An environmental agenda for the growth of India's Chemical Sector

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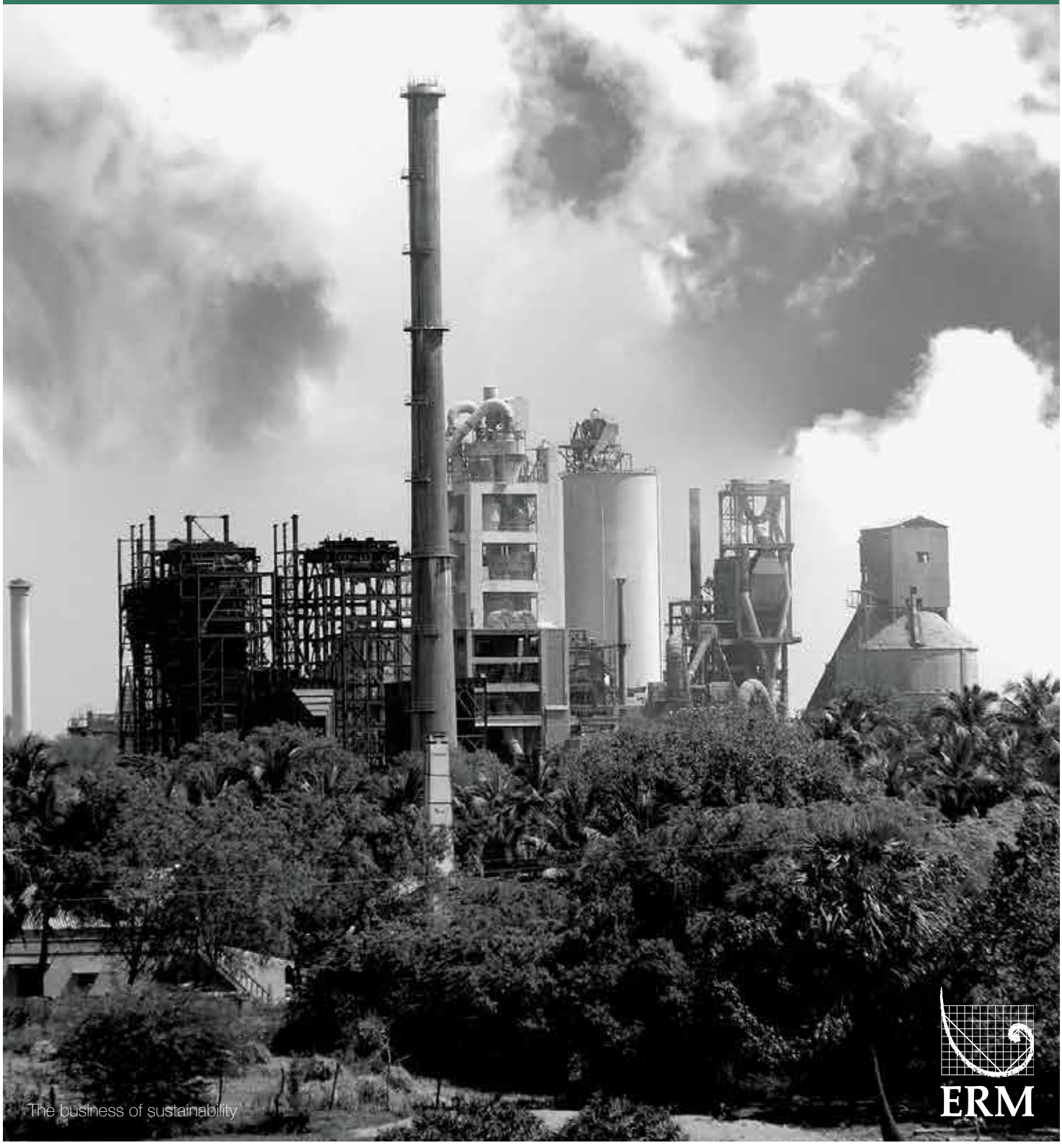

The business of sustainability

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Can India become the next big chemical manufacturing hub of the world? Government through the Make in India campaign plans to increase overall manufacturing share of GDP from the current 16% to 25% over the next five years. Chemical Sector is the bedrock of a manufacturing economy. As manufacturing increases, so will the demand for chemicals. The fundamentals of a robust chemical demand in India are in place with the rapidly growing middle class and low penetration of chemical use. Over the last two decades of India's rapid GDP growth, Industry has largely imported chemicals to meet its requirement. This time round the business and policy fundamentals for domestic manufacturing appear stronger.

So what has constrained chemical production i n India? The Chemical Industry blames it on the lack of supporting infrastructure, i.e., roads and pipelines, lack of mature consumer demand, difficulties in sourcing viable feedstock, too many wrong types of regulations and free trade agreements that allow cheap imports thereby undermining the business case for domestic manufacturing. The Government on the other hand dismisses these as old excuses and questions Industry's commitment to making in India. At a recent Industry event, a Government representative questioned why India, with its small share of petroleum resources, is one of the largest exporters of naphtha in the world and why can't the Industry use naphtha to make chemicals in India? Lately, the Government and the Industry have shown more willingness to work together on the issues.

China evokes a lot of interest in India for the spectacular growth of its Chemical Sector. Over the last twenty years, China has become the largest producer of chemicals in the world, riding the growth of its manufacturing sector. In doing so, China has created jobs for its people and taken hundreds of millions of people out of poverty. Today, Chinese public and private sector multi-national companies dominate the global business landscape. Chinese policymakers saw a strategic significance in the Chemical Sector to the extent that sensible commercial and regulatory checks and balances were set aside to enable its growth. The Industry grew but it also resulted in large scale degradation of air, ground and water in China. The massive explosion at Tianjin Port's chemical warehouse in 2015 that was visible from space was a loud testimony to the safety and health issues that plague China's chemical sector. It is an open question if China's economic growth justifies the environmental cost that the country has incurred.

Replicating China's growth model is a tantalizing prospect for India's Government and the Industry. However, growth at the expense of the environment will not fit in India's socio-political context given India's large, poor and vulnerable population and its democratic political structure. India should instead look at the twenty year history of growth of chemical industry in China, learn from its mistakes, and create the Industry in India that thrives in the future without destroying the environment.

Why does the Chemical Industry in India require an environmental agenda?

Chemical industry has a large environmental footprint. It is energy and water intensive, consumes hazardous materials, emits noxious gases, and produces a significant amount of hazardous waste. Transportation and storage of chemicals entails serious health and safety risks. From sourcing through final disposal, chemicals need special handling to minimize impact on human health and the environment. It is clear that if growth of the Chemical Sector is not managed responsibly, it is capable of causing serious harm to the environment and larger public interest. Regardless of how strategic the chemical industry and its perceived benefits may be for India, there are significant risks to growth if it is in conflict with public interest. For example, several chemical clusters in India remain closed for further growth due to the extent of environmental damage, leaving major Chemical Sector investments stranded. Legacy soil and groundwater contamination has created a threat of regulatory action, fines and penalties that could be triggered by a solitary public complaint.

Recognizing the risks to growth, Indian companies such as the *Aditya Birla Group (ABG)* have included an environmental agenda as a key theme in their business strategy. India's pharmaceutical sector which has similar operating characteristics as the Chemical Sector offers an interesting case study on the business benefits of environmental responsibility. Pharmaceutical sector operates under the close supervision of foreign regulators and companies that import drugs manufactured in India. This association, in some cases has resulted in the sector paying closer attention to its environmental performance. In most cases, this has improved the environmental record of the sector. India's pharmaceutical sector today is a world leader in manufacturing of drugs and APIs. While there may be other reasons for the success of pharmaceutical manufacturing in India, relative lack of environmental issues has enabled the sector to focus on pursuing growth at home and abroad. Chemical Sector can emulate the pharmaceutical sector by embracing an environmental agenda that addresses the following three main areas of concern that are impeding its growth:

Public resistance to use of chemical products

Usage of chemicals in Indian society is small on a per capita basis. One reason for low usage is the rural lifestyle of majority of its population in which incorporation of chemicals in daily living, outside of agricultural use, is minimal. There is also a lack of trust in chemical companies due to the history of industrial disasters, chemicals spills and localized contamination issues. As society urbanizes, India's per capita income grows, and millions of young Indians turn into consumers, it creates a huge opportunity to generate demand for chemical products. To develop this opportunity to the fullest, it is important that the Chemical Industry address the environmental issues that underlie society's traditional resistance to the use of chemicals and distrust of chemical companies.

Rapidly evolving environmental regulatory framework

Rapid economic growth since economic liberalization in the 1990s in an environmental regulatory system that has not caught up has significantly compromised environmental protection in India. The state has responded both at the judicial and the legislative levels creating a very dynamic regulatory landscape. Many regulatory changes have occurred due to increasingly active public/non-governmental organizations' interventions in courts, as well as media attention. The State has been forced to take a bigger role with the regulations since industry failed to take the initiative vis-a-vis meaningful self-governance. The creation of a National Green Tribunal (NGT) in 2010 was a landmark event in this regard. These changes in law pose a significant liability risk to the Industry and its future growth. Regulatory issues will continue to hurt the growth prospects of Chemical Sector unless there is a change in the Sector's attitude towards compliance with environmental regulations.

Innovation for the sustainable economy of the future

At the global level, sustainability issues have triggered major innovations that can be credited, at least in part to the Chemical Sector. Renewable power, water purification, energy efficiency in buildings, shale gas as a cleaner alternative to coal, etc., are all new industries that were made possible by innovations from Chemical Sector. In return, these innovations helped the industry by increasing demand for its chemical products. In India, the opportunity to innovate is particularly unique given the millions of poor Indians with low penetration of chemical use coming into disposal income. This *Bottom of the Pyramid* segment of the population had traditionally been off the radar of chemical companies. There are few products in the existing portfolio of chemical companies that can be cross-sold to this segment. Chemical Sector needs to bring its innovation to realize the opportunity to sell new, sustainable products to this segment.

Setting an environmental agenda for growth of Chemical Industry in India

ERM's team of Sector specialists undertook research to determine the key elements for an India focussed environmental agenda for the Chemical Sector. Research primarily relies on ERM's experience working on environmental issues faced by chemical companies operating in India. In addition, our experts studied publicly available information, met with the Industry and regulators and attended Industry events to further understand key issues. ERM also incorporated findings from an industry survey in 2015 to track and quantify the perception of environmental risks among industry managers and operators in India. A significant majority of the survey respondents believed that environment is a risk to their business. While perception of risk is primarily driven by past experience, for the Chemical Sector significant business opportunities lie in sustainable future. Therefore, an environmental agenda for the Chemical Sector should be both backward and forward looking.

In ERM's opinion, the following are absolute 'must haves' on the agenda:

- Conduct an environmental risk and liability assessment of all existing and planned assets
- Evaluate waste management practices
- Assess compliance with future environmental laws
- Evaluate Health and Safety practices
- Get a complete picture on sourcing, supply chain and usage of resources
- Work on labour and community relations
- Collaborate to innovate in the new sustainable economy
- Environmental non-tariff barriers

Conduct an environmental risk and liability assessment of all existing and planned assets

A small to medium sized manufacturing facility in India typically operates under environmental performance thresholds of Air Act, Water Act, Environmental Protection Act and multiple regulations governing management of solid and liquid wastes. It is not uncommon for chemical businesses in India to be non-compliant with regulatory requirements. Compliance with regulations should be a non-negotiable item for Chemical Sector companies. Chemical spills and leaks in the surrounding environment are difficult to hide and pose a liability risk for the business and an exposure risk for the surrounding communities. Fresh water sources, biodiversity zones and human settlements in the areas surrounding the chemical asset should be evaluated for such risk from chemical operations and if necessary, changes should be made to reduce the risk. Companies should carry out on-site audits to understand performance of environmental infrastructure (i.e., hazardous waste storage and disposal) and the risk of fines and legal notices for non-compliance. Acquisitions, joint ventures (JVs) and divestitures should be planned based on a due-diligence process that incorporates environmental performance as material criteria. Identifying and planning to address environmental impacts proactively can potentially reduce the cost of compliance and draw a favourable response from regulators and potential investors.

Evaluate waste management practices

Industrial waste management is a relatively new practice in India. Traditionally, the State did not have means to off-take hazardous waste and businesses were required to treat it in-house. While some industries (e.g., cement), turned that into a strategic advantage by using waste for energy, the most common practice was ground disposal. Even with regulations in place now, overall attitude towards waste management is lax both at the regulator and the industry.

The practice of careless disposal of waste is especially prevalent in the Chemical Sector in India. Companies continue to inject wastewater into the ground posing huge risks and liabilities from soil and groundwater contamination. Industry is finding it difficult to meet the Zero Liquid Discharge (ZLD) requirements in certain states. On the other hand, ZLD requirements have resulted in innovations that have allowed chemical companies to reduce their overall water use and cut down waste management expense. Chemical companies should evaluate current waste disposal methods for techniques and adequacy of infrastructure capacity with special emphasis on hazardous waste and evaluate commercial opportunities in waste. Large chemical companies can multiply the effect of their actions by conducting such assessments across the supply chain. Companies should initiate efforts to assess potential soil and groundwater contamination from past waste disposal practices and start working on a long term, cost effective plan to remediate the contamination.

Assess compliance with future environmental laws

As India gets more industrialized, it is entering an era of more environmental regulations and stricter enforcement of existing laws. States of Gujarat, Maharashtra and Tamil Nadu, the three most industrialized states in India also have the most proactive state pollution control boards. Specific to the Chemical Sector, the Government has notified or issued rules and guidelines to minimize and manage environmental impacts. In January 2016, for the first time in India, guidelines were issued imposing punitive and liability measures (penalties as well as environmental clean-up costs) on owners/operators/transporters of hazardous chemicals that cause accidents, spills, or other incidents. These enforceable guidelines refer to existing legal provisions in acts and rules that were first promulgated in the 1970s, showing a new-found seriousness in addressing land and groundwater contamination. Similarly, the hazardous waste rules were amended and re-issued in April 2016 to make compliance less onerous and more transparent.

Contrary to the growing environmental awareness in the country, most of India's industry including the Chemical Sector continues to argue for dilution of the environmental regulatory framework. Such arguments are flawed and do not serve the Industry's long term self-interest. The chemical industry needs to position itself to comply with existing and impending laws and also to earn a seat on the table to influence law as it is debated in the democratic process.

Evaluate Health and Safety practices

For a country that experienced the worse industrial accident at a chemical plant in Bhopal 1984, India continues to have poor health and safety (H&S) standards. Consequently, accident and injury rates in India are the highest in the world. Chemical Sector, with industrial hygiene issues related to worker exposure to hazardous (toxic, carcinogenic, explosive, ignitable, reactive) chemicals is especially vulnerable to business interruption and liability risk due to catastrophic events. Research and Development (R&D) for specialized chemicals involves handling new materials leading to process safety related risk with unforeseen health and safety consequences. Since Bhopal, chemical industry in India faces multiple health and safety requirements under the Factories Act, Chemical Accident Rules, Manufacture, Storage and Import of Hazardous Chemical Rules and Public Liabilities Insurance Act. Among other things these rules allocate responsibility for H&S at a facility, specify health and safety audit requirements and define storage conditions for hazardous material, emergency planning and insurance coverage from liability risk. While many large chemical companies in India raise the bar on compliance with H&S law, small and medium enterprises are largely non-compliant. Improvements in H&S will lower accident rates and reduce business interruption risk. Chemical Sector companies should conduct comprehensive H&S assessment in the manufacturing operations and the supply chain and improvements should cover issues from culture/ attitude shifts, training, tools and operating practices to Quantitative Risk Assessments (QRA), applicability of Process Safety Management Systems (PSMS) and a framework for management of change.

Get a complete picture on sourcing, supply chain and usage of resources

In India, production of chemicals is largely in the states of Gujarat and Maharashtra and consumption is in manufacturing centres across India. The geographical spread of producers and consumers creates a large and diverse supply chain that passes through vulnerable clusters of population with little or no infrastructure to prevent or respond to a catastrophic spill or an explosion. The supplier base in India for goods and services, including for logistics is made up of cost conscious, small and medium enterprises. In such an operating environment, given the limited ability of the State to enforce safety regulations, chemical supply chain in India has all makings of a perfect industrial accident. Other risks in the supply chain may emerge due to the large variability in environmental conditions such as resource supply (i.e. raw water, electricity), risks from natural events (i.e. storms, floods, earthquakes), socio-economic conditions, air pollution levels and proximity to sensitive receptors such as fresh water bodies and protected habitat. Chemical companies should know the requirements, sources and alternatives for resources such as water, electricity, hazardous chemicals, etc. in the manufacturing operations and in the supply chain and assess threats and weaknesses to continued access to such resources through supply chain and source vulnerability audits. Such audits will enable companies to select sourcing locations, vendors, supply chain routes etc. to lower risk to their business. Nicer Globe program of Indian Chemical Council (ICC) establishes standards for safe transportation of chemicals and enable response in case of emergencies.

Work on labour and community relations

Traditionally, industry in India was located near population centres due to the availability of supporting infrastructure. With space getting scarce in cities, Industry is expanding outwards leading to conflict with the incumbent communities and migrant labour force that works for the industry. These conflicts are managed in an opaque manner by key people on both sides who often fail to adequately address genuine grievances. As a result, industry in India constantly faces the threat of Public Interest Litigation (PIL), a form of legal challenge that is driven by concerns of a community as a whole. Chemical Industry with its large, visible environmental footprint and its resource intensity is especially vulnerable to conflicts with the community. Odour from chemical plants and groundwater impact on which surrounding communities are dependent are significant social issues in chemical clusters and can be addressed with changes to the factory layout, storage, handling and sampling practices. A social due diligence on the impact of Industry on the surrounding community, identifying the stakeholders, their grievances and a mechanism to address such grievances are tools to manage social risks to the Industry throughout its lifecycle.

Collaborate to innovate in the new sustainable economy

Sustainability issues of the future are complex and require a multi-disciplinary response. In most cases, Chemical Sector is not in a market facing role to understand the end user needs but it is a key enabler of solutions. There would have been no innovation in wastewater reuse and energy efficiency in buildings had it not been for innovations made by the Chemical Sector. Chemical companies should get more proactive in the sustainability drive by creating or joining Industry coalitions, NGO initiatives and collaborate with academia and government agencies. As an example, World Business Council for Sustainable Development (WBCSD), a global environmental non-profit has envisioned an Indian Chemical Industry coalition to foster development of technologies to address climate change. Chemical companies should join and support such coalitions. There are other pertinent issues where chemical companies can play an important role in creating ecosystems to develop solutions. India is at the front end of an unprecedented urbanization drive and municipalities in India are already failing to address problems of air pollution, waste management and water shortages in cities. Cities are drowning in the ever increasing piles of trash from packaged food and beverage consumption. Even though these problems are not unique, it has been difficult to deploy solutions that have worked in other parts of the world, in India. Unique solutions are required and chemical companies should actively participate in devising such solutions.

Environmental non-tariff barriers

In a globalized economy where there is general consensus that free trade across national borders is good, Industry should consider environmental non-tariff barriers to counter the flood of cheap chemical imports. A more accurate accounting of cheaper imports will be apparent when the overall sustainability impact of the imported product is considered. Sustainability can be defined in multiple aspects relevant in the Indian socio-economic context, i.e., water intensity, GHG intensity, hazardous chemical use, biodiversity impact, disposal cost and limitations, human impact, Indian law, etc. A science driven, data intensive compilation of domestic chemical use and related sustainability information can be used to create import and export scenarios that are favourable to the Indian Industry. It may well provide the boost that is needed for Green Chemistry to expand in India.

Conclusion

The Chemical Sector in India has a choice to make on its approach to environmental issues. Companies can choose to ignore the issue and run business the old way focussing on cost control and compromising on environmental responsibilities. Lowest-cost production also implies environmental compliance costs lower than in the competing economies, i.e., China. In practice, it may well mean that environmental performance of the Sector deteriorates further in the future. In India, where over the long term, public interest trumps all else, growth that destroys the environment can be envisioned but it cannot be sustained. Eventually, the people, the politics and if all else fails, the judiciary gets in the way of such growth as has been experienced by the mining sector in India and more recently by the automotive sector.

The other alternative for the Industry is to think strategically and understand that poor environmental performance holds back growth. Responsible Care and Nicer Globe are important initiatives by the Industry but more companies have to get on board. It is important for chemical companies to understand that a transparent environmental agenda that does not necessarily right all the wrongs of the past but more importantly, aligns the Industry's interest with the public interest going forward will position the Industry to break the mistrust and suspicion of chemical companies and increase demand for its products in India and with foreign buyers; it will de-risk the business by planning to comply with existing and upcoming laws and influence the development of future regulations; and it will encourage Industry to collaborate and assist in the development of specialized, higher margin chemical innovations that address some of the most pertinent sustainability issues of our time.

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About ERM

Environmental Resources Management (ERM) is a leading global provider of environmental, health, safety, risk, social consulting services and sustainability related services. We have more than 160 offices in over 40 countries and territories employing more than 5,000 people who work on projects around the world. ERM is committed to providing a service that is consistent, professional and of the highest quality to create value for our clients. Over the past three years we have worked for more than 50 per cent of the Global Fortune 500 delivering innovative solutions for business and selected government clients helping them understand and manage the sustainability challenges that the world is increasingly facing.

For over 40 years we have been working with clients around the world and in diverse industry sectors to help them to understand and manage their environmental, health, safety, risk and social impacts. The key sectors we serve include Oil & Gas, Mining, Power, and Manufacturing, Chemical and Pharmaceutical. All face critical sustainability challenges and our clients in these and many other areas rely on our ability to assist them operate more sustainably which has a positive impact on our planet.

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