

Outsourced Responsibility?

Response to Fatal Explosion by Chemical Giants





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Executive Summary

On March 21, 2019, a major explosion occurred at the Jiangsu Tianjiayi Chemical Co., Ltd. (hereinafter referred to as “JTC”) in the Xiangshui Chemical Industrial Park, Yancheng City, Jiangsu Province, China. The enormous explosion, which triggered an earthquake, caused 78 deaths and injured more than 600 people.¹ Authorities in the Yancheng Municipal Government have closed all operations at the Xiangshui Chemical Industrial Park in the wake of the JTC explosion to scrutinize any remaining hazards.²

Publicly available inspection records clearly suggest that JTC was an accident waiting to happen. The factory had multiple serious safety and environmental violations on record – 13 types of safety hazards documented in February 2018 by the former State Administration of Work Safety (now the Ministry of Emergency Management), including the lack of an emergency shut-off valve near the root of the benzene tanks, which hosted the chemical allegedly responsible for the explosion³. Environmentally, the factory was similarly operating well outside the law, with egregious infractions on the books such as building a hidden pipeline to discharge its pollutants into nearby waterways and evading supervision of its air emissions.

What’s more, it appears that the JTC situation is not at all unique; many other chemical factories located in the Xiangshui Chemical Industrial Park where JTC operated and in adjacent industrial parks also have extensive documented environmental violations. Adding insult to injury, a nearby factory in Zhejiang province, which benefitted from the reduced competition in chemicals production following the closure of JTC, itself has a record of environmental violations and has just been listed as posing critical safety hazards.

Chemical manufacturing is an inherently dangerous operation; it relies upon a large number of highly toxic, flammable and explosive raw materials, undertakes reactions that must be carefully controlled for temperature and pressure build-up, and generates products that themselves often threaten human health and the environment if mismanaged. It is a sector that rightfully concerns both the general public and government authorities, which understand that many of the products it makes are important to modern life but also recognize the critical necessity of ensuring its safe and responsible operation. The explosion at JTC reinforces concerns about weak safety and

environmental supervision by local government agencies and about the poor quality of corporate safety and environmental management in chemical manufacturing.

In response to the JTC explosion, government officials are rolling out major corrective actions. Officials in Jiangsu have announced draft plans to significantly reduce the number of chemical enterprises in the province. Thousands of enterprises will be re-evaluated and those not up to standards will be shut down.⁴ Other provinces such as Shandong and Zhejiang are following suit, based on lessons from the tragic case of JTC, and have launched safety inspections to phase out potential hazards and pollution from chemical manufacturing operations.

But in the on-going storm, the corporations that buy the chemicals manufactured at JTC and similar suppliers have been strangely silent. In this case, records indicate that at least four of the world’s global chemical giants – DuPont, Merck, BASF and Clariant – may count JTC in their supply chain. Yet these companies have kept their heads down about the urgent need to put their own shoulders to the wheel and join government and stakeholder efforts to prevent similar incidents from happening again.

One may wonder whether these chemical and pharmaceutical giants are in a position to help. The answer is yes, they are actually quite well positioned to do so via sourcing policies that require their procurement departments to buy **only from factories that comply with local safety and environmental laws** and rewarding factories that go beyond compliance with additional business. If, instead, corporate buyers look only at price, and violators remain eligible for business, these companies sustain a powerful engine for continued irresponsible operations around the world. Their procurement policies serve as a damaging drag and counterforce to stakeholder efforts to achieve safer and more environmentally responsible manufacturing, particularly in China.

Not only are companies well-positioned to leverage improvements in the performance of factories in their supply chain, it is also good business practice for them to do so – if for no other reason than to ensure the reliability of their own production. Government inspections and the enforcement of environmental and safety regulations have been on the upswing in China for the past several years, and will clearly accelerate in the wake of this explosion. If, as suppliers are closed or penalized for safety or environmental performance violations, companies again and again scramble to find the quickest and cheapest new supplier, without a due diligence

investigation of that supplier's compliance status, they run the risk of again perpetuating irresponsible operations and putting their supply chain at risk of disruption.

The growing community of ESG investors, who concern themselves with the environmental, social and governance practices of an investment that may have material impact on the performance of that investment, should be quite alarmed by supplier selection practices that do not undertake full investigations of the safety and environmental performance of potential suppliers.

On paper, chemical and pharmaceutical giants actually appear to recognize the responsibility they bear for supplier operations, often providing flowery language on their websites about their concern for safe and sustainable supply chain operations. They often cite reliance on supplier Codes of Conduct, which accompany supplier contracts and require compliance with local law, to reduce supplier risk. However, a code of conduct, without significant accompanying inspections, requirements for compliance and disqualification for businesses where egregious problems are not resolved, cannot defend against the risk posed by manufacturing their dangerous goods.

Moreover, there is a serious weakness in the **scope** of supply chain policies of many corporations; codes of conduct are often applied only to the "direct supplier" at the very top of the supply chain, rather than throughout the entire supply chain where higher risks may be found. The recent incident at Xiangshui County proves that these codes of conduct fall far short of what is necessary to ensure responsible operations.

While the JTC explosion should serve as a call to action for chemical giants to join forces for improvement, no company has stepped forward to announce initiatives to strengthen the obvious poor oversight of suppliers in response to outreach by IPE. Only one of the four companies – Merck – has even indicated a preliminary willingness to further explore its responsibility for this factory as a secondary supplier (i.e. a supplier to one of their suppliers). Every other company has disputed its association with the JTC accident, rejecting its association outright or disavowing responsibility on the grounds that the factory was not a "direct" supplier.

IPE calls upon the chemical manufacturing industry to stop dodging responsibilities and to immediately step up and put reinvigorated action behind their words of commitment. The list of violations at the many factories in China that manufacture for export in and adjacent to Xiangshui

Chemical Industrial Park underscores the relevance of this tragedy to each of their procurement departments and the need for chemical companies to upgrade their supply chain programs and join stakeholder efforts for improved, comprehensive supervision.

Government authorities and local stakeholders such as NGOs have developed efficient and effective tools that can facilitate and strengthen the corporate supervision of supply chain operations. Dozens of major corporations outside of the chemical industry have now used IPE's tools for dynamic supply chain oversight, and IPE's partnership with the most active of these participating companies has led more than 7,000 suppliers to take responsibility for their problems and undertake necessary corrective action. We urge chemical and pharmaceutical brands to tap into the records of violations that the government has made publicly available and to identify and to address all significant environmental and safety hazards in the factories in their supply chains. We hope that this terrible tragedy shall become the wake-up call for the chemical industry and for all those who have a stake in its safe and responsible supply chain management.



Introduction



On March 21, 2019, a major explosion occurred at the Jiangsu Tianjiayi Chemical Co., Ltd. (hereinafter referred to as “JTC”) in the Xiangshui Chemical Industrial Park, Yancheng City, Jiangsu Province, China. The enormous explosion, which triggered an earthquake, caused 78 deaths and injured more than 600 people.⁵ Authorities in the Yancheng Municipal Government have closed all operations at the Xiangshui Chemical Industrial Park in the wake of the JTC explosion to scrutinize remaining hazards.⁶

JTC had multiple environmental violation records on the books for infractions including building a secret pipeline to emit pollutants, evading supervision of air emissions, inadequately dealing with hazardous waste, violating environmental impact assessment procedures and operating outside of the “three simultaneous” systems regulation for construction projects. (Table 1) The company had been punished by the local environmental protection bureau repeatedly and fined more than 1 million RMB (approximately \$150,000) in 2018 alone for these violations.⁷

Table 1. JTC environmental violation records

Year	Penalty Reason	Penalty Outcome	Penalty Date
2018	Secretly set up a pipeline to emit pollutants, violating Article 83 of the Water Pollution Prevention and Control Law	Ordered to correct illegal practices and fined RMB 200,000	2018/7/18
2018	Took measures to evade supervision in order to discharge air pollutants and violate the standards for solid waste management systems, counter to the regulations stipulated in Article 99 of the Air Pollution Prevention and Control Law and Article 75 of the Solid Waste Pollution Prevention and Control Law ⁸ , respectively	Fined RMB 530,000	2018/5/24
2018	Violated the environmental impact assessment procedure for construction projects and the “three simultaneous” systems regulation ⁹ , as well as the regulations for solid waste management systems and air pollution prevention management systems, counter to Article 23 of the Regulations on the Environmental Management of Construction Projects, Article 31 of the Environmental Impact Assessment Law, Article 107 of the Air Pollution Prevention and Control Law, and Article 75 of the Solid Waste Pollution Prevention and Control Law	Fined RMB 480,000	2018/5/24
2017	Received a yellow rating on the 2017 Yancheng Annual Non-State-Controlled Major Enterprise Environmental Credit Evaluation Results for Xiangshui County ¹⁰	-	2018/7/2
2017	Environmental protection facilities paired with the project were not accepted by the local authorities, and the management of hazardous waste was not up to the standard of the Jiangsu Province Regulations on Solid Waste Pollution Prevention and Control	Fined RMB 280,000	2017/7/26
2016	Received a yellow rating on the 2016 Yancheng Annual Major Enterprise Environmental Credit Evaluations for Xiangshui County	-	2017/7/4

2016	Violated the regulations for water pollution prevention and control systems	Ordered to correct illegal practices and fined RMB 100,000	2016/7/12
2016	Violated the regulations for solid waste management systems	Ordered to correct illegal practices and fined RMB 50,000	2016/7/12
2016	Violated the “three simultaneous” systems regulation and the regulations for solid waste management systems	Ordered to correct illegal practices and fined RMB 100,000	2016/7/12
2016	Violated the regulations for air pollution prevention and control systems	Ordered to correct illegal practices and fined RMB 200,000	2017/1/16
2016	Violated the regulations for solid waste management systems	Ordered to correct illegal practices and fined RMB 60,000	2017/1/16
2013	Phase II wastewater treatment facilities were put into production without prior acceptance from environmental authorities; the project was put into production without authorization; no hazardous waste identification signs were set up	Fined RMB 100,000	2013/11/8

(Source: Government records accessed from the IPE Blue Map Database)

JTC’s safety record was no better than its environmental records. In February 2018, the former State Administration of Work Safety (now the Ministry of Emergency Management) published 13 safety hazard violations found during an onsite inspection at the company, including the lack of an emergency shut-off valve at the root of the benzene and methanol tanks, which is listed as Level 2 major hazard¹¹ and poor on-site management, with a relatively high number of leaks, among other serious problems.¹² (Table 2)

Table 2. Safety hazards found during an onsite inspection at JTC

Relevant Safety Risks and Issues
1. Primary person in charge has not yet been examined for safety knowledge and management qualifications.
2. Only one special instrument operator has obtained certification, a number which does not satisfy the actual safe production work requirements.
3. The production equipment operating procedures are not adequate, because they lack operating procedures and specific technical indicators for the benzene tank area. There is no patrol system and no specific requirements for inspections.
4. After the nitrification equipment is set to lock, there is no prompt procedure for revisions or changes in operations.
5. Some dinitrate tanks’ pressure transmitters share one pressure point.
6. There is no emergency shut-off valve at the root of the benzene and methanol tanks, which is listed as a Level 2 major hazard source.
7. Some dinitrate tanks that supplement the hydrogen pipeline have a shut-off valve that reroutes to a secondary pipeline; the lock is not used.
8. The cabinet room and monitoring room are illegally set up inside the nitrification plant.
9. The safe production responsibilities do not match the actual company production circumstances for some posts; for instance, the procurement department did not put forth requirements for the safety quality of purchased products.
10. There is poor on-site management, with a relatively high number of leaks; on-site safety warning signs did not meet standards; some safety warning signs were blurry or unclear and there was no weather vane on site.
11. There was no standardization of any work involving fire. For instance, some safety measurements had not identified people in charge, and the results of a flammable gas analysis were written as "non-existent, no flammable gas", among other issues.
12. There were no leak prevention or emergency disposal measures for the loading and unloading of benzene and methanol. The filling point is close to the pumping area. The device for washing eyes is damaged and waterless.
13. Operators who were asked on site were not clear about the flammable gas alarm system nor the emergency measures after an alarm sounded; the flammable gas alarm for nitrification equipment has no visual aspect to the alarm.

Who are the customers of JTC, and have they stepped forward to join government and stakeholder efforts to learn the bitter lessons of this explosion for other factories manufacturing their goods?

Chemical manufacturing is an inherently dangerous operation; it relies upon a large number of highly toxic, flammable and explosive raw materials, undertakes reactions that must be carefully controlled for temperature and pressure build-up, and generates products that themselves often threaten human health and the environment if mismanaged. It is a sector that rightfully concerns both the general public and government authorities, which understand that many of the products it makes are important to modern life but also recognize the critical necessity of ensuring its safe and responsible operation. The explosion at JTC reinforces concerns about poor quality chemical manufacturing and calls for the immediate re-examination of the adequacy of corporate programs in place to ensure basic safety and responsibility.

In particular, this explosion raises urgent and important questions about the corporations that buy the products manufactured at JTC and similar suppliers. Do they not have responsibility to ensure that they do business only in factories that operate safely and responsibly?

What does JTC sell?

JTC manufactures chemical intermediates, which are sold to other companies up the manufacturing supply chain to make final products. Its most important products (by volume) are 1,3-dinitrobenzene, m- and o-phenylenediamine, and tris(hydroxymethyl)aminomethane, as well as eight others.^{13 14} (Table 3)

JTC appears to be a particularly important supplier of m-phenylenediamine; records indicate it supplies up to 25-30% of the Chinese market of that chemical;¹⁵ this compound is a noteworthy ingredient in the manufacture of dyes for the textile industry among other applications. JTC also

manufactures tris(hydroxymethyl)amino methane, a buffering agent commonly used in medical research and practices. Other JTC chemical products are important intermediates used in the plastics, pharmaceutical and rubber industries.

Table 3. JTC production capacity and the market share of its products

Products of JTC	Production Capacity (t/a)	Chinese Market Share (data as of 2017)
1,3-dinitrobenzene	30,400	Unknown
M-phenylenediamine	17,000	25-30%
o-Phenylenediamine	2,500	Unknown
Tris(hydroxymethyl)amino Methane	1,000	Unknown
p-Phenylenediamine	500	Unknown
3-Hydroxybenzoic acid	500	Unknown
2,4,6-trimethylaniline	500	Unknown
p-toluidine	500	Unknown
3,4-diaminotoluene	300	Unknown
m-dimethylaminobenzoic acid	300	Unknown
KSS	200	Unknown
2,5-dimethylaniline	100	Unknown

(Source: National Enterprise Credit Information Publicity System; Huatai Securities)

Which companies appear to be JTC customers?

It is in fact quite difficult to track the supply chains of most multinational corporations, which operate comfortably in obscurity too often under the status quo; the absence of transparency in the global chemical manufacturing supply chain is certainly no exception to this rule.

Sources of information indicate that JTC manufactures for export around the world,¹⁶ and although much important information about chemical markets is confidential for business, various sources suggest that **DuPont**, **BASF**, **Clariant**, and **Merck KGaA** are all customers of JTC.

DuPont appears to have a longstanding business relationship with JTC. Recent data from an import and export data platform¹⁷ indicate that between 2014 and 2019, JTC provided more than 3.5 million kilograms of m-phenylenediamine in roughly 50 shipments to DuPont, with the most recent transactions¹⁸ taking place in February and March 2019 (Figure 1). Import and export data from Panjiva S&P Global Market Intelligence indicates that 29.3% of DuPont’s overseas supply comes from China, more than any other country (Figure 2).¹⁹

U.S. CUSTOMS RECORDS ORGANIZED BY COMPANY				
58 U.S. shipments available for Jiangsu Tianjiayi Chemical Co., Ltd., updated weekly since 2007				
Date	Supplier	Customer	Details	40 more fields
2019-04-16	JIANGSU TIANJIAYI CHEMICAL CO., LTD.	E. I. DUPONT DE NEMOURS AND CO.	META PHENYLENE DIAMINE99. 8 BD MOLTEN ISO TAN. META PHENYLENE DIAMINE99. 8 BD MOLTEN ISO TAN.	BILL OF LADING
2019-03-06	JIANGSU TIANJIAYI CHEMICAL CO., LTD.	E. I. DUPONT DE NEMOURS AND CO.	META PHENYLENE DIAMINE99. 8 BD MOLTEN ISO TAN.	BILL OF LADING
2019-02-18	JIANGSU TIANJIAYI CHEMICAL CO., LTD.	E. I. DUPONT DE NEMOURS AND CO.	META PHENYLENE DIAMINE99. 8 BD MOLTEN ISO TAN. META PHENYLENE DIAMINE99. 8 BD MOLTEN ISO TAN.	BILL OF LADING

Figure 1. From February to April 2019, E. I. du Pont de Nemours and Co. (DuPont) received three shipments of m-phenylenediamine from JTC (Source: Panjiva S&P Global Market Intelligence)

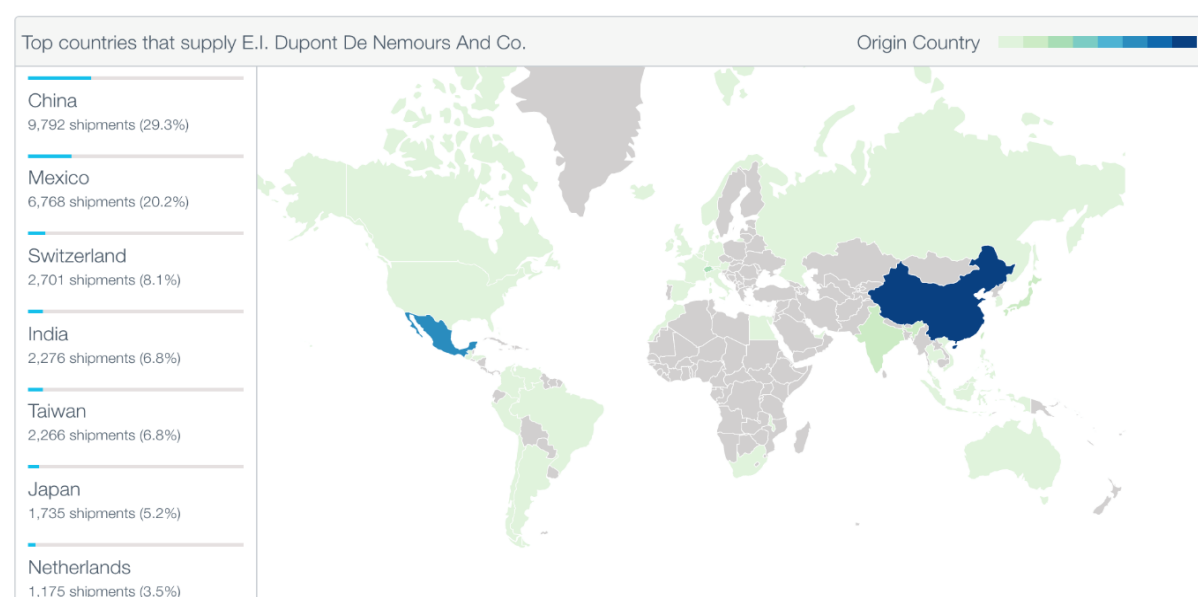


Figure 2. 29.3% of E. I. du Pont de Nemours and Co.’s overseas supply comes from China (Source: Panjiva S&P Global Market Intelligence)

According to another import and export data platform, Merck Life Science Private Limited is another customer for JTC, purchasing chemical tris(hydroxymethyl) aminomethane from the factory (Figure 3).²⁰ This chemical, commonly nicknamed “tris”, is widely used as a buffer in a number of medical research applications. Tris itself is not a toxic chemical product, illustrating the important principle that very dangerous factories and manufacturing practices can operate behind the generation of products that themselves pose no hazard to consumers.

与merck life science pvt ltd.的交易记录	
公司贸易数据已更新至2019-03-06, 共计8条提单	
货运信息	
采购商	Merck Life Science Pvt Ltd.
供应商	Jiangsu Tianjiayi Chemical Co.Ltd.
日期	2018/02/05
采购区域	India
供应区域	China
产品描述	
HS编码	29222190
产品描述	tris(hydroxymethyl) aminomethane
数量	2000.0 OTHER
总金额	23800.0(美元)
单价	11.9

Figure 3. In February 2018, Merck Life Science Pvt., Ltd. received a shipment of tris(hydroxymethyl) aminomethane from JTC (Source: 52wmb.com)

Information provided by Hifi Chemical Co. the day after the explosion stated that JTC was one of its suppliers of 3,4 diaminotoluene, o-phenylenediamine and 2,4,6-trimethylaniline.²¹ This company is engaged in the production of high performance organic pigments, dyes and related intermediates. HiFi Chemical’s 2018 IPO indicates that its main customers include BASF and Clariant et al.²² Assuming this information is accurate, JTC is therefore also a part of the supply chains of these two chemical giants.

Finally, most recently, Lonza Group, a Swiss multinational chemicals and biotech company, itself announced that JTC was an important supplier; an April 18, 2019 press release noted unexpected shortages and supply chain disruptions from the JTC explosion and the need for the company to undertake cost containment steps to overcome the business consequences.²³

“All LSI (Specialty Ingredients) businesses faced continued raw material shortages and supply-chain disruptions caused by China’s Blue Sky environmental initiative and a major chemical plant explosion in China producing feedstock used across the LSI portfolio.”

-- Lonza Group Media Release

IPE outreach to suspected JTC clients leads mostly to denial of business relationships

Based on the information from these public records, IPE reached out to DowDuPont, Clariant, BASF and Merck to inquire about their business relationships with JTC and any programs and policies they had in place to address and prevent these hazards from occurring across their supply chain.²⁴ All four replied, with only Merck responding constructively to IPE's outreach.

DowDuPont -> DuPont²⁵



DuPont denies any business relationship with JTC, Dow says this is now all on DuPont

Despite the publicly available records of sourcing, DuPont responded on March 28 that JTC is **not a supplier**, insisting that "we, DuPont, care for environment and safety."

Dow replied to IPE with a statement on April 5 that DuPont had indicated to them that "JTC is **not a primary ingredient supplier**,"²⁶ which contradicted the outright denial made by DuPont.

Dow disavowed responsibility for this incident on the grounds that the company had split from Dupont as of April 1, but we notice that this split of the Dow and DuPont companies officially occurred after the explosion.

BASF

JTC is not a supplier



On March 25, BASF responded in a telephone conversation with IPE that it needed time to confirm internally whether JTC was indeed a BASF supplier, and it then followed up with an email to us stating that the company had not found JTC within their supply chain in China. BASF's response indicates they are not looking at indirect suppliers.

Clariant



JTC is not a direct supplier

Clariant responded that JTC was not a "direct supplier", although the company indicated that "the indirect business impact is under estimation."

Merck KGaA



JTC is a tier 2 supplier

Merck indicated in a response dated April 30 that JTC is a tier 2 supplier through a Spanish trading company. It stated it was unaware of JTC's compliance problems, and that it was further investigating the situation with its direct supplier.

In the face of publicly available data from various sources, we see some chemical giants busy making the denials, on the technical basis that JTC is not a primary supplier, or not a direct supplier, or not a tier one supplier.

We give credit to Merck and Clariant, which at least indicate or imply that JTC was a part of their supply chains. But it is regrettable to see none of them showed any willingness in their responses to address the broader concern that goes beyond the narrow question of whether this particular facility sold them goods to learn the underlying lesson taught by this devastating experience and improve their overall supply chain oversight.

JTC is only the tip of the iceberg

With the closure of JTC, brands may have to end their sourcing relations with the company anyway. But will this mean that their supply chains are safer or more environmentally responsible than when JTC was a part of them?

Right after the explosion happened, one company in China experienced a huge surge in its stock price -- Zhejiang Longsheng Group²⁷ (hereinafter referred to as “Lonsen”). The reason for the surge is because Lonsen manufactures some of the chemical products that JTC manufactured and was therefore in a position to pick up market share, becoming a direct “beneficiary” of JTC’s explosion.

Lonsen ranks as the top producer of m-phenylenediamine in China, and JTC the second. The JTC explosion directly reduced the national m-phenylenediamine production capacity by 25-30%, resulting in a supply shortage and skyrocketing prices²⁸. Lonsen has two subsidiary companies manufacture m-phenylenediamine: Zhejiang Hongsheng Chemical Co., Ltd. (hereinafter referred to as “Zhejiang Hongsheng”) and Zhejiang Amino Chem Co., Ltd. (hereinafter referred to as “Amino Chem”), with a combined annual production capacity of 45,000 tons, nearly three times that of JTC.²⁹ ³⁰ Zhejiang Hongsheng is also an important global supplier of resorcinol, which is a chemical widely used in the rubber industry and the manufacture of dyestuff and pharmaceuticals.³¹

It seems that Lonsen has a long-term relationship with DuPont. Lonsen’s 2017 annual report states that “in July 2014, Lonsen signed a long-term strategic procurement agreement with DuPont, as the main customer of the company’s m-phenylenediamine.”³²

How about the safety and environmental performances of this suspect supplier of DuPont?

In the wake of the tragic case of JTC, the Zhejiang Provincial Safety Production Committee carried out safety inspections in April, and put Zhejiang Hongsheng as one of the 22 factories posing critical safety hazards and listed for supervision. (Table 4) The Committee required Zhejiang Hongsheng to complete rectifications by May 30, 2019.³³

Table 4. Safety hazards found during an onsite inspection at Zhejiang Hongsheng

Relevant Safety Risks and Issues
1. Insufficient safety distance between hydrogenation unit and east Class A production unit
2. Insufficient installation of flammable or toxic gas alarm devices in the hydrogenation unit and in the nitric acid unloading tank area
3. Some flammable gas detectors are not calibrated as required
4. The storage tank area of the No. 3 Plant constitutes a major source of danger and is not managed in accordance with regulatory requirements

(Source: Government records accessed from the IPE Blue Map Database)

On April 22, Lonsen claimed that they had fixed all the problems. In the statement, it indicated that “Zhejiang Hongsheng has actively rectified all the safety hazards in accordance with relevant laws and regulations, as well as industry standards and local government’s requirements for safety production. Up to now, all rectifications have been completed during the rectification period. Zhejiang Hongsheng does not have any production suspension. At present, all subsidiaries related to the company’s intermediate business are in normal production and operation...”³⁴

The provincial agency in charge of safety production announced in a statement on the following day that “Zhejiang Hongsheng has not yet completed the rectification of all the safety hazards, nor has it applied for acceptance and verification in accordance with procedures, and has issued an announcement that the safety hazards have been rectified and completed, which interferes with supervision and misleads the public...”³⁵ Zhejiang Provincial Safety Production Committee ordered Zhejiang Hongsheng to truthfully release its rectification progress to the public, and submit a self-reflection report to the municipal Safety Production Committee.

Information from an import and export data platform indicates that BASF Mexico is a customer of Lonsen’s subsidiary Amino Chem, purchasing m-phenylenediamine from the company.³⁶

Both Zhejiang Hongsheng and Amino Chem have previous environmental violations on record. In 2016, Zhejiang Hongsheng was punished by the local environmental protection bureau (EPB) for

the improper use of exhaust treatment facilities.³⁷ The same year, Amino Chem was also punished by the local EPB for directly discharging exhaust gas without treatment.³⁸

With all the safety and environmental records this supplier has incurred, we wonder whether DuPont and BASF know about these violations records and have taken any corrective actions.

Unfortunately, the dire safety and environmental conditions evident in the supervision records of JTC and Lonsen may just be the tip of the iceberg. Xiangshui Chemical Industrial Park and two other chemical industrial parks nearby house a total of 318 chemical manufacturers, many of whom produce pharmaceuticals, pesticides and chemical intermediates, and are important suppliers to the global chemical and pharmaceutical industries. Among them, 275 have government-issued environmental violation records.³⁹

The experience from the past years have shown that, environmental inspections carried out by local government have severely impacted the global supply chain, resulting in “continued raw material shortages and supply-chain disruptions” as was remarked in Lonza Group’s media release following JTC’s explosion. To ensure the reliability of their own production and control their operational risks, chemical giants should drive the improvement of safety and environmental performance in their supply chains. The growing community of ESG investors should also be alarmed by the lack of effective management regarding the environmental performance of the full supply chain.

Chemical giants’ irresponsible sourcing practice serves as a dragging force to responsible manufacturing

The explosion at JTC reinforces concerns about weak safety and environmental supervision by local government agencies and about the poor quality of corporate safety and environmental management in chemical manufacturing. In response, stakeholders in China are taking actions to resolve the problem.

Meanwhile, these chemical giants are not trying to participate in the multi-stakeholder efforts; instead, they are still trying to shy away from their responsibilities. Present procurement policies serve as a damaging drag and counterforce to stakeholder efforts to achieve safer and more environmentally responsible manufacturing across the country.

Knowing they cannot get away without any supply chain safety and environmental management policies, each of these four brand customers of JTC provides flowery language on their websites about their concern for safe and sustainable manufacturing, as does their prominent trade association in the United States, the American Chemistry Council, which vigorously promotes its “Responsible Care” program in this regard. Yet a careful reading of these policies reveals important ambiguities about the extent to which they actually apply to all of the factories in their supply chain, particularly these factories that supply their suppliers of chemical products. What’s more, these policies are not explicit about any business consequences for noncompliance with these policies.

DuPont asserts its concern for the environmental impacts of its manufacturing abroad in its 2018 GRI (Global Reporting Initiative) report co-released by Dow DuPont. This document states that DuPont requires all suppliers to comply with a Supplier Code of Conduct, concerning environmental, labor, human rights and social impacts. According to the report, DuPont has “evaluated” 380 of its suppliers and is in the process of implementing a broader supplier assessment program, covering environmental, labor, ethics and supply chain sustainability aspects.

2017 Supply Chain Sustainability Performance

308-1 and 414-1: Percentage of new suppliers that were screened using environment, labor, human rights, impacts on society criteria.

All DuPont suppliers are expected to uphold the DuPont Supplier Code of Conduct, which includes principles in the areas of the environment, labor, human rights, and impacts on society. This is in addition to existing contract language and other mechanisms already intended to ensure supplier adherence with our Code and all applicable laws and regulations.

In addition to the above, DuPont is in the process of implementing a broader supplier sustainability assessment program. This program adopts a risk-based approach and assesses strategic and core suppliers based on more than 20 criteria across four areas, including environment, fair labor practices, ethics, and supply chain sustainability. In 2017, we continued to make progress on the roll out of this program and have assessed approximately 380 suppliers, representing approximately 40% of our strategic and core supplier base.

Figure 4. DowDuPont 2018 GRI report

Significantly, notwithstanding this stated corporate policy and the company's alleged invigorated supply chain oversight, DuPont did not respond to IPE with a recognition of the need for increased oversight of its overall supply chain factories in light of this explosion.

Both BASF and Clariant also have similarly stated the expectation for their suppliers to comply with applicable laws and standards in their Supplier Codes of Conduct.⁴⁰ BASF explicitly mentions that it expects its suppliers to "use best efforts" to ensure that their own suppliers also follow the law.

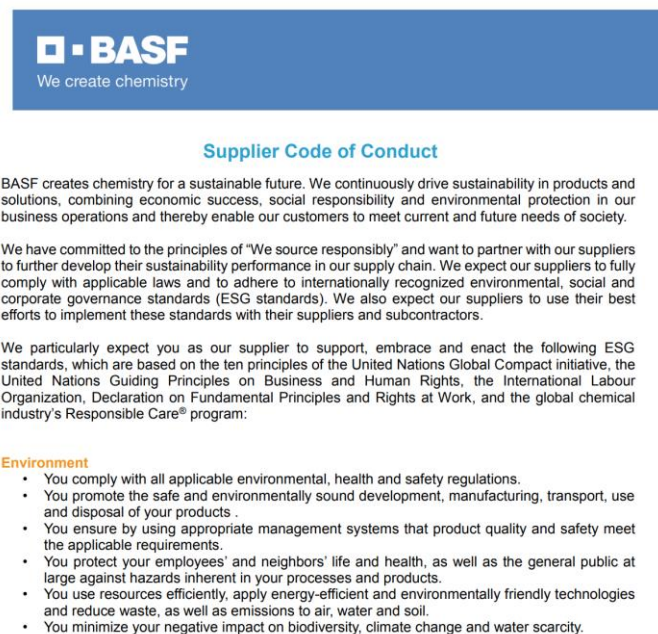


Figure 5. BASF Supplier Code of Conduct

Compliance with this Supplier Code of Conduct

We expect our suppliers and their contractors to abide by this Code of Conduct for Suppliers and to help us reduce our environmental and social impacts by establishing and operating state of the art standards for a sustainable supply chain including the collection and evaluation of adequate and relevant information, the establishment of relevant, measurable objectives and targets, and the regular monitoring and verification of their progress. Our employees are expected to report to their management any practices in dealings with business partners that are in violation of this Code of Conduct for Suppliers. A non-respect of our values may lead to a discontinuation of the business relationship..

The environmental scope: planet

- Environment –suppliers shall ensure compliance with applicable environment, health and safety laws and regulations, including ensuring the protection of the health and safety of the local neighborhoods of the sites or locations they are operating in.

Figure 6. Clariant Supplier Code of Conduct

According to its 2018 Corporate Responsibility Report, Merck, too, "strives to ensure" that all of its suppliers comply with environmental and social standards.⁴¹

Our approach to making our supply chains more sustainable

One of the goals of our supplier management is **compliance with fundamental environmental and social standards**, alongside high quality, reliable delivery and competitive prices. To achieve this, we've introduced relevant strategies, processes and guidelines that we are continuously improving to prevent violations of supply chain standards. Our supply chains are diverse and differ in their characteristics. While some supply chains are automated, others, especially in the service sector, are labor intensive. Our risk-based supplier selection and management approach takes this diversity into account. If the risk probability exceeds our risk appetite, we take further actions. For example, we ask the supplier to conduct a sustainability assessment or an audit. This additional step helps our sourcing employees to identify required mitigation actions with relevant suppliers and work on improvements.

Figure 7. Merck KGaA, 2018 CR report

As members of the American Chemistry Council (ACC), all three of the above companies (DuPont, BASF, and Clariant) participate in the Responsible Care program, a global initiative to uphold health, safety and environmental standards. DuPont is said to have played a leadership role in developing the ACC Codes of Management Practices⁴² and just this month DuPont received the ACC's Responsible Care Facility Safety Award in recognition of its "outstanding achievements in employee health and safety", with an irony somewhat bitter to IPE, given its responses to our recent inquiries. On April 15th, roughly one month after the JTC explosion, ACC also gave 49 member companies awards for "exemplary environmental, health and safety initiatives" – including DuPont, BASF, Clariant and Dow Chemical.⁴³

ACC's Responsible Care program outlines procedures for responsible management, for its membership including identifying potential hazards associated with operations, setting targets, and implementing appropriate action to address risks.⁴⁴ Major pillars of the Responsible Care Program also include the responsibility to uphold worker safety, process safety, and public reporting.⁴⁵

Regardless of the high-profile nature of the ACC Responsible Care Program, however, careful reading of its language demonstrates that the initiative does not clearly address **coverage of suppliers** among its member companies.

On May 2, 2019, IPE met with ACC regarding the explosion, hoping to learn the extent to which the ACC Responsible Care program currently covers responsibility for the global scope of the chemical manufacturing supply chain and to inquire whether this incident might increase ACC's motivation to broaden the reach of its current programs and policies to ensure safer and more environmentally responsible manufacturing within its membership around the world. At this meeting, ACC clarified that its Responsible Care Program focuses primarily on responsible use of chemical products downstream of sale, not on supply chain responsibility. It did not consider the JTC explosion to be a clarion call to improve the program.⁴⁶ IPE also reached out to the chemical industry supply chain initiative Together for Sustainability (TfS), which declined to respond to our inquiry.

History of Excellence

Responsible Care[®] is the chemical manufacturing industry's environmental, health, safety and security performance initiative. For the past 30 years, Responsible Care has helped American Chemistry Council (ACC) member companies significantly enhance their performance and improve the health and safety of their employees, the communities in which they operate and the environment as a whole.



A Commitment to Health, Safety and Security

Responsible Care is a **global initiative** that began in **Canada** in 1984, was enacted by the U.S. chemical industry in 1988, and today is practiced in 68 economies around the world. Participation in Responsible Care is a condition of membership for **ACC members** and Responsible Care **Partner** companies, all of which have made CEO-level commitments to uphold the program elements.

The Responsible Care **Guiding Principles** are at the heart of the Responsible Care commitment—through these principles, members and Partners pledge to improve environmental, health, safety and security (EHS&S) performance for facilities, processes and products throughout the entire operating system.

Performance Management

A pillar of the Responsible Care program is environmental, health, safety and security (EHS&S) performance monitoring and reporting, both for individual companies and the chemical industry overall.

All ACC member companies are required to publicly report, through Responsible Care, specific performance measurements in the following areas:



- Environmental metrics, including hazardous air pollutants released, SO_x and NO_x emissions and net water consumption.
- Energy metrics, including greenhouse gas emissions and energy efficiency.
- Safety metrics, including number of process safety incidents, DOT-reportable distribution incidents, OSHA recordable lost workday incidence and fatalities.
- Accountability metrics, including community outreach and emergency response initiatives.

Some of these metrics are reported on a company-by-company basis, while others are reported as aggregated industry statistics. This **public reporting** is meant to enhance transparency and accountability and drive performance of ACC member companies.

ACC uses these reported metrics to openly demonstrate the commitment of ACC members and their partners along the supply chain to continuous improvements in the EHS&S performance of their operations and businesses.

In addition, companies communicate their progress toward meeting and improving compliance with key performance measures to all of their stakeholders – including facility communities, employees, business partners and the general public.

Figure 8. Responsible Care website pages

Recommendations for chemical manufacturing supply chain

responsibility

The JTC explosion, a series of safety and environmental accidents in recent years, and all the records of illegal practices emphasize the critical situation of the chemical industry. More regrettably, all these records are publicly available, yet the chemical giants simply choose not to face the industry's problems and allow fatal accidents to occur repeatedly.

We strongly urge chemical giants and industry associations to stop being a dragging force and to work with the local stakeholders to become part of the solution.

We'd like to see chemical giants to take the following specific actions:

1. Tap into the safety and environmental records of suppliers to identify the risks, and closely track the compliance status and performance of suppliers in China, addressing them from the baseline expectation of compliance with local laws and regulations;
2. Learn from leading brands in the textile and IT industries to identify priority sectors in the upstream supply chain, and work with them to mitigate the risks;
3. Recognize the demand within globalized manufacturing and sourcing to extend responsible care throughout the supply chain to tackle the key sources of environmental and safety hazards.

- Here are 1.4 million publicly available environmental violation records:
<http://www.ipe.org.cn/IndustryRecord/Regulatory.html?keycode=4543j9f9ri334233r3rixxyyo12>
- Here are Corporate Information Transparency Index (CITI) reports, which evaluate the supply chain environmental management of various industries:
<http://www.ipe.org.cn/reports/reports.aspx?year=All&key=CITI>
- Here are green supply chain best practices from leading brands:
<http://www.ipe.org.cn/GreenSupplyChain/BrandStoryList.html>
- Here is a demonstration of advanced supply chain transparency from leading brands:
<http://www.ipe.org.cn/MapBrand/Brand.html?q=6>

We hope that all stakeholders, especially investors, customer brands of chemical products, civil society groups and consumers who care about the safety and environmental protection pay greater attention to the chemical giants who have notably failed to be a part of the solution following the events in Xiangshui County in March 2019.

We hope that in the future, these stakeholders may work together to motivate chemical giants to change their sourcing practices. We trust that their changes are critical for the urgently needed green transformation of the chemical industry.



Footnotes

- ¹ South China Morning Post. (2019). *Death toll from China chemical plant blast rises to 78*. [online] Available at: <https://www.scmp.com/news/china/society/article/3003149/death-toll-chinese-chemical-plant-blast-rises-78> [Accessed 7 May 2019].
- ² Global Times. (2019). *Chinese chemical firms face regulation - Global Times*. [online] Available at: <http://www.globaltimes.cn/content/1145075.shtml> [Accessed 7 May 2019].
- ³ Caixin Global. (2019). *Contamination Fears After East China Chemical Blast Kills 47 - Caixin Global*. [online] Available at: <https://www.caixinglobal.com/2019-03-22/contamination-fears-after-east-china-chemical-blast-kills-47-101395872.html> [Accessed 7 May 2019].
- ⁴ Chemical Industry Safety and Environmental Improvement Plan released by Jiangsu Provincial Government. See <http://www.nbd.com.cn/articles/2019-05-06/1328243.html> (Chinese) for more details.
- ⁵ South China Morning Post. (2019). *Death toll from China chemical plant blast rises to 78*. [online] Available at: <https://www.scmp.com/news/china/society/article/3003149/death-toll-chinese-chemical-plant-blast-rises-78> [Accessed 7 May 2019].
- ⁶ Global Times. (2019). *Chinese chemical firms face regulation - Global Times*. [online] Available at: <http://www.globaltimes.cn/content/1145075.shtml> [Accessed 7 May 2019].
- ⁷ <http://wwwwen.ipe.org.cn/IndustryRecord/regulatory-record.aspx?companyId=207624&dataType=0&isyh=0&showtype=0> [Accessed 7 May 2019].
- ⁸ The Solid Waste Pollution Prevention and Control Law in China also covers regulations for hazardous waste management.
- ⁹ The "three simultaneous" systems regulation refers to the requirement that construction projects design, construct and begin operating labor safety, sanitation and pollution prevention facilities concurrently with any new construction, reconstruction or expansion.
- ¹⁰ According to the Corporate Environmental Credit Evaluation Standards and Methods of Jiangsu Province, enterprises that receive a yellow rating generally meet national or local pollutant discharge standards, but have incurred minor environmental violations in the past. Enterprises are scored out of 100 points depending on their environmental performance in real-time monitoring, solid and hazardous waste treatment and disposal, meeting pollution permit requirements and completing discharge fees, securing construction approval and acceptance, and additional related areas as well as during government inspections. For more details on the evaluation system, please see the Jiangsu Province Notice on Corporate Environmental Credit Evaluation Standards and Methods: http://hbt.jiangsu.gov.cn/art/2013/11/18/art_1600_4046744.html (Chinese)
- ¹¹ According to the Interim Provisions on the Supervision and Administration of Major Hazardous Sources of Hazardous Chemicals (Order No. 40 of the State Administration of Work Safety), major hazardous sources are classified into Level 1-4 based on the type of hazards posed by chemicals on site (toxic, explosive, flammable,

etc.), the amount of chemicals stored, and the number of people at risk who are living/working near the factory. See http://www.chinasafety.gov.cn/fw/fifgbz/gz/201508/t20150827_233433.shtml (Chinese) for more details.

- ¹² <http://wwwwen.ipe.org.cn/IndustryRecord/regulatory-record.aspx?companyId=207624&dataType=0&isyh=0&showtype=0> [Accessed 7 May 2019].
- ¹³ National Enterprise Credit Information Publicity System: <http://www.gsxt.gov.cn/corp-query-homepage.html> [Accessed 7 May 2019]
- ¹⁴ Huatai Securities. (2019). *The Contraction of the M-phenylenediamine Supply, Pay Attention to the Subsequent Impact of the Accident*. [online] Available at: <http://data.eastmoney.com/report/20190322/hy,APPJ5ZYEkdA3Industry.html> [Accessed 7 May 2019]
- ¹⁵ Ibid
- ¹⁶ Xiangshui.gov.cn. (2019). *Tianjiayi Company: Eight New Products Sold Well in Europe and America, Completed the Third Quarter Target ahead of Schedule – Xiangshui County People’s Government*. [online] Available at: http://www.xiangshui.gov.cn/html/2014/xmgj_0922/18984.html [Accessed 7 May 2019]
- ¹⁷ Shipment records of Jiangsu Tianjiayi Chemical Co. Ltd. [online] Available at: <https://www.52wmb.com/supplier/7602461> [Accessed 7 May 2019].
- ¹⁸ Shipment records of Jiangsu Tianjiayi Chemical Co., Ltd. [online] Available at: <https://panjiva.com/Jiangsu-Tianjiayi-Chemical-Co-Ltd/35321091> [Accessed 1 May 2019]
- ¹⁹ Shipment records of E.I. Dupont De Nemours And Co. [online] Available at: <https://panjiva.com/E-I-DuPontDuPont-De-Nemours-And-Co/27805521> [Accessed 1 May 2019]
- ²⁰ Shipment records of Jiangsu Tianjiayi Chemical Co. Ltd. [online] Available at: <https://www.52wmb.com/supplier/7602461> [Accessed 7 May 2019].
- ²¹ Shenzhen Stock Exchange. (2019). *HifiChem Clarification Announcement*. [online] Available at: <http://www.szse.cn/disclosure/listed/bulletinDetail/index.html?12218d19-fb67-4f73-bf8d-9b6dd273458e> [Accessed 7 May 2019].
- ²² Shenzhen Stock Exchange. (2019). *HifiChem 2018 IPO*. [online] Available at: <http://www.szse.cn/disclosure/listed/bulletinDetail/index.html?c9b8e4a2-a967-423a-9675-39848625c7df> [Accessed 7 May 2019].
- ²³ Lonza Group. (2019). *Press Release: Pharma Biotech & Nutrition Businesses Continue to Drive Lonza Performance in Q1 2019*. [online] Available at: http://e3.marco.ch/publish/lonza/551_962/190418_Q1_News_Release_FINAL_EN_FINAL.pdf [Accessed 7 May 2019].

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- ²⁴ IPE did not yet reach out to Lonza Group, as the press release was issued subsequent to the drafting of this report.
- ²⁵ E. I. du Pont de Nemours and Company, commonly referred to as DuPont merged with Dow Chemical company in 2017. The combined company, DowDuPont, became one of the largest holding companies in the global chemical industry. On April 1, 2019, DowDuPont separated into three independent companies, one operating in agriculture, one in materials science and one in specialty products.
- ²⁶ The careful terminology of a “primary ingredient supplier” raises important questions with regard to whether JTC is, in fact, part of the DuPont supply chain, perhaps further up the supply chain than DuPont considers within its scope of responsibility.
- ²⁷ Zhejiang Longsheng Group Co., Ltd. website: <http://www.longsheng.com/en/> [Accessed 10 May 2019].
- ²⁸ Chinatimes.net.cn. (2019). *Zhejiang Longsheng's share price soared 115%; the market price of m-phenylenediamine rose by more than 240% in half a month* [online] Available at: <http://www.chinatimes.net.cn/article/85576.html> [Accessed 15 May 2019].
- ²⁹ Qichacha.com. (2019). *Zhejiang Amino Chem Co., Ltd.* [online] Available at: https://www.qichacha.com/firm_a598ad78d99804603868a2bdf00d9187.html [Accessed 15 May 2019].
- ³⁰ Qichacha.com. (2019). *Zhejiang Hongsheng Chemical Co., Ltd.* [online] Available at: https://www.qichacha.com/firm_f3a885b38c54c90fe0db7f32fc7397d7.html [Accessed 15 May 2019].
- ³¹ Information from an import and export data platform indicates that specialty chemicals company Lanxess, and reinforcement technology company Kordsa are both global customers of Zhejiang Hongsheng, purchasing resorcinol from the company. See <https://www.52wmb.com/supplier/67055038> (Chinese) for more details.
- ³² Lonsen 2017 Annual Report. [online] Available at: http://pdf.dfcfw.com/pdf/H2_AN201804091120014226_1.pdf [Accessed 7 May 2019].
- ³³ <http://wwwen.ipe.org.cn/IndustryRecord/regulatory-record.aspx?companyId=148082&dataType=0&isyh=0&showtype=0> [Accessed 7 May 2019].
- ³⁴ Cfi.net.cn. (2019). *Zhejiang Longsheng: Announcement on Media Reports - Cfi.CN.* [online] Available at: <http://www.cfi.net.cn/p20190421000317.html> [Accessed 13 May 2019].
- ³⁵ Zjsafety.gov.cn. (2019). *Notice of the Zhejiang Provincial Safety Production Committee on the supervision of major safety hazards.* [online] Available at: <http://www.zjsafety.gov.cn/cn/whfxgk/zcwj/334538.shtml> [Accessed 13 May 2019].
- ³⁶ 52wmb.com., shipment records of Zhejiang Amino Chem Co., Ltd. [online] Available at: <https://www.52wmb.com/supplier/67125480?SRID=ZsKawpVmwpppZg==> [Accessed 13 May 2019].
- ³⁷ <http://wwwen.ipe.org.cn/IndustryRecord/regulatory-record.aspx?companyId=148082&dataType=0&isyh=0&showtype=0> [Accessed 13 May 2019].
- ³⁸ <http://wwwen.ipe.org.cn/IndustryRecord/regulatory-record.aspx?companyId=79450&dataType=0&isyh=0&showtype=0> [Accessed 13 May 2019].
- ³⁹ IPE's Blue Map Database of government violation records.
- ⁴⁰ BASF. (2019). *Supplier Code of Conduct.* [online] Available at: <https://www.basf.com/global/en/who-we-are/organization/suppliers-and-partners/sustainability-in-procurement/supplier-code-of-conduct.html> [Accessed 7 May 2019].
- Clariant. (2019). *Supplier Code of Conduct.* [online] Available at: <https://www.clariant.com/en/Company/Corporate-Governance/Codes-of-Conduct> [Accessed 7 May 2019].
- ⁴¹ Merck KGaA. (2019). *Corporate Responsibility Report 2018.* [online] Available at: <https://www.emdgroup.com/en/cr-report/2018/business-ethics/suppliers/supply-chain-standards.html> [Accessed 7 May 2019].
- ⁴² DuPont. (2019). *DuPont seeks consistent, measurable progress in implementing its Commitment: Safety Health and the Environment throughout its worldwide operations and supports Responsible Care® as a key program to achieve this Commitment.* [online] Available at: <https://www.dupont.com/corporate-functions/sustainability/sustainability-commitments/operations/articles/responsible-care.html> [Accessed 7 May 2019].
- ⁴³ American Chemistry Council (2019). *Chemical Industry Leaders Honored for Exemplary Environmental, Health, Safety Initiatives.* [online] Available at: <https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/Chemical-Industry-Leaders-Honored-For-Exemplary-Environmental-Health-Safety-Initiatives.html> [Accessed 7 May 2019].
- ⁴⁴ American Chemistry Council. (2019). *Responsible Care | Management System and Certification.* [online] Available at: <https://responsiblecare.americanchemistry.com/ResponsibleCare/Responsible-Care-Program-Elements/Management-System-and-Certification.aspx> [Accessed 10 May 2019].
- ⁴⁵ American Chemistry Council. (2019). *Responsible Care Performance Measures and Reporting Guidance.* [online] Available at: <https://responsiblecare.americanchemistry.com/ResponsibleCare/Performance-Results.aspx> [Accessed 10 May 2019].
- American Chemistry Council. (2019). *Responsible Care | Safety Related Performance Measures.* [online] Available at: <https://responsiblecare.americanchemistry.com/ResponsibleCare/Performance-Results/Safety/> [Accessed 10 May 2019].
- ⁴⁶ In-person meeting between Linda Greer, Senior Fellow IPE, and Dan Rocznik, American Chemistry Council on May 2, 2019.