

## **PART 1**

### **Business Operations**

#### **1. Policy and Overview of Business Operations**

##### ***1.1 Vision, Mission, Objective and Strategy of the Company***

###### ***Vision***

To be a world-class chemical company making great products for society.

###### ***Mission***

We commit to be a responsible industry leader leveraging on the excellence of our people, processes, and technologies to create value for our stakeholders.

###### ***Value /Objective***

###### ***The customer is why we exist.***

We measure ourselves by our customers' success. Through unparalleled innovation and attention to quality we aim to exceed their expectations.

###### ***Our people make the difference.***

A company is its people and people provide the competitive advantage. We respect every voice and rely on one another to grow.

###### ***We see change as an opportunity.***

The business landscape is constantly evolving. We embrace the challenges of change to be world-class and maintain our differentiation.

###### ***Diversity is our strength.***

As a global company we value the variety of knowledge, perspectives and experiences in our organization, and draw strength from these to fuel our competitiveness.

###### ***We are responsible.***

In our pursuit of business growth and profitability we do things the right way – economically, socially, and environmentally.

###### ***Group Strategy***

Indorama Ventures is a major global intermediate petrochemicals producer and one of the largest vertically integrated polyester value chain producers in the world, serving world-class customers in diverse end-use markets including food, beverages, personal and home care, health care, automotive, textile and industrial uses. With around 15,000 employees, and 75 sites<sup>1</sup> in 25 countries across four continents, we supply our products to customers in nearly every part of the world.

<sup>1</sup> As on Dec. 2017

Our objective is to strengthen our position as a market leader in the polyester value chain segment of intermediate petrochemicals in terms of scale, integration and differentiation as well as profitability and return on investment; supported by a focus on delivering long-term, superior, shareholder value.

It is estimated that in 2030, the world population will reach 8.4 billion people (according to third party sources). This surge in population growth will present global challenges, but we see this as an opportunity for increased demand across all our markets. With the fast-paced evolution of technologies, innovation will also play a key role in the chemical industry creating a market that is sufficiently sustainable in balancing the environment, resources, climate, food and nutrition, and quality of life. As the fastest growing polymer in the world at a rate of roughly 6% annually, polyester is the future.

### Strategic Levers

Our strategy has been designed to help us continue achieving our objectives as follows:

- Focused growth and investment
- Vertical integration business model
- Geographic diversification
- Product diversification driven by innovation and R&D
- Sustainability
- Cost efficiency and operational excellence
- Financial prudence

### Focused Growth and Investment

Our growth and investment strategy is to build and enhance our existing market leadership position in each of the regions in which we operate, as well as expand our geographic presence through organic growth and value-enhancing acquisitions.

We have an established a track record of implementing this strategy through green field investments, brownfield expansions as well as through attractive acquisitions. Acquisitions are a strategy for achieving our strategic targets. Indorama Ventures has strict strategic and financial acquisition criteria that are used to evaluate potential acquisition targets. We have a strong track record of acquiring businesses and successfully integrating them into our organization.

### Vertical Integration Business Model

We expect vertical integration, either through asset ownership, co-located sites with owned assets or virtual integration through co-located sites with key raw material suppliers, to enhance our operational and logistical efficiency, cost-competitiveness and raw material security. Integration through owned assets also enhances our ability to insulate ourselves from sector cyclicalities and improve the quality, visibility, and predictability of earnings. Continuing with our strategy we have invested in ethylene production through our 440kt pa Louisiana-based gas cracker which is under refurbishment following

our acquisition in 2015. We expect a commercial restart by second quarter of 2018.

#### Geographic Diversification

Diversifying our customer mix, both geographically and through end-use applications (for some business segments), is an important aspect for our continued success in the polyester value chain. We plan to continue to enhance our marketing efforts and geographically diversify our customer base based on product lines. Today, the Group sells its products in more than 100 countries and, through its localized manufacturing facilities in various regions, is able to serve its customers from close and convenient locations.

#### Product Diversification driven by innovation and R&D

As a leading polyester value chain player, we intend to focus on the development of our research and development capabilities, either through our own facilities or through the establishment of relationships with other industry players.

We work carefully alongside our customers to provide them with innovative ideas, expertise and support solutions for their specific requirements. Through this effort to differentiate, we have significantly expanded our non-commodity or high value-added (HVA) portfolio.

As part of its product diversification strategy, the Group aims to focus its expansion into industries with HVA products. Such industries include the automotive, personal care, packing and specialties and industrial sectors. In the automotive industry, the Group focuses on HVA products such as interior textiles, tires, airbags and seat belts. In the personal care industry, the Group supplies high quality materials for end products such as flame retardant home textiles, diapers, wet wipes and other medical care products. The Group believes that these HVA businesses have strong market potential and high barriers to entry and will continue to leverage its leading market positions in these HVA industries for further growth.

#### Sustainability

We believe that the increase in our ability to use recycled materials and integrate such recycled materials within our standard processes will allow us to cater to changing customer objectives and proactively address environmental issues. In addition to recycling, we continue to promote our sustainability initiatives through the seven pillars of sustainability namely, Waste Reduction, Reducing Resources, Renewable Energy, Recycling, Employee Development, Stakeholder Engagement and Local Community Development.

#### Operational Excellence

Maintaining a low-cost philosophy through a continued focus on production cost efficiency, scale and technology efficiency, raw material efficiency and investment efficiency will help us maintain our industry cost position in the future. In our volume-driven commodity businesses, such as our PET, PTA and some commodity polyester fiber businesses, cost competitiveness is a key driver which differentiates industry leaders from others.

We emphasize the importance of operational excellence to bring synergies and facilitate best practices and knowledge transfer across IVL's global footprint. Key focus areas include benchmarking conversion costs, optimizing the workforce, waste reduction and recovery, and environmental health and safety issues.

#### Financial Prudence

We are committed to maintaining a continued emphasis on financial discipline and prudent investment decisions. We evaluate each potential investment on the basis of stand-alone profitability and efficiency, in addition to its potential synergistic contributions within the overall organization. We strive to maintain an efficient capital structure as we grow to provide us with adequate flexibility in our operations and sufficient liquidity in our cash flow position to meet our covenants at all times.

### **1.2 Changes and Important Developments**

#### **Company Overview**

Formerly known as Beacon Global Limited, the company was established on February 21, 2003, and re-named Indorama Ventures Public Company Limited on March 19, 2009. Indorama Ventures Public Company Limited is a holding company with investments in companies operating in the intermediate petrochemicals industry in Thailand and globally. These companies are manufacturers and suppliers of three key business segments, namely PET, Fibers and feedstock comprising PTA, IPA, PX, NDC, MEG and various Ethylene Oxide (EO) derivatives.

#### **Company Background**

##### Business in Thailand

We commenced business operations in 1994 with the incorporation of Indorama Holdings Ltd., which was the first worsted wool yarn producer in Thailand.

##### *Entry into the PET Business*

The PET business segment comprises primarily the manufacture and sale of PET, a plastic polymer resin primarily used for beverage containers and food packaging, the packaging of pharmaceutical and household products as well as in industrial packaging applications. In addition, the Group also manufactures High Value-Added ("HVA") products such as packaging for oxygen-sensitive foods and beverages. In 1995, we entered the petrochemical industry focusing on the polyester value chain business with the establishment of a PET resin facility in Thailand. Since then, each successive growth and addition has been committed to the polyester value chain. We have grown significantly to become a major global polyester value chain producer with a presence in three key business segments, PET resin, polyester fibers and yarns and Feedstock comprising PTA, IPA, PX, NDC, MEG and various EO derivatives.

Our growth in the PET business has been achieved through greenfield investments, strategic acquisitions, and brownfield expansions. From 1995 onwards, we grew our PET business by

engaging in the downstream production of PET preforms, bottles and closures through a joint venture with Serm Suk Pcl, as well as through various expansion projects leading to increased capacities.

#### *Entry into the Fibers Business*

The Group's fibers business segment comprises the manufacture and sale of a variety of polyester and other types of fiber and yarns (which are also used in the Group's HVA products, particularly in personal care, automotive and industrial applications). Polyester is one of the most widely used synthetic fibers in the world and is a versatile material with wide-ranging textile and industrial applications. Our development in the polyester business has been achieved through the acquisition of distressed assets and organic growth through debottlenecking and asset optimization. We entered the polyester business in 1997 through the acquisition of Indo Poly, a polyester fiber plant in Thailand. In 2008, we acquired Tuntex Thailand, the largest polyester fiber producer in Thailand. Both of our polyester facilities were acquired as distressed assets at a discount to their replacement cost and have been successfully turned around. In 2009, Indo Poly transferred all of its assets to, and all of its liabilities were assumed by Tuntex Thailand, which was subsequently re-named Indorama Polyester Industries. Further expansions subsequently took place at this site. In 2014, a state-of-the-art greenfield polyester plant was commercially started in Indonesia.

#### *Backward Integration into Feedstock*

The Group's feedstock business segment comprises the manufacture, production and sale of PTA, IPA, PX, NDC, MEG, EO derivatives and by-products, which are raw materials used in the production of the Group's polyester products. The Group's feedstock business segment supports its PET and polyester business segments and forms part of its strategy to vertically integrate its operations.

#### *Becoming a Global Leader*

##### *Expansion of PET Business in the US, Europe and Asia*

We expanded our PET production footprint internationally into North America in 2003, with the acquisition of the StarPet facility, and into Europe in 2006, with the commencement of our Orion Global PET facility. The expansion made us the only PET resin producer with operations in the three largest consuming regions of Asia, Europe and North America. We have further expanded our manufacturing presence with the acquisition of two PET resin facilities from Eastman Chemical Company in Europe in 2008, and a greenfield investment in the PET business with AlphaPet in North America in 2009. In the first half of 2011, IVL had completed major acquisitions of PET plants in China, Indonesia, Mexico, Poland and the US, which has resulted in the company becoming the world's largest PET producer and the largest player in Europe. We also expanded our PET production footprint to Africa by implementing the new solid state polymerization SSP plant in Nigeria, which started commercial operations in 2012. In 2012, we also acquired the PET resin assets of PT Polypet Karyapersada, which is located in Cilegon, Indonesia. In 2015, we entered into the Middle East following the acquisition of two PET plants in Turkey, one in the south and one in north of the country. In May 2015, the Group also acquired a stake in Bangkok Polyester Public Company Limited, a PET producer in Thailand that further consolidated PET production in the local market. In December 2015,

we acquired the PET business of Micro Polypet Private Limited (MicroPet) and its two subsidiaries Sanchit Polymers Private Limited and Eternity Infrabuild Private Limited in India. Subsequently in September 2016, MicroPet was merged with Dhunseri Petglobal Limited and deconsolidated to be an equal Joint Venture partnership. After consolidating its position through a joint venture with Dhunseri Petrochemicals in India, which is one of the world's fastest growing markets, the Company has become the second-largest manufacturer of PET in India.

#### *Expansion of Polyester Business Globally*

In the first half of 2011, we expanded our polyester production footprint internationally. In November 2011, we acquired the PET and Polyester fibers recycling businesses of Wellman International in Europe, which is comprised of three production facilities in the Republic of Ireland, the Netherlands, and France. In January 2012, we acquired 100% of FiberVisions Holdings LLC, a global manufacturer of specialty mono and bi-component fibers based in the US in Duluth, Georgia.

#### *Backward Integration into MEG*

In 2012, we took another step upward to feedstock integration with the acquisition of Old World Industries I, Ltd. and Old World Transportation, Ltd., which is the largest single EO/EG production facility in the US. Mono Ethylene Glycol (MEG) is one of our key feedstocks together with Purified Terephthalic Acid (PTA) in the manufacture of Polyethylene Terephthalate (PET) and Polyester fibers and yarns, both downstream products of IVL. Recently, the acquisition from Compañía Española de Petróleos ("CEPSA")'s PTA business in Canada and we also acquired 100% of Indorama Ventures Olefins Holding LLC, an old ethylene cracker in the US in September 2015 (under refurbishment). In March 2016, IVL bought BP's assets in Decatur Alabama USA and in April 2016, IVL purchased CEPSA PET, PTA and IPA assets in Spain.

#### Focus on Business Differentiation

##### *Advancing towards High Value-Added (HVA) Segments*

As we grew to become an industry leader, so did the importance of working more closely with our global customers in providing them with innovative and specialized solutions to meet their evolving needs. IVL has invested laterally into high value-added products in PET, Polyester fibers and yarns, polypropylene fibers and yarns, nylon fibers and yarns and Purified Ethylene Oxide (PEO). The expansion into HVA products has helped mitigate the weakness that our commodity sector has seen over the past two years allowing us to maintain healthy margins. We have made significant headway on the HVA front as a market leader and innovator of numerous products. Our specialty range has enhanced the brand value of IVL making the company a total global solutions provider. In 2017, our HVA portfolio represented 20% of production and 53% of consolidated core EBITDA. Core EBITDA is calculated as book EBITDA minus inventory gains or losses and extraordinary items, if any.

#### Recycling Business

We entered the recycling space in 2011 with the acquisition of Wellman International in Europe. At the beginning of 2014, we extended the know-how we obtained from the Wellman International purchase

and commenced production of our recycled PET and fiber facility in Nakhon Pathom, Thailand. We expect to further leverage on Wellman's bottle to flake technology on a global scale. We have also integrated three production sites in the US and Mexico with recycled PET and our objective is to continue to increase the use of recycled PET in our operations.

### ***Success in Raising Capital***

#### ***Our Initial Public Offering***

Indorama Ventures became a public company on September 25, 2009. In January, 2010, IVL completed an initial public offering of 400,000,000 ordinary shares at an offering price of THB 10.20 per ordinary share. The total amount raised in cash from the initial public offering of shares totaled THB 4,080 million. Simultaneously, the minority shareholders of Indorama Polymers Public Company Limited, a subsidiary of IVL listed on the Stock Exchange of Thailand were offered under an exchange offer 582,727,137 ordinary shares of Indorama Ventures Public Company Limited. The ordinary shares of Indorama Ventures Public Company Limited were listed and commenced trading on the Stock Exchange of Thailand (SET) on February 5, 2010 under the ticker symbol IVL. The company soon became a member of the major indices, the SET 50 Index, FTSE SET Large Cap Index and MSCI.

#### ***Rights Offering***

In November, 2010, the Board of Directors passed a resolution to increase the authorized share capital from THB 4,334,271,047 to THB 4,815,856,719 and reserve the increase in authorized share capital of THB 481,585,672 for the exercise of Transferable Subscription Rights (TSR). The Board approved a rights issue of TSRs to existing shareholders at the ratio of one TSR for every nine existing ordinary shares held of IVL. The conversion ratio was 1:1. One TSR to one ordinary share and the exercise price of the TSR to ordinary shares is THB 36 per ordinary share. On December 17, 2010, at the extraordinary general meeting of shareholders (EGM), the shareholders approved the issue, allocation and the terms and conditions of the TSR. On February 24, 2011, the subscription of TSRs was completed with 99.67% of TSRs being exercised into shares. A total of 479,986,198 new shares started trading on the SET on March 3, 2011. The total amount raised in cash from this rights issue totaled THB 17,280 million.

#### ***Tender Offer***

Our PET business was listed on the SET as Indorama Polymers Public Company Limited IRP in 2005. On December 24, 2009, IVL offered to purchase up to 100% of IRP through a tender offer whereby IRP shareholders (other than IVL and its subsidiaries) were offered IVL shares in exchange for IRP shares. The said tender offer was completed on February 1, 2010 which resulted in IVL holding directly and indirectly (through its subsidiary Indorama Holdings [Thailand] Limited) around 99.08% of the issued and paid-up capital of IRP. IRP shares were delisted from the SET on February 5, 2010.



#### Warrants IVL-W1 Exercised

Upon conversion IVL-W1 till the last exercise date which was on 24 August 2017, the paid-up capital of the Company increased to Baht 5,244,965,472 representing 5,244,965,472 ordinary shares.

#### 4.1 Changes and Important Developments

Year	Event	Location	Business
1994	Incorporation of Indorama Holdings Ltd.	Thailand	Wool
1995	Establishment of Indorama Polymers PCL PET resin plant in Lopburi, Thailand.	Thailand	PET
1996	Establishment of Petform (Thailand) Ltd., a joint venture with Serm Suk PCL.	Thailand	PET
2002	Completion of various expansion projects leading to increased capacity in Thailand.	Thailand	PET / Polyester
2003	<ul style="list-style-type: none"> <li>Incorporation of Beacon Global Limited (subsequently re-named Indorama Ventures PCL in 2008).</li> <li>First major international expansion with the acquisition of StarPet PET plant in Asheboro, North Carolina.</li> </ul>	Thailand	PET
		US	PET
2006	<ul style="list-style-type: none"> <li>Acquisition of a 94.57% interest in Indorama Holdings Ltd. from an entity controlled by Mr. Aloke Lohia</li> </ul>	Thailand	Wool/ Holding Company
	<ul style="list-style-type: none"> <li>Expansion into Europe with the establishment of Orion Global PET plant in Klaipeda, Lithuania.</li> </ul>	Lithuania	PET
2007	Completion of various expansion projects leading to increased capacity.	US / Thailand	PET / Polyester
March 2008	<ul style="list-style-type: none"> <li>UAB Indorama Polymers Europe, IRP Rotterdam and IRP Workington acquired the net assets (property, plant and equipment and working capital) and the operations of two PET production facilities located in the Netherlands and the United Kingdom, previously owned and operated by subsidiaries of Eastman Chemical Company.</li> <li>UAB Indorama Holdings Ltd. Europe and IRH Rotterdam also acquired the net assets (property, plant and equipment and working capital) and the operations of a PTA production facility located in the Netherlands, previously owned and operated by a subsidiary of Eastman Chemical Company.</li> </ul>	The Netherlands/ UK	PET
		The Netherlands	PTA
June 2008	Indorama Holdings Ltd. sold its shares representing 89.71% of Indo-Rama Chemicals (Thailand) Ltd., to an entity controlled by Mr. Aloke Lohia and his immediate family.	Thailand	Chemicals



Year	Event	Location	Business
August - October 2008	The Company acquired a 50.56% equity interest in TPT Petrochemicals PCL from various parties.	Thailand	PTA
September 2008	<ul style="list-style-type: none"> <li>The Company acquired a 65.81% equity interest in Tuntex (Thailand) pursuant to Tuntex (Thailand)'s bankruptcy rehabilitation plan.</li> </ul>	Thailand	Polyester
	<ul style="list-style-type: none"> <li>The Company acquired an additional 44.38% of the outstanding shares of Indo Poly (Thailand) Ltd. from Indorama International Finance PCL. As a result of the acquisition, the Company increased its direct and indirect shareholdings of Indo Poly (Thailand) Ltd. to 98.85%.</li> </ul>	Thailand	Polyester
September - October 2008	The Company acquired a 100% equity interest in Indorama Petrochem Ltd. from various parties.	Thailand	PTA
October 2008	The Company acquired an additional 3.94% of the outstanding shares of Indorama Polymers PCL from DEG, thereby increasing direct and indirect holdings of Indorama Polymers PCL to 69.29%.	Thailand	PET
December 2008	The Company acquired an additional 31.20% of the outstanding shares of Tuntex (Thailand) PCL (re-named Indorama Polyester Industries PCL).	Thailand	Polyester
July 2009	<ul style="list-style-type: none"> <li>Indo Poly (Thailand) Ltd. transferred all of its assets and businesses to Indorama Polyester Industries PCL. (In August 2009, Indo Poly [Thailand] Ltd. commenced action to liquidate itself, a process which was completed in August 2011.)</li> </ul>	Thailand	Polyester
	<ul style="list-style-type: none"> <li>The Company acquired an additional 2.08% of the outstanding shares of TPT Petrochemicals PCL from International Finance PCL, thereby increasing direct and indirect holdings of TPT Petrochemicals PCL to 52.64%.</li> </ul>	Thailand	PTA
August 2009	The Company and Indorama Holdings Ltd. jointly made a tender offer to purchase all outstanding shares of Indorama Polyester Industries PCL that we did not own. After the tender offer, the Company and Indorama Holdings Ltd. increased our shareholdings of Indorama Polyester Industries PCL to 99.55% and delisted Indorama Polyester Industries PCL from the SET effective on November 9, 2009.	Thailand	Polyester
October 2009	Startup of the AlphaPet PET plant in Decatur, Alabama.	US	PET
November 2009	TPT Utilities Co., Ltd. transferred all of its assets to TPT Petrochemicals PCL and subsequently completed the liquidation on October 29, 2011.	Thailand	Others

Year	Event	Location	Business
December 2009	<ul style="list-style-type: none"> <li>The Company acquired an additional 1.96% of the outstanding shares of TPT Petrochemicals PCL from International Finance PCL, thereby increasing direct and indirect holdings of TPT Petrochemicals PCL to 54.60%.</li> </ul>	Thailand	PTA
	<ul style="list-style-type: none"> <li>On December 24, 2009 Indorama Ventures Public Company Limited IVL announced a tender offer to purchase up to 100% of shares in Indorama Polymers Public Company Limited IRP with an intention to delist the shares of IRP from the Stock Exchange of Thailand "SET." A total of 424,480,300 shares of IRP were purchased through an exchange offer whereby IRP shareholders received IVL shares.</li> </ul>	Thailand	PET
February 2010	IVL shares were listed and began trading on the Stock Exchange of Thailand after completion of an initial public offering of 400 million new shares at THB 10.20 and completion of exchange offer to minority shareholders of Indorama Polymers Public Company Limited IRP. Simultaneously delisted IRP shares from the SET on the first day of trading of IVL.	Thailand	Corporate
July 2010	Acquisition of a 50% equity stake in a joint venture company, UAB Ottana Polimeri Europe, for the purpose of acquiring an integrated PTA and PET plant in Ottana, Italy from Equipolymers. The joint venture partner, PCH Holdings, is in the power and utilities business and holds the remaining 50% stake.	Italy	PTA and PET
August 2010	<ul style="list-style-type: none"> <li>Announced the establishment of a greenfield project for PET polymers in Port Harcourt, Nigeria with an installed capacity of 75,000 tpa.</li> </ul>	Nigeria	PET
	<ul style="list-style-type: none"> <li>Announced capacity expansion by 190,000 tpa for PET through a new production line at an existing site in Rotterdam, the Netherlands. Europe is a net importer of PET resins and the expansion has helped to reduce imports and growth in demand. In addition, the PET expansion will result in full captive consumption of PTA produced onsite and cost benefits from economies of scale.</li> </ul>	Netherlands	PET
October 2010	Acquisition of additional shares in TPT Petrochemicals PCL from Tuntex Taiwan and other shareholders to increase the Company's equity stake from 54.60% to 99.96%.	Thailand	PTA

Year	Event	Location	Business
November 2010	<ul style="list-style-type: none"> <li>Announced the approval of an acquisition to make PET resins and Polyester polymers for fibers and yarns in Kaiping City, Guangdong Province, China, from Guangdong Shinda UHMWPE Company Limited. The total installed capacity of the plant is 406,000 tpa. The acquisition allows the Company to expand its global footprint and to enter the high-growth market in China. The acquisition was completed in January, 2011.</li> </ul>	China	PET
	<ul style="list-style-type: none"> <li>Announced the signing of a definitive agreement with INVISTA S.a.r.l. to acquire their PET resins and Polyester staple business located in Spartanburg, South Carolina, US and Queretaro, Mexico. The total installed capacity at the Spartanburg site is 470,000 tpa and 535,000 tpa at the Queretaro site. The acquisition will allow the Company to build on its expanding global platform making IVL the world's largest PET producer and provide access to new markets in Central and South America. The acquisitions were completed in March 2011.</li> </ul>	US / Mexico	PET / Polyester
	<ul style="list-style-type: none"> <li>Board of Directors Meeting No. 8/2010 on 10 November, 2010 approved the issuance of 481,585,672 free Transferable Subscription Rights (TSRs) to the company's existing shareholders and with an allocation ratio of 9 existing shares to 1 new TSR. The conversion ratio of 1 TSR will entitle the TSR holder to purchase 1 newly issued share of the Company. The exercise price of the TSR into ordinary shares was determined prior to the extraordinary general meeting of shareholders to approve the rights issue.</li> </ul>	Thailand	Corporate
December 2010	<ul style="list-style-type: none"> <li>Announced the signing of a definitive agreement with SK Chemicals and SK Syntec to acquire their Polyester Filament yarns and PET resins business in Indonesia and PET resins business in Poland. The total installed capacity in Indonesia is 196,000 tpa and 140,000 tpa in Poland. The acquisition will allow on the Company to expand its global platform and reinforce our focus on the polyester value chain. It provides important access to the growth markets of Indonesia and Poland. The acquisitions were completed in March 2011.</li> </ul>	Indonesia / Poland	Polyester / PET
	<ul style="list-style-type: none"> <li>Board of Directors Meeting No. 9/2010 on 16 December, 2010 approved an exercise price of THB 36 per share to subscribe to newly issued shares by each TSR holder.</li> </ul>	Thailand	Corporate
	<ul style="list-style-type: none"> <li>Extraordinary General Meeting of Shareholders No. 1/2011 approved the resolution of a rights issue and allocated an issue of TSRs at a ratio of 9 existing shares to 1 TSR to existing shareholders.</li> </ul>	Thailand	Corporate

Year	Event	Location	Business
March 2011	<ul style="list-style-type: none"> <li>A total of 479,986,198 new IVL shares were listed and began trading on the Stock Exchange of Thailand after completion of the TSR subscription at an exercise price of THB 36 per share.</li> </ul>	Thailand	Corporate
	<ul style="list-style-type: none"> <li>Announced capacity expansion by 300,000 tpa for PET at an existing site in Purwakarta, Indonesia.</li> </ul>	Indonesia	PET
April 2011	Announced a brownfield expansion of PET polymers production with a capacity 220,000 tons per annum at the existing site in Poland.	Europe	PET
May 2011	Announced a brownfield expansion of PTA production at the Rotterdam plant, with a new production line with an annual capacity of PTA of 250,000 tons per annum. This expansion will enhance the Company's business integration with a key raw material for production of PET polymers in Europe.	Europe	PTA
June 2011	The IVL Board approved the acquisition of a 50% stake in PT Polyprima Karyesreska (PT Polyprima), a PTA producer located in Cilegon, West Java, Indonesia and has an installed capacity of 465,000 tons per annum.	Indonesia	PTA
July 2011	Acquisition of a 75% equity stake in a joint venture company, Trevira Holdings GmbH, for the purpose of acquiring a polyester fiber plant in Germany and Poland with a capacity of 120,000 tons per annum. The acquisition of Trevira GmbH facilitated IVL's entry into the branded specialist filament business and provides access to an outstanding research and development facility with the accompanying intellectual property.	Germany/ Poland	Polyester
August 2011	The Board approved investments in a new recycling plant in Thailand (now complete) and a high technology business in Polyester fibers and yarns in Thailand and Indonesia. These projects have higher value addition and margins to leverage on our existing assets.	Thailand/ Indonesia	Polyester
November 2011	The Board approved the acquisition of a 100% equity stake in the recycling business of Wellman International in Europe from WIT Beteiligungs GmbH and Wellman International Trading which is subsidiary of Aurelius AG. This business consists of three plants, a Polyester plant in Mullagh, Ireland with an installed capacity over 80,000 tons, a recycling plant in Spijk, Netherlands with an installed capacity over 45,000 tons, and Verdun, France with an installed capacity of 28,000 tons	Ireland / France and Netherlands	Polyester

Year	Event	Location	Business
January 2012	The Board approved the acquisition of 100% of FiberVisions Holdings LLC, a global manufacturer of specialty mono and bi-component fibers based in Duluth, Georgia, US. Its total global capacity was 221,000 tons per annum of specialties, with 117,000 tons per annum capacity in the United States, 90,000 tons per annum capacity in Europe and 14,000 tons per annum capacity in China.	US	Polyester
February 2012	<ul style="list-style-type: none"> <li>The Board of Directors approved the acquisition of a 100% partnership interest in Old World Industries I Ltd., and Old World Transportation Ltd., (collectively called Old World), located in Clear Lake, Texas, US. Old World is the largest single EO/EG production facility in the US with Crude EO capacity of 435,000 tons per annum (which is the equivalent to 550,000 tons per annum of equivalent MEG capacity).</li> </ul>	US	EO/EG
	<ul style="list-style-type: none"> <li>Acquisition of a 51% stake in a packaging business. Beacon Trading (UK) Limited acquired a 51% stake in Beverage Plastics (Holdings) Limited ("BPL") in Northern Ireland, United Kingdom.</li> </ul>	UK	Packaging
March 2012	Acquisition of 100% of the PET resin assets of PT Polypet Karyapersada. The PET facility is located in Cilegon, Indonesia with a production capacity of 100,800 tons per annum.	Indonesia	PET
April 2012	Acquisition of a 100% partnership interest in Old World Industries I, Ltd. and Old World Transportation, Ltd. in the US. Old World is in the business of production and sales of ethylene oxide EO and derivative products from ethylene oxide: purified ethylene oxide PEO, mono ethylene glycol MEG, diethylene glycol DEG, and triethylene glycol TEG.	US	EO/EG
July 2012	Start-up of a Solid State Polymerization (SSP) Plant in Nigeria at a capacity of 84,000 tons per annum. This is IVL's first PET investment in Africa and establishes its foothold in the estimated 450,000 tons PET market for the African continent which currently has only one other PET producer.	Nigeria	PET
August 2012	Completion of the acquisition of the PET resin assets through its wholly owned subsidiary, PT Indorama Polypet Indonesia, with a capacity of 100,800 tons per annum in Cilegon, Indonesia	Indonesia	PET
November 2012	<ul style="list-style-type: none"> <li>An announcement of the green field expansion of PET production in North America through the establishment of a new plant with a capacity of 540,000 tons per year.</li> </ul>	US	PET

Year	Event	Location	Business
	<ul style="list-style-type: none"> <li>With respect to the announced PET expansion at its Polish site, the Board decided to carry out a significant debottlenecking instead of setting up a new line as it would be more value accretive. This has now been completed.</li> </ul>	Poland	PET
February 2013	<ul style="list-style-type: none"> <li>Acquisition of a 100% stake in a packaging company, which produces PET Preforms, in Nigeria. This acquisition will be a forward integration for the PET segment which set up a PET bottle resin manufacturing unit in Nigeria. All of the closing formalities were completed and the plant was taken charge of effective April 3, 2013.</li> </ul>	Nigeria	Packaging
May 2013	<ul style="list-style-type: none"> <li>The Board of Directors approved the formation of 50:50 Joint Venture Company with a global producer of non-woven fibers to set up a 14,500 ton per annum Bicomponent Fiber Plant at IPI in Rayong, Thailand. The plant started operations in Q2 2015.</li> </ul>	Thailand	Polyester
	<ul style="list-style-type: none"> <li>The Board also approved expanding the current Bicomponent Fiber capacity by 10,800 tons at the Covington, Georgia (US) unit of wholly-owned FiberVisions Manufacturing Company</li> </ul>	US	Polyester
October 2013	<ul style="list-style-type: none"> <li>Establishment of Indorama Ventures Packaging (Philippines) corporation to start a new packaging business in the Philippines.</li> </ul>	Philippines	Packaging
	<ul style="list-style-type: none"> <li>The establishment of new subsidiaries: Indorama Ventures USA Holdings LP Indorama Ventures AlphaPet Holdings, Inc. Indorama Ventures Europe B.V. The three holding companies have been formed as part of a restructuring exercise.</li> </ul>	US US Netherlands	Holding Company
November 2013	An announcement for the moth-balling of our PET plant at Indorama Polymers Workington Ltd., in the UK, as part of our business improvement plan and restructuring strategy of our European businesses.	UK	PET
December 2013	The establishment of a new subsidiary: <ul style="list-style-type: none"> <li>Indorama Ventures Global Services Limited.</li> </ul>	Thailand	Corporate
	<ul style="list-style-type: none"> <li>Signing of a Joint Venture Agreement for Aromatics production in Abu Dhabi to develop the Tacaamol Aromatics Plant on Madeenat ChemaWEyaat Al Gharbia's (MCAG) site in the Western Region of Abu Dhabi. The plant is expected to have an annual capacity of about 1.4 million tons of Paraxylene and 0.5 million tons of Benzene.</li> </ul>	Abu Dhabi	PX

Year	Event	Location	Business
February 2014	<ul style="list-style-type: none"> <li>Acquisition of PHP Fibers GmbH and its subsidiaries (PHP), where IVL holds 80% of PHP while the remaining 20% is held by Toyobo Co., Ltd., a leading Japanese manufacturer of high function products, including among others, automotive products. The acquisition was completed on 30 April, 2014.</li> </ul>	Germany US China	Air bags & Tire cord yarns
	<ul style="list-style-type: none"> <li>The establishment of a new indirect subsidiary company in the Republic of Ghana.</li> </ul>	Republic of Ghana	Packaging
March 2014	The establishment of a new joint venture company in Thailand, 50% owned by Indorama Holdings Ltd., a subsidiary company of IVL, and 50% owned by JNC Fibers Corporation of Japan.	Thailand	Polyester
June 2014	Acquisition of 100% of Artenius TurkPET A.S. (Artenius) in Adana, Turkey. Artenius is a PET producer in Turkey with a capacity of 130,000 tons per annum. The acquisition was completed on 2 June, 2014.	Turkey	PET
October 2014	Reorganization of the Company's subsidiaries in the Netherlands and the US to improve operational and fiscal efficiencies, business workflows and to pool common resources, and some of the businesses of its subsidiaries.	Netherlands & US	Corporate
November 2014	The establishment of two new joint venture companies: <ul style="list-style-type: none"> <li>Indorama Ventures EcoMex, S. de R. L de C.V.</li> <li>Indorama Ventures EcoMex Services, S. de R. L de C.V.</li> </ul>	Mexico	PET
December 2014	Announced the signing of a share purchase agreement to acquire a 100% equity stake in Performance Fibers Asia (PF Asia). PF Asia is a leading producer of premium polyester tire cord fabric in Asia. PF Asia's plants are located in Kaiping City, Guangdong province of China, with an annual capacity of 41,000 tons of Polyester Tire Cord Fabric and 48,000 tons of Polyester Tire Cord Yarn. All of the closing formalities were completed and the plants were taken charge of effective April 01, 2015.	China	Polyester
January 2015	The establishment of a new indirect subsidiary company in Myanmar. Indorama Ventures Packaging (Myanmar) Limited investment 100% by a wholly owned subsidiary, IVL Singapore Pte. Ltd.	Myanmar	Packaging
March 2015	<ul style="list-style-type: none"> <li>Completed the acquisition of a 100% stake in Polyplex Resins San. ve Tic. A.S, Turkey. Polyplex Turkey owns a newly set-up greenfield PET plant with a planned capacity of 252,000 tons per annum located in Corlu, close to Istanbul, Turkey.</li> </ul>	Turkey	PET



Year	Event	Location	Business
	<ul style="list-style-type: none"> <li>Acquisition of a 100% stake in the PTA business of CEPESA Chimie Montréal s.e.c in Montreal, Canada. CPESA is the largest and the only PTA manufacturing facility in Canada with an annual capacity of 600,000 tons and is one of the three merchant PTA producers in North America.</li> </ul>	Canada	PTA
May 2015	Completion of the acquisition of a 94.91% stake in a PET business in Thailand, Bangkok Polyester PCL (BPC). BPC is a producer of PET polymers in Rayong, Thailand, with an annual capacity of 105,000 tons. Further shares were also acquired from the minority shareholders, thereby taking the Company's total shareholding in BPC to 98.97%.	Thailand	PET
June 2015	The Acquisition of CEPESA Chimie Montréal s.e.c in Montreal, Canada was completed, including all of the closing formalities, and the plant was taken charge of effective June 1, 2015. IVL will rename the above companies as Indorama Ventures Gestion, Inc., Indorama Ventures Northern Investments and Indorama Ventures PTA Montreal, respectively.	Canada	PTA
September 2015	The establishment of three new subsidiaries: <ul style="list-style-type: none"> <li>Indorama Ventures Dutch Investments B.V.</li> <li>Indorama Ventures Investments USA LLC</li> <li>Indorama Ventures Olefins LLC</li> </ul>	The Netherlands US US	Holding Company Ethylene Cracker
November 2015	<ul style="list-style-type: none"> <li>Acquisition of 100% of CEPESA's business in Spain. CEPESA Spain is Europe's largest producer of IPA (Isophthalic acid) and is the second largest producer in the world. With 220,000 tons of IPA capacity, 175,000 tons of PET, and 325,000 tons of PTA.</li> </ul>	Spain	PET, PTA and IPA
	<ul style="list-style-type: none"> <li>The establishment of a New Indirect Subsidiary Company in the US: Indorama Ventures Olefins Holding LLC</li> </ul>	US	Holding Company
December 2015	Completed the acquisition of a 100% stake in the Polyethylene Terephthalate (PET) business of MICRO POLYPET Private Limited (MicroPet) and its two subsidiaries Sanchit Polymers Private Ltd and Eternity Infrabuild Private Ltd in India, effective 23 December, 2015. MicroPet has an annual PET capacity of 216,000 tons and is situated in Panipat district, in the Northern Indian State of Haryana, and has a virtual integration with a major refinery for its PTA and MEG feedstocks.	India	PET

Year	Event	Location	Business
January 2016	Acquisition of a 100% stake in BP Amoco Chemical Company (BP)'s chemical complex in Decatur, Alabama, US. BP's integrated facility is located adjacent to IVL's PET manufacturing subsidiary, AlphaPet, Inc. and has a combined capacity of approximately 1.8 million tons of which PX capacity is 720,000 tons, PTA capacity of 1,020,000 tons, and NDC (Naphthalene Dicarboxylate). (The acquisition was completed and effective as of March 31, 2016.)	US	PTA, PX and NDC
February 2016	Formation of an equal Joint Venture in India with Dhunseri Petrochem Limited. IVL will divest its 50% equity stake in its indirect, fully-owned PET manufacturing company - Micro Polypet Private Limited, India to Dhunseri Petrochem Limited. IVL will also acquire a 50% equity stake in a new carved-out entity from Dhunseri Petrochem Limited. The new entity will own the 480,000 ton PET manufacturing facility of Dhunseri Petrochem Limited located in the port city of Haldia in the Eastern Indian state of West Bengal.	India	PET
March 2016	The establishment of a New Indirect Subsidiary in India Indorama Ventures Packaging (India) Private Limited	India	Packaging
April 2016	Completed the acquisition of a 100% of Compañía Española de Petróleos S.A.U. ("CEPSA Spain")'s Isophthalic Acid (PIA) , Polyethylene Terephthalate (PET) and Purified Terephthalic Acid (PTA) business in Guadarranque-San Roque, Cadiz, Spain. The operation was effective as of April 7, 2016. The company will be renamed Indorama Ventures Química S.L.U.	Spain	PET, PTA and IPA
July 2016	The establishment of a Subsidiary Company and a Joint Venture Company in China. The new indirect subsidiary: Performance Fibers (Kaiping) No. 3 Company Limited	China	Polyester
	The new Joint Venture Company: ES FiberVisions Shanghai Co., Ltd.	China	Trading Business
August 2016	• Name change of a Subsidiary Company in the US. Polyamide High Performance, Inc., an 80% indirect subsidiary of IVL in the US changed its name to "PHP Fibers Inc."	US	Air bags & Tire cord yarns
	• The merger of two of its indirect subsidiaries in Germany. PHP Overseas Investments GmbH, a non-operating entity merged into PHP Fibers GmbH, an operating Fibers business entity. The new merged entity will be known as "PHP Fibers GmbH."	Germany	Air bags & Tire cord yarns

Year	Event	Location	Business
September 2016	<ul style="list-style-type: none"> <li>Completed the formation of an equal Joint Venture in India with Dhunseri, effective September 12, 2016. The Joint Venture Company in India was also renamed. Dhunseri Petglobal Limited was changed to "IVL Dhunseri Petrochem Industries Limited".</li> </ul>	India	PET
	<ul style="list-style-type: none"> <li>The establishment of a new indirect subsidiary company in China: Performance Fibers (Kaiping) Trading Company Limited</li> </ul>	China	Polyester
December 2016	The establishment of a new indirect Subsidiary Company in Mexico , Indorama Ventures Mexico Assets, S. de R.L. de C.V., which is 99.99% held by Grupo Indorama Ventures, S. de R.L. de C.V., a wholly-owned indirect subsidiary company of IVL.	Mexico	Service Company
May 2017	Acquisition of 100 per cent. stake of Glanzstoff Group (Glanzstoff), a tire cord business in Luxembourg, Italy ,the Czech Republic and China. The Glanzstoff acquisition provides a strategic fit to the automotive segment in the HVA portfolio with a capacity of 36,300 tonnes per annum.	Luxembourg Italy Czech Republic China	Tire cord
May 2017	Acquisition of balance 25 per cent. stake of Trevira Holdings GmbH (Trevira) in Germany. With this acquisition, IVL will hold 100% of Trevira. Trevira is a leading brand of specialty polyester fibers globally.	Germany	Polyester
September 2017	Acquisition of 100 per cent. stake of DuraFiber Technologies México Operations, S. A. DE C. V. ("DuraFiber"), a tire cord business with a capacity of 22,400 tonnes per annum	Mexico	Tire cord
October 2017	Acquisition of 100 per cent. stake of DuraFiber Longlaville, France a tire cord business with a capacity of 35,000 tonnes per annum	France	Tire cord
November 2017	Acquisition of the PTA assets of Artlant PTA S.A. and the adjacent utility assets of Artelia Ambiente, S.A. in Portugal	Portugal	PTA

In August, 2014, the Board of Directors of IVL passed a resolution to increase the Company's share capital and issue warrants through a rights issue to existing shareholders. Further, the Extraordinary General Meeting of shareholders No. 1/2014 held on 6 August, 2014 considered and approved the rights issue of warrants to existing shareholders, terms of the warrants, and the increase in registered share capital and allocation of share capital for the exercise of the warrants. The key terms of the issued warrants are:

Warrant	IVL W1	IVL W2
Term	3 Years	4 Years
Exercise Ratio	1 unit of warrant for 1 share	1 unit of warrant for 1 share
Exercise Price	THB 36 per share	THB 43 per share
Issue Date	25 August 2014	25 August 2014
Expiry Date	24 August 2017, 3 years from the issue date	24 August 2018, 4 years from the issue date
Warrant Issue Price	THB 0 (at no cost)	THB 0 (at no cost)
Allocation	To existing shareholders at the ratio of 10 IVL existing shares to 1 IVL-W1	To existing shareholders at the ratio of 13 IVL existing shares to 1 IVL-W2
Exercise Period	Last business day of each month for every 3 months starting from 31 October 2014. The last exercise date is the 3 <sup>rd</sup> anniversary from the issue date.	Last business day of each month for every 3 months starting from 31 October 2017. The last exercise date is the 4 <sup>th</sup> anniversary from the issue date.

As of August 31, 2014, the Company has increased its registered share capital from THB 4,815,856,719 to THB 5,666,010,449 in ordinary shares with a par value of THB 1 per share. The increase in registered share capital by THB 850,153,730 is reserved for the exercise of IVL-W1 and IVL-W2 warrants into ordinary IVL shares. As per the terms of the issue, if all warrants are exercised by the warrant holders into ordinary shares, IVL will raise on the exercise of all IVL-W2 up to THB 15.9 billion by September, 2018.

In October 2014, the Company successfully completed the offering of Subordinated Perpetual Debentures No. 1/2557 for THB 15 Billion. The Perpetual Debentures carry a fixed rate coupon of 7.0% per annum for the first five years, after which the coupon will be adjusted ever five years as per the stated terms and conditions. The issuance has strengthened IVL's capital structure, and improved the liquidity and flexibility of the Company. The Company's rating was reaffirmed at A+ stable in October 2015 and the perpetual debentures have an issue rating of A- from the TRIS Rating Company Limited TRIS.

In October 2015, the Company successfully issued its first overseas Senior Unsecured Bond in the amount of SGD 195 million to institutional investors in Singapore through its wholly-owned subsidiary,

IVL Singapore PTE Ltd. The Bond was rated AA (Stable) by Standard and Poor's with a tenure of 10-years at an interest rate of 3.73 percent per annum. It is guaranteed by the Credit Guarantee & Investment Facility (CGIF), a trust fund of the Asian Development Bank and listed on the SGX-ST.

In 2017, the total number of IVL-W1 exercised from October 2014 till the last exercise on 24 August 2017 is 430,708,227 Warrants, representing 89.47% of the total Warrants issued. The unexercised (IVL-W1) Warrants has expired and delisted on 25th August 2017. The Company will use this inflow of funds to reduce its debt and pursue future growth opportunities.

In October 2017, TRIS Ratings (a strategic partner of S&P Global) ascribed the Company's rating at "A+". They also upgraded the outlook of IVL to "Positive" from "Stable" reflecting the Company's successful strategy and future potential.

## 2. The Company's Shareholding Structure

IVL is a holding company conducting business through investment in companies engaging in the manufacture of both domestic and international integrated petrochemical products. Our headquarters is located in Bangkok. These companies are manufacturers and suppliers of polyethylene terephthalate (PET), polyester fiber and yarn, purified terephthalic acid ("PTA"), mono ethanol glycols (MEG), wool worsted yarns, polypropylene fibers and yarns, nylon fibers and yarns and others.

Our core businesses are classified in the following business segments:

### PET

Name	Country	Type of business	% of Shareholding
Indorama Polymers PCL	Thailand	Manufacture of SSP chips and PET	72.60
Asia Pet (Thailand) Ltd.	Thailand	Manufacture of amorphous chips	99.90
Indorama Polyester Industries PCL	Thailand	Manufacture of PET	64.94
StarPet Inc.	United States	Manufacture of PET (bottle-grade resin chips)	99.99
UAB Orion Global Pet	Lithuania	Manufacture of PET (bottle-grade resin chips)	99.91
Indorama Polymers Workington Ltd.	United Kingdom	Manufacture of PET (bottle-grade resin chips)	99.59
Indorama Ventures Europe B.V.	The Netherlands	Manufacture of PET (bottle-grade resin chips)	99.99

Name	Country	Type of business	% of Shareholding
AlphaPet Inc.	United States	Manufacture of PET (bottle-grade resin chips)	99.99
Indorama Ventures Polymers Mexico, S. de R.L. de C.V.	Mexico	Manufacture of PET (bottle-grade resin chips)	99.99
Indorama PET (Nigeria) Ltd.	Nigeria	Manufacture of PET (bottle-grade resin chips)	89.92
Guangdong IVL PET Polymer Company Limited	China	Manufacture of PET (bottle-grade resin chips)	99.91
Auriga Polymers Inc.	United States	Manufacture of PET (bottle-grade resin chips) and Polyester Fibers	99.99
Petform (Thailand) Ltd.	Thailand	Manufacture of PET preforms, closures and blown bottles	59.94
Indorama Ventures Poland Sp.z.o.o.	Poland	Manufacture of PET (bottle-grade resin chips)	99.99
PT Indorama Ventures Indonesia	Indonesia	Manufacture of PET	99.99
PT Indorama Polypet Indonesia	Indonesia	Manufacture of PET	99.99
Beverage Plastics Limited	United Kingdom	Manufacture of PET performs, bottles and closures	51.00
Aurus Packaging Limited (Renamed to Indorama Ventures Packaging (Nigeria) Limited)	Nigeria	Manufacture of PET performs, bottles and closures	99.99
Indorama Ventures Packaging (Philippines)	The Philippines	Manufacture of PET performs, bottles and closures	99.99
Indorama Ventures Packaging (Ghana) Limited	Republic of Ghana	Manufacture of PET performs, bottles and closures	99.99
Indorama Ventures Adana PET Sanayi Anonim Şirketi	Turkey	Manufacture of bottle-grade resin chips	99.99
Indorama Ventures Packaging (Myanmar) Limited	Myanmar	Manufacture of PET preforms	99.91
Indorama Ventures Corlu PET Sanayi A.Ş.	Turkey	Manufacture of PET	99.99

Name	Country	Type of business	% of Shareholding
Indorama Petrochem Ltd.	Thailand	Manufacture of PTA	99.99
Indorama Ventures Packaging (India) Private Limited	India	Manufacture of packaging	99.98
Indorama Ventures Química S.L.U. (CEPSA Spain)	Spain	Manufacture of integrated PET, PTA and IPA	99.99

### Fibers

Name	Country	Type of business	% of Shareholding
Indorama Polyester Industries PCL	Thailand	Manufacture of polyester fibers and yarns	64.94
PT Indorama Ventures Indonesia	Indonesia	Manufacture of polyester filament, yarns and PET	99.99
PT Indorama Polyester Industries Indonesia	Indonesia	Manufacture of polyester fibers and yarns	99.98
PT Indorama Polychem Indonesia	Indonesia	Manufacture of polyester chips, fibers and yarns	99.99
Wellman International Limited	Ireland	Manufacture of polyester fibers and other recycling products	99.99
Wellman France Recyclage SAS	France	Manufacture of flakes and other recycling products	99.99
PHP Fibers Inc.	United States	Manufacture of polyester fibers and yarns	80.00
Auriga Polymers Inc.	United States	Manufacture of polyester fibers and yarns	99.99
FiberVisions Manufacturing Company	United States	Manufacture of polypropylene fibers and yarns	99.99
FiberVisions Products, Inc.	United States	Manufacture of polypropylene fibers and yarns	99.99
FiberVisions A/S	Denmark	Manufacture of polypropylene fibers and yarns	99.99



Name	Country	Type of business	% of Shareholding
FiberVisions (China) Textile Products Limited	China	Manufacture of polypropylene fibers and yarns	99.99
Indorama Holdings Ltd.	Thailand	Manufacture of worsted wool yarns	99.81
PHP Fibers GmbH	Germany	Manufacture of nylon fibers and yarns for airbags and tire cords	80.00
Indorama Ventures Polymers Mexico, S. de R.L. de C.V.	Mexico	Manufacture of polyester fibers and yarns	99.99
Performance Fibers (Kaiping) Company Limited	China	Manufacture of polyester tire cord fabric	99.99
Performance Fibers (Kaiping) No.2 Company Limited	China	Manufacture of industrial fibers and fabrics	99.99
Performance Fibers (Kaiping) No.3 Company Limited	China	Manufacture of industrial fibers and fabrics	99.99
Trevira GmbH	Germany	Manufacture of polyester fibers and yarns	99.99
Textilcord Steinfurt S.A. (Glanzstoff)	Luxembourg	Manufacture of tire cords	99.99
Glanzstoff - Bohemia s.r.o.	Czech Republic	Manufacture of tire cords	99.99
Società Industriale Cremonese SICREM s.p.a. (Glanzstoff)	Italy	Manufacture of tire cords	99.99
Glanzstoff Industries (Qingdao) Company Limited (Glanzstoff)	China	Manufacture of tire cords	99.99
Glanzstoff Longlaville S.A.S. (Durafiber)	France	Manufacture of tire cords	99.99
Performance Fibers Operations Mexico, S. de R.L. de C.V. (Durafiber)	Mexico	Manufacture of tire cords	99.99

**Feedstock**

Name	Country	Type of business	% of Shareholding
Indorama Petrochem Ltd.	Thailand	Manufacture of PTA	99.99
TPT Petrochemicals PCL	Thailand	Manufacture of PTA	99.97
Indorama Ventures Europe B.V.	The Netherlands	Manufacture of PTA	99.99
Indorama Ventures (Oxide & Glycols) LLC	United States	Manufacture of EO and EG	99.99
Indorama Ventures PTA Montréal LP	Canada	Manufacture of PTA	99.99
Indorama Ventures Olefins LLC	United States	Manufacture of Ethylene Cracker	75.99
Indorama Ventures Xylenes & PTA LLC (BP)	United States	Manufacture of integrated PTA, PX and NDC	99.99
Indorama Ventures Química S.L.U. (CEPSA Spain)	Spain	Manufacture of integrated PET, PTA and IPA	99.99
Indorama Ventures Portugal PTA - Unipessoal, LDA.	Portugal	Manufacture of PTA	99.99

## 2. Nature of the Business

### Revenue Structure

The details of our sales revenue structure, according to our consolidated financial statements for the year ended December 31, 2015 to 2017, are as follows:

Details	Year Ended December 31,					
	2015		2016		2017	
	(Bt million)	%	(Bt million)	%	(Bt million)	%
<b>Revenue breakdown by Business Segments</b>						
PET	131,834	56	134,990	53	145,760	51
Fibers	73,219	31	73,291	29	81,065	28
Feedstock	59,960	26	93,771	37	115,161	40
Elimination	(30,315)	(13)	(47,432)	(19)	(55,655)	(19)
<b>Consolidated revenue from sale of goods</b>	<b>234,698</b>	<b>100</b>	<b>254,620</b>	<b>100</b>	<b>286,332</b>	<b>100</b>

Source: The Company's consolidated financial statements

The Company's operations in major regional markets allows for diversified sales, which are serviced from manufacturing units within the region and through exports. Our sales by geographic segment for the year ended December 31, 2015 to 2017 are as follows:

Details	Year Ended December 31,					
	2015		2016		2017	
	(Bt million)	%	(Bt million)	%	(Bt million)	%
<b>Revenue breakdown by Geographic Segments*</b>						
Thailand	14,783	6	14,789	6	17,823	6
North America	83,023	36	94,552	37	105,568	37
Europe	70,624	30	77,443	30	92,075	32
Rest of the World	66,268	28	67,836	27	70,866	25
<b>Consolidated revenue from sale of goods</b>	<b>234,698</b>	<b>100</b>	<b>254,620</b>	<b>100</b>	<b>286,332</b>	<b>100</b>

\*Geographic revenue breakdown based on customers' location

Source: The Company's consolidated financial statements

### Business Overview

Indorama Ventures (SET: IVL) is a major global intermediate and downstream petrochemicals producer with 75 sites in 25 countries across four continents (as of December 31, 2017) providing value-added and differentiated products and services to the fast-moving consumer goods industry. Our management team has in-depth experience in the polyester and high value-added products chain.

High value-added products are premium products and normally have higher margins over pure staple commodity (which we also call 'necessities') products.

IVL has integrated businesses and are aligned to create a sustainable value proposition. IVL's customer orientation, global reach and scale allow us to benchmark ourselves globally to enhance operational excellence.

The new factor that will provide a broader portfolio of products for customers is in innovation, high value-added products and recycling, which will enable faster earnings growth and enhanced sustainability of the business. Investment in research and development provide customers with new products and services that will improve our offerings and complete IVL's loop as a one-stop center for global requirements. From 2011-2017, we acquired businesses manufacturing high value-added products (HVA). Our principal acquisitions in HVA products are:

**Trevira:** A manufacturer of polyester fibers and yarns for applications in apparel, home furnishings, automotive and industrial applications. The principal operating units are based in Germany.

**FiberVisions:** A manufacturer of high value-added polypropylene fibers and yarns for hygiene applications. The principal operating unit is based in the United States.

**PHP Fibers:** A manufacturer of nylon 6.6 polyamide fibers and yarns for application in the automotive industry, commonly used for manufacturing air bags and tire cords. The principal operating unit is in Germany.

**Performance Fibers:** A manufacturer of premium polyester tire fabrics in China, which is the largest and fastest-growing market for polyester tire cord fabric.

**IPA:** A product that came with the acquisition of CEPSA in Spain in April 2016, and which expanded IVL's HVA profile making the Company the second-largest IPA producer globally.

**NDC:** A product that came with the acquisition of BP Decatur in the United States in March 2016, and which expanded IVL's HVA profile making the Company the largest NDC producer globally.

**Glanzstoff :** A largest converter for tire cord fabrics in Europe, a global leader in single endcords (SEC) and is vertically integrated into high tenacity rayon technology. The business comprises three locations in Luxembourg, Italy and the Czech Republic, with a new single-end-tire cord plant under construction in Qingdao, China.

**DuraFiber :** A leading producer of durable technical textiles for industrial, tire reinforcement, and specialty applications globally. The principal operating unit is in Mexico and France.

### **Business Description**

The term Polyester can be broken into poly, meaning many, and ester, a basic organic chemical compound. The principle ingredients used in the manufacture of polyester are purified terephthalate acid, derived from paraxylene, a part of the aromatics chain leading backwards to crude oil, and monoethylene glycol, part of the olefins chain that leads backward to crude oil or natural gas. The chemical process that produces the finished polyester is polymerization. IVL is one of the world's foremost-integrated producers in the Polyester industry.

IVL is a bridge connecting the oil and gas industry with fast-moving consumer goods (FMCG) producers. There is constant demand growth from downstream customers, as they are mostly FMCG companies, which grows in volume.

The industry norm is to have long-term volume contracts with customers, normally of one to three years; however, the pricing is adjusted monthly as per benchmark prices in the industry and according to an agreed mechanism. The system indicates IVL's ability to pass through price (not always contractually) movements to end customers.

This mechanism implies that crude oil and its derivative raw materials used to produce PET and Polyester fibers have a low-impact on the business except in the event there is a sharp rise or fall in the price of such materials within a short period, entailing an adjustment in the cost of inventory to reflect market prices. This mark-to-market effect is termed inventory gains or inventory losses.

However, there could be volatilities in the spread when there is oversupply or tight supplies in the industry in the short-term.

### **PET Business**

#### **PET Business Overview**

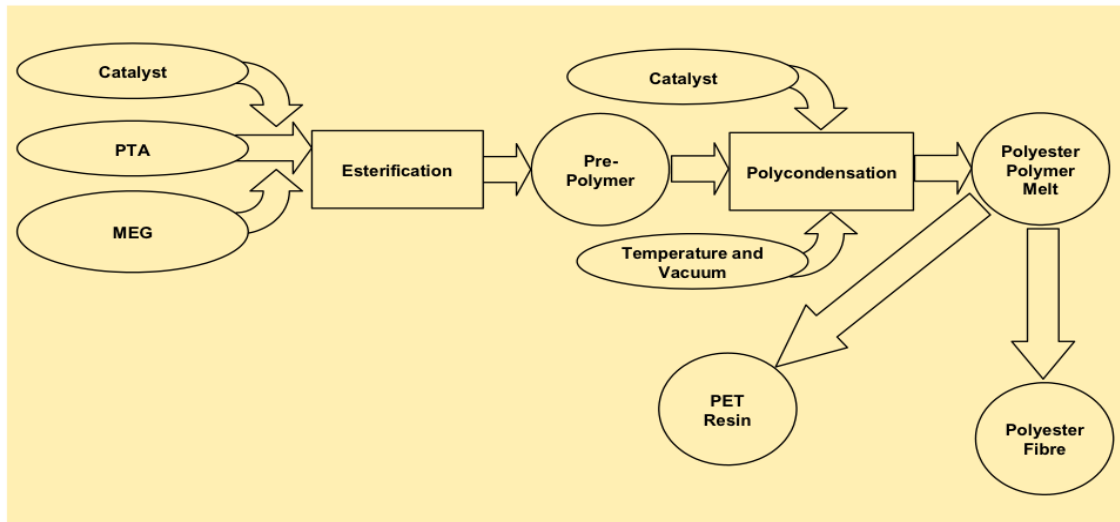
Our PET business is part of our core polyester value chain business and comprised 41% of production volumes in 2017. Beginning with one manufacturing plant, we have grown today to operate across the four major consuming continents of North America, Europe, Africa and Asia. Our PET business comprises the production and sale of PET resin, a plastic polymer resin primarily used for beverage containers and food packaging, packaging of pharmaceutical and household products and in industrial packaging applications. We also produce PET packaging in the form of preforms, bottles and closures through various production facilities including Petform, a joint venture with Serm Suk Pcl. in Thailand, and through facilities in Ireland, Nigeria, the Philippines, Ghana and Myanmar. As of December 31, 2017, we are the largest PET resin producer in the world with an aggregate installed production capacity of 5 million tons per annum (including 100% capacity in our India joint ventures where IVL owns a 50% equity interest).

#### **PET Products**

We produce a variety of PET resins, including hot-fill, high and low intrinsic viscosity, quick heat and general grade, to serve a variety of markets including carbonated soft drinks, food, bottled water, juices, other beverages, and other applications.

#### **PET Production Process**

PET resin comes from polyester polymer melt. The chart below summarizes the polyester production process.



The melt is converted into PET resin, either through a conventional solid-state process or through a newer technology melt-to-resin process. Under the conventional solid-state polycondensation process, the melt is extruded in strands, which are cooled down quickly by water. After solidification, the strands are cut into small pellets, dried and further crystallized by being heated in a reactor under a specific temperature and pressure conditions under a nitrogen flow. Under the melt-to-resin process, the polycondensation process is completed during the melt phase, resulting in the formation of pellets without going through the solidification process. We have plants that use both of these technologies.

### **PET Production Facilities**

The following table describes our PET production facilities as of December 31, 2017.

Production Facility	Location	Installed Capacity <sup>(1)</sup> ('000 tons per annum)
AlphaPet PET Facility	Decatur, Alabama, US	450
StarPet PET Facility	Asheboro, North Carolina, US	266
Orion Global PET Facility	Klaipeda, Lithuania	263
IRP Rotterdam PET Facility	Rotterdam, the Netherlands	426
IRP/AsiaPet PET Facilities <sup>(2)</sup>	Lopburi, Thailand	184
Indorama Polyester Industries PET Resin Line	Map Ta Phut, Thailand	110
GIVL PET Facility	Kaiping, China	523
Arteva PET Facility	Queretaro, Mexico	484
Auriga Facility - PET Resin Line	Spartanburg, South Carolina, US	286
IVL Wloclawek PET Facility	Wloclawek, Poland	230
IVL Tangerang Facility - PET Resin Line	Tangerang, Indonesia	95

Production Facility	Location	Installed Capacity <sup>(1)</sup> ('000 tons per annum)
Port Harcourt SSP Facility	Nigeria	73
PT Indorama Polypet Facility – PET Resin Line	Cilegon, Indonesia	102
Polyplex, PET Facility	Istanbul, Turkey	256
Indorama Ventures Polymers (Rayong)	Rayong, Thailand	121
Micropet <sup>(3)</sup>	India	219
Dhunseri <sup>(3)</sup>	India	480
CEPSA Spain	Spain	203
Packaging Facility	Various sites	182
<b>Total</b>		<b>4,952</b>

(1) We have re-rated the plant capacity to reflect the de-bottlenecking projects taken-up by various plants from time-to-time. In addition, the capacity does not include three non-operating PET sites: IRP Workington, Ottana Polimeri S.R.L. and Adana Turkpet.

(2) This comprises the Indorama Polymers PCL PET facility and the AsiaPet Amorphous PET facility, each with a capacity of 184 Kt per annum and together forming a single PET resin line. The AsiaPet (Thailand) Ltd. Amorphous PET facility produces amorphous PET, used in the Indorama Polymers PCL PET facility to produce PET resin.

(3) A 50/50 Joint Venture partnership with Dhunseri Petrochem Limited in India.

### **PET Sales and Marketing**

We have PET sales and marketing teams in each of the regions in which we operate, which are overseen strategically by our sales and marketing head office in Thailand. We classify our main customers for PET into four main groups:

- Well-known brand name beverage companies with their own conversion plants to produce PET bottles;
- Well-known brand name beverage companies who sub-contract the production of PET bottles to converters using PET resin purchased by such beverage companies;
- PET resin traders; and
- PET converters who use PET resin to manufacture preforms, bottles, sheets and other PET packaging to service the needs of end users.

We sell our PET resin primarily through direct sales to end-use customers. A small proportion of our sales take place through agents and traders.

We are the world's largest PET resin producer and the only PET resin producer with production facilities in four continents, i.e. Asia, North America, Europe and Africa, which allows us to market our PET resin products globally to customers for their worldwide PET requirements. Our marketing activities include regular meetings with our customers to understand their requirements, maintain good relationships as well as provide excellent customer service.



### **PET Competition**

We are the largest PET producer globally: No. 1 in Europe, No. 2 in North America and with a significant position in Asia. Our principal competitors in the European market are Equipolymers and Neo Group. Our principal competitors in the North American market are Alpek (DAK Americas LLC) and the Far Eastern Group. Our competitors in the Thai market are Thai Shinkong Industry Corp. and Thai PET Resin Co., Ltd. Although PET technology is available through commercial licenses, we believe the capital investment required to achieve profitability through economies of scale may inhibit new entrants to the market.

### **Fibers Business**

#### **Polyester Fibers and Yarns Business Overview**

Polyester was discovered in the 1940s and has been manufactured on an industrial scale since 1947. Polyester fibers are the first choice for apparel and are used in trousers, skirts, dresses, suits, jackets, blouses and outdoor clothing.

Blends with cotton and virgin wool are very popular. They are often referred to as the "classical blend."

Polyester fibers are produced by the melt spinning process. Raw materials are heated to a spinning mass, which is then pressed through spinnerets (similar to a sieve). Manufacturing techniques have developed to the point where they can produce round, oval or angular profiles, making them firm to the touch.

Polyester fibers are particularly resistant to light and weather, and can withstand climatic effects, being as light or as fine as the weather demands. Polyester fibers have good moisture transport and dry quickly.

#### **Polyester Fibers and Yarns Products**

Polyester fibers are most commonly used for apparel, from sportswear to high fashion; home textiles, such as bedding and carpets; non-woven materials including surgical gowns; technical textiles such as filters and automotive uses including carpets and insulation.

With the acquisition of Performance Fibers in China in 2015, IVL can now produce polyester yarns and Polyester Fabrics that are used in tires and supplied to various world-class tire companies. With the growth in demand, IVL is in the process of expanding product capacity by around 40% in China.

The acquisition of Glanzstoff in 2017 enhanced the offering of fibers in the automotive space with Rayon fiber. It also makes composite fibers for the automotive sector. This acquisition enhances our strategic position in automotive fibers as now it can offer a suite of products to the same or similar group of customers.

DuraFibers in France and Mexico expanded the footprint of Performance Fibers in China as they produce similar products in the automotive fibers space.

### ***Polyolefin Fibers Business Overview***

The fiber forming substance is any long-chain synthetic polymer composed of a weight of at least 85% of ethylene, propylene, or other olefin unit in these manufactured fibers. Italy began production of olefin fibers in 1957. Production of olefin fibers in the United States began in 1960. The first commercial producer of olefin fibers in the United States was Hercules, Inc., now known as FiberVisions, and wholly-owned by IVL.

Polymer granules are usually fed into an extruder that melts the polymer that is then pumped through a spinneret. The filaments are cooled in an air stream before being wound on a package or collected in cans. Because the fibers are difficult to dye, colored pigments are often added to the polymer stream before extrusion to produce colored fibers.

Propylene, when polymerized, creates a crystalline polypropylene polymer. The fibers made with these polymers can be used in furnishings, apparel and industrial products. Olefin fibers provide warmth without much weight. Olefin is resistant to abrasions, stains, sunlight, fire and chemicals. It does not dye well, but has the advantage of being colorfast since pigments are added in the fibers. Since Olefin fibers have a low melting point, they can be thermally bonded. One of the most important properties of Olefin fibers is its strength, which can be tailored for different applications. It keeps its strength in wet or dry conditions. Olefin fibers can be multi- or monofilament and staple, tow, or film yarns. The cross section is usually round, but can be modified for different end uses.

### ***Polyolefin Fibers Products***

Uses include nonwoven fabrics for diapers, feminine care and adult incontinence products (as top sheet, back sheet, leg cuffs, elastic waistband, and transfer layers); in spun laced nonwoven products such as medical disposable textiles, filtration products or in air-laid nonwoven structures as absorbent cores, and wet wipes.

In terms of apparel, olefin fibers are used in sports and active wear, socks, thermal underwear and as lining fabrics, while in the home they are often used independently or in blends for indoor and outdoor carpets, carpet tiles and carpet backing. The fiber can also be used in upholstery, draperies, wall coverings, slipcovers, and floor coverings as well as heat-sealable paper for use in cases such as tea and coffee-bags.

In heavier applications, the fibers are often used for interior fabrics, sun visors, arm rests, door and side panels, and trunk and parcel shelves, while olefin can be created into carpets, ropes, and geo-textiles that are in contact with the soil, filter fabrics, bagging and concrete reinforcements.

### ***Bicomponent Fibers Business Overview***

Bicomponent fibers may be defined as "extruding two polymers from the same spinneret with both polymers contained within the same filament." A close relative is "co-spun fiber," which is a group of filaments of different polymers, but with a single component per filament spun from the same spinneret. The term "conjugate fibers" is often used, particularly in Asia, as synonymous with bicomponent fibers. The main objective of producing bicomponent fibers is to exploit capabilities not

existing in either polymer alone. Bicomponent fibers are commonly classified by their fiber cross-section structures as side-by-side, sheath-core, islands-in-the-sea and citrus fibers or segmented-pie cross-section types. Bicomponent fibers made of polyethylene sheath and polypropylene core are important fibers for the nonwoven fabric market.

### ***Worsted Wool Yarns Business Overview***

The name Worsted is derived from Worstead, a village in the English county of Norfolk. Worsted wool fabric is typically used in the making of tailored garments such as suits, as opposed to woolen wool, which is used for knitted items such as sweaters. The essential feature of worsted yarn is its straight, parallel fibers. Worsteds differ from woolens, in that the natural crimp of the wool fiber is removed in the process of spinning the yarn. IVL produces wool from Merino sheep. These sheep are sought after for their coats, which are said to produce the finest, softest wool available.

While many forms of wool require that the fiber undergo a spinning process, the production of worsted wool follows a slightly different path. Rather than going directly into a spinning process, the wool is first combed in a carding process. This is where the fibers are separated and prepared for spinning to remove any short and brittle fibers from the wool, leaving only the longer strands of fiber to undergo the spinning process, producing a smooth yarn that possesses a higher durability.

Owing to the strength of worsted wool, the fibers can be woven into a finer material that is more crease resistant than many other fabric choices making it an ideal choice for garments that need to hold their shape. Worsted wool has been a popular choice for men's trousers, pleated skirts for women, and both men's suits and sport jackets. Because worsted wool is so durable, it wears very well and drapes easily, making it an ideal fabric for all sorts of garments.

### ***Worsted Wool Yarns Products***

Worsted Wool produced by Indorama Ventures is used in high-end suiting for both men and women.

### ***Nylon 6.6 Tire Cord Yarns Business Overview***

With the acquisition of PHP Fibers GmbH and its subsidiaries ("PHP"), IVL holds 80% of PHP while the remaining 20% is held by Toyobo Co., Ltd., a leading Japanese manufacturer of high function products, including among others, automotive products.

PHP is a globally recognized manufacturer of branded high-tenacity polyamide nylon 6.6 yarns and is one of the leading suppliers in Europe for the automotive safety supply chain. PHP Group production facilities are located in the United States, Europe and China.

This acquisition of PHP significantly enhances the Company's High Value-Added (HVA) product portfolio with the addition of high performance automotive and industrial products.

### ***Nylon 6.6 Tire Cord Yarns Products***

These yarns are extensively used in air bags and tire cords in the automotive sector.

### Fibers Production Facilities

The following table describes our fibers and yarns production facilities as of December 31, 2017.

Production Facility	Location	Installed Capacity <sup>(1)</sup> ('000 tons per annum)
Indorama Polyester Industries Nakhon Pathom Facility	Nakhon Pathom, Thailand	120
Indorama Polyester Industries Map Ta Phut Facility	Map Ta Phut, Thailand	192
Indorama Holdings Facility – Wool line	Lopburi, Thailand	6
Auriga Facility – Polyester line	Spartanburg, South Carolina, US	83
IVL Karawang Polyester Facility	Karawang, Indonesia	38
IVL Tangerang Facility – Polyester line	Tangerang, Indonesia	75
Trevira – Polyester line <sup>(2)</sup>	Bobingen and Guben, Germany	123
Arteva Polyester Facility	Queretaro, Mexico	64
Wellman International – Recycled Polyester	Mullagh, Ireland, Spijk, Netherlands and Verdun, France	175
FiberVisions – Polyolefin line	Duluth, Athens and Covington, US, Varde, Denmark and Suzhou, China	212
Indorama Polyester Industries Map Ta Phut Facility - BICO	Map Ta Phut, Thailand	7
Polychem Facility (CP4) – Polyester line	Purwakarta, Indonesia	323
PHP Fibers – Nylon 6.6 tire cord and yarns	Germany, US and JV in China	85
Performance Fibers	Guangdong, China	55
DuraFiber Technologies México Operations, S. A. DE C. V.	Queretaro, Mexico	20
DuraFiber	Longville, France	35
Glanzstoff Group	Luxembourg, Czech Republic, Italy & China	31
<b>Total</b>		<b>1,644</b>

(1) The capacity of plants has been re-rated to reflect the de-bottlenecking projects taken-up by various plants from time-to-time.

(2) Facility acquired through a 75% JV on July 1, 2011. From October 1, 2013, Trevira was fully consolidated due to a revision in terms with the JV partner.

### ***Fibers Sales and Marketing***

Our main customers for fibers and yarns products are companies producing textiles for apparel, fast moving consumer goods companies in hygiene, companies producing home textiles and industrial companies such as automotive companies and packaging film producers.

### ***Fibers Competition***

Competition in the global fibers and yarns industry is characterized by the presence of large diversified industrial companies, as well as a large number of relatively small niche players with a capacity of sometimes less than 10,000 tons per annum. Larger fiber producers usually focus on high-volume standard fibers for sale in domestic markets where the level of competition is high and predominantly based on price and, to a lesser degree, on consistency of product quality. The larger polyester producers of commodity polyester products continue to focus on increasing their production of non-commodity products. They comprise approximately half of our total output. China dominates polyester production and has many companies involved in this business. There are a few companies in Korea, China, Turkey and in western markets where they make specialized fibers and yarns, which competes with our specialized fibers and yarns.

### ***Feedstock Business***

Feedstock for Indorama Ventures encompasses PTA, PX, IPA, NDC, MEG, EO derivatives and by-products, which are raw materials for producing our major products. With the commercial startup of the gas cracker in the United States, Ethylene and Propylene will also be added in the feedstocks.

In full, PTA is Purified Terephthalic Acid and is an organic compound. This colorless powder is a commodity chemical, used principally in the manufacture of PET, which is generally used to make clothing and plastic bottles.

### ***PTA Business Overview***

Terephthalic acid is an organic compound and a colorless solid. It is a commodity chemical, used principally as a precursor to polyester PET, used to make clothing and plastic bottles.

IVL entered the PTA business in 2008 with a strategy of developing raw material integration to ensure an uninterrupted supply of raw materials and ensure better integration in the polyester value chain. This provides IVL with a cost competitive edge to the PET and Fiber businesses. The Company's PTA assets are strategically co-located with downstream facilities in Thailand, Indonesia, Canada, Spain, the United States and the Netherlands with a capacity of 4.2 million tons per annum (including 100% capacity in our Indonesia joint ventures where IVL owns a 47.25% equity interest).

With the acquisition of the PTA and utility assets in Portugal in 2017, IVL enhanced the PTA business in Europe with a capacity of 700,000 tons.

### ***PTA Products***

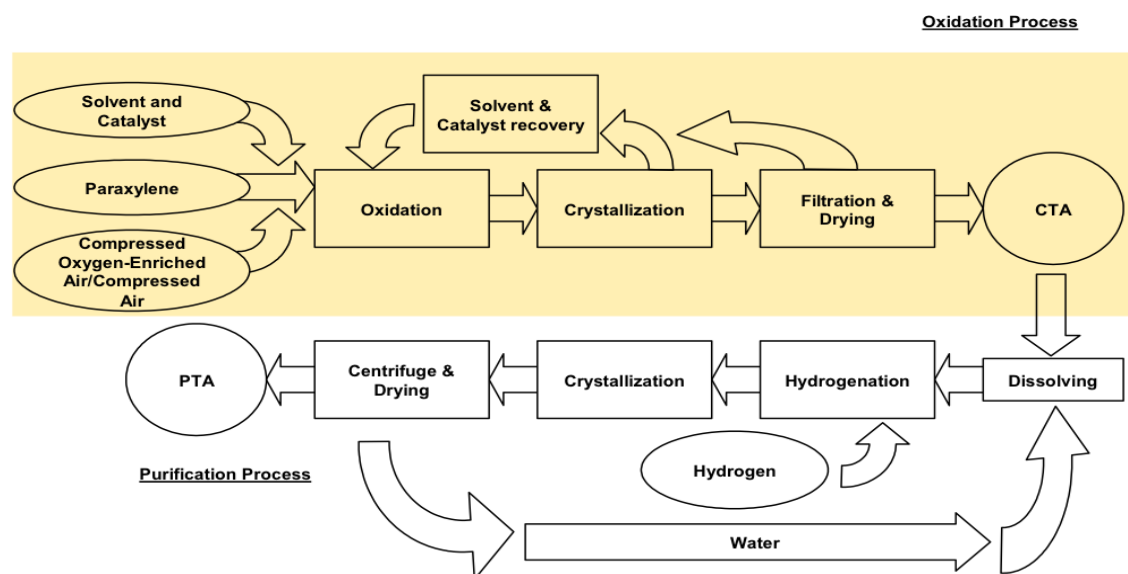
PTA is a major feedstock of PET and polyester fibers and yarns, however, a few small niche uses occur, such as in the analgesic drug oxycodone, which occasionally comes as a terephthalate salt.

### PTA Production Process

Terephthalic acid is the result of the oxidation of Paraxylene (PX). The commercial process utilizes acetic acid as a solvent together with a catalyst composed of cobalt and manganese salts, with a bromide promoter.

A radical chain reaction occurs in a series of intermediates, starting with the oxidation of paraxylene and finally to terephthalic acid (TA). It is then further purified to make PTA.

The chart below summarizes the PTA production process.



### PTA Sales and Marketing

Our main customers for PTA are PET resin and polyester producers. Our downstream PET and polyester production facilities use a significant proportion of our PTA production. We sell the remaining PTA that we do not use within the group to third party customers. In 2015, 2016, and 2017, 53.8%, 55.9% and 53.1% respectively, of our PTA were sold to the group and 46.2%, 44.1% and 46.9% respectively, of our PTA were sold to third party customers.

Our PTA sales and marketing head office is located in Thailand and is responsible for sales and marketing activities relating to our customers worldwide. Our marketing activities include regular meetings with our customers to understand their requirements and maintain good relationships as well as providing customer service.

### PTA Competition

As PTA is a commodity product, competition relies mainly on price and, to a lesser extent on lead times to product delivery.

Manufacturers of PTA can be classified between merchant producers and integrated PTA producers. Merchant producers manufacture and supply PTA to third parties, whereas integrated PTA producers manufacture and use PTA for their own captive consumption partially or fully. We are an integrated PTA producer. Currently in China, there are many new PTA plants using the latest technology and

having lower conversion costs than previously. However, there are other competitors in Europe and North America.

### ***IPA Business Overview***

IPA is a new business for IVL with the recent acquisition of CEPSA assets in Spain in April 2016, and consists of 220,000 tons per annum of capacity. IPA is produced with metaxylene as its feedstock, which is supplied by CEPSA in Spain and imported from other suppliers. IVL consumes IPA captively and also supplies to other customers. IPA can be used in PET resin manufacturing and can also be used in paints and coatings. IVL has increased its production with increased supplies of more metaxylenes from its suppliers in 2018.

### ***NDC Business Overview***

In April 2016, we acquired an aromatics complex located in Decatur, in the United States, from BP Amoco Chemical Company. The Decatur facility manufactures PTA and its raw material, paraxylene (PX). The facility provides raw materials to IVL's Alpha PET co-located business operation and to external customers worldwide. It is also the world's only commercial manufacturer of naphthalene dicarboxylate (NDC), which is a chemical used in new-generation polyesters and resins to make items such as LCD flat panels displays and ultra-thin data storage tape.

### ***Monoethylene Glycol (MEG) Business Overview***

The other major feedstock produced by Indorama Ventures is MEG, which is an organic compound. In its pure form, it is an odorless, colorless, syrupy, sweet-tasting liquid.

Monoethylene glycol comes from ethylene via intermediate ethylene oxide. Ethylene oxide reacts with water to produce ethylene glycol.

### ***MEG Products***

The major end uses of ethylene glycol are in the polyester industry and in anti-freeze for automobile radiators. Besides automobiles, MEG is a medium in liquid-cooled computers, chilled water air-conditioning systems and geothermal heating/cooling systems.

### ***Purified Ethylene Oxide (PEO) Business Overview***

Purified Ethylene Oxide comes from the direct oxidation of ethylene in the presence of a silver catalyst.

### ***PEO Products***

Purified Ethylene Oxide is used in the production of detergents, thickeners, solvents, plastics and various organic chemicals such as ethylene glycol, ethanolamines, simple and complex glycols, polyglycol ethers and other compounds. Pure ethylene oxide is a disinfectant that is widely used in hospitals and the medical equipment industry to replace steam in the sterilization of heat-sensitive tools and equipment, such as disposable plastic syringes.



PEO derivatives are used to manufacture various products such as soaps, detergents, brake fluids, weed killer and urethane foam.

Ethylene oxide is one of the most important raw materials used in large-scale chemical production. Most ethylene oxide is used for the synthesis of ethylene glycols, including diethylene glycol and triethylene glycol that accounts for up to 75% of global consumption. Other important products include ethylene glycol ethers, ethanolamines and ethoxylates. Among glycols, ethylene glycol is used as antifreeze, in the production of polyester and PET, liquid coolants and solvents. Polyethylene glycols are used in perfumes, cosmetics, pharmaceuticals, lubricants, paint thinners and plasticizers. Ethylene glycol ethers are used in brake fluids, detergents, solvents, lacquers and paints. Other products of ethylene oxide include ethanolamines, which are used in the manufacture of soaps and detergents and for the purification of natural gas. Ethoxylates are reaction products of ethylene oxide with higher alcohols, acids or amines. They are used in the manufacture of detergents, surfactants, emulsifiers and dispersants.

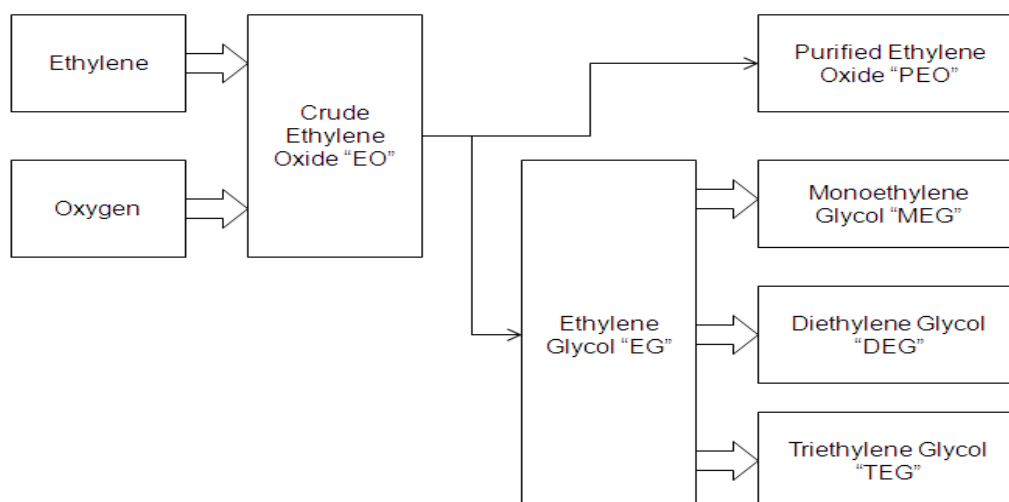
### ***Diethylene Glycol (DEG) and Triethylene Glycol (TEG) Business Overview***

Diethylene Glycol (DEG) is a by-product made together with MEG through the processing of EO. DEG has broad applications and is used to manufacture polyester polyols, unsaturated polyester resins, buffet heaters, morpholine production, paints and coatings, plasticizers, liquid laundry detergent, cement grinding and as an intermediate for polyethylene glycol.

Triethylene Glycol (TEG) is a by-product made by processing EO and is mainly used for natural gas dehydration. The other applications are air sterilizers, resin for windshield plate glass and as an intermediate for polyethylene glycol. It is used as a plasticizer for vinyl. It is also used in air sanitizer products. When aerosolized it acts as a disinfectant. It is an additive for hydraulic fluids and brake fluids and is used as a base for "smoke machine" fluid in the entertainment industry.

### ***Oxide and Glycol Production Process***

The chart below summarizes the EO/EG production process.



### ***Oxide and Glycol Sales and Marketing***

IVL acquired its first EO/EG plant in April 2012, which has 100% of its sales in North America. Sales and Marketing for Indorama Ventures (Oxide & Glycols), or IVOG, is overseen by the sales and marketing head office in Thailand and implemented by the US sales team. Sales of our products are broken into two main categories:

Purified Ethylene Oxide (PEO) is sold exclusively into the US merchant market. The product is used as a chemical intermediate in the manufacturing of PEO derivatives such as ethanolamines, polyols, ethers and surfactants which are used in the manufacture of agricultural chemicals, rigid and flexible foams, cleaning solvents and the personal care and beauty care industries, respectively.

There are currently many pure merchant consumers of PEO in the United States and IVOG supplies many of these companies, a testimonial to our reliability and service excellence. IVOG has an approximate 30% of the US merchant market share of PEO sales.

In addition to PEO, the plant manufactures the glycol products, Monoethylene Glycol (MEG), Diethylene Glycol (DEG) and Triethylene Glycol (TEG) through a distillation process. The majority of the yield is MEG.

- IVL's acquisition of the Clear Lake, Texas plant accompanied an MEG supply agreement with the former owner who consumes MEG for the engine coolant market principally in the US.
- IVL's US Polyester and PET plants consume MEG as a raw material for their products. IVL's US plants have consumptive MEG capacity in excess of the Clear Lake, Texas plant's production capabilities, giving IVL the option to merchant MEG in the US and global markets or consume the MEG on a captive basis.

In 2015, 2016 and 2017, 31.0%, 31.2% and 33.1% respectively of our EO/EG were sold to the group and 69.0%, 68.8% and 66.9% respectively of our EO/EG were sold to third-party customers.

### ***Oxide and Glycol Competition***

**PEO Competition** – Due to the hazardous nature of PEO, there are no imports or exports of PEO as a product. PEO derivatives are open to import-export. IVOG competes in the US PEO market with global competitors, all of whom primarily produce PEO to support internal production of PEO derivatives and sell the balance of their capacity to the merchant market. Unlike all of our competitors, IVOG does not produce any PEO derivatives, which competes with our merchant customers businesses.

**Glycols Competition** – The global market for MEG is highly competitive, involving a large number of producers located throughout the world. MEG is easy to transport and store. The shale gas revolution in America has given US producers advantaged ethylene as a feedstock material ensuring the US as a low-cost region for MEG production. IVL's integration into MEG adds value to the US PET and Polyester margin chain. The largest competitors in North America include Shell Chemical, MEGlobal, Equistar and Sabic, along with PEMEX in Mexico. The US is a largely mature consumer of MEG with

demand growth driven by new PET capacity and an opportunistic export arbitrage platform based on the advantaged North American ethylene costs associated with shale gas.

### **US Olefin Cracker Business Overview**

IVL acquired an old and mothballed ethylene cracker located in the United States in Lake Charles, Louisiana, through its subsidiary, Indorama Ventures Olefins LLC. The refurbishment and restart process is ongoing. The plant has an expected commercial startup in the second quarter of 2018. On completion, our integration will expand in North America, as today we are a buyer of ethylene, which will be the end product of our US cracker once the refurbishment is completed.

### **Feedstock Production Facilities**

The following table sets out the key figures for our feedstock production facilities as of December 31, 2017 (excluding the US Gas Cracker as it is under a restart process):

Production Facility	Location	Nameplate Capacity <sup>(1)</sup> ('000 tons per annum)
Indorama Petrochem PTA Facility	Rayong, Thailand	771
TPT Petrochemicals PTA Facility	Map Ta Phut, Thailand	602
IRH Rotterdam PTA Facility	Rotterdam, the Netherlands	700
Polyprima PTA Facility <sup>(2)</sup>	Indonesia	500
CEPSA PTA Facility	Montreal, Canada	600
CEPSA Spain PTA Facility	Spain	325
BP Chemicals PTA Facility	Decatur, United States	1,020
Indorama Ventures (Oxide and Glycol) EO/EG Facility	Texas, United States	550
CEPSA Spain IPA Facility	Spain	220
<b>Total</b>		<b>5,288</b>

(1) The capacity of plants has been re-rated to reflect the de-bottlenecking projects taken-up by the various plants from time-to-time. However, the capacity does not include a non-operating site: Ottana Polimeri S.R.L.

(2) Joint Venture investment with a 47.25% shared interest.

### **Competitive Strengths**

#### **1. Industry Focus and Leading Market Positions**

We are a leading global producer in the polyester value chain within the broader petrochemical stream and additionally offer various types of high value-added products. We have maintained a keen focus and commitment to the industry in which we operate. Since 2003, we have focused on the polyester value chain through expansions and acquisitions, the disposal of a non-core chemical

business, and by expanding our business portfolio and geographic presence. As a result, we have become a leading vertically integrated global manufacturer of polyester polymers.

We have a leading market position in the PET polymers and hygiene fibres market. We has around 20% of global PET market share including its JV companies in India. Smilarly in hygeine fibers we has around 50% market share in premium baby diapers fibers relevant to IVL. We are also a major airbag yarn producer in Europe globally

We believe that we are one of the few petrochemical companies that focus more on the polyester value chain, compared with other important players that are organized in large divisions that, in turn, consist of many different businesses. We believe that the key advantages of being a focused player are:

- Better understanding of the key success factors for individual businesses;
- More efficient allocation of capital and human talent;
- Ability to make quick management and commercial decisions;
- Reduction in overhead needed to manage a diverse set of operations and the addition of more value due to the similarity of the businesses; and
- Strong Research and Development departments with 11 R&D sites globally.

## 2. *Global Sales and Manufacturing Footprint*

We are a global company with 75 manufacturing facilities located in 25 countries (as of December 31 2017) across four continents, namely Asia, North America, Europe, and Africa, supplying products to customers worldwide. We are the only PET resin producer with operations in Asia, North America, Europe and Africa.

We believe that our global presence enables us to:

- Capture volume growth;
- Widen our customer base;
- Increase our cost competitiveness by being closer to our customers and suppliers;
- Lower our logistics costs;
- Benefit from averting existing trade barriers; and
- Reduce the exposure to cyclicalilty and dependence on any single market.

## 3. *Integrated Business Model*

Our polyester value chain business is integrated into MEG, PTA, PET resin, polyester fibers and yarns and in packaging at certain locations. A significant proportion of our feedstock (PX, PTA, MEG, IPA) requirements (48.5% in 2015, 54.7% in 2016 and 52.7% in 2017) for our downstream PET and polyester production facilities are sourced internally.

We believe that the key benefits from integration include:

- Security of feedstock supply for our PET and polyester operations during periods of market fluctuations, specifically in periods when there is high demand for raw materials;
- Captive consumption for our PTA and MEG operations, resulting in the ability to maintain higher capacity utilization as compared to merchant suppliers, even in periods of increased industry supplies;
- Cost savings through PTA, PET, IPA and polyester site co-locations due to a reduction in logistics costs and the sharing of common services; and
- Cost savings through integration due to a reduction in fixed costs associated with raw materials procurement, sales and marketing, and administrative functions.

We believe that integration enhances our operating efficiency, competitiveness and responsiveness to customers and market developments, as well as allowing stability in volumes and profits.

#### 4. **Strong Cost Position**

We have maintained an emphasis on cost and efficiency. The Company holds a strong cost position in the businesses and regions in which we operate, and we believe that this has been achieved by the following:

We believe we that have some of **the largest scale capacity and most efficient** production facilities in the PET resin, Polyester Fibers, HVA products, MEG and PTA industries. We operate the largest single-line PET resin plant in Europe at our Orion Global PET facility in Lithuania, which has a capacity of 263,000 tons per annum. We also operate the largest single-line PTA plant in Thailand at our Indorama Petrochem PTA facility, which has a capacity of 771,000 tons per annum. We earlier had constructed a new PET resin plant in North America at our AlphaPet PET facility in Alabama, US, with a capacity of 445,000 tons per annum. The AlphaPet PET facility is one of the largest in this region and employs the latest generation PET technology. These large-scale, modern and efficient facilities enable us to achieve a competitive cost position in the industries where economies of scale are critical. In the polyester business, where we focus on the production of niche products, we have invested in fit-for-purpose, flexible assets that are ideally suited for the production of niche and value-added products. We also have a latest state of art polyester fibers plant in Indonesia which has one of the lowest cost of manufacturing of the fibers of its kind globally.

We believe we have the **best-in-class manufacturing efficiency**, achieved by running our facilities at high capacity utilization rates with optimal levels of labor, low overhead costs as well as energy and utility cost-savings. We have enhanced our cost competitiveness by building efficient utility plants using coal or gas as feedstock at most of our facilities and, where possible, we sell excess electricity and steam to third parties to reduce our own cost of electricity and steam. We benchmark all of our facilities against each other in order to optimize performance.

We are able to achieve **advantageous raw material costs** due to our large purchasing volumes, proximity to raw material feedstock and long-term relationships with key suppliers. We benefit from a

significant purchasing advantage for PX, PTA and MEG. We are among the world's largest buyers of PX and MEG. By being a global producer of polyester polymers, we have an advantage over regional producers in being able to manage MEG procurement on a pan-global basis. We are one of the largest merchant PTA buyers in the US market, which provides an enhanced purchasing advantage. Our plants are well-positioned, mainly through co-location or close proximity for advantaged raw material logistics and infrastructure support.

We have been able to achieve a **low capital cost structure** by constructing large-scale plants and acquiring assets at a discount to their replacement cost. Our efficiency in buying businesses is in our financial statements as a "gain on bargain purchase." This arises if we buy any business below its fair value. An independent appraiser normally calculates the fair value of an acquisition.

### **5. Experienced Management Team with a Proven Track Record of Successfully Growing and Managing the Business**

Our management team is composed of highly experienced managers with longstanding leadership experience, as well as significant and diversified industry knowledge.

Our management team has a proven track record of successfully implementing capital-intensive projects to increase our production capacities as well as selecting attractive acquisition opportunities and successfully improving the operations and profitability of acquired businesses.

#### **Raw Materials and Suppliers**

The two principal raw materials used in the production of the polyester value chain are PX and MEG. However, we also purchase Ethylene to produce MEG in the United States and also purchase PTA at certain locations. Other additives and utilities that we require in our business include acetic acid, isophthalic acid, various catalysts and gases such as nitrogen and hydrogen, but in lower quantities compared to our major raw materials. We purchase these consumables from various suppliers typically under short-term contracts of one year.

#### **PTA/IPA**

We have vertically integrated a portion of our PET business and Polyester fibers and yarns to our PTA business to provide reliable and cost effective PTA supplies. Our IRP Rotterdam PET facility and our Indorama Polyester Industries Polyester fibers and yarns line and PET resin line are co-located with our IRH Rotterdam PTA facility and TPT Petrochemicals PTA facility, respectively, while our AlphaPet PET facility is co-located with the PTA production facility of BP with whom we have long-term offtake agreements to purchase PTA. Our Poland PET facility is located next door to the PKN Orlen PTA facility. Our Asia Pet/Indorama Polymers PET plant in Lopburi, Thailand and Indorama Polyester Industries, Nakhon Pathom facility, Thailand source PTA from Indorama Petrochem and TPT Petrochem plants in Thailand. In Indonesia, our PET and Polyester fibers and yarns facility source PTA from our joint venture unit PT Polyprima. In the United States, PET sources PTA from IVL plants in Canada and the US.

Similarly, IPA is being supplied to IVL plants globally (depending on logistics advantages) from its site in Spain and also sold to third-parties.

### **MEG**

We purchase MEG, a downstream derivative of ethylene, from large global producers through short- and medium-term contracts at a price linked to benchmark published prices. In order to obtain the best prices for the MEG that we purchase, we source for, and negotiate the prices of these raw materials through an informal arrangement with the S.P. Lohia Group (which is controlled by our Chairman and his immediate family) and the O.P. Lohia Group (which is controlled by the brother of both our Chairman and our Chief Executive Officer). However, purchase contracts are entered into by the relevant subsidiary company according to such subsidiary's volume and specification requirements. By being a global producer of polyester polymers, we are able to procure MEG on a pan-global basis. Major MEG suppliers are Sabic, MEGlobal, Shell, and PTT Group.

### **Paraxylene**

We are among the world's largest buyers of PX. We purchase our PX under long-term contracts with PTT Group, Exxon Chemicals, etc., typically through long-term contracts. Our Thai PTA plants are able to take delivery of PX either from Thai or international suppliers via their own Map Ta Phut pipeline, which runs directly from the Thai Tank Terminal (our raw material storage services) to their tank yard. In Rotterdam, our PTA facility has its own jetty and Paraxylene arrives by barge. Our Canadian PTA plant is sourcing PX from a nearby supplier.

However, in the United States, IVL now has a PX manufacturing site following the acquisition of the BP site in Decatur.

### **Ethylene**

We are the fourth largest non-integrated buyer of ethylene in the United States and purchase ethylene from various suppliers in the United States including Exxon, ChevronPhillips Chemical, and Ineos, and with access to other ethylene pipelines.



### 3. Indorama Ventures Potential Risk Factors

#### **Risk monitoring and control mechanism at IVL:**

The Enterprise Risk Management framework uses top-down and bottom-up approaches to identify and manage business risks at corporate and subsidiary levels around the world to identify and mitigate business risks at every level. This is led by the Board, the Committee and senior management. This covers the assessment and review of internal and external risks, including global risks and factors that may affect the Company's operations. Business heads in the Sustainability and Risk Management Committee, as well as the Business Risk Management Committees, monitor key risks and ensure adequate preventive measures and mitigation controls. All significant risks identified are analyzed, recorded and reported. The risk management report and mitigation plan are reviewed quarterly by the committees at business segment and plant level. In addition, the Sustainability and Risk Management Committee reviews a sensitivity analysis of the business plan, Greenfield and M&A projects to ensure sustainability, especially the environmental and social impacts to business operations.

#### **3.1 Emerging Business Risks**

##### **3.1.1 Climate Change Risk**

Climate change is inevitable and is going to have potentially serious implications for businesses. Post-COP21, IVL anticipates more environmental, social, political, and economic repercussions. The Company has carried out Climate Change Risk and Opportunity analyses.

The following are some of the Climate Change related Risks:

- **Regulatory Risks:** Increased operational costs due to direct climate change legislation (e.g. cap-and-trade, carbon taxes) and indirect legislation (renewable energy targets, efficiency upgrades, etc.) may impact the Company's operations.

As of 31 December 2017, IVL has 75 operating sites in 25 countries. Depending on the scope of any carbon levy, IVL could be directly and/or indirectly affected either through increased production costs and/or through impacts from the supply chain and downstream customers.

There would be financial implications to the Company as the Company would be required to produce more energy efficient, less carbon intensive products for climate protection in the long-term.

- **Physical Risks:** Extreme weather events, increasing frequency and severity of floods, droughts, cyclones, etc., may impact the Company's operations and supply chain.
- **Changing Consumer Preferences:** Changing consumption patterns towards increasing demand for environmentally-friendly products and technologies will most probably result in a declining demand for established or GHG-intensive products, particularly in Europe. A company that is lagging in this area could face the risk of being outmaneuvered by companies that have positioned themselves early with eco-friendly or green products/services.

- **Reputational Risks:** This is another important risk as laggards on climate action risk may face damage to their reputation and brand image.

**Climate Change is an opportunity:** At the same time, climate change is also perceived as an opportunity as changes in regulations will drive the Company towards using more renewable energy, innovation and production of low-carbon products thereby making the Company as one of the customers' and consumers' preferred company and financial gain through lowering overall cost of production.

The following are possible climate change opportunities:

- Tax incentives for increased use of renewable energy
- Savings from global carbon and emission trading schemes due to reductions in carbon emissions
- An enhanced reputation for being an environmentally-friendly company
- Becoming the most preferred company on the part of consumers

The management has nominated one senior executive at the corporate level to closely monitor both climate change risks and opportunities, who will report to all concerned, including the Sustainability and Risk management Committee (SRMC) which in turn, reports to the Board.

#### **Risk Mitigation Actions:**

IVL has increased its focus on efficiency improvements, adherence to GHG reduction goals and targets as defined and disclosed in its [Sustainability Report 2016](#).

The Company has also participated in CDP's Climate Change and Supply Chain Assessments in 2017 and received a 'B' rating in both assessments. Companies reporting to their investors through CDP benefit from:

- Identifying financial savings
- Preparedness for regulations
- Improved risk awareness and long-term resilience
- Enhanced reputation and shareholder confidence

Other risk mitigation measures taken include:

- Our continued focus on accelerating innovation, recycling and developing a circular economy
- Increased focus on renewable energy
- Carbon footprint reduction in all our operations through life cycle assessment and management, greenhouse gasses accounting, energy and environment management
- Producing low carbon products, improving operational eco-efficiency within IVL operations and in value chain, lowering product toxicity
- Water risk assessment globally in all our operations and initiate water management

- Light weighting of our products
- Strategic moves to be in close proximity to our customers and suppliers to avoid supply chain risks
- Exploring opportunities for more post-consumer recycling of our products, increased usage of bio-based raw materials

***3.1.2 Increasing Business and International Operations naturally exposes us to various challenges such as macro-economic, geopolitical, environmental, and regulatory risks.***

The Company's business operations have been rapidly increasing globally annually. This presents new challenges and risks, such as political instability; the safety and security of employees, tangible and intangible property due to increased terrorist attacks in new countries; anti-national or communal activities, unanticipated economic developments, and rapid changes in legislation, regulations, standards, or pandemic diseases. We may also have to comply with inconsistent or unexpected changes in foreign laws; currency controls, tax regulations, and changes in international tax treaties; the imposition of duties on imports; anti-dumping duties; environmental and regulatory requirements, or import and export controls. Many of these could be beyond our control and could have an adverse impact on the Company.

**Risk Mitigation Actions:**

IVL has considered the likelihood and potential business impact of each risk and has undertaken the following mitigation actions:

- Long-term and short-term sensitivity analyses of the Company's business plans; correlation of various risks to the business.
- Stringent due diligence process to benefit from opportunities and mitigate business risks including, but not limited to, an environmental and geopolitical risk analysis of every business opportunity before a decision is taken by the management and the Board.
- Close and continuous monitoring of political, economic and legislative conditions of each country, including threats from anti-national and terrorist activities, safety and security of employees, and the assets of the Company.

***3.1.3 Cyber Threats***

We may not be sufficiently prepared to manage cyber threats that may disrupt our operations or damage our corporate brand.

Fundamental things that we undertake in order to drive performance and the execution of business strategies may also be the things that create cyber security risks. This includes globalization, mergers and acquisitions, extension of third-party networks and relationships, outsourcing, the adoption of new technologies; the movement to cloud-based computing, or mobility.

Events may be deliberately malicious acts, such as hacking to compromise sensitive information, but may also be unintentional, such as a user error that makes a system temporarily unavailable. Risk

events may come from sources outside the company, such as cybercriminals or supply chain partners, or ones inside the company such as employees or contractors.

We recognize potential impacts like operational delays (production downtimes or plant and utility outages); the inability to manage the supply chain; inability to process customer transactions or otherwise service customers; inventory management disruptions; lost R&D data; and intellectual property devaluation.

Any cybersecurity failures may have a quantitative impact, such as fines, legal fees, lost productivity and mitigation, remediation, and incident response, while others costs might be qualitative and long lasting like diminished brand equity, reduced goodwill, and the loss of intellectual property, which might lead to a weaker market position or, lack of competitive advantage. There are third party impacts in both directions. It is possible that a third party experiences a loss event, and, while unintentional; this could affect deadlines, or worse, reveal proprietary information.

#### **Risk Mitigation Actions:**

- We have the capability to reduce the impact and proliferation of an event; to identify and classify applications, databases, systems, and information. We can minimize insider risks by keeping a closer watch on user activities, analyzing user behavior, and regularly assessing risks to proactively spot weaknesses and improve their security posture.
- By enhancing security and privacy capabilities across the company, we establish stricter control over user IT activities in order to keep sensitive information secure and prevent insider breaches.
- The ongoing assessment of security threats, balanced against the existence and adequacy of security controls is to ensure that security controls and countermeasures in place are commensurate with potential risks.

### **3.2 Other Business Risks**

#### ***3.2.1 We operate in highly competitive industries and the actions of our competitors could impact our profitability and market share.***

The industries in which we operate are characterized by price and other competition. The majority of our products are commodities – necessities – with a growing number of high value-added (HVA) products, and it may be difficult to have product differentiation and pass on increased costs to customers. Other competitive factors include product quality, specifications or product performance, continuity and reliability of supplies to customers and sustainable long-term customer relationships. We often compete with large multinational companies as well as regional and/or specialized producers in the markets for our polyester fiber products. Margin pressure could arise from, for instance, limited demand growth and overcapacity in a market.

We are mitigating such risks by greater integration and diversification of our manufacturing facilities across geographies, product innovation, product diversification, cost reductions and other operational excellence measures.

### ***3.2.2 How continuous demand growth in PTA, Oxide and Glycols, PET resins, and Polyester fiber and yarn and Non-Polyester fiber and yarn industries could result in overcapacity***

Our operating results reflect the historically cyclical pattern of the PTA, MEG, PET resin, Polyester fiber and yarn and Non-Polyester fiber and yarn industries, with periodic overcapacity and resulting pressure on pricing. This cyclical nature arises, in part, from investments made at the top of the cycle (when margins are high and funds are available), thereby shifting the balance of supply to demand as new capacity comes on-stream in large quantities. The industry has experienced periods of overcapacity, when new plants become operational, and there can be no assurance that this will not recur in future. In the absence of sufficient economic growth to generate increased demand, or the closure of facilities to mitigate the effect, new capacity causes a period of regional or global overcapacity often leading to downward pressure on margins.

### ***3.2.3 We may not be able to protect our intellectual property rights and we could be impacted adversely should we infringe on the intellectual property rights of others.***

Fibers and Yarns (both Polyester and non-Polyester) and PET resins operate in industries where our competitors have substantial intellectual property portfolios. The continued success of this business depends on our ability not only to protect our own technologies and trade secrets, but also to develop and sell new products that do not infringe on existing patents or threaten existing customer relationships. Intellectual property litigation can be very costly and could result in substantial expense and diversions of resources, both of which could adversely affect our businesses, financial condition and results. Furthermore, there may be no effective legal recourse against infringement of our intellectual property by third parties, whether due to limitations on enforcement of rights in foreign jurisdictions or as a result of other factors. An unfavorable outcome in any intellectual property litigation could have a materially adverse effect on financial conditions and results of operations in the fibers and yarns business and to a lesser extent in PET resins.

### ***3.2.4 Our business could be affected by an information technology system failure.***

We rely on information technology (IT) systems to handle our businesses. Any systemic failure for whatever reason could disrupt our operations and prevent us from being able to process transactions with our customers, operate our manufacturing facilities, prepare internal MIS reports and properly report those transactions in a timely manner. A significant, protracted IT system failure may result in a materially adverse effect on our financial condition, operational results, or cash flows.

#### **Risk Mitigating Actions:**

IVL adopts IT policies, processes and procedures to manage and protect IT risks. These policies and procedures are implemented as guidelines to IT team and users. All policies and processes are reviewed and revised as appropriate.

IT Infrastructure and IT Applications are provided to ensure adequate resource allocation and optimal system that aligns strategies and goals of the company.

We have IT assessment by external as well as internal auditors. Moreover, we conduct IT internal assessment of all sites accordance with IT general controls (ITGC) and report to senior management and SRMC.

***3.2.5 Crude oil price volatility affects the valuation of inventories and the capital employed distorting the reported performance to an extent.***

Volatility of crude oil prices brings the risk of markdowns or markups of inventories that we carry at any point and can adversely or positively impact our reported performance. Similarly, our reported capital employed might also be affected as working capital requirements change with movements in our product or raw materials prices which normally follow the trend in crude oil prices.

Similarly, natural gas price volatility affects cash conversion costs in countries where we operate. As we consume natural gas at certain locations, the volatility of natural gas prices can benefit or adversely affect our performance.

**Risk Mitigating Actions:**

The losses or gains due to marking-to-market our inventories are largely mitigated by cash inflows respectively, in our net working capital.

**3.3 Production Risk**

***3.3.1 Our operations are dependent on the availability and cost of raw materials***

Our operations are fundamentally dependent on the availability and cost of our primary raw materials. We procure PTA (limited to merchant purchases, primarily in the US) and MEG for our PET and fibers businesses, PX for our PTA business, Ethylene for our Oxide and Glycols business, other types of raw materials for our Non-Polyester fibers business and recyclable bottles and flakes for our recycling business.

PTA and MEG are oil and natural gas derivatives, which are usually manufactured by large petrochemical companies. Thus, the costs of production of PTA, MEG, PET, Polyester and Non-Polyester are affected by the international and domestic prices of crude oil, natural gas and refined petroleum products. Our financial condition and operational results are thereby influenced by market prices of these items, which are then subject to supply and demand forces, as well as other factors beyond our control.

The markets and prices for petroleum products may be influenced by aggregate demand for such products (which can fluctuate with changes in economic conditions and cycles, seasons and weather patterns), the level of domestic and regional production, the prices and availability of imports, the prices and availability of substitute fuels and the extent and nature of government regulations and taxation. Worldwide supply conditions and the price levels of crude oil may also be significantly influenced by international groupings, which control the production of a significant portion of the worldwide supply of crude oil, and by political developments. In addition, factors such as domestic and foreign government regulations, weather conditions, and competition from other energy sources also have an impact on crude oil and petroleum product prices.

Any increase in raw materials costs without a corresponding increase in the selling price would reduce our operating results. Our ability to pass on raw materials price increases is dependent upon market conditions and our relative cost position compared to competitors. There may be periods of time in which we may not be able to fully recover increases in the cost of raw materials due to contractual arrangements or weaknesses in demand for, or oversupply of, our products.

However, the Company regulates somewhat its main raw materials such as PX and Ethylene by entering into long-term purchase agreements with suppliers where possible.

### ***3.3.2 Increases in our costs could adversely affect our operating results***

We are unable to influence commodity prices directly, thus our competitiveness and long-term profitability are, to a significant degree, dependent upon our ability to reduce costs and maintain low-cost and efficient operations. Not being able to maintain our cost structure and efficiently operate our manufacturing facilities may increase our costs and adversely affect our operating results. Certain non-controllable costs may increase by reason of external factors beyond our control, which may also reduce our operating results. Examples of non-controllable costs are energy, insurance, tax and pension costs.

### ***3.3.3 Our ability to pass on increases in our costs to customers is dependent upon market conditions.***

In addition to the risks mentioned in 3.3.1, the cost of our products may increase due to various external factors such as an increase in labor costs due to inflation, changes in minimum wage regulations, unplanned or prolonged shutdowns, raw material shortages, natural disasters, force majeure, strikes, technical failures, and regulatory rulings for environmental non-compliance.

In such events, we may not be able to fulfill our product delivery obligations and could be exposed to claims for damages and suffer reputational risk.

To mitigate this risk, the Company has undertaken various risk mitigation measures such as:

- Extensive insurance coverage including, but not limited to, loss from business interruption caused by accidents, natural disasters, damage to property, plant and machinery breakdowns, etc.
- Safeguarding assets that are more vulnerable or located in high risk areas from natural disasters through enhanced protection. For instance, an extra-high wall has been constructed around our Lopburi facility in Thailand to protect it from floods.
- Geographical diversification of business operations to minimize the risk of disruption from natural disasters or unexpected events.

### ***3.3.4 Our production facilities are subject to operational risks that may adversely affect our operations***

We are dependent on the continued operation of our production facilities. These production facilities are subject to hazards associated with the manufacturing, handling, storage and transportation of chemical materials and products, including pipeline leaks and ruptures, explosions, fires, inclement



weather and natural disasters, mechanical failure, unscheduled downtime, labor difficulties, transportation interruptions, remediation complications, chemical spills, discharges or releases of toxic or hazardous substances or gases, storage tank leaks and other environmental risks. These hazards can cause personal injury and loss of life, severe damage to, or destruction of, property and equipment, environmental damage, fines and liabilities.

In addition, AlphaPet PET, Indorama Ventures Europe BV, Indorama Polyester Industries' Map Ta Phut polyester, TPT Petrochemicals PTA, Indorama PET Nigeria Limited, Guangdong IVL PET Polymer Company Limited, Indorama Ventures Poland Sp. Z.o.o., IVL Adana PET and others are co-located at sites where our neighbors face the same operational risks and, in some cases, they provide critical supplies and/or services, and any disruption in those supplies and/or services could affect our operations.

### 3.4 Management Risk

#### ***3.4.1 The costs and difficulties of integrating future acquired businesses and technologies could impede our future growth and adversely affect our competitiveness***

As part of our strategy, we may seek further growth through acquisitions of manufacturing facilities producing PTA, PET, Fibers, Oxide and Glycols or other products in our value chain in order to maintain a competitive position within the industries in which we operate and to enhance our position in our core areas of operations. This strategy entails risks including:

- Unidentified or unanticipated liabilities or risks in the operations of the companies which we may acquire;
- Potential failure to achieve the economies of scale, synergies or other benefits sought;
- Greater than expected costs and time and effort spent by management in completing and integrating the acquisitions;
- Inability to successfully integrate the services, products and personnel of the acquisitions into our operations or to realize any expected cost savings or other synergies from the acquisitions;
- Inability to retain employees, customer or supplier relationships;
- Lack of return on our investment.

We may not be able to identify attractive acquisition opportunities or make acquisitions on attractive terms, or obtain the financing necessary to complete and support such acquisitions. Regulations on mergers and acquisitions by the European Union, the United States, Thailand or other national regulators may also limit our ability to make future acquisitions or mergers.

#### ***3.4.2 The Indorama name is used by other companies that we do not control***

The 'Indorama' wordmark belongs to Lohia Global Holdings Limited. IVL has a non-exclusive license for its use pursuant to a License Agreement with Lohia Global Holdings Limited and pays a royalty fee to Lohia Global Holdings Limited for the use of the 'Indorama' wordmark.

The business groups of other family members use the ‘Indorama’ wordmark. We do not control the usage of the wordmark by such business groups nor any adverse impact due to their actions on our reputation associated with the Indorama wordmark.

However, IVL differentiates itself and presents the Company as Indorama Ventures Pcl, listed and headquartered in Thailand.

### ***3.4.3 The risk of a shareholder group that holds the majority of outstanding shares***

The Lohia family holds around 65.88% of outstanding shares and can control voting results on significant agenda items.

## **3.5 Financial Risk**

### ***3.5.1 Significant capital investments including the future development of new facilities have been, and may in the future continue to be, necessary to achieve our growth plans, which carry project and other risks***

Our growth plans have required, and may continue to require, significant capital investments to expand, renovate, convert or upgrade existing facilities, develop new facilities or make major acquisitions or investments. Projects that require significant capital expenditures carry risks including:

- Failure to complete a project within the prescribed project timetable and/or within budget; and
- Failure of the project to perform according to prescribed operating specifications following its completion.

In addition, any significant increase in costs unforeseen in the project plan and any inability to sell the products produced at volumes and/or price levels envisaged in the project plan could affect the success of our projects. Due to the significant amount of capital required and the long lead time between the planning and completion of such projects, project delays could have an effect on our business and prospects.

Acquisitions can provide meaningful opportunities to grow our business and improve profitability. Acquired businesses may not achieve the expected levels of revenue, profit or productivity, or otherwise perform as we expect. Acquisitions involve special risks, including, the diversion of management’s time and attention from our existing businesses, the potential assumption of unanticipated liabilities and contingencies and potential difficulties in integrating acquired businesses and achieving anticipated operational improvements. While our strategy is to acquire businesses that will improve our competitiveness and profitability, acquisitions may not be successful or accretive to earnings.

### ***3.5.2 Exchange rate and/or interest rate fluctuations may have a significant adverse impact on our business, financial condition, prospects and operational results***

As a result of the global nature of our business, changes in foreign currency rates could have an adverse impact on our business, financial condition, prospects and operational results. Currency fluctuations affect us because of mismatches between the currencies in which operating costs are

incurred and those in which revenues are received. We sell products that are typically priced by reference to prices in US dollars or euros, while a portion of operating costs are incurred in local currencies.

Our reported earnings may also be affected by fluctuations between the baht, which is our reporting currency, and the non-baht currencies in which some of our overseas subsidiaries report their results.

In order to minimize currency risks, the Company primarily utilizes forward exchange contracts with maturities of less than one year to hedge certain financial assets and liabilities denominated in foreign currencies. Our operating subsidiaries usually borrow in their principle currencies. Generally, long-term loans are borrowed on floating interest rates and are linked to the benchmark interest rates for each currency. The floating interest rates are impacted by macro-economic conditions and the monetary policy of each region. Interest rate risk is the risk that future movements in market interest rates will affect the results of the Company's operations and its cash flows. However, the Company has mitigated the risk by using derivative financial instruments, principally interest rate swaps, contracting a fixed interest rate and the issuance of debentures including Perpetual Debentures in the Thai Bond market, to manage exposure to fluctuations in interest rates on borrowings. Furthermore, there is a natural hedge to a large extent where foreign currency liabilities are supported by same currency assets wherever possible.

Credit risk is the potential financial loss resulting from the failure of a customer or counterparty to settle its financial and contractual obligations to the Company as and when they fall due. Management has a credit policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. The Company does take credit insurance in specific regions to cover credit risk. Our exposure to credit risk is represented by the carrying amount of the receivables in the Statement of Financial Position.

The Company monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's/Company's operations and to mitigate the effects of fluctuations in cash flows.

### ***3.5.3 The Company is a holding company and is dependent on the receipt of dividends to make dividend payments on our shares***

As a holding company, the Company is dependent on the receipt of dividends from its subsidiaries and associated companies, for which payment will depend on their future financial performance, which, in turn, depends on successfully implementing their strategies as well as on financial, competitive, regulatory, technical and other factors, general economic conditions, demand and selling prices for their products and other factors specific to their respective industries or specific projects, many of which are beyond our control.

The subsidiaries have dividend policies to not pay over 80% of net profit after tax and legal reserves. However, the board of those subsidiaries will approve dividends paid from time to time by considering some factors i.e., cash reserved for loan repayment, expansion investment or support the cash flow of the Company in case of impact by market condition change. The ability of our direct and indirect

subsidiaries to pay dividends to their shareholders, including the Company, is subject to applicable laws. Although we intend to pay dividends with respect to shares, our ability to pay dividends in the future will depend on a decision of the Board of Directors and/or the approval of the shareholders at a general meeting, our results of operations, cash flows, financial condition, contractual restrictions and restrictions imposed by applicable laws and other factors the Board of Directors deems relevant.

### **3.5.4 The risk that the Company cannot comply with debt covenants**

As the Company has loans from financial institutions and issued debentures of THB 95.79 billion, IVL needs to comply with debt covenants, which in most cases are a net debt-to-equity ratio of not over 2:1. As of December 31, 2017, the net debt-to-equity ratio was 0.75:1. There are also other covenants and there could be a risk of not complying with the same in case of a significant deterioration in the financial position and/or performance of the Company, however, the Company's financial position as at December 31, 2017 is favourable in regard to all covenants

## **3.6 Other Risks**

### **3.6.1 The below lawsuits against Indorama Petrochem PTA facility may have an adverse effect on our business**

#### **3.6.1.1 Lawsuit regarding the project to increase production efficiency and improve the air pollution treatment system**

On June 19, 2009, a lawsuit was filed in the Thai Central Administrative Court (the CAC) against various Thai governmental entities and Ministers (the Respondents) by various Claimants requesting that the CAC render a judgment ordering the Respondents to revoke an environmental impact assessment report (the EIA Report) and to revoke their approvals of projects or activities, required to prepare the EIA Report, located in Map Ta Phut, Ban Chang and the surrounding area in Rayong Province, Thailand. The lawsuit alleges that 76 projects in such areas may have a serious impact on the community with regard to the quality of the environment, natural resources and health. One of the projects named in the lawsuit is a project to increase the production efficiency and improve the air pollution treatment system of Indorama Petrochem PTA facility, which was approved by the Minister of Industry.

On September 2, 2010, the CAC issued a judgment revoking the permission granted that had not completely complied with the provision of Paragraph 2 of Section 67 of the then Constitution. According to the judgment, the Indorama Petrochem project was not classified as a project for which permission to operate was revoked.

However, on October 1, 2010, the Claimants filed an appeal to the Supreme Administrative Court (the "SAC") requesting the SAC reverse the judgment of the CAC and not rely on the Notification of the Ministry of Natural Resources and Environment, and rule that the Respondents be required to revoke the environmental impact assessment reports and permission granted to the projects or activities which were approved or obtained from August 24, 2007 onwards until the study and assessment of the impact on the quality of the environment and health is completed as required by the then

Constitution. On December 7, 2010, the Respondents submitted the statement of defense against the appeal of the Claimants. As of December 2017, the SAC has not yet issued a judgment on this case.

While Indorama Petrochem was not considered a project for which permission was revoked by the CAC; it therefore can operate its PTA facility. However, the Company cannot ensure that the judgment to be rendered by the SAC will not have an impact on the project of Indorama Petrochem to the extent that the permission will be revoked or the construction of buildings or the business operation of Indorama Petrochem will be suspended. Indorama Petrochem's plant has never been affected by this lawsuit and the operation of the plant is continuing normally.

### **3.6.1.2 Lawsuit regarding the project to improve the reverse osmosis (RO) system**

On March 10, 2010, Claimants filed a lawsuit in the CAC against the Respondents (above). This requested the CAC to order the Respondents to revoke the EIA Report and to revoke their approvals of projects or activities, required to prepare the EIA Report, located in Map Ta Phut, Ban Chang and the surrounding area in Rayong Province, Thailand. The lawsuit alleges that nine projects in those areas may have a serious impact on the community with regard to the quality of the environment, natural resources and health. The Claimants requested that the CAC suspend such projects, activities or operations of applicants or owners because they may have breached relevant procedures specified under the then Constitution and other relevant laws, including the commissioning of a HIA Report, the holding of a public hearing and the hearing of opinions from independent environmental organizations, prior to operating such projects or activities. One of the projects named in the lawsuit is the project to improve the reverse osmosis (RO) system of Indorama Petrochem's PTA facility, which was approved by the Minister of Industry.

On February 28, 2011, the CAC issued an order dismissing the petition for an injunction on the grounds that the facts made by the Claimants were insufficient to issue a court injunction and there was no evidence to prove that the Claimants would be damaged by the operation of the projects. At present, the CAC has not yet issued a final judgment on this case. The operation of the plant is continuing normally.

As of 31 December 2017, there is no material litigation against the Company or its subsidiaries which could have a negative effect on our assets exceeding 5% of shareholders equity.

Apart from this, there is no lawsuit, which could have a significant effect on our business. However, the above litigation could have an adverse effect on a subsidiary of the Company, the impact of which cannot be estimated.

### **3.6.2 Changes in laws and regulations relating to beverage containers and packaging could reduce demand for such end use products – Product Risk**

Legal requirements have been enacted in the United States and elsewhere requiring that deposits or certain eco-taxes or fees be charged for the sale, marketing and use of certain non-refillable beverage containers. Other proposals relating to additional beverage container deposits, recycling, and eco-tax and/or product stewardship have been or may be introduced in various jurisdictions in the United

States and elsewhere. Increased consumer concerns and changing attitudes about solid waste, environmental responsibility and related publicity could result in the adoption of such legislation or regulations. This has encouraged some of our PET customers to reduce the amount of PET resin they use in their bottle production process, known as light weighting, which has achieved this goal and has impacted the demand for PX, PTA and PET resin. However, PET can be recycled and IVL has made investments in PET recycling projects in the Mexico, the US, Europe and Thailand.

### **3.6.3 Environmental regulations may cause us to incur costs and liabilities**

Our operations are subject to environmental laws and regulations by central and local authorities in the countries in which we operate. These requirements are complex, subject to frequent changes and have tended to become more stringent over time. We have incurred, and will continue to incur, costs and capital expenditures in complying with these laws and regulations and in obtaining and maintaining all necessary permits.

We have procedures in place to allow us to comply with environmental laws and regulations; however, there can be no assurance that we will at all times be in compliance with all of our obligations in the future or that we will be able to obtain or renew all licenses, consents or other permits necessary to allow us to continue to operate our businesses. Any failure by us to comply with such laws and regulations could subject us to fines, penalties and other liabilities.

#### 4. Business Assets

##### Property, Plant and Equipment

Indorama Ventures PCL had fixed assets as stated in consolidated financial statement are property, plant and equipment of subsidiaries. As of December 31, 2016 and December 31, 2017, we had net book value of plant and equipment of subsidiaries used in our operation after deducting of accumulated depreciation and other impairment as stated in our consolidated financial statement equal to Baht 136,860 million and Baht 151,202 million or 53.0 % and 53.5% of total assets. Details are as follows:

Unit: Baht million

Type	Net Book Value after Accumulated Depreciation	
	December 31, 2016	December 31, 2017
Land and land improvements	7,691	7,839
Buildings and building improvements	13,425	14,548
Machinery and equipment	98,876	106,111
Office furniture, fixtures, and equipment	531	567
Transportation equipment	147	155
Spare parts	686	554
Construction in progress	15,504	21,427
<b>Total Net Book Value</b>	<b>136,860</b>	<b>151,202</b>

**Remark:** As of December 31, 2017, mortgaged with financial institutions for Baht 28,237 millions

##### On-going Investment Projects

Major announcement & ongoing projects as on 31<sup>st</sup> December 2017 are as follows:

- Refurbishing of US Gas Cracker at Lake Charles, Louisiana
- Acquisition of PTA assets and Utility asset in Portugal
- Expansion of High-value added Performance Fiber tire-cord facility in China
- Expansion of fiber capacity in Indonesia
- Other minor expansions and debottlenecks at various locations

##### Intangible Assets

Indorama Ventures PCL had net book value of intangible assets as of December 31, 2016 and December 31, 2017 equal to Baht 17,602 million and Baht 18,027 million or 6.8 % and 6.4 % of total assets, respectively. Details are as follows:



Unit: Baht million

Type	Net Book Value	
	December 31, 2016	December 31, 2017
Right Acquired	100	91
Supplier Contract and relationships	6,214	5,626
Software Licenses	91	132
Technology License and Knowhow	6,877	7,075
Customer Contracts and Relationships	2,524	3,040
Trade Name and Trademarks	1,218	1,185
Chemical Exchange Contract	269	228
Capitalised development expenditure	309	649
<b>Total Book Value of Intangible Assets</b>	<b>17,602</b>	<b>18,027</b>

### Investments

Indorama Ventures PCL operates as a holding company; therefore our main assets are the investments. As of December 31, 2016 and December 31, 2017, we had net book value of our investments in subsidiaries as stated in our separate financial statement under the cost method equal to Baht 57,798 million and Baht 65,567 million or 54.3% and 50.7% of total assets in our separate financial statement, respectively. Details are as follows:

Unit: Baht million

Subsidiaries <sup>1</sup>	Ownership Interest <sup>2</sup> (Direct) (%)	Net Book Value of Investment as of	
		December 31, 2016	December 31, 2017
Indorama Petrochem Ltd.	99.99	7,944	7,944
Indorama Holdings Ltd.	99.81	2,001	2,001
Indorama Polymers PCL	72.60	7,220	7,220
Indorama Polyesters Industries PCL	64.94	1,474	1,474
TPT Petrochemicals PCL	99.97	5,182	5,182
IVL Belgium N.V.	99.99	122	122
Indo Polymers Mauritius Limited	100.00	30,535	2
Indorama Ventures Global Services Limited	99.99	3,320	41,621
<b>Total Book Value</b>		<b>57,798</b>	<b>65,567</b>

**Remarks:** <sup>1</sup> Only companies which are held directly by Indorama Ventures PCL





<sup>2</sup> As at December 31, 2017

### Trademarks in connection with our business

The Company, subsidiaries and affiliates use a number of trademarks, trade names and service marks in connection with the business. We market our products under various brand names, which are registered in various countries.

The Indorama wordmark does not belong to us. We are a part of an informal Indorama Group, which consists of three independently managed associate groups, namely ourselves, the Sri Praksh Lohia Group in Indonesia and the Om Prakash Lohia Group in India. The Indorama Group was founded by late Mr. Mohan Lal Lohia in 1976 in Indonesia, and each of the groups is currently managed by one of Mr. Mohan Lal Lohia's sons. We have a non-exclusive license for its use pursuant to a License Agreement with Lohia Global Holdings Limited, a company owned by Ms. Shruti Lohia, a daughter of Mr. Sri Praksh Lohia. The Sri Praksh Lohia Group and the Om Prakash Lohia Group also use the Indorama wordmark.

As of 31<sup>st</sup> December 2017, the Company, subsidiaries and affiliates have approximately 86 trademarks registered with the national/regional trademark office in the countries where IVL invested and/or have businesses. Out of the 86 trademarks, 19 marks, i.e. "INDORAMA VENTURES", "RAMAPET", etc., are managed by the head office of the Company in Thailand. Some of the key trademarks of the Company are as below:

	RAMAPET	TREVIRA
DIOLEN		
FiberVisions		Glanzstoff
BIO RAMAPET	PLYTEC	INOV

### Patent

As of 31<sup>st</sup> December 2017, the Company, subsidiaries and affiliates have approximately 564 patents registered with the national/regional patent office worldwide. Below is the information of Patents as of 31<sup>st</sup> December 2017.

Businesses	Number of Patents
Feedstock and PET Business	136
Fibers Business	428
<b>Total</b>	<b>564</b>

### Long Term Lease Agreements

As at 31 December 2017, the Company has entered into certain lease agreements for a period over 3 years for business purposes. The following summarizes the long-term lease agreements:

#### PET Business

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>Petform (Thailand) Ltd.</b>	3,850 square meters	Packaging Facility	Industrial Estate Authority of Thailand	8 October 2042
<b>Indorama Ventures Packaging (Myanmar) Limited</b>	15,124 square meters	Packaging Facility	Myanmar Japan Thilawa development Ltd.	4 June 2064
<b>AlphaPet, Inc.</b>	161,874.26 square meters	PET Facility	BP Amoco Chemical Company	31 August 2027
<b>Indorama Ventures Polymers Mexico S.de R.L de C.V</b>	361,683.09 square meters	PET Facility	Indorama Ventures Polycom S.de R.L de C.V	Upon the termination of agreement
<b>Indorama Ventures EcoMEX, S. de R.L. De C.V.</b>	46,538 square meters	PET Facility	IVL Holding, S.de R.L. de C.V.	3 February 2022
<b>UAB Orion Global Pet</b>	47,651 square meters	PET Facility	Klaipeda Free Economic Zone Management Company UAB	8 June 2098
<b>Indorama Ventures Europe B.V.</b>	478,640 square meters	PET & PTA Facility	Port of Rotterdam	28 February 2093
<b>Indorama Ventures Poland Sp.z.o.o.</b>	79,093 square meters	PET Facility	Ministry of Treasury, the Government of Poland	4 December 2089
<b>Guangdong IVL PET Polymer Co., Ltd.</b>	136,782.60 square meters 12,529.10 square meters 4,828.38 square meters	PET Facility	Government of the People's Republic of China	6 February 2057 28 November 2052 18 September 2061
<b>Indorama PET</b>	15,000 square meters	PET Facility	Eleme	31 December 2025

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>(Nigeria) Ltd.</b>			<i>Petrochemicals Co., Ltd.</i>	
<b>Indorama Ventures Packaging (Nigeria) Ltd.</b>	10,000 square meters	Packaging Facility	<i>Eleme Petrochemicals Co., Ltd.</i>	31 December 2025
<b>Indorama Ventures Packaging (Ghana) Ltd.</b>	2,388 square meters	Packaging Facility	<i>Davenport Developers Ltd.</i>	31 March 2024
	1,190 square meters			31 July 2026
<b>Indorama Ventures Packaging (Philippines) Corporation</b>	4,335 square meters	Packaging Facility	<i>Southern Luzon Int'l Business Park Corp.</i>	31 August 2018
<b>PT.Indorama Polypet Indonesia</b>	47,580 square meters	PET Facility	<i>Government of the Republic of Indonesia</i>	13 June 2034
	5,690 square meters			21 September 2034
	10,100 square meters			13 June 2034
	165 square meters			31 January 2034
	10,440 square meters			24 September 2026
	1,720 square meters			24 September 2026
	1,630 square meters			24 September 2026
	910 square meters			24 September 2026
<b>Indorama Ventures Adana PET Sanayi Anonim Sirketi</b>	33,255 square meters	PET Facility	<i>Advansa Sasa Polyester Sanayi A.S.</i>	30 September 2055
<b>Dhunseri Petrochem Industries Ltd.</b>	140,911.54 square meters	PET Facility	<i>Haldia Development Authority</i>	14 May 2088
	170,939.21 square meters			19 August 2101
	1,092.65 square meters			12 February 2099
	10,845.57 square meters		<i>Haldia Riverside Estates Limited</i>	10 February 2098
	10,845.57 square meters			28 August 2045

### Polyester Fiber and Yarn Business

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>Indorama Polyester Industries Pcl.</b>	283,794 square meters	Polyester & Yarn Facility	<i>Industrial Estate Authority of Thailand</i>	12 May 2018
<b>ES FiberVision (Thailand) Co.,Ltd.</b>	32,356 square meters	Polyester & Yarn Facility	<i>Industrial Estate Authority of Thailand</i>	14 December 2044
<b>PT.Indorama</b>	83,164 square meters	Polyester &	<i>Government of the</i>	18 December 2043

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>Polychem Indonesia</b>	20,160 square meters	Yarn Facility	<i>Republic of Indonesia</i>	18 December 2043
	3,394 square meters			2 October 2043
	4,480 square meters			2 October 2043
	98,380 square meters			2 October 2043
	14,816 square meters			2 October 2043
	39,000 square meters		<i>PT Indorama Synthetics TBK (PT IRS)</i>	December 2026
<b>PT.Indorama Ventures Indonesia</b>	8,206 square meters	Polyester & Yarn Facility	<i>Government of the Republic of Indonesia</i>	7 April 2028
	240,051 square meters			4 October 2033
	26,575 square meters			7 April 2028
	1,913 square meters			13 November 2042
<b>PT.Indorama Polyester Industries Indonesia</b>	40,840 square meters	Polyester & Yarn Facility	<i>Government of the Republic of Indonesia</i>	25 May 2025
<b>FiberVisions Manufacturing Company</b>	598.11 square meters	Polyester & Yarn Facility	<i>GCC Partners, LLC</i>	30 November 2020
<b>FiberVisions (China) Textile Products Ltd.</b>	44,946.86 square meters	Polyester & Yarn Facility	<i>Government of the People's Republic of China</i>	17 January 2045
<b>FiberVisions Products, Inc.</b>	69,589.74 square meters	Polyester & Yarn Facility	<i>Athen-Clarke County Industrial Development Authority</i>	1 December 2020
<b>ES FiberVisions (Suzhou) Co.,Ltd.</b>	16,000 square meters	Polyester & Yarn Facility	<i>FiberVisions (China) Textile Products Ltd.</i>	30 April 2033
<b>Wellman International Ltd.</b>	46,545 square meters	Polyester & Yarn Facility	<i>MJR Recycling B. V.</i>	31 December 2020
	2,197 square meters		<i>Swanenberg Beheer B. V.</i>	30 October 2020
<b>Wellman France Recyclage S.A.S</b>	32,670 square meters	Bottle Recycling Plant	<i>Societe Albertus</i>	31 December 2022
<b>PHP Fibers GmbH</b>	192 square meters	Polyester & Yarn Facility	<i>Mainsite GmbH &amp; Co.KG</i>	Upon the termination of agreement
	118,570 square meters			
	646 square meters			
<b>Safe Tweave Inc.</b>	13,935.46 square meters	Polyester &	<i>Glanzstoffhaus PHP Fibers Inc.</i>	31 December 2017 Upon the

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
		Yarn Facility		termination of agreement
<b>Performance Fibers (Kaiping) Co., Ltd.</b>	98,157 square meters	Polyester & Yarn Facility	Government of the People's Republic of China	30 October 2046
<b>Performance Fibers (Kaiping) No.2 Co., Ltd.</b>	44,422 square meters	Polyester & Yarn Facility	Government of the People's Republic of China	11 November 2060
<b>Performance Fibers (Kaiping) No.3 Co., Ltd.</b>	35,482.40 square meters	Polyester & Yarn Facility	Government of the People's Republic of China	11 June 2066
<b>Shenma-PHP (Pingdingshan) Air Bag Yarn Manufacturing Co., Ltd.</b>	53,328 square meters	Polyester & Yarn Facility	Government of the People's Republic of China	26 January 2061
<b>Glanzstoff Industries (Qingdao) Co., Ltd</b>	7,668 square meters	Polyester & Yarn Facility	Qingdao Ruishengyuan Machinery Co., Ltd	29 November 2026
<b>Società Industriale Cremonese SICREM s.p.a.</b>	72,000 square meters	Polyester & Yarn Facility	Hypo Vorarlberg Leasing SPA	6 December 2029
<b>Glanzstoff-Bohemia s.r.o.</b>	26,410 square meters	Polyester & Yarn Facility	ZEVYP - pozemky s.r.o.	Upon the termination of agreement
	1,123 square meters		Konečný Zdeněk,	
<b>Textilcord Steinfurt S.A.</b>	1,428.30 square meters	Polyester & Yarn Facility	City of Steinfurt	30 September 2096
<b>Glanzstoff Longlaville S.A.S</b>	301,814.55 square meters	Polyester & Yarn Facility	Glanzstoff Services S.A.S	Upon the termination of agreement

#### Feed Stock Business (PTA & EG/EO)

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>TPT Petrochemicals PCL</b>	240,000 square meters	PTA Facility	Industrial Estate Authority of Thailand	6 February 2022
<b>Indorama Petrochem Limited</b>	59,566 square meters	Piping System	Eastern Fluid Transport Co., Ltd.	10 November 2039
		PX and acetic	Thai Tank Terminal	8 January 2021
				7 December 2018

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
		acid Storage	Limited	
<b>PT.Indorama</b>	76,090 square meters	PTA Facility	Government of	13 June 2034
<b>Petrochemicals</b>	19,850 square meters		Indonesia	18 August 2034
	15,710 square meters			21 September 2034
	47,090 square meters			13 June 2034
	1,720 square meters			24 September 2026
	100,000 square meters		PT.Pelindo	31 October 2037
<b>Indorama Ventures (Oxide &amp; Glycols) LLC U.S.(D.E.)</b>	3,900,562.56 square meters	EG/EO Facility	Celanese Ltd.	5 December 2098
<b>Indorama Ventures Xylenes &amp; PTA LLC</b>	8,305.53 square meters	Warehouse	Trinity Warehousing and Distribution	Upon the termination of agreement
	1,046.83 square meters	Warehouse	Johnson Bates & Legg, Inc.	
<b>Indorama Ventures Portugal PTA-Unipessoal LDA.</b>	146,849 square meters	PTA Facility	IAPMEI	6 August 2027

#### Others (Holding Business, Trading & Service Business)

Lessee	Details of Lease Assets	Purpose of Lease	Lessor	Expiration
<b>Beverage Plastic (Holding) Limited</b>	18,967 square meters	Warehouse & Office	Silverwood Business Park Limited	20 March 2031
<b>TTI GmbH</b>	1,568 square meters	Technical Center	Immomeile	Upon the termination of agreement
	1,193 square meters	Laboratory	Immomeile	
	860 square meters	Storage	Immomeile	
	110 square meters	Storage	Immomeile	
	600 square meters	Storage	Buenger	
<b>Indorama Ventures Portugal Utility, Unipessoal Lda.</b>	21,500 square meters	thermoelectric plant	IAPMEI	6 August 2027

#### Thai Board of Investment Tax Incentives

Under the Industrial Investment Promotion Act B.E. 2520, the Company and certain subsidiaries incorporated in Thailand have been Granted privileges by the Board of Investment at various times relating to manufacturing of worsted wool yarn, wool top, polyester fiber, PTA, PET resin, PET



preforms and closures, amorphous resin and the operation of the TPT Petrochemicals cogeneration plant (the “promoted operations”). The privileges Granted, subject to compliance with the terms and conditions prescribed in the relevant promotional certificates, include:

- (a) exemption from payment of import duty on machinery approved by the Board of Investment;
- (b) exemption from payment of income tax on net profit from promoted operations for a period of eight years from the date on which income is deemed to be first derived from such operations;
- (c) a 50% reduction in the normal income tax rate on the net profit derived from promoted operations for a period of five years, commencing from the expiry date in (b) above;
- (d) a five-year carry forward period for losses for tax purposes from promoted operations during the period in (b) above;
- (e) income exclusions and additional deductions in computing the taxable income for promoted operations during the period in (b) above;
- (f) exemption from income tax on dividend paid to the shareholders from the profit of the promoted operations during the corporate income tax exemption period; and
- (g) double deduction of the cost of transportation, electricity and water supply for corporate income tax purposes for a period of ten years, from the date on which income is deemed to be first derived from the promoted operations.

Moreover, other non Thai subsidiaries of the Company operating in various jurisdictions may have their own incentives from the local Government.

The table below summarizes the expiry dates of our BOI tax incentives got by the subsidiary as of 31<sup>st</sup> December 2017.

Subsidiary	Year of Expiry for Full Exemption from Tax	Year of Expiry for 50% Reduction in Tax
Asia Pet (Thailand) Ltd. (BOI Certificate No. 5089(2)/2556)	2021	-
Indorama Polymers PCL (BOI Certificate No. 5090(2)/2556)	2021	-
Indorama Petrochem Ltd. (BOI Certificate No. 1123(2)/2547)	2014	2019
Indorama Petrochem Ltd. (BOI Certificate No. 60-0436-0-00-0-2)	-	-
TPT Petrochemical PCL (BOI Certificate No. 1121(2)/2549)	2014	2019
TPT Petrochemical PCL (BOI Certificate No. 1965/Or.Or./2552)	-	-
Indorama Polyester Industries PCL (BOI Certificate No. 1271(2)/2552)	2017	2022

Subsidiary	Year of Expiry for Full Exemption from Tax	Year of Expiry for 50% Reduction in Tax
Indorama Polyester Industries PCL (BOI Certificate No. 1969(2)/2554)	2021	2026
Petform Thailand Ltd (BOI Certificate No. 1764 (2)/2546)	2012	-
Petform Thailand Ltd (BOI Certificate No. 1766 (2)/2548)	2014	-
Petform Thailand Ltd (BOI Certificate No. 1971 (2)/2548)	2014	-
Petform Thailand Ltd (BOI Certificate No. 2170 (2)/2548)	2014	-
Petform Thailand Ltd (BOI Certificate No. 1853 (2)/2550)	2016	-
Petform Thailand Ltd (BOI Certificate No. 1334 (2)/2550)	2015	-
Petform Thailand Ltd (BOI Certificate No. 1095 (2)/2554)	2020	-
Petform Thailand Ltd (BOI Certificate No. 1057 (2)/2553)	2018	-
Petform Thailand Ltd (BOI Certificate No. 1812 (2)/2552)	2017	-
Petform Thailand Ltd (BOI Certificate No. 1414 (2)/2553)	2018	-
Petform Thailand Ltd (BOI Certificate No. 1811 (2)/2552)	2018	-
Petform Thailand Ltd (BOI Certificate No. 2556 (2)/2554)	2020	-
Petform Thailand Ltd (BOI Certificate No. 1213 (2)/2555)	2020	2025
Petform Thailand Ltd (BOI Certificate No. 2142 (2)/2555)	2020	2025
Petform Thailand Ltd (BOI Certificate No. 5137(2)/2556)	2021	-
Petform Thailand Ltd (BOI Certificate No. 5138(2)/2556)	2021	-
Petform Thailand Ltd (BOI Certificate No. 5139(2)/2556)	2021	-
Petform Thailand Ltd (BOI Certificate No. 2094(2)/2556)	2021	2026

Subsidiary	Year of Expiry for Full Exemption from Tax	Year of Expiry for 50% Reduction in Tax
Petform Thailand Ltd (BOI Certificate No. 1199(2)/2557)	2022	-
Petform Thailand Ltd (BOI Certificate No. 2453(2)/2557)	2023	-
Petform Thailand Ltd (BOI Certificate No. 2435(2)/2557)	2023	-
Petform Thailand Ltd (BOI Certificate No. 2587(2)/2557)	2025	-
Indorama Ventures Global Services Ltd (BOI Certificate No. 1236/2557)	-	-
Indorama Ventures Global Services Ltd (BOI Certificate No. 59-0783-1-00-0-0)	-	-
ES FiberVisions (Thailand) Ltd (BOI Certificate No. 2412(2)/2557)	2025	2030
Indorama Holdings Ltd (BOI Certificate No. 2111 (1)/2553)	2019	2024
Indorama Holdings Ltd (BOI Certificate No. 1289 (2)/2555)	2020	-

***Policy on Investment in Subsidiaries and Associated Companies and Policy on Management of Subsidiaries and Associated Companies***

The Company will have investments in subsidiaries and associated companies aggregating not less than 75 percent of the Company's total investment in securities. In case, if the Company wishes to make any material change to the policy or scope of investments, such as lowering the proportion of investment in subsidiaries and associated companies in relation to the Company's total investments in securities to less than 75 percent, the Company will obtain prior approval from the shareholders meeting.

The Company has a policy on investment in subsidiaries and associated companies of the Company that the Company will invest in business with a high potential of growth and long-term profitability. Moreover, the Company will send at least one of its representative to be a director of such subsidiaries and associated companies; such representative might be the Chairman of the Board of Directors, Chief Executive Officer, Managing Director, directors, the high level managers of the Company or any third person who has the qualifications and experience suitable for such business with no conflict of interest directly with the business of those subsidiaries. Such representative shall manage and administer the business of such subsidiaries according to the regulations and procedures provided in the Articles of Association of the Company and of such subsidiaries and relevant laws and recommendation of the IVL parent company.

## **5. Legal Disputes**

As of 31<sup>st</sup> December 2017, there is no material litigation against the Company or its subsidiaries which could have a negative effect on our assets exceeding 5% of shareholder's equity. In addition, there is no lawsuit, which could have a significant effect on our business.

## 6. General Information and Other Information

### General Information

Name	: Indorama Ventures Public Company Limited
Symbol	: IVL
Head Office	: 75/102 Ocean Tower 2, 37 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana) Asoke Road, Klongtoey Nua, Wattana, Bangkok 10110, Thailand Tel: 0-2-661-6661 Fax: 0-2-661-6664-5 <a href="http://www.indoramaventures.com">www.indoramaventures.com</a>
Type of Business	: Holding Company
Company Registration No.	: 0107552000201
Registered Capital	: Baht 5,666,010,449 divided into 5,666,010,449 common shares of par value at Baht 1
Paid-Up Capital	: Baht 5,245,411,431 divided into 5,245,411,431 common shares of par value at Baht 1

### References

Share Registrar	: Thailand Securities Depository Company Limited 93 Ratchadapisek Road, Dindaeng, Dindaeng, Bangkok 10400, Thailand Tel: 0-2-009-9999 Fax: 0-2-009-9991
Debenture Registrar	: Bangkok Bank Public Company Limited 333 Silom Road, Silom, Bangrak, Bangkok 10500, Thailand Tel: 0-2-230-1136 Fax: 0-2-626-4545-6
Debenture Registrar (For IVL Debenture No. 1/2015 Tranche 1 & 2)	: Siam Commercial Bank Public Company Limited 1060 SCB Chidlom Tower 2, 3 <sup>rd</sup> Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel: 0-2-256-2339 Fax: 0-2-256-2406
Debenture Registrar (For IVL Debenture No. 2/2015)	: Krungthai Bank Public Company Limited 35 Sukhumvit Road, Klongtoey Nua, Wattana, Bangkok 10110, Thailand Tel: 0-2-298-0830 Fax: 0-2-298-0835

Debenture Holders' Representative	: Bank of Ayudhya Public Company Limited 1222 Rama III Road, Bang Phongphang, Yannawa, Bangkok 10120, Thailand Tel: 0-2-296-3582 Fax: 0-2-296-2202
Auditor	: KPMG Phoomchai Audit Limited 195 Empire Tower, 50 <sup>th</sup> – 51 <sup>st</sup> Floor, South Sathorn Road, Yannawa, Sathorn, Bangkok 10120, Thailand Tel: 0-2-677-2000 Fax: 0-2-677-2222
Legal Advisor	: The Capital Law Office Limited 44 Smooth Life Tower, 18 <sup>th</sup> Floor, North Sathorn Road, Silom, Bangrak, Bangkok, 10500, Thailand Tel: 0-2-633-9088 Fax: 0-2-633-9089

**Investments of the Company**

As of 31 December 2017

<b>EG&amp;EO Business</b>					
<b>No.</b>	<b>Company Name/Address</b>	<b>Country</b>	<b>Type of Shares</b>	<b>Shares Issued</b>	<b>Shareholding</b>
1	<b>Indorama Ventures (Oxide &amp; Glycols) LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 847 943 3100 Fax: +1 847 943 3196	USA	(Membership Interest)	-	99.99%
<b>Ethylene Cracker Business</b>					
<b>No.</b>	<b>Company Name/Address</b>	<b>Country</b>	<b>Type of Shares</b>	<b>Shares Issued</b>	<b>Shareholding</b>
1	<b>Indorama Ventures Olefins LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 337 502 4678 Fax: N/A	USA	(Membership Interest)	-	75.99%
<b>PTA Business</b>					
<b>No.</b>	<b>Company Name/Address</b>	<b>Country</b>	<b>Type of Shares</b>	<b>Shares Issued</b>	<b>Shareholding</b>
1	<b>TPT Petrochemicals Public Company Limited</b> 75/116-117, Ocean Tower 2, 41 <sup>st</sup> Floor, Soi Sukhumvit 19 (Wattana), Sukhumvit Road, Klongtoey Nuea, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664 – 5	Thailand	Common Share	492,500,000	99.97%
2	<b>PT. Indorama Petrochemicals</b> Graha Irama, 16th Floor, Jalan H R Rasuna Said, Blok X-1, Kav. 1-2, Kuningan Timur, Setiabudi, Jakarta Selatan 12950, Indonesia Tel: +62 21 526 1555 Fax: +62 21 526 4436	Indonesia	Common Share Class B1 Class B2 Class C Class D Class E	1,833,743 166,257 50,000 200,000 250,000 12,770	47.25%
3	<b>Indorama Ventures PTA Montreal LP.</b> 10200 rue Sherbrooke E., Montreal-Est, Quebec H1B 1B4, Canada Tel: +1 514 645 7887(229) Fax: +1 514 645 9115	Canada	(Partnership Interest)	290,000,000	99.99%
4	<b>Indorama Ventures Portugal PTA - Unipessoal, LDA.</b> ZILS Zona 2, Lote 2E1, Monte Feio, 7520-064 Sines, Portugal Tel: +351 269 189 000 Fax: +351 269 189 099	Portugal	Quota	1	99.99%
<b>PTA &amp; PET Business</b>					
<b>No.</b>	<b>Company Name/Address</b>	<b>Country</b>	<b>Type of Shares</b>	<b>Shares Issued</b>	<b>Shareholding</b>
1	<b>Indorama Ventures Europe B.V.</b> Markweg 201, 3198NB Europoort Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	Common Share	100	99.99%



**PTA & PET Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
2	<b>Indorama Petrochem Limited</b> 75/93, Ocean Tower 2, 35 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Sukhumvit Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664 – 5	Thailand	Common Share	1,014,616,651	99.99%

**PTA & PET & Purified Isophthalic Acid Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Ventures Quimica S.L.U.</b> Poligono Industrial Guadarranque, 0 S/N, 11360 San Roque, Cadiz, Spain Tel: +34 956 671 000 Fax: +34 956 671 127	Spain	Common Share	6,000	99.99%

**PTA & Paraxylene & NDC Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Ventures Xylenes &amp; PTA LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 302 636-5401 Fax: +1 302 636-5454	USA	(Membership Interest)	-	99.99%

**PET Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Polymers Public Company Limited</b> 75/102, 103 Ocean Tower 2, 37 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664 – 5	Thailand	Common Share	1,382,197,870	99.91%
2	<b>Asia Pet (Thailand) Limited</b> 75/102 Ocean Tower 2, 37 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664 - 5	Thailand	Common Share	45,000,000	99.90%
3	<b>Guangdong IVL PET Polymer Company Limited</b> No.1 Meihua Road, Shuikou Town, Kaiping City, Guangdong, People's Republic Of China Tel: +86 750 220 9680 Fax: N/A	China	(Capital Contribution)	-	99.91%
4	<b>UAB Orion Global pet</b> Metalo G.16, Klaipeda, Republic of Lithuania, LT-94102 Tel: +370 846 300684 Fax: +370 846 300749	Lithuania	Common Share	776,880	99.91%

PET Business					
No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
5	<b>Indorama PET (Nigeria) Limited</b> East West Expressway, Eleme, Port Harcourt, Rivers State, Nigeria Tel: N/A Fax: N/A	Nigeria	Common Share	450,000,000	89.92%
6	<b>PT. Indorama Polypet Indonesia</b> JL. Raya Anyar Km.121, Kel. Kepuh, Kec. Ciwandan, Cilegon 42445 (Banten), Indonesia Tel: +62 254 602300 Fax: +62 254 602940	Indonesia	Common Share	3,500	99.99%
7	<b>Indorama Ventures Corlu PET Sanayi Anonim Sirketi</b> Karamehmet Mahallesi, Avrupa Serbest Bölgesi, 3. Sokak No: 2 Ergene/Tekirdag - 59860, Turkey Tel: +90 282 691 1100/207 Fax: +90 282 691 1008	Turkey	Common Share	16,217,649	99.99%
8	<b>Indorama Ventures Poland Sp. z o.o.</b> ul. Krzywa Gora 19, 87-805 Wloclawek, Poland Tel: +4854 416 6442 Fax: +4854 416 6449	Poland	Common Share	993,988	99.99%
9	<b>Indorama Ventures Ecomex, S. de R.L. de C.V.</b> Carretera Libre a Colotlan 6800. Colonia Extramuros. Zapopan, Jalisco, Mexico Tel: +5233 1561 3732 Fax: N/A	Mexico	Equity Quota Class I	2	51.00%
10	<b>Indorama Ventures Polymers Mexico, S. de R.L. de C.V.</b> Avenida Prolongación Paseo de la Reforma 1015, Torre A piso 2, Colonia Santa Fe Cuajimalpa, CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 9177 5700 Fax: +52 55 5292 4919	Mexico	Equity Quota Class I	2	99.99%
11	<b>Alphapet, Inc.</b> 1301 Finley Island Road, Decatur, Alabama, AL35601, USA Tel: +1 256 308 1180 Fax: +1 256 341 5926	USA	Common Share	4,400	99.99%
12	<b>Auriga Polymers Inc.</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808 USA Tel: +1-877-738-7527 Fax: +1-980-233-6602	USA	Common Share	5,000	99.99%
13	<b>Starpet Inc.</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808 USA Tel: +1-336-672-0101 Fax: +1-336-672-0904	USA	Common Share	5,000	99.99%

**PET Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
14	<b>IVL Dhunseri Petrochem Industries Private Limited</b> Dhunseri House, 4A, Woodburn Park, Kolkata- 700020, P.S. Bhawanipur, India Tel: +91 33 2283 6128 – 33 Fax: +91 33 2283 6056	India	Common Share	40,000,000	50.00%

**Packaging Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Petform (Thailand) Limited</b> 85 Moo 11, Bangnga-Thaklong Road, Khao Samorkorn Sub-district, Thawung District, Lopburi Province, Thailand Tel: +66 36 489 116 Fax: +66 36 489 115,117	Thailand	Common Share	7,500,000	59.94 %
2	<b>Beverage Plastics Limited</b> Silverwood Business Park, 70 Silverwood Road, Lurgan, Craigavon, County Armagh, BT66 6LN, Northern Ireland Tel: +44 283 831 1800 Fax: +44 283 831 1802	Northern Ireland	Common Share	600,000	51.00%
3	<b>Indorama Ventures Packaging (Nigeria) Limited</b> Eleme Petrochemicals Complex, East-West Expressway, Eleme, Rivers State, Nigeria Tel : +234 (1) 2793841 Fax: +234 (1) 2793842	Nigeria	Common Share	150,000,000	99.99%
4	<b>Indorama Ventures Packaging (Ghana) Limited</b> Plot 234 Meridian Rd. COMM.2 Accra, Greater Accra, BOX CO PMB 350 TEMA GA/R, Ghana Tel: +233 266082249 Fax: N/A	Republic of Ghana	Common Share	1,949,215	99.99%
5	<b>Indorama Ventures Packaging (Philippines) Corporation</b> Building 1, Southern Luzon Complex, Baranggay Batino, Calamba City, Laguna, Philippines Tel: +63 495 303 592 / +63 495 340 036 Fax: N/A	Philippines	Common Share	1,075,005	99.99%
6	<b>Indorama Ventures Packaging (Myanmar) Limited</b> Lot No. A11-1, Thilawa Special Economic Zone A, Yangon Region, Myanmar Tel: +95-12309022 Fax: N/A	Myanmar	Common Share	2,943,108	99.91%
7.	<b>Indorama Ventures Packaging (India) Private Limited</b> C 524, Defence Colony, New Delhi - 110024, Delhi, India Tel: +91 11 4163 0033 Fax: +91 11 2433 9075	India	Common Share	140,000	99.98%

**Fibers Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Polyester Industries Public Company Limited</b> 75/92, Ocean Tower 2, 35 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel : +66 2 661 6661 Fax : +66 2 661 6664 - 5	Thailand	Common Share	2,202,850,000	99.49%
2	<b>ES Fibervisions (Thailand) Company Limited</b> 75/64, 65 Ocean Tower 2, 28 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel : +66 2 661 6661 Fax : +66 2 661 6664 - 5	Thailand	Common Share	41,000,000	50.00%
3	<b>PT. Indorama Polychem Indonesia</b> JL. Desa Kembang Kuning, Kecamatan Jatiluhur, Purwakarta (Jawa Barat), Indonesia Tel : +62 264 207727 Fax : +62 264 211260	Indonesia	Common Share	70,000	99.99%
4	<b>PT. Indorama Ventures Indonesia</b> Desa Cihuni, RT/RW 002/004, Cihuni, Pagedangan, Tangerang, Banten, 15820 Indonesia Tel : +62 215 371111 Fax : +62 215 378811	Indonesia	Series A Series B	80,000 2,812,500	99.99%
5	<b>PT. Indorama Polyester Industries Indonesia</b> JL. Surya Lestari Kav. 1-16A, Kawasan Industry Surya Cipta, Desa Kutamekar, Kec Ciampel, Karawang, 41361, Jawa Barat, Indonesia Tel : +02 674 40501 Fax: +02 674 40764	Indonesia	Common Share	20,000	99.98%
6	<b>Trevira GmbH</b> Max-Fischer-Strasse 11, 86399 Bobingen, Germany Tel : +49 8234 9688 2100 Fax: +49 8234 9688 5355	Germany	Common Share	25,300	99.99%
7	<b>PHP Fibers GmbH</b> Industrie Center Obernburg, 63784 Obernburg, Germany Tel: +49 6022 81 2552 Fax: +49 6022 81 31 2552	Germany	Common Share	25,001	80.00%
8	<b>Shenma-PHP (Pingdingshan) Air Bag Yarn Manufacturing Co., Ltd.</b> Pingdingshan City, Henan Province, People's Republic Of China Tel: +49 6022 81 2552 Fax: +49 6022 81 31 2552	China	(Capital Contribution)	-	39.20%

**Fibers Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
9	<b>PHP Fibers Inc.</b> 300 Serrano Way, Scottsboro, AL 35768 , USA Tel: +1-256-218-4000 Fax: +1-256-218-4062	USA	Common Share	1,000	80.00%
10	<b>SafeTweave, Inc.</b> 302 Serrano Way, Scottsboro, AL 35769, USA Tel: +1-256-218-4000 Fax: +1-256-218-4062	USA	Common Share	1,000	80.00%
11	<b>FiberVisions A/S</b> Engdrægt 22, Varde Denmark, DK-6800, Denmark Tel: +45 7994 2200 Fax: +45 7994 2201	Denmark	Class A Class B	122,949,441 29,117,600	99.99%
12	<b>FiberVisions (China) Textile Products Limited</b> No. 29 Heng Shan Rd., New District, Suzhou, China Tel: +86 512 6823 1099 Fax: +86 512 6823 0021	China	(Capital Contribution)	-	99.99%
13	<b>ES FiberVisions (Suzhou) Company Limited</b> No. 29 Hengshan Rd. Suzhou New District 215011, China Tel: +86 512 6823 1099 Fax: +86 512 6823 0021	China	(Capital Contribution)	-	50.00%
14	<b>FiberVisions Manufacturing Company</b> The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801, USA Tel: +1 302 658-7581 Fax: +1 302 655-2480	USA	Common Share	100	99.99%
15	<b>FiberVisions Products, Inc.</b> CT Corporation System, 289 S. Culver Street, Lawrenceville, Georgia 30046 USA Tel: +1 800 241 8922 Fax: +1 404 888 7795	USA	Common Share	25,000	99.99%
16	<b>Wellman France Recyclage S.A.S.</b> Zone Industrielle de Regret 55100 Verdun, France Tel: +33 971 002 005 Fax: +33 329 843 104	France	Common Share	500	99.99%
17	<b>Wellman International Limited</b> Mullagh, Kells, Co.Meath, A82 NN93, Ireland Tel: +353 46 9280200 Fax: +353 46 9280300	Ireland	Common Share	1,100,850	99.99%
18	<b>Performance Fibers (Kaiping) Company Limited</b> 3 Hongqiao Road, Changsha, Kaiping, Guangdong Province, People's Republic Of China Tel: +86 750 2278000 Fax: +86 750 2218093	China	(Capital Contribution)	-	99.99%

Fibers Business					
No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
19	<b>Performance Fibers (Kaiping) No.2 Company Limited</b> 1 Huan Cui Road West, Cuishan Lake New Region, Kaiping, Guangdong Province, People's Republic Of China Tel: +86 750 2278000 Fax: +86 750 2218093	China	(Capital Contribution)	-	99.99%
20	<b>Performance Fibers (Kaiping) No.3 Company Limited</b> Land Lot JCR2016-57(Kaiping 14)B, west of Die Cui Da Road , north of Huan Cui West Road, Cuishanhu New District, Kaiping, Guangdong, People's Republic Of China Tel: + (86) 750-2201707 Fax: + (86) 750-2218093	China	(Capital Contribution)	-	99.99%
21	<b>Glanzstoff Industries (Qingdao) Company Limited</b> <ul style="list-style-type: none"> <li>No.1735 Maoshan Road, Huangdao District, Qingdao, Shandong Province, People's Republic Of China</li> <li>Room 299, No.2877 Tuanjie Road, Huangdao District, Qingdao City, Shandong Province, People's Republic Of China</li> </ul> Tel: +86 532 80987237 Fax: +86 532 80983559	China	(Capital Contribution)	-	99.99%
22	<b>Glanzstoff Longlaville S.A.S.</b> Pôle Européen de Développement, 54810 Longlaville, France Tel: +33 3 82 44 80 00 Fax: +33 3 82 44 56 82	France	Common Share	3,037,323	99.99%
23	<b>Società Industriale Cremonese SICREM s.p.a.</b> Pizzighettone, Via G.B. Pirelli, 56, Italy Tel: +39 0372 738011 Fax: +39 0372 730001	Italy	Common Share	9,180,000	99.99%
24	<b>Textilcord Steinfort S.A.</b> Rue Schwarzenhof, 34 L-8452 Steinfort – GD, Luxembourg Tel: +352 399 8811 Fax: +352 399 881 213	Luxembourg	Common Share	1,000	99.99%
25	<b>Glanzstoff - Bohemia s.r.o.</b> Terežinská 60, 41002 Lovosice, Czech Republic Tel: +420 416 575 111 Fax: +420 416 575 107	Czech Republic	Common Share	750	99.99%
26	<b>Winnsboro Fibres LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: + (256) 218-4006 Fax: + (256) 218-4017	USA	(Membership Interest)	-	99.99%

**Fibers Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
27	<b>Performance Fibers Operations Mexico, S. de R.L. de C.V</b> Av. de la Luz 77 Zona Industrial Benito Juárez, CP 76120, Querétaro, Qro., México Tel: +52 442 211 3000 Fax: N/A	Mexico	Equity Quota Class I	50,000	99.99%

**Wool Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Holdings Limited</b> 75/64, 65 Ocean Tower 2, 28 <sup>th</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664 - 5	Thailand	Common Share	77,446,800	99.81%

**Holding Company Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Netherlands Cooperatief U.A.</b> Markweg 201, 3198NB Europoort, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	(Ownership Interest)	-	99.99%
2	<b>Indorama Netherlands B.V.</b> Markweg 201, 3198NB Europoort, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	Common Share	18,000	99.99%
3	<b>Beacon Trading (UK) Limited</b> 23 Northiam, Woodside Park, N 12 7ET, London, United Kingdom Tel: N/A Fax: N/A	United Kingdom	Common Share	70,000	99.81%
4	<b>Beverage Plastics (Holdings) Limited</b> Silverwood Business Park, 70 Silverwood Road, Lurgan Craigavon, County Armagh, BT 66 6 LN, Northern Ireland Tel: +44 2838311800 Fax: +44 2838311888	Northern Ireland	Class A Class B Class C	5,100 2,450 2,450	51.00%
5	<b>KP Equity Partners Inc.</b> Lot 2&3, Level 3, Wisma Lazenda, Jalan, Kemajuan, 87000 F.T. Labuan, Malaysia Tel: +087 414 073 Fax: +087 413 281	Malaysia	Common Share	10,000	99.99%
6	<b>Trevira Holdings GmbH</b> Max-Fischer-Strasse 11, 86399 Bobingen, Germany Tel: N/A Fax: N/A	Germany	Common Share	25,000	99.99%



Holding Company Business					
No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
7	<b>Indorama Ventures Recycling Netherlands B.V.</b> Markweg 201, 3198 NB Europoort, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: N/A	Netherlands	Common Share	18,000	99.99%
8	<b>Indorama Ventures Holdings LP</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1-847-943-3100 Fax: +1-847-943-3196	USA	(Partnership Interest)	-	99.99%
9	<b>Indorama Ventures USA Holdings LP</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1-847-943-3100 Fax: +1-847-943-3196	USA	(Partnership Interest)	-	99.99%
10	<b>Indorama Ventures Performance Fibers Holdings USA LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 302 636-5401 Fax: +1 302 636-5454	USA	(Membership Interest)	-	99.99%
11	<b>FiberVisions Corporation</b> The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801, USA Tel: +1 678 578 7240 Fax: +1 678 578 7276	USA	Common Share	1,000	99.99%
12	<b>FiberVisions (China) A/S</b> Engdraget 22, Varde Denmark, DK-6800, Denmark Tel: +45 7994 2200 Fax: +45 7994 2201	Denmark	Common Share	100,000	99.99%
13	<b>ES FiberVisions Holdings ApS</b> Engdraget 22, Varde Denmark, DK- 6800, Denmark Tel: +45 7994 2200 Fax: +45 7994 2201	Denmark	Common Share	48,500	50.00%
14	<b>Indorama Ventures OGL Holdings LP</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1-847-943-3100 Fax: +1-847-943-3196	USA	(Partnership Interest)	-	99.99%
15	<b>FiberVisions, L.P.</b> 3700 Crestwood Pkwy, Suite 900, Duluth, GA 30096, USA Tel: +1 302 658-7581 Fax: +1 302 655-2480	USA	(Partnership Interest)	-	99.99%

Holding Company Business					
No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
16	<b>ES FiberVisions, Inc.</b> 3700 Crestwood Parkway, Suite 900, Duluth, GA 30096, USA Tel: +1 302 636 5401 Fax: +1 302 636 5454	USA	Common Share	100	50.00%
17	<b>IVL Holding, S. de R.L. de C.V.</b> Avenida Prolongación Paseo de la Reforma 1015, Torre A piso 2, Colonia Santa Fe Cuajimalpa CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 91775700 Fax: +52 55 52924919	Mexico	Equity Quota Series A	2	99.99%
18	<b>Grupo Indorama Ventures, S.de R.L. de C.V.</b> Avenida Prolongación Paseo de la Reforma 1015, Torre A piso 2, Colonia Santa Fe Cuajimalpa CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 91775700 Fax: +52 55 52924919	Mexico	Equity Quota Class I	2	99.99%
19	<b>Indorama Ventures Polyholding LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 256 308 1180 Fax: +1 256 341 5926	USA	(Membership Interest)	100	99.99%
20	<b>Indorama Polymers (USA) LLC</b> 1301 Finley Island Road, Decatur, Alabama, AL 35601, USA Tel: +1 256 308 1180 Fax: +1 256 341 5926	USA	(Membership Interest)	-	99.99%
21	<b>Indorama Ventures USA LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 256 308 1180 Fax: +1 256 341 5926	USA	(Membership Interest)	-	99.99%
22	<b>IVL Belgium N.V.</b> Jules Bordetlaan 160, 1140 Evere, Belgium Tel: N/A Fax: N/A	Belgium	Common Share	30,615	99.99%
23	<b>Performance Fibers Holdings Finance, Inc.</b> The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801, USA Tel: +1 678 578 7240 Fax: +1 678 578 7276	USA	Common Share	1,000	99.99%
24	<b>Performance Fibers Asia Holdings, LLC</b> Corporation Trust Center, 1209 Orange St., Wilmington, Delaware 19801, USA Tel: +1 678 578 7247 Fax: +1 678 578 7276	USA	(Membership Interest)	-	99.99%

Holding Company Business					
No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
25	<b>Performance Fibers Asia, LLC</b> Corporation Trust Center, 1209 Orange St., Wilmington, Delaware 19801, USA Tel: +1 678 578 7247 Fax: +1 678 578 7276	USA	(Membership Interest)	-	99.99%
26	<b>Indorama Ventures Northern Investments Inc.</b> 10200 rue Sherbrooke E., Montreal-Est, Quebec H1B 1B4, Canada Tel: +1 514 645 7887 Fax: +1 514 645 9115	Canada	Class A Class B Class C	10,401 149,889,750 256,766,500	99.99%
27	<b>Indorama Ventures Gestion Inc.</b> 10200 rue Sherbrooke E., Montreal-Est, Quebec H1B 1B4, Canada Tel: +1 514 645 7887 Fax: +1 514 645 9115	Canada	Common Share	100	99.99%
28	<b>Indorama Ventures Dutch Investments B.V.</b> Markweg 201, 3198NB Europoort, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	Common Share	8,914,320	51.00%
29	<b>Indorama Ventures Investments USA LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 302 636 5401 Fax: +1 302 636 5454	USA	(Membership Interest)	-	51.00%
30	<b>Indorama Ventures Olefins Holding LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1 302 636 5401 Fax: +1 302 636 5454	USA	(Membership Interest)	-	99.99%
31	<b>Glanzstoff Holding (Hong Kong) Limited</b> Unit 1301, 13/F. Chung Nam Building, 1 Lockhart Road, Wanchai, Hong Kong Tel: + 852 2153 9718 Fax: +852 2117 1879	Hong Kong	Common Share	100	99.99%
32	<b>Glanzstoff Industries S.r.l.</b> Pizzighettone, Via G.B. Pirelli, 56, Italy Tel: +39 0372 738011 Fax: +39 0372 730001	Italy	Quota	10,000	99.99%
33	<b>Indorama Ventures Spain S.L.</b> Poligono Industrial Guadarranque, S/N, 11360 San Roque, Cadiz, Spain Tel: N/A Fax: N/A	Spain	Common Share	10,000	99.99%

**International Headquarter Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Ventures Global Services Limited</b> 75/80-81 Ocean Tower 2, 32 <sup>nd</sup> Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: + 66 2 661 6661 Fax: + 66 2 661 6664 – 5	Thailand	Common Share	4,162,124,995	99.99%

**Trading & Services Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>IVL Singapore Pte. Ltd.</b> 133 Cecil Street, #13-03 Keck Seng Tower, Singapore 069535 Tel: N/A Fax: N/A	Singapore	Common Share	19,000,000	99.91%
2	<b>UAB Indorama Polymers Europe</b> Metalo G.16, LT-94102 Klaipeda, Republic of Lithuania Tel: + 370 46 300749 Fax: + 31 181 285 405	Lithuania	Common Share	725,088	99.91%
3	<b>UAB Indorama Holdings Europe</b> Metalo G.16, LT-94102 Klaipeda, Republic of Lithuania Tel: + 370 46 300749 Fax: + 370 46 314323	Lithuania	Common Share	1,173,952	99.81%
4	<b>Indorama Trading (UK) Limited</b> 23 Northiam, Woodside Park, N12 7ET, London, United Kingdom Tel: N/A Fax: N/A	United Kingdom	Common Share	10,000	99.81%
5	<b>Indorama Trading AG</b> c/o RA Mauro Locarnini, Anwaltsbüro Locarnini, Talstrasse 39, CH-8001 Zürich, Switzerland Tel: N/A Fax: N/A	Switzerland	Common Share	100	99.81%
6	<b>PHP-Shenma Air Bag Yarn Marketing (Shanghai) Co. Ltd.</b> China Merchants Plaza, East Building, Room 1107, No 333 Cheng Du Road (North), Shanghai 200041, People's Republic Of China Tel: +49 6022 81 2552 Fax: +49 6022 81 31 2552	China	(Capital Contribution)	-	40.80%
7	<b>ES FiberVisions Shanghai Co., Ltd.</b> Room 2401-B, Manpo Plaza, 500 Yan An West Road, Shanghai, People's Republic Of China Tel: +86-(0)21-6212-5877 Fax: +86-(0)21-6226-8829	China	(Capital Contribution)	-	50.00%

**Trading & Services Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
8	<b>Performance Fibers (Kaiping) Trading Company Limited</b> No.3 Hongqiao Road Kaiping, Guangdong Province, People's Republic Of China Tel: +86 750 2201707 Fax : +86 750 2218093	China	(Capital Contribution)	-	99.99%
9	<b>TTI GmbH</b> Kasinostr. 19 – 21, 42103 Wuppertal, Germany Tel: +49 6022 81 2552 Fax: +49 6022 81 31 2552	Germany	Common Share	25,100	40.00%
10	<b>Trevira North America, LLC</b> 5206 Leonardslee CT, Charlotte, Mecklenburg County, North Carolina, 28226, USA Tel: N/A Fax: N/A	USA	(Membership Interest)	-	99.99%
11	<b>ES FiberVisions Company Limited</b> 3-3-23 Nakanoshima, Kita-Ku, Osaka 530-0005, Japan Tel: +81 6 6441 3307 Fax: +81 6 6441 3347	Japan	Common Share	200	50.00%
12	<b>ES Fiber Visions LP</b> Entity Services (Nevada) LLC, 2215- B Renaissance Dr., Suite 10, Las Vegas, NV 89119, USA Tel: +706 357 5100 Fax: +706 966 4247	USA	(Partnership Interest)	-	50.00%
13	<b>Indorama Ventures Alphapet Holdings, Inc.</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808 USA Tel: +1 256 308 1180 Fax: +1 256 341 5926	USA	Common Share	100	99.99%
14	<b>ES FiberVisions ApS</b> Engdraget 22, Varde Denmark, DK- 6800 Tel: +45 7994 2200 Fax: +45 7994 2201	Denmark	Common Share	10,000	50.00%
15	<b>Indorama Ventures Ecomex Services, S. de R.L. de C.V.</b> Carretera Libre a Colotlan 6800. Colonia Extramuros, Zapopan, Jalisco, Mexico Tel: +52 33 1563732 Fax: N/A	Mexico	Equity Quota Class I	2	51.00%
16	<b>Indorama Ventures Polycom, S. de R.L. de C.V.</b> Avenida Prolongación Paseo De La Reforma 1015 , Torre A piso 2, Colonia Santa Fe Cuajimalpa CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 91775700 Fax: +52 55 52924919	Mexico	Equity Quota Class I	2	99.99%

**Trading & Services Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
17	<b>Indorama Ventures Servicios Corporativos, S. de R.L. de C.V.</b> Avenida Prolongación Paseo de la Reforma 1015, Torre A piso 2, Colonia Santa Fe Cuajimalpa CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 91775700 Fax: +52 55 52924919	Mexico	Equity Quota Class I	2	99.99%
18	<b>Indorama Ventures Mexico Assets, S. de R.L. de C.V.</b> Avenida Prolongación Paseo de la Reforma 1015, Torre A piso 2, Colonia Santa Fe Cuajimalpa CP 05348, Delegación Cuajimalpa de Morelos, Ciudad de México, México Tel: +52 55 91775700 Fax: +52 55 52924919	Mexico	Equity Quota Class I	2	99.99%
19	<b>Performance Fibers (Hongkong) Limited</b> Room 3B, 22nd Floor, 148 Electric Road, North Point, Hong Kong Tel: + 852 2110 8242 Fax: + 852 2110 0033	Hong Kong	Common Share	1,000	99.99%
20	<b>ES FiberVisions HongKong Limited</b> Unit No. 2810. 28/F, The Metropolis Tower, 10 Metropolis Drive, Hunghom, Kowloon, Hong Kong Tel: +852 2970 5555 Fax: +852 2970 5678	Hong Kong	Common Share	616,010	50.00%
21	<b>4200144 Canada Inc.</b> 3400 First Canadian Centre, 350 - 7th Avenue SW, Calgary, Alberta T2P 3N9, Canada Tel: +1 514 645 7887 (229) Fax: +1 514 645 9115	Canada	Class A	100	99.99%
22	<b>Indorama Ventures Exporter Inc.</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1-980-233-8191 Fax: +1-980-233-6220	USA	Common Share	2,500	100.00%
23	<b>Glanzstoff Services S.A.S.</b> Pôle Européen de Développement, 54810 Longlaville Tel: +33 3 82 44 80 00 Fax: +33 3 82 44 56 82	France	Common Share	82,195	99.99%
24	<b>Glanzstoff Industries A.G.</b> Rue Schwarzenhof, 34 L-8452 Steinfort - GD Luxembourg Tel: +352 399 881 Fax: +352 399 881 213	Luxembourg	Common Share	960,000	99.99%

**Trading & Services Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
25	<b>Glanzstoff Management GmbH</b> Technologiezentrum, Haus C, Technopark 1, 3430 Tulln, Austria Tel: N/A Fax: N/A	Austria	Common Share	500	99.99%
26	<b>Indorama Ventures Portugal Utility - Unipessoal, LDA.</b> ZILS Zona 2, Lote 2E1, Monte Feio, 7520-064 Sines, Portugal Tel: +351 269 189 000 Fax: +351 269 189 099	Portugal	Quota	1	99.99%
27	<b>Performance Fibers Services, S. de R.L. de C.V.</b> Av. de la Luz 77 Zona Industrial Benito Juárez, CP 76120, Querétaro, Qro., México Tel: +52 442 211 3000 Fax: N/A	Mexico	Quota	50,000	99.99%

**Logistic Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Ventures Logistics LLC</b> Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, USA Tel: +1-847-943-3100 Fax: +1-847-943-3196	USA	(Membership Interest)	-	99.99%

**Non-Operating Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
1	<b>Indorama Polymers Rotterdam B.V.</b> Markweg 201, 3198 NB, Europoort, Harbour No.6347, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	Common Share	18,002	99.91%
2	<b>Indorama Holdings Rotterdam B.V.</b> Markweg 201, 3198 NB, Europoort, Rotterdam, Netherlands Tel: +31 181 285 400 Fax: +31 181 285 405	Netherlands	Common Share	18,002	99.91%
3	<b>MJR Recycling B.V.</b> Tengnagelwaard 5, NL-6917 AE Spijk(Gld), Netherlands Tel: +31 656 6250 Fax: +31 656 6251	Netherlands	Common Share	18,100	99.99%
4	<b>FiberVisions Vermögensverwaltungsgesellschaft mbH</b> Local Court of Düsseldorf, Werdener Straße 1, 40227 Düsseldorf Germany Tel: +49211 8306 0 Fax: +49 211 87565 116 0	Germany	Common Share	3,000,000	99.99%



**Non-Operating Business**

No.	Company Name/Address	Country	Type of Shares	Shares Issued	Shareholding
5	<b>ES FiberVisions China Limited</b> No. 305, 7Sone, Trade Bldg., GuangBao Rd., Guangzhou Free Trade Zone, People's Republic Of China Tel: +86 20 8220 9018 Fax: +86 20 8220 9973	China	(Capital Contribution)	-	50.00%
6	<b>Indorama Ventures Polymers (Rayong) Public Company Limited</b> 75/93 Ocean Tower 2, 35th Floor, Soi Sukhumvit 19 (Wattana), Asoke Road, Klongtoey Nuer, Wattana, Bangkok 10110, Thailand Tel: +66 2 661 6661 Fax: +66 2 661 6664-5	Thailand	Common Share	20,021,356	99.98%
7	<b>Ottana Polimeri S.R.L.</b> Strada Provinciale 17, Km 18, Ottana (NU) - 08020, Italy Tel: N/A Fax: N/A	Italy	Quota	1	50.00%
8	<b>Indorama Ventures Adana PET Sanayi Anonim Sirketi</b> Sarihamzalı Mah.T.Cemal Beriker Blv.No:559/3A 01355 Adana/Turkey Tel: +322 441 0253-226 Fax: +322 441 0110	Turkey	Common Share	5,489,505,865	99.99%
9	<b>Indo Polymers Mauritius Limited</b> Les Cascades, Edith Cavell Street, Port Louis, Republic of Mauritius Tel: N/A Fax: N/A	Mauritius	Common Share	58,827	100.00%
10	<b>Indorama Polymers Workington Limited</b> Siddick, Workington, Cumbria, CA14 1LG, United Kingdom Tel: +44 1900 609375 / +44 1900 609342 Fax: +44 1900 609317	United Kingdom	Common Share	1	99.99%