



**U.S. CHAMBER OF COMMERCE**  
International Affairs

# **FROM INTERNATIONAL TO INTERSTATES: ASSESSING THE OPPORTUNITY FOR CHINESE PARTICIPATION IN U.S. INFRASTRUCTURE**



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# FROM INTERNATIONAL TO INTERSTATES: ASSESSING THE OPPORTUNITY FOR CHINESE PARTICIPATION IN U.S. INFRASTRUCTURE



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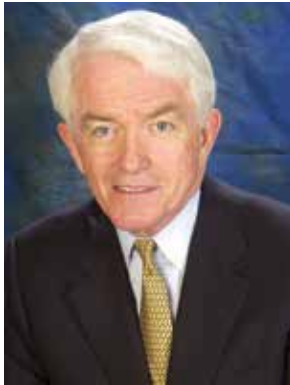
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## MESSAGE FROM THE PRESIDENT AND CEO

The U.S. Chamber of Commerce is proud to partner with the China Center for International Economic Exchanges (CCIEE) in efforts to strengthen U.S.-China economic and commercial ties, including the U.S.-China CEO and Former Senior Officials' Dialogue. Each organization is staunchly committed to that mission, and two-way infrastructure investment has emerged as one of the most promising opportunities to further integrate the world's two largest economies and drive substantial benefits for the United States and China.

To better understand the challenges and opportunities of increased Chinese investment in American infrastructure products, the U.S. Chamber engaged the law firm Covington & Burling LLP, the economic research and advisory firm Rhodium Group, and the strategic advisory firm Sphere Consulting to produce a study on these issues.

Our study found that Chinese participation in U.S. infrastructure would enable the United States to leverage Chinese capital, industrial capacity, and infrastructure experiences, while allowing China to help support and capitalize on the coming wave of U.S. infrastructure redevelopment. Such cooperation would strengthen the relationship between the two nations and enhance global stability and prosperity.

The study also found that although the opportunities are significant, achieving them will likely be complex. Chinese investment in certain sectors and in certain jurisdictions will prove more challenging than in others. Identifying and pursuing potential investments, as well as anticipating challenges, will require planning and patience by Chinese parties and their U.S. counterparts.

However, we believe that the U.S. infrastructure sector offers significant opportunities for Chinese investors. Investors should feel confident pursuing mutually beneficial opportunities in the United States.

The Chamber has a long history of promoting two-way foreign direct investment (FDI) between the United States and China. In 2012, it published *Faces of Chinese Investment in the United States* (presenting profiles of Chinese investments in the United States) and *China's Approval Process for Inbound Foreign Direct Investment* (outlining China's regulation of inbound FDI). The Chamber also supports the negotiation of a high-standard U.S.-China bilateral investment treaty and welcomes recent developments on that front.



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This report aims to build on the insights of our earlier studies and provides clear analysis and useful guidance for potential investors, U.S. partners, key stakeholders, and policymakers as they consider the impact and potential of Chinese investment in U.S. infrastructure.

Above all, we believe that these efforts and the continued partnership between the U.S. Chamber and CCIEE will advance the immeasurably important U.S.-China bilateral relationship.

Sincerely,

Thomas J. Donohue  
President and CEO  
U.S. Chamber of Commerce



# EXECUTIVE SUMMARY

The United States is poised to undertake the most significant expansion and modernization of its infrastructure since the 1950s.<sup>1</sup> Unlike previous infrastructure booms, this new period is taking place in the context of significant pressure on federal, state, and local budgets, suggesting that substantial private capital will be necessary to finance the new infrastructure investments. This expansion is also taking place in a dramatically changed global economy that boasts new players in global trade and investment. The most important of these new players is China. As the United States' second-largest goods trading partner—and with a large and growing pool of available capital—China is well positioned to participate in and benefit from U.S. infrastructure expansion and modernization.

## Economic, Trade, and Political Factors Drive Compelling Opportunities for Chinese Participation in U.S. Infrastructure

The pressing need for capital to modernize U.S. infrastructure is creating substantial new opportunities for Chinese investors. At a minimum, we estimate that more than \$8 trillion in new investment will be needed in U.S. transportation, energy, and wastewater and drinking water (water-related) infrastructure from 2013 through 2030—totaling some \$455 billion per year. In reality, a much higher amount of investment will likely be necessary. Investment in energy infrastructure accounts for 57% of the total projected need, followed by 36% for transport and 7% for water-related infrastructure. Making the most of these opportunities will require navigating the legal, regulatory, and political landscape in the United States. This study examines the opportunities for Chinese participation in U.S. infrastructure and provides practical advice for potential participants.

### INVESTMENT

The first way in which Chinese firms can benefit from participating in U.S. infrastructure is as providers of capital. Currently, Chinese institutional investors and firms have large and growing capital pools, but their balance sheets show a high degree of “home bias”—that is, almost all of their investments are in the domestic economy. Greater uncertainty about domestic growth in China has increased awareness of the risks of maintaining domestically-concentrated portfolios and the benefits of global diversification.

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<sup>1</sup> The term “infrastructure” refers to a wide range of physical assets and institutions that support the operation of a society. In this report, we focus on three general sectors: energy, transport, and water-related infrastructure. We do not directly address opportunities for Chinese participation in other areas—such as communications infrastructure, solid waste management, or social infrastructure—which are of clear importance to society’s operation but are less conducive to systematic treatment. (Social infrastructure, for example, includes a society’s health care system, prisons, educational institutions, libraries, parks, and sports and recreation facilities.)





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Investment in U.S. infrastructure projects and firms thus offers Chinese firms a compelling opportunity. U.S. investments benefit from a stable political and legal environment, robust capital markets for refinancing, and proven infrastructure needs—each of which is particularly important to long-duration investments. Investments in capital-intensive infrastructure projects also have the advantage of allowing for the passive investment of large amounts of money, without the need for constant managerial supervision.

Opportunities for equity investment include acquiring stakes in companies involved in infrastructure, investing in infrastructure-targeted investment funds, and providing equity financing to special purpose vehicles (SPVs), in the context of either private sector projects or public–private partnerships (PPPs). Opportunities for debt investment include the provision of loans to infrastructure projects and the purchase of debt instruments issued by related entities, such as public or private bonds used to fund projects.

## **PROVISION OF GOODS AND SERVICES**

The U.S. infrastructure sector also offers opportunities for Chinese providers of infrastructure goods and services. Owing to China's infrastructure boom of the past 30 years, many Chinese firms now have significant economies of scale which, when combined with low labor costs, enable them to offer construction materials at globally competitive prices. China's infrastructure boom and educational priorities also have grown the size, capabilities, and experience of the country's engineering corps. Chinese firms have thus become increasingly competitive in the market for such infrastructure-related services as civil engineering, engineering, procurement and construction services, contract management services, and operations and maintenance or life-cycle management services.

## **A Complex Legal and Regulatory Framework Makes Some Opportunities for Chinese Participation in U.S. Infrastructure More Suitable than Others**

The nature of the opportunity for China's participation in U.S. infrastructure is defined as much by U.S. laws and regulations as it is by economics.

First, laws, regulations, and common contractual structures differ significantly depending on whether the applicable infrastructure assets are publicly or privately owned. As a general rule, nearly all water infrastructure is public, while most energy infrastructure is private. Transportation infrastructure is a mix. Roadway assets are primarily owned and operated by federal, state, and local governments, but there are well-established structures for private sector investment in and management of toll roads, tunnels, and bridges. Similarly, rail, aviation, and shipping infrastructure can be private, public, or subject to a PPP.



Second, foreign investment in U.S. infrastructure must comply with a particular set of laws and regulations. Investments that give a Chinese party “control” of an existing U.S. infrastructure business will often require a national security review by the Committee on Foreign Investment in the United States (CFIUS). And investments in certain infrastructure sectors may require additional regulatory approvals. For example, investments in an energy enterprise that owns, controls or makes sales from electricity facilities are likely to require advance approval from the Federal Energy Regulatory Commission and, in some cases, state authorities.

Third, the provision of goods or services by foreign parties must address local procurement preferences and comply with a range of other laws and regulations. For example, certain procurements by U.S. government agencies are limited to products from a list of designated countries, including parties to the WTO Agreement on Government Procurement (GPA). China is in the process of acceding to the GPA, but until it does so, procurement opportunities in the United States will be limited. Procurement preferences attach both to purely public projects and to many projects that have a mix of public and private financing. And a web of labor, environmental, health, safety, zoning, and other rules apply to the infrastructure sector and must be understood by both foreign owners of infrastructure assets and foreign providers of design, construction, or management services.

## Challenges for Chinese Parties in the U.S. Market

Although extensive opportunities abound for Chinese participation in U.S. infrastructure, the firms most likely to succeed will be those that anticipate and develop strategies to address likely challenges, including the following (some of which apply to all foreign parties):

- **NATIONAL SECURITY CONCERNS.** While the United States has a longstanding policy of openness to foreign investment, certain proposed transactions that result in Chinese ownership of existing infrastructure projects or businesses may raise national security concerns and face scrutiny from CFIUS or political opposition. In particular, investment in the electricity grid, upstream and midstream oil and gas assets, airports, and seaports are likely to be viewed as highly sensitive from a national security perspective and are susceptible to political scrutiny. Among the factors that can be closely examined by CFIUS or attract public attention are: state control of Chinese investors, whether an entity is motivated by commercial or political interests, financing of the transaction, and concerns over cyber espionage or the proximity of a project to military bases or restricted airspace.
- **ADVERSE REACTIONS TO FOREIGN OWNERSHIP.** Chinese investment in U.S. infrastructure may also generate strong local reactions against foreign ownership of core domestic assets even where national security is not implicated. Such reactions often center on concerns that decisions affecting the public will be left in the hands of foreign powers, and these concerns have been raised even for foreign investors from close U.S. allies. These problems are best addressed through a thoughtful public outreach and education program. Many states—especially those



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pursuing PPPs—are aware of the political problems that foreign participation may generate and may serve as helpful partners in navigating the political and regulatory challenges surrounding foreign investment.

- **QUALITY CONTROL AND PRODUCT SAFETY.** Chinese firms seeking to sell goods for infrastructure projects may face concerns about quality control and product safety as a result of high-profile defective products cases in recent years.
- **INADEQUATE LEGAL REMEDIES.** Given concerns about product quality and safety and the limited legal cooperation between the United States and China, there may be concerns about the availability of legal remedies against Chinese suppliers in the case of damage from faulty products.
- **AFTER-SALE SERVICE.** In addition, because Chinese firms have mostly served overseas markets through export channels rather than through establishing operations abroad, they often lack established capabilities to provide after-sale service and maintenance, which may be a vital component to winning contracts for infrastructure projects.

## Challenges to Chinese Participation Arising from Chinese Laws and Regulations

In addition to U.S. laws and regulations, Chinese firms and their U.S. counterparts must plan for any legal and regulatory requirements governing outbound investment from China:

- **CHINESE OUTBOUND INVESTMENT APPROVALS PROCESS.** Chinese parties must first gain approval from their home regulators before they invest or move funds overseas. Under current law, direct investments typically require separate approvals from the National Development and Reform Commission (NDRC), the Ministry of Commerce, and the State Administration of Foreign Exchange, and relevant industry regulators. For financial investments, Chinese investors need to have a specific government mandate for overseas investment or to obtain a quota under the Qualified Domestic Institutional Investors Program (QFII).
- **STATE CONDITIONS ON OUTBOUND INVESTMENT.** It also is not uncommon for state-owned investors or banks to condition investments or loans on other state-owned firms obtaining service or supply contracts, which can add additional complexity to the potential transaction.



## Managing Challenges in Order to Realize Valuable Opportunities— Strategies for Success

Although these challenges are very real, they should not obscure the significance of the potential opportunity for Chinese investment in infrastructure. Given our projections of massive U.S. infrastructure needs, China's importance as a source of global capital and infrastructure goods and services, and the mutual advantages to be realized, substantial opportunities should develop. Chinese firms and their U.S. counterparts that engage in careful planning and preparation will be most likely to realize these opportunities.

As a summary point, we put forth the following suggestions for Chinese parties—as well as their U.S. counterparts—contemplating participation in U.S. infrastructure. We direct these points to potential transactions that will involve direct investment, but many of them apply in equal force to potential providers of infrastructure goods or services.

- **UNDERSTAND U.S. NATIONAL SECURITY CONCERNS.** Investors should anticipate the natural security concerns associated with investments in strategic sectors and U.S. businesses. As described above, certain infrastructure sectors are likely to be viewed as more sensitive from a national security perspective. Chinese participation in these sectors will require additional attention and preparation beyond that required for typical opportunities.
- **UNDERSTAND THE REGULATORY LANDSCAPE.** In connection with a long-term strategy to develop and grow their position in the U.S. marketplace, investors should consider what approvals are required in connection with particular transaction structures. For some investors, “greenfield” projects may offer an attractive opportunity.
- **PRIORITIZE TRANSPARENCY AND LEGAL COMPLIANCE.** Increased corporate transparency and broader legal compliance policies will benefit Chinese parties contemplating investments or other participation in U.S. infrastructure. Taking such steps will likely facilitate regulatory reviews and help to preempt potential political criticism. Likewise, given the post-transaction compliance concerns that are frequently voiced in connection with potential Chinese investment, the ability to demonstrate a strong compliance program and culture to U.S. authorities will enhance prospects for successful investment. For example, having sound written policies and procedures for export control compliance and anticorruption compliance, including training materials for employees, reflects an understanding of U.S. regulatory interests and could enhance a Chinese investor's reputation.



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- **BE MINDFUL OF HOW OTHER GLOBAL INVESTMENTS MAY IMPACT INVESTMENTS IN THE UNITED STATES.** It is important for all investors, and Chinese firms especially, to understand how business outside the United States can impact the ability to make investments in the United States. In particular, transacting business with and having significant investments in countries subject to U.S. sanctions—including Iran, Syria, the Democratic People’s Republic of Korea, and Cuba—can present regulatory compliance challenges as well as political risks for U.S. investments.
- **INVEST IN U.S. OPERATIONS AND DEVELOP RELATIONSHIPS.** Another key element of sustained success in the United States is the ability to demonstrate a commitment to the U.S. market. Investing in and developing sustained operations in the United States enables the formation of important relationships with business partners, local and national elected representatives, and other third parties who can validate the reputation of the investor.
- **DEVELOP A COMPREHENSIVE STRATEGY TO MANAGE RISK.** Chinese firms contemplating investments in the United States may wish to develop a comprehensive strategy to help manage political risk—at the federal, state, and local levels—well before any investment is made. Such investors should also consider a long-term, sustained strategy to develop legal compliance, government affairs, and public relations functions. Such capabilities will improve: (1) the likelihood of overcoming challenges to prospective transactions; (2) the chances of success after investments are made; and (3) the prospects of beneficial legislative changes in the future. Studies have suggested that states themselves can be helpful allies in navigating political and regulatory challenges to infrastructure projects.



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## ASSESSING THE OPPORTUNITY FOR CHINESE PARTICIPATION IN U.S. INFRASTRUCTURE

Infrastructure is the bedrock of a nation's economy. It enables the flow of intermediate inputs to production—including energy, telecommunications, semi-finished goods, and raw materials—as well as the movement of people between homes, schools, jobs, and recreation. The United States was a leading infrastructure investor throughout the 20th century, as it met the needs of a rapidly growing, industrializing continental economy. For example, the federal government spent \$425 billion (in 2006 inflation-adjusted dollars) to build 41,000 miles of roadway over the 35 years following President Eisenhower's 1956 Federal Aid Highway Act. With extraordinary demographic growth over the century—from 76 million at the turn of 1900 to 314 million today—and a regulatory and political environment highly conducive to the productive and profitable use of those assets, these investments at the federal, state, and local levels laid the groundwork for American success.

The structural economic conditions that drove the demand for and sustainable financing of U.S. infrastructure have evolved, and today it is widely agreed that a new reality exists. The need for infrastructure investment remains tremendous. The aging of an expanded asset base has increased basic demands for capital asset renewal—including maintenance, rehabilitation, and infrastructure replacement—while demographic shifts necessitate additional investment to support GDP growth in new geographic regions. At the same time, traditional financing strategies have become outmoded. Public funds for infrastructure investment have dwindled, owing to the recession and its aftermath, competing budgetary needs, and other factors.<sup>2</sup>

In this context, foreign investors offer a potentially important source of supplemental financing for U.S. infrastructure investment. In addition, some foreign firms providing infrastructure goods or services provide the prospect of lower input costs and greater economies of scale than available domestically. Each should be considered in the context of U.S. infrastructure needs.

Historically, foreign parties have been prominent participants in U.S. infrastructure investment. European consortia provided much of the financing for U.S. railway construction in the 19th century, and by the early 20th century Canadian and Mexican railway companies had extended and were maintaining rail

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2      Regarding the effect of inflation and rising fuel economy standards on the gas tax's ability to fund the Highway Trust Fund, the principal source of federal funding for highway projects, *see* Devin Braun, Ryan Endorf & Stephen Parker, *The Impact of Fuel Use Trends on the Highway Trust Fund's Present and Future*, COLLEGE OF WILLIAM & MARY, THOMAS JEFFERSON PROGRAM IN PUBLIC POLICY, *available at* <http://www.wm.edu/as/publicpolicy/documents/prs/aed1.pdf>.



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lines over the U.S. border.<sup>3</sup> By the 1920s, British-Dutch Royal Dutch Shell had accumulated significant stakes in U.S. crude oil extraction operations via foreign direct investment.<sup>4</sup>

Today China is joining the ranks of major global investors. Decades of rapid growth, based on a model that promotes capital formation and external balance of payments surpluses, have positioned China to be a global financial and direct investor abroad. China has already become the world's second largest economy, the U.S.'s second largest goods trading partner,<sup>5</sup> and a significant source of capital for the U.S. economy.<sup>6</sup>

This report's objective is thus to explore and assess the potential for Chinese participation in the U.S. infrastructure sector.

In Part I of the report, we develop a projection of the floor level of capital financing needs for the U.S. energy, transport, and water-related infrastructure sectors. As with past emergences of new economic flows—such as the rise of Japanese investment or of China's goods exports—a mix of initial concerns, policy challenges, and emotions will need to be managed if the full potential for Chinese participation is to be realized. These tasks will be substantially simpler if clear metrics are available for the scale and scope of potential activity.

We next address how parties can participate in such investment. We consider the legal and contractual structures common in public infrastructure and private infrastructure sectors, and we address select legal and regulatory issues for foreign parties and in specific sectors.

In Part II of the report, we examine the legal, political, and commercial opportunities and challenges for Chinese participation in the energy, transport, and water-related infrastructure sectors, and we offer suggestions and strategies for addressing such challenges.

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3 Mira Wilkins, *History of Foreign Investment in the United States, 1914-1945* 148, (2005).

4 On the role of European players in American Oil, *see* Daniel Yergin, *The Prize* (1990)

5 In 2011, there was \$503 billion in total (two-ways trade). *See U.S.-China Trade Facts*, OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE, *available at* <http://www.ustr.gov/countries-regions/china-mongolia-taiwan/peoples-republic-china>.

6 Daniel H. Rosen & Thilo Hanemann, *The Changing US-China Investment Relationship*, CHINA ECON. J., (forthcoming).



# PART I. ASSESSING THE U.S. INFRASTRUCTURE OPPORTUNITY

## I. A Economic Assessment: Projecting U.S. Infrastructure Investment Needs through 2030

We begin our assessment of opportunities for participation in the U.S. energy, transport, and water-related infrastructure sectors by estimating the required capital investment needs for these sectors for the years 2013 through 2030. We chose these three segments for their size, definable needs, and past openness to foreign participation. Importantly, in all cases we project minimum floor levels of required investment using conservative assumptions and cover only those subsectors least likely to give rise to controversy. We do not, for example, estimate the amount of investment required to adapt to the likely impacts of climate change; doing so would have resulted in much higher numbers, but may have distracted attention from the principle message of this study—that U.S. infrastructure needs are huge and offer plenty of room for major growth in foreign participation—by inviting side debates about climate science. We thus estimate capital investment for only those subsectors of energy, transport, and water-related infrastructure offering reliable economic data, third-party analysis, and general consensus among experts. These subsectors are listed in Table 1 and are discussed more fully in the *Technical Appendix*.

**Table 1: Infrastructure Subsectors Supporting Quantitative Projections**

Sector	Energy	Transport	Water-Related
<b>Subsector</b>	Oil and gas Electricity Coal Biofuels	Highways, bridges, and mass transit Freight rail Passenger rail Airports Seaports Inland waterways	Drinking water Wastewater





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## BOX 1

### Methodological Note

The projections contained in this report are based on historical data, common assumptions, and estimates by authoritative sector specialists. Where necessary, we extrapolate and interpolate from incomplete data and long-term investment figures. We discuss at length the methodology used to generate these projections in the *Technical Appendix* and also therein provide thorough references to all source data. The numbers in this assessment have all been converted to 2011 U.S. dollars for comparability.

The report's qualitative analysis discusses additional components of energy, transport, and water-related infrastructure not included in our quantitative floor estimates. We discuss, for example, the Chicago parking meter lease and concession, yet we have excluded parking from our projections of transport-investment needs due to the absence of solid forecasting data. We also address opportunities in the renewable energy space, though we have similarly excluded renewable energy from our investment projections, given the small percentage that renewables currently represent in the U.S. energy mix, the speed of technological change, and the significance and uncertainty of policy support for the sector.

In addition, our projections reflect only capital projects that are required to keep infrastructure in a state of good repair. They do not include the growing financial cost of operations and maintenance—which we discuss as well in the report's qualitative analysis—proposed capital expansion investments, such as high-speed rail, high-tech navigation systems for U.S. airports or efficiency enhancements at U.S. seaports, or projects that may be necessitated by climate change. This final limitation is particularly significant in light of estimates that hundreds of billions of dollars in seawall construction may be required to protect U.S. cities from rising sea levels.

Projecting investment over two decades at a time of great financial and economic change is inherently speculative; however, given the foregoing limitations, and because we have selected lower-bound numbers in the sectors we cover, we believe our projections establish a floor level of capital investment needs. Where there are significant upside risks to our figures, we discuss such risks qualitatively and in the *Technical Appendix*.

After arriving at aggregate estimates of capital investment for energy, transport, and water-related infrastructure, we distribute such amounts across the nine U.S. Census divisions, using assumptions of regional growth discussed in the *Technical Appendix*.

The nine U.S. Census divisions include the following states:

- *New England Division*: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
- *Middle Atlantic Division*: New Jersey, New York, and Pennsylvania
- *East North Central Division*: Illinois, Indiana, Michigan, Ohio, and Wisconsin
- *West North Central Division*: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota
- *South Atlantic Division*: Delaware, District of Columbia, Florida, Georgia, Maryland, North



- Carolina, South Carolina, Virginia, and West Virginia
- *East South Central Division:* Alabama, Kentucky, Mississippi, and Tennessee
- *West South Central Division:* Arkansas, Louisiana, Oklahoma, and Texas
- *Mountain Division:* Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
- *Pacific Division:* Alaska, California, Hawaii, Oregon, and Washington

## United States Census Regions and Divisions

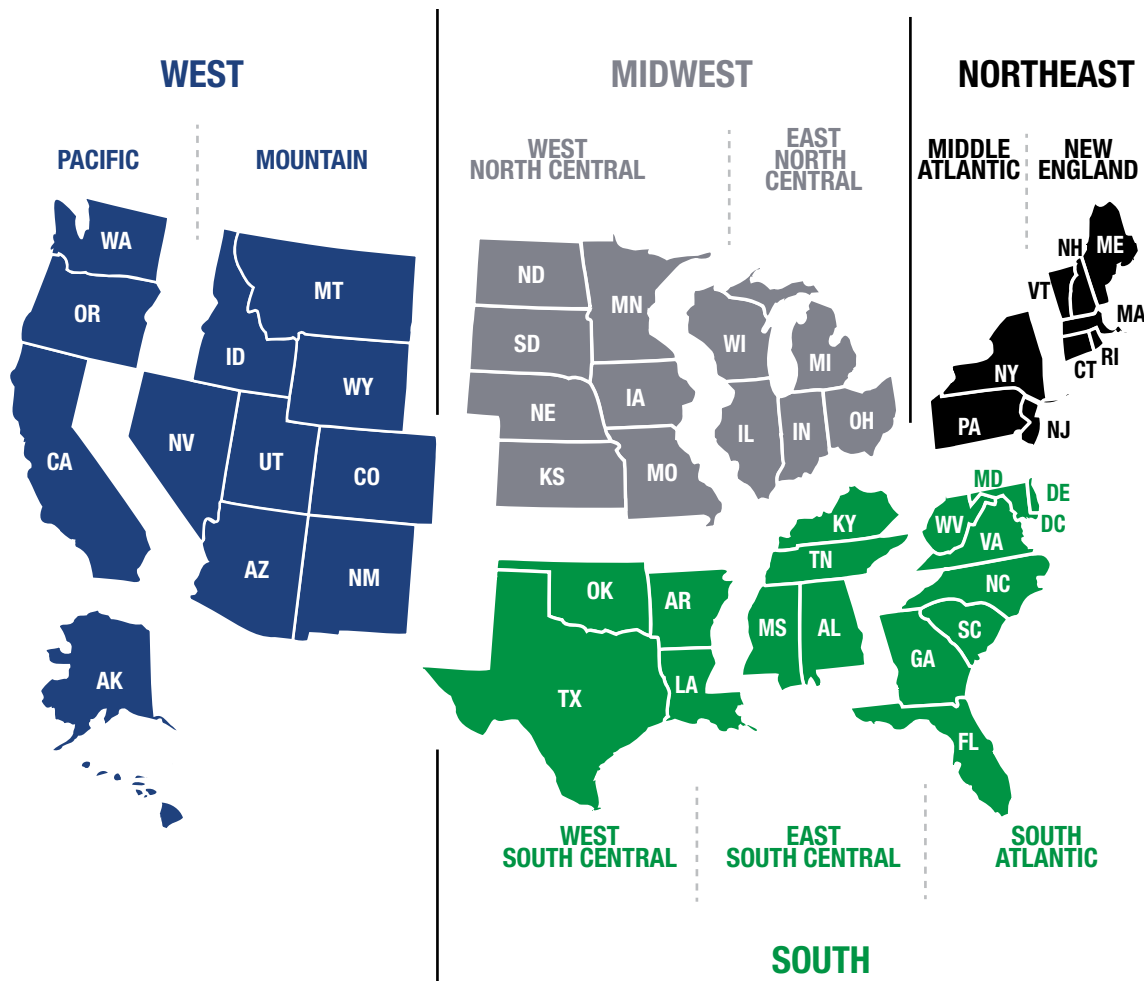


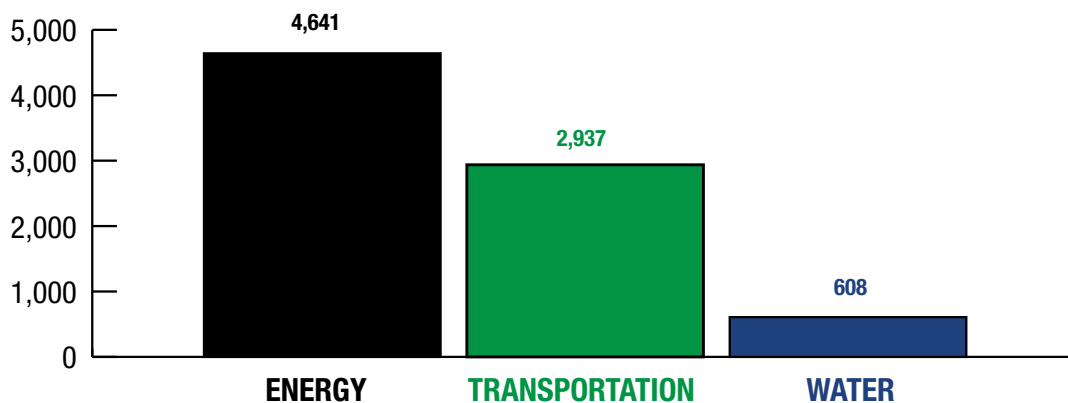
Figure 1. Source: Energy Information Administration (EIA). <http://www.eia.gov/consumption/commercial/census-maps.cfm>



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Our aggregate 2013–2030 projection of capital investment needs for the three selected infrastructure sectors comes to \$8.2 trillion, an average annual investment of \$455 billion. Capital investment in energy represents 57% of this total, followed by 36% for transport and 7% for water.

## Cumulative U.S. Capital Investment Needs in Energy, Transport, and Water: 2013–2030 (\$2011 billions)



**Figure 2.** Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.

## Energy Infrastructure

To project U.S. energy supply infrastructure investment through 2030, we have defined four groups of assets: oil and gas (including both upstream and downstream assets), electricity (including power plants and transmission and distribution assets), biofuel production (including ethanol and biodiesel assets), and coal (both mining and transportation).

We project total 2013–2030 capital investment needs for energy infrastructure of \$4.6 trillion, with average annual investment of \$258 billion. Investment in oil and gas infrastructure accounts for 60% of this total (\$2.8 trillion), while electricity infrastructure accounts for 37% (\$1.7 trillion), biofuels infrastructure for 2% (\$98 billion), and coal infrastructure for 1% (\$55 billion).

These estimates are primarily derived<sup>7</sup> from energy supply infrastructure investment demand projections produced for the International Energy Agency (“IEA”)’s *2012 World Energy Outlook* (“WEO”),<sup>8</sup> which

<sup>7</sup> We used investment estimates from the Organization for Economic Cooperation and Development for coal numbers.

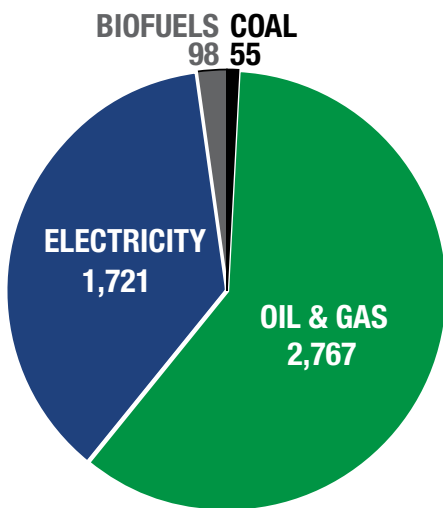
<sup>8</sup> *World Energy Outlook 2012*, INTERNATIONAL ENERGY AGENCY, available at <http://www.worldenergyoutlook.org/publications/weo-2012/>.



projects energy trends through 2035. Based on these trends, we apply energy-use statistics from the nine U.S. Census regions to determine capital needs within the four sectors for each division and for the United States overall. This approach to aggregating energy infrastructure capital outlays is discussed in further detail in the *Technical Appendix*.

There is considerable uncertainty surrounding our base case energy infrastructure investment projections. The application of hydraulic fracturing and horizontal drilling to low-permeability shale formations has led to a dramatic expansion in oil and gas production and investment. The IEA significantly revised its estimates of U.S. oil and gas investment demand between the 2011 and 2012 WEOs, and there could be further upward revisions in the years ahead. The dramatic change in America’s energy trade position also has raised the prospect of billions of investment in new liquefied natural gas (LNG) and coal export terminals. And future environmental policy, such as the greenhouse gas regulations on existing coal-fired power plants currently being developed by the Environmental Protection Agency (EPA) or policies that promote and accelerate widespread adoption of electric vehicles, could lead to electricity sector investment needs far above the IEA’s current projections. As with all estimates in this report, our assessment of future energy sector investment demand should be considered conservative.

**Total U.S. Investment Needs in Oil & Gas, Electricity, Biofuels, and Coal from 2013–2030 (\$2011 billions)**



**Figure 3.** Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.

**Cumulative Investment in U.S. Energy Infrastructure by Census Region, 2013–2030 (\$2011 billions)**

Region	Total	Percent
New England	52	1%
Middle Atlantic	289	6%
East North Central	349	8%
West North Central	418	9%
South Atlantic	411	9%
East South Central	260	6%
West South Central	1,612	35%
Mountain	632	14%
Pacific	617	13%
<b>Grand Total</b>	<b>4,641</b>	<b>100%</b>

**Table 2.** Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.



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## Transport Infrastructure

Transport infrastructure in the United States is owned and operated by a mix of private and public sector entities. Some modes, like highways and mass transit, are primarily operated by state and local governments, and they are financed by a combination of state funds, local funds, and user fees. Other modes—like passenger rail (Amtrak), airports, and seaports—rely on a combination of private and public financing.

We project 2013–2030 capital investment needs in transport infrastructure of \$2.9 trillion, with an annual average of \$163 billion. More than half of this investment will be required to meet highway and bridge capacity needs.

Capital investment needs for highways and bridges, mass transit, airports, freight rail, passenger rail, ports, and the U.S. inland waterways system were considered for this analysis. Because maintenance, financing, operation, and development of these modes are shared between the private and public sector—and federal and state authorities—aggregating total funding needs requires compiling data from varied sources and extrapolating investment demand when data are not available.

For highways, bridges, and mass transit, we used capital investment needs identified by state transportation authorities to determine regional and national investment needs (a bottom-up approach). For states in which data are not available, we extrapolated needs through a combination of population projections and data from states where capital needs projections are available. For the remaining modes, we used national-level capital investment needs estimates developed by transport sector experts (e.g., the American Association of Railroads for freight rail and the Federal Aviation Administration for airports) to derive regional investment demand (a top-down approach). We then assumed equal annual investment over the outlook period and applied these figures to our 2013–2030 time frame.

As with energy, risks to our transport infrastructure investment projections are all to the upside. We have extrapolated from traditional transportation-sector fixed investment patterns, but alternative analyses point to higher rates of growth and new needs in the future. Consider, for example, seaports. Although our aggregate figure from 2013 through 2030 is \$21.4 billion, based on investment projections determined by the American Society of Civil Engineers (ASCE), planned 2011–2020 capital investment outlays for harbor-related port infrastructure for the Port Authority of New York and New Jersey alone are \$611 million (2010 dollars). And in 2013, the Long Beach Board of Harbor Commissioners approved the port's largest ever capital improvement spending plan, representing \$720 million (2013 dollars) in capital spending over the fiscal year beginning in October 2013.

For a detailed explanation of our approach to aggregating transport infrastructure capital investment needs, see the *Technical Appendix*.



### Total U.S. Capital Investment Needs in Transportation from 2013–2030: All Modes

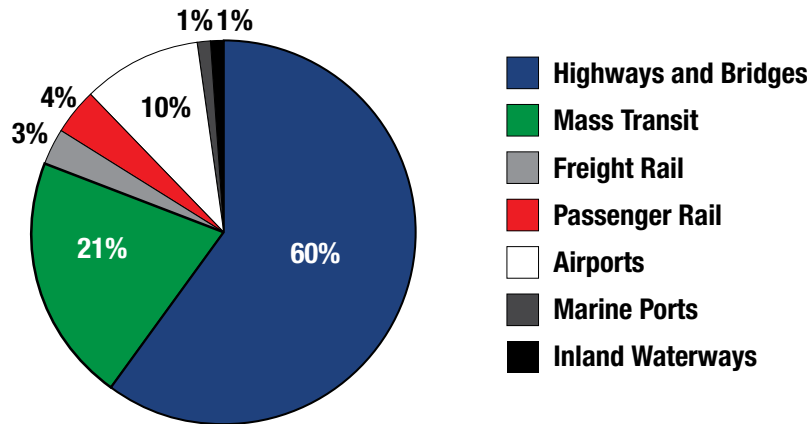


Figure 4. Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.

### Cumulative Capital Investment in U.S. Transport Infrastructure by Census Region and Sector, 2013–2030 (\$2011 billions)

	Total		Highways and Bridges		Mass Transit		Freight Rail	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
New England	86	3%	45	2%	19	2%	1	1%
Middle Atlantic	286	5%	61	11%	158	11%	5	5%
East North Central	387	18%	225	13%	89	13%	18	18%
West North Central	209	14%	119	3%	28	3%	14	14%
South Atlantic	655	16%	448	13%	127	13%	16	16%
East South Central	112	7%	60	9%	19	9%	7	7%
West South Central	435	12%	325	34%	39	34%	12	12%
Mountain	254	19%	154	0%	48	0%	19	19%
Pacific	513	8%	325	15%	96	15%	8	8%
Grand Total	2,937	100%	1,762	100%	623	100%	99	100%
Annual Investment	163		98		35		5.5	

	Passenger Rail		Airports		Marine Ports		Inland Waterways	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
New England	12	10%	9	3%	0.2	1%	0.5	2%
Middle Atlantic	36	31%	20	7%	2.2	10%	2.8	11%
East North Central	14	12%	37	13%	1.1	5%	3.4	13%
West North Central	2	2%	44	15%	0.5	2%	0.7	3%
South Atlantic	22	19%	36	12%	2.6	12%	3.3	13%
East South Central	1	0%	21	7%	1.7	8%	2.3	9%
West South Central	2	1%	39	13%	10.4	48%	9.0	34%
Mountain	1	1%	32	11%	0.0	0%	0.0	0%
Pacific	27	23%	51	18%	2.8	13%	3.9	15%
Grand Total	117	100%	289	100%	21	100%	26	100%
Annual Investment	6		16		1.2		1.5	

Table 3. Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.



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## Water-Related Infrastructure

For the water sector, we considered total 2013–2030 capital investment needs in drinking water and wastewater (also known as clean water) infrastructure.

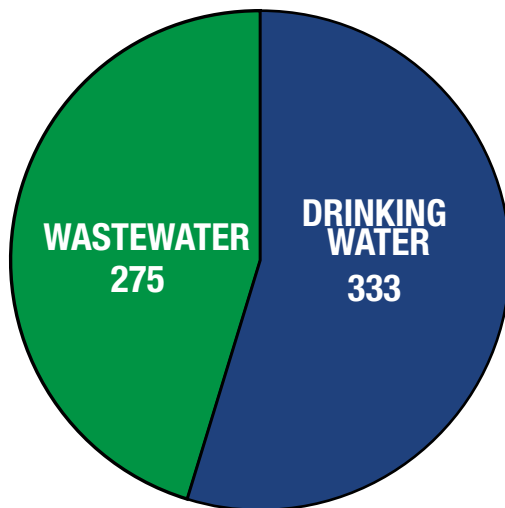
We project total needs of \$608 billion, with 55% (\$333 billion) required for drinking water and 45% (\$275 billion) required for wastewater. We project average annual water infrastructure investment needs of approximately \$34 billion, with \$18.5 billion annual investment required for drinking water and a \$15.2 billion annual investment required for wastewater.

To estimate total capital investment needs in drinking water and wastewater, we relied on 20-year capital funding needs projections for drinking water and wastewater infrastructure prepared by the EPA in two survey-based reports: the Drinking Water Infrastructure Needs Survey and the Clean Watersheds Needs Survey, respectively. Assuming equal annual investment over the years covered by these studies, we determined investment needs in drinking water and wastewater infrastructure over our outlook period. As for other sectors, for detailed methodology notes on our approach to aggregating drinking water and wastewater infrastructure capital investment needs, see the *Technical Appendix*.

There also are notable upside risks to our water sector projections. For example, the impact of storm surges associated with climate change and sea-level rises on wastewater treatment and drinking water distribution in littoral America may require capital investment well beyond that estimated here. Specifically, EPA capital needs surveys are based on rigorous analysis of the wear and tear that will affect water quality over the outlook period; such surveys do not consider the cost of possible damage wrought by climate change scenarios.

Equally, EPA surveys do not adjust needs estimates based on the impact of population growth, regional emigration, or other demographic shifts, each of which may impose stresses on water infrastructure and may require enhanced water treatment and distribution networks. Our projections of funding needs, therefore, relate only to basic repair and rehabilitation and do not reflect possible funding needed to harden or rebuild infrastructure in potentially vulnerable regions.

**Total U.S. Capital Investment Needs in Drinking Water and Wastewater from 2013–2030 (\$2011 billions)**



**Figure 5.** Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.

**Cumulative Capital Investment in U.S. Water Infrastructure by Census Region, 2013–2030 (\$2011 billions)**

Region	Total	Percent
New England	28	5%
Middle Atlantic	115	19%
East North Central	99	16%
West North Central	46	8%
South Atlantic	96	16%
East South Central	27	5%
West South Central	63	10%
Mountain	38	6%
Pacific	96	16%
<b>Grand Total</b>	<b>608</b>	<b>100%</b>
<b>Annual Investment</b>	<b>34</b>	

**Table 4.** Source: Rhodium Group estimates. For details on primary data sources and methodology, see *Technical Appendix*.

## I. B Analysis of Select Forms of Foreign Participation

Having estimated the magnitude of capital investment needs in the selected infrastructure sectors, we now turn to analyzing participation opportunities. The possible forms of participation comprise financial investment, provision of goods, and provision of services.

Financial investment itself comprises two categories: the provision of equity financing and the provision of debt financing. Within equity, we cover in this report the purchase of stakes in existing companies (including SPVs involved in infrastructure-related activities) and investment in new infrastructure-related operations—so-called greenfield investments. Within debt, we cover the provision of loans to infrastructure projects and the purchase of debt instruments issued by related entities, such as purchases of public or private bonds used to fund infrastructure projects.<sup>9</sup> We choose not to analyze in depth other more passive or indirect channels through which private investors finance U.S. infrastructure—such as investments in infrastructure-related funds or trusts managed by third parties, or purchases of U.S. Treasury securities or general obligation municipal bonds. Although general obligation municipal bonds are the single largest source of financing for

<sup>9</sup> See *infra* p. 27 “Participation in Private Infrastructure” on financing sources and trends. These categories reflect definitions and classifications of cross-border capital flows as presented in the IMF’s *Balance of Payments Manual, Fifth Edition*.





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U.S. infrastructure investment,<sup>10</sup> they are supported by municipal taxes and other collections, which are only indirectly tied to the municipality's infrastructure assets.

The second form of participation, firms participating as vendors, includes the sale of raw, semi-finished, and finished goods for use in U.S. infrastructure projects, as well as the design, manufacture and sale of component parts, like steel sections of suspension bridges or precast concrete pipes for storm sewers.

The third form of participation is the provision of services. Opportunities across infrastructure sectors include civil engineering and architectural services, engineering, procurement and construction services, contract management services, and operation and maintenance or life-cycle management services.

**Table 5: Forms of Foreign Participation in U.S. Infrastructure**

Mode	Category	Subcategory	Description	Example
Investment	Equity	Acquisition of equity stake in an existing company	An investor buys an equity stake in an infrastructure-related firm, including a SPV project company.	An investor purchases a stake in an American power utility or acquires a stake in a SPV set up to build a wind farm.
		Greenfield investment	An investor invests in a new infrastructure-related venture, building facilities from the ground up.	An investor builds a network of natural gas fueling stations in the United States.
	Debt	Loans	An investor provides a loan under specified terms of interest and repayment of principle to an infrastructure-related project or firm.	A bank provides several billion dollars in lending to finance construction of a U.S. power plant.
		Bonds and other debt	An investor purchases a public or private bond used to fund an infrastructure project or firms engaged in related activities.	An investor subscribes to a special bond issued by a state development corporation to finance a seaport.
Provision of Goods	NA	NA	A firm sells raw materials or component parts for use in U.S. infrastructure projects or operations.	A firm manufactures and sells raw materials for resin and engineering plastics, for a new energy facility in the United States.
Provision of Services	NA	NA	A firm provides construction or project management services for an infrastructure project.	A firm is contracted by an American company to build an advanced facility that will convert coal into gas in the United States.

10 *Protecting Bonds to Save Infrastructure and Jobs 2013*, NATIONAL ASSOCIATION OF COUNTIES, NATIONAL LEAGUE OF CITIES AND THE UNITED STATES CONFERENCE OF MAYORS (Feb. 2013), available at <http://www.naco.org/research/Documents/Protecting-Bonds-to-Save-Infrastructure-and-Jobs-2013.pdf>.



In the remainder of Part I, we will focus primarily on investment, including foreign investment, in the selected infrastructure sectors. We devote substantial attention to public-private partnerships (PPPs), which comprise a range of vehicles that enable participation in so-called public infrastructure, and we address the provision of services and goods, as well as financial investment, in such context. We also examine the impact of rules favoring local materials over foreign materials on opportunities for the provision of goods for use in public infrastructure projects, both inside and outside of PPPs. We do not discuss the broader trade and customs issues implicated by the provision of goods by foreign parties.

Opportunities for participation in U.S. infrastructure differ depending on whether the relevant infrastructure assets will be or are publicly owned, which we refer to as “public infrastructure,” or privately owned, which we refer to as “private infrastructure.” Public infrastructure assets are owned by the federal government, a state or local government, or a governmental agency or authority formed and capitalized by a combination of the foregoing. As a general rule, nearly all water infrastructure and most, but not all, transport infrastructure in the United States constitutes public infrastructure, while most energy infrastructure constitutes private infrastructure. Though privately owned, assets that constitute private infrastructure still serve public purposes and thus invite significant government involvement. Whether infrastructure assets are public or private frequently determines the applicable financing, operational and ownership structures, and the extent of government regulation over their assets, their operations, and the qualifications of their private owners. We describe below many of the principal structural and legal considerations affecting each of the two categories of infrastructure.

## Overview of Foreign Participation in Public Infrastructure

In public infrastructure, where the public is the ultimate owner of the infrastructure asset, various laws and contractual structures allow for private parties to provide financing, goods, or services. This section provides an overview of such laws and structures, as well as common sources of ongoing funds and financing.

### COMPONENTS OF INFRASTRUCTURE PROJECTS

The creation and life of a public infrastructure asset—collectively referred to as a public infrastructure “project”—has five components: design, construction, operation, maintenance, and finance. Opportunities for participation in public infrastructure can be categorized by the combination of these components for which the private sector is engaged. The components can be described as follows.

- **DESIGN.** Design includes the development of both the construction-ready specifications and the economic and operational features of a project. Private parties engaged to provide such services must create designs that meet performance specifications and must comply with zoning guidelines and environmental requirements.



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- **CONSTRUCTION.** Construction involves the building of the physical assets at a designated location over a prescribed period of time. When construction service providers are engaged on a fixed-fee basis, they effectively provide insurance for risks of cost overruns, design changes necessitated by problems in the field, and “acts of God.”
- **OPERATION.** Operation involves post-construction management of infrastructure assets, including, where applicable, revenue (e.g., toll) collection. Operations contractors are generally subject to performance standards that, if unmet, may result in the loss of their fees. Engaging a single party to provide both construction and operational services internalizes for such party the benefits of early delivery, and the costs of delayed delivery, of the project’s construction component.
- **MAINTENANCE.** Maintenance is aimed at ensuring the physical operability of the project and maximizing its usable life. Combining maintenance with either construction or operations services creates efficiencies in materials sourcing and life-cycle management.
- **FINANCE.** Finance refers to the arranging of financing rather than the provision of capital itself. As discussed below, private parties can provide capital for a project—for example, by purchasing public activity bonds (discussed below)—even where responsibility for arranging financing is retained by the public owner. A public owner may shift financing responsibilities to a private party in order to obtain cheaper financing than it can obtain itself or to take advantage of the private party’s greater experience or institutional capacity.

## BASIC CONTRACTING STRUCTURES FOR NEW BUILD PROJECTS

The following are the principal contracting structures by which public owners engage the private sector to perform components of new-build public infrastructure projects. The term “public–private partnership” is commonly used with respect to each of these structures, other than traditional procurement and privatization.

- **TRADITIONAL PROCUREMENT.** In traditional procurement (also known as Design-Bid-Build), the public entity contracts with a private engineer for design services and uses the resulting design to conduct a public tender process for a construction contractor. The contractor is typically chosen on the basis of lowest cost. Unlike Design-Build (described below), the structure allows for specialized design and specialized construction firms to compete.
- **DESIGN-BUILD.** In Design-Build, the public owner engages a single private entity to provide design and construction services pursuant to a fixed-fee contract. The private entity may be a single firm, a partnership of design and construction firms, or an entity that intends to subcontract responsibility for one or both components. Combining design and construction functions creates efficiencies—for example, when problems in implementation necessitate design changes—as well as



opportunities for innovation. Contracts are awarded in a competitive process and, given differences in design among competing bidders, on the basis of best value rather than lowest cost.

- **DESIGN-BUILD-OPERATE-MAINTAIN (DBOM).** In DBOM, the public owner contracts with a private entity to perform all components of a project other than finance, in some cases for as long as twenty years. The public owner finances the project, either from existing funds or from new borrowing, and remits the proceeds to the private entity, which is typically a newly formed entity dedicated to the specific project. DBOM allows the design-build function to be integrated into the full life-cycle management of the project. Bidders for DBOM projects, referred to as private sector “sponsors,” submit a single price for their services and evidence of their or their subcontractors’ qualifications to operate and maintain the project. The private entity generally subcontracts some of its design, construction, operations, or maintenance obligations.
- **DESIGN-BUILD-FINANCE (DBF).** DBF differs from Design-Build in that the public owner’s payment for the project is partially or fully deferred, leaving the design-builder to finance some or all of the upfront design and construction costs. Public owners generally opt to defer payments because they otherwise face higher costs of financing than that implied by the deferred payment, or they do it to motivate the design-builder to accelerate construction. Although various forms of financing that do not rely on the credit of the design-builder do exist, DBF creates an opportunity for design-builders with low costs of capital that can partially or fully self-finance their activities.
  - Example: I-485 Charlotte Loop: In 2010, the North Carolina Department of Transportation entered into its first DBF structure in 2010 with respect to a \$139.5 million project for the construction of an eight-lane freeway from a state to an interstate highway. The private design-builder, Blythe Construction Inc., agreed to complete construction over four and a half years but to receive its compensation according to a five-and-a-half-year payment schedule, to be funded by future state assembly appropriations.
- **DESIGN-BUILD-OPERATE-MAINTAIN-FINANCE (DBOMF).** DBOMF is used for major infrastructure projects with concessions extending for 30 to 50 years or, in some cases, longer. Common across such structures is that some or all of the project’s financing will leverage a revenue stream linked to the project’s operation, such as user fees or availability payments (described in Box 2). Often such projects use federal or local financing tools to issue tax-free debt financing. Equity capital is typically provided by the private sector sponsor in return for a portion of the project’s upside and downside revenue risk. As with DBF, such projects favor private partners with access to low-cost capital.
  - Example: Downtown Tunnel / Midtown Tunnel / MLK Extension (Cities of Norfolk and Portsmouth, Virginia): In 2012, the Virginia Department of Transportation (VDOT) contracted with Elizabeth River Crossings Opco, LLC (ERC)—a newly formed joint venture



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between Swedish firm Skanska Infrastructure Development, Inc. (Skanska), and Australian firm Macquarie Financial Holding Limited—in connection with a \$2.1 billion transportation project. ERC agreed to construct a new tunnel across the Elizabeth River, to make certain modifications to two existing tunnels, to extend another section of highway and to operate and maintain highways in the project area for 58 years. In exchange, ERC will receive toll collections, subject to revenue sharing with the VDOT upon various thresholds being met. ERC has subcontracted design-build responsibility to a joint venture of an affiliate of Skanska, Kiewit Construction Company, and Weeks Marine. The project's financing included private activity bonds, a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan (described in Box 4 below), and equity contributions.

## BASIC CONTRACTING STRUCTURES FOR PROJECTS WITH EXISTING ASSETS

The following are basic contracting structures for projects with existing assets:

- **OPERATIONS AND MAINTENANCE (O&M) CONTRACT.** In an O&M contract, a public owner contracts with a private entity on a fixed-fee or incentive-fee basis tied to performance benchmarks in order to provide operations and maintenance services for an existing project. Outsourcing such services may allow public owners to limit budgetary uncertainty or to improve a project's life-cycle management. Generally, such contracts do not involve an upfront payment by the private party, do not entitle the private party to user fees or similar revenue directly derived from the project, and have terms of fewer than five years.
  - Example: Anton Anderson Memorial Tunnel: In 1998, the State of Alaska awarded a design-build contract to convert the 2.6-mile Anton Anderson Memorial Tunnel into a combined highway and railroad tunnel and, in connection therewith, entered into an O&M contract with VMS, Inc. VMS's responsibilities included operations and maintenance, toll collection and administration, snow removal, and emergency services. VMS was acquired in 2007 by the Australian firm Transfield Services.
- **LONG-TERM LEASES AND CONCESSIONS.** In long-term leases and concessions, private parties pay an upfront fee and incur certain management obligations in exchange for the right to receive user fees, availability payments, or other payments linked to the project's operation. Because the lessee often covenants to perform some improvements that require financing, long-term leases and concessions principally differ from DBOMF structures by serving as capital-raising vehicles for public owners.
  - Example #1: Chicago Skyway: In 2005, the City of Chicago entered into a 99-year lease and concession with Skyway Concession Company, LLC (SCC)—an entity newly formed by



Spanish firm Cintra Concesiones de Infraestructuras de Transport and Australian firm Macquarie Investment Holdings—with respect to a toll road on the South Side of Chicago. For an upfront payment of \$1.83 billion and the agreement to operate and maintain the road, SCC acquired the right to all associated toll and other concession revenue, subject to the limitation that tolls be increased each year by no more than the highest of (1) 2%; (2) such year's increase in the consumer price index; or (3) such year's increase in nominal gross domestic product per capita. SCC financed the upfront payment with a combination of bank loans and equity; a later refinancing added a tranche of subordinated debt and enabled SCC to partially repay equity. Chicago used proceeds of the project for other budgetary needs.

- **Example #2: Port of Baltimore, Seagirt Marine Terminal.** In 2009, Ports America Chesapeake (PAC), a subsidiary of Ports America Group (itself a portfolio company of infrastructure private equity fund Highstar Capital), entered into a 50-year lease and concession agreement with the Maryland Port Administration (MPA) with respect to the Seagirt Marine Terminal at the Port of Baltimore. Pursuant to the agreement, PAC agreed (1) to lease, operate, and maintain the terminal; (2) to construct a 50-foot berth at the terminal; and (3) to invest in related capital equipment. As consideration, PAC made an upfront payment to enable the MPA to acquire the terminal from the Maryland Transit Authority (MdTA) and agreed to make annual rent payments of \$3.2 million to the MPA and to pay a \$15 fee to the MPA for each container over 500,000 per year handled by the terminal, in each case as indexed for inflation. PAC subcontracted the engineering, procurement, and construction work related to the new berth to McLean Contracting Company and acquired cranes from Shanghai Zhenhua Heavy Industry Co., Ltd. The project was financed with equity capital and with the issuance, by the Maryland Economic Development Corporation, of tax-exempt revenue bonds (the proceeds of which were paid to the MdTA) and private activity bonds.
- **PRIVATIZATION.** True privatizations involve the transfer of ownership of publicly owned infrastructure assets to the private sector. In many cases, privatization will occur in conjunction with the promulgation of regulations that limit the private owner's ability to raise prices or impose minimum service standards. Like long-term leases and concessions,

## BOX 2

### PPP Funding and Fees

A key issue in structuring public infrastructure projects is whether there exists or will exist an ongoing source of funds linked to the operation of the applicable asset. Such funds are distinguishable from a project's financing, the upfront contribution of capital to a project in anticipation of future returns, as well as the public owner's payment of compensation or deferred compensation for services irrespective of the project's operation.

The principal types of ongoing funding are direct user fees, "shadow" user fees, and availability payments. User fees are fees assessed on the amount of usage of an infrastructure asset, such as tolls, water, gas and power rates, off-take fees (as in the case of power generation), or access charges (as in the case of ports, airports, or railways). Such fees are considered "shadow" fees when they are paid by the project owner rather than by users. Availability payments are fees paid by the project owner based on the ability of the infrastructure to be used rather than the amount of use. When such amounts are capped, they are effectively a form of deferred compensation.



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privatizations enable public owners to raise capital; however, they are less common than long-term leases because they offer marginal economic advantage (given that leases can be as long as 99 years) but may be politically problematic or require different enabling legislation.

## PPP ENABLING STATUTES

The feasibility and attractiveness of participation in public infrastructure projects frequently turns on the governing law of the jurisdiction that owns the infrastructure asset. PPP “enabling statutes” define the government agencies or authorities that may employ PPP structures, the assets that may be subject to PPPs, and the forms such PPPs may take. U.S. state governments, which are the principal owners of public infrastructure covered by this report, have in recent years increasingly enacted such statutes. As of July 1, 2013, 33 U.S. states and Puerto Rico had enacted enabling legislation permitting PPP transportation projects, almost a third of them within the past decade.<sup>11</sup>

Enabling statutes may contain a wide variety of provisions that can significantly impact the attractiveness of potential PPPs to the nonpublic party. Table 6 sets forth a variety of such provisions and the states that have adopted them within their PPP enabling statutes. Of these, whether unsolicited project proposals may be accepted, whether further legislative action is required to approve projects, and whether projects may be financed by a combination of public and private funds were identified as the most significant factors to private partners by a recent Cornell University study.<sup>12</sup> We examine the first two concerns below. In addition, whether the enabling statute exempts PPPs from the state’s public contracting law can have a significant impact on a project, as state procurement laws often restrict how subcontractors are selected, require workers to be paid “prevailing wages” that can be significantly higher than minimum wage, require contractors to hire or give preference to local labor, require contractors to post payment or performance bonds,<sup>13</sup> or impose restrictions on materials or equipment procurement.<sup>14</sup>

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11 *Innovative Program Delivery State P3 Legislation*, FEDERAL HIGHWAY ADMINISTRATION (2013), available at [http://www.fhwa.dot.gov/ipd/p3/state\\_legislation/index.htm](http://www.fhwa.dot.gov/ipd/p3/state_legislation/index.htm).

12 R. Richard Geddes & Benjamin Wagner, *Why Do U.S. States Adopt Public-Private Partnership Enabling Legislation* (Dec. 2010), available at <http://www.human.cornell.edu/pam/people/upload/Why-Do-States-Adopt-PPP-Leg-Dec-2010.pdf>.

13 Such wage restrictions are imposed at the federal level, subject to various limitations, by the Davis Bacon Act of 1931, ch. 411, 46 Stat. 1494 (codified as amended at 40 U.S.C. §§ 3141-3148), and related acts, and at the state level by so-called Little Davis-Bacon provisions. Such bonding requirements are imposed at the federal level, subject to various limitations, by the Miller Act, 116 Stat. 1147 (2002) (codified as amended at 40 U.S.C. § 3131-3134), and at the state level by so-called Little Miller Act provisions.

14 See also *infra* p. 43 “Select Legal Issues Affecting the Foreign Provision of Goods for Infrastructure Investment.”



**Table 6. PPP Enabling Statutes**

State	Year PPP legislation enacted	Unsolicited proposals allowed	Availability payments / shadow fees allowed*	Local, state, or federal funds can be combined with private sector funds	Legislative approval required*	Public sector can issue toll revenue bonds or notes	Public sector agency can hire its own technical and legal consultants	Transport PPPs Authorized	Transport PPPs closed since 2006	Transport PPPs in pipeline
Alabama	2009		✓					✓	0	2
Alaska	2006			✓		✓	✓		0	0
Arizona	2009	✓	✓					✓	0	3
Arkansas	2010						✓		0	3
California	2009	✓						✓	10	14
Colorado	2009	✓		✓		✓	✓	✓	2	5
Connecticut	2011			✓			✓		0	0
Delaware	2007	✓		✓	✓			✓	0	2
Florida	2009	✓	✓	✓	✓	✓	✓	✓	4	4
Georgia	2009	✓	✓	✓				✓	0	5
Illinois**	2010	✓	✓	✓		✓	✓	✓	2	3
Indiana	2010			✓	✓	✓	✓	✓	2	3
Louisiana	2012	✓	✓	✓		✓		✓	0	3
Maine	2010	✓		✓	✓		✓	✓	0	1
Maryland	2010	✓					✓	✓	6	4
Massachusetts	2009						✓		0	0
Minnesota	2012	✓				✓			0	0
Mississippi	2010	✓		✓		✓	✓	✓	0	1
Missouri	2009	✓			✓	✓			0	0
Nevada	2011	✓		✓				✓	0	3
North Carolina	2009	✓		✓	✓	✓	✓	✓	0	4
North Dakota	1993	✓		✓					0	0
Ohio	2011	✓		✓		✓	✓	✓	0	3
Oregon	2011	✓	✓	✓		✓	✓	✓	2	1
Pennsylvania	2012	✓		✓		✓	✓	✓	2	5
South Carolina	2007					✓			0	0
Tennessee	2008			✓	✓	✓			0	0
Texas	2009	✓	✓	✓		✓	✓	✓	7	11
Utah	2010	✓				✓	✓	✓	0	1
Virginia	2011	✓		✓			✓	✓	3	8
Washington	2005	✓		✓	✓	✓	✓		0	0
West Virginia	2008	✓		✓	✓	✓	✓	✓	0	1
Wisconsin	2011	✓		✓		✓	✓		0	1

Source: Sphere Consulting, unless otherwise indicated. For detail on selection of closed and "in-pipeline" PPPs, see the *Technical Appendix*.

\*\*Brookings-Rockefeller Project on State and Metropolitan Innovation, "Moving Forward on Public Private Partnerships," December 2011.

✓ - Refers to provisions specifically provided for in applicable PPP enabling statute.

Table 6 also sets forth the number of completed and “in pipeline” transport transactions for each of the listed states. “In pipeline” refers to projects that are being actively developed or are dormant; in practice, projects can be completed after many years of dormancy following political or budgetary changes. We note that there is no apparent correlation between the “PPP-friendliness” of states’ enabling statutes and the number of transport PPPs that they have completed or that are in pipeline.

Little research to date has examined what combination of PPP provisions achieves the best outcome for public and private stakeholders, although the Cornell study mentioned above finds an overall trend among states toward more “PPP-friendly” legislation. We note that several provisions, including those described below, present trade-offs for both public and private parties. Accordingly, whether a PPP regime is attractive for a potential investor or provider of goods or services should be considered carefully in the context of particular projects.





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## BOX 3

### Chicago Metered Parking

Chicago's experience with a PPP related to its municipal metered parking offers lessons on legislative approval requirements. In 2008, the City of Chicago entered into a 75-year concession agreement with Chicago Parking Meters, LLC (CPM), an entity formed by Morgan Stanley Infrastructure Partners and other related parties. In exchange for an upfront payment of \$1.15 billion and commitments to operate, maintain, and improve 36,000 parking meters in Chicago, CPM acquired the right to receive all parking payments for the contract term.

Despite overwhelming approval by the Chicago City Council, the project became extremely unpopular post-closing in response to increased parking rates (despite having been provided for by the concession agreement) and technical problems, and amid doubts that Chicago received a fair upfront in the transaction. Many also charged that the city squandered its upfront payment. Years of litigation, including public hearings involving Morgan Stanley managers, have ensued. The experience demonstrates that legislative review, if insufficiently thorough or transparent, may fail to insulate a transaction from post-closing political problems.

- **ACCEPTANCE OF UNSOLICITED PROPOSALS.** Permitting unsolicited proposals allows private parties to introduce project ideas that may not have been considered by the public sector. On the other hand, states that choose to evaluate unsolicited submissions must absorb significant administrative costs and, by prohibiting unsolicited proposals, states encourage public sponsors to consider and articulate their project priorities and evaluation criteria, thus providing greater transparency for private bidders and potentially greater support for projects. Procedures for unsolicited proposals may also pose hidden risks to bidders. After a submission is made, competing proposals are typically invited, and competitors may seek to “piggyback” off the initial submission. To maintain an incentive for first-movers, Florida, for example, amended its enabling statute in June 2013 to provide for at most a 120-day period for competing proposals to be submitted.<sup>15</sup>
- **PRIOR LEGISLATIVE APPROVAL OF CONTRACTS.** In most states, PPPs require the approval of an executive branch agency, such as a department of transportation, a bureau of public works, or a special PPP oversight body. Several states require additional action or inaction by a legislative body; for example, Tennessee requires PPPs to be approved by the state's legislature,<sup>16</sup> Delaware requires approval by the co-chairs of the state general assembly's bond committee,<sup>17</sup> and Minnesota allows the governing body of any county or municipality through which a project passes to veto a project within 30 days after approval by the state's commissioner of transportation.<sup>18</sup> Such provisions introduce uncertainty and risk, as proposals may fall victim to political vetoes or extended reviews. On the other hand, if obtained, such approvals ensure legislative support for projects and give officials who grant such approvals an incentive to see them successfully implemented.

Legislative review requirements should be particularly considered by foreign partners. PPP-enabling statutes generally do not distinguish between foreign and domestic investors. (Arizona's requirement that foreign investors apply for “authority to conduct affairs”<sup>19</sup> in the state prior to entering into an

15 Fla. Stat. § 287.05712.

16 Tenn. Code Ann. § 54-3-102(b).

17 Del. Code tit. 2, § 20-2003(e)(3).

18 Minn. Stat. Ann. § 160.85.

19 Ariz. Rev. Stat. § 28-7705(H).



infrastructure PPP is a notable exception.) But foreign involvement may generate heightened political resistance to a PPP, and extensive legislative hearings or other public review may provide a forum for such resistance to be expressed, thereby increasing risks to the project's approval. On the other hand, potential foreign partners may welcome a robust public approval process as a means to address political resistance upfront rather than risk the possibility of a public backlash post-closing, as occurred in the Chicago parking meter concession discussed in Box 3.

## FINANCING SOURCES AND TRENDS

Financing is frequently required during the design and construction phases of projects, when a project's costs exceed the funds it generates, and by private sponsors in order to make upfront payments to public owners in connection with long-term leases and concessions or privatizations. This section covers the declining capacity of states to self-finance projects, debt financing of public infrastructure projects, and sources of equity capital.

### Capacity of States to Self-Finance Public Infrastructure

A public owner's first option to fill the gap between a project's sources and required uses of funds is to look to its own coffers or to federal funds<sup>20</sup> that may be contributed or loaned to the project. However, recent years have seen a significant downward trend in the budgetary capacity of states to self-finance infrastructure expenditures. Among the factors contributing to this trend are large, unfunded pension obligations in several states, which affect states' abilities to finance long-term projects, and near-term budget shortfalls, which affect states' abilities to address current infrastructure needs.

In particular, in fiscal year 2011 adjusted net pension liabilities among states ranged from 6.8% to 241% of annual revenue, with a median of 45.1%. Nine states had adjusted unfunded liabilities in excess of 100% of annual revenues, led by Illinois (241%), Connecticut (190%), and Kentucky (141%).<sup>21</sup> In terms of current capabilities, in the first quarter of 2012 state revenues remained 5.5% below pre-recession levels and, in fiscal 2013, 31 states were forced to close a total of \$55 billion in budget gaps to comply with balanced budget requirements, a significant amount given cuts the states had already implemented since the depths of the recession.<sup>22</sup>

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20 The varieties of state and federal grants (such as federal highway funds) that may be available for particular projects and the tools (such as advance construction and Grant Anticipation Revenue Vehicles [GARVEEs]) that are available for managing or borrowing against such grants are beyond the scope of this report. For information, see *Tools & Programs: Federal-aid Fund Management Tools*, FEDERAL HIGHWAY ADMINISTRATION, available at [http://www.fhwa.dot.gov/ipd/finance/tools\\_programs/federal\\_aid/index.htm](http://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_aid/index.htm).

21 *Adjusted Pension Liability Medians for U.S. States*, MOODY'S INVESTOR SERVICE (June 27, 2013), available at [http://www.washingtonpost.com/t/2010-2019/WashingtonPost/2013/06/27/National-Economy/Graphics/Moodys\\_State\\_Pension\\_Liability\\_Medians.pdf](http://www.washingtonpost.com/t/2010-2019/WashingtonPost/2013/06/27/National-Economy/Graphics/Moodys_State_Pension_Liability_Medians.pdf).

22 Phil Oliff, Chris Mai, & Vincent Palcios, *States Continue to Feel Recession's Impact*, CENTER ON BUDGET AND POLICY PRIORITIES (June 27, 2012), available at <http://www.cbpp.org/cms/index.cfm?fa=view&id=711> (last visited Aug. 26, 2013).



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The ability of states to self-finance public infrastructure projects may remain constrained in the medium term even if state revenues return to pre-recession levels. State budgets are likely to favor the restoration of services cut during and since the recession over infrastructure investment. Available funds will be affected by structural changes in the economy, such as the growing number of Medicaid beneficiaries.<sup>23</sup> And asset renewal needs, if left unaddressed, may continue to grow, further diverting funds from greenfield projects.

## Debt Financing

Significant public infrastructure projects are almost always financed in part by loans or debt financing. The public owner may issue bonds backed by its own rather than the project's credit, such as general obligation bonds, tax increment bonds, or public authority bonds. The public owner may issue debt linked to the project, such as bonds backed by tolls or other fares. Alternatively, the owner may look to the private entity to provide its own financing, as in the DBF and DBOMF structures and by definition in long-term leases and concessions and privatizations, where the project serves as a financing vehicle for the public owner.

Public infrastructure projects have raised project-based financing from a variety of sources. Banks, insurance companies, and pension funds that have an appetite for long-duration loans are the most common private lenders. Projects issue bonds in both private placements and registered offerings. And recent years have seen the rise of a number of infrastructure debt funds, which can provide long-duration, bank-like loans or long-duration credit enhancement. According to *Preqin Infrastructure Online*, as of August 2013, nine unlisted funds in North America, representing \$9.8 billion in aggregate capital, were or would (upon closing) be authorized to invest in private infrastructure debt.

Capital structures vary substantially sector to sector and project to project, in part due to the variety of federal programs that may be available to lower financing costs (see Box 4) and in part due to the stability of the project's cash flows and the market for such risks at the time of financing. For example, debt represented more than 80% of the capital structure for the 2012 Elizabeth River Crossings project (mentioned above), as compared with only 50% of the Chicago Skyway's capital structure initially and 75% following a refinancing.<sup>24</sup>

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23 *Id.* (projecting that 4.8 million more people would be eligible for subsidized health insurance through Medicaid in 2012 than were enrolled in 2008, in part due to employers ending their health care coverage).

24 *Project Profiles*, FEDERAL HIGHWAY ADMINISTRATION, available at [http://www.fhwa.dot.gov/ipd/project\\_profiles/va\\_midtown\\_tunnel.htm](http://www.fhwa.dot.gov/ipd/project_profiles/va_midtown_tunnel.htm) and [http://www.fhwa.dot.gov/ipd/project\\_profiles/il\\_chicago\\_skyway.htm](http://www.fhwa.dot.gov/ipd/project_profiles/il_chicago_skyway.htm).



**Box 4**

## Federal Support of Public Infrastructure Debt Financing

The following federal and state programs aim to encourage infrastructure projects by increasing the availability and lowering the cost of debt financing.

**Private Activity Bonds.** The Internal Revenue Code allows municipalities to issue tax-exempt bonds, the proceeds of which are used for private business purposes in certain infrastructure sectors. Such “private activity bonds” give private concessionaries the benefit of lower-cost debt financing and are secured by the project’s revenues rather than by the municipality’s credit. Historically, qualifying infrastructure categories included airports, docks, waste-to-energy facilities, and water and sewer facilities, among others. In 2005, pursuant to the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation, Congress authorized up to \$15 billion of additional qualifying bonds for certain highway and surface transfer facilities already receiving federal assistance under Title 23 (Highways) or Title 49 (Transit) of the U.S. Code. Notably, federal assistance under Title 23 requires compliance with certain prevailing wage requirements,<sup>25</sup> the “Buy America” requirements set forth in the Surface Transportation Assistance Act of 1982,<sup>26</sup> and certain requirements regarding participation by disadvantaged business enterprises.<sup>27</sup> The most onerous of those may be the Buy America provisions, as they demand, absent a waiver, that projects be awarded to bidders who submit the lowest bids involving only domestic steel and iron materials, unless the cost of such bid exceeds a bid involving foreign steel and iron by more than 25%.

**63-20 Bonds.** Private concessionaires may also benefit from tax-exempt funding through “63-20 Bonds,” which the concessionaires may issue through private, nonprofit corporations that qualify as a “public benefit corporations”

under state law (for purposes of the state tax exemption) and that satisfy certain Internal Revenue Service requirements (for purpose of the federal tax exemption). Generally speaking, (1) such corporations must engage in only public activities and be approved and have their obligations approved by the state or applicable public authority, and (2) the state or applicable public authority must have a beneficial interest in such asset—through exclusive possession of the asset, control of the issuing corporation, or possession of a right to obtain title and exclusive possession—for as long as the bonds are outstanding.

**TIFIA.** The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides federal loans, loan guarantees, and standby lines of credit to national or regional surface transportation projects, including highways, bridges, tunnels, and various rail and intermodal facilities. TIFIA loans can generally make up no more than 33% of a project’s funding and can be used only in projects where the senior debt is investment grade and some or all of the project’s support comes from user charges or other nonfederal funding. Projects receiving TIFIA assistance must comply with the Title 23 (Highway) requirements described above.

**State Infrastructure Banks and Funds.** State Infrastructure Banks are revolving infrastructure investment funds capitalized with federal and state dollars that offer a range of loans and credit support to public and private sponsors of Title 23 (Highway) or Title 49 (Transit) projects. Many states have also created infrastructure funds to address additional needs. As of July 2013, 34 states had infrastructure banks, 31 had drinking-water infrastructure funds, and 12 had wastewater infrastructure funds.

**WIFIA (Proposed).** In May 2013, the U.S. Senate passed a bill to create the Water Infrastructure Finance and Innovation Authority (WIFIA), modeled on TIFIA, to support water infrastructure projects. The bill has not yet been passed by the U.S. House of Representatives.

25 See 23 C.F.R. § 635.117(f).

26 See 23 C.F.R. § 635.410.

27 See 23 C.F.R. § 635.107.



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## BOX 5

### Pocahontas Parkway

The risks attendant to investments in projects without proven revenue streams are demonstrated by the long-term lease and concession involving the Pocahontas Parkway near Richmond, Virginia.

Opened in 2002, the Pocahontas Parkway is an 8.8-mile toll road connecting two major highways south of Richmond. In 2006, Australian concessionaire Transurban entered into a 99-year lease with the Virginia Department of Transportation to operate the toll road. The deal, valued at \$611 million, was funded with \$191 million in equity and \$420 million in debt. In 2007, Transurban secured a TIFIA loan of \$150 million to build an airport connector and refinance a portion of its existing project debt.

The traffic and revenue projections used to model the project's financial structure assumed levels of residential and commercial development that have not materialized. In June 2012, Transurban announced that it was writing down the value of its investment to zero. That month, it also transferred its interests in the asset to the project's lenders. The lenders are reviewing options, including finding a new operator and entering into an alternative financial arrangement with a new concessionaire.

## Equity Financing

The principal sources of equity financing for PPPs are financial equity and corporate equity. Corporate equity refers to equity capital provided by counterparties to the project, such as design-builders, operators or materials suppliers, or their affiliates. The investment of equity in the project decreases agency costs and allows the party to internalize the benefits of its performance as a counterparty. More important, to the extent that third-party equity capital for the project is otherwise insufficient, the counterparty's contribution may be critical to the project being undertaken.

Financial equity is equity contributed by parties who do not have strategic or commercial interests in a project. The principal source of such equity is investment funds targeting the infrastructure sector. Estimating the total amount of equity available for investment in U.S. energy, transport, and water-related infrastructure projects is difficult, as many funds are authorized to invest in a range of sectors and jurisdictions, and committed funds are often not publicly disclosed. However, industry experts estimate that approximately \$250 billion is available for all U.S. infrastructure sectors. In addition, as of September 2013, funds were seeking \$34.1 billion in commitments for investments in the energy (\$30.9 billion, including \$7.4 billion for renewables), transport (\$1.8 billion), and water-related (\$1.5 billion) sectors.<sup>28</sup>

The amount of equity capital, while huge in the aggregate, does not clearly indicate the amount of financial capital available for particular projects. Many funds authorized to invest in both private and public infrastructure focus their attention only on a narrow subset of one or the other. For example, funds often show a preference for projects that have proven streams of payments—such as long-term leases and concessions involving existing toll roads—over projects that will create new revenue streams. Structuring PPPs is also time intensive, and funds frequently face pressure to deploy their capital quickly. Finally, given the long duration of many projects and the inherent execution and performance risks, many projects do not offer the financial profile that funds demand.

28 *Infrastructure Investor*, PEI ALTERNATIVE INSIGHT (2013), available at <https://www.infrastructureinvestor.com/>.



## Overview of Foreign Participation in Private Infrastructure

Private infrastructure is characterized by private financing and ownership. Most private infrastructure is nonetheless subject to government regulation, implicating opportunities for providing financing, providing goods, or providing services. Such regulation is least burdensome in the least “naturally monopolistic” subsectors, where barriers to entry are few and alternatives exist for users or consumers. Within energy, transport, and water-related infrastructure, examples of such subsectors include energy equipment infrastructure, intermodal containers, and parking.

In more regulated private infrastructure sectors—such as freight railroads and energy generation, transmission, and distribution—material transactions may require regulatory review or approval. Additionally, other government policies, such as tax incentives, grants, mandates, and government purchasing programs, can significantly affect the operations, financing, and ownership of many private infrastructure projects. This is particularly the case in the energy industry.

Opportunities for investing in private infrastructure can be separated into two categories: the development of new infrastructure and the operation of existing infrastructure assets.

### DEVELOPMENT STAGE OPPORTUNITIES

Structures for investing in the development of new infrastructure center around traditional project finance models where project assets—that is, land rights (by leasehold or fee ownership) and project equipment, such as energy generation or transmission assets—are controlled by a special purpose entity established by a developer that is in the business of developing private infrastructure projects. The developer may seek third-party equity investment in the project entity, but the most significant portion of the capital structure typically involves various pieces of structured debt purchased by financial investors. Such debt typically does not have recourse to the developer but instead is backed solely by the project’s future revenues and other economic attributes.

Developers of private infrastructure projects generally invest minimal amounts of their own capital in the projects they develop. Their business focuses on arranging financing and managing development risk for third-party investors in exchange for a development fee and some carried interest in the project company’s equity. Developers do require corporate-level investment to cover their overhead, and thus themselves represent opportunities for investment. But the more significant opportunity to participate in private infrastructure at the development stage is as a provider of capital to a project, either by contributing funds or by making an in-kind contribution of services—such as construction services—or goods. Chinese renewable energy companies, in particular, are supplying solar panels, inverters, wind turbines, batteries, and other components to U.S. renewable energy projects. And some Chinese manufacturers, such as Hanergy and Talesun, have established U.S. project development ventures.



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Although the structures and regulations applicable to private infrastructure projects vary across the energy, transport and water-related sectors, the basic model of a developer obtaining third-party financing backed principally or exclusively by the revenues and economic attributes of the project is common across all sectors. See Figure 6.

## Typical Project Finance Structure

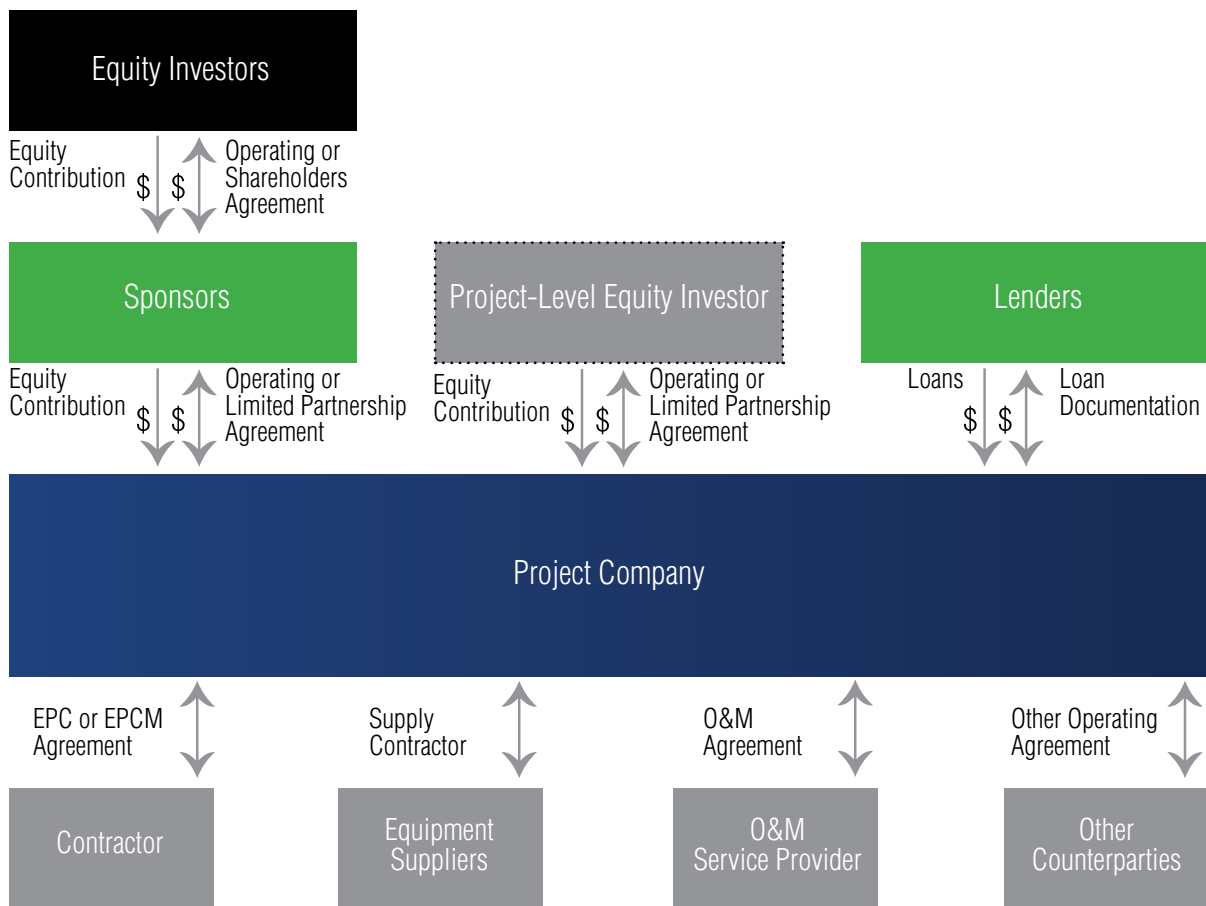


Figure 6. Source: U.S. Partnership for Renewable Energy Finance.



## OPPORTUNITIES WITH RESPECT TO OPERATING ASSETS

Some developers own and operate completed projects, but many developers seek only to initiate and bring projects into service for sale to a more permanent owner. Thus, the other principal means for participating in the private infrastructure market is to invest in owners and operators of infrastructure assets. Such investments generally take the form of equity investments in the project owner or direct purchases of the completed project assets, although there are also secondary markets for some types of project debt. Equity investments can be limited to specific infrastructure assets—such as a single power plant or pipeline—or can encompass investments into entities that own and operate pools of infrastructure assets, such as utilities and independent power producers or gas pipeline companies. Also within the equity category are two principal subdivisions: control investments and noncontrol investments. Control investments typically combine financial investment with responsibility for selecting or materially influencing the selection of managers who operate and maintain the infrastructure, while noncontrol investments are simply passive financial investments.

### BOX 6

#### Proposed Initiatives to Promote Foreign Investment in Infrastructure

- **FIRPTA.** The Foreign Investment in Real Property Act of 1980 (FIRPTA) subjects foreign persons to U.S. taxes on gains from dispositions of U.S. real property interests, which in some cases can include interests in infrastructure-related entities. So, as to better encourage investments in U.S. infrastructure and real estate by foreign persons, in March 2013 the Obama administration proposed exempting foreign pension funds from FIRPTA.
- **Build America Bonds.** Created by the 2009 American Recovery and Reinvestment Act and authorized through 2010, Build America Bonds (BABs) were bonds issued by states and local governments that could qualify for a larger federal tax subsidy than traditional tax-exempt debt.

Issuers could select Tax-Credit BABs, in which investors would receive a tax credit equal to 35% of the bonds' interest payments, or Direct-Payment BABs, in which the federal government would pay a 35% tax credit on the bonds' interest directly to the issuer. The latter were designed to attract foreign investors who generally do not benefit from the tax-exempt feature of state and municipal bonds. Notably, BABs were not permitted to be used in connection with PPPs. In February 2013, the Obama administration proposed a new bond program known as America Fast Forward Bonds, modeled after the BAB program. Limited detail was provided, other than that the program would extend to qualifying private activity bonds.





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## Select Legal and Regulatory Issues Affecting Infrastructure Investment and Provision of Goods and Services by Foreign Parties

This section describes certain fundamental regulatory approvals that apply to investment by foreign parties in existing businesses in the U.S. energy, transport, and water-related infrastructure sectors and the provision of certain materials by foreign parties to such sectors.

As an initial matter, foreign investment into *existing* infrastructure businesses may implicate at least three standard regulatory approvals and legal compliance requirements: (1) reviews or notifications related to U.S. antitrust laws; (2) filings with securities regulators and U.S. exchanges; and (3) a national security review conducted by the Committee on Foreign Investment in the United States (CFIUS). The first two of these apply with equal force to both U.S. and foreign investors, while the third is focused specifically on foreign investment.

### ANTITRUST REVIEWS AND NOTIFICATIONS

Infrastructure investments structured as mergers, acquisitions, or asset sales may require a competition review conducted by the U.S. Federal Trade Commission (FTC) and the Department of Justice (DOJ). U.S. antitrust laws prohibit acquisitions of interests or assets of a party engaged in interstate commerce where the “effect of such acquisition may be substantially to lessen competition” in a relevant U.S. product market. The Hart-Scott-Rodino Antitrust Improvements Act of 1976 (HSR) requires parties to submit premerger notification to the FTC and DOJ for most significant acquisitions. The HSR notification requirements apply if the transaction meets certain thresholds based on the value of the transaction and the parties’ sizes, or if, regardless of the parties’ sizes, the transaction will result in the acquirer acquiring at least \$283.6 million of the target’s interests and assets.

Upon receipt of an HSR notification, the FTC and DOJ have a 30-day “waiting period” to investigate the transaction and determine whether there is any potential harm to competition. This waiting period may be extended if the agencies determine that further scrutiny is warranted. Such scrutiny is often warranted when a transaction further concentrates moderately or highly concentrated product markets. Ultimately, if the agencies conclude that the acquisition would substantially lessen competition, they may seek a court injunction prohibiting the transaction. Notably, even if the FTC or DOJ does not act during the HSR waiting period, the transaction is not exempt from U.S. antitrust laws and is subject to later challenge by the FTC or DOJ, state enforcement officials, and even private parties. However, such post-waiting-period challenges are extremely rare.

### U.S. SECURITIES LAWS AND REGULATIONS

In transactions involving U.S. target companies listed on a U.S. stock exchange or otherwise registered under the Securities Exchange Act of 1934 (the Exchange Act), several U.S. securities laws and regulations may bear on either the target company or the foreign investor. The following is a non-exhaustive list of



the types of filings and disclosures that may be required as a result of an investment or merger involving entities that are registered with the Securities and Exchange Commission (SEC) in the United States:

- Registered U.S. companies must make Form 8-K filings providing prompt disclosure of changes of control and the company's entrance into material agreements, such as merger or business combination agreements, material asset purchase agreements, or other commercial agreements.
- Persons who acquire beneficial ownership interest of more than 5% of a class of voting equity securities registered under the Exchange Act must file with the SEC a form addressing, among other things, the shareholder's intent with respect to the target (including plans or proposals with regard to future actions), the percentage of ownership, the source and amount of any financing, and an explanation of the transaction.
- In single-step cash mergers, the target company will prepare and file with the SEC a proxy statement for the target's shareholders, describing the merger and the negotiations and seeking their approval for the merger; in single-step mergers involving securities of the acquirer, the merger will constitute an offering of the acquirer's securities, and the joint proxy statement/prospectus will contain extensive information about the acquirer.

The SEC will review, and may provide comments on, certain of these filings, and the parties will not be permitted to complete the transaction until the SEC confirms that it has no further comments on such filings.

In addition to these federal filing requirements, the various exchanges (NYSE, AMEX, NASDAQ) have certain requirements, such as disclosure and notification requirements for material events that may affect the value of a company's stock. Many states also have anti-takeover laws that govern acquisitions of stock of companies incorporated in their jurisdictions. These state laws may impose requirements for shareholder or board approval for acquisitions of stock above a certain threshold.<sup>29</sup>

## NATIONAL SECURITY: CFIUS REVIEWS

The principal regulatory review governing certain foreign investments in existing infrastructure projects may be a national security review conducted by CFIUS, on behalf of the President of the United States. Section 721 of the Defense Production Act of 1950, as amended by the Foreign Investment and National Security Act of 2007 (FINSNA)—provides the President with express authority to review the national security effects of foreign acquisitions, mergers, and takeovers.<sup>30</sup> More specifically, the President has authority to review for national security implications “any merger, acquisition, or takeover . . . by or with any foreign person which could

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29 See generally Jack Levin, *Structuring Venture Capital, Private Equity, and Entrepreneurial Transactions*, at ¶¶ 503.3.2.1-2.7, 503.3.3 (2008).

30 Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, § 5021, 102 Stat 1107, 1425 (1988), (codified as amended at 50 U.S.C. App. § 2170).



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result in foreign control of any person engaged in interstate commerce in the United States.”<sup>31</sup> The President ultimately has authority to suspend or prohibit any transaction that threatens to impair the national security if “there is credible evidence that leads the President to believe that the foreign interest exercising control might take action that threatens to impair the national security,”<sup>32</sup> and other laws except for the International Emergency Economic Powers Act<sup>33</sup> “do not in the judgment of the President provide adequate and appropriate authority for the President to protect the national security in the matter before the President.”<sup>34</sup>

The President has delegated his initial review and decision-making authorities to CFIUS, an inter-agency body originally established in 1975 to monitor and evaluate the impact of foreign investment in the United States.<sup>35</sup> CFIUS is chaired by the Secretary of the Treasury, and includes eight other voting members (from the Departments of Commerce, Defense, Homeland Security, Justice, State, and Energy; the U.S. Trade Representative; and the White House Office of Science and Technology).

By statute, CFIUS is authorized to review a transaction either upon a voluntary filing by a party to the transaction or upon initiation of the Committee.<sup>36</sup> By regulation, any Committee member also can issue its own notice to the full Committee requesting a review of a particular transaction.<sup>37</sup> The Treasury Department, as chair of CFIUS, also has considerable discretion on whether to accept a notice for review. Thus, for example, while the statute and regulations indicate a single party to a transaction may file a voluntary notice, it is extremely rare for the Treasury to deem a notice containing information and responses from only one party to a transaction sufficient to initiate a review.

Once CFIUS has sufficient information from both parties to begin a review, the statutorily mandated timetable for the review and “investigation” process is as follows:

- Initial 30-day review following receipt of notice.
- Forty-five-day “investigation” period for transactions deemed to require additional review following the initial 30-day period, including foreign government-controlled transactions.
- If action has not concluded by the end of the 45-day investigation period, CFIUS must issue a formal report to the President or the parties must withdraw the filing (and may refile in certain cases in order to restart the statutory clock).
- Presidential decision within 15 days of receiving the formal report.

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31 50 U.S.C. App. § 2170(a)(3)).

32 FINSA, § 6 (codified as amended at 50 U.S.C. App. § 2170(d).

33 50 U.S.C. §§ 1701–1706.

34 FINSA, § 6 (codified as amended at 50 U.S.C. App. § 2170(d)).

35 Executive Order 11858 (1975).

36 FINSA, § 2 (codified as amended at 50 App. U.S.C. § 2170(b)).

37 31 C.F.R. § 800.401.



CFIUS *must* investigate any transaction that would result in foreign control of U.S. critical infrastructure, if such control threatens to impair U.S. national security and the threat is not mitigated during the initial review period. In addition, there is no statute of limitations on the inherent authorities of the President and CFIUS. The President can act at any point, even after a transaction has closed, and the President’s decision is not subject to judicial review by U.S. courts.<sup>38</sup> However, once a transaction has undergone a review, it receives a form of safe harbor: FINSA and the implementing Executive Order provide that the Committee can initiate another review only if certain limited conditions are met.<sup>39</sup>

Accordingly, foreign investors into existing U.S. infrastructure projects and their U.S. partners would be well advised to understand and anticipate CFIUS’s analysis and considerations before undertaking transactions that might require a CFIUS review. The critical threshold questions for a CFIUS review in this context will be: (1) whether there is foreign control over a U.S. business; (2) if there is foreign control, whether the transaction may present any national security concerns; and (3) if there are national security concerns, whether they can be mitigated through contractual commitments from the transaction parties or other permissible means.

### Control Over U.S. Business

The threshold question for any CFIUS review is whether there is a transaction that presents a foreign person with “control” over a U.S. business. “Control” means:

[T]he power, direct or indirect, whether or not exercised, through the ownership of a majority or a dominant minority of the total outstanding voting interest in an entity, board representation, proxy voting, a special share, contractual arrangements, formal or informal arrangements to act in concert, or other means, to determine, direct, or decide important matters affecting an entity.<sup>40</sup>

In practice, “control” is very much a functional definition. The amount of share interests and the right to board seats, for example, are highly relevant to finding control, but they are not necessarily determinative. Rather, CFIUS will take into consideration all relevant factors of a foreign person’s ability to determine, direct, or decide important matters affecting a U.S. business. Among other things that CFIUS will consider are: the right to direct or determine certain extraordinary corporate actions—such as the sale of all assets or dissolution of an entity; approval rights with respect to major expenditures, the closing or relocation of facilities, or the appointment or dismissal of managers and officers; and policies and

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38 50 U.S.C. App. § 2170(e).

39 Examples of such circumstances include: the initial review was based on false or materially misleading information, or material omitted information; existence of an intentional material breach of a mitigation agreement upon which approval was originally conditioned. 50 U.S.C. App. § 2170(b)(1)(D).

40 31 C.F.R. § 800.204(a).



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procedures governing the treatment of non-public information.<sup>41</sup> At the same time, certain standard minority economic protections—including certain negative rights and anti-dilution rights—will not, by themselves, confer control.<sup>42</sup>

In addition, there must be control over a U.S. business. There are two important points with respect to the term “U.S. business.” First, CFIUS’s jurisdiction extends only as far as a business undertakes activities in interstate commerce in the United States. Second, a transaction does not necessarily have to involve an investment into or acquisition of a legally organized entity to trigger CFIUS’s jurisdiction. For example, the sale of a business unit or of assets in the United States that includes customer lists, intellectual property, and employees (i.e., elements of a going concern) could be a covered transaction.

## ‘Control of Business’ and PPPs

In the context of PPPs, investors should be mindful that certain arrangements that are not mergers or acquisitions in the traditional sense may nonetheless trigger CFIUS jurisdiction. As a general matter, a contractual arrangement is not a “transaction” for CFIUS purposes; however, certain other arrangements that give an investor rights over an existing U.S. business may constitute a transaction and implicate CFIUS’s authority. In limited cases, long-term leases or concessions that give an investor control rights similar to an owner over an existing business may constitute a transaction.

CFIUS has provided guidance on this question through its regulations. The regulations provide that “long-term leases are transactions when, because of the terms of the lease and the extent of the lessee’s authority over the U.S. business, the lessee operates the business as if it were the owner.” However, the preamble states that, as a general rule, “the more significant the substantive responsibilities retained by the lessor over the leased property, the likelier that the lease would not be viewed as a transaction.” Thus, for example, CFIUS would not consider the following to be a “transaction” that is subject to its review: a 99-year concession agreement for a foreign company to operate a toll road, in which the U.S. lessor is required under the agreement to maintain responsibility for all safety and security functions and to monitor the compliance of the foreign company with specified operating requirements, and in which the U.S. lessor may terminate or impose penalties for breach of the operating requirements. Such an agreement is not a “transaction” because the U.S. company maintains control over essential functions of the toll road and may terminate the concession for failure to comply with its requirements. Likewise, a transaction that involves simply a long-term production contract or a contractual license to utilize certain technology or other assets would not be a covered transaction. As these examples suggest, whether CFIUS has jurisdiction is a fact-specific inquiry that requires careful analysis of the rights and responsibilities afforded to the investor by the lease or concession.

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41 *Id.*

42 *Id.* at § 800.204(c).



In this context, some typical contracting structures, as described above, such as traditional procurement, Design-Build, and DBF will not be subject to review by CFIUS. However, structures such as DBOME, O&M contracts, long-term leases and concessions, or privatizations may be subject to CFIUS review, depending on the specific rights afforded and the nature of the U.S. asset that is the subject of the arrangement. The more rights the foreign investor has over the operations of the U.S. business and the longer the term of the arrangement, the more likely it is to constitute a covered transaction. Nevertheless, the analysis will be fact specific, and consultation with experienced CFIUS counsel is advisable.

### National Security Analysis

FINSA formally requires CFIUS to conduct a risk-based analysis for transactions that it reviews. This analysis must consider the national security risk a transaction poses, as assessed by the Director of National Intelligence.<sup>43</sup> For every transaction, CFIUS engages in a three-part analysis of: (1) whether a foreign person has the capability or intention to exploit or cause harm (i.e., the “threat” associated with the buyer); (2) the vulnerabilities associated with the U.S. assets at issue (i.e., whether there are weaknesses or shortcomings in the assets that create a susceptibility to impairment of U.S. national security); and (3) the transaction’s potential consequences, which relates to the “interaction between threat and vulnerability.”<sup>44</sup>

What constitutes “national security” for CFIUS purposes—and, in turn, what might inform the risk-based assessment—is not defined precisely. However, the statute provides certain indicia that are relevant to national security. To start, the statute provides a “clarification” that “‘national security’ shall be construed so as to include those issues relating to ‘homeland security,’ including its application to critical infrastructure.”<sup>45</sup> The statute also specifically directs CFIUS to consider the “potential national security-related effects [of the transaction] on United States critical infrastructure, including major energy assets.”<sup>46</sup> CFIUS has defined “critical infrastructure” to mean “in the context of a particular covered transaction, a system or asset, whether physical or virtual, so vital to the United States that the incapacity or destruction of the particular system or asset ... over which [foreign] control is acquired ... would have a debilitating impact on national security.”<sup>47</sup> Under this definition, the fact that a transaction is occurring in a critical infrastructure sector is not dispositive; rather, it is the particular character of the assets and business at issue in a given transaction that determines whether the transaction in fact involves “critical infrastructure.”

In addition, several other factors identified by the statute as bearing on national security may be particularly relevant to Chinese investments into infrastructure sectors. They include:

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43 50 U.S.C. App. §§ 2170(b)(4), (d)(1)(B).

44 *Guidance Concerning the National Security Review Conducted by the Committee on Foreign Investment in the United States*, U.S. DEPARTMENT OF TREASURY, 73 Fed. Reg. 74567, 74569 (Dec. 8, 2008).

45 50 U.S.C. App. § 2170(a)(5).

46 *Id.* at § 2170(f)(6).

47 31 C.F.R. § 800.208.



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- Whether the covered transaction is a foreign-government-controlled transaction;
- For transactions involving foreign government control that result in an investigation, whether the host country adheres to nonproliferation regimes, whether the host country presents any risk of transshipment of export and military-controlled items, and the relationship of the host country to U.S. counterterrorism efforts; and
- The long-term projection of U.S. requirements for sources of energy and other critical resources and material.<sup>48</sup>

Beyond the statutorily identified factors, there is a much broader range of factors that, in practice, inform CFIUS's national security analysis. CFIUS' annual report to Congress attempts to capture these practice-based considerations. Of particular relevance to infrastructure-related transactions, CFIUS's annual report to Congress in 2012 notes that foreign control over businesses with the following characteristics may, depending on the transaction, raise national security concerns:

- Businesses that provide “services that could expose national security vulnerabilities, including potential cyber security concerns, or create vulnerability to sabotage or espionage”;
- “Businesses that involve infrastructure that may constitute critical infrastructure; businesses that involve various aspects of energy production, including extraction, generation, transmission, and distribution; [and] businesses that affect the national transportation system”; and
- Businesses that “[a]re in proximity to certain [U.S. government] facilities.”<sup>49</sup>

These factors have arisen—and have proved challenging—with some frequency in Chinese investments; in particular, so-called proximity considerations have proved insurmountable in several Chinese investments in natural resource transactions.<sup>50</sup>

## Mitigation

If CFIUS determines that a particular transaction presents national security risks, it will seek to mitigate the perceived threats by imposing conditions or requiring commitments from the parties to a transaction.

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48 50 U.S.C. App. § 2170(f)(8)-(10).

49 *Annual Report to Congress - Report Period: CY 2011* at 20, COMMITTEE ON FOREIGN INVESTMENT IN THE UNITED STATES, (Dec. 2012), available at <http://www.treasury.gov/resource-center/international/foreign-investment/Documents/2012%20CFIUS%20Annual%20Report%20PUBLIC.pdf>.

50 Investments that were prohibited or abandoned as a result of proximity issues include the acquisition by the Ralls Corporation of wind-farm projects in Oregon State; the proposed investment in Lincoln Mining by Procon Mining and Tunnelling Ltd., which is affiliated with the China National Machinery Industry Corporation; and the bid by Northwest Non-Ferrous International Company to acquire a controlling interest in Nevada-based Firstgold Corporation.



Such conditions and commitments may take the form of a signed agreement with agreed-upon penalties between the parties to the transaction and the relevant government agencies. Alternatively, parties have been requested to provide somewhat more informal “assurances” via a letter to the concerned agencies.

The types of commitments and assurances sought by CFIUS can vary. At the most basic level, they can be straightforward assurances that the foreign acquirer does not intend to change the business’s production levels, U.S. facilities, or participation in certain U.S. government programs. Such assurances also can include concomitant record keeping and reporting obligations. On the other end of the spectrum, certain mitigation agreements impose various governance requirements and more costly and onerous security measures, including technical and physical security requirements, U.S. government access to systems and personnel, testing and screening of personnel, and third-party auditing. The most extreme agreements can also limit a foreign acquirer’s decision-making authority and access to the U.S. company.

Finally, CFIUS can reopen a transaction for a material breach of a mitigation agreement if there is a finding of intentional breach by the lead agency *and* a finding by all of CFIUS that no other remedies are available.<sup>51</sup>

## **SELECT LEGAL ISSUES AFFECTING THE FOREIGN PROVISION OF GOODS FOR INFRASTRUCTURE INVESTMENT**

Foreign providers of goods to the U.S. infrastructure sector must navigate a range of local procurement preferences at both the federal and state levels. At the federal level, the Buy American Act<sup>52</sup> mandates a preference for American goods in direct government purchases. For U.S. agency procurements that exceed a threshold of \$203,000, the Trade Agreements Act of 1979 (TAA)<sup>53</sup> restricts the purchase of goods to those originating from “designated countries” with which the United States has signed an international trade agreement. Countries that are parties to the WTO Agreement on Government Procurement (GPA) qualify as “designated countries” under the TAA. Currently, China is not a “designated country,” but it has obtained “observer” status with respect to the GPA and is in the process of acceding to the agreement. Unless and until it becomes a party to the GPA, China’s ability to achieve its procurement objectives in the United States will be limited. However, if China fully accedes to the GPA and adopts implementing agreements with the United States, it will be eligible to be named a “designated country” for purposes of the TAA, thereby greatly expanding its ability to participate in U.S. infrastructure projects. Further, as noted in the context of PPPs, the Buy America Act<sup>54</sup> imposes various domestic goods requirements on purchases made by state and local entities using federal transportation funds. Specifically, the Buy America Act provides that all steel, iron, and manufactured goods used in transportation infrastructure projects receiving federal funding must be produced in the United States, subject to certain qualifications.

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51 50 U.S.C. App. § 2170(b)(1)(D).

52 41 U.S.C. § 8301–8305 (formerly 41 U.S.C. § 10a *et seq.* It is part of the 2011 recodification of portions of title 41 “Public Contracts” enacted by Pub. L. No. 111-350).

53 Pub. L. No. 96-39, 93 Stat. 144 (codified at 19 U.S.C. § 2501 *et seq.*).

54 23 U.S.C. § 313.





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In addition to these federal provisions, state and local governments are empowered to impose further restrictions on the purchase and use of foreign materials. The Third Circuit Court of Appeals recently affirmed this principle in the context of transportation materials when it held that the Pennsylvania Steel Products Procurement Act, which imposes more stringent restrictions on foreign steel than the Buy America Act, was not preempted by federal law.<sup>55</sup> In addition to stricter requirements for domestic goods, many states and municipalities also have adopted state or local geographic preferences. Nearly all the states implement some form of geographic preference in competitive public procurements. These local preference laws take a variety of forms:

- **PERCENTAGE PRICE PREFERENCES.** To name a few examples, Louisiana offers a 10% price preference for steel rolled in state; Illinois recognizes a 10% preference for bidders using Illinois coal; and Alaska affords up to a 7% preference for in-state timber.
- **TIE-BID PREFERENCES.** Nearly all states formally recognize a preference for in-state offerors in a tie-bid scenario.
- **ABSOLUTE PREFERENCES.** Among other states, North Dakota requires contracts for highway grade stakes to be awarded to in-state “work activity centers;” Ohio mandates that “major term” printing contracts be completed in state; and Minnesota requires government-purchased all-terrain vehicles to be manufactured in state.
- **RECIPROCAL PREFERENCES.** At least 35 states have adopted a form of “reciprocal preference” law, a type of retaliatory legislation that gives preference only to residents of states that have not enacted local preference laws.

Although often criticized as unsound economic policy, geographic preferences have been increasingly adopted in recent years by legislatures seeking to protect local jobs and business interests from the effects of a challenging economic environment.

## I. C Sector-Specific Legal and Regulatory Issues

The following sections address select sector-specific laws and regulations that may impact participation in the energy, transport, and water-related infrastructure sectors.

### Energy Infrastructure

In the energy sector, where most assets constitute private infrastructure, foreign parties can, in principle, make debt or equity investments or provide goods or services. Of these forms of participation, acquisitions

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55 See *Mabey Bridge & Shore, Inc. v. Schoch*, 666 F.3d 862 (3d Cir. 2012).



of U.S. energy infrastructure companies or assets are most likely to require advance approvals from federal and state regulators.

Advance approvals are likely required for acquisitions of target companies that control infrastructure connected to the U.S. electricity grid or for transactions that give the acquirer control of important aspects of the target company's operations. Regulation of the energy sector is shared between the federal government, acting primarily through the Federal Energy Regulatory Commission (FERC), and state public utility commissions.

## FEDERAL REGULATION

Investments in an energy enterprise that owns or controls electricity facilities or makes sales from them are likely to require advance approval from FERC. FERC has jurisdiction to review: (1) certain facility and security transactions that involve a “public utility” and (2) certain acquisitions by a “holding company.”<sup>56</sup> A “public utility” is broadly defined to include any entity that owns or operates facilities for “the transmission of electric energy” or for the “sale of electric energy at wholesale” in interstate commerce.<sup>57</sup> Thus, the category of public utility includes owners or operators of power-generating or transmission assets, electricity marketers, and transmission managers. Any entity that is not engaged in interstate commerce—such as those involved in exclusively local distribution of electric energy that does not cross state lines or the sales of electric energy to end users—is not a public utility.

A “holding company” is defined as “any company that directly or indirectly owns, controls, or holds, with power to vote, 10% or more of the outstanding voting securities of a public-utility company or of a holding company of any public-utility company.”<sup>58</sup> It is important to note that “public-utility company” applies to a broader set of entities than does “public utility.” A “public-utility company” includes any company that owns or operates facilities used for the generation, transmission, or distribution of electric energy for sale or facilities for the retail distribution of natural or manufactured gas. To come under this definition, a company need not be in interstate commerce or located in the United States, and may be in the natural gas business instead of electricity. Importantly, however, a holding company does not include “any foreign governmental authority not operating in the United States” or any agency or instrumentality of such authority.<sup>59</sup>

Any transaction that would result in an investor acquiring “control” of a public utility or holding company requires advance approval from FERC.<sup>60</sup> “Control” is assumed where an investor would hold 10% or more of the voting securities of the public utility (or the equivalent interest in the case of a

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56 16 U.S.C. § 824 (b).

57 Federal Power Act, 15 U.S.C. §§ 201(b)(1) and (e).

58 42 U.S.C. § 16451; 16 U.S.C. § 824b(a)(6). These provisions do not apply to “any foreign governmental authority not operating in the United States,” or “any agency, authority, or instrumentality,” or “any officer, agent, or employee ... acting as such in the course of his or her official duty” thereof. 42 U.S.C. § 16456.

59 *Id.*

60 Federal Power Act, 16 U.S.C. § 824(e).



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partnership or limited liability company) or holding company, directly or indirectly. Obtaining approval requires filing a public application. FERC will examine the proposed acquisition to determine the potential effects on competition, rates, and regulation, and the potential for cross-subsidization. However, FERC's advance approval is not required when investors acquire less than 10% of voting securities or structuring investments provided that such investments are considered "passive." For an interest to be "passive," the investor cannot have the authority to manage, direct, or control the activities of the public utility. In addition, there are numerous "blanket authorizations"—essentially advance approvals by regulation—for public utility and holding company transactions unlikely to result in a transfer of control or adversely affect the public interest.<sup>61</sup>

It is also important to point out that holding companies have minimal reporting obligations to FERC, but FERC and to some extent state public utility commissions have access to the books and records of holding companies. Thus, a transaction that results in the investor becoming a holding company brings additional regulatory exposure.

As pointed out, FERC has jurisdiction over wholesale sales of electricity and the transmission of electric energy interstate commerce. Accordingly, FERC approval is needed for the rates, terms, and conditions for providing those services.

As discussed above, in addition to the preclearance requirements with FERC, investments that are structured as mergers or acquisitions may also be subject to antitrust approval under HRS. As new energy fields like the solar, wind, and storage industries continue to consolidate, antitrust concerns will become more significant.

Finally, electric power facilities that connect to the electric grid may be subject to reliability standards administered by the North American Electric Reliability Corporation (NERC). NERC is a nonprofit corporation that ensures the reliability of the bulk power system in North America. Because NERC is designated as the Electric Reliability Organization pursuant to the Energy Policy Act of 2005, compliance with the NERC standards is mandatory for all users, owners, and operators of the United States bulk power system and enforceable by civil penalties. In the case that a transaction is reviewed by CFIUS, compliance with NERC's reliability standards and the target company's cyber security plan are likely to be relevant considerations.

## STATE REGULATION

In addition to any required federal approvals, investment in the energy sector may additionally be subject to review by state-level public utility commissions. Every state in the United States has established a public service commission or public utility commission to act as an independent regulatory body to oversee power generation and wires facilities as well as electricity service within the state. Public utility commissions generally are responsible for reviewing proposals for new generation, transmission, or distribution infrastructure projects and for determining the prices utilities can charge for electricity service in the state. Some state commissions

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61 18 C.F.R. § 33.1(c).



also have authority to ensure the financial security and transparency of regulated public utilities. For example, many states require prior approval or reporting of the disposition of a utility's stock or other assets (e.g., through an acquisition or merger) or of its issuance of additional equity or debt instruments.

## Transport Infrastructure

As compared with participation in the energy sector, participation in the transport sector is far more likely to entail taking part in PPPs. Above, we addressed the principal PPP structures and the limitations that PPP enabling legislation can impose. This section addresses additional transportation-specific legal and regulatory constraints on building, maintaining and operating transportation infrastructure projects.

### FEDERAL REGULATION OF TRANSPORTATION INFRASTRUCTURE

The federal government has broad authority to regulate interstate transport systems. It exercises that authority through a range of sector-specific regulatory bodies that promulgate rules to ensure the safety, reliability and efficiency of the interstate transport system. Because the applicable federal rules vary widely depending on the specific industry, we consider each in turn.

#### Airports

The Federal Aviation Administration (FAA) regulates the operation and maintenance of airport facilities, ensuring that “the national airport system is safe, efficient, and environmentally responsible and meets the needs of the traveling public.”<sup>62</sup> Through a mandatory certification program for the operation of airports, the FAA requires that airport operators adopt and comply with an “Airport Certification Manual,” which includes a description of operating procedures, facilities and equipment, and responsibility assignments.<sup>63</sup> Additionally, operators must comply with prescribed operations regulations encompassing a wide variety of airport activity, including mandatory record keeping, detailed standards for grounds upkeep, maintenance of aircraft rescue and firefighting resources, environmental regulations, noise pollution regulations, and protections for public areas.<sup>64</sup>

#### Railways and Public Transit

Railways and public transit are subject to regulation by multiple agencies with overlapping authorities, including the Surface and Transportation Board (STB), the Federal Railroad Administration (FRA), and the Federal Transit Administration.

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62 *Airport Programs & Guidance (2013)*, FEDERAL AVIATION ADMINISTRATION, available at <http://www.faa.gov/airports/>.

63 14 C.F.R. § 139.201.

64 14 C.F.R. §§ 139.301–139.343, 161.1–161.505.



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Investors wishing to construct, acquire, operate, or abandon railroad lines must receive a certificate of authorization from the STB, which oversees rail lines.<sup>65</sup> The STB will issue such certificates only upon a finding that the proposed project or transaction is not inconsistent with “public convenience and necessity.”<sup>66</sup> Certificate applications require the submission of detailed information concerning the proposal, including operational data, financial information, descriptions of proposed rail traffic and commodities, maps, time schedules, environmental data, and any additional information that the STB deems appropriate.<sup>67</sup> Additionally, any proposals affecting a consolidation transaction of more than one railroad are subject to additional restrictions and filing requirements.<sup>68</sup>

The FRA is charged with carrying out “all railroad safety laws of the United States”<sup>69</sup> and, accordingly, it has promulgated extensive and detailed regulations prescribing the minimum safety requirements. Similarly, comprehensive regulations exist for track crossings, signal and train control systems, bridges, and the safety integration plans that must be generated in instances of significant railroad consolidation transactions.<sup>70</sup>

## Roadways

Federal roadways are subject to a broad set of regulations administered by the Federal Highway Administration (FHWA) within the Department of Transportation. Although federal roads are owned and operated by the states, the FHWA is responsible for oversight of highway safety programs and management of “development related to highway design, construction and maintenance, [and] traffic control devices.”<sup>71</sup> The FHWA has issued regulations governing transportation infrastructure management systems, highway beautification, and exhaustive design standards for transportation infrastructure. Additionally, the FHWA administers federal funding programs for transportation infrastructure projects, including the Federal-Aid program, which provides funds to states for “construction, reconstruction, and improvement of highways and bridges on eligible [routes].”<sup>72</sup>

## STATE AND LOCAL REGULATION

States and localities independently regulate local transportation infrastructure, including state and local roads, bridges, and public transit systems. Such regulation will generally be integrated with the legislation authorizing PPPs for the applicable assets.

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65 49 U.S.C. § 10901(a).

66 49 U.S.C. § 10901(c).

67 49 C.F.R. §§ 1150.1–1150.10.

68 49 U.S.C. §11323; 49 C.F.R. §§ 1180.0–1180.11.

69 49 U.S.C. § 103(b).

70 49 C.F.R. §§ 244.1–244.21.

71 49 U.S.C. § 104(c).

72 *A Guide to Federal-Aid Programs and Projects*, FEDERAL HIGHWAY ADMINISTRATION, available at <http://www.fhwa.dot.gov/federalaid/projects.cfm>.



## Water-Related Infrastructure

Like transportation, water-related infrastructure traditionally has been an area dominated by public utilities with little private investment. Yet as the U.S. water infrastructure has aged and pressures to modernize the system have increased, PPP arrangements have been put to wider use, creating investment opportunities for private entities, including foreign investors. This section describes the regulatory landscape for the U.S. water infrastructure.

### FEDERAL REGULATION

In contrast to the regulation of transportation infrastructure, federal regulation of water infrastructure is largely centralized in a single agency: the EPA. Some of the EPA's regulatory authority directly implicates infrastructure while other regulatory authority applies generally, with special considerations implications for water infrastructure projects.

Infrastructure projects that supply drinking water must comply with requirements of the Safe Drinking Water Act (SDWA), which authorizes EPA to set national standards for drinking-water contaminants. Under the SDWA, EPA has promulgated regulations that set limits on the levels of certain contaminants in drinking water and that establish water-testing schedules and methods.<sup>73</sup>

Water infrastructure projects also must comply with pollution control programs under the Clean Water Act, which authorizes the EPA to set water-quality standards for surface water contamination.<sup>74</sup> EPA administers the National Pollutant Discharge Elimination System (NPDES) permit program, which requires industrial, municipal, and other facilities that are not privately owned homes to obtain permits if discharges go directly to surface waters.<sup>75</sup> The NPDES standards apply generally but are particularly applicable to water infrastructure projects, such as wastewater treatment facilities.

Water infrastructure projects may also be required to conduct vulnerability assessments and emergency response plans. After the terrorist attacks of September 11, 2001, Congress and the President increased EPA's role in protecting water infrastructure.<sup>76</sup> EPA administers the water-specific provisions of the Public Health and Bioterrorism Preparedness and Response Act, which require drinking-water systems serving "a population of greater than 3,300 persons" to conduct vulnerability assessments and prepare emergency response plans, and submit them to EPA.<sup>77</sup>

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73 *Current Drinking Water Regulations* U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at <http://water.epa.gov/lawsregs/rulesregs/sdwa/currentregulations.cfm>.

74 Clean Water Act, Pub. L. No. 845, ch. 758, 62 Stat. 1155 (June 30, 1948) (codified as amended at 33 U.S.C. § 1252 *et seq.*).

75 *Id.* See also 40 C.F.R. §§ 122.1–122.64.

76 *Water Security: Legislation and Directives*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at <http://water.epa.gov/infrastructure/watersecurity/lawsregs/#seven>.

77 42 U.S.C. § 300i-2.



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## BOX 7

### Water Companies

Although the drinking water and wastewater services sector is highly diffuse, a few companies have emerged as significant players. The following are two of the largest.

**United Water**, a New Jersey–based subsidiary of the French utility Suez Environment, provides water and wastewater treatment services to more than 5.5 million customers across 21 states and operates 90 municipal and industrial waste and wastewater systems through PPPs and contractual arrangements.

In a joint venture in which KKR provided 90% of the equity capital, United Water recently entered into a 40-year contract with the Bayonne Municipal Utilities Authority (BMUA) to operate, maintain, and manage water and wastewater services in Bayonne, New Jersey. According to United Water, the return on investment will likely be a “low double-digit” annual percentage, and the joint venture’s potential profits will effectively be capped. If water usage in Bayonne dips, the joint venture can tap a rainy-day fund of as much as \$5 million to make up for the revenue shortfall. If revenue is stronger than expected, then the extra will accrue to Bayonne.

KKR will benefit in the joint venture from United Water’s knowledge of and experience in providing operations and maintenance services to municipal waterworks. The partnership thus demonstrates the opportunities for both financial and strategic equity capital in PPPs.

**American Water**, a New Jersey–based company, is the largest publicly traded waste and wastewater utility company in the United States, serving an estimated 14 million customers across 30 states. It manages municipal water systems throughout the country. Among notable PPPs, American Water manages the Tolt Water Treatment Plant, a DBOM project in Seattle that supplies roughly 30% of the city’s annual drinking water and is estimated to have saved the city upwards of \$70 million in design costs.

As noted in our discussion of legal and political challenges to Chinese participation in Part II.B, American Water was owned and operated by the German firm RWE for three years in the early 2000s. However, the company was later spun off from RWE following a political resistance to foreign ownership of water facilities.

## STATE AND LOCAL REGULATION

Water infrastructure in the United States is funded primarily by public entities, either through federal and state appropriations or the issuance of local utility bonds. Because these programs are paid for by utility customers, it is often difficult to convince consumers to assume additional indebtedness in order to modernize water utilities. Some cities and states are increasingly turning to private financing for water infrastructure investments, either through PPPs or private ownership of water utilities. Many states have passed enabling legislation authorizing municipalities to enter into contracts with private entities to supply water to the public.

In contrast, some states’ laws strictly limit or even prohibit private investment in water infrastructure. For example, Ohio defines “water development project” to include only water utility facilities that are ultimately acquired by the state.<sup>78</sup> This definition necessarily precludes projects that improve private land. In a similar vein, New Jersey has passed comprehensive and detailed legislation “specifying what types of privatization are authorized” and “mandating specific standards, conditions, and procedures to govern local privatization of municipal water services.”<sup>79</sup>

78 Ohio Rev. Code Ann. § 6121.01.

79 See, e.g., New Jersey Water Supply Privatization Act, N.J. Stat. Ann. § 58:26-1 et seq.



# PART II. OPPORTUNITIES, CHALLENGES, AND STRATEGIES FOR CHINESE PARTICIPATION IN U.S. INFRASTRUCTURE

## II. A Prospects for Chinese Participation in Practice: Commercial Opportunities and Impediments

In the first part of this report, we projected 2013–2030 U.S. capital investment needs in energy, transport, and water infrastructure of \$8.2 trillion. This projection was formed using a combination of hard data and extrapolations based on conservative assumptions. In reality, U.S. infrastructure in these sectors over this period will almost certainly require a much higher level of investment. When considered in connection with the funds required for U.S. infrastructure categories outside of those explored here, it is clear that capital needs are huge and that significant opportunities exist for Chinese investors to participate in the United States’ coming infrastructure build-out.

In this part we look at the commercial logic behind Chinese participation in U.S. infrastructure build-out through three potential channels: financial investment, the provision of goods and the provision of services. Because Chinese participation in global infrastructure projects is still at an early stage, a systematic review of potential Chinese involvement in the coming U.S. infrastructure modernization is unrealistic. However, we draw conclusions about commercial opportunities and impediments based on our understanding of China’s position in the global economy and selected case studies.

### Financial Investment

One role for Chinese players considering participation in U.S. infrastructure is as a financial investor. Chinese institutional investors and firms have growing capital pools, but their balance sheet shows a high degree of “home bias”—that is, almost all of their investments are in the domestic economy. Greater uncertainty as to domestic growth in China has increased awareness of the risks of maintaining domestically-concentrated portfolios and the benefits of global diversification.<sup>80</sup> At the same time, the

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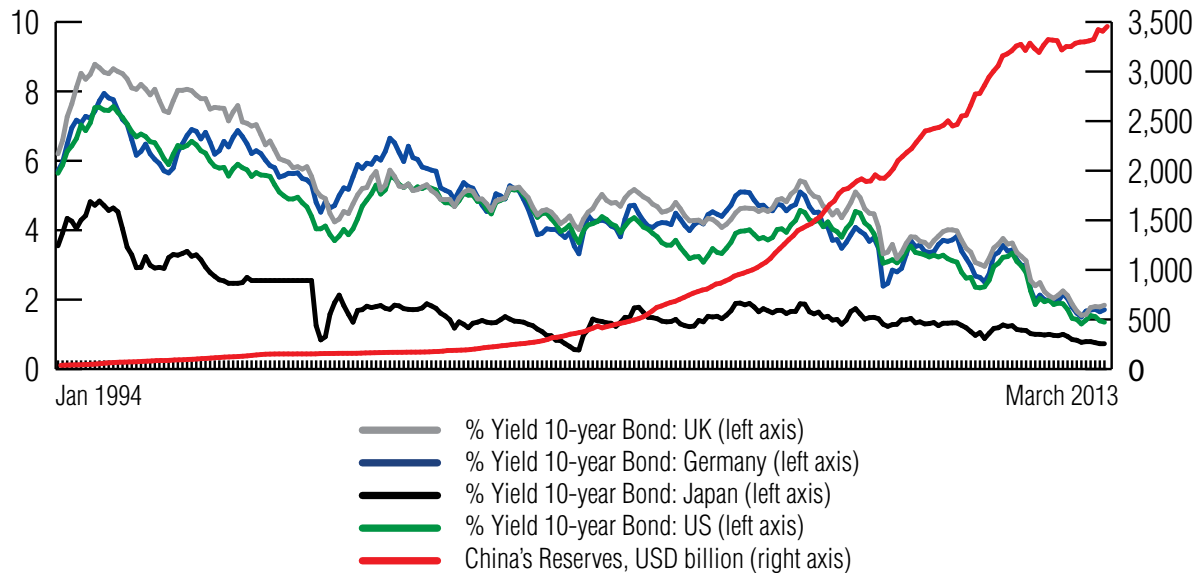
80 Hamid Faruquee, Shujing Li, & Isabel K. Yan, *The Determinants of International Portfolio Holdings and Home Bias*, INTERNATIONAL MONETARY FUND (Feb. 2004), available at <http://www.imf.org/external/pubs/ft/wp/2004/wp0434.pdf>.





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returns for low-risk investments have fallen precipitously across the globe in light of quantitative easing and a flight to safe haven assets since the financial crisis (Figure 7).



**Figure 7.** Source: Bloomberg, Rhodium Group.

For international investors, financial investments in infrastructure projects or firms offer relatively safe returns and a longer-term investment horizon. Investments in capital-intensive infrastructure projects also have the advantage of allowing for the passive investment of large amounts of money without the need for constant managerial supervision. This provides a particularly attractive opportunity for cash-rich Chinese firms that are looking to “go out” and invest abroad.

For most of the past three decades, Chinese entities have not been very active investors in the debt and equity markets discussed in Part I. Nevertheless, Chinese entities have recently become an important source of capital for developed economies through these channels, and they are poised to grow in importance in the United States.

## CHINESE EQUITY INVESTMENT IN U.S. INFRASTRUCTURE

Chinese funds and sovereign investors are known to have significant equity holdings in mature markets, but because there are no disclosure requirements for smaller equity stakes, it is impossible to provide an accurate snapshot. However, bigger stakes usually are disclosed, and these have increased substantially in recent years. For example, in 2012, the China Investment Corporation (“CIC”; one of China’s sovereign wealth funds) purchased an 8.68% stake in British water utility Thames Water and a 10% stake in Heathrow Airport Holdings, the firm that owns London’s Heathrow Airport, for \$726 million.



In the United States, Chinese infrastructure-related equity investment has most recently targeted the energy sector. Examples include CIC's purchase of a 15% stake in the power company AES in 2009; China Huaneng Group's purchase of a 50% stake in the Massachusetts-based global power utility InterGen in April 2011, with a bid of \$1.2 billion<sup>81</sup>; CIC's purchase of a minority stake in Washington-based asset manager EIG Global Energy Partners<sup>82</sup> in 2013; and a \$27.5 million joint venture by China's largest privately owned energy company, Haimo Oil & Gas, with Texas-based Carrizo Oil & Gas. In February 2013, the China Petroleum and Chemical Corporation (a major subsidiary of state-owned Sinopec) purchased a 50% stake in one of U.S.-based Chesapeake Energy Corporation's oil and natural gas fields, straddling northern Oklahoma and southern Kansas, for \$1.02 billion<sup>83</sup>; a year earlier, in January 2012, Sinopec purchased a one-third stake in five of Devon Energy Corp's exploratory shale projects for \$900 million in cash.

In addition to opportunities for Chinese companies, high-net-worth individuals may also invest in U.S. infrastructure through the United States' EB-5 program, which provides foreign investors with U.S. residence permits in exchange for investments of more than \$1 million (or \$500,000 for certain targeted employment areas) that create 10 or more U.S. jobs. The funds may be channeled through special government-licensed "regional centers," such as the Inland Empire Center in California, which focuses on solar energy infrastructure projects.<sup>84</sup>

Beyond acquiring stakes in existing companies and assets, Chinese firms have recently begun to enter the U.S. infrastructure market through greenfield investments. One example is a joint venture between China's ENN group and Utah-based CH4 Energy Corporation, which is building a nationwide network of natural gas fueling stations (known as "blu LNG" fueling stations) for trucks along U.S. highways. CH4 benefits from ENN's experience in operating more than 200 such gas stations in China. In the United States, two stations are already operational, four more are under construction and the consortium plans to build an additional fifty stations throughout the United States this year.<sup>85</sup> ENN's expertise and industrial capacity are crucial assets to CH4 as it and its leading competitor in the emerging U.S. natural gas transportation market, Clean Energy Fuels Corp., seek to accelerate infrastructure build-out to make commercial use viable in the long term.<sup>86</sup>

81 Press Release, China Huaneng, *China Huaneng Group Acquired 50% Stake of InterGen* (Apr. 12, 2011), available at <http://www.chng.com.cn/eng/n75863/n75941/c546018/content.html>.

82 Stephen Aldred, *China CIC Buys Minority Stake in EIG*, REUTERS (Feb. 2, 2012), available at <http://www.reuters.com/article/2012/02/02/us-cic-eig-idUSTRE8110WO20120202>; Press Release, *The Carlyle Group, TCW, EIG, Carlyle Reach Agreement, Clearing Way for Closing of Transaction* (Jan. 15, 2013), available at <http://www.carlyle.com/newsroom/news-release-archive/tcw-eig-carlyle-reach-agreement-clearing-way-closing-transaction>.

83 Swetha Gopinath, *Sinopec to Buy Stake in Chesapeake Assets for \$1.02 Billion*, REUTERS (Feb. 25, 2013), available at <http://www.reuters.com/article/2013/02/25/us-sinopec-deal-chesapeake-idUSBRE91O0GM20130225>.

84 Maria Gallucci, *This Week in Clean Economy: Green Cards for Clean Energy Job Creators*, INSIDECLIMATE (Mar. 30, 2012), available at <http://www.reuters.com/article/2012/03/30/idUS18586092220120330>.

85 Thilo Hanemann, *Chinese FDI in the United States: Q1 2013 Update*, RHODIUM GROUP (April 30, 2013), available at <http://rhg.com/notes/chinese-fdi-in-the-united-states-q1-2013-update>.

86 *Id.*



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## CHINESE DEBT INVESTMENT IN U.S. INFRASTRUCTURE

With regard to loans and debt instruments, there are also signs of greater Chinese activity, but similar data problems exist. It is likely that Chinese investors already own significant amounts of debt instruments issued by infrastructure-related firms and platforms, but there is no comprehensive source to calculate the aggregate amount of such holdings. Anecdotal evidence suggests that Chinese banks and other investors are increasingly ready to provide loans to U.S. firms and infrastructure projects. In a \$5 billion credit agreement with a group of global financial institutions and North Carolina-based Duke Energy in 2011, Bank of China, Industrial and Commercial Bank of China (ICBC), and China Merchants Bank provided 14% of the total.<sup>87</sup> In 2013, Bank of China participated in two syndicated loans arranged by Bank of America: \$2.5 billion for Florida Power & Light and \$4.1 billion for NextEra Energy Capital Holding, both subsidiaries of Florida-based electric company NextEra Energy.<sup>88</sup> And in Texas, a \$2.5-billion-dollar coal gasification plant is being financed by the state-owned Export-Import Bank of China.<sup>89</sup> Finally, many firms with Chinese equity investments are receiving follow-up lending or other financing from the original investor or Chinese banks; Sinopec's collaboration with Devon Energy, for example, calls for Sinopec to provide an estimated \$1.6 billion in future financing to cover shale gas drilling costs.<sup>90</sup>

## CHALLENGES FACING CHINESE FINANCIAL INVESTMENT IN THE UNITED STATES

There are clear mutual benefits to be gained by the investment of Chinese capital in U.S. infrastructure, but, as compared to other foreign capital sources, there are also several hurdles and disadvantages that are specific to Chinese capital. For one, Chinese capital controls restrict the free movement of capital and require investors to secure approvals from Chinese regulators before they invest or move funds offshore. These restrictions, which historically existed to avoid capital flight and illicit outflows of capital, have become cumbersome and problematic as they now involve multiple government agencies and delay flexibility and timeliness. They are particularly burdensome for private Chinese investors who want to invest overseas. Another challenge is that most institutional investors and banks are still state owned, which sometimes leads to situations in which investments or loans are conditioned on other state-owned firms obtaining service or supply contracts in connection with the project. For example, when in 2012 China Export-Import Bank increased its participation in a \$2.5 billion Texas power plant, it also negotiated for further Chinese participation—a construction contract for Sinopec's engineering arm to build a critical part

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87 Press Release, *Duke Energy, Duke Energy Signs \$6 Billion Credit Agreement* (Nov. 28, 2011), available at <http://www.duke-energy.com/news/releases/2011112801.asp>.

88 Thomson One Data.

89 Rebecca Smith & Brian Spegele, *China Takes Big Role in Texas Power-Plant Project*, WSJ ONLINE (Sept. 12, 2013), available at <http://online.wsj.com/article/SB10000872396390443696604577647951084423834.html>.

90 *Devon Reaches \$2.2 Billion Shale Deal With Sinopec*, WSJ ONLINE (Jan. 3, 2012), available at <http://online.wsj.com/article/BT-CO-20120103-705967.html>.



of the plant.<sup>91</sup> In 2013, a \$1.7 billion infrastructure deal between potential Chinese financier China Development Bank (CDB) and American developer Lennar Corp failed, in part, due to requirements that Chinese National Railway Company be procured as a contractor.<sup>92</sup>

Regulatory hurdles related to tax and transparency also stand in the way of greater financial investment. Under the U.S. Foreign Account Tax Compliance Act, overseas financial institutions like CDB must provide the U.S. government with the names of U.S. clients.<sup>93</sup> However, according to Liu Xiangman, deputy director of legal affairs at People's Bank of China, "China's banking and tax laws and regulations do not allow Chinese financial institutions to comply [with this demand]," and it is thought that this legal conflict may ultimately have been a contributing factor to the failed Lennar Corp-CDB project's demise.

## Provision of Materials and Subcomponents

Chinese firms can also participate in U.S. infrastructure in the second manner discussed in Part 1, as a vendor. The commercial logic for China's participation as vendor is primarily cost based. Chinese firms can produce goods and manufacturing services at globally competitive prices, a function of low labor costs and economies of scale resulting from increased industrial capacity, following China's infrastructure build-out at home over the past several years.

For example, steel fabrication for several U.S. suspension bridges has recently been outsourced to China. In 2006, steel manufacture for part of the new San Francisco–Oakland Bay Bridge was outsourced to Chinese state-owned enterprise (SOE) Shanghai Zhenhua Heavy Industries (Shanghai Zhenhua), after an American joint venture between American Bridge and Fluor enterprise underbid competing firms in 2006. A spokesperson for the joint venture noted that Shanghai Zhenhua's advantages included its excess cash, low cost of labor and huge warehouses for massive steel production projects.<sup>94</sup>

Similarly, in 2012, China's Railway Shinghaiguan Bridge group was subcontracted to manufacture the steel deck for the Verrazano-Narrows Bridge in New York; steel manufacture was then subcontracted to China's Anshan Iron and Steel Group to complete the project.<sup>95</sup> Again, the Chinese firms were able to compete based on industrial capacity and cost, enabling the Chinese parties to immediately produce and supply the steel deck panels required at a competitive price. Discussing the Chinese firms' role in the project, the chairman and CEO of the New York Metropolitan Transit Authority, managers of the project,

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91 Rebecca Smith & Brian Spegele, *China Takes Big Role in Texas Power-Plant Project*, WSJ ONLINE (Sept. 12, 2013), available at <http://online.wsj.com/article/SB10000872396390443696604577647951084423834.html>.

92 Phillip Matier & Andrew Ross, *S.F.-China Development Deal Falls Apart*, SFGATE.COM (Apr. 11, 2013), available at <http://www.sfgate.com/bayarea/matier-ross/article/S-F-China-development-deal-falls-apart-4427448.php>.

93 *Id.*

94 David Barboza, *Bridge Comes to San Francisco With a Made-in-China Label*, NEW YORK TIMES (June 25, 2011), available at <http://www.nytimes.com/2011/06/26/business/global/26bridge.html?pagewanted=all>

95 *U.S. Icons Now Made of Chinese Steel*, WSJ ONLINE (June 20, 2013), available at <http://online.wsj.com/article/SB10001424127887324049504578545431938331880.html>.



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noted that their decision to use a Chinese manufacturer was based on the U.S. steel industry's limited capacity to fabricate orthotropic deck panels, and that the additional costs from using an American supplier would have ranged from \$100 million to \$235 million for the project.<sup>96</sup>

The possibility of Chinese participation as vendor has also led some Chinese manufacturers to set up factories on U.S. soil in order to localize production. For example, TPCO Enterprise, Inc., a subsidiary of Tianjin Pipe Group, a Chinese supplier of seamless steel pipes, has a factory in Houston, Texas, where it produces pipes for the American market.<sup>97</sup> By bringing production to America, firms can (1) establish distribution networks or more closely monitor third-party distributors; (2) provide improved post-sales support; and (3) in some cases, reduce the impact of tariffs on their products.

## CHALLENGES

These examples illustrate how sourcing from Chinese suppliers can help make the United States' infrastructure build-out more affordable. At the same time, opportunities for Chinese participation as vendors could be limited by problems with quality control, the absence of capacity to provide after-sale services, and potential problems with legal liability and the Buy America regulations discussed in Part 1.

First, while China has emerged as a major source for many products consumed in the United States, there are rampant problems with quality control, and U.S. buyers have exhibited growing concern over the safety and quality of Chinese-sourced products as a result of several high-profile defective products cases in recent years.<sup>98</sup> For example, from 2006 to 2008, when a construction boom along the U.S. Gulf Coast resulted in a shortage of drywall for new starts and post-hurricane reconstruction, construction firms turned to multiple Chinese suppliers to meet additional supply demands. However, the drywall turned out to be defective, posing health risks and resulting in huge economic losses to homeowners and construction firms.<sup>99</sup> For infrastructure in particular, it is critical that parts and components are safe, high-quality, and durable.

Second, because Chinese firms have mostly served overseas markets through standard trade channels, they often lack the after-sale service and maintenance network required for the sale of such components in foreign markets. For example, in the wind-power sector, after-sales services— such as operation and maintenance, spare parts support, training, software, and development upgrades— are critical. As such, while today Chinese wind turbines are priced approximately one-third less than turbines manufactured

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96 *Buying Steel from China: The M.T.A. Explains*, NEW YORK TIMES (Aug. 12, 2013), available at <http://www.nytimes.com/2013/08/13/opinion/buying-steel-from-china-the-mta-explains.html>.

97 TIANJIN PIPE (GROUP) CORPORATION, About Us, available at <http://www.tianjinpipe.com/about-test.htm>.

98 *FDA's China Offices Focus on Product Safety*, U.S. FOOD & DRUG ADMINISTRATION (Apr. 4, 2012), available at <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm284461.htm>.

99 Press Release, *United States Consumer Product Safety Commission, CPSC Identifies Manufacturers of Problem Drywall Made in China*, available at <http://www.cpsc.gov/en/Newsroom/News-Releases/2010/CPSC-Identifies-Manufacturers-of-Problem-Drywall-Made-in-China/>.



in Europe, the lack of after-sales services can render the upfront cost savings moot, as lower-quality, irreparable hardware results in shorter usable lives.<sup>100</sup>

Finally, legal issues can obstruct provision of goods in several ways. With respect to quality control, there is a concern that the current state of U.S.–China legal cooperation may make it difficult to hold Chinese vendors liable for the damage caused by a faulty product.<sup>101</sup> For example, the 2007 and 2008 discoveries of contaminated blood thinners, pet food, toothpaste, toys and other products produced in China and distributed by American companies demonstrated how difficult it is to identify and prosecute wrongdoers in China.<sup>102</sup> Even if a claim is litigated successfully in a U.S. court, China does not ordinarily recognize U.S. court judgments, which may make obtaining recoveries difficult. Some plaintiffs may also be reluctant to file suit in China because there remains a general perception that Chinese courts may not fairly adjudicate lawsuits by foreign parties. For infrastructure projects with large capital expenditures, such liability problems may pose an intolerable risk for many stakeholders.

Despite these challenges Chinese manufacturers may still want to participate as a supplier of raw and intermediate materials in the private sphere and in channels beyond the scope of Buy American laws.<sup>103</sup> Most Chinese firms, however, lack the local supply network required for such participation. Furthermore, in instances where an intermediate good can only be finished once it has been shipped to the end user (as in the delicate final stages of wind-turbine assembly),<sup>104</sup> failing to localize also reduces the possibility of transitioning from an intermediate goods supplier to a supplier of higher value-added finished goods in the American market.

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100 Christoph Steitz & Mette Fraende, *Wind Turbine Battleground Shifts for European and Chinese Rivals*, REUTERS, available at <http://www.reuters.com/article/2013/07/22/wind-industry-turbines-idUSL6N0FL2YZ20130722>; Xaiomei Tan et al., *China's Overseas Investment in the Wind and Solar Industries: Trends and Drivers*, WORLD RESOURCES INSTITUTE (Apr. 2013), available at [http://pdf.wri.org/chinas\\_overseas\\_investments\\_in\\_wind\\_and\\_solar\\_trends\\_and\\_drivers.pdf](http://pdf.wri.org/chinas_overseas_investments_in_wind_and_solar_trends_and_drivers.pdf).

101 While China is a signatory to the New York Convention, and thereby bound to enforce arbitral awards arising in another jurisdiction, this avenue may not be available to all potential plaintiffs harmed by a faulty product.

102 *FDA's China Offices Focus on Product Safety*, U.S. FOOD AND DRUG ADMINISTRATION (Apr. 4, 2012), available at <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm284461.htm>; see also *China's Toxic Toymaker*, THE ECONOMIST (Aug. 16, 2007), available at <http://www.economist.com/node/9645770>; David Barboza, *China Order New Oversight of Heparin, With Tainted Batches Tied to U.S. Deaths*, NEW YORK TIMES (Mar. 22, 2008), available at [http://www.nytimes.com/2008/03/22/world/asia/22heparin.html?\\_r=0](http://www.nytimes.com/2008/03/22/world/asia/22heparin.html?_r=0).

103 As mentioned, China currently is not among the “designated countries” exempted from the Buy American Act’s domestic preference provision. If China accedes to the WTO’s GPA, however, it will be eligible to qualify as a “designated country.”

104 Michaela D. Platzer, *U.S. Wind Turbine Manufacturing: Federal Support for an Emerging Industry*, R42023 at 11-16, CONGRESSIONAL RESEARCH SERVICE (Dec. 18, 2012), available at <http://www.fas.org/sgp/crs/misc/R42023.pdf>.



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## Provision of Services

Provision of services offers a third mode for Chinese participation in U.S. infrastructure build-out. Opportunities across infrastructure sectors range from supplying contract construction services to acting as a general contractor and managing the entire life of an infrastructure project.

Chinese firms are typically known for providing cost-competitive products globally—supported by low-cost inputs and government incentives assuring industrial production margins. However, Chinese firms are now increasingly becoming internationally competitive in the provision of certain services. Infrastructure-related service is one such category, as China’s rapid urbanization process, which has involved countless so-called “mega projects” has given firms the experience and capability needed to compete overseas.<sup>105</sup>

Consider, for example, the capabilities of Chinese firms in the energy sector. China is home to the world’s largest energy market. Over the past 10 years, Chinese companies have installed 800 gigawatts of power generation capacity domestically, almost as much as total U.S. installed capacity. This scope of investment has also allowed Chinese firms to gain experience in projects that have not recently been built in advanced economies, such as large hydro dams or new technology like coal liquefaction plants. Chinese construction, engineering, and equipment companies are unrivaled in the scale and speed at which they are able to build electrical infrastructure. In the past decade, they have become efficient providers of low-cost infrastructure in the developing world as well, especially in Africa.<sup>106</sup>

More recently, Chinese firms have begun to expand in developed economies, and a number of notable transactions show that Chinese companies are ready for a bigger role in the U.S. energy sector. In Wyoming, Sinopec Engineering Group (wholly owned engineering arm of Sinopec), has been engaged by Texas-based DKRW Advanced Fuels to build a facility that will convert coal into gas, applying advanced carbon-capture technology to reduce emissions—reportedly involving a \$2 billion investment.<sup>107</sup> And in Texas, Sinopec is managing construction of a critical component of a coal liquefaction plant that will employ coal gasification technology equipment provided by German company Linde AG.<sup>108</sup>

As in energy, contract construction services in the transportation sector have also begun to proliferate. Since winning a bid to renovate a New York subway station in 2003, China Construction America (CCA), a wholly owned subsidiary of the China State Construction Engineering Corporation, has

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105 *Infrastructure in China Sustaining Quality Growth*, KPMG GLOBAL CHINA PRACTICE (2013), available at <http://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/documents/Infrastructure-in-China-201302.pdf>.

106 Moin Siddiqi, *China Strengthening Africa’s Infrastructure Base*, AFRICAN BUSINESS (Mar. 2010), available at <http://www.focac.org/eng/jlydh/xzhd/t674046.htm>.

107 *China’s Sinopec Moves Into Small U.S. Town*, WSJ ONLINE (Nov. 5, 2012), available at <http://online.wsj.com/article/SB10001424052970204789304578086391876177054.html>.

108 *China taxes big role in Texas Power-Plant Project*, WSJ ONLINE (Sept. 12, 2012), available at <http://online.wsj.com/article/SB10000872396390443696604577647951084423834.html>.



carved out a niche position in transport-infrastructure-related projects in New York and South Carolina. Recent bids in New York City include a \$57 million contract for construction of ventilation shafts for the No. 7 subway line extension, a \$94 million contract for the new Long Island Rail Road expanded access terminal beneath Grand Central Terminal, and a \$407 million contract to rehabilitate New York's Alexander Hamilton Bridge.<sup>109</sup> In the United States, CCA manages myriad construction projects, sometimes as a single contractor, sometimes in partnership with an American firm.

As these cases suggest, there is a viable commercial opportunity for Chinese firms to provide services in the U.S. infrastructure sector. For growing Chinese industrial conglomerates specializing in energy, construction, and engineering, this offers an opportunity to gain additional revenue as well as upstream expertise in an advanced economy, an important step for future development and competitiveness at home.

## CHALLENGES

At the same time, the provision of services in developed economies poses many challenges to Chinese firms, thus limiting the potential opportunities in the United States. Although Chinese construction service providers have operated successfully in developing economies, lack of experience operating within foreign and often complex regulatory environments in developed economies is a primary commercial impediment. A leading example of large-scale failure brought on by lack of operational expertise is China Overseas Engineering Group's (Covec's) unsuccessful attempt to build a highway in Poland in 2009.

In September 2009, Covec—a subsidiary of the large, state-owned China Railway Engineering Corporation—became the first Chinese company selected to build a European construction project after winning a bid to build two sections of highway covering a 50-kilometer stretch between Warsaw, the Polish capital, and the German border. At the time, the project was invoked as evidence that Chinese construction companies had accumulated the capacity and know-how to operate as service providers in developed economies. However, two years later, mid-construction, Covec was forced to pull out mid-construction due to several critical oversights related to the project's management. As of June 2012, Covec and two Chinese banks guaranteeing the project had not remunerated the Polish government and Polish workers for unfinished work and unpaid wages, despite contractual obligations to do so.<sup>110</sup> The case and its aftermath highlight several obstacles to Chinese participation as a service provider:

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109 Kirk Semple, *Bridge Repairs by a Company Tied to Beijing*, NEW YORK TIMES (Aug. 10, 2011), available at [http://www.nytimes.com/2011/08/11/nyregion/china-construction-co-involved-in-new-yorks-public-works.html?\\_r=0](http://www.nytimes.com/2011/08/11/nyregion/china-construction-co-involved-in-new-yorks-public-works.html?_r=0).

110 COVEC bliżej wypłaty odszkodowań za A2("COVEC Closer to Paying Damages for A2"), WYBORCZA.BIZ (July 7, 2012), available at [http://wyborcza.biz/biznes/1,100896,12186599,COVEC\\_blizej\\_wypłaty\\_odszkodowań\\_za\\_A2.html](http://wyborcza.biz/biznes/1,100896,12186599,COVEC_blizej_wypłaty_odszkodowań_za_A2.html).





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- **LACK OF EXPERIENCE ESTIMATING LOCAL COSTS.** First, Covec's low bid, which came in at less than half (\$481 million) of the \$1 billion budgeted by the government,<sup>111</sup> was well below the actual costs of the project; Covec neither budgeted for the possibility of higher-than-expected costs of construction materials nor mitigated against the possible increase in construction costs by procuring sufficient supplies when prices were low. Covec also failed to plan for costs associated with Polish environmental regulations, which further contributed to major cost overruns.
- **LACK OF EXPERIENCE MANAGING LOCAL LABOR.** Second, the failed project also revealed weaknesses in managing non-Chinese labor relations. Polish press reports that Covec failed to pay subcontractors debts amounting to several million PLN,<sup>112</sup> and a month before Covec resigned in June 2011, subcontractors protested delayed payment by blockading Covec's offices.<sup>113</sup>
- **ENFORCEABILITY ISSUES.** Issues related to the legal liability of Chinese firms and potential financial backers is a third commercial impediment. With Covec, project guarantees and other possible penalties were negotiated during the bidding process and delineated in the contract. With respect to the guarantee specifically, Germany's Deutsche Bank, the Export Import Bank of China (Exim Bank), and the Bank of China had jointly guaranteed the project. However, only Deutsche Bank paid its portion of the guarantee when the project fell apart. The Chinese banks, both affiliates of the state, claim they could not pay their portion, amounting to a combined \$39 million,<sup>114</sup> because a court ruling in China denies them the legal authority to do so. The Polish National Roads and Motorways authority indicates that the Polish court case related to payment of guarantees, penalties, and damages was still ongoing as of June 2012.

Such cases of failure, however, should not overshadow Chinese firms' recent successes and growing capacity in providing construction services in advanced economies. As highlighted by CCA and Sinopec Engineering's expanding role in the American infrastructure services space, Chinese firms can apply specific strategies to foster provision capabilities. Namely, by participating as a contracted service provider (as opposed to a general contractor), these firms can limit exposure to the operational risks of providing contractual services while increasing their operational exposure to the U.S. market.

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111 Jan Cienski, *Poland to China: Pay Up, Now*, FINANCIAL TIMES (June 7, 2011), available at <http://blogs.ft.com/beyond-brics/2011/06/07/poland-to-china-pay-up-now/#axzz2c35Hl1m4>.

112 1 PLN, the national currency of Poland, is equal to approximately .31 U.S. dollars.

113 Jan Cienski, *Poland to China: Pay Up, Now*, FINANCIAL TIMES (June 7, 2011), available at <http://blogs.ft.com/beyond-brics/2011/06/07/poland-to-china-pay-up-now/#axzz2c35Hl1m4>.

114 COVEC bliżej wypłaty odszkodowań za, WYBORCZA.BIZ (July 7, 2012), available at [http://wyborcza.biz/biznes/1,100896,12186599,COVEC\\_blizej\\_wypłaty\\_odszkodowan\\_za\\_A2.html](http://wyborcza.biz/biznes/1,100896,12186599,COVEC_blizej_wypłaty_odszkodowan_za_A2.html).



## II. B Legal and Political Challenges to Chinese Participation

As with any cross-border transaction, foreign investments in U.S. infrastructure projects require careful planning to identify opportunities and avoid pitfalls. This is particularly true for Chinese investments. While the U.S. market is very open to investment generally, including from China, aspects of investment from China can give rise to certain legal and political challenges, depending on the facts and circumstances of the investment, including the form and nature of the transaction, the identities of the parties, and the location, sector, or industry and size of the investment.

### CFIUS and Political Challenges

As described in Part 1, the CFIUS regulatory process applies only to transactions that will result in a foreign party acquiring a controlling interest in an existing U.S. business. Many infrastructure-related projects involving Chinese firms may not result in such a transfer of control in an existing U.S. business and, accordingly, may not be subject to a formal CFIUS review. Nevertheless, even if a transaction will not face CFIUS review, it may be subject to broader political scrutiny at either the federal or local level (or both). In turn, certain factors that otherwise have drawn attention in CFIUS reviews also can attract political attention and require careful consideration, even when CFIUS does not have jurisdiction. This is particularly true for Chinese investments. The factors include those listed in the following subsections.

#### THE LEVEL OF STATE OWNERSHIP AND CONTROL IN THE INVESTING COMPANY

Given the landscape of the Chinese economy and the strong history of Chinese companies being at least partly owned by the government, the issue of state control and whether an entity is acting on the basis of commercial concerns or on behalf of government interests may result in increased regulatory or political scrutiny of Chinese participation in infrastructure projects.

From the perspective of U.S. government officials and politicians evaluating Chinese investment, even publicly traded Chinese companies that otherwise look and feel like Western companies not affiliated with the state may present government control issues. Ministries and agencies within China have served as incubation grounds for companies that were later spun off privately. The fact that the founders of these companies may have their origins with the Chinese government can contribute to a view of the companies as government affiliated or controlled. Furthermore, the Chinese government often retains shares in publicly traded companies, and senior officials in China's larger state-owned enterprises are appointed and evaluated by the Organization Department of the Central Committee of the Chinese Communist Party.<sup>115</sup>

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115 Li-Wen Lin & Curtis Milhaupt, *We Are the (National) Champions: Understanding the Mechanisms of State Capitalism in China*, 65 STAN. L. REV. 697, 737-8 (2013).



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While there is a strong record of successful investments in the United States by state-owned enterprises from China, the relationship between the government and the companies, including the nature of ownership interests, can be a significant factor for U.S. regulatory approval authorities, such as CFIUS, as well as in the politics related to infrastructure projects.

## STATE SUBSIDIES

The funding that Chinese companies rely on in making investments in the United States may be an important regulatory and political factor. First, on the regulatory front, such funding can be indicative of state control. One of the factors that CFIUS considers to determine government control is “contractual arrangements” and the “pledge or other transfer of any of the tangible or intangible principal assets of the entity.”<sup>116</sup> As a contract, a loan agreement could be considered to meet these terms if it includes a “pledge” of certain of the acquirer’s assets as collateral. Further, if an entity appears to be making an investment on nonmarket terms, CFIUS may question whether the transaction is purely a commercial transaction or, instead, reflects state-related interests and direction.

State subsidies also can present policy questions that garner attention from American political actors, with such questions focusing on the potential competitiveness of U.S. firms and the motivations of the foreign government in funding the project, although there is no statutory basis to exclude a bidder in the United States based on such non-national security grounds. Another policy concern related to state subsidies is that they obscure inherent inefficiencies or other weaknesses in SOEs. These weaknesses can include, for example, high costs of production, inefficient capital and labor combinations, and artificially determined product mixes and technology. In the context of Chinese investment, subsidies to SOEs can raise questions, whether fair or not, about the SOE’s ability to make efficient decisions and be a beneficial investor.

## COMMERCIAL AND STATE ESPIONAGE

One of the biggest challenges for Chinese participants in certain sectors is regulatory and political concern over Chinese commercial and state espionage. The U.S. intelligence community has characterized the Chinese intelligence services as among the “most capable and persistent intelligence threats and ... aggressive practitioners of economic espionage against the United States,”<sup>117</sup> and the Department of Justice considers Chinese espionage one of its “top priorities.”<sup>118</sup>

Espionage concerns predominate in high-technology industries important to national defense, such as defense, aerospace, telecommunications, and information technology, which they are likely to be less acute in infrastructure-related industries. In most cases, companies involved in infrastructure projects

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116 31 C.F.R. § 800.204.

117 Statement of James Clapper, Director of National Intelligence, before the Senate Select Committee on Intelligence (Mar. 12, 2013).

118 Statement of Eric Holder, Attorney General (Feb. 20, 2013).



simply do not possess the types of high-tech intellectual property that are likely to be viewed as especially sensitive. There are, of course, important exceptions. As certain U.S. infrastructure assets—such as the electricity grid—become more technologically advanced, Chinese investments in those sectors are likely to present greater challenges. Airports and seaports are also generally viewed as critical infrastructure; information about their operations and, in particular, their security procedure is likely to be viewed as sensitive information that must be protected.

## CYBER SECURITY

Cyber security is a significant public policy issue for U.S. officials and other governments around the world. Senior U.S. defense officials have warned about “cyber Pearl Harbor” that could “derail passenger trains ... contaminate the water supply in major cities, or shut down the power grid across large parts of the country.”<sup>119</sup> The Industrial Control System-Computer Emergency Response Team (ICS-CERT) at the Department of Homeland Security issued a warning in May 2013 to energy companies to be on alert for attacks.<sup>120</sup> It was not entirely clear whether that alert was in response to particular activities, but *The New York Times* also reported that 10 major energy companies had seen probing activity that appeared to resemble an attack on Saudi Aramco that destroyed 30,000 computers.<sup>121</sup>

The U.S. government’s concerns about the cyber threat posed by China are well documented. Given these concerns, Chinese participation in certain types of infrastructure projects may face greater challenges than others. For example, a Chinese investment in energy infrastructure may be particularly challenging as a regulatory and political matter, given the number of reports that have emerged detailing cyber operations originating in China and targeting U.S. energy infrastructure and companies.<sup>122</sup> By contrast, other infrastructure projects including toll roads or certain types of rail projects are inherently less vulnerable to cyber- or other attacks and therefore may be less likely to present exceptional hurdles to investment from China.

## PROXIMITY TO SENSITIVE U.S. GOVERNMENT INSTALLATIONS

A final important consideration for potential Chinese participants is the location of the project. Among the most challenging issues that have confronted Chinese parties in the United States are so-called proximity issues, which arise when a potential investment would occur near sensitive U.S. government facilities or spaces. U.S. national security concerns related to proximity are particularly problematic

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119 Speech by Leon Panetta, Secretary of Defense, at the Intrepid Sea, Air and Space Museum, New York (Oct. 11, 2012), available at <http://www.defensenews.com/article/20121012/DEFREG02/310120001/Text-Speech-by-Defense-U-S-Secretary-Leon-Panetta>.

120 See U.S. Department of Homeland Security, ICS-CERT Monitor (April-June, 2013), available at [http://ics-cert.us-cert.gov/sites/default/files/ICS-CERT\\_Monitor\\_April-June2013.pdf](http://ics-cert.us-cert.gov/sites/default/files/ICS-CERT_Monitor_April-June2013.pdf).

121 Nicole Perlroth, *In Cyberattack on Saudi Firm, U.S. Sees Iran Firing Back*, NEW YORK TIMES (Oct. 23, 2012).

122 See, e.g., *Cybersecurity Issues and Policy Options for the U.S. Energy Industry*, 53 BAKER INSTITUTE POLICY REPORT, JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY (Sept. 2012), available at <http://www.bakerinstitute.org/publications/IT-pub-PolicyReport53.pdf>.



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because they involve fixed real estate and are therefore difficult to mitigate or resolve. Further, proximity issues may not be immediately apparent. Issues may arise not only from military or defense facilities, but also from restricted airspace used for military training or testing, or intelligence facilities that may not be publicly disclosed. In the infrastructure context, airports and seaports are often located in close proximity to military facilities, providing another reason that Chinese participation in such sectors may be challenging. In contrast, commercial roads and some types of railways are less likely to be problematic.

## BOX 8 Congressional Considerations

Apart from CFIUS and other regulatory approvals, the U.S. Congress can take an active interest in foreign participation in U.S. infrastructure and be an important institution for parties to consider and engage in the context of specific transactions. This is particularly true for transactions that present national security issues.

Congress is likely to continue to be a more important institutional consideration for investments from China than it will be for investments from virtually any other country. Indeed, in 2000, Congress created a bipartisan committee, the United States–China Economic and Security Review Commission (USCC), specifically “to monitor, investigate, and report to Congress on the national security implications of the bilateral trade and economic relationship between the United States and the People’s Republic of China.” The USCC regularly holds hearings and publishes research papers on specific subjects pertinent to U.S.–China relations, and it is required to submit to Congress an annual report that includes recommendations for legislative and administrative action.

Over the past decade, the experience of a number of Chinese companies—which can be defined broadly to encompass Hong Kong–based companies as well—has proven the direct impact Congress can have on

individual transactions involving Chinese investors. For example, congressional opposition ultimately killed China National Offshore Oil Corporation’s (CNOOC) bid for Unocal in 2005, and there was substantial political opposition to the proposed investment by Huawei Technologies (Huawei) in 3Com in 2007, which ultimately was rejected by CFIUS.

These experiences demonstrate that congressional and public reaction—and the possibility for a transaction to become politicized—are factors that Chinese investors must consider and plan for. However not all investment from China has been subject to the same degree of congressional scrutiny, and Chinese investors should not necessarily anticipate a congressional environment that will always be hostile. For example, the political reaction to Lenovo’s acquisition of IBM’s Personal Computer division was relatively mild, as was Congress’s reaction to CNOOC’s proposed acquisition of Nexen (and its U.S. assets) in 2012. Some members of Congress expressed concerns about Wanxiang’s acquisition of the nondefense assets of A123 Systems, but the transaction was ultimately approved. Most recently, CFIUS’s approval of Shuanghui International’s acquisition of Smithfield Foods generated only limited Congressional opposition.



## Additional Legal and Political Challenges by Sector or Form of Participation

### ENERGY

As described previously, investments in the U.S. electricity industry may require advance approval by FERC, one or more state public utility commissions, or both federal and state regulators, depending on the nature of the investment and type of asset. Because of the highly interconnected nature of the U.S. electricity grid, such investments may raise not simply local concerns but also national concerns. U.S. policymakers at both the federal and state levels are keenly aware of the need for new capital to update and expand aging grid infrastructure, and foreign investors may be an important source of such capital. Nonetheless, given the critical importance of electricity to the U.S. economy and to the fabric of American life, Chinese investments in the U.S. electricity infrastructure may be particularly sensitive and could be given especially close scrutiny by regulators.

Regulators are primarily concerned with investments that convey control, construed by FERC to be a 10% or more voting interest in most cases. Given that the review by regulators is often pursuant to a general public interest standard, regulators have broad discretion in deciding whether to grant approval. In addition, members of state public utility commissions in some states are elected rather than appointed, which may heighten their political awareness and in some cases concern about Chinese investments in local generation or wires infrastructure. Commissioners at FERC are appointed for a term of five years and, as such, face somewhat less political pressure in decision making. However, political sensitivities about the ownership, operation, and reliability of the electricity infrastructure remain at both the federal and state levels. Chinese investors must be prepared to address national and local concerns.

That said, in 2009 China Investment Corporation agreed to purchase a 15% voting interest in AES Corporation, a public utility holding company. AES Corporation indirectly owned a diverse portfolio of 13,000 MW of generation assets in various regions of the United States, and Indianapolis Power & Light Company, a traditional, vertically integrated utility in Indiana with significant grid assets. The investment required prior approval by FERC. No approval was required in Indiana, but prior approval was sought from the New York Public Service Commission because of AES generation assets in New York. Both regulatory bodies unanimously approved the transaction without apparent fanfare and in a timely manner. The investment was at the holding company level, and neither agency raised particular concerns. Notably, in its approval order, FERC applied its traditional standards, evaluating the effect of the transaction on competition, rates, and regulation, and whether there was any cross-subsidization. The commission had no concerns about these issues. The commission indicated in its order that it has the authority to examine certain books and records of any entity that controls, directly or indirectly, a public utility, and that compliance with all reliability and cybersecurity standards approved by FERC is mandatory and enforceable regardless of the physical location of the affiliates or investors, information databases, and operating systems.



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## BOX 9

### Spanish Investments in Transport Infrastructure

The investments of the Spanish company Cintra Concesiones de Infraestructuras de Transporte S.A. (Cintra) provide an example of the opportunities and challenges Chinese investors may encounter. In the face of strong political opposition, Cintra successfully acquired controlling interests in several privatized toll roads, including the Chicago Skyway Bridge, the 157-mile Indiana Toll Road and portions of what was formerly known as the Trans-Texas Corridor (TTC). In most cases, opposition focused on concerns that foreign companies were profiting from investments made at taxpayer expense and that these profits would not benefit the local communities. The Texas project was initially proposed in 2005, but due to strong public resistance the broader project was abandoned. Despite this setback, Cintra recently received two contracts for smaller pieces of the TTC project, suggesting that an incremental approach may be a viable means of managing political obstacles to infrastructure investment.

## TRANSPORT

Because transport infrastructure in the United States is largely a local matter, Chinese participants, and particularly investors, should be prepared to address local political concerns. By one estimate, more than 80% of U.S. voters oppose the use of foreign capital in domestic infrastructure projects.<sup>123</sup> Thus, while investments in roadways and related infrastructure have the benefit of being less likely to raise national security concerns than, for example, investments in airports or seaports, they may still face adverse public opinion. Despite possible political obstacles, the need for new capital to modernize the U.S. roadways offers considerable opportunities for investors.

Many states pursuing PPP projects are aware of the political problems that foreign participation may generate. In a study assessing the ability of California to attract foreign investment to local PPP projects, researchers explicitly recognized that “one policy factor that may relate uniquely to overseas investors is the potential for an adverse reaction to foreign ownership and operation of core domestic assets.”<sup>124</sup> The study concluded that these problems could be mitigated through “a well-thought-out public outreach and education program,” in conjunction with decentralized transactions that aggregate investments from diverse investors. These studies suggest that states can be helpful partners not only in the PPP projects themselves but also in navigating the political and regulatory challenges surrounding the projects.

## WATER

Like transportation, water infrastructure is primarily a state and local issue, and Chinese participation may therefore face opposition from affected constituencies. Opposition to foreign investment in water infrastructure is not a new phenomenon and is not limited to Chinese investors. Indeed, one commentator has expressed concern that “most of the private owners or operators of public water systems in the United States are subsidiaries of French or German corporations,” thereby making the “American public

123 Oscar Teunissen & Joni Geuther, *Infrastructure Investing: Global Trends and Tax Considerations (Part 2)*, 22 J. INT'L INT'L. TAXATION 24, 35 (Mar. 2011).

124 Sean Randolph & Peter Luchetti, *Framework Conditions for Foreign and Domestic Private Investment in California's Infrastructure: Seizing the P3 Opportunity* 14–16, BAY AREA COUNCIL ECONOMIC INSTITUTE, available at <http://www.bayareaeconomy.org/media/files/pdf/SeizingtheP3opportunity.pdf>.



vulnerable to decisions that may not adequately protect its interests.”<sup>125</sup> Such views are best addressed through a long-term public relations strategy aimed at educating concerned groups, proactively combating misinformation, and working with a wide array of stakeholders.

Political concerns for foreign investors are exemplified by the case of German-owned RWE AG (RWE). In late 2001, RWE acquired American Water Works, Co., currently the nation’s largest publicly traded water company, serving 14 million customers in 30 states. Opposition to RWE’s American holdings was organized by the interest group Public Citizen, which in addition to raising environmental and corporate governance concerns also emphasized the corporation’s German ownership. RWE’s foreign ownership of local water production was so unpopular that it prompted some communities to campaign for nonprofit, local water utilities to manage the locality’s water infrastructure.<sup>126</sup> Citing “considerable political resistance to privatization of the water sector,” RWE decided to sell its American Water holdings three years later.

RWE’s experience should not be understood to mean that all investments in water infrastructure are likely to face insurmountable political opposition. However, it does suggest that investors should carefully consider the risks of certain investments and plan in advance to navigate local political dynamics.

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125 Craig Anthony Arnold, *Water Privatization Trends in the United States: Human Rights, National Security, and Public Stewardship* 33, WM. & MARY ENV’T L. & POL’Y REV. 785, 794–95 (2009).

126 *The Future of American Water: The Story of RWE and the Politics of Privatization*, FOOD & WATER WATCH (2008), available at <http://documents.foodandwaterwatch.org/doc/AmericanWater.pdf>.





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## Box 10

### PRC Legal Approvals

The following is a non-exhaustive list of the domestic government bodies that must approve Chinese outbound foreign direct investment. Approvals or record filing with additional bodies may be required for certain companies and in certain industries—for example, the **State-owned Assets Supervision and Administration Commission (SASAC)** for state-owned or state-controlled companies or the China Banking Regulatory Commission for certain financial services investments.

**National Development and Reform Commission (NDRC).** A Chinese firm looking to invest abroad must first apply to its local NDRC office (the local DRC). The local DRC has authority to approve the investment without further NDRC review unless the project involves:

- An investment of more than USD \$300 million in resource-based sectors;
- An investment of more than USD \$100 million in non-resource-based sectors; or
- An investment in a “sensitive country” (described as a country “without a formal diplomatic relationship with China or under international sanctions, at war or in a state of unrest, etc.”) or a “sensitive industry” (described as “basic telecommunication operations, cross-border water resources development and utilization, large-scale land development, main electrical grids, news media, etc.”).

For such investments, NDRC approval, in addition to local DRC approval, is required. In certain cases, State Council approval may also be required. State-owned or state-

controlled companies under the direct administration of SASAC may simply file for record with NDRC and do not need to obtain local DRC or NDRC approval.

Notably, an August 2012 draft regulation would eliminate the need for NDRC approval (though not local DRC approval) for investments of up to \$300 million in transportation and infrastructure projects.<sup>127</sup> The draft measures would also eliminate the need for NDRC approval for outbound investments by overseas subsidiaries of Chinese companies that do not involve mainland financing or guarantees.

**Ministry of Commerce (MOFCOM).** As with NDRC approval, whether an application must be submitted to MOFCOM or its local affiliate turns on the type or amount of the planned investment. Central MOFCOM must approve, *inter alia*, investments over \$100 million or that create an offshore special purchase vehicle, while a provincial-level MOFCOM is the approval authority for investments between \$10 and \$100 million, investments in resources and minerals industries, and investments that seek to obtain financing from other Chinese investors.

**State Administration of Foreign Exchange (SAFE).** Finally, a Chinese investor must apply for a “foreign exchange registration certificate for outbound investment” from SAFE or its local office in order to transfer funds overseas. SAFE approvals are not necessary if the Chinese investor wishes to use profits earned overseas for an overseas investment.

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*Administrative Measures for Approval of Outbound Investment Projects (Draft for Consultation)*, available at [http://www.sdpc.gov.cn/tztg/t20120816\\_497238.htm](http://www.sdpc.gov.cn/tztg/t20120816_497238.htm).



## Managing U.S. Regulatory and Political Dynamics: Strategies for Success

Notwithstanding that Chinese SOEs and other investors may have inherent characteristics that, at least in the United States, raise their regulatory and, in particular, political risk profile, there are a number of practical measures that Chinese investors can take to help manage these risks and enhance the prospects of regulatory approval without political interference.

- **UNDERSTAND RISKS AND INVEST STRATEGICALLY IN THE MOST COMMERCIAL, LEGALLY, AND POLITICALLY VIABLE PROJECTS.** Investors should understand the potential risks associated with any investment and be strategic about the sectors and U.S. businesses in which they invest. Although not within the infrastructure sectors covered by this report, the experience of Bain Capital and Huawei Technologies, which sought to acquire the U.S. telecommunications firm 3Com in 2007 in a deal that ultimately was rejected by CFIUS, is still instructive. Based upon their public statements, it appears the transacting parties may have underestimated the degree to which an investment that would have provided Huawei only with a 16% interest in 3Com and minority representation on 3Com's board of directors on 3Com's board of directors would raise regulatory issues and strike political nerves.

This is not to argue that Bain Capital and Huawei Technologies should have refrained from pursuing the investment in 3Com or that the decision by CFIUS to block the transaction was the right result. Outsiders to any transaction cannot know exactly the considerations that factored into the transaction parties' or CFIUS's respective analyses. However, the 3Com case does exemplify the importance of Chinese investors conducting an informed regulatory and political risk analysis in connection with the due diligence evaluation of potential investments in the United States. The lesson remains: select investment sectors carefully and conduct a full risk analysis before proceeding.

- **TAKE A LONG-TERM VIEW AND UNDERSTAND REGULATORY REQUIREMENTS.** In connection with a long-term strategy to develop and grow their position in the U.S. marketplace, there may be opportunities to minimize regulatory approvals by, for example, pursuing investment strategies in "greenfield" projects or other transactions that do not trigger CFIUS review. Transacting parties should bear in mind that CFIUS only has jurisdiction to review a transaction that will result in the transfer of control of an existing U.S. business to a foreign person. Investing in a greenfield project or acquiring a non-controlling interest in an existing business is not a circumvention of CFIUS, but rather compliant with it, as U.S. policy is specifically designed to treat such transactions differently from those that do confer control upon a foreign party. Indeed, even transactions that will result in a change in ownership may be structured in a way that provides economic benefit to the foreign investor but not "control." Rendering the investor more passive in this fashion may still enable the investor to realize the financial upside of the investment as well as other commercial objectives while lowering the potential for U.S. government concerns on the front end. For example,



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an investment fund that is based in the United States and controlled by a U.S. general partner is typically not deemed to be a foreign person, even if one or more limited partners is foreign. Thus, the fund's investments in the United States will not result in control by a foreign person and could offer a straightforward and ready channel for Chinese investment in U.S. infrastructure. To be sure, CFIUS will scrutinize the rights of the limited partners to determine whether they provide the limited partner with "control"; examples of rights that can trigger a finding of control include the right to terminate contracts, the right to veto the dismissal of officers, the right to veto major investments, and the right to choose representatives on the board of directors. Rights that do not trigger control include certain economically-focused protective rights, such as the rights to prevent the sale or pledge of substantially all of a company's assets, to prevent diversion of revenue or funds to other investors, and to prevent changes to corporate governance documents.

- **ENHANCE TRANSPARENCY.** Measures to enhance corporate transparency of Chinese investors are important both for the CFIUS process and to help preempt potential political criticism. There is no silver bullet for any Chinese investor to address completely U.S. government concerns over the investor's ties, perceived or actual, to the Chinese government. However, there are certain fundamental steps that Chinese companies can take to address these questions and create greater confidence that they are acting on commercial grounds. These include publishing annual reports with standard financial disclosures, briefing reporters and financial analysts on commercial strategies, using Western financial advisors and financing transactions solely on commercial terms, and, in certain circumstances, offering briefings to CFIUS agencies regarding business plans and product developments.
- **DEVELOP A STRONG COMPLIANCE CULTURE AND PROGRAM.** Given the potential post-transaction compliance concerns that frequently arise in connection with Chinese investment, a Chinese company's ability to demonstrate a strong compliance program and culture to U.S. authorities is another important measure to enhance prospects for successful investment in the United States. For example, having sound written policies and procedures for export control and anti-corruption compliance, including training materials for employees, reflects an understanding of U.S. regulatory interests and may enhance the reputation for the Chinese investor. In certain cases, Chinese investors may consider joining with a well-known and reputable U.S. partner to pursue an investment opportunity or allowing an opposing U.S. party to take the lead in public statements and political strategy. Having a U.S. partner obviously will not guarantee a successful and trouble-free investment in all circumstances—after all, Huawei Technologies was the minority partner to Bain Capital's predominant position in the failed 3Com transaction. But U.S. parties may have stronger relationships and a well-established reputation that engenders trust from key constituencies, and gaining the support of such constituencies may increase prospects for success in particular transactions and may create momentum for future partnerships.



- **CONSIDER HOW BUSINESS OUTSIDE THE UNITED STATES MAY IMPACT OPPORTUNITIES IN THE UNITED STATES.** It is important for all investors, and Chinese firms in particular, to understand how business outside the United States can impact the ability to make investments in the United States. In particular, conducting business with and having significant investments in countries subject to U.S. sanctions, including Iran, Syria, the Democratic People’s Republic of Korea, and Cuba, can present regulatory compliance challenges as well as political risks for investments in the United States. Some potential investors may conduct a cost-benefit analysis of business opportunities in these sanctioned countries and conclude that the risks, including of the possible impact on U.S. opportunities, outweigh the potential rewards. Others may reach the opposite conclusion. In all events, for those firms that seek to invest in the United States and that also conduct business in such sanctioned markets, it is imperative that they be thoughtful about how they structure their various investments and who they involve.
- **INVEST IN U.S. OPERATIONS AND DEVELOP RELATIONSHIPS.** Another key element of sustained success in the United States is the ability to demonstrate a commitment to the U.S. market. Investing in and developing sustained operations in the United States enables the formation of important relationships with business partners, local and national elected representatives, and other third parties who can validate the reputation of the investor. For example, since 1994, Wanxiang Group has operated in the United States through its subsidiary Wanxiang America, headquartered in Elgin, Illinois, since 1994. The company has reinvested all of its profits from the United States back into its U.S. operations, and in less than 20 years has grown to have operations in 11 states and to employ more than 3,000 people. The State of Illinois declared August 12, 2002 to be “Wanxiang Day” because Wanxiang had increased operations in Illinois, keeping manufacturing jobs in the state when many companies moved manufacturing abroad. Wanxiang also was active in acquiring and sustaining manufacturing plants in the United States during the financial crisis, and received public thanks from the Connecticut governor in 2009 for, along with Chrysler, investing in Connecticut. This record of sustained investment and public endorsements from key political officials proved helpful for Wanxiang when, in its 2013 acquisition of a substantial majority of the assets of lithium-ion battery company A123 Systems, it had to overcome opposition and political interference fomented by a U.S. rival bidder, Johnson Controls.
- **DEVELOP COMPREHENSIVE STRATEGY TO MANAGE POLITICAL RISK.** Sixth and finally, foreign investors potentially contemplating major acquisitions in the United States may wish to develop a comprehensive strategy—well before any investment is made—to help manage political risk, especially in Washington, but also at the state and local levels. This, again, is particularly true for Chinese investors. One of the primary issues facing infrastructure investors both in the United States and abroad is the large number of potential stakeholders who may be affected directly and indirectly by infrastructure development and use. Actors range from local community groups to national non-governmental organizations, local and national trade unions, regulators, the media, and lawmakers. A comprehensive strategy must include a sophisticated, well-conceived



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communications strategy targeting the groups most affected by a project. Strategies to this end include:

- *Developing a plan that attracts a diverse group of stakeholders and builds stakeholder support early:* Potential investors and their partners should consider at the outset the range of stakeholders affected by the target project. As early as possible, stakeholders should be educated on the investing firm or investor's background, qualifications, and objectives for the project. Greater transparency, ideally maintained throughout the life of a project, may help manage regulatory scrutiny (as in the CFIUS context discussed above) and improve local relations.
- *Clearly articulating tangible benefits of foreign participation and anticipating opposition from specific groups:* Some stakeholders may have vested interests that would be negatively impacted by a potential transaction. Foreign participants should conduct careful due diligence to identify potential opposition groups, to anticipate the form and scope of their potential dissent, and to develop strategies for combatting oppositional messages. Parties hoping to secure Chinese participation in infrastructure projects should be prepared at the onset to address common criticisms—for example, regarding the potential loss of American jobs, unfair competition due to Chinese government support, or substandard product quality. In the case of public infrastructure projects, it is also important to articulate to the public the benefits of engaging parties other than the federal government or state governments:
  - By delivering best practices and technological innovation that enhances the public's experience, creates jobs, and grows the economy;
  - By transferring risk to the most appropriate party, allows for the government to focus on managing its core assets; and
  - By streamlining inefficient agency bureaucracies.



**Box 11**

## **San Francisco–Oakland Bay Bridge**

The experience of Chinese participation in the replacement of the eastern span of the San Francisco–Oakland Bay Bridge highlights some of the public relations difficulties likely to be encountered by Chinese companies looking to participate in U.S. infrastructure and how such difficulties can be overcome with the right level of government support, product quality and competitive pricing.

San Francisco and Oakland began to develop plans to improve the bridge following the collapse of portions of the existing bridge in the 1989 Loma Prieta earthquake. The new design was finalized years later, at a time of fiscal austerity for California, and the state's procurement process accordingly focused on reducing the project's expected \$7.2 billion cost.

At the time of the first bidding, Shanghai Zhenhua seemed an unlikely candidate to fabricate steel for the new bridge's tower and girders. The company's business centered on manufacturing port cranes, and it had little experience with bridge building. In addition, the selection of Shanghai Zhenhua was likely to face strong resistance from U.S. steel and manufacturing interests over the potential loss of jobs overseas and the overall quality of Chinese steel.

Shanghai Zhenhua nevertheless prevailed in the bidding, overcoming the opposition of labor and other stakeholder groups. Several factors and strategies contributed to its success:

- Public support by Gov. Schwarzenegger and the state of California;
- An arranged visit of key officials, including Gov. Schwarzenegger, to the Shanghai Zhenhua plant in Shanghai;
- Shanghai Zhenhua's maintaining of a low public profile and its use of Caltrans, the California Department of Transportation, as its de facto spokesman; and

Consistent messaging throughout the process regarding Shanghai Zhenhua's competitive strengths—specifically, its large steel-fabrication facilities (which did not exist in the United States), its low-cost workforce, its competitive pricing (estimated by California officials to lead to \$400 million in savings), its stable cash flow, and its steel-fabrication experience as gained through its participation in China's own recent infrastructure boom.



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## CONCLUSION

The need for more than \$8 trillion in spending for infrastructure renewal in the United States over the next two decades presents clear opportunities for global investors and infrastructure firms. As a key source of global capital and America's second largest trading partner, China is well positioned to participate in this opportunity. Chinese investors can look to the U.S. infrastructure sector for portfolio diversification and safe, long-duration investment opportunities. Chinese providers of infrastructure goods and services can look to leverage low labor costs, economies of scale, and significant infrastructure experience to enter the U.S. market.

This report has described and suggested strategies to address many of the legal, political, and commercial challenges to Chinese participation in the U.S. infrastructure sector. Chinese parties looking to expand participation in the sector are well advised to consider, assess, and plan for these challenges, both on a project-by-project basis and in the context of a long-term strategy. We believe that if they do, and if Chinese participation realizes a fraction of its potential, the infrastructure sector will serve as an important area for bridge building—both literal and figurative—between the two nations.



# TECHNICAL APPENDIX

## Background and Methodology

There is no comprehensive database or study that quantifies total capital investment needs in U.S. infrastructure in the years ahead. In order to illustrate the magnitude of future investment needs, we assess required capital investment needs from 2013 through 2030 in three important infrastructure sectors: energy, transportation, and water.

Projecting investment over two decades at a time of great financial and economic change is inherently speculative, and understandably there is considerable disagreement about what should be counted. Importantly, in all cases we employ conservative available estimates of anticipated investment outlays rather than upper-bound numbers. We aim to establish a floor level of investment in three basic sectors that everyone can agree on. Where there are significant upside risks to our figures, we have discussed them qualitatively in the body of this report as well as below.

We generally rely on estimates by authoritative sector experts for the data and assumptions in these projections. Where necessary, we conduct appropriate extrapolations and interpolations from incomplete data and headline long-term investment figures. The numbers in this assessment have all been converted to 2011 U.S. dollars to assure comparability.

## Energy Infrastructure

For the energy sector, we rely on energy supply infrastructure investment demand as forecast in the International Energy Agency (IEA)'s 2012 *World Energy Outlook* (WEO),<sup>128</sup> The WEO which projects energy trends through 2035. As the IEA indicates in its report, given the many factors affecting global energy demand and the interconnectedness of energy demand and production, there are several possible scenarios for U.S. energy infrastructure investment needs over the period. For the purposes of our study, we apply assumptions from the WEO's "New Policies Scenario." According to the IEA, "This scenario takes into account broad policy commitments and plans that have already been implemented to address energy-related challenges as well as those that have been announced, even where the specific measures to implement these commitments have yet to be introduced."<sup>129</sup>

While, in general, the New Policies Scenario assumes enacted and stated policy commitments will be realized, the scenario nevertheless represents conservative projections, assuming cautious implementation of these plans. Where implementing action seems particularly uncertain, the scenario assumes such

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128 *World Energy Outlook 2012*, INTERNATIONAL ENERGY AGENCY (2012), available at <http://www.worldenergyoutlook.org/publications/weo-2012/>.

129 *Id.*





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policies will not be sufficient to meet the stated goal. As such, this scenario, from which we derive our overall estimates, is in line with the conservative approach we take to aggregating total investment demand across all sectors represented in this report.

For the United States, the WEO estimates \$6.1 trillion (2011 dollars) of investment from 2012 through 2035 in the energy supply infrastructure we cover in this report—oil upstream and refining, and natural gas upstream and transmission and distribution (oil and gas), power plants and transmission and distribution (electricity), biofuels, and coal mining and transportation (coal). Assuming equal annual investment, we estimate that energy infrastructure investment required nationally during our projection timeframe, 2013 through 2030, is \$4.6 trillion. We distribute this national number among regions based on the following:

## OIL AND GAS

*Oil Upstream and Downstream:* Investment in oil upstream and downstream is distributed among census divisions based on share of proven oil reserves in that division. The latest data available through the Energy Information Administration (EIA) on oil proven reserves is as of December 2011.

*Gas Upstream and Transmission & Distribution:* Investment in gas upstream is distributed among census regions based on share of proven oil reserves in that region. The latest data available through the EIA on oil proven reserves is as of December 2011, Investment in gas downstream is distributed based on projected consumption of natural gas as pipeline fuel. These projections are available from the *Annual Energy Outlook* (AEO) 2013, published by the EIA.<sup>130</sup>

## ELECTRICITY

*Power Plants and Transmission & Distribution:* Investment in electricity infrastructure is distributed across the nine census divisions based on projected electricity consumption available from AEO 2013.

## COAL

The EIA provides cumulative investment numbers for the Organisation for Economic Co-operation and Development (OECD) Americas region; to determine total U.S. investment demand for coal, we take the ratio of Total Primary Energy Demand (TPED) for coal in the United States to TPED for OECD America (93%) and apply that ratio to an overall cumulative investment figure to arrive at total U.S. investment demand. Investment demand is distributed among census divisions based on the share of recoverable reserves in that division. The latest data available on coal reserves is as of 2011 and is available on the EIA website.<sup>131</sup>

130 *Annual Energy Outlook 2013*, U.S. ENERGY INFORMATION ADMINISTRATION, available at [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf).

131 *U.S. Coal Reserves* U.S. ENERGY INFORMATION ADMINISTRATION, (Nov. 20, 2012), available at <http://www.eia.gov/coal/data.cfm#reserves>.



## BIOFUELS

*Biofuels:* Divisional distribution of investment in biofuels is based on the current distribution of ethanol and biodiesel production capacity across the division.

There is considerable uncertainty surrounding the EIA's energy supply infrastructure investment projections. The application of hydraulic fracturing and horizontal drilling to low-permeability shale formations has led to a dramatic expansion in oil and gas production and investment. The EIA significantly revised their estimates of U.S. oil and gas investment demand between the 2011 and 2012 *World Energy Outlooks* and there could well be further upward revisions in the years ahead. The dramatic change in America's energy trade position has also raised the prospect of billions of investment in new liquefied natural gas and coal export terminals. And future environmental policy, such as the greenhouse gas regulations on existing coal-fired power plants, currently being developed by the Environmental Protection Agency (EPA) could lead to electricity sector investment needs far above the EIA's current projections. As with all estimates in this report, our assessment of future energy sector investment demand should be considered conservative.

## Transport Infrastructure

The following addresses our methodological approach to estimating total capital investment need in U.S. infrastructure across the transportation modes considered in this analysis. For highways and bridges, and mass transit, we applied a bottom-up approach, aggregating data from state-level long-term capital investment needs plans and extrapolating investment needs where no data were available. For freight rail, passenger rail, airports, ports, and inland waterways, we applied a top-down approach, using commonly relied upon industry studies to identify headline numbers and applying divisional transportation related statistics to breakdown total needs by division. As in the other sections, all methodological choices are discussed in detail below.

## HIGHWAYS AND BRIDGES AND MASS TRANSIT

In order to estimate total highway, bridge and mass transit investment needs over the period, we applied a bottom-up approach, aggregating capital investment plans developed by state transportation authorities that address these modes. While federal law requires states develop and make publicly available long-term transportation plans under the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU),<sup>132</sup> states are not required to publish (or necessarily determine) long-term capital funding needs projections—though many do. Approximately two-thirds of all states have made capital funding needs available.

In line with our overall approach, when a range of capital funding needs scenarios were developed, we applied the scenario identified as funding required to keep service at parity with the present—or to attain

132 See, *Fact Sheets on Highway Provisions*, FEDERAL HIGHWAY ADMINISTRATION, available at <http://www.fhwa.dot.gov/safetealu/factsheets/statewide.htm>.



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minimum acceptable investment for safe use — over the period. After tallying investment needs in states with available data, we then converted long-term figures into 2011 dollars and assumed equal annual investment over the study's outlook period. We then interpolated states' needs over our outlook period by summing annual investment needs over the 2013 -2030 period.

For highways and bridges, to make divisional needs assessments we identified the ratio of the population of states with data to total divisional population, which ranged from 55% to 100% across the nine census divisions. We used the average state populations over the period 2012 to through 2030<sup>133</sup> for population values. We then divided the sum of needs for states with data by the percentage of divisional population covered by these states to arrive at total highway and bridge investment needs for each division.

For mass transit we followed a similar approach. To determine investment needs for states without data, we regressed capital needs in states with data (y-variable) against the average population from 2012 through 2030 (x-variable) and applied the resulting relationship to determine capital needs (y-values) for all states and attendant divisional investment.

## FREIGHT RAIL

To calculate freight-rail capital investment needs, we took a total long-term capital needs estimate developed by the Association of American Railroads (AAR).<sup>134</sup> AAR estimates the cost of capital improvements for rail infrastructure from 2008 to 2035 are \$148 billion (2007 dollars). We converted this figure to 2011 dollars, assumed equal annual investment over the AAR's 28 year outlook period, and interpolated total capital needs over our outlook period. We then divided capital needs among states by applying the ratio of total freight-rail shipments originating and terminating in a state to total rail shipments originating and terminating in the associated census division.

While other industry reports note that a larger investment is required to significantly expand and improve freight rail service,<sup>135</sup> conversations with industry experts indicate that, given our overall estimate, an annual investment of approximately \$5.5 billion represents a reasonable base-case scenario for capital needs required by major U.S. freight-rail operators to meet growing capacity expansion needs over our outlook.

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133 We used 2012 U.S. Census data for 2012 state population figures and 2005 U.S. Census Interim Population Projections for 2030 state population figures to find the average population over the period. See *Population Estimates*, UNITED STATES CENSUS, available at <http://www.census.gov/popest/data/state/totals/2012/>; 2030 projection data are available at <http://www.census.gov/population/projections/data/state/projectionsagesex.html>.

134 *National Rail Freight Infrastructure Capacity and Investment Study*, ASSOCIATION OF AMERICAN RAILROADS (Sept. 2007), available at [http://www.camsys.com/pubs/AAR\\_Nat\\_%20Rail\\_Cap\\_Study.pdf](http://www.camsys.com/pubs/AAR_Nat_%20Rail_Cap_Study.pdf)

135 A 2003 American Association of State Highway Transportation Officials report assumed railroads would make substantial investments to improve and expand service given growing demand for freight rail. They estimated that \$250–276 billion (2011 dollars) would be required over the period 2004–2023. See *Transportation: Invest in America*, AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (2003), available at <http://www.camsys.com/pubs/FreightRailReport.pdf>.



## PASSENGER RAIL

Passenger rail in the United States is almost wholly owned and operated by Amtrak, a private for-profit company which was established by the Federal government, and whose operating expenses and capital needs are supported by the government. Amtrak ridership is growing, and there is considerable pressure for Amtrak to expand capacity needs to meet growing demand, especially in the 100 largest U.S. metropolitan areas, which are driving ridership to record levels.<sup>136</sup> While in their long-term transportation plans, certain states indicate they are considering build-out of additional passenger-rail and high-speed rail projects distinct from Amtrak, but capital funding required for those projects is not included in our projections.

Amtrak does not publish long-term capital funding plans for all of its operating regions or on a state-by-state basis. In order to project capital funding needs for passenger rail over the period, we started with a regional long-term capital funding plan projected by Amtrak Northeast Corridor in association with regional transport authorities in 12 states in the U.S. northeast and the Federal Railroad Administration.<sup>137</sup> Total capital needs estimated by this working group over the period 2010 through 2030 are \$52 billion (2010 dollars). We then applied the ratio of total annual boardings and alightings in the Northeast to total annual boardings in the United States (42%) to establish overall investment needs in passenger rail over the 2010–2030 outlook period, \$126 billion (2010 dollars). We converted this figure to 2011 dollars, assumed equal annual investment over the outlook period, and interpolated a total figure from 2013 through 2030. Finally, to distribute the total funding needs over the balance of the census divisions, we applied the percentage of boardings and alightings in the remaining census divisions to the total investment figure to determine divisional investment needs.

## AIRPORTS

There are 19,786 airports in the United States of which 3,355 are included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS covers public use airports designated by the Federal Aviation Administration (FAA) as eligible for federal grants and ongoing operation and development support. These 3,355 airports include 499 commercial airports as well as smaller general aviation and non-primary commercial service airports. Commercial airports, which handle all regularly scheduled commercial airline traffic and have at least 2,500 enplanements (boarding by passengers) annually, account for the majority of investment demand for capital funding in U.S. airports. The remaining 16,000 airports are primarily small, private and have limited infrastructure and, we assume, low levels of annual enplanements. They also include approximately 1,800 public-use general aviation airports, which do not meet FAA criteria for inclusion in the NPIAS. Record keeping of activity and historical spending and spending needs for non-NPIAS airports is limited, and their capital investment needs are not considered in our aggregation.

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136 Robert Puentes, Adie Tomer, & Joseph Kane, *A New Alignment: Strengthening America's America's Commitment to Passenger Rail*, THE BROOKINGS INSTITUTE (Mar. 2013), available at <http://www.brookings.edu/-/media/Research/Files/Reports/2013/03/01%20passenger%20rail%20puentes%20tomer/passenger%20rail%20puentes%20tomer.pdf>.

137 *The Northeast Corridor Infrastructure Investment Plan*, AMTRAK (2010), available at <http://www.amtrak.com/ccurl/870/270/Northeast-Corridor-Infrastructure-Master-Plan.pdf>.



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In order to estimate total capital investment demand for U.S. airports, we interpolated total demand over our outlook period from an American Society of Civil Engineers (ASCE) report<sup>138</sup> that identifies total capital investment needs over the period 2012–2040 for NPIAS airports—converting the overall figure of \$364 billion (2010 dollars) to 2011 dollars and assuming same annual investment over the life of the study. Because this study includes only capital funding for commercial airports in the NPIAS, we then applied a ratio of capital funding needs allocated to commercial NPIAS airports versus total NPIAS airports over the next five years (approximately 80%), estimated by the Airports Council International North America,<sup>139</sup> to expand the funding projections to capture funding for both categories. We then distributed the headline capital investment figure across divisions by tallying the percentage of NPIAS airports in each division and attributing total funding needs in line with these ratios.<sup>140</sup>

## SEAPORTS

America's 361 seaports are primarily managed by public or quasi-public organizations, known as port authorities, which are typically associated with a city, county, regional or state government.<sup>141</sup> One hundred fifty of these ports are deep draft seaports that have significant capacity to onload and offload waterborne freight; their output captures the majority of economic activity associated with America's seaports. These 150 deep draft seaports are managed by 126 port authorities; port authorities often manage more than one port.<sup>142</sup> Operation and management of port infrastructure for commercial purposes is primarily leased to private firms.

To estimate total seaport needs over the outlook period, we took an ASCE estimate of U.S. seaport capital investment needs to 2040,<sup>143</sup> converted to 2011 dollars, assumed equal annual investment, and applied annual investment needs to our outlook period. By this calculation, total U.S. capital needs in maritime commercial port infrastructure are \$21.4 billion from 2013 through 2030.

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- 138 *Failure to Act: The Economic Impact of Current Investment Trends in Airports, Inland Waterways, and Marine Ports Infrastructure*, AMERICAN SOCIETY OF CIVIL ENGINEERS (2012), available at [http://www.asce.org/uploadedFiles/Infrastructure/Failure\\_to\\_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf](http://www.asce.org/uploadedFiles/Infrastructure/Failure_to_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf).
- 139 *Airport Capital Development Needs 2013-2017*, AIRPORTS COUNCIL INTERNATIONAL NORTH AMERICA at 4 (2013), available at [http://www.aci-a.org/sites/default/files/2013\\_capital\\_needs\\_survey\\_report.pdf](http://www.aci-a.org/sites/default/files/2013_capital_needs_survey_report.pdf).
- 140 See *Report to Congress National Plan of Integrated Airport Systems 2013-2017*, FEDERAL AVIATION ADMINISTRATION (2012), available at [http://www.faa.gov/airports/planning\\_capacity/npias/reports/media/2013/npias2013Narrative.pdf](http://www.faa.gov/airports/planning_capacity/npias/reports/media/2013/npias2013Narrative.pdf) (see Appendix A for the complete list of NPIAS airports by state).
- 141 John Frittelli & Jennifer E. Lake, *Terminal Operators and Their Role in U.S. Port and Maritime Security*, CONGRESSIONAL RESEARCH SERVICE, RL33383 (2006), available at [http://digital.library.unt.edu/ark:/67531/metacrs9273/m1/1/high\\_res\\_d/RL33383\\_2006Apr20.pdf](http://digital.library.unt.edu/ark:/67531/metacrs9273/m1/1/high_res_d/RL33383_2006Apr20.pdf).
- 142 Statistics on the U.S. commercial port industry were researched via conversations with industry specialists at the American Association of Port Authorities (AAPA) and select major U.S. ports. See *U.S. Public Port Facts*, AMERICAN ASSOCIATION OF PORT AUTHORITIES (2013), available at <http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=1032>.
- 143 *Failure to Act: The Economic Impact of Current Investment Trends in Airports, Inland Waterways, and Marine Ports Infrastructure*, AMERICAN SOCIETY OF CIVIL ENGINEERS (2012), available at [http://www.asce.org/uploadedFiles/Infrastructure/Failure\\_to\\_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf](http://www.asce.org/uploadedFiles/Infrastructure/Failure_to_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf).



We then distributed total needs among census divisions by applying the percentage of short tons of waterborne freight originating and terminating in a given division to overall waterborne freight originating and terminating in the United States.

Background conversations with some of the largest U.S. port operators and industry experts indicate that while ASCE estimates are highly regarded by industry specialists, the upside risks to this estimation are considerable. These upside risks include capital investment related to the increasing cost of maintaining aging port infrastructure in a state of good repair; the costs of increasing the efficiency of cargo handling; the need to expand assets to accommodate increased import and export of energy commodities and related security investments; and, finally, the need to harden port infrastructure to defend against highly destructive super storms and rising sea levels. The potential knock-on effects from widening of the Panama Canal on U.S. port investment needs are unclear, but if larger ships begin to percolate northward, then modernization required to accommodate post-Panamax<sup>144</sup> ships may be extensive.

Selected industry figures illustrate the upside risks to our estimation. Planned capital investment outlays from 2011 to 2020 for harbor-related port infrastructure for the Port Authority of New York and New Jersey are \$611 million (2010 dollars).<sup>145</sup> And in 2013, the Long Beach Board of Harbor Commissioners approved the Port of Long Beach's largest ever capital improvement spending plan, approving \$720 million (2013 dollars) in capital spending over the fiscal year beginning in October, 2013.<sup>146</sup> However, only \$312 million (2013 dollars) of this figure is allocated to terminal development, with the balance allocated to environmental projects, security and safety projects, and investment in intermodal connectors (streets, bridges, and railways).

Additional figures for port industry investment needs include American Association of Port Authorities (AAPA) projections of public and private port expenditure over the next five years of \$46 billion.<sup>147</sup> These projections include capital investment needs required to build-out infrastructure related to import and export of energy, including LNG and coal terminals.

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- 144 A port is considered post-Panamax ready when it has a channel depth of 50 feet with sufficient channel width and turning basin size; cranes capable of loading and unloading post-Panamax ships; and docks engineered to handle the new bigger cranes. See *North American Port Analysis. Preparing for the first post-Panamax decade*, COLLIER'S INTERNATIONAL (2012), available at [http://www.colliers.com/-/media/files/marketresearch/unitedstates/colliers\\_portreport\\_2012q2\\_final.ashx?campaign=Colliers\\_Port\\_Analysis\\_NA\\_Aug-2012](http://www.colliers.com/-/media/files/marketresearch/unitedstates/colliers_portreport_2012q2_final.ashx?campaign=Colliers_Port_Analysis_NA_Aug-2012).
- 145 *Phase II Report to the Special Committee of the Port Authority of New York and New Jersey NAVIGANT* (2012), available at <http://www.panynj.gov/corporate-information/pdf/navigant-phase-2-and-rothschild-reports.pdf>.
- 146 *Annual Budget – Fiscal Year 2013*, PORT OF LONG BEACH, available at <http://www.polb.com/civica/filebank/blobload.asp?BlobID=10304>.
- 147 *U.S. Port Infrastructure Investment Survey 2012-2016*, AMERICAN ASSOCIATION OF PORT AUTHORITIES (2012), available at <http://aapa.files.cms-plus.com/2012%20AAPA%20Port%20Infrastructure%20Spending%20Survey%20Summary.pdf>



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## INLAND WATERWAYS

There are 25,000 miles of commercially active waterways in the United States, 12,000 of which are managed by the U.S. Army Corps of Engineers (USACE). These 12,000 miles, known as the inland waterway system (IWS), cover 38 states and handle approximately 50% of all inland waterway freight, representing one-twelfth of total national freight transportation.<sup>148</sup> A 2013 CRS report notes that “the cost for new construction or major rehabilitation (currently defined as any upgrade in excess of \$8 million) is shared equally between the Corps and the commercial industry.”<sup>149</sup> We consider capital investment needs for USACE-managed inland waterways in our calculation, as capital investment needs in the remaining commercially active waterways are not documented and, we assume, minor by comparison. However, additional investment needs in unmanaged waterways, and capital investment needs for coast-wise or lake-wise traffic, not included in the IWS, pose an upside risk to our estimation. To estimate total investment demand for the U.S. inland waterways, we took an ASCE estimate of capital funding needs of \$28.2 billion (2010 dollars) to 2040.<sup>150</sup> We then converted this figure to 2011 dollars, assumed equal annual investment over the life of the study, and applied annual investment needs to our outlook period. To allocate total funding needs between divisions, we took the percentage of average annual (2009–2010) waterborne freight originating and terminating in a given division to total average waterborne freight originating and terminating in the United States, and distributed accordingly.

## WATER INFRASTRUCTURE

Capital investment in U.S. water infrastructure is largely funded by the federal government. EPA is the primary source of government funding, with EPA water infrastructure grants dedicated to providing financing for upgrades and new construction necessary to maintain the quality of U.S. drinking water and wastewater infrastructure. User fees are typically assessed to cover operating and maintenance costs. Such costs are not included in our estimates of capital investment needs.

Twenty-year capital funding needs for drinking water and wastewater infrastructure are assessed by the EPA via two survey-based reports, which are updated every four years: the Drinking Water Infrastructure Needs Survey (DWS) and the Clean Watersheds Needs Survey, respectively. To arrive at total capital needs, EPA works with state- and local-level water authorities to assess total capital improvement needs over the 20-year period on a survey basis. Each survey provides an overall U.S. capital needs figure and a state-by-state breakdown; the most recent EPA drinking water survey covers the period from 2011

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148 Charles V. Stern, *Inland Waterways: Recent Proposals and Issues for Congress*, R41430, CONGRESSIONAL RESEARCH SERVICE (2013), available at <http://www.fas.org/sgp/crs/misc/R41430.pdf>.

149 *Id.*

150 *Failure to Act: The Economic Impact of Current Investment Trends in Airports, Inland Waterways, and Marine Ports Infrastructure*, AMERICAN SOCIETY OF CIVIL ENGINEERS (2012) available at [http://www.asce.org/uploadedFiles/Infrastructure/Failure\\_to\\_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf](http://www.asce.org/uploadedFiles/Infrastructure/Failure_to_Act/Failure%20To%20Act%20Ports%20Economic%20Report.pdf).



through 2030,<sup>151</sup> and the most recent EPA wastewater survey covers the period from 2008 to 2027.<sup>152</sup>

In the case of drinking water, the EPA survey identifies capital funding required to continue to provide safe drinking water to the public. Drinking water investment needs considered by the DWS are those related to “expanding, replacing, or rehabilitating existing infrastructure...and projects to construct new infrastructure in order to preserve the physical integrity of water systems and to convey drinking water to existing residential, commercial and industrial customers.”<sup>153</sup>

In the case of wastewater, the EPA survey identifies “capital investment necessary for the nation’s wastewater pipes and treatment facilities and municipal stormwater management projects to meet Clean Water Act water quality objectives...and to [a]ddress a water quality or a water quality related public health problem ... expected to occur within the next 20 years.”<sup>154</sup>

To arrive at total investment demand for U.S. drinking water and wastewater infrastructure, we converted projected investment needs, on a state-by-state basis, to 2011 dollars and assumed equal annual investment over the outlook period for each survey. For drinking water, we then derived 2013 through 2030 data by interpolating needs over the period; for wastewater, we derived 2013–2030 investment needs by extrapolating investment over the final three years (assuming the same annual investment would continue, in 2011 dollars).

We then aggregated total investment demand from the bottom-up, for drinking water and for wastewater infrastructure, to arrive at our divisional and national estimates.

Our figures vary slightly from headline EPA estimates of capital needs. They do not include drinking water or wastewater needs for U.S. territories or Puerto Rico. We also made certain assumptions to extrapolate total water needs when a state did not fully report; namely 15 states did not report needs for medium community water systems in the last drinking water survey. For these states we took the total community water systems needs estimate for the 15 partially surveyed states estimated by EPA, divided this value equally among them, and added the value to each state’s total drinking water capital investment needs.<sup>155</sup>

The EPA has rigorous eligibility criteria for projects it considers in its 20-year needs estimates. For example, in its 2011 to 2030 Drinking Water Survey, the EPA noted “that there are legitimate and

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151 *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at [http://water.epa.gov/grants\\_funding/dwsrf/upload/epa816r13006.pdf](http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf).

152 *Clean Watersheds Needs Survey 2008: Report to Congress*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2010), available at <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf>.

153 *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at [http://water.epa.gov/grants\\_funding/dwsrf/upload/epa816r13006.pdf](http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf).

154 *See Summary of the Clean Water Act*, U.S. ENVIRONMENTAL PROTECTION AGENCY, available at <http://www2.epa.gov/laws-regulations/summary-clean-water-act>.

155 *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at [http://water.epa.gov/grants\\_funding/dwsrf/upload/epa816r13006.pdf](http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf).





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significant water system needs that are not eligible for DWSRF<sup>156</sup> funding, such as raw water dams and reservoirs, projects related primarily to population growth, and water system operation and maintenance costs.<sup>157</sup> In addition, capital investment needs necessary to secure America's water supply, which are receiving increasing attention among sector experts, are likely not fully considered by the EPA reports, which focus primarily on investment required to meet traditional water treatment, distribution, and storage needs. A 2003 study by the American Waterworks Association "estimates that municipal water systems would have to spend more than \$1.6 billion just to ensure control access to critical water system assets."<sup>158</sup> Regardless of whether private foreign investors could participate in this category of water infrastructure capital investment demand, such figures indicate total future needs may be significantly higher than EPA survey estimates indicate.

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- 156 For information on the EPA's Drinking Water State Revolving Fund (DWSRF), see *Drinking Water State Revolving Fund (DWSRF)*, U.S. ENVIRONMENTAL PROTECTION AGENCY, [http://water.epa.gov/grants\\_funding/dwsrf/index.cfm](http://water.epa.gov/grants_funding/dwsrf/index.cfm).
- 157 *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, U.S. ENVIRONMENTAL PROTECTION AGENCY (2013), available at [http://water.epa.gov/grants\\_funding/dwsrf/upload/epa816r13006.pdf](http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf).
- 158 *Protecting Our Water: Drinking Water Security in America After 9/11*, AMERICAN WATER WORKS ASSOCIATION (2003), available at <http://www.fortressteam.com/resources/watersecurity.pdf>. See also, Claudia Copeland & Mary Tiemann, *Water Infrastructure Needs and Investment: Review and Analysis of Key Issues, RL31116*, CONGRESSIONAL RESEARCH SERVICE (2010), available at <http://www.fas.org/sgp/crs/homesecc/RL31116.pdf>.



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