Pipe Dreams: How A Chinese State Company Sought to Ride the US Energy Boom

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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 papers 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 of The Paulson Institute, directs the case study project.

For this case study of Tianjin Pipe Corporation, we are grateful to Nicholas Aeppel, a talented University of Chicago undergraduate working with the institute for the second time, for his research and enthusiasm for the project.

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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: Reuters

Timeline

1989 As part of China's strategic economic plan to develop a domestic steel pipe industry, a new state entity is formed in Tianjin.

1992 *June*: Tianjin Pipe Corporation (TPCO), a municipal state-owned enterprise, launches operations in Tianjin, China.

1995 TPCO decides to build a second production line even though it is weighed down by severe debt burdens.

1999 The Chinese government decides to restructure a wholly unprofitable TPCO through a pilot debt/equity swap program. China's asset management companies held 50 percent of the new entity.

2006 *July*: TPCO commissions a six-month feasibility study on building a seamless pipe mill in the United States.

December: Beijing transforms TPCO, which has by now become the largest steel pipes producer in China, into a joint stock company owned by the Tianjin government.

2007 *Q1*: The Texas state government requests proposals for a TPCO plant from the local Corpus Christi and San Patricio County economic development agencies.

June: Six US steel pipe producers, alongside the United Steelworkers union, request that the US Commerce Department (DOC) levy anti-dumping tariffs and additional countervailing duties on Chinese steel pipe makers.

2009 *January*: TPCO announces it will build a $1 billion-plus, 1.6 million square foot facility on a 253-acre site in San Patricio County, Texas.

July: The European Union imposes tariffs on Chinese steel pipe exports

November: The US DOC announces its preliminary decision to impose tariffs on seamless steel pipe imports from China.

2010 *November*: The International Trade Commission upholds US tariffs on TPCO and other Chinese seamless steel pipe producers.

2014 Phase One of plant construction is completed, and TPCO America selects its local contractor to begin Phase Two, now expected to finish in mid-2016.

Key Players

United States

San Patricio County Economic Development Corporation
County-level economic promotion and investment attraction arm.

Corpus Christi Regional Economic Development Corporation
Larger, more consultancy-oriented economic development agency that worked with San Patricio County to attract the TPCO investment.

City of Gregory, Texas
Eventual site of TPCO's steel pipes plant.

Department of Commerce
US federal agency whose mandate is, in part, to support job creation and economic growth through global trade.

China

Tianjin Pipe Corporation (TPCO)
China's largest seamless steel pipe producer, based in Tianjin.

Tianjin Municipal Government
One of four municipalities with the same political status as provinces. As such, Tianjin has considerable authority and is the ultimate owner of TPCO, which in turn is considered to be a strategic state entity.

Introduction

In early 2009, Tianjin Pipe Corporation (TPCO), China's largest steel pipe producer, announced that it would invest more than $1 billion to build a seamless pipe manufacturing facility in Gregory, Texas. This investment constitutes the largest single manufacturing investment in the United States by a Chinese firm and was TPCO's first such major direct investment in an advanced economy.

Photo: Flickr/Aaron Gilson

TPCO's deal was, in essence, a bet on America's oil and gas boom, particularly the future prospects of its exploding shale gas market. It was, too, a play by an ambitious Chinese local firm to tap and ride that growth while diversifying its markets overseas.

Despite low natural gas prices and high production costs, US domestic shale gas production has been moving forward vigorously, driving demand for precisely the type of pipes TPCO produces. But TPCO's Texas investment is also revealing of market dynamics in China, a country that possesses nearly twice the technically recoverable shale resources of the United States yet lacks the technological capacity and infrastructure to extract these resources in a significant way.[1]

What is more, the story of TPCO's investment provides insight into the periodically tense bilateral trade relationship between the United States and China. TPCO's Texas investment was partly catalyzed, albeit unintentionally, by Washington's levying of tariffs against Chinese steel pipe producers.

The process that led to TPCO's investment began in July 2006, when the firm commissioned a six-month feasibility study on whether and how to build a seamless steel pipe manufacturing facility in the United States. As this case study goes to press in the fall of 2014, the factory has yet to fully open its doors. Yet even in its current, partially completed form, the investment reveals some unique lessons that can inform and shed light on other Chinese direct investments in the US market.

In particular, the TPCO case illustrates:

- How the possession of a unique technology with global applications can drive a firm from a developing

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country to widen its horizons beyond high-growth emerging markets to *established* markets like the United States.

- How the shale gas boom is reshaping America's attractiveness as a destination for energy-related foreign direct investment (FDI).

- How, in certain manufactured product categories, Chinese-made products are increasingly competitive with those made in advanced economies.

- How punitive trade policies can produce unintended consequences. In this case, a US government action aimed at punishing Chinese producers and boosting US industry was partially responsible for driving the Chinese producers to establish their own presence in the United States.

- How a resource-constrained US municipal government and development board can work collaboratively and pool resources, successfully attracting a major investment to an atypical locale. When TPCO began scouting in the United States, the vast majority of Chinese had never heard of Gregory, Texas, a small city whose population in the 2000 US census was just 2,318 people.

The following case study tells the story of TPCO's investment in Gregory. It analyzes how this local Chinese state-owned firm, facing headwinds in its domestic market and trade tensions internationally, sought to ride rapidly changing energy market dynamics in an effort to establish itself in the United States.

America's "Shale Gale"

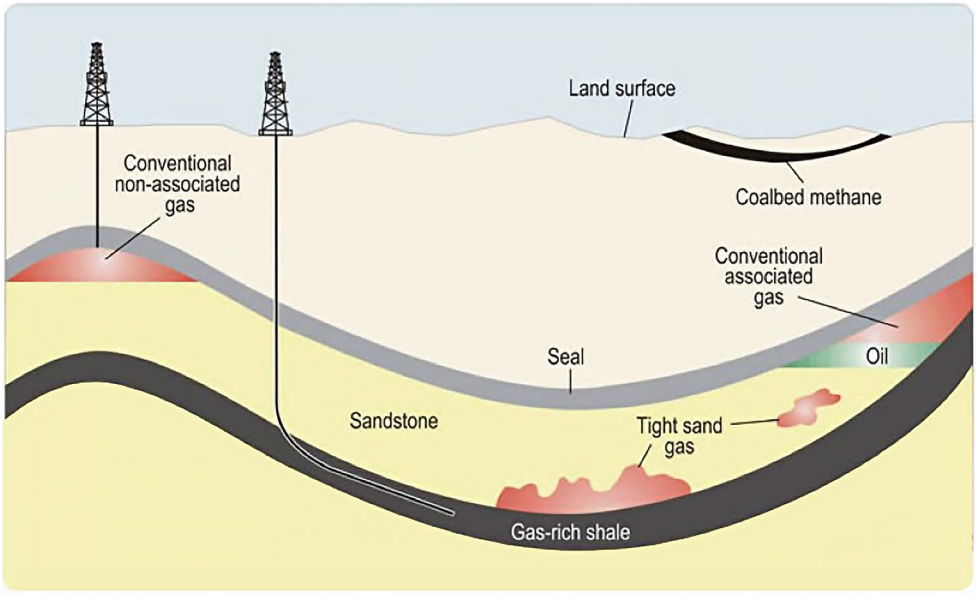
The US shale industry has taken decades to build and has been driven principally by a large number of small private players. Their work led to innovative techniques to extract resources in places that had previously been little touched. Indeed, once shale extraction technology began to mature by the 1990s, production costs were driven down quickly. And this, in turn, led to the booming shale gas industry that has emerged in the United States today, spanning states as far-flung as Pennsylvania (Marcellus Shale), Michigan (Antrim Shale), Arkansas (Fayetteville Shale), New York (Utica Shale), and Oklahoma (Carney Shale).

Deploying and commercializing shale extraction and production technology, as well as bottom-up process innovation, is central to an understanding of the booming US shale market.[2] Thus the technology itself necessitates a brief explanation.

Hydraulic Fracking 101

Conventional drilling involves tapping an underground reservoir of oil or natural gas that has migrated away from the source rock where it was formed to areas of lower pressure. Such resources become trapped by the impermeable rock that defines the reservoir.

Figure 1. Conventional and Unconventional Drilling



Source: US Energy Information Administration and US Geological Survey.

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Figure 1 shows the conventional drilling of non-associated gas (where a reservoir purely holds gas) and associated gas (where oil and gas are mixed). In both instances, the resource is relatively easy to access and extract through a vertically drilled well: once the reservoir is reached, the oil and gas naturally flow from the area of high pressure in the reservoir to the area of low pressure above ground.

Unconventional drilling, by contrast, is a method of extracting shale oil and natural gas from reserves that, until recently, have been uneconomical to drill. Such drilling does not involve accessing a clean-cut reservoir. Instead, the oil or gas remains stuck in its source rock.

This type of drilling centers on two technologies used to extract the oil or natural gas: horizontal drilling and hydraulic fracturing. As illustrated in Figure 1, the shale or natural gas associated with unconventional drilling is spread over a relatively thin layer. Horizontal drilling allows access to a greater amount of this thin layer.

Moreover, unlike conventional drilling, oil or gas drilled unconventionally remains stuck in its source rock and will not naturally flow out of the shale reserve and toward the surface because of the source rock's low permeability. In order to access the oil or gas, this "tight" rock is fractured to raise its permeability. Explosives are sent through the pipes, which crack the source rock and puncture the pipes to create a pathway for the oil or gas to enter the pipe.

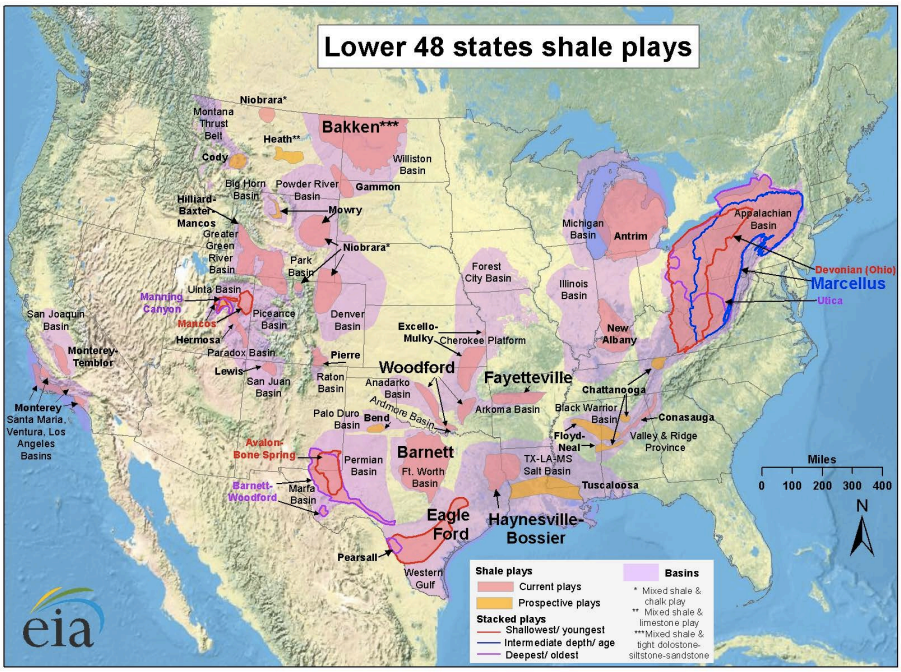
Next comes hydraulic fracturing, where a huge amount of pressurized liquid—about a trainload of sand and two trainloads of water—is sent down the pipes to further fracture the rock formation. The sand, known as a proppant, finds its way into newly-created cracks and keeps them open, helping to decrease the rock's permeability and allowing oil and gas to flow out of the well and onto the surface.

This process is usually quite water-intensive, which has been a source of environmental (and thus political) controversy in the United States. For example, unconventional drilling requires an average of 4 million gallons of water per well (although this can range from 2 to 9 million) and takes about three months to drill, roughly 100 times more water and three times longer than drilling conventional wells.[3]

Making Shale Economically Viable

Horizontal drilling and hydraulic fracturing are not new technologies. And the line between conventional and unconventional drilling is blurry because conventional sources have long borrowed from unconventional methods to boost extraction. As early as the 1860s, the explosive nitroglycerin was used to crack rocks in shallow wells.[4]

Figure 2. Geographic Distribution of US Shale Plays



Source: Energy Information Administration.

Moreover, horizontal drilling falls under a broader category called "directional drilling," which traces its development to the 1920s and 1930s.

What has changed in recent decades is the efficiency with which these unconventional sources can be drilled. It took a cohort of entrepreneurs and repeated experimentation to fine-tune the techniques and dramatically improve efficiency.[5]

Although hydraulic fracturing was first attempted in the 1940s, unconventional drilling would not proliferate until the turn of the century. In the 1970s, research conducted by the US Department of Energy (DOE) helped develop some of the early technologies behind hydraulic fracturing. By the 1980s, drilling technology had already improved to a point where Texas businessman George Mitchell could begin to experiment with unconventional drilling with his eye firmly fixed on the issue of commercial viability.[6]

Improved downhill drilling motors and inventions such as downhole telemetry equipment were particularly crucial to Mitchell's efforts.[7] Despite DOE's basic research efforts and these technological advancements, however, not many firms enthusiastically embraced fracking at

the outset. "We had people who told us we were nuts," Dan Steward, a Mitchell Energy and Development Corporation geologist, later recalled to *The New York Times*. "But for George Mitchell, this was survival, this was need."

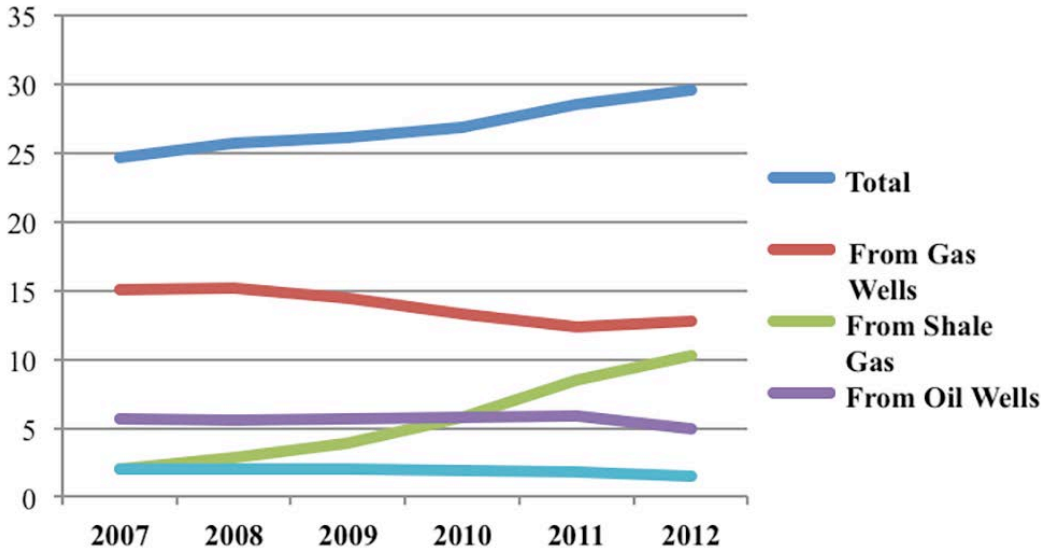
The wells owned by Mitchell's company in the Texas Barnett Shale had begun to dry up, leading to aggressive experimentation in the Barnett in the 1980s and 1990s.[8] Later dubbed "the father of fracking," Mitchell is largely credited with pioneering the unconventional drilling techniques that are being used today. More crucially, he and others were able to lower the cost of fracking to $4 per million British thermal unit (BTU) in the Barnett Shale, cheap enough to bring these reserves into the realm of commercial viability.[9]

The Production Boom

After Mitchell's experimentation, commercial successes encouraged an increasing number of firms to enter the unconventional market and drill in the Barnett Shale and beyond. Large-scale shale gas production in the United States began around 2000 in the Barnett; by 2005, almost half a trillion cubic feet (tcf) of natural gas was being extracted from the Barnett per year.[10]

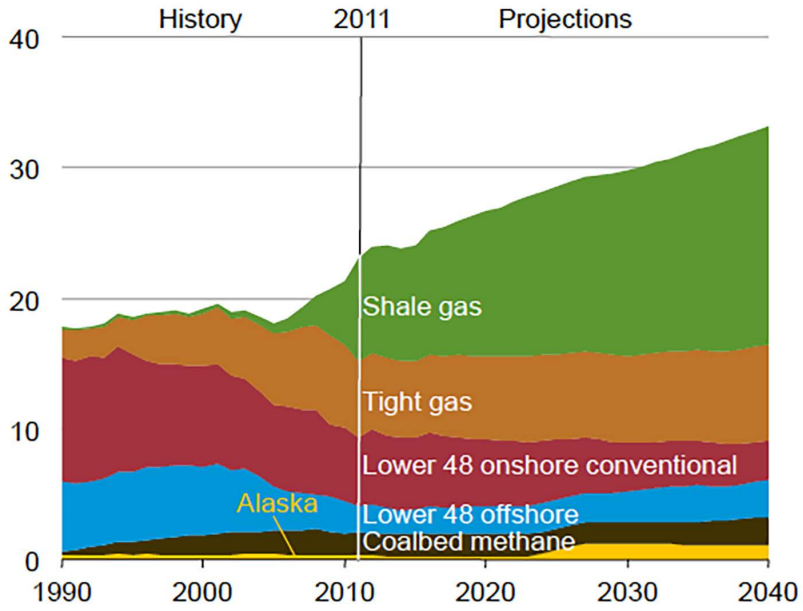
The explosion of drilling in the Barnett encouraged firms to begin fracking, first in the Fayetteville Shale in northern Arkansas, and then in the Haynesville, Marcellus, Woodford, and Eagle Ford shale formations scattered across the country.[11] In short order, shale extraction activities spread

Figure 3. US Natural Gas Production Volumes (tcf)



Source: EIA.

Figure 4. Projection of US Natural Gas Production Through 2040 (tcf)



Source: EIA Annual Energy Outlook 2013.

across the continental United States (see Figure 2).

The development of these shale plays has led to an explosion in US natural gas production since the mid-2000s. Gross natural gas withdrawals from shale reserves soared some five times in as many years, from just under 2 tcf in 2007 to over 10 tcf in 2012.[12] Moreover, shale gas was primarily responsible for the increase in total natural gas withdrawals during 2007-2012, despite the decrease in volumes from conventional resources (see Figure 3).

This explosion in production from shale and other "tight" gas resources is widely expected to continue. The US Energy Information Administration's (EIA) estimates for natural gas production over the next few decades further illustrate this trend (see Figure 4). Indeed, without these resources, US natural gas production would be on a slow decline rather than a vigorous boom. Shale and tight oil extraction is seeing similar growth.

Prices Plummet

Rising American natural gas production has caused US natural gas prices to fall to historic lows. Abundant shale resources and improved technology have helped to drive the Henry Hub natural gas spot price from an average monthly high of $13.42/million BTU in

Figure 5. Natural Gas Consumption by Sector in Reference Case (tcf)

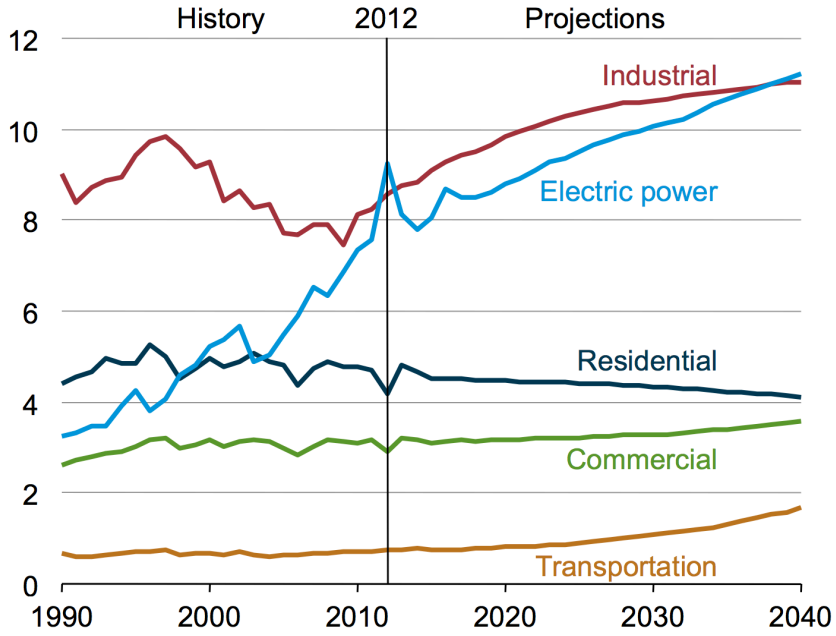
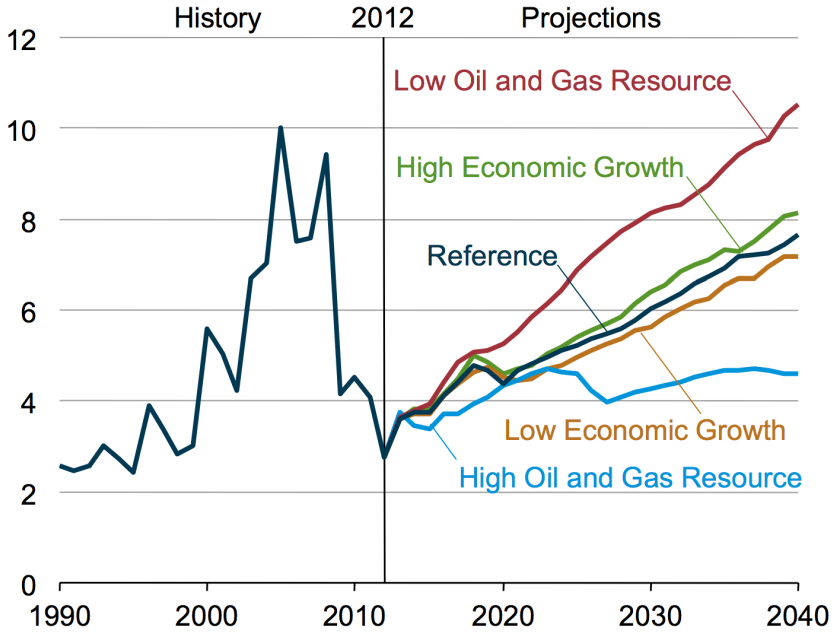


Figure 6. Annual Average Henry Hub Spot Prices for Natural Gas in Five Cases*



*in 2012 dollars per million BTU
Source: EIA.

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October 2005 to a low of $1.95/million BTU in April 2012. By September 2014, prices had risen to just below $4 per million BTU, still very low by historical standards.[13] (Henry Hub is a key gas distribution center in the southern United States that sets daily market prices for natural gas.)

Low natural gas prices have also bolstered demand for industrial purposes and for electricity generation in the United States. But the EIA projects that producers will be forced to drill in areas where natural gas extraction is more difficult and expensive, in order to continue to meet global natural gas demand. This has the potential to result in rising natural gas prices over the next few decades (see Figures 5 and 6).[14]

The US shale boom has driven huge demand for OCTG and standard and line steel pipes.

America the Exporter

Exports to the global market could serve as an additional source of demand and potentially drive up natural gas prices. Differentials in transportation costs prevent natural gas from trading in a globally integrated market and with unified prices. So lower natural gas prices in the United States and Canada do not necessarily reflect prices in other markets, for example in Asia. For this reason, exporting to markets where prices are high is very attractive to US producers. The EIA projects that by 2020 the United States could be a net exporter of natural gas.[15]

But the idea of exporting cheap gas has engendered some domestic controversy. America's oil and gas industry has backed the issuance of licenses allowing firms to export liquefied natural gas (LNG), but some US industrial firms and manufacturers that buy large volumes of natural gas have pushed back against the Obama administration's decision to award these export licenses, arguing that exports will push up domestic natural gas prices. Detractors of pro-gas export policies contend that natural gas should be kept in the United States for domestic uses, and to promote the wider adoption of fuel switching through substituting gas for coal in power generation.

Ultimately, however, US DOE has decided to heed the recommendation of a NERA Economic Consulting report it commissioned. This report concluded that LNG exports would provide a net economic benefit to the United States in all cases analyzed. The NERA report also concluded that domestic prices would not rise sharply in the event of export, since the processing and transportation fees associated with sending LNG abroad are steep and exported LNG would need to compete with alternative, and potentially cheaper, sources in global markets.[16]

Since 2011, then, DOE has begun to cautiously approve US natural gas exports, albeit only on a case-by-case basis. In addition to the DOE license, which allows US firms to export natural

gas to countries with which the United States does not have a free trade agreement, another license from the Federal Energy Regulatory Commission (FERC) is required for firms that wish to build an LNG terminal. Both DOE and FERC have begun approving projects, although the construction of a liquefaction facility will take approximately five years.[17]

Piping Gas

As will be seen in the next sections of this case, TPCO's Texas plant aims to produce two types of seamless steel pipes: oil country tubular goods (OCTG) pipes, which are used in the high-pressure drilling and extraction of oil and natural gas, and standard and line steel pipes, which are used in both gas transportation and processing. The US shale boom has driven huge demand for OCTG and standard and line steel pipes. For instance, OCTG demand in the United States rose from 5 million to 7.2 million tons, or nearly 45 percent, between 2010 and 2012.[18]

Unconventional drilling requires strong and reliable OCTG pipes that can withstand fracturing and horizontal drilling. The shale boom in the United States has buoyed demand for seamless pipes of precisely the kind that TPCO will produce in its Texas plant. Unlike welded pipes, which are produced by rolling a plate of steel and welding the seam, these seamless pipes are not welded, making them structurally stronger and more resilient.

Tianjin Pipe: Anatomy of a Municipal SOE

In many ways, TPCO is emblematic of a typical Chinese local state-owned heavy industrial giant. Many such firms blossomed in the 2000s as China entered a phase of intense industrialization.

Formally created in 1989, TPCO, which did not get its current name until the mid-2000s, was meant to serve as a centerpiece strategic project in China's Eighth Five-Year Plan (1991-1995).[19]

The Chinese government's rationale for the original incarnation of TPCO reflected its view that the country's heavy reliance on OCTG imports had impeded the development of a domestic petroleum industry. So, as is typical of governments that favor national industrial policies, Beijing deemed TPCO to be the Eighth Five-Year Plan's "Big Seamless" project that would lead the way to achieving reliance on domestically produced OCTG.[20]

Photo: Flickr/Robert Galloway

Since launching operations in June 1992, TPCO has helped China meet this goal, but that achievement has come at the price of heavy government involvement and expensive subsidies. And the firm has taken on large amounts of corporate debt.

In the early 1990s, Chinese corporates, especially state-owned enterprises (SOEs), had little capital and barely any savings. The state, via the so-called "big four" state banks, provided the capital for development, since these banks behaved less like commercially-oriented financial entities and more like extensions of fiscal policy to fund economic growth priorities. To get the initial 14 billion yuan seamless pipe project off the ground, the Big Four stepped in to provide the necessary capital.[21]

But the banks were not expecting a return on their "investment," nor should they have. Indeed, TPCO's early performance turned out to be disastrous: its razor thin profits could not even cover the interest payments on the bank loans for most years throughout the 1990s.[22]

But even though the new entity faced financial challenges throughout the 1990s, it nonetheless pursued ambitious expansion plans, in large part because it could derive confidence from the fact that it was backed by the Tianjin municipal government. This was an important distinction because Tianjin is

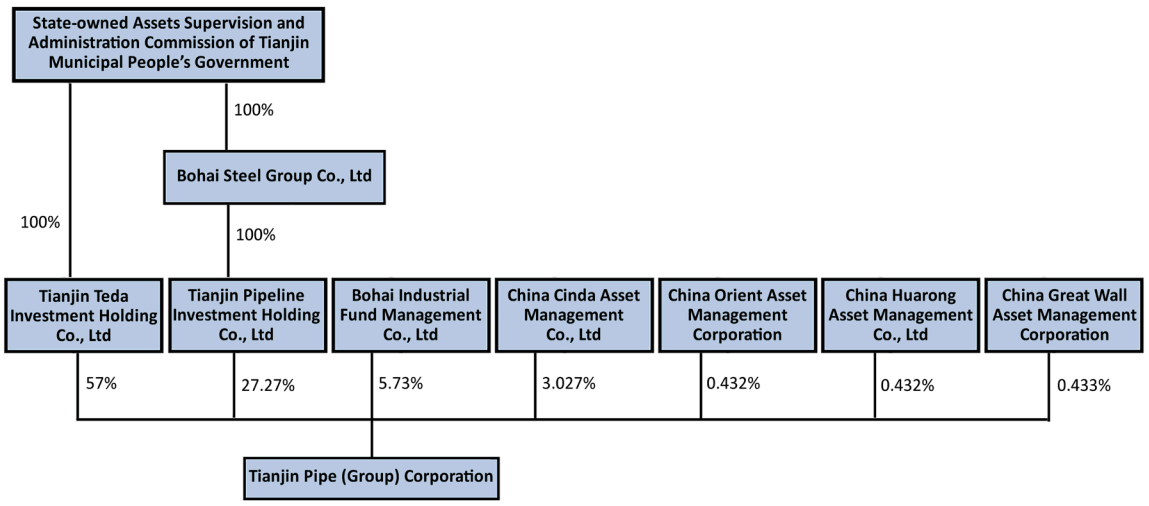
one of just four cities in China that are treated as if they are provinces.

In 1995, for example, TPCO decided to build a second production line, consistent with the Tianjin Ninth Five-Year Economic and Social Development Plan (1996-2000), which called for expanded steel pipe production in the city.[23] This expansion of production required significant government support, yet TPCO remained weighed down by debt, and this meant that it still had significant liabilities to state lenders.[24]

By 1999, the State Council had decided to restructure TPCO through a pilot debt/equity swap program, through which a new limited liability entity was created. This new entity was capitalized with 9.4 billion yuan in debt, about half of which was held by the four state Asset Management Companies (AMCs).[25]

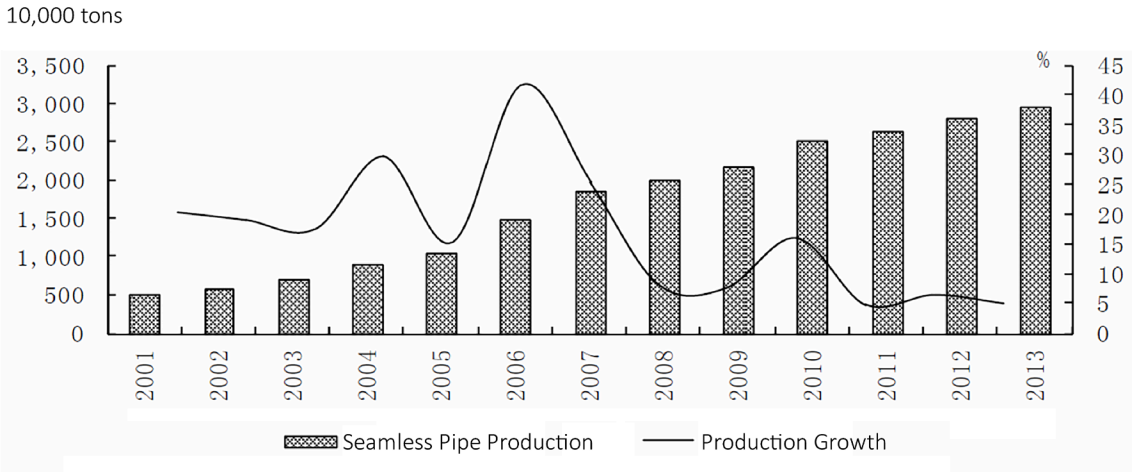
The late 1990s also marked a period of overhaul for the state sector in China. Large numbers of local SOEs were restructured or forced to exit the market, leading to millions of laid off workers in urban China. But many of the larger, central SOEs were spared and kept largely intact. And a number of the major enterprises at the provincial or municipal level, such as TPCO, survived too because they were viewed as strategic state assets and were protected by local governments. In TPCO's case specifically, the firm held an exalted place in China's macroeconomic development plans, which meant that there was virtually no chance the government would simply let TPCO fold.

Figure 7. TPCO's Ownership Structure As Of March 2014



Source: TPCO 2Q 2014 Financial Prospectus.

Figure 8. Seamless Pipe Production Growth in China, 2001-2013



Source: WInd.

The Roaring 2000s

TPCO, like many troubled and debt-laden Chinese industrial firms, not only survived into the 2000s, but actually prospered on the back of a booming Chinese economy, an export surge, and large-scale industrial expansion amid double-digit GDP growth. In 2001, the year that China officially joined the World Trade Organization, TPCO announced plans to double annual seamless pipe production capacity from about 500,000 tons to 1 million tons by 2005.[26]

By 2006, TPCO had established itself as China's largest OCTG producer, accounting for one-fifth of total production in China.[27] To move further toward modern corporate governance, the Chinese government decided in that same year to once again transform the Tianjin SOE into a joint stock corporation. In December 2006, the limited liability entity was officially changed into TPCO, with TEDA Investment Holdings Limited taking a 57 percent stake, Tianjin Steel Pipe Investment Holdings Limited a 33 percent stake, and the four national AMCs taking the remaining 10 percent. The first two entities were ultimately controlled by the Tianjin branch of the State-Owned Assets Supervision and Administration Commission (SASAC), thus effectively making TPCO a fully state owned firm (see Figure 7).[28]

The prior decade had been a boon for TPCO and similar firms. From 2001 to 2013, China's seamless pipe production increased from 5 million to nearly 30 million tons. Prior to the global financial crisis, production volume growth had been averaging about 20 percent per

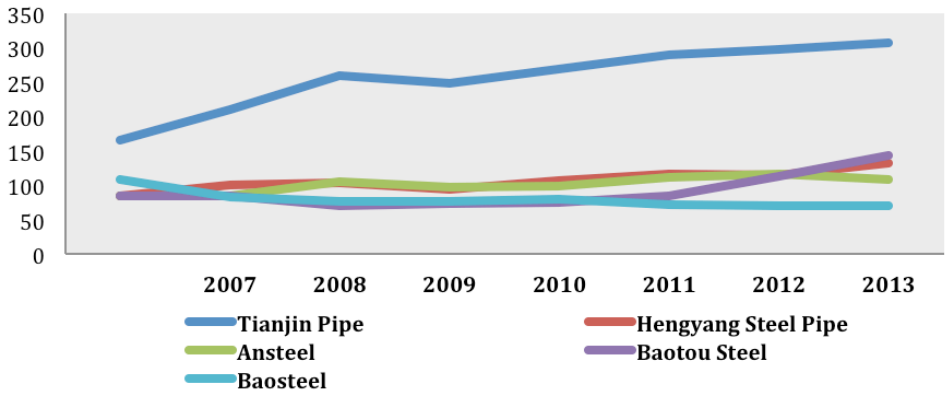
year (see Figure 8). And through May 2014, China produced 127 million tons of seamless pipes, already surpassing the total in the same period in 2013.[29]

TPCO was not the biggest steel company in China, but it certainly was the biggest steel pipe producer by far. It served a range of domestic clients, with some of the biggest customers being China National Petroleum Corporation (CNPC) and its subsidiaries, thus tying it to China's largest oil and gas producer. By 2013, TPCO produced more than double the volume of seamless pipes than its next biggest competitor, Hengyang Steel Pipe in Hunan province (see Figure 9 and Table 1).

Boom to Bust

But the exuberance proved short-lived, as TPCO was soon confronted with the same set of challenges that beset the broader Chinese steel industry. The most important of these was vast overcapacity. In 2013, China's total steel seamless pipe production capacity had

Figure 9. Top Seamless Pipe Producers in China, 2007-2013 (in 10,000 tons)



Source: Dagong Global Credit Ratings.

Table 1. TPCO's Top Domestic Customers (in 10,000 yuan)

Rank	Name	Sale	% of total revenue from seamless pipe sales
1	Sinopec Materials and Equipment Department	208,659	11.08
2	CNPC Cangzhou subsidiary	107,699	5.72
3	CNPC Changqing subsidiary	80,188	4.26
4	CNPC Tianjin subsidiary	62,515	3.32
5	Xinjiang Petroleum Administration Bureau	41,987	2.23

Source: Dagong Global Credit Ratings.

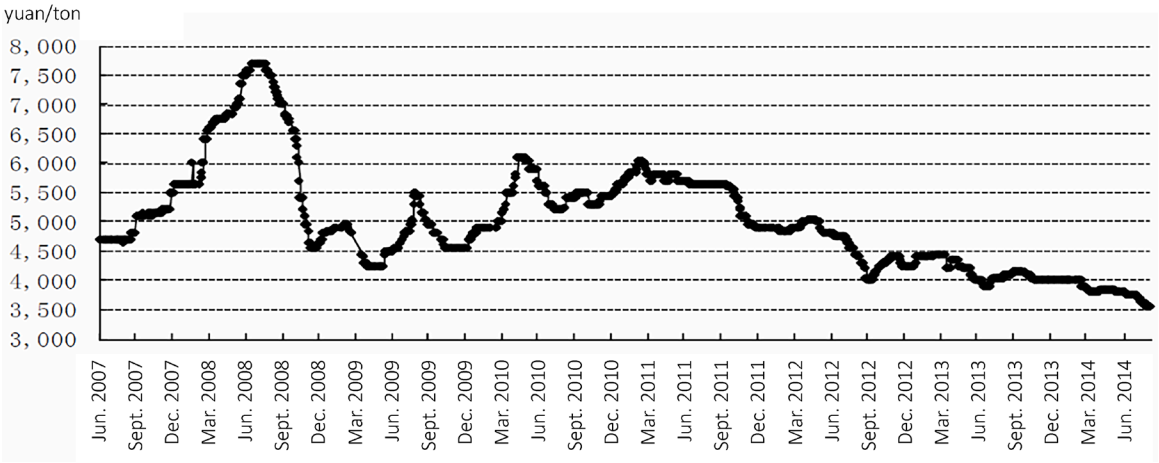
already reached 43 million tons, even though the actual production was below 30 million tons. This translates into a capacity utilization ratio of less than 70 percent, far lower than the international standard of 80 percent utilization.[30]

In addition, China's steel sector suffers from fragmentation, despite Beijing's repeated efforts to consolidate the sector into a few conglomerates. The top ten Chinese steel firms produced less than 40 percent of total output, and they face cutthroat competition, which makes it difficult to raise prices and improve profit margins. Meanwhile, input costs have increased significantly over the last few years, meaning that China's steel sector has been squeezed from both ends.

The combined effect of these factors has led to a highly unprofitable steel pipes industry in China. To illustrate, consider TPCO's return on equity, which has hovered at around just 1 percent during the past three years. The company's earnings can barely cover its interest payments. And while the central government's massive $586 billion fiscal stimulus program in 2008 and 2009 provided a temporary jolt to this industry, decelerating economic growth and overcapacity have dragged down both production volume and price (see Figure 10).

TPCO's extensive government support and subsidies also became a critical issue within the context of its large export volumes to the United States. Victor Shih of the University of California San Diego (UCSD) told Bloomberg in 2010: "The very existence of this company is due to massive subsidies through state banks, which will bail out

Figure 10. Overcapacity and Price Declines in the Seamless Pipe Industry



Source: Wind.

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state firms favored by local and central governments endlessly."[31]

Indeed, TPCO's preferential treatment from the Chinese government was a major factor that eventually drove the United States in December 2009 to levy tariffs of between 10 and 16 percent on imports on steel pipe from TPCO and the other state-owned producers that dominate the seamless pipe market in China.[32]

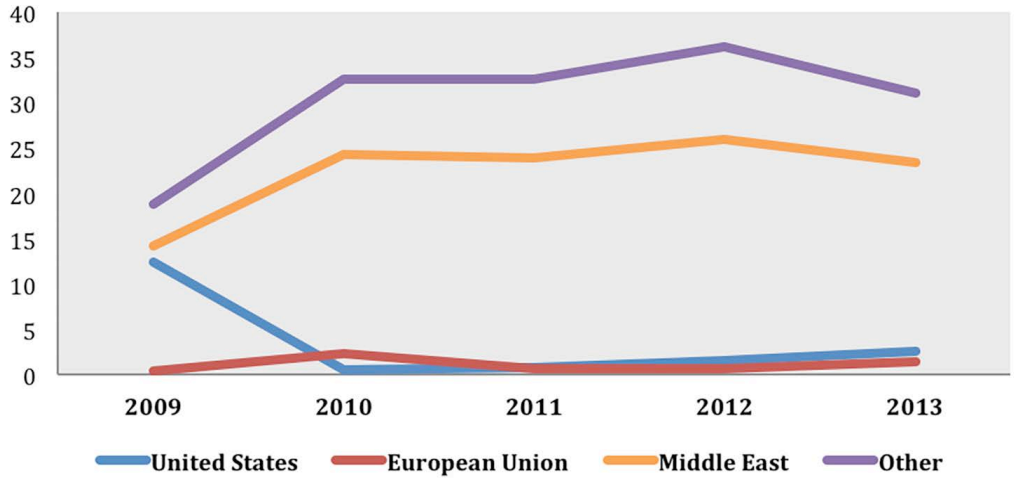
But Washington is hardly the beginning and end of this story. The European Union, too, took the same action earlier in 2009, rationalizing it with the same concern that cheaper Chinese steel pipes were flooding the EU market, especially during the severe economic downturn that followed the global crisis of 2008.[33]

These measures from the US and EU rippled throughout China's steel pipe industry. What had once been the largest export markets for TPCO quickly collapsed (see Figure 11).

But even without the US and EU trade tariffs, it is clear that TPCO has been losing market share elsewhere—for example, in the Middle East—to other competitors in recent years. Confronting overcapacity and a fiercely competitive and low-margin domestic market and uncertainty in its traditional export markets, TPCO was faced with a crisis. It needed to either find new markets internationally or else figure out another way to access old markets. And when it came to the United States, once TPCO's largest export market by value, the company took the latter course.

In fact, TPCO trained its gaze on the Lone Star State.

Figure 11. TPCO's Exports to Various Regions, 2009-2013[34] (in 10,000 tons)



Source: Dagong Global Credit Ratings.

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From Bohai Bay to the Gulf of Mexico

The journey that led TPCO to the small town of Gregory, Texas began despite looming US-China trade frictions. That is perhaps because it had deeper roots. In July 2006, nearly three years before TPCO ultimately announced its investment, the firm commissioned a six-month feasibility study on building a seamless pipe plant in the United States.[35] The municipal government of Corpus Christi was involved in this feasibility study—and therefore knew the project was being considered as early as the end of 2006—yet the city did not become formally involved in site selection until the subsequent year.[36]

From the outset, Corpus Christi knew that a prospective investment by TPCO could be large. Having established operations in Houston in 1993 to facilitate exports of its steel pipes to the United States, TPCO is one of the largest seamless steel pipe manufacturers in the world and, as noted, is the largest OCTG producer in China. TPCO has the capacity to produce 3.5 million tons of seamless pipes in China annually, including casing, tubing, line pipe, and other products, and exports its goods to over 80 countries across the world.[37]

Why Expand in the United States?

But with a revenue cushion from the export of pipes manufactured in China, why make a risky investment play in the United States as early as 2006, before the global crisis and at a time when the company was performing well in the domestic market?

In mid-2006, TPCO, which was already one of the world's largest steel pipe producers, announced plans to triple its production of pipes. In that context, TPCO saw an opportunity to reach its goal by increasing its presence in a burgeoning US market.[38]

According to a statement TPCO released when it announced the Texas expansion, the company believed that "US domestic seamless steel pipe production only covers half of US demand,"[39] so TPCO hoped to fill the gap with new US-based production.

This supposition had some basis: In 2011, the United States produced just 2.2 million tons of seamless pipes, barely eclipsing its net imports of about 1.8 million tons.[40] The TPCO plant in Texas, once at full capacity, aims to produce 550,000 tons of seamless pipes, representing about a quarter of 2011 US production.

Tariffs

But another key driver of TPCO's eventual decision was the growing threat of trade tensions. In addition to

anticipated robust market opportunities in the United States, by 2006-07, TPCO increasingly sensed that a target was being painted squarely on its back from US trade lawyers.

In June 2007, six US steel pipe producers, alongside the United Steelworkers union, requested that the US Department of Commerce (DOC) levy anti-dumping (AD) and countervailing duties (CVDs) on Chinese steel pipe makers, including TPCO.[41] Led by US Steel, this group argued that Chinese producers were dumping pipes at below-market prices.

As DOC and the US International Trade Commission (ITC) progressed with their review of the case, US imports of Chinese steel pipes skyrocketed, more than tripling in 2008 to over $2 billion. Still, TPCO had no reason to feel assured.[42] And in November 2009, DOC released its preliminary decision to impose tariffs on steel pipe imports from China.

Li Liancang, an export manager at TPCO, went on the record after the decision to defend Chinese pipe producers: "The anti-dumping ruling is unfair to Chinese producers who sold the pipes in the US at a 20 percent premium to our domestic prices," said Li. "Chinese pipe exports to the US have almost stopped since the preliminary ruling in September [2009]."[43]

Li argued that a tariff levied on TPCO would be detrimental to the firm's prospects in the United States, stating that a tariff greater than 20 percent would make it "totally impossible for us to export to the US."[44] But TPCO did understand that it had to adjust. A November 2010 ITC decision upheld the tariffs on TPCO and other major Chinese producers, including state-owned Baosteel and Hengyang Valin Steel Tube. With these tariffs ranging from 10 to 16 percent for CVDs and 32 to 99 percent for AD, TPCO itself was slapped with a 13.66 percent CVD and a 48.99 percent AD.[45]

Much as Li had predicted, seamless pipe imports from China nearly collapsed following the approval of these tariffs in 2009.

Much as Li had predicted, seamless pipe imports from China nearly collapsed following the approval of these tariffs in 2009 (refer to Figure 11).[46] According to Josephine Miller, who, as executive director of the San Patricio County Economic Development Corp (SPCEDC), would play a central role in attracting the TPCO investment to Gregory, believed these tariffs were a major motivation behind TPCO's decision to invest in the United States. Although TPCO had commissioned its feasibility study a full three years before the tariffs hit in 2009, Miller recounted in an interview that "[TPCO] was very concerned about what Washington was going to do. They were driven by the fear of American tariffs."

Still, TPCO had planned ahead. The firm developed a sense early on that

tariffs might be levied, and thus made preparations to begin producing in the United States if it became unable to profitably export its pipes from China to the crucial US market. Moreover, the trade case and a subsequent decline in exports injected a sense of urgency into TPCO's decision making about whether to invest in the United States.

By the end of 2009, the domestic market opportunity in the United States had closely intertwined with the company's need to adapt to the fallout from US tariffs. Taken together, these two factors accelerated TPCO's decision to push forward with a US investment.


Photo: Flickr/Frank Taillandier

Enter Texas

Texas was, of course, a major oil and gas center, and thus an important customer for TPCO's pipes. But Texas was also aggressive in courting a major investment from the company.

Two regional economic development offices were responsible for attracting and eventually securing the TPCO investment. With six staff members, the Corpus Christi Regional Economic Development Corporation (CCREDC) was the larger of the two organizations. It was responsible for promoting and attracting business to a city of just under 300,000 people that boasted the fifth-largest port in the United States.[47]

Its smaller counterpart was the SPCEDC, the county-level investment arm of San Patricio County. With just 64,804 people in the county in 2010, the group had a staff of just two, led by Miller,[48] and served a county located directly north of Corpus Christi as part of the greater metropolitan area.

In the wake of the feasibility study, TPCO decided to further pursue the US investment. CCREDC's President and CEO Roland Mower recalls that TPCO began by evaluating 73 communities in the United States, and possibly even a few international locations as a point of comparison.

In early 2007, the state-level Texas economic development office in Austin reached out to the CCREDC and SPCEDC requesting a proposal for TPCO. Both development offices periodically received requests for proposals, but this time, both believed that a TPCO investment could be particularly significant to their region, and sensed that the firm was serious.[49]

"This region had a lot to offer," recalled Mower in an interview. "Not only are

we a port community, a community that has a 45-foot ship channel that can accommodate international logistics both inbound and outbound, but we're also a manufacturing community. We're a fairly large industrial community that is in attainment for air quality. We have access to power [and] access to natural gas."

From Mower's perspective, Corpus Christi's proximity to oil and natural gas production was a strength, but the region's location was perhaps its greatest asset. "More important," he recalled, "as we got to work on the project, we came to realize our close proximity to [TPCO's intended] market in the United States, principally the oilfields of Texas, Oklahoma, and Louisiana, made [us] an attractive location for the majority of the products that they intended to produce out of this facility."[50]

Mower and Miller quickly realized they would be competing with each other for the TPCO investment. Miller notes that CCREDC "didn't like at all" that another community in South Texas would be competing with Corpus Christi, especially one in the city's immediate metropolitan area.

Soon after receiving the proposal request from the state, CCREDC approached Miller about collaborating, rather than competing. And that pitch made sense to Miller since SPCEDC had an operating budget of just about $200,000 and was hard pressed to shepherd a project of the size and scope of TPCO's on its own.

What SPCEDC did have, however, was local contacts. These, Miller and Mower reasoned together, could prove invaluable in securing land for a site and the local infrastructure needed to accommodate a TPCO plant.

Striking a quick agreement to cooperate, the two organizations proceeded to submit joint proposals for sites throughout their neighborhood. After a first look, TPCO trained its sights exclusively on one locale in San Patricio County. Both organizations began to focus all their energies there.

Miller credits Mower with taking the initiative to reach out and pool resources. During his 23-year career in economic development, Mower had previously held positions with regional and local economic development organizations in Texas and Colorado, before joining the CCREDC in 2005.[51]

Since joining, Mower had made the CCREDC view Corpus Christi more broadly as encompassing the entire metropolitan region. He had positioned the organization as a service-oriented shop.

"We've shaped this program as more of a consultancy kind of operation," notes Mower now, "where we provide technical assistance and direct services

to a wide range of counterparts across the region" around Corpus Christi. "We know what's good for San Patricio County, what's good for Corpus Christi, and what's good for Nueces County… We're the largest office in the region and we have the most expertise in a number of areas, so we just make those skillsets available to close deals. When the region wins, we all win."[52]

A First Site Selection Collapses

But although Corpus Christi and San Patricio pooled their economic development teams, the Chinese investment still hit snags. The combined team would encounter several challenges during the two years leading up to the TPCO investment. And no challenge proved to be as acute as the attempt to secure land for the TPCO facility.

After more than a year of work, site negotiations with Alcoa collapsed.

The initial site in San Patricio that attracted TPCO belonged to the US aluminum giant Alcoa, which had first entered the Corpus Christi region in May 2000. At that time, Alcoa's purchase of Reynolds Metals Company gave it ownership of a massive alumina refinery in San Patricio County.[53] Although it did not hold onto the refinery for long, selling it to BPU Reynolds in December 2000, Alcoa still owned 348 acres of adjacent land.[54]

This site seemed like an ideal fit for TPCO.

For one thing, the Alcoa property was situated on the Gulf of Mexico coast with direct access to a rail line, which would allow TPCO to easily transport materials into and out of the facility by sea and land. This was especially important because TPCO planned to use its US facility to sell products not only within the United States, but also to Central and South America, the Caribbean, Canada, and West Africa.[55] The Texas site would, TPCO hoped, become its hub for all of the Americas and beyond. So having adequate transportation infrastructure nearby was critical to its investment strategy.

But after more than a year of work, site negotiations with Alcoa collapsed. Some details of just what happened remain unclear, but one of the main sticking points appeared to have been control of the waterfront.

Sherwood Alumina, the BPU Reynolds-owned refining facility, controlled access to the waterfront and was not interested in sharing the space with TPCO. What was more, according to both CCREDC and SPCEDC, the negotiations with Alcoa proved to be taxing. The two local development organizations were unable to agree with Alcoa on fair terms and a price for its land.

Momentarily, then, it seemed as if the Corpus Christi area would drop out of the running for TPCO's new US plant. The region's economic team had

dedicated considerable energy to securing this single site, but it now appeared to have slipped from their hands without a solid backup plan in place.

Miller's Eleventh-Hour Gambit

Miller had mostly given up hope of landing the TPCO investment when one of TPCO's external advisors urged her to find another location: "He told me, 'You know, Josephine, they kind of like this area. They like y'all. Why don't you try to find them another location?'" Miller recalls. "I had been naïve to think another spot would not be available."[56]

As this anecdote illustrates, the Texas team had built up a strong rapport with the TPCO team. Still, they presumed that since TPCO had looked at alternative locations in other states, it was likely too late in the process to start a new location search from scratch.

"I was talking to people who remembered the Korean War," Miller recalls, "and I was telling them to sell to the Chinese!"

But Miller's local relationships—as well as some luck—ended up salvaging the deal for the Texas team. A county commissioner in San Patricio informed Miller that an older gentleman had inherited land directly across the street from the Alcoa site and might be willing to sell. But initially, this Houston-based owner was very unwilling to speak with Miller. Only when Miller mentioned that her husband's father and the owner's father had been good friends did the man become open to discussing the possibility of a sale.

Miller soon learned that this owner did not possess enough land for the potential TPCO site. She immediately contacted the owner of the adjacent property to convince him to sell as well. But once again, Miller encountered some reluctance. "I was talking to people who remembered the Korean War," Miller recalls, "and I was telling them to sell to the Chinese!"

But Miller's persistence and persuasion, together with TPCO's willingness to pay a high price for the land, ended up convincing both owners to sell their adjacent parcels. Private land in this area of San Patricio County generally sold for just $2,500 to $3,000 per acre because sales were based on farmland prices. But industrial land could command upwards of $10,000 per acre. And that was a far higher return than these two owners had thought they could ever realize through a land sale.[57]

Once the two owners had agreed to sell, TPCO still had to be convinced that the new site would adequately serve its needs. One of the site's major advantages was that it would certainly be able to meet TPCO's considerable demand for power consumption: the highway separating the two parcels, Texas State Highway 361, was a dividing line for

electricity coverage, so a theoretical site at that location would be served by both AEP Texas and the San Patricio Electric Cooperative instead of just AEP.

However, TPCO did have a particular issue with the site: initially, the firm had been convinced it would need waterfront property, but this second site, comprised of two private land parcels, lacked access to the water. TPCO was eventually convinced that it could use the public access port at a much-reduced cost and that this actually provided more benefit than a private port. One possible reason for the reconsideration: TPCO had been concerned about the threat of hurricanes damaging the waterfront site; it was reassured, therefore, that a slightly inland site might prove to be more protected from nasty weather.

Photo: Flickr/US Department of Energy

In the end, this second site became the TPCO plant's home.

Incentives

South Texas also appealed to TPCO, and was able to prevail, through an array of favorable local tax incentives. Since Miller had taken the lead in securing the new site, Mower's CCREDC team, working with San Patricio County Judge Terry Simpson, instead took the lead in assembling an incentive package. This became another factor in luring TPCO to the region.

The vast majority of the incentives that CCREDC generally uses to attract investment to metropolitan Corpus Christi come from the local community and region. "The state authorizes (or provides) local jurisdictions like cities and counties to offer tax abatements and things like that, so there's some enabling legislation at the state level providing tools," says Mower. "We have taken advantage of those tools to craft incentive offerings [such as those that TPCO] found attractive."[58]

According to Mower, the majority of the incentives offered to TPCO were standard incentives given to all major domestic and international projects by CCREDC. These are based on the job numbers that TPCO or another investor plans to create. CCREDC's maximum tax incentive is 100 percent tax abatement for ten years, but TPCO received an incentive significantly smaller than this, with full abatement for only the first few years before a gradual decline in the amount of tax abated.

Miller notes that subsequent investments received better incentives than TPCO. "We did not win this project based on incentives," she argues.

Beating the Competition

The Texas group's approach contrasted with that of neighboring Louisiana, in particular. The latter, according to Miller, was willing to strike incentive deals directly through the Governor's office.[59] Not surprisingly, then, New Orleans eventually became San Patricio County's main competitor for the TPCO investment, with Louisiana's comparative flexibility in incentive offerings proving to be stiff competition.

In the end, the San Patricio team's ability to work through immense challenges, like the failure of the Alcoa property deal, helped seal the deal.

In addition to Louisiana, San Patricio's other competitors for the TPCO investment were Baytown, Texas (in the Houston metropolitan area) and Osceola, Arkansas, which is next to the Mississippi River.[60] But TPCO's eventual decision to invest in San Patricio was primarily a function of the region's—and the site's—access to transportation infrastructure, proximity to TPCO's end user markets, availability of other local infrastructure (especially electricity), and its somewhat competitive, although hardly generous, incentive package.

One important factor that may have tipped the scale in San Patricio's favor was the strong relationship CCREDC and SPCEDC had built with TPCO's team in the early phases of the feasibility study and (failed) first site selection.

Miller, in particular, worked to form a strong personal bond with many individuals on the TPCO team. "I always felt that the Chinese came to our area because they felt socially comfortable [with people here]," notes Miller.

Another striking example of the close relationships San Patricio residents developed with TPCO is the case of JJ Johnson, who served as Mower's executive vice president at CCREDC. A few years after the TPCO investment was announced, Johnson even left CCREDC to head up external relations and human resources for TPCO America, suggesting a close bond from the days of negotiating the deal.

Yet another small example can be seen in the relationship Miller developed with the main TPCO advisor, who later would implore Miller to propose a new location after initial site negotiations with Alcoa collapsed. Early on in the negotiation, Miller realized that this advisor consistently left his briefcase and cellphone behind, "so I began following him around at these meetings and making sure he had all his stuff. Those small touches are why he found me [to suggest I find a new location]," said Miller.

In short, famed Texas hospitality, and a dose of Miller's sheer tenacity, may have helped cement the deal for a Chinese company that put a premium on strong personal relationships.

Nor was Miller alone in understanding the importance of personal and seemingly quotidian connections.

"These things happened with someone else being the pick-up guy over and over and over again," recalls Miller. In the end, the San Patricio team's ability to work through immense challenges, like the failure of the Alcoa property deal, helped seal the deal. And this was despite the fact that the county team was constrained by limited resources and personnel. Ultimately, TPCO gained confidence that the region would be a reliable partner willing to jump through hoops to help TPCO succeed.

Deal Announced

On January 8, 2009, TPCO formally announced that it would put up over $1 billion for a 1.6 million square foot facility on a 253-acre site in San Patricio County.[61] The investment still marks the largest single direct investment by a Chinese company in a manufacturing facility in the United States.[62]

The effect on the local economy, if this investment ultimately meets expectations, should be profound. A preliminary study projected that the facility would boost the local economy by approximately $2.7 billion during its first decade of construction and operation.

After a 34-month construction period that will provide approximately 2,000 construction-related jobs, the facility aims eventually to hire 600 to 800 workers.[63] For a county of just 60,000 people, that is a substantial contribution to employment.

TPCO's announcement was met with considerable enthusiasm in the Corpus Christi metropolitan area, where the fact that the investor was a Chinese SOE seems largely to have been ignored. "When we did the announcement in Portland [a small coastal town in San Patricio County], we printed 375 brochures, and every single one of them was picked up," Miller recalls proudly.

TPCO America Today

But despite the fanfare, the TPCO project has a long way to go.

Construction Process

TPCO split its construction process into two phases. As of publication, the company has already completed Phase One, which involved the construction of a heat treatment and finishing facility.

In March 2014, TPCO announced that it had selected Yates Construction, a family-owned, Mississippi-based firm with significant operations in Texas,[64] to complete Phase Two, which will involve the construction of administrative offices, an arc furnace facility, and a rolling mill.[65] The plant is expected to become fully operational by mid-2016.[66]

Despite the fanfare, the TPCO project has a long way to go.

Training Workers

Construction of the Texas plant has, however, seen significant delays. "They are now struggling to get themselves up and running," Miller admits candidly. This can be partly attributed to a shortage of qualified personnel, especially those who speak both Chinese and English. "Some of the more technical positions that require two languages, English and Chinese Mandarin, particularly in engineering, have been challenges to find," said Johnson.[67] Indeed, not only was it difficult to find the appropriate personnel with the right mix of skills in general, the task was made all the more challenging by having to attract them to Gregory.

Local universities have been helping to train workers with requisite technical skills to operate the plant's equipment. Del Mar Community College in Corpus Christi, for example, is offering courses in welding, non-destructive testing procedures, workplace and employee safety, and other programs that will support line operations at TPCO's Texas operation. Similar programs are in place at Corpus Christi's Craft Training Center and Texas A&M's Corpus Christi campus.[68]

But unlike other greenfield investments from China, TPCO opted for a location that provided easy access to markets while choosing to site its facility away from major research universities, where access to a large pool of human capital is readily available. This stands in contrast, for example, to another greenfield investment covered in this series of Paulson Investment case studies—an aluminum facility in West Lafayette, Indiana, built by Nanshan America,[69] which was deliberately located in proximity to Purdue University, various local technical colleges, and other

schools to tap a specific pool of human capital.

In TPCO's case, locational advantages, such as access to the Gulf of Mexico, outweighed these human capital considerations.

San Patricio County Today

Since its success in attracting the TPCO investment, the Corpus Christi metropolitan area has continued to successfully land other substantial foreign direct investments. In 2012, M&G Company, a firm headquartered in Luxembourg, announced that it would build the world's largest positron emission tomography (PET) (a medical body scanner) integrated plant in Corpus Christi.[70] In 2013, Voestalpine, a company based in Linz, Austria, announced that it would build a direct reduction iron plant in the area, an investment totaling $740 million and representing that firm's largest FDI to date.[71]

These successes are not coincidental. Landing an investment as large as TPCO raised the profile of the Corpus Christi area as a manufacturing destination and sent a signal to other foreign firms that the region was an attractive locale worth at least a first, and then perhaps a second or third, look.

But the recent successes are also testament to effective collaboration among multiple economic development offices in a single region. Despite mismatched sizes and resources, the team approach taken across offices in south Texas demonstrated an ability to collaborate in attracting lucrative FDI that have generated jobs for the local economy.

Lessons Learned for Chinese Investment in US Energy

When the TPCO plant is fully operational in 2016, it will finally be able to leverage the US energy boom, thus demonstrating to other Chinese firms whether tapping the US market directly is a good gamble.

But the recent revival of the United States as a major energy producer, rather than a major importer, could prove transformative. It has certainly sparked a great deal of interest from an array of Chinese investors, from large state firms such as the China National Offshore Oil Corporation (CNOOC) to market players, such as private equity funds, which have begun to explore US energy bets in anticipation that acquiring technology and know-how will help fuel a similar shale boom in China down the road.

Photo: Flickr/US Department of Energy

In stark contrast to the percolating volatility and uncertainty in the Middle East and Russia, the US energy sector looks like a bedrock of stability. Such stability in an energy producing country is a major asset for potential investors, and this is no less true of Chinese companies, some of whom are very exposed to the Middle East and are seeking to diversify and hedge their risk.

It is no surprise, therefore, that TPCO is but one of many Chinese corporates eyeing the US market, and in particular, investments in shale plays.

For its part, TPCO is a supplier to energy producers, but other Chinese energy giants have also invested in the Texas energy boom. In 2010, for example, a high-profile deal was concluded through which CNOOC bought one-third of Chesapeake Energy's shale assets in south Texas for over $1 billion.[72] Just two years later, the same Chinese company also bought Canada-based Nexen for $15 billion, a firm that possessed shale assets in Canada and other assets in the Gulf of Mexico.[73]

Chinese firms' massive energy investments in the United States reflect domestic limitations, above all. Despite having larger potential shale gas reserves than the United States, China has not yet managed to replicate the US shale revolution. If anything, production

volumes in China are actually lower than government targets.

For a number of reasons, including inadequate technology, high costs of domestic production, and geological challenges, Chinese companies are likely, for the time being, to continue scouring the global market for assets that can help them overcome those challenges in the future. Given the technological maturity of shale production in the United States, it is an especially attractive market for Chinese energy investors in general.

Natural gas demand in China is expected to rise dramatically over the next decade, yet China lacks adequate domestic production to meet that demand.[74] Therefore, Chinese firms will have to look beyond the country's borders to boost supplies and make strategic investments. That is one of many reasons that, from the Chinese vantage point, makes the US market seem so promising for direct investment.

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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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