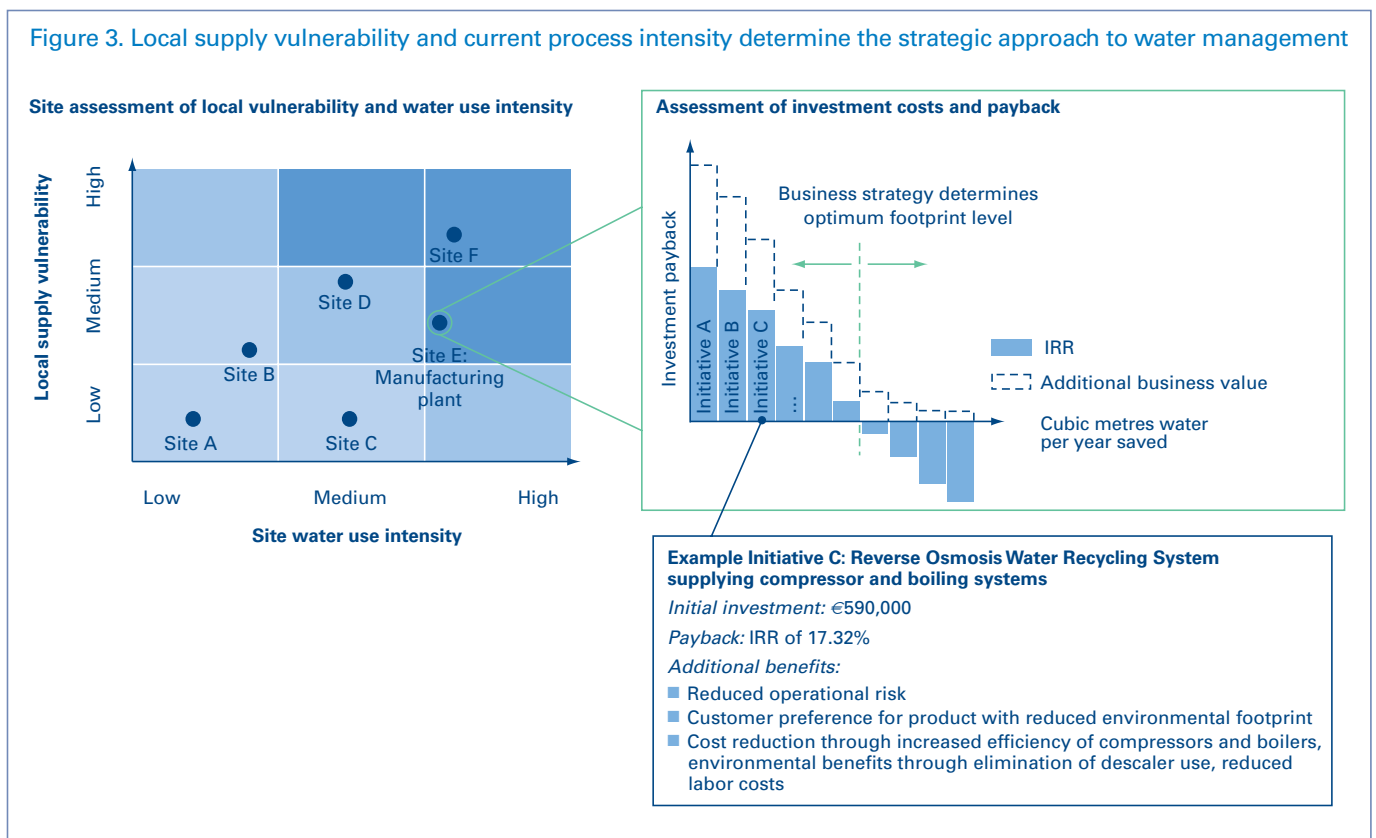
An overall strategic response is governed by two key parameters: local supply vulnerability at the locations where the company operates, and the water use intensity of the company's operations.

Specific responses can then be sensibly determined by an assessment of water efficiency improvement options against their associated value to the business. Business value takes different forms:

- **Immediate cost savings** – how much will you save by improving water efficiency?
- **Future cost savings** – how will cost savings vary as water prices change over time?
- **Additional benefits** – how will water efficiency investments provide additional value to your business (e.g. reduced risks, indirect cost savings, improved stakeholder perception, consumer preference, first mover advantage, etc.)?

Overall approach is governed by an assessment of each site in the business portfolio, as shown in Figure 3 below.

Figure 3. Local supply vulnerability and current process intensity determine the strategic approach to water management





Combining these factors gives a profile of how the return on initial investment is likely to vary in response to changes in the water footprint. This dictates the optimum footprint for each business unit within the company's portfolio, answering the question "How far should I go to reduce our water footprint?"

A key challenge is to estimate the intangible components of value added by your water strategy. These factors, more than any other, will be influenced by local supply vulnerability and process intensity. Consider a business unit operating in India. If local supply vulnerability is high and process intensity is high, it is likely that there will be conflict with other water users in the area. Reducing the unit's water footprint would add significant value through reduced physical risks to the water supply and improved stakeholder perception of the company associated with the business unit, in addition to return on investment gained through cost savings associated with lower water use.

Our experience shows that senior executives benefit from an opportunity to assess the risks and potential rewards across their product and operational portfolio quite quickly, in such a way that they can choose and prioritize appropriate actions.

Some companies are heading, for example, towards water neutrality across their entire value chain. Although the precise terms of the concept are still being defined, there are recognizable benefits in reducing and offsetting the impacts of water. This can be achieved by minimizing water use and recycling so that there is zero waste; or, in uses where recycling is not possible (such as agriculture), by reducing the negative economic, social and environmental externalities as much as possible and fully compensating for the remaining externalities.

### Case study

The Coca-Cola Company has been reporting water quality and quantity as a material risk to investors since 2003. This risk takes many forms: reputational, financial, and operational (both in-house and across the supply chain). Coca-Cola itself went through a period of critical press coverage related to its bottling plant in India, where protests were staged by local people, national and international organizations about the impact of the plant on water pollution and availability in the neighborhood. For any company in manufacturing or processing, lack of water as a resource will clearly constrain production volumes and revenues – not only for itself, but for partners up and down the supply chain as well. Conversely, becoming more efficient in water use, and more effective at its re-use or disposal, offers the benefits of cost reduction and potential revenue generation, with additional public perception improvements in many cases.

Coca-Cola's move over the last 5 years to develop a water stewardship programme across 49 countries of operation has resulted in an integrated water strategy that includes plant performance, watershed protection, sustainable communities and global leadership. The company reports that "the work accomplished between 2003 and 2007 helped build system capability, affirm strategic directions and partnerships, and establish goals and metrics to track its progress in the years to come"<sup>8</sup>.

This journey is by no means finished, but an important start has been made.

<sup>8</sup> *Drinking It In: The Evolution of a Global Water Stewardship Program at the Coca-Cola Company*, BSR, March 2008

# Proven Opportunities for Value Creation and Innovation

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With water as a rapidly emerging issue for business, first mover advantage is imperative if companies are to successfully exploit water related opportunities. First mover advantage is particularly important in those sectors and regions most exposed to water risks and most likely to experience them soon, if they have not hit already. In regions such as Australia, already eight years into a major drought, the response includes farmers focusing on profit from selling water because it provides a better return than using it to irrigate their cereal crops<sup>9</sup>. The country has a 25-year old water market, originally set up to better share available water among farmers. The result of the drought, having pushed up prices, is tantamount to a 'gold rush', attracting a wide range of participants. In this situation, as in many others where water is making a substantial difference to markets, sitting on the fence could prove a dangerous option.

Opportunities extend beyond companies with direct water consumption. As more companies begin to understand their strategic options regarding water management, demand will increase for innovative products that enable improvements in water efficiency and alternative water supply.

This technology pull presents a huge opportunity for companies aiming to create value through innovation based on a clean technology strategy with water as a key differentiator.

*“The global market for industrial water equipment was  $\square$ 6.0 billion in 2007 and is expected to grow some 8% per annum globally 2008-2014<sup>10</sup>.”*

More specifically the desalination market is expected to grow to  $\square$ 2.5 billion in 2012, corresponding to a global CAGR of 13%<sup>11</sup>.

At Arthur D. Little we are already supporting companies to take advantage of clean technology related opportunities. As the water crisis continues beyond the current economic crisis, the associated opportunity for innovation and value creation will grow; clean technology strategies will need to be adjusted to maximize competitive advantage.

## Perhaps Not Now – But When?

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Should your company be looking into water neutrality, or at least be moving in that direction?

Water may not be an issue for your business now; how will you know when it has become an issue?

Perhaps now is the time to examine your business and product portfolio, to identify the risks and opportunities presented by water, so you can prepare for an uncertain future before it arrives.

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<sup>9</sup> Business Report, September 2008

<sup>10</sup> Global industry analysts – Water treatment equipment and supplies (2008), Arthur D. Little analysis

<sup>11</sup> BCC Research – Seawater and brackish water desalination (2008), Arthur D. Little analysis

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### **The Water Margin**

More and more companies are recognizing that strategic management of water can grow business value. Development of water management as a key element of business strategy requires recognition of the forces for change impacting the business together with management of the associated risks and opportunities to optimize value.

### **Arthur D. Little**

Arthur D. Little, founded in 1886, is a global leader in management consultancy, linking strategy, innovation and technology with deep industry knowledge. We offer our clients sustainable solutions to their most complex business problems. Arthur D. Little has a collaborative client engagement style, exceptional people and a firm-wide commitment to quality and integrity. The firm has over 30 offices worldwide. With its partner Altran Technologies, Arthur D. Little has access to a network of over 16,000 professionals. Arthur D. Little is proud to serve many of the Fortune 100 companies globally, in addition to many other leading firms and public sector organizations. For further information please visit **[www.adl.com](http://www.adl.com)**

Our Sustainability and Risk practice supports companies across the world to find performance through integrity and innovation. Our work is rooted in the origins of the firm. Since the days when Arthur D. Little himself advised clients on finding commercial uses for their process waste, we have combined our in-depth sector knowledge and expert advice in business strategy and performance, technology and innovation with a strong track record in advising companies on environmental and social responsibility.

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