

A Chinese Paper Maker Commits to Green Production in Virginia

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Preface

For decades, bilateral investment has flowed predominantly from the United States to China. But Chinese investments in the United States have expanded considerably in recent years, and this proliferation of direct investments has, in turn, sparked new debates about the future of US-China economic relations.

Unlike bond holdings, which can be bought or sold through a quick paper transaction, direct investments involve people, plants, and other assets. They are a vote of confidence in another country's economic system since they take time both to establish and unwind.

The Paulson Papers on Investment aim to look at the underlying economics—and politics—of these cross-border investments between the United States and China.

Many observers debate the economic, political, and national security implications of such investments. But the debates are, too often, generic or take place at 100,000 feet. Investment opportunities are much discussed by Americans and Chinese in the abstract but these discussions are not always anchored in the underlying economics or a realistic investment case.

The goal of the Paulson Papers on Investment is to dive deep into various

sectors, such as agribusiness or manufacturing—to identify tangible opportunities, examine constraints and obstacles, and ultimately fashion sensible investment models.

Most of the case studies in this Investment series look ahead. For example, our agribusiness papers examine trends in the global food system and specific US and Chinese comparative advantages. They propose prospective investment models.

But even as we look ahead, we also aim to look backward, drawing lessons from past successes and failures. And that is the purpose of the case studies, as distinct from the other papers in this series. Some Chinese investments in the United States have succeeded. They created or saved jobs, or have proved beneficial in other ways. Other Chinese investments have failed: revenue sank, companies shed jobs, and, in some cases, businesses closed. In this sense, past investments offer a rich set of lessons to learn.

Damien Ma, Fellow and Associate Director of the Paulson Institute think tank, directs the case study project.

For this case study of Tranlin Paper, we are grateful to Dan Li, a talented graduate of the Harris School of Public

Policy at the University of Chicago and student fellow at the Paulson Institute, for his research and dedication.

Case studies are reconstructed on the basis of the public record, personal interviews with participants, and

journalistic accounts. They aim to reflect a best reconstruction of the case. But they may have gaps and other inadequacies where the record is incomplete, facts are murky, or players chose not to share their views.

Cover Photo: Richmond Times-Dispatch/Bob Brown

Timeline

1976	Gaotang Paper Mill, a local government-owned plant, begins operating in Liaocheng City, Shandong Province.
1983	Li Hongfa joins the firm as a technical specialist. Li becomes the deputy factory manager for technical research and development the following year.
1993	Li becomes the general manager and Communist Party secretary of the factory.
1995-1998	Seven Fourdrinier pulp machine production lines are built and a 3,800 multi-cylinder Fourdrinier pulp machine is imported from Austria, driving annual output up to 130,000 tons.
2000	
<i>June</i>	Tranlin establishes a packaging company subsidiary.
<i>December</i>	The Gaotang factory transforms into Shandong Tranlin Paper LLC, and Li assumes the posts of chairman and president.
2002	Shandong Tranlin Jiayou Fertilizer Company is established, later becoming the largest organic fulvic acid fertilizer producer in China.
2003	Tranlin Group is incorporated.
2004	Tranlin undergoes another restructuring through which the state completely relinquishes its shares, effectively making the firm into a private company.
2005	The government lists Tranlin in its first batch of pilot enterprises focused on the “circular economy.”
2006	Tranlin Group sells shares in Tranlin Packaging to strategic investors CDH Capital and Bain Capital.
2009	Tranlin Group invents clean straw pulping technology, branding its unbleached paper products as “natural color.”

2010

- April* Tranlin's unbleached paper is selected as the "official paper" of the Shanghai World Expo in 2010.
- August* Tranlin's first comprehensive straw utilization project is announced in Dehui, Jilin province.
- December* Tranlin Packaging goes public in Hong Kong, with Goldman Sachs and Morgan Stanley as joint book-runners.

2012

- Two more comprehensive straw utilization projects are announced in Jiamusi, Heilongjiang province and Gaotang, Shandong province.
- October* Jerry Peng, a former Goldman Sachs banker, joins the company as its chief strategy officer.

2014

- January* Tranlin, Inc. is formed.
- March* Tranlin receives \$1.3 billion in state financing, led by the China Development Bank, for straw paper projects and uses intellectual property as collateral.
- June* Tranlin announces a \$2 billion investment over five years to build and operate its first advanced manufacturing facility outside of China in the state of Virginia.
- August* The firm's paper product passes Wal-Mart's inspection and signs long-term supplier contract with the US retail giant.

Key Players

United States

Virginia Economic Development Partnership (VEDP)

State-level economic promotion and investment attraction arm

Greater Richmond Partnership

Regional-level economic development team, representing the counties of Chesterfield, Hanover, Henrico, and the City of Richmond, Virginia

Chesterfield County

Site of Tranlin's manufacturing plant

Chesterfield County Department of Economic Development

County-level economic promotion and investment-attraction arm

University of Virginia

Leading public research university, based in Charlottesville, Virginia

China

Shandong Tranlin Group

Private paper and pulp company based in Liaocheng, Shandong province

Liaocheng Municipal Government

Prefecture-level city in western Shandong province, nicknamed "Water City"

Introduction

In June 2014, Tranlin, a Chinese paper maker, announced a \$2 billion investment to build an advanced manufacturing facility on an 850 acre campus in Chesterfield County, Virginia. When complete and operating at full capacity by 2020, the plant is expected to generate more than 2,000 local jobs.

Tranlin's investment marked the largest greenfield investment in the United States to date from a private Chinese company. But more significant than the size of the deal was this distinguishing factor: where most US-China greenfield investments tend to involve export of US technology to China, in this instance the Chinese investor actually played the role of the technology exporter, rather than technology acquirer.

The vast majority of paper mills, including Chinese ones, have shifted to wood pulp production processes, in part because wood has been relatively abundant and because it tends to be less polluting than straw-based paper production. But Tranlin has taken a different approach—it claims to have developed a leading straw pulping technology that simultaneously turns agricultural waste into high-quality paper products and the waste runoff into organic fertilizer. According to the

firm, this process has less of an impact on the environment.

Already a top Chinese paper producer,¹ Tranlin has dubbed its clean production process the “Tranlin model,” arguing that its technology supports a so-called “circular economy” and benefits farmers because the company needs to buy agricultural waste as inputs to its papermaking process.

Tranlin decided to invest in Virginia for several reasons. First, in the mature US paper market, consumers generally attach greater value to environmentally friendly products and are more tolerant

of a price premium. Second, siting a factory close to the straw supply and final consumers can cut costs. Third, Tranlin sought access to an advanced capital market that offered more financing options for future expansion. And ultimately, Tranlin viewed the US market as a strategic play to establish a more reputable brand and prepare for competition in the global marketplace.

Despite the eye-catching \$2 billion price tag, the US operation represents only a small portion of Tranlin's ambitious expansion. Since early 2010, as the company's technology has matured, Tranlin has announced

Tranlin's investment marked the largest greenfield investment in the United States to date from a private Chinese company.

four projects—three in China and one in the United States—totaling \$7.8 billion, an investment amount that is more than six times its total apparent assets. But because it is a private company, its financial position remains murky at best. How it will finance the subsequent phases of its US expansion remains a question mark.

The timing of the US deal was also somewhat counter-intuitive in terms of the firm's overall performance. In 2010, the Chinese paper industry writ large was battling stagnant growth, resulting from higher raw material costs and overcapacity, which was exacerbated by Beijing's massive stimulus program during the 2008-2009 financial crisis. But while most Chinese paper makers cut back to weather slower growth, Tranlin instead began to launch its expansion.

Tranlin seemed to relish going against the grain. Ten years earlier, when most Chinese paper companies, under pressure from Beijing's new pollution regulations, turned to wood pulp paper because it is less polluting, Tranlin stood by straw paper and invested aggressively to enhance its straw-based papermaking technology.²

The following case study examines Tranlin's venture into the US market. The case begins by analyzing the motivations behind, and the technologies involved, in Tranlin's investment. It also recounts the firm's history, details the broader

transformation of the Chinese paper industry, and discusses some of the policies that affected the domestic industry.

Then, the case turns to Tranlin's 11-month deal process in Virginia, including site selection, negotiation of terms, and challenges related to strategy and culture. It highlights the role of a proactive, adaptable, and experienced local economic development authority in Virginia looking to attract more technology-intensive firms to the state. Tranlin's investment appeared to fit Virginia's broader efforts to diversify its economy.

At the time of this writing, Tranlin's Virginia operation is still years from its full completion by 2020. Yet even in its current, partially completed form, the investment offers some notable lessons that can inform and shed light on future Chinese direct investments in the US market.

The Tranlin case illustrates:

- How at least some Chinese companies are actually technology exporters to OECD markets, including the United States, rather than acquirers.
- How technological advancement can be a major distinguishing factor for an industry replete with homogeneous products and players that suffer from overcapacity.

- How patents and intellectual property (IP) are becoming more recognized and valuable in China, as Tranlin's development of its own IP attests.
- How environmental consciousness is transforming some traditional polluting industries, as consumers, including wealthier Chinese, are increasingly willing to pay a premium for greener products.
- How despite being a private firm, the state nonetheless stepped in to play a crucial role in securing financing for Tranlin.
- How a positive local government-to-government relationship between Virginia and Shandong still matters in the deal making process.

Evolution of Papermaking

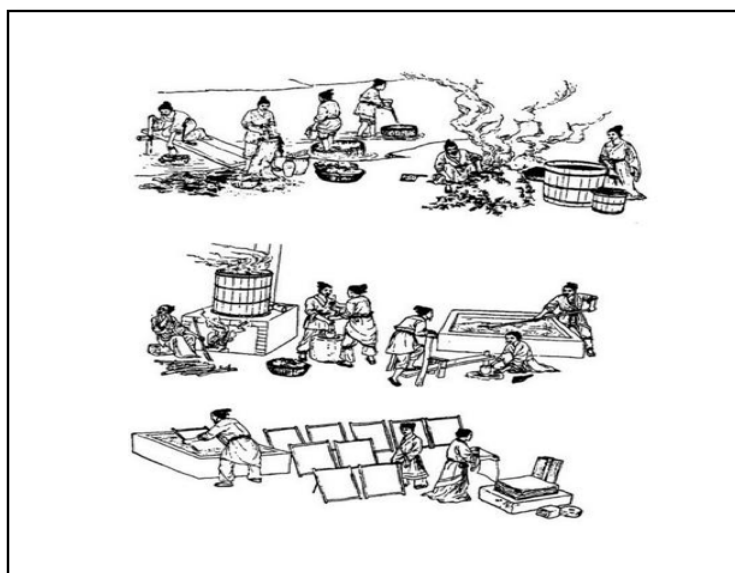
Paper is one of the oldest products in the world and has transformed human civilization. Invented by the Chinese more than 2,000 years ago, the papermaking process continues to evolve.

In 105 AD, Cailun, an official of the Eastern Han Dynasty (25-220 AD), improved upon an ancient papermaking process by combining bark, linen, and fishing net (see Figure 1).³ This enhanced process succeeded both in lowering the cost of paper and in expanding its popularity among a broader swath of the Chinese public. Several centuries later, during the Tang dynasty (618-907 AD), the quality of paper further

improved as a subsequent generation of Chinese innovators added bamboo and straw to the papermaking process.

Dynastic China largely monopolized papermaking technology for almost seven centuries until the Battle of Talas in 751 AD, when the Arab Abbasid Caliphate defeated a Tang army as it sought to control Central Asia. Thereafter, papermaking technology was also assimilated by the Arab world and refined and mechanized in the manufacture of bulk paper. This led to the first paper mill powered by water.⁴ And by the late 13th century, papermaking technology had spread to Europe.⁵

Figure 1. The Papermaking Process During The Han Dynasty



Source: Wang, Juhua, *The History of Papermaking and Technologies in Ancient China*.

But only in the early 19th century did the most significant leap in papermaking take place, with the invention of the Fourdrinier machine, named after the British inventor Henry Fourdrinier. Prior to the Fourdrinier machine, paper had been produced one individual sheet at a time. A wooden frame would be vertically submerged into the pulp with a mixture of fiber and then drawn out horizontally to produce a sheet of paper.

The Fourdrinier machine, by contrast, was able to produce a continuous roll of paper by distributing the pulp slurry onto a moving screen. The water would then be allowed to drain from the slurry by gravity or else under a vacuum. The wet paper sheet moves through presses and dries into large rolls.⁶ In essence, this machine dramatically raised the scale and efficiency of papermaking.

The Fourdrinier machine had broader economic and social impacts: it ushered in a new era by making wood pulp the most popular and low cost raw material for papermaking. As late as the 19th century, relatively expensive fiber crops, such as straw, had still been used as the primary raw material for papermaking. The Fourdrinier paved the way for switching to wood, but other technological advancements throughout the 19th century also helped make wood the preferred choice for basically all papermaking.

For example in 1879, Carl F. Dahl, a German chemist invented the kraft

process (“force” in English),⁷ which is a treatment that enabled the recovery and re-use of inorganic pulping chemicals to form a closed-cycle process. This, in turn, greatly increased the efficiency of papermaking and enhanced the strength of paper fibers by maintaining a high effective sulfur ratio to prevent cellulose degradation.

Today, more than 80 percent of paper mills use this kraft process.⁸ Yet despite its popularity, a major drawback of the kraft process is that one of its key byproducts are volatile sulfur compounds, responsible for the intense sulfur odor that surrounds paper mills.

By the turn of the 20th century, many of the advanced paper mills around the world switched to wood pulp since straw-based paper has become synonymous with low-end products from developing countries where fiber supplies are scarce and environmental regulations are considered lax.

Paper Province: Shandong’s Survival of the Cleanest

That brings the case to China, where knowledge of the environmental risks of straw papermaking has not prevented firms from capitalizing on cheaper raw materials. This has been especially true of China because wood is relatively scarce there while straws are abundant. Indeed, Shandong province on China’s east coast became ground zero for Chinese papermaking precisely because of its

easy access to wheat straw supplies, as well as a smoothly functioning port. In the early 2000s, Shandong became the leading province for papermaking in China, home to some 700 registered paper mills and 20 percent of total paper production nationally.⁹

But more than 80 percent of these Shandong paper mills produced polluting straw-based paper.¹⁰ Thus, while the paper industry contributed just 3 percent to Shandong's provincial GDP, it accounted for more than half of its industrial water and chemical oxygen demand (COD) emissions, a measure of water pollution.¹¹ Put differently, the economic cost and benefit of the paper industry in Shandong were substantially mismatched (see Box 1).

Indeed, the pollution from Shandong's papermaking industry was so well

known that locals even had a popular refrain for it: "A paper mill pollutes a river" (一个造纸厂污染一条河).¹⁴ By 2003, Shandong's standard for COD emissions was 420 mg/L, more than four times the global standard.¹⁵ Recognizing that this could become a sensitive political issue used to criticize the provincial government, the Shandong authorities in May 2003 issued a "Paper Industry Water Pollutant Emission Standard." This was followed by a four-stage plan to progressively cap COD emissions at 60mg/L (or 14 percent of the province's 2003 level) by 2010.¹⁶

Complying with the new environmental standards proved costly for hundreds of paper mills in the province that were essentially polluting with abandon. Many factories shut down, while others switched from straw to wood-based paper because it was a less polluting

Box 1: The Disadvantages of Straw Paper

Straw paper typically has several quality disadvantages, not least of which are a dirtier production process and high spoilage rate. For one, wheat and rice straws produce much shorter fibers than wood, which means they usually are unable to meet the demands of the printing and packaging industries. Also, straws contain significant amounts of silica, which, during the pulping process, is separated from the fiber and enters the waste stream along with "black liquor," a major pollutant from the kraft process. The excessive silica can make the black liquor difficult to recover and recycle, which means the liquor becomes runoff that enters water sources, causing pollution and environmental damage.¹²

Beyond these quality and pollution concerns, straws must also be harvested alongside the grains from which they come. This means that the collection and storage conditions of the raw materials are crucial in preventing mold and rot. These factors tend to make straw a less optimal input for papermaking.¹³

production process. Compounding the local industry's woes, the Chinese central government around the same time announced a new round of credit tightening policies to rein in inflation and economic overheating. For the capital-intensive paper industry, this proved a double whammy on top of the new environmental regulations. Consequently, companies found it nearly impossible to finance new projects.

These various policies altered the landscape in Shandong, in part by

forcing major industrial consolidation through mergers or else forcing market exits altogether. Among the province's 700 or so paper mills, only about 200 survived into the 2010s. But there was a silver lining: after consolidation, Shandong's paper production increased some 200 percent, contributing 17.6 percent of paper production nationwide. Meanwhile, total COD emissions in the province dropped by 62 percent, accounting for just 5 percent of total COD emissions in China.¹⁷

Adapt or Perish

One of the paper mills that looked to be heading for extinction in the early 2000s was Tranlin, whose name is an adaptation of the Chinese words quanlin (泉林), or “spring and forest.” By 2000, Tranlin’s annual pulp production was just 50,000 tons, yet the mill emitted some 50,000 tons of wastewater daily with a high COD level. As a result, the Tranlin mill was ordered by the local government to lower its annual production to 10,000 tons to avoid a full shutdown.¹⁸

But Tranlin was a plucky survivor, in large part because the firm decided to embark on a dramatically different strategy from

its local competitors. That new strategy was centered on technology upgrades and an emphasis on environmental soundness. Facing potential elimination, the firm undertook years of transformation that seemed to have saved itself. To understand how Tranlin managed this transition, the firm’s history is relevant.

A TVE Perseveres

Like many so-called “township and village enterprises” (TVEs) of the early reform era in the late 1970s to 1980s, Tranlin was first established as the Gaotang County Paper Mill in 1976.

As part of China’s initial property rights reforms, this Gaotang TVE was restructured to become a local holding corporation in 2000 under the name “Tranlin Paper.” By 2004, in line with the privatization wave in the Chinese economy at the time, the local government decided to relinquish its shares in the company, making Tranlin a fully private firm.¹⁹

Tranlin’s current chairman Li Hongfa joined the factory as a technical specialist in 1983. Within a year, he had become the

Tranlin was a plucky survivor, in large part because the firm decided to embark on a dramatically different strategy from its local competitors.

deputy general manager of the factory, in charge of technical research and development (R&D). Ten years later, he was promoted to

general manager and Communist Party secretary of the factory (most Chinese private firms also have party committees). When Tranlin Paper was re-founded as a corporation in 2000, he assumed the company’s top post as chairman and president. Under Li’s leadership, the company grew from 300 employees in 1993 to over 10,000 in 2013.

According to Li, Tranlin’s earlier years can be broken into three periods: 1976-1993, 1993-1998, and 1998-2003.²⁰ The first 15 years proved rocky for the company, since the TVE had to operate within the confines of a planned economy and was unable to

generate economies of scale. “Those days were anything but plain sailing,” Li has recalled. “It only made one product, the output of which was so low that the factory barely broke even.”²¹

As Li took over the plant in 1993, he pushed for investments in technological transformation and industrial upgrades, plowing more than \$6.5 million into new machinery and productivity-enhancing initiatives from 1995 to 1997. In 1993, the first year after Li took control, Tranlin turned a very modest profit of \$31,000 with a production of 12,000 tons. By the end of 1998, however, its annual production had climbed to 60,000 tons.²²

Technological Advancement and Diversification

Although Tranlin enjoyed steady growth in the 1990s, water pollution had always been a blight on the company, not to mention on China’s paper industry more broadly. Even Tranlin’s investment in waste treatment projects in 1998 had not prevented it from being blacklisted and ordered shut down in the early 2000s. Like many of its competitors, Tranlin had also shifted more production to wood pulp paper, in the hope that this might ease environmental concerns.

But unlike its competitors, Tranlin did not fully abandon straw paper. With his technical background, Li believed strongly that the company could innovate its way out of the dirty straw

production process. Thus the company invested more aggressively in clean straw pulping technologies that aimed to reverse the environmental reputation of straw paper.

Li believed that if pollution concerns could be addressed, the economics of straw paper held more promise than wood pulp paper. “A ton of wood chips costs 2,000 yuan (~\$160) and a ton of wood pulp is priced at 6,000 yuan (~\$1,000),” he has recalled. “A ton of straw only costs 500 yuan (~\$80), and a ton of straw pulp is priced at 4,000 yuan (~\$650). I don’t see the merit of tree paper. After all, why can’t we handle ... the pollution problem with straw paper properly?”²³

This hedge around straw-based production led Tranlin to establish its own R&D center in 2000, with Li serving as the director in addition to his broader management role within the company. “We believe in straw,” argues Jia Minhao, a Tranlin deputy general manager. “Straw paper has a natural advantage for two reasons: First, wood is a scarce resource in China, and industry will face a supply shortage of raw materials sooner or later. Second, China has a big population with a huge grain demand. Therefore, the supply of straw will always be abundant.”²⁴

In fact, the firm’s technological improvements and supply chain upgrades began even before the R&D center was established in 2000. For

instance, in 1998, as the company's assets reached \$130 million, Tranlin accelerated its expansion by diversifying production lines and integrating its supply chain. The same year, Tranlin imported its first coated paper production line from Austria and acquired several local competitors to produce high-quality printing-and-writing wood-based paper in response to an increase in demand.

In 2005, Tranlin developed a business model that integrated multiple technology enhancements and was recognized by the central government as the first national pilot enterprise for the "circular economy" concept (discussed in more detail below). By 2009, six years after Shandong toughened its water pollution regulations, Tranlin successfully launched unbleached straw paper products for printing, households, and packaging. Its products were later selected as an "official paper" of the Shanghai 2010 World Expo.²⁵



Photo: Flickr/Jonathan Haerber

Golden Age for China's Paper Industry

The period from 2001 to 2013 marked a "golden age" of sorts for the Chinese paper industry, albeit one interrupted by market volatility. Despite stricter emissions control policies and problems

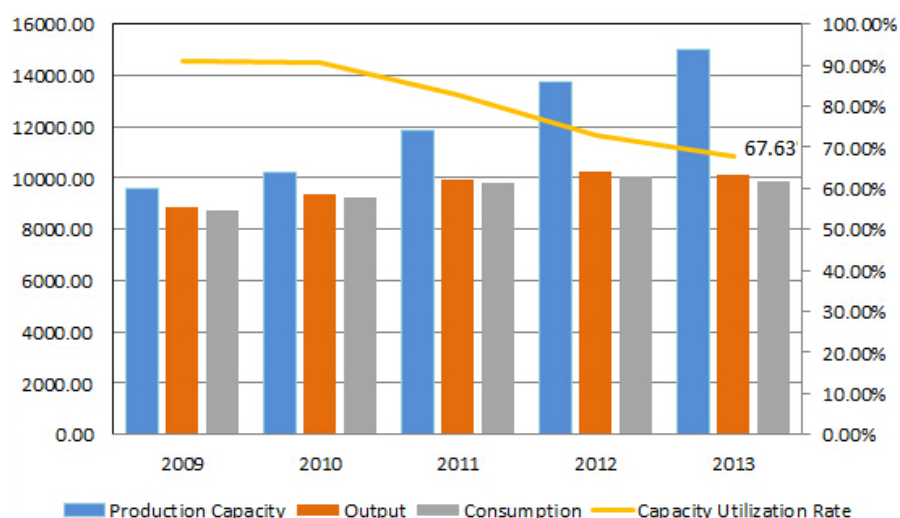
of overcapacity, not to mention a global economic crisis, some Chinese paper companies actually prospered.

Among the successes were Shandong-based Chen Ming Group and Shandong Sun Paper. These two firms both focused on high-quality paper products; the latter partnered with a global paper giant in an effort to improve management efficiency and globalize its brand.²⁶ In Dongguan, a bustling manufacturing hub in Guangdong province, paper makers proved to be

more aggressive and ambitious among Chinese companies. For example, Nine Dragons Paper, a local firm, grew into the world's biggest domestic cardboard producer and one of the leading producers of recycled

paper globally.²⁷ Leeman, a vertically integrated paper maker in Dongguan, also rose to prominence as a leading cardboard producer. To raise capital for continued expansion, all four of these firms went public in the early 2000s.

During the global financial crisis, most paper producers around the world cut production and hunkered down to weather the storm. But the opposite happened in China, as Beijing's gargantuan \$586 billion fiscal stimulus helped stave off catastrophe in the

Figure 2. Chinese Papermaking: Production and Capacity Utilization, 2009-2013

Source: China Papermaking Industry 2013 Annual Report, China Paper Association.

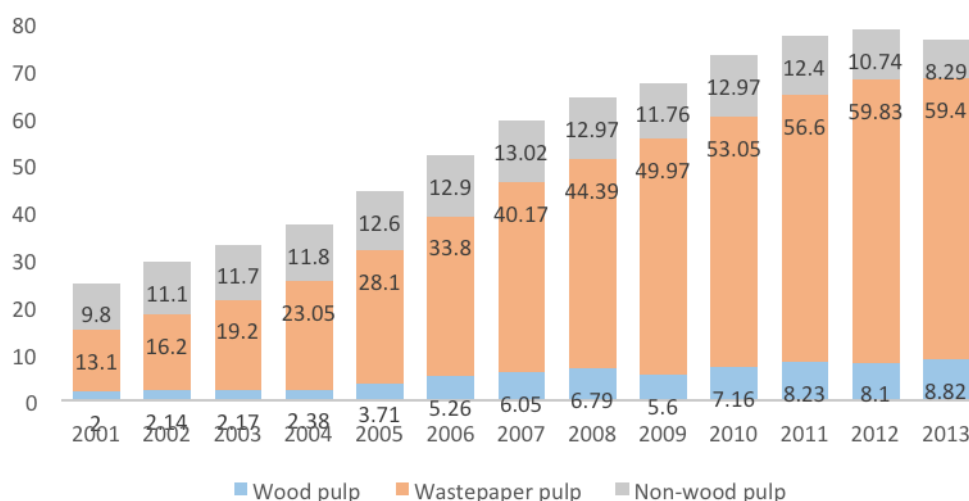
paper industry. Indeed, while Chinese paper companies' average gross margin shrunk to 12.6 percent, their lowest level in a decade, it bounced back to 13.4 percent in 2009. That same year, China surpassed the United States to become the largest maker of paper products in the world.²⁸

But China's stimulus-led recovery proved fleeting, and actually "papered over" other issues in the paper industry. As the flood of easy money led Chinese paper companies to expand capacity aggressively, actual production and consumption did not follow suit. Starting in 2010, evidence of overcapacity had begun to emerge as more production lines idled. In another telling sign, average capacity utilization rates declined from 90 percent in 2010 to 68 percent in 2013 (see Figure 2).

In 2011 alone, the Chinese government forced 559 "zombie" paper companies to close, while many more simply exited the market. In 2013, overall pulp consumption began to decline for the first time in the history of the Chinese paper industry (see Figure 3).²⁹ This reduced capacity owed much to the shuttering of straw paper mills on account of the environmental concerns noted earlier in this case study.

Tranlin Changes Tack

Throughout this period of crisis and adaptation, Tranlin was among those firms that achieved healthy growth, but at a slower pace compared to the industry leaders. Still, the firm quietly reshaped its strategy to take a different approach from these other players. Tranlin did not seek foreign partners or an initial public offering

Figure 3. Chinese Domestic Pulp Consumption, 2001-2013 (million tons)

Source: China Papermaking Industry 2013 Annual Report, China Paper Association.

(IPO). Instead, it sought to double down on straw papermaking, believing that the application of technology could ultimately make straw paper a more appealing product.

Developments at the time favored elements of Tranlin's emerging strategy. As shown in Figure 3 above, from 2001 to 2013, consumption of wood pulp had more than tripled and wastepaper pulp more than doubled. Together, their portion of total pulp consumption rose from 68 percent to 90 percent in China. This trajectory basically comported with the paper industry development plan that China's state planning agency, the National Development and Reform Commission (NDRC), had issued in 2007, which called for the Chinese paper industry to rely mainly on wood and wastepaper inputs.

But both wood pulp and wastepaper pulp have limitations. Foremost among these is the fact that China lacks forest coverage. The country's per capita forest area is only 0.145 hectares, less than one-fourth of the global average.³⁰ As a result, supply constraints on wood will persist, putting upward pressure on wood chip prices—for instance, over 60 percent of tree logs, the raw material for wood chips, must be imported.³¹ In terms of wastepaper pulp: although it is the top raw material input for papermaking, further growth is limited since China's wastepaper utilization rate has already hit 70 percent, converging with the level in developed markets.³²

From 2002 to 2012, precisely the period that many straw paper mills shifted their production processes because of pollution regulations, wood pulp production in Shandong rose eightfold

from 500,000 tons to more than 4 million tons. Meanwhile, straw pulp production shrunk from 1.5 million tons to less than half a million tons.³³ At the same time, China had no shortage of straws. For instance, in 2013, Chinese farmers produced some 700 million tons of straw, about 40% of which could be turned into paper products, while the rest could be turned into biofuels or mixed with soil to provide fertilizer.³⁴

In the face of these market dynamics, Tranlin saw an opportunity to raise output of its straw paper products and capture the market that its competitors had relinquished. While the raw material usually comprises more than half the total cost of a paper product, Tranlin believed that by relying on straws, it would have at its disposal relatively cheaper raw materials.

So Tranlin began to expand straw production aggressively in 2010 (see Figure 4). In August 2010, it announced a \$1.4 billion greenfield investment in Dehui, Jilin province, a major logistics center in northeast China, with an annual straw consumption of 2 million tons.³⁵ At the end of 2012, two similar projects in Jiamusi, Heilongjiang province and Gaotang, Shandong province were unveiled with total investments of \$2.5 billion and \$1.7 billion, respectively.³⁶ All these sites were located close to water and straw supplies, with easy access to

transportation. Dehui and Jiamusi, for example, are near the Songhua River, the main water artery of northeast China and a major grain production base.

Nicknamed “paper city,” Jiamusi in some ways epitomizes the decline of China’s industrial rust belt. Once home to Asia’s largest paper producer, the state-owned Jiamusi Paper Mill, the company went bankrupt in 2004 and laid off 8,000 employees. In 2010, another 11 paper mills in Jiamusi were forced to close because of the imposition of stricter environmental standards.³⁷ Yuxiang Yan, Tranlin’s deputy administrative

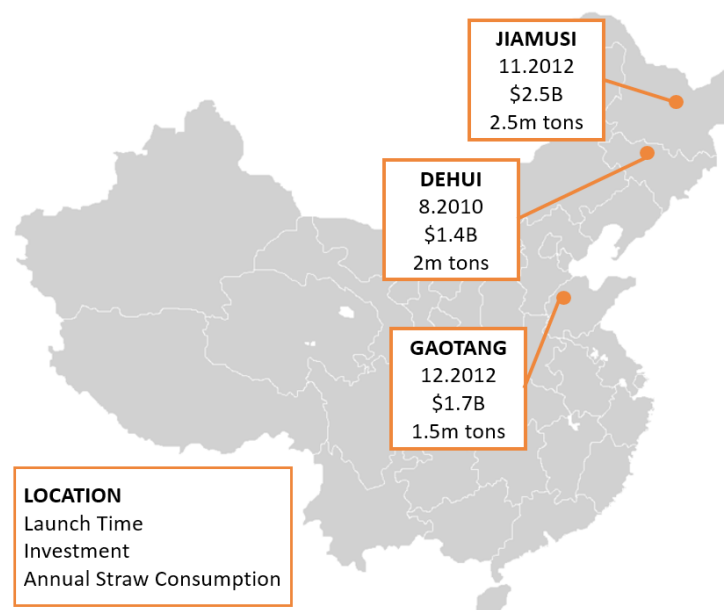
manager, noted that, “Jiamusi has a unique geographic advantage. It has 14 million mu (930,000 hectares) of rice and corn fields, and the Songhua

River provides a water supply. More important, the Tongjiang Railway Bridge nearby could give the firm access to the Russian market.”³⁸

A Little Help from State Financing

With a combined total investment of \$5.6 billion, these greenfield projects were the largest in northeast China. But they were also nearly five times Tranlin’s total assets of \$1.2 billion in 2013. Since Tranlin clearly could not make such investments on its own, it had to leverage the financial muscle of state banks and tap support from central government agencies.

What Tranlin had going for it was the alignment of its production model with China’s new national strategy of sustainable development and innovation in the economy as a whole.

Figure 4. Tranlin's Projects to Expand Production

Source: Author.

What Tranlin had going for it was the alignment of its production model with China's new national strategy of sustainable development and innovation in the economy as a whole. Thus Tranlin's early-stage R&D into clean straw papermaking in 1998 received state support to the tune of \$80 million in government grants. In 2006, the China Development Bank (CDB), an important state policy lender, loaned \$280 million to the firm to support its forest-pulp-paper integration project.³⁹ Other state-owned lenders pitched in too. To help Tranlin enhance its supply chain, the Industrial and Commercial Bank of China (ICBC) lent it \$260 million in 2007.⁴⁰ And as Tranlin became more vertically integrated with subsidiaries in its supply chain, banks sometimes

proved willing to lend to multiple subsidiaries at the same time.

Tranlin took advantage of another policy to boost its financing—the Chinese government's 2013 release of a new "Guiding Opinion on IP-Backed Commercial Loans." This allowed companies to receive loans by using IP as collateral.⁴¹ Such a regulation was released within the context of a Chinese economy facing significant headwinds from a slowing economy, overcapacity, and upward wage pressures. These factors meant that traditional manufacturers were being squeezed, and the state sought to incentivize them to make changes that would move them up the value chain and improve their production efficiency through innovation.

Of course, one of the biggest obstacles to innovation in China has been the lack of IP protection generally. Policymakers reasoned that if IP could be tied to financing, it would give Chinese companies some incentive to develop their own innovations. Tranlin drew on this opportunity, especially as some banks had proactively reached out to the company.⁴² Backed by 110 Chinese patents for its paper-related technologies, valued at \$1.1 billion, and 34 registered Chinese trademarks, valued at \$730 million, Tranlin in March 2014 received another \$1.3 billion loan from a CDB-led consortium.⁴³ “Tranlin has partnered with China Development Bank and Bank of China since 2012,” noted Yin Liu, Gaotang

County’s director of finance. “In earlier phases, they informed the banks about their technologies and investigators were sent to conduct due diligence and evaluate its IP.”⁴⁴

For private companies like Tranlin, China’s capital markets are not always as efficient as they can be. But Tranlin rode the market through claims of unique IP in the paper sector. Ultimately, it was the Chinese government that played a crucial role in securing financing for the firm, helping to offset certain deficiencies in the capital markets. The \$1.3 billion loan—ostensibly tied to Tranlin’s own IP—sent a signal that the Chinese government was serious about supporting Chinese firms in this sector.

The “Tranlin Model”

What drew the government’s attention to Tranlin in the first place? Most notably, it was the company’s “green” business model, which emphasized recycling and re-use of all waste material and residue from its papermaking process. This “Tranlin model” aligned, in a sense, with the principles of the circular economy (循环经济) that the Chinese government sought to promote.

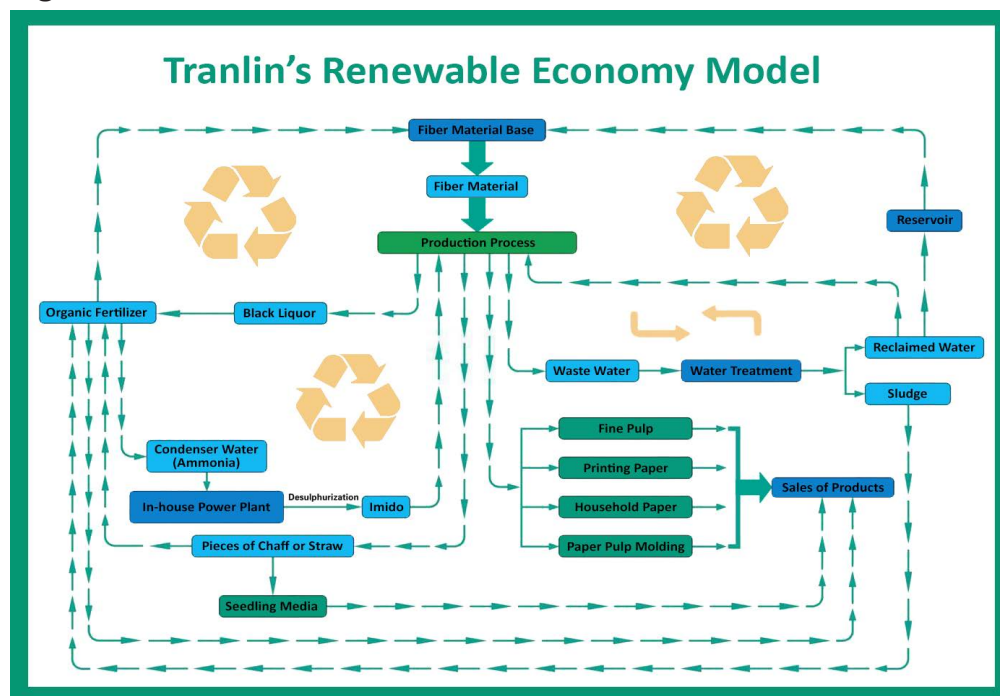
Three such circular chains are manifest in Tranlin’s production process: straw pulping and papermaking, black liquor

transformation, and wastewater processing (see Figure 5).

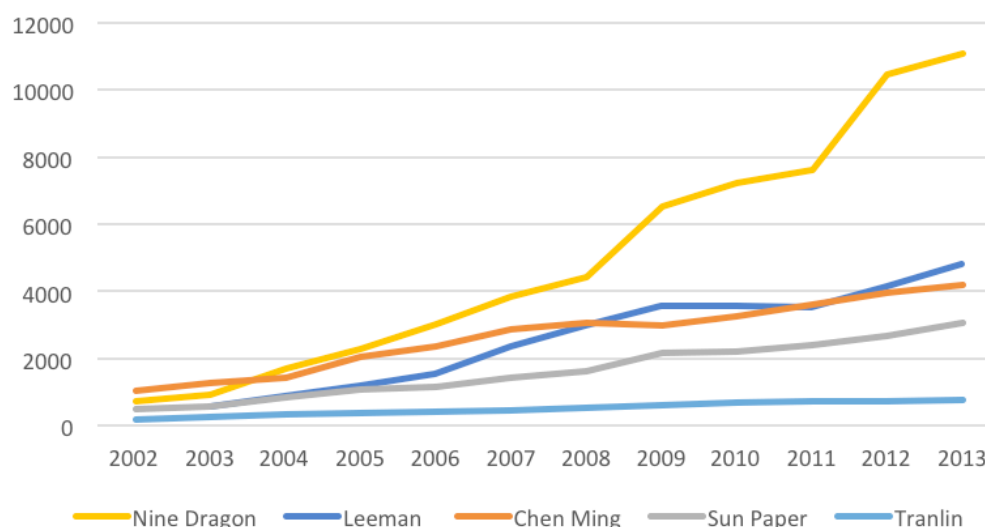
In the first “circle,” Tranlin buys straw from farmers and turns it into pulp and paper. Straw is an agricultural byproduct that is usually burned after the harvest season, causing air pollution. But by turning this waste into greater value, the Tranlin process ostensibly benefits the company, farmers, and the environment.

To secure these straw supplies, Tranlin established more than 1,000

Figure 5. The Tranlin Model



Source: Tranlin Inc.

Figure 6. Production of Top Chinese Paper Makers, 2001-2013 (thousand tons)

Source: China Papermaking Industry 2013 Annual Report, China Paper Association.

straw collection centers in 50 Chinese cities and counties. These collection centers are contracted to locals, who manage the workers, equipment, and daily operations. The local contractors, or the center managers, negotiate and sign contracts with farmers to purchase unprocessed straws. After their collection, they bundle the straws with machines, and then prepare temporary storage for future deliveries. Tranlin buys these bundled straws directly from each contractor.

To ease the financing burden for purchasing this new equipment, Tranlin provides joint liability assurance to help local contractors obtain needed loans. As of this writing, each straw collection center covers about 6,000 mu (400 hectares)

of land and generates an annual profit between \$30,000 and \$50,000. For every ton of straw, farmers can receive \$15.⁴⁵

A second “circle” involves fertilizer. During the black liquor recovery process, herb lignin is extracted from the black liquor through acidification. Nitrogen phosphorous and potassium are added into the lignin to make organic fertilizer. Tranlin sells the fertilizer back to farmers. And the filtrate from black liquor can also be made into adhesives to be sold as a product. Straw waste is sent back to Tranlin’s own power plant to generate electricity.

Finally, in the third “circle,” wastewater from the biochemical process is recycled and reused.

A “Technology-Centric” Strategy

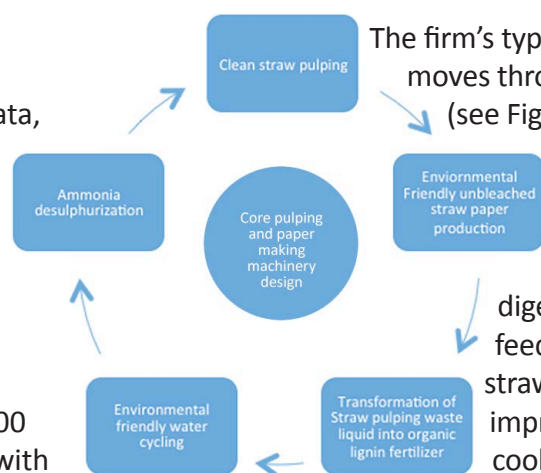
Tranlin seemed to relish its role as an unconventional Chinese paper firm. In 2003, it had doubled down on straw while the rest of the Chinese industry ran away from it. Seven years later, Tranlin launched three major capital-intensive projects across northeast China just as its competitors cut back capacity. Not surprisingly, these strategies took many in Chinese industry by surprise.

Looking at historical data, Tranlin’s bold moves yielded little in the end. From 2001 to 2013, for example, Tranlin’s production steadily but not at an extraordinary clip, expanding from 133,500 tons to 808,000 tons, with a brief dip in 2012 (see Figure 6). Tranlin became a top 20 player in the industry but only managed to achieve a market share of under 1 percent.

What, then, gave Tranlin continuing confidence in its strategy? To Tranlin’s managers, the key was its technology. Indeed, Tranlin had long been focused on enhancing the technological dimensions of the firm. It has invested roughly \$500 million in R&D since 1998 to solve various quality and environmental problems.⁴⁶ Within a

decade, by 2008, Tranlin had developed six “core” technologies that, from the company’s perspective, seemed to have satisfactorily addressed these problems. These six technologies were clean straw pulping, environmentally friendly straw paper production, transforming liquid waste from straw pulping into organic lignin fertilizer, water recycling, ammonia desulphurization, and core machinery and assembly design (see Figure 7).⁴⁷

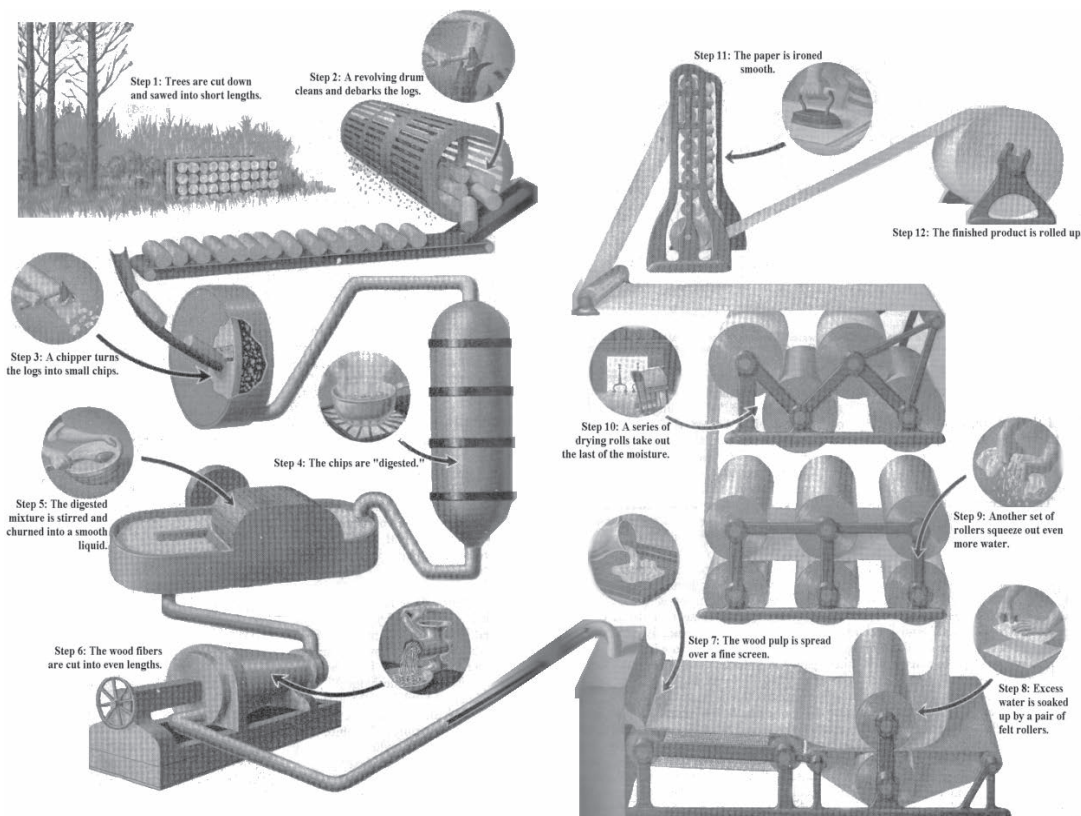
Figure 7. Tranlin’s Six “Core” Technologies



Source: Tranlin, Inc.

The firm’s typical production process moves through several stages (see Figure 8). First, straw moves from the raw material preparation area along a conveyor belt to the top of the digester where the screw feeds it to the digester. The straw then goes through the impregnation, heating, and cooking zones, at the end of which liquid is withdrawn to the hot liquid tank and replaced by washing liquid. The pulp then travels down the digester through the high-heat washing zone and is cooled off in the blow tank at the bottom of the digester. Tranlin’s core technologies sit in three particular segments of this process: fine material preparation, displacement cooking, and oxygen delignification.⁴⁸

For fine material preparation, for instance, Tranlin developed a hammer mill and cylinder cyclone separator that can sort out impurities in the straw

Figure 8. Diagram of the Pulping Process

Source: The Papermaker's Companion.

Box 2: Tranlin's Other Technological Developments

By 2001, Tranlin had found that lignin in black liquor could be turned into fulvic acid, a very good ingredient for making organic fertilizer. The company then focused on developing the process of transforming black liquor into organic fertilizer, which culminated in the establishment of the Tranlin Jiayou Fertilizer Company in 2002. This subsidiary would become the largest organic fertilizer manufacturer in China, with an annual capacity of 400,000 tons in 2014.⁵²

In 2003, Tranlin successfully developed a non-wood fiber replacement and continuous digesting process, which can save 20 percent of energy compared to the traditional method of boosting the black liquor extraction rate to 92 percent.⁵³ By then, Tranlin had become a sizable company with annual sales of \$180 million.⁵⁴

with high efficiency, thereby raising the straw acceptance rate from 75 percent to 92 percent.⁴⁹ This greatly purifies the final raw materials that are fed into the pulping machine.

Tranlin's second innovation involves displacement cooking, which allows liquor to be withdrawn from the digester for indirect heating and delivery to the flash tank. Through the circulation process, Tranlin claimed to have successfully reduced the viscosity of black liquor, making straw liquor withdrawal possible. This improved process increases the black liquor extraction rate from 85 percent to 92 percent and reduces pollutants in the wastewater, according to the company.⁵⁰

Finally, Tranlin's process includes oxygen delignification in the non-wood pulping process, which effectively removes the remaining lignin from pulp without a bleaching process. Tranlin claims to have completely eliminated the bleaching process, which conserves washing water and prevents the formation of high-polluting absorbable organic halogen (AOX) compounds (see Box 2).⁵¹

Tranlin claims other achievements as well—for instance, the world's first fully automated continuous digester

for non-wood pulp production that was unveiled in 2014. This technology allows the mill to produce both unbleached and chlorine-free bleached pulp. Hou-min Chang, Professor Emeritus at North Carolina State University, has described this as “a major breakthrough” for Tranlin: “the [previously used] continuous digester was not...feasible for straw pulping.”⁵⁵

Then there is Tranlin's recycling process for wastewater. Three types of wastewater are involved in a papermaking process: black liquor, white water, and mid-water. Black liquor is the waste liquor after the cooking process, mid-water is formed by the washing process, and white water comes from the final stage where pulp becomes paper. In Tranlin's process, the company turns the black liquor into organic fertilizer, reuses the white water, and purifies the mid-water through the wastewater treatment process. Since 2013, Tranlin has put the mid-water into a 1,566 mu artificial wetland, which can process 20,000 tons of wastewater daily. As a result, Tranlin stabilized its COD emissions to under 40mg/L and ammonia nitrogen to 2mg/L, and has reportedly eliminated the negative

Confronting Competition

As China prepared to enter the World Trade Organization (WTO) in 2001, Li Hongfa observed in an interview that “the wolves are coming.”⁵⁷ While Chinese media and public opinion celebrated WTO entry as a national achievement, many Chinese entrepreneurs, much like Li himself, viewed the change as the beginning of a battle to come.

To these executives, embracing globalization meant that Chinese companies would now be pitted against global heavyweights (“the wolves”) and needed to prepare for intense competition. But this competition would not just be global but also domestic, as Chinese firms struggled to compete against each other for market share and new business opportunities.

Along the way, Li and Tranlin learned a few lessons.

Lesson 1: Antidumping

First, Tranlin had to navigate the world of WTO-related antidumping suits. In 2001, China’s total paper and

cardboard output was just 32 million tons, a mere one-tenth of total world output. Wood pulp paper represented 19 percent of total pulp output, compared to the world average of 50 percent.⁵⁸ This suggested that Chinese paper products were still concentrated at the lower end of the value chain. In the late 1990s, Tranlin had gained some experience with higher quality products as it imported and assembled its first coated-paper production line from Austria. Since demand proved

to be relatively robust, by 1999, the company’s annual output of coated-paper had reached 130,000 tons.⁵⁹ But with China’s entry into the WTO, the winds of the market shifted.

Tranlin now had to quickly adjust to the rules of global competition. Even before its WTO entry in 2001, China faced competition from foreign producers of coated paper, including South Korea, Japan, and the United States. As early as 1998, domestic Chinese papermakers had noticed that coated paper imports from Korea were \$100-\$200 lower per ton than the domestic price, and certain Japanese products were up to \$300-\$400 cheaper per ton.



Photo: Flickr/Thomas Hawk

For Chinese producers, this presented an opportunity to pursue antidumping action against their foreign competitors. “It appeared like smuggling initially, but we kept seeing low prices with large quantities and we noticed that something was wrong. We believed it was dumping,” argued a representative of Jiangnan Paper.⁶⁰ In 2001, therefore, a consortium of Chinese papermakers, including Tranlin and Jiangnan Paper, requested MOFTEC, the predecessor to China’s Ministry of Commerce (MOFCOM), to investigate the conduct of foreign competitors.⁶¹

This was China’s first antidumping case after joining the WTO. The case took one and a half years to investigate, starting from February 2002 to the actual imposition of antidumping duties on coated paper in August 2003 for a period of five years. One year later, the price of coated paper rose from \$6,000/ton to \$7,200/ton. “We were not afraid of trade friction. This was an exam for us and we learned a lot from it,” Li subsequently recalled.⁶²

Indeed, after further investigation from August 2008 to 2009, the duties were extended for another five years until they were lifted in September 2014. Only then were Japanese and South Korean producers no longer subject to additional tax of 9.71 percent and 4.51 percent, respectively, when exporting their products to China.

During the investigation period, China’s total coated paper imports fell from

875,000 tons in 2001 to 615,000 tons in 2002, down 30 percent—something that likely helped Tranlin, Jiangnan, and other Chinese producers. (However, total imports from Japan and South Korea only declined by 14,000 tons, accounting for just 5 percent of the total decline in imports.)⁶³

Lesson 2: Antitrust

A second lesson for Tranlin involved alleged monopolistic competition from foreign players. Specifically, Tranlin faced fierce competition from Tetra Pak, a Swedish food packaging company with annual sales of €11 billion (\$12.3 billion) in the “aseptic packaging” market—a process by which a sterile product is packaged inside a sterile container. This “David vs. Goliath” battle received extensive Chinese media coverage at the time.

Having entered the China market as early as 1972, Tetra Pak had brought its advanced aseptic packaging technologies to the daily lives of many Chinese consumers. Its packaging prolonged the shelf life of milk and beverage products and thus helped to facilitate the rise of Chinese dairy producers, such as Yili and Mengniu, who used their packaging. Tetra Pak bundled machinery with its packaging materials through exclusive contracts: while its Chinese customers only had to pay 20 percent of the price of machinery up front, they also had to buy the firm’s more expensive packaging materials.

This bundling strategy proved tremendously successful for Tetra Pak in the 2000s and its products soon became ubiquitous in China. For every ten milk products consumed by Chinese, one Chinese publication claimed, eight used Tetra packaging. And for each box of dairy product sold, the Swedish firm took in three-quarters of the profit, Chinese media alleged.⁶⁴ Tetra Pak ultimately commanded a 95 percent market share in China's beverage packaging industry.⁶⁵

By 2005, the Swedish firm's dominance of the China market had attracted scrutiny from the Chinese government and the firm's Chinese packaging competitors. It was accused of engaging in monopolistic practices as a result of its bundling and exclusive contracts. Under Tetra Pak's exclusivity terms, Chinese customers allegedly were not legally allowed to use the packaging materials of Chinese competitors, therefore limiting consumer choices.

Tranlin's involvement has to do with the fact that Li had decided in 2000 to enter the Chinese beverage packaging market—essentially pitting it against the dominant Swedish player. The

new business line did not initially specialize in aseptic packaging but rather in multi-layered compound packaging materials, paper cartons, and other paper packages for beverage companies. Tranlin spent \$39 million to purchase new machinery from Italy, Germany, and the United States, hoping that this would make it more competitive in the market segment.

Ultimately, in 2003, Tranlin poached two senior managers from Tetra Pak's Chinese operation, who then worked with Tranlin to create a specific aseptic packaging subsidiary, expanding the new spin-off business to focus on this specialized packaging technology. Li offered the defectors a 25 percent share in the new firm, which then poached several more experts from Tetra Pak.⁶⁶

Once ensconced as CEO of the new Tranlin Pak, Gang Hong argued that Chinese authorities should investigate his former employer for monopolistic practices in the aseptic packaging sector, which affected downstream Chinese firms.⁶⁷ In 2005, reportedly under pressure from Tranlin and a Chinese dairy company, Tetra stopped bundling its packaging materials

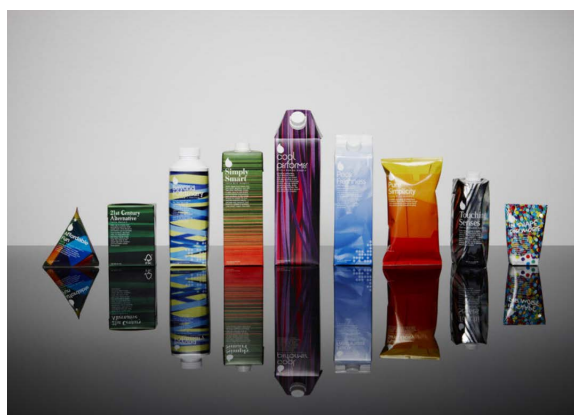


Photo: Flickr/Tetra Pak

with its other products. In 2013, the State Administration of Industry and Commerce launched an investigation into Tetra.⁶⁸

Tranlin makes much hay of its battle against the dominant Tetra Pak. But the ironic coda to this story was that Tranlin Pak simply did not prosper in this initial phase. Antitrust action could buffet a foreign competitor but not, in itself, build a successful business that aimed to enter a new business line outside its core competence. Merely acquiring advanced equipment proved insufficient. And even with its new personnel, Tranlin Pak lacked market savvy in this new area.

Indeed, Tranlin's new packaging company lost money through its first several years, partly because Tetra proved to be a formidable competitor. In the end, Tranlin sold its remaining shares in the packaging business to CDH Capital in 2005 and then Bain Capital in 2006 for a combined total of \$60 million.⁶⁹

After some market repositioning, Tranlin Pak started to turn a profit under its new owners. This owed much to the fact that by 2006, Tetra Pak simply could not meet demand, which was expanding rapidly in China. By 2010, when Tranlin Pak became a publicly listed company in Hong Kong as "Greatview Pack," it had become

the world's second-largest global aseptic packaging supplier.

Dances with Wolves

These and other lessons taught Tranlin that it would need to compete vigorously in the marketplace, including by attempting to use global and national rules as shield and spear. And these experiences also trained Tranlin's gaze on the global marketplace.

"Huawei, Lenovo, and Haier's stories inspired me a lot," recalled Li, who is fond of reading management books.⁷⁰ Indeed, he wanted to make Tranlin

into a global player like these firms, rather than settle for being just a Chinese company. Li's ambition

for Tranlin was to export its own technology, not just its products. By early 2010, then, as Tranlin's clean straw-pulping technology matured and product performance and emissions standards improved to global levels, Tranlin began to explore the possibility of internationalizing its operations.

Like many Chinese companies, Tranlin first tested global demand for its products by evaluating the international response to its exports. It launched unbleached straw food packaging products in early 2010 in both the domestic and international

Like many Chinese companies, Tranlin first tested global demand for its products by evaluating the international response to its exports.

markets. By 2014, the company's annual sales of packaging boxes had reached \$10 million, with a 32.8 percent year-on-year increase, leading to a 2-3 months lag in inventory.⁷¹ The firm attributed this seemingly robust demand largely to foreign markets. Of the firm's total output, 90 percent was exported to over 30 countries, while just 10 percent was sold in China (primarily in Beijing and Guangzhou). After four years, the company had made scant progress in cultivating Chinese customers.⁷²

One reason for this could be chalked up to the price premium for straw paper products. An unbleached food packaging box costs around \$0.08, five times the cost of foam plastic products (the disposable takeout boxes used by most small restaurants in China).⁷³ "Our products were overwhelmingly welcomed

by overseas customers because they were seen as environmentally responsible. However, many domestic restaurants were scared away by our high price," said Guo Xiyan, Tranlin's director of public relations.⁷⁴

This healthy international demand for Tranlin's packaging boxes in foreign markets gave the firm greater confidence about its potential to compete on the global stage. But Tranlin did not necessarily enjoy a cost advantage, not least because of the long shipping distances involved for its products to reach consumers abroad. Because of the low value-to-weight ratio, cutting these transportation costs could lead to major savings for customers of straw paper products. Setting up overseas facilities, close to both raw materials and the customer base, could achieve these objectives.⁷⁵

To the Commanding Heights: Capturing the US Market

Once it began to look overseas, Tranlin decided to start with the United States. “If the American customer accepts our products,” said Jerry Peng, who led Tranlin’s US market entry effort, “then people from other countries will also like our products.”⁷⁶

Peng had joined Tranlin in 2012 as the company’s chief strategy officer and then went on to lead its US market entry effort. Peng was a seasoned finance professional, with 15 years in senior roles with Goldman Sachs, Morgan Stanley, and Standard Chartered Bank. But it was his affiliation with the Darden School of Business at the University of Virginia (UVA) that proved most helpful in establishing Tranlin’s presence in the United States, since Peng had strong connections in the state of Virginia where the Chinese company ultimately invested.

Peng and Li first met in 2009, and Peng soon began to provide strategic counsel to Tranlin in his role as a managing director at Goldman Sachs. “My influence then was limited because I was an outsider. Chinese companies were always skeptical about that,” Peng recalled. But in 2012, when Tranlin began seriously considering expanding overseas, Peng became a go-to advisor.⁷⁷ This was a mutually

agreeable arrangement since Peng was also looking to move from banking to entrepreneurship. Recalled Peng in an interview, “Banking is like riding a horse. You find a good horse, climb on the horse’s back, ride it for a while, and then jump onto another one. Entrepreneurship is different: it is more about long-term vision.”⁷⁸

A Global Market

Tranlin contemplated global expansion at a moment when the paper market was experiencing turbulence. A 2010 assessment from Finland’s Helsinki University of Technology noted, for

Tranlin contemplated global expansion at a moment when the paper market was experiencing turbulence.

example, that “market growth in North America and Europe is below GDP growth, price

differentials between suppliers are marginal at best, switching costs are low and negotiation power lies with the customers. Radical changes are needed, if suppliers want to break out.”⁷⁹

In essence, papermaking is a legacy industry that has been around for more than a century, led by the United States and Europe. But since the 1990s, the paper industry in both North America and Europe has suffered declining profits and general weakness, with new investments heading mainly to Asia and South America.⁸⁰

A large part of the trouble bedeviling the paper industry can be traced to important structural changes in the global pulp and paper markets, including overcapacity, stagnant demand, rising input costs, and changes in end-user demand as household paper and package products have become more of a driver than demand from printing and writing.

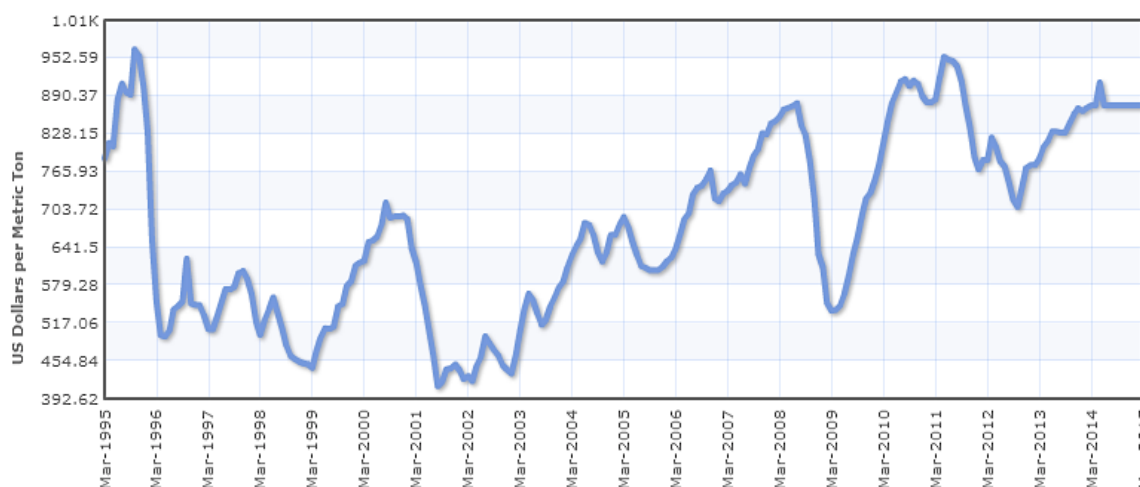
Communication paper, which primarily encompasses printing paper and newspaper, has been hardest hit because of the mass digitalization of media and printed content. By contrast, packaging and household paper, such as paper towels and toilet paper, where Tranlin has chosen to focus, are still seeing stable growth. In 2013, firms in Germany, Sweden, and Finland—the three largest paper suppliers in Europe—all cut back output

of communication paper and increased their production of household paper.⁸¹

And then there is the raw materials sector: waste paper has become by far the most common type of fiber used in papermaking, with its share of papermaking inputs growing from under 40 percent in 1990 to 57 percent in 2010. Meanwhile, the share for wood pulp has declined proportionally from 60 to 43 percent.⁸²

The market share of non-wood input, meanwhile, including straw and bamboo, has been relatively flat over the past decade, constituting less than 2 percent of fiber used by paper mills. Another feature of the non-wood fiber paper market is fragmentation: no single company has more than a 4 percent share. Tranlin today, for example, produces just about 2 percent of the

Figure 9. Global Wood Pulp Prices, 1995-2015



Source: Index Mundi.

industry's non-wood pulp.⁸³ Finally, the high price of wood pulp in recent years has also led papermakers to favor straw pulp as a raw material. Because of increasing demand, the price of wood pulp has more than doubled since 2002, climbing from below \$400/ton to over \$900/ton, while straw pulp costs two-thirds as much (see Figure 9).

The confluence of these factors—increasing demand for household paper and packaging materials, the rising cost of raw materials, and the growing emphasis on environmental protection—all seem to suggest a niche market existed for unbleached

straw paper products. But high shipping costs—and the price premium these products command—suggest that the export model may not be an optimal choice in the long run. By producing directly in the United States, Tranlin aimed both to cut costs and to obtain ready access to a mature market full of environmentally conscious consumers with the highest per capita consumption of paper products.

Within that context, in early 2013, Tranlin made a decision to invest in the United States. It aimed principally to build up scale in the US market before competitors in the straw products segment emerge and move in.

Finding a Home in America

Tranlin began its US-based site selection process in early 2013, with the expectation of building an advanced manufacturing plant equivalent in size to its three ongoing projects in China. The firm's key consideration from the outset was to assure easy access to both raw materials and customers.⁸⁴ Soon, the company narrowed its search to the Midwest, the Southeast, Texas, and California.

Initially, California had the inside track because Tranlin wanted to present an advanced manufacturing story and the state was, from the firm's perspective, home to technology leaders and industry titans.

California was also viewed as a "green," or environmentally conscious state, with a large pool of wealthier consumers who would pay a premium for Tranlin's green paper products. With this in mind, Peng, Tranlin's chief US advisor for market entry, made initial contact with California's economic development authorities.⁸⁵

To Peng's dismay, however, the Golden State soon presented an array of challenges for Tranlin. For one, the

prospective production site would need an abundant supply of water and energy—and at competitive prices, which the state did not offer.

What was more, from Tranlin's perspective, numerous criteria need to be met for a site location to accommodate a competitive and sustainable advanced manufacturing center. These included: shipping distance to straw and consumer

markets, the overall tax burden, quality and efficiency of government agencies, transportation systems, and a supply of skilled workers.⁸⁶ Yet on too many of these counts, Tranlin concluded that

California came up short. After careful field study and evaluation on the west coast, Tranlin decided to search for alternatives in the summer of 2013.

Virginia Is for (Chinese Investment) Lovers

Tranlin soon turned its sights to the American southeast, and specifically to the state of Virginia. This state was certainly no stranger to economic linkages with China. In 2013, China



Photo: Flickr/CGP Grey

became the top export market for Virginia agriculture and forestry products. And over the prior 14 years, Virginia had received some \$8.8 billion in Chinese investment.⁸⁷ Indeed, one of the most high profile Chinese investments ever in the United States, Shuanghui's \$4.7 billion acquisition of Virginia-based Smithfield Foods in 2013, helped put the state on the map for Chinese investors. In 2013, Virginia also signed a \$300 million soybeans export deal with China.

To develop more opportunities in China, the Virginia Economic Development Partnership (VEDP), the state's economic development authority, had opened an office in Shanghai in 2011—its third office in Asia, after Tokyo and Hong Kong.

But that was not at all. Tranlin also had a key Virginia connection in Peng himself, an alumnus of the Darden School of Business at UVA. In July 2013, at around the same time Shuanghui was pursuing its Smithfield acquisition, Peng reached out to then Virginia Secretary of Commerce and Trade Jim Cheng, a fellow Darden alumnus and a trustee on the Darden school board. Peng told Cheng that California was likely out of the running as a prospective site for a new Tranlin plant and asked whether Virginia might be supportive of the firm's plan. Cheng notified Roy Dahlquist, Managing Director for Asia at the VEDP, which had been created and was still supervised as a public agency by the state legislature, the General Assembly.⁸⁸

Having worked for 12 years at Reynolds Metal in Shanghai, Dahlquist had deep experience dealing with Chinese companies. And so after studying Tranlin's criteria, he proposed three cities—Richmond, Danville, and Hampton Roads—as possibilities for the project and asked local economic development authorities to prepare pitches.⁸⁹

Yes, Virginia!

Fortuitously, Tranlin's interest in Virginia coincided with the state's own desire to diversify its economy. Traditionally dependent on defense industries and federal funding, Virginia had been actively looking for more sustainable and diversified growth model. Dahlquist recalled in a subsequent interview, "Virginia was in a position where we had historically depended on the federal government, military, defense for a lot of jobs. In our new economy, we can't do that."⁹⁰

Within a week of the proposal moving to Dahlquist, Peng's team sat down with economic development representatives from the three Virginia regions, as well as then Governor Robert McDonnell, the Secretary of Agriculture and Forestry Todd Haymore, and Secretary of Commerce and Trade Jim Cheng—a very senior executive team that Dahlquist had quickly assembled.⁹¹

During the meeting, the state introduced its investment policies and utility

costs, while the three regional teams each provided an overview of their respective populations, labor force, and transportation networks. The Virginia state government was particularly keen to emphasize its low utility cost of just \$0.06/kwh. But its pitch included other factors as well, not least convenient transportation with the sixth-largest port in the United States at Hampton Roads, which had done more than 78 million short tons of cargo volume in 2013.⁹² The Virginia team also touted right-to-work legislation in the state, which has proven important as part of pitches to Chinese investors in other states as well.⁹³

“We told [Tranlin] that they could reach two-thirds of the American population with an overnight delivery and noted that Dulles International Airport up in northern Virginia has direct flights to



Photo: Flickr/Bob Mical

China. We also talked about the fact that people could bring in raw materials in early stages from within a 2-hour drive,” recalled Greg Wingfield, Richmond’s representative at the pitch meeting who had helped build the Greater Richmond Partnership from the ground up.⁹⁴

In 2013, Richmond was home to 155 international companies, 45 of them German, 35 British, 20 Japanese, and five Chinese. The area has had a mixed

history with foreign investment, in part because semiconductor manufacturers had invested \$2 billion and hired 2,500 people in greater Richmond but went bankrupt in 2009 and left unemployment in their wake.⁹⁵

Richmond expected Tranlin’s investment, if successful, to generate the same amount of employment that the region had lost to the collapse of the semiconductor business. But in addition to creating jobs, Richmond also hoped Tranlin would establish a new market for local farmers who would sell agricultural waste to the papermaker.

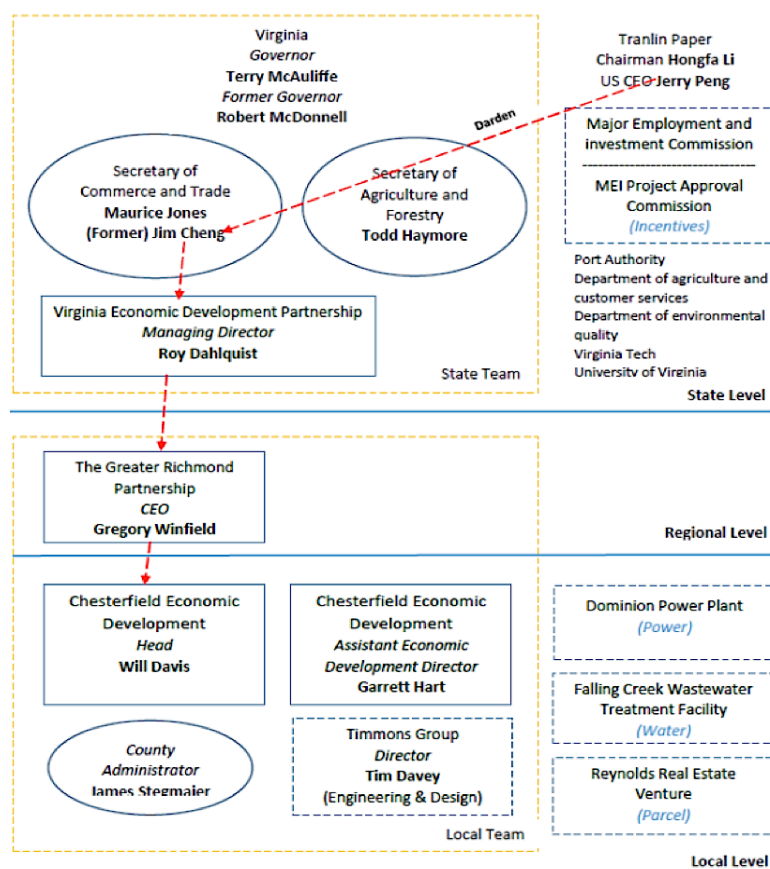
For its part, Tranlin proved receptive to Virginia’s proactive approach to attracting Asian companies to the state. Virginia officials, meanwhile, recall being impressed by Tranlin’s technology

and business model, which they believed matched well with the state’s sustainable development initiatives.

The “Cavalier Club”

In January 2013, as Tranlin sought to pursue its US expansion, Peng began to assemble a small project team comprised entirely of the Darden network (see Figure 10). Dubbed “Project Cavalier” after the UVA

Figure 10. The Project Cavalier Network



Source: Author.

mascot, Peng first brought on fellow Darden alum, Yue Zhu, to help with site selection and a feasibility study. In the wake of the project announcement in June, Peng then tapped Jill Douthit, yet another Darden alum, to join the team. Douthit had been Peng's classmate twelve years earlier and the two had worked together as student leaders of Darden's "International Business Society." But Peng wasn't done recruiting from Darden: in addition to Yue and Douthit, he brought on three

student consulting teams from Darden to work on branding strategy, marketing, and straw supply chain issues for Tranlin's prospective US operation.

Douthitt had served as Chief Financial Officer in a fresh and organic foods company in Charlottesville. Now, she assumed the same role at Tranlin, taking up broad responsibilities that included supervision of accounting and information technology, overseeing human resources, and handling initial

vendor system selection. Yue, by then a second-year MBA student at Darden, served as board secretary and, upon graduating, formally assumed the full-time role of director of strategic development. Where Douthit focused on administrative and business process issues, Yue focused on engineering and strategy work, supervising projects around straw supply sourcing and the handling of natural gas providers, while also doing preparatory work for environmental permitting.⁹⁶

Site Selection Criteria

By late September 2013, Tranlin's Virginia team met again to discuss and finalize the criteria for site selection. According to Douthit, the team settled on seven main requirements:

1. An 800 to 2,000 acre parcel of land ready for construction;
2. Sufficient straw supply within a roughly 100-mile radius of the facility;
3. Close proximity to a river, in order to secure the 25 million gallons of daily water supply needed (and to save cost by shipping on barges);
4. Easy access to an existing power grid to meet the early-stage requirements as internal power generation sources were being developed;
5. Abundant and competitively priced natural gas supply;
6. Well developed transportation infrastructure, such as ports, highways, and rail;

7. A willing and skilled workforce of 2,000, with minimal training needs.

Having settled with Tranlin on these seven criteria, the economic development groups went out to identify potential sites for the project.⁹⁷ They arranged meetings for Tranlin with various local stakeholders, such as the Port Authority, Dominion Resources, the Virginia Department of Agriculture and Consumer Services, and the Virginia Department of Environmental Quality. These meetings aimed to help the Chinese company become more comfortable with the state's transportation, electricity supply, and agricultural endowments and networks. The team also worked with Virginia Tech, a state university, to provide agricultural data and analysis.

The Virginia state government also retained a top law firm to conduct due diligence on Tranlin's technology. "It was still counter-intuitive for many that a Chinese company would be bringing new technology to the United States," Peng recalled. "But after the diligence effort, Virginia concluded that Tranlin's IP position was exceptionally strong."⁹⁸ For the state, this apparent validation from the diligence process bolstered Tranlin's credibility.

Government Relations

In October 2013, VEDP invited Tranlin for site visits to seven locations it had hand-picked with the three regional

governments. Hampton Roads proposed two sites in Isle of Wight County, Danville selected two sites in the Berry Hill Mega Park in Pittsylvania County, and Richmond picked three sites, two in Henrico County and one in Chesterfield County.⁹⁹

This time, Peng brought a larger delegation that included Tranlin's Chairman Li and a Liaocheng delegation that included Lin Haifeng, the Municipal People's Congress Chairman and Communist Party Secretary. As the second-largest private taxpayer in Liaocheng, Tranlin's success was vital to the local government, thus its interest in Tranlin's overseas expansion. In this sense, the trip was not just a site visit, but reflected an effort by Liaocheng to establish government-to-government relations with municipalities in Virginia.

At the government level, the outcome of these meetings was the signing of a Memorandum of Understanding (MOU) on Exchange and Cooperation between Virginia and Liaocheng. Similar to other MOUs, the Virginia-Liaocheng agreement covered three areas: high-level visits, bilateral trade and investment, and cultural exchange.

But Lin also took the occasion to regale his Virginia audience with a story about a Liaocheng-born American woman, Moe Brock, a former US missionary who had sold all her properties at the age of 83 and returned to Liaocheng to help people in need. "Virginia is for lovers," said Lin, "but Moe Brock brought a lot of love from America to China. And we hope future generations will pass on the love between us."¹⁰⁰

The delegation also held a county-to-county meeting between Gaotang and Chesterfield. Jay Stegmaier, another

UVA graduate, attended the meeting as the Chesterfield county administrator and told the Tranlin team that the project could go forward in his county.

"Jay's participation was critical to give the company

comfort," said Will Davis, head of the local development authority Chesterfield Economic Development (CED). "Because of the close government interaction they have in China, Tranlin wanted to see equally strongly that our state government and local government supported the project. And that it wasn't just a business deal but a government-approved-type of business deal." In this sense, said Davis, his biggest personal lesson from working on the project had



Photo: Flickr/John Lillis

more to do with business culture than business strategy.¹⁰¹

For Tranlin, that level of government support was effective. After two additional visits in December, Tranlin seemed to lean favorably toward the Chesterfield County site. The county was business friendly, boasting Capital One, Sabra Hummus, and the landmark Amazon fulfillment center.

A New Governor Doubles Down on Tranlin

When Terry McAuliffe was inaugurated as Governor of Virginia in January 2014, he brought with him a new Secretary of Commerce and Trade, Maurice Jones. For Tranlin, a new team was concerning since the Chinese firm had no assurance that the new governor and his aides would support their project.

But McAuliffe embraced Chinese business. An electric vehicle (EV) firm he founded in 2012, GreenTech, had been acquired by a Chinese EV maker, MyCar. McAuliffe had used EB-5 visas, an immigration program tied to direct investment, to attract Chinese investment to his firm. These experiences gave the new governor exposure to and a connection with Chinese business and culture.

McAuliffe soon reached out to Tranlin. As Governor-elect, he assured the Chinese company that he would support the project, floating the possibility of tapping

the Governor's Opportunity Fund, a discretionary fund available to the Virginia governor to secure a business location or expansion project in the state.¹⁰²

Chesterfield Says "Mei Wenti" ("No Problem")

Courted by the new state-level executive team, Tranlin made another site visit in January 2014 and further narrowed down its choices to the James River Industrial Center in Chesterfield and the Berry Hill Mega Park in Danville.

"Starting in early 2014, things shifted to the local level and we basically followed up with some research on labor and transportation," said Wingfield, key representative of the Greater Richmond Partnership. He continued, "The company had a lot of questions about the site, and water and sewer and taxes and gas, and all the other things with the site's specifics." In Chesterfield, for example, Will Davis and his assistant director Garret Hart led a project team to help answer these questions.¹⁰³

The Chesterfield team involved a county partner, Timmons Group, a Virginia-based site engineering and planning company, which helped conduct site planning. Going with Timmons saved Tranlin some time because the engineering firm already had experience surveying the 850-acre site in question for another project that ultimately fell through.

But communication over the site design and planning eventually proved difficult as the teams from Chesterfield and Tranlin struggled to bridge cultures and languages. Much was “lost in translation” and the discussions foundered. Tim Davey, a director of Timmons Group, and Chesterfield’s Garret Hart decided to travel to Shandong in an effort to work out kinks directly with Tranlin’s leadership.

Once in Shandong, Hart and Davey worked closely with Tranlin’s Chinese engineers to make sure they understood the project and how it would fit onto the site. They also delivered more information about Chesterfield utility costs in an effort to alleviate Tranlin’s persistent concerns about access to sufficient water and power, and their respective cost.

Ultimately, argued the Chesterfield team, the James River Industry Center was well positioned for Tranlin’s vision for the project. Its falling creek water treatment facility sat less than four miles from the site, with a Dominion power plant just one mile from the site. “They could get the water directly from the James River,” said Hart, “but we had in our sewage treatment plant cleaned sewage water in the range of 14-17 million gallons a day. We offered this water to them at a minimum cost to take less treatment than the river water.”¹⁰⁴

The Dominion power plant was particularly crucial for Tranlin’s energy requirements. As the largest coal-fired facility in the state, the plant aimed to meet part of the Tranlin plant’s needs, with the rest coming from a new steam plant that Dominion planned to build. According to Hart, Virginia Power put an additional offer on the table, assuring the Chinese firm that it would invest in a steam plant. This gave another boost to the Chesterfield site.

As the project moved forward, both sides became increasingly comfortable as a relationship gradually formed between Tranlin and the Chesterfield team. Hart, who says he now has numerous friends

in China, recalls hugging the Tranlin team every time a solution to this or that business problem was reached. Certain issues, he recalled, were sorted out at the dinner table rather than in the meeting room.

Hart even learned some Chinese phrases in the process, particularly “*mei wenti*,” which means “no problem” in Chinese. “We were able to listen in the process and say ‘no problem,’ in response to their concerns, which put us in a very good position.”¹⁰⁵

By contrast, the other two prospective Virginia sites under serious consideration fell short from Tranlin’s perspective. In the case of Berry Hill, for

“We were able to listen in the process and say ‘no problem,’ in response to their concerns, which put us in a very good position.”

instance, the absence of a site ready for construction and complex permitting hurt that site's prospects. The industrial park authority there ran into a chicken and egg problem: it needed grading permits for wetlands and stream mitigation from the US Army Corps of Engineers in order to attract industry to site their plants. But the US Army Corps didn't want to give a permit because no prospective industrial plant had been identified yet.¹⁰⁶

So Chesterfield won the day. For Tranlin, it fit the firm's needs—port access, sufficient water and power supply, and, to quote Hart, a “*mei wenti*” attitude when it came to

granting permits. During their final site visit, the Tranlin team spent three hours on a scorching day in a Chesterfield-offered sewage treatment facility, inspecting its water treatment process.

“One of Tranlin's chief operation officers is a licensed operator for its treatment facility in Shandong, so he had a very large personal interest in how that process occurs,” said Hart. “Tranlin,” he continued, “is a very environmentally conscious company. They actually run and operate the sewage treatment plant not only for their own facility in Shandong but for other sewage as well.”¹⁰⁷

Figure 11. Tranlin Site in Chesterfield County



Concept of 850-acre Tranlin Campus in JRIC



Source: Tranlin, Inc.

This last visit finally alleviated Tranlin's concern about locating its plant in Chesterfield. On June 18, 2014, after months of negotiation, site visits, and planning, Tranlin announced a \$2 billion greenfield investment in Chesterfield County, Virginia—the largest such Chinese greenfield investment in the United States to date (see Figure 11).

Peng and McAuliffe waxed lyrical at the opening ceremony.

“Tranlin is headquartered in Shandong, China, the home of Confucius—a philosopher whose thought shapes much of Chinese culture. It is a delightful coincidence that Tranlin's first overseas investment is in Virginia, the home of Thomas Jefferson, whose ideas permeate US culture and history as founder of the University of Virginia and author of the Declaration of Independence,” Peng remarked, as he opened his speech to celebrate the occasion.¹⁰⁸

McAuliffe, for his part, welcomed the deal with a \$5 million check from the Governor's Opportunity Fund aimed at helping Tranlin build the factory. And the state provided funding for workforce training from the Virginia Jobs Investment Program.¹⁰⁹ By locating in an industrial zone, Tranlin will also enjoy breaks on permitting fees and a five-year waiver on machinery and tool taxes. According to VEDP, the total

benefit to Tranlin could ultimately add up to as much as \$31 million.¹¹⁰

Soon after the announcement, the state organized a China trip, led by Governor McAuliffe and with a delegation to Shandong joined by Hart and Stagmaier from Chesterfield County. In addition to visiting Tranlin's 5,000-acre campus at headquarters and discussing further cooperation, the delegation was feted at a luncheon that included fried cicadas, a traditional delicacy from Shandong.¹¹¹

Big Local Impact?

Tranlin's considerable investment is expected to create 2,000 direct jobs

“Chesterfield's brand is quite sticky in China right now, so we need to take advantage of that and focus our efforts in China.”

once the entire facility is complete and to create a sizable market for purchasing agricultural waste from local famers.

The project involves three modules, with two production lines—for paper and fertilizer—and shares a wheat product treatment facility and a natural gas cogeneration plant that produces electricity.¹¹²

The plant expects to consume \$50 million worth of straw (wheat straw in spring, corn straw in autumn) to produce hundreds of thousands of tons of straw pulp each year. Twenty-five million gallons of water per day will be needed for production. The plant will begin construction in 2016 and launch its first module in 2017. The entire

project will be built in several modules, with full completion expected in 2020.

Tranlin's products in the US market are likely to cover several categories: household paper products (facial tissues, napkins, and toilet paper), food and medical packaging products (food wrapping paper, paper cups, and bento boxes), and food and medical containers (disposable hamburger boxes, lunch boxes, cups, plates, and industrial packaging linens) and humus-based organic fertilizer.

With the Tranlin deal sealed, several of the key players on the Virginia economic development teams departed. In October 2014, Wingfield announced his retirement from the Greater Richmond Partnership after 20 years of service.¹¹³

Davis, too, stepped down from CED. With various projects in the pipeline, Wingfield and Davis reckoned it was a good time to make room for a new generation of successors.¹¹⁴

More broadly, though, publicity surrounding the Tranlin investment elevated Chesterfield as a destination for Chinese investors. Shortly after the announcement, a local developer partnered with a Chinese investment group, Jinma Group, on a \$160 million project to build an indoor water park and convention center in Chesterfield.¹¹⁵

Stegmaier frames the experience this way, "Chesterfield's brand is quite sticky in China right now, so we need to take advantage of that and focus our efforts in China."¹¹⁶

Aftermath

Having commenced in July 2013 and ending in June 2014, the Tranlin-Chesterfield deal process took just 11 months. Such speed was crucial for Tranlin as it sought to solidify a first-mover advantage. Since the straw paper market is still nascent and highly fragmented, companies that could rapidly ramp up scale could enjoy a comparative advantage and capitalize on expanding market share.

New Market Entrants

Why was Tranlin in such a hurry? The fact is, Tranlin's was not the first project in the United States to use straws for pulping. Startups had quietly entered this market in early 2013, and competition was already intensifying.

One example was Columbia Pulp, which in December 2013 announced an investment to build a wheat and alfalfa straw-based pulp mill in Columbia County, Washington state. This mill was projected to consume 240,000 tons of straw annually and produce 140,000 tons per day of wet lap pulp to be sold to paper mills. It was also projected to produce 26,000 tons of soil amendment

additives, a supportive fertilizer, from the waste.¹¹⁷

Another example was the Canadian company, Prairie Pulp and Paper, which also announced a paper mill project in 2013 that would sell paper made from 80 percent wheat straw and 20 percent recycled fiber. Already manufacturing its products in India, Prairie's straw paper products, branded as "Step Forward Paper," are now sold by Staples, the office supply store, and have even received the celebrity endorsement of Woody Harrelson.¹¹⁸



Photo: Tranlin, Inc.

But Tranlin also faced competition closer to home. The 65-year-old Taiwanese paper company YFY likewise established a new straw paper package brand, "Npulp," in 2013.

Like Tranlin, YFY started the development of clean straw pulping technology more than a decade earlier and had discovered a different biochemical process that mimicked a cow's digestive process. Instead of turning black liquor into fertilizer, YFY transformed the waste into fungi bags and fuel rod. The company invested \$250 million to produce straw

packaging materials in Yangzhou,¹¹⁹ a southern Chinese city, and boasted Dell Computer as one of its first customers.¹²⁰

This market segment went beyond just new upstarts. Establishment giants, such as Kimberly Clark and International Paper, have also sought to develop their own straw paper technologies in an effort to diversify from the traditional paper market. Kimberly Clark, the second-largest papermaker in the world, fired its first shot in April 2014 when it rolled out a new line of tissues and paper towels that incorporated wheat straw and bamboo. The company had explored the use of wheat straw from 2011 and marketed its prototype products in Canada, India, and California before its full-scale rollout.¹²¹

Doubling Down on Virginia

Tranlin was sensitive to this growing legion of potential competitors. Still, Peng remained confident that Tranlin was well positioned. He had faith in his firm's technology, scale, and quality. Peng remarked, "Mr. Li has a dream. He hopes that one day straw paper products will be everywhere."¹²²

Indeed, Tranlin's ultimate goal is to become a leading global player in the high-end household paper and organic fertilizer markets. Its leaders viewed the

Chesterfield plant as a starting point for realizing this broader ambition, and thus a fulcrum upon which to build a global strategy.

Peng suggested that the completion of the plant would likely be followed by an IPO in the United States to raise capital for Tranlin and attract talent. Peng argued that America's mature and advanced capital markets could serve Tranlin well.¹²³ Once listed, Tranlin would seek to expand to other areas in Virginia, so that Danville and Hampton Roads—the sites not chosen for the original plant—might eventually see Tranlin presence too, according to Peng. Meanwhile, Texas, California, and parts of the Midwest, because of their abundant straw supplies and consumer and agriculture markets, also crop up on Tranlin's radar.

"Expansion into Canada and Mexico is reasonably easy," Peng argued, "but we have no plan to expand beyond North America yet. There is plenty of runway in the United States. So Tranlin will plough the US market deeply, with focus and care, aiming to develop it into a global headquarters."¹²⁴

Current Status

As of this writing, Tranlin was still mired in a long permitting process that could take up to 18 months. The company

Tranlin's ultimate goal is to become a leading global player in the high-end household paper and organic fertilizer markets.

will need to secure PSD (Prevention of Significant Deterioration) permits from various agencies, including the Virginia Department of Environmental Quality, the US Army Corps of Engineers, state-level Marine and Fishery, and the federal Environmental Protection Agency on emissions control, water discharge, and air pollution, among other issues.

But Tranlin has progressed in some areas. It began hiring in October 2014, and in February 2015 opened its engineering, sales, and marketing office in Colony Village on the Jefferson Highway. Tranlin also purchased the first 60-acre piece of its planned 850-acre paper and fertilizer complex in Chesterfield. It paid \$3.18 million for this

parcel, part of the \$2 billion investment, in a sale that closed March 31, 2015, according to public reports.¹²⁵

Tranlin has also started to test-drive its unbleached household paper products in the North American market. It aims to cultivate consumer interest even while the plant is under construction. In an interview, company officials claimed they had achieved \$10 million in sales in the US market in 2015.¹²⁶ In what could also turn out to be a major development for Tranlin's US business, its products passed factory inspection by Wal-Mart and obtained long-term supplier qualification in August 2014, which will allow Tranlin to supply products to Wal-Mart in the future.

Cloudy Future

Tranlin's Virginia investment is unique in two ways. First, many Chinese investors deploy capital to acquire advanced American technology. Tranlin's investment, however, was predicated on exporting what it claimed to be superior technology to North America. Second, many Chinese investments aim to acquire US-based environmental technology or expertise to repatriate to China as it addresses domestic environmental degradation. Tranlin's investment, by contrast, centered on exporting what it purports to be a sustainable and green business model.

In China, Tranlin built its brand by promoting the image of an innovative and environmentally responsible firm,

assiduously nurtured by the Chinese government. This alignment of Tranlin's business model with Beijing's official policy had earned it kudos from the government and translated into state-backed loans and other governmental support. Private Chinese firms like Tranlin navigate a difficult path: they must be shrewd enough to leverage government support while keeping the state at arm's length in other areas.

For Tranlin, technology and IP was essential to its corporate brand. The

firm has never been the largest player in its class, but had a vision distinct from its Chinese competitors. The firm's founders and leaders say they have been playing the long game at a time when many Chinese companies focused on the here and now of cheap capital and easy profits. And this was especially the case in China's "Roaring 2000s."

This fostered a corporate culture that, in its executives' words, values innovation, environmental stewardship, and entrepreneurship. Only after a decade of R&D aimed at developing clean straw pulping technology did the company

feel confident enough to launch an ambitious domestic and global expansion.

To be sure, Tranlin is still a small player

in the global arena. But it hopes to capitalize on its first-mover advantage to reach scale and thereby best its competitors, both existing and emerging. Ultimately, Tranlin is taking a risky gamble that the future of its industry will be built on straw-based paper. Its huge investment in the United States reflects an all-in bet on that future, even as vast uncertainties and risks remain.

Some of the biggest challenges and risks for the company include pressure on its

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As a company with \$1.2 billion in assets and annual sales of \$1.8 billion and profit of \$150 million, Tranlin's total of \$7.8 billion investment in three China-based projects and one US project seems wildly disproportionate to the firm's actual size. While its projects in China are largely supported by the \$1.3 billion in IP-backed loans, these are still just about a quarter of the company's total investment in China. Presumably, loans from state banks and other sources help soften the impact on the firm generally, but it is not entirely clear just how leveraged Tranlin actually is. Nor is it clear whether Tranlin can be profitable enough to make good on these loans. As a private, unlisted company, Tranlin's finances remain murky.

As to the Virginia plant, which is a stand-alone project apart from Tranlin China, both Tranlin and the State of Virginia have expressed confidence and optimism in financing the project. According to Peng, the Tranlin team seeks both equity and debt financing, and is considering using the EB-5 visa program to attract additional capital from high net worth individuals in China.

But concern over the company's cash flow may be warranted. Although reports vary, Tranlin apparently briefly halted its Jiamusi project in 2014 before resuming construction in early 2015

and had cut back its investment from \$4.3 billion to \$2.5 billion, as well as the project's production volume.¹²⁷ Tranlin has also reportedly faced some criticism on the Internet from Chinese workers, who have accused it of wage arrears.¹²⁸ Whether these financing and worker issues will materialize in the Virginia project remains to be seen.

Moreover, similar to many Chinese companies that have recently expanded overseas, Tranlin also faces managerial and vertical integration challenges. In Tranlin's case, Peng may have partially solved the problem by bringing onboard a specialized team for the Virginia project, and more local talent could be added to the "Cavalier Club" once the project picks up steam. A planned IPO may also make it easier for Tranlin to attract human capital.

But ultimately, the test for Tranlin in the United States will be whether it can sell to US customers and sustain a business already replete with incumbent firms that boast established sales networks and marketing ecosystems. In the past, Tranlin has shown that it is not shy about taking the battle to competitors that have underestimated it, such as Tetra Pak. But the firm will need to play a different game in the United States. Advantages for incumbents, such as Kimberly Clark, should also not be underestimated. For a new Chinese brand, winning the hearts and minds of American consumers is a tall order indeed.

Still, for all these challenges, Tranlin's Virginia project is still moving forward as of this writing. More than 100 Tranlin Chinese employees—mostly technical personnel and workers who arrived from China to prevent IP leaks—will start their new life as expatriates in Chesterfield County. They will move into new homes and work with their new American colleagues. And Hart, for one, says that he looks forward to welcoming some of his old Chinese friends to America.

"Sitting down, sharing a meal, and having these guys make me eat the parts of chicken that Americans don't normally eat ... these were all good. At the end of the day, we were all laughing and having a good time, said Hart. "Personally and genuinely, I like these people and I look forward to having them as our neighbors in the community."¹²⁹

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The Paulson Institute's Program on Cross-Border Investment

There are compelling incentives for the United States and China to increase direct investment in both directions. US FDI stock in China was roughly \$60 billion in 2010, yet a variety of obstacles and barriers to further American investment remain. Meanwhile, Chinese FDI stock in the United States has hovered at around just \$5 billion. For China, investing in the United States offers the opportunity to diversify risk from domestic markets while moving up the value-chain into higher-margin industries. And for the United States, leveraging Chinese capital could, in some sectors, help to create and sustain American jobs.

As a nonprofit institution, The Paulson Institute does not participate in any investments. But by taking a sector-by-sector look at opportunities and constraints, the Institute has begun to highlight commercially promising opportunities—and to convene relevant players from industry, the capital markets, government, and academia around economically rational and politically realistic investment ideas.

The Institute's goal is to focus on specific and promising sectors rather than treating the question of investment abstractly. We currently have two such sectoral efforts—on agribusiness and manufacturing.

The Institute's aim is to help develop sensible investment models that reflect economic and political realities in both countries.

The Paulson Institute currently has four investment-related programs:

US-China Agribusiness Program

The Institute's agribusiness programs aim to support America's dynamic agriculture sector, which needs new sources of investment to spur innovation and create jobs. These programs include:

- A US-China Agricultural Investment Experts Group comprised of some of the leading names in American agribusiness. The group brainstorms ideas and helps in the Institute's effort to develop innovative investment models that reflect economic and technological changes in global agriculture.
- Periodic agribusiness-related investment workshops, bringing key players and companies together. The Institute held the first workshop in Beijing in December 2012. Attendees included CEOs and experts. It has since held smaller, sessions in the United States focused on specific technologies or aspects of agribusiness.

- Commissioned studies that propose specific investment models, including for commodities, such as pork, or value chain opportunities, such as collaborative research and development (R&D).

US-China Manufacturing Program

In June 2013, the Institute launched a program on trends that will determine the future of global manufacturing and manufacturing-related capital flows. We aim to identify mutually beneficial manufacturing partnerships that would help support job growth in the United States. The Institute's principal manufacturing programs include:

- Investment papers that the Institute is co-developing with private sector and academic partners.
- Periodic workshops in Beijing and Chicago with Chinese, American and global CEOs and executives, focused on technological change, sectoral trends, and investment opportunities.

Case Study Program

The Institute publishes in-depth historical case studies of past Chinese direct investments in the United States, examining investment structures and economic, political, and business rationales. These detailed studies are based on public sources but also first-hand interviews with deal participants on all sides. They aim to reconstruct motivations and actions, and then to draw lessons learned.

State-Level Competitiveness Program

The Institute works closely with several US governors to help them hone their teams' approach to attracting job-creating foreign direct investment. Our core competitiveness program is a partnership with states in the Great Lakes region, but we work with other governors as around the United States as well.

- Paulson Institute-Great Lakes Governors Partnership: Working closely with the Council of Great Lakes Governors, the Institute is honing pilot strategies to help match the "right" investors and recipients to the "right" sectoral opportunities. Work is also focusing on how to connect Great Lakes/St. Lawrence-based R&D and innovation to foreign deployment opportunities while opening markets in China. The Council includes the governors of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, as well as the Canadian premiers of Ontario and Quebec.

- American Competitiveness Dialogues: The Institute convenes an ongoing series of competitiveness forums around the United States. These aim to address the implications of the changing global economy for US competitiveness, opportunities and challenges associated with foreign direct investment.
- R&D+Deployment (“R&D+D”): Working with partners, including McKinsey & Company and a small number of universities, the Institute is exploring new models that would link Chinese investors to the US innovation engine, especially in areas linked to demand-side needs in the China market. The aim is to design fresh models that capture value in both countries but do not sacrifice America’s innovation edge or intellectual property protection. Our dialogue in this area aims, ultimately, to lead to a pilot initiative.

About The Paulson Institute

The Paulson Institute, an independent center located at the University of Chicago, is a non-partisan institution that promotes sustainable economic growth and a cleaner environment around the world. Established in 2011 by Henry M. Paulson, Jr., former US Secretary of the Treasury and chairman and chief executive of Goldman Sachs, the Institute is committed to the principle that today's most pressing economic and environmental challenges can be solved only if leading countries work in complementary ways.

For this reason, the Institute's initial focus is the United States and China—the world's largest economies, energy consumers, and carbon emitters. Major economic and environmental challenges can be dealt with more efficiently and effectively if the United States and China work in tandem.

Our Objectives

Specifically, The Paulson Institute fosters international engagement to achieve three objectives:

- To increase economic activity—including Chinese investment in the United States—that leads to the creation of jobs.
- To support urban growth, including the promotion of better environmental policies.
- To encourage responsible executive leadership and best business practices on issues of international concern.

Our Programs

The Institute's programs foster engagement among government policymakers, corporate executives, and leading international experts on economics, business, energy, and the environment. We are both a think and “do” tank that facilitates the sharing of real-world experiences and the implementation of practical solutions.

Institute programs and initiatives are focused in five areas: sustainable urbanization, cross-border investment, climate change and air quality, conservation, and economic policy research and outreach. The Institute also provides fellowships for students at the University of Chicago and works with the university to provide a platform for distinguished thinkers from around the world to convey their ideas.

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