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**RISING DRAGON: INFRASTRUCTURE DEVELOPMENT
AND CHINESE INFLUENCE IN VIETNAM**

by

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June 2009

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INFLUENCE IN VIETNAM**

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ABSTRACT

China and Vietnam have recently stepped up cooperation in cross-border infrastructure development in both overland and electric power sectors. While this development is done in the name of “economic development,” these projects may have unintended consequences. Using Albert Hirschman’s theory of trade as national power, this thesis argues that the cross-border infrastructure development provides China two mechanisms to apply the influence effect of trade on Vietnam. Both sectors of cross-border infrastructure development are analyzed in national, regional and bilateral contexts. The results of this analysis demonstrate that China may not be intentionally creating the mechanisms to use the influence effect of trade. Regardless of the intentions, these mechanisms are being created. China could, in the future, use Hirschman’s influence effect of trade to modify Vietnamese behavior. These mechanisms could be used in the event of a territorial dispute in the South China Sea or in the broader geopolitical affairs of the region.

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I. INTRODUCTION

A. IMPORTANCE

This thesis will contribute to the on-going debate over whether China's rise as a regional and potential global power will be benign or disruptive for Southeast Asia. The central argument is that China is creating mechanisms that can exert influence on Vietnam by developing infrastructure links and creating regional economic dependencies. These mechanisms are being formed as a consequence of economic development programs associated with bilateral and regional initiatives. These infrastructure developments create the mechanisms for future exploitation by expanding China's economic and military power projection capabilities.

This thesis will argue that the newly developed, cross-border infrastructure links can be used to exert Chinese influence over Vietnam in the event of a regional contingency involving territorial disputes in the South China Sea or broader geopolitical affairs in the region.

B. LITERATURE REVIEW

As China rises in power, a major debate has ensued concerning China's role in the international community. One school of thought is that China will have a "peaceful rise," where it stresses the opportunities of being a new global power and does not see a powerful China as a threat to the existing international system.¹ Another school of thought is wary of the Chinese rise, warning that China will seek to be a disruptive

¹ Zheng Bijian, "China's "Peaceful Rise" to Great-Power Status," *Foreign Affairs* 84, no. 5 (Sep/Oct, 2005), 18.; Michael Yahuda, "The Evolving Asian Order: The Accommodation of Rising Chinese Power" in *Power Shift : China and Asia's New Dynamics*, ed. David L. Shambaugh (Berkeley: University of California Press, 2005), 347–361.

power, and seek to change the existing world order to its benefit.² This debate is not just academic, as it influences the formulation of China policy in governments around the world. This debate has particular impact on the United States, as it wrestles with the notion of a rise of another potential superpower, with U.S. leadership debating on treating China as a “strategic partner” or “strategic competitor.”³

The debate is no less heated in Southeast Asia. The ten nations of the Association of Southeast Asian Nations (ASEAN) pursue a mix of balancing, bandwagoning and hedging in both bilateral relations with China and in their various multilateral fora.⁴ China is keenly aware of both the fears of its southern neighbors, and has pursued what some have called a “charm offensive” in the region. A key aspect of this policy has been stressing “win-win” situations, such as economic cooperation and development, while putting contentious issues, like territorial disputes in the South China Sea on the backburner.⁵

² David Shambaugh, "Introduction: The Rise of China and Asia's New Dynamics" in *Power Shift : China and Asia's New Dynamics*, ed. David L. Shambaugh (Berkeley: University of California Press, 2005), 1–22. For analysis see Denny Roy, "Rising China and U.S. Interests: Inevitable Vs. Contingent Hazards," *Orbis* 47, no. 1 (Winter 2003, 2003), 125–137. More recently Jonathan D. Pollack, "The Transformation of the Asian Security Order: Assessing China's Impact" in *Power Shift : China and Asia's New Dynamics*, ed. David L. Shambaugh (Berkeley: University of California Press, 2005), 329–346.

³ For representative articles see Robert Sutter, "China's Regional Strategy and Why it may Not be Good for America" in *Power Shift : China and Asia's New Dynamics*, ed. David Shambaugh (Berkeley: University of California Press, 2005), 289–305.; David M. Lampton, "China's Rise in Asia Need Not be at America's Expense" in *Power Shift : China and Asia's New Dynamics*, ed. David Shambaugh (Berkeley: University of California Press, 2005), 306–326.

⁴ For an ASEAN perspective see Denny Roy, "Southeast Asia and China: Balancing Or Bandwagoning?" *Contemporary Southeast Asia* 27, no. 2 (Aug, 2005), 305–322. For analysis of China's actions see Kuik Cheng-Chwee, "Multilateralism in China's ASEAN Policy: Its Evolution, Characteristics, and Aspiration," *Contemporary Southeast Asia* 27, no. 1 (April, 2005), 102–122.

⁵ Ralf Emmers, *Maritime Disputes in the South China Sea: Strategic and Diplomatic Status Quo*, Vol. 87 (Singapore: Institute of Defence and Strategic Studies, 2005), 16, <http://www.rsis.edu.sg/publications/WorkingPapers/WP87.pdf> (accessed May 20, 2009).; Jing-dong Yuan, *China-ASEAN Relations: Perspectives, Prospects, and Implications for U.S. Interests* (Carlise, PA: Strategic Studies Institute, U.S. Army War College, 2006), 83, <http://www.strategicstudiesinstitute.army.mil/pdf/files/PUB735.pdf> (accessed May 20, 2009).

Relations, however, have not always been so cordial between China and one of its key southern neighbors, Vietnam.⁶ While having a relationship described as “lips and teeth” during Vietnam’s war with the United States, the Sino-Vietnamese relationship soured in the following years. The relationship turned openly hostile when Vietnam invaded Cambodia in 1978.⁷ In early 1979, China sought to “teach a lesson” to Vietnam by invading its northern provinces. While the invasion had limited objectives and lasted a short time, the lingering hostility lasted well into the next decade, with China having a policy to “bleed Vietnam white.” Sino-Vietnamese relations started to thaw in 1989, when Vietnam announced that it would withdraw from Cambodia. Over the next three years there were significant developments in the Sino-Vietnamese relationship, as well as in the broader Communist world, that would lead to the normalization of relations in 1991.

Sino-Vietnamese relations continued to improve through the 1990’s, in the context of greater regional integration and cooperation. When Vietnam was integrated into ASEAN in 1995, it was seen as a major turning point for the region. Vietnam was no longer viewed as a threat by its neighbors, as demonstrated by former Thai Prime Minister Chatichai Choonhavan’s policy of “turning battlefields into marketplaces.”⁸ At first, China was reluctant to engage multilateral organizations. China, however, came to view ASEAN and other multilateral fora, such as the Greater Mekong Subregion (GMS)

⁶ Ramses Amer, "Sino-Vietnamese Relations: Past, Present and Future" in *Vietnamese Foreign Policy in Transition*, eds. Carlyle A. Thayer and Ramses Amer (New York: St. Martin's Press, 1999), 68–129.; Ramses Amer, "Assessing Sino-Vietnamese Relations through the Management of Contentious Issues," *Contemporary Southeast Asia* 26, no. 2 (August, 2004), 320–345.

⁷ Nayan Chanda, *Brother Enemy : The War After the War*, 1st ed. (San Diego: Harcourt Brace Jovanovich, 1985), 479.; Robert S. Ross, *The Indochina Tangle : China's Vietnam Policy, 1975–1979* (New York: Columbia University Press, 1988), 361.

⁸ Carlyle A. Thayer, "Vietnamese Foreign Policy: Multilateralism and the Threat of Peaceful Evolution" in *Vietnamese Foreign Policy in Transition*, eds. Carlyle A. Thayer and Ramses Amer (New York: St. Martin's Press, 1999), 1–24.; David Wurfel, "Between China and ASEAN: The Dialectics of Recent Vietnamese Foreign Policy" in *Vietnamese Foreign Policy in Transition*, eds. Carlyle A. Thayer and Ramses Amer (New York: St. Martin's Press, 1999), 148–169.

grouping,⁹ as key actors in Chinese policy toward Southeast Asia.¹⁰ Thus, the Sino-Vietnamese relationship took on an added dimension through regional multilateral organizations.¹¹ There is debate in the literature on the vector of Vietnam's policies toward China, focusing on if Vietnam is balancing, bandwagoning or hedging against their northern neighbor.¹²

In recent years, economic development has been a major theme into Sino-Vietnamese relations. China has concentrated on economic development since the groundbreaking market reforms enacted in 1978. Vietnam enacted similar "doi moi" reforms, in response to their economic crisis in 1986. Since their respective reforms, both countries have increasingly relied on economic development as a source of legitimacy for government of, by and for the Party. Both China and Vietnam view stable relations as a key prerequisite for sustained economic growth. Good relations mean good business and continued economic development. Both the Communist Parties of China and Vietnam promote economic development as a way to maintain legitimacy and continued rule by the Party.

In this atmosphere, Sino-Vietnamese economic relations have blossomed. Cross-border trade has outpaced expectations, and a regional free-trade agreement is becoming

⁹ The Greater Mekong Subregion includes Burma, Cambodia, Laos, Thailand, Vietnam, and two provinces from China. Yunnan province was an original member, while a second Chinese province, Guangxi Zhuang Autonomous Region, was added in 2004. While the only 2 Chinese provinces are members, Beijing is in charge of China's action. For further discussion see Thomas Chang, *China's Participation in the Greater Mekong Subregion (GMS): A Review and Analysis of Chinese News Media* (Washington, D.C.: The Henry L. Stimson Center, 2006), <http://www.stimson.org/southeastasia/?SN=SE20060518998> (accessed May 20, 2009).

¹⁰ Evan S. Medeiros and M. Taylor Fravel, "China's New Diplomacy," *Foreign Affairs* 82, no. 6 (Nov/Dec, 2003), 22–35.; David Shambaugh, "Return to the Middle Kingdom?: China and Asia in the Early Twenty-First Century" in *Power Shift : China and Asia's New Dynamics*, ed. David L. Shambaugh (Berkeley: University of California Press, 2005), 23–47.

¹¹ Ramses Amer and Nguyen Hong Thao, "The Management of Vietnam's Border Disputes: What Impact on its Sovereignty and Regional Integration?" *Contemporary Southeast Asia* 27, no. 3 (Dec, 2005), 429–452.; Oliver Hensengerth, "Vietnam's Security Objectives in Mekong Basin Governance" *Journal of Vietnamese Studies* 3, no. 2 (Summer 2008).

¹² Henry J. Kenny, *Shadow of the Dragon : Vietnam's Continuing Struggle with China and its Implications for U.S. Foreign Policy*, 1st ed. (Washington, D.C.: Brassey's, 2002), 177.; Jorn Dosch, "Vietnam's ASEAN Membership Revisited: Golden Opportunity Or Golden Cage?" *Contemporary Southeast Asia* 28, no. 2 (August, 2006), 234–258.

a reality.¹³ These interdependent relationships have been described as “win-win.” Both China and Vietnam realize the need for increased cross-border infrastructure development to support further economic development. These cross-border efforts are part of larger infrastructure development schemes by both countries¹⁴ and the region.¹⁵

At the tenth China-ASEAN summit, China, Vietnam and the wider region identified infrastructure development as an important area of cooperation.¹⁶ The energy and transportation sectors are of particular interest. Each of these sectors has extensive projects at the bilateral and regional levels. Recent studies of cross-border infrastructure development indicate the positive effects of transportation infrastructure development on regional development. Transportation initiatives include “hard” infrastructure development for roads and railroads, such as the Kunming-Singapore railway and road development in support of the GMS economic corridors. “Soft” infrastructure initiatives provide transportation facilitation, such as streamlined border crossing procedures. Recent studies of the GMS trade patterns demonstrate positive effect of cross-border

¹³ For general economic background and the important role of cross-border links for Yunnan province see Ingrid d'Hooghe, "Regional Economic Integration in Yunnan" in *China Deconstructs : Politics, Trade, and Regionalism*, eds. David S. G. Goodman and Gerald Segal (London ; New York: Routledge, 1994), 286–321.; Sandra Poncet, "Economic Integration of Yunnan with the Greater Mekong Subregion," *Asian Economic Journal* 20, no. 3 (Sep, 2006), 303–317. Womack has written extensively on Sino-Vietnamese cross-border trade. For a representative article see Brantly Womack, "China's Border Trade and its Relationship to the National Political Economy," *American Asian Review* 19, no. 2 (Summer, 2001), 31–48.

¹⁴ China undertook the “Open Up the West” campaign in 2000, that places high priority on infrastructure development. For more information see David S. G. Goodman, "The Campaign to "Open Up the West": National, Provincial-Level and Local Perspectives," *The China Quarterly*, no. 178 (Jun, 2004), 317.; Hongyi Harry Lai, "China's Western Development Program: Its Rationale, Implementation, and Prospects," *Modern China* 28, no. 4 (Oct., 2002), 432–466. Vietnam sponsored various economic development programs since the doi moi reforms. For an overview of these projects see World Bank, Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, *Vietnam Aiming High: Vietnam Development Report 2007* (Hanoi: World Bank,[2006]).

¹⁵ Various organizations such as United Nations, APEC, ASEAN and the GMS have sponsored infrastructure development projects. For instance, the UN has sponsored the Trans-Asian Highway and Trans-Asian Railway projects. The ASEAN initiatives include Vietnam, but not the China, one example is the Trans-ASEAN power grid.

¹⁶ Gloria Macapagal-Arroyo, "Chairman's Statement of the Tenth ASEAN-China Summit" (Cebu, Philippines, ASEAN, January 14, 2007), <http://www.12thaseansummit.org.ph/innertemplate3.asp?category=docs&docid=39> (accessed May 20, 2009).

infrastructure development on trade and economic development.¹⁷ This effect has been applied to infrastructure in general and specifically to roads.¹⁸ This research also shows that increased domestic infrastructure can have a negative effect of cross-border trade, as it provides additional markets to the previously remote border provinces. This may be a function of the gross underdevelopment of infrastructure in the border provinces. As their integration into the domestic economy grows, they have less need for cross-border trade.¹⁹ The most important finding is that cross-border infrastructure has distinct effects from domestic infrastructure.

The energy sector has many facets, but one area singled out for regional cooperation is electric power transmission. The GMS has started towards developing an electricity market, and an interconnected transmission grid. These infrastructure development and integration efforts are conducted under the banner of mutual benefit for economic cooperation and growth. Two aspects of Chinese infrastructure development have been addressed in existing literature, expanding transportation links with Central and South Asia, and the impact of hydropower resource development in western China.

There is a growing body of literature on the transportation infrastructure development in Central and South Asia in relation to China's growing influence in the region.²⁰ Garver focused on the identification of the mechanism to exert Chinese influence by the development of transportation infrastructure, not China's underlying intentions.²¹ China is still far behind the Western powers in its ability to influence the region, especially in a post-9/11 world. Since 9/11, the United States and North Atlantic

¹⁷ Manabu Fujimura and Christopher Edmonds, *Impact of Cross-Border Transport Infrastructure on Trade and Investment in the Greater Mekong Subregion*, Vol. 48 (Toyko: Asian Development Bank Institute, 2006), 35, <http://www.adbi.org/files/2006.03.dp48.impact.crossborder.gms.pdf> (accessed May 31, 2009).

¹⁸ Christopher Edmonds and Manabu Fujimura, *Impact of Cross-Border Road Infrastructure on Trade and Investment in the Greater Mekong Subregion* (Toyko: Asian Development Bank Institute, 2006), 17, <http://www.adbi.org/files/cpp.road.infrastructure.paper.pdf> (accessed May 31, 2009).

¹⁹ *Ibid.*, 11.

²⁰ For details see John W. Garver, "China's Influence in Central and South Asia: Is it Increasing?" in *Power Shift : China and Asia's New Dynamics*, ed. David Shambaugh (Berkeley: University of California Press, 2005), 205–227. More recently, John W. Garver, "Development of China's Overland Transportation Links with Central, South-West and South Asia," *The China Quarterly*, no. 185 (March, 2006), 1–22.

²¹ *Ibid.*, 2.

Treaty Organization (NATO) countries have expanded their role in Central Asia with the Global War on Terrorism operations in Afghanistan. China is not yet in a position to compete with this Western military presence in the region. While China may not be the predominant actor in Central and South Asia, these projects represent efforts to expand its presence, and may impact Chinese relations with the other great powers in the region. While it includes Chinese projects in Burma, which is part of a GMS economic corridor, Garver's analysis does not include other major Sino-Southeast Asian transportation infrastructure development projects. China's infrastructure development projects in Southeast Asia, both bilateral and within the GMS and their geopolitical impact on the region remain under analyzed.

Not all infrastructure development projects are considered to be "win-win" situations. The development of hydropower resources on the Lancang River has been the topic of much debate and controversy, much of it surrounding the "non-traditional" security implications surrounding the environmental impact of changing the flow of the river and potential economic effect for the downstream riparian states.²² Liebman proposed that the Chinese exploitation of the Lancang may reveal Chinese intentions in the Southeast Asian region, based on a six criteria.²³ The criteria focus on if the behavior is of significant importance, not a "win-win" situation and will cost China to cooperate. Other aspects include that China has preponderance of power in the situation, with the central government in Beijing in control of the decision making and if cooperation is irreversible. Based on his analysis, Liebman asserts that China's actions with regards to the Lancang development suggest China may not have a "peaceful rise" with regards to its Southeast Asian neighbors. Liebman's analysis focused on the lack of Chinese cooperation with Southeast Asia on the use of the Mekong's water resources and does not address the economic effects of the Chinese-Vietnamese cross-border electricity trade, or the impact of the cross-border infrastructure development.

²² Evelyn Goh, *China in the Mekong River Basin: The Regional Security Implications of Resource Development on the Lancang Jiang*, Vol. 69 (Singapore: Institute of Defence and Strategic Studies, 2004), <http://www.rsis.edu.sg/publications/WorkingPapers/WP69.PDF> (accessed May 20, 2009).

²³ Alex Liebman, "Trickle-Down Hegemony? China's "Peaceful Rise" and Dam Building on the Mekong," *Contemporary Southeast Asia* 27, no. 2 (August 2005), 281–304.

The analysis surrounding China's actions for developing the Lancang indicate that Beijing has been pursuing its own interests in developing electric power generation capability.²⁴ Critics note that China has ignored the potential environmental impacts of developing the massive hydropower potential in western China, and Yunnan in particular. According to estimates, the exploitation of Yunnan's hydropower potential has only begun, with less than half of the potential resources currently developed.²⁵ Based on their behavior thus far, one cannot rule out Beijing using the electricity generated from these facilities as a form of economic leverage.

China's electric power sector has been studied in depth. Much of the literature offers analysis of the "Open Up the West" campaign, and its impact on Yunnan and Guangxi provinces.²⁶ Another area of study focuses on hydroelectric projects for the Mekong River, especially the Chinese Lancang projects.²⁷ The literature stresses the environmental impacts and non-traditional security issues caused by upstream utilization of the river. A final area of study is the structure of the Chinese electric power administration system and various restructuring and reorganizing efforts.²⁸ The geopolitical impact of the GMS electric power grid and the Sino-Vietnamese cross-border electrical trade has not been fully developed.

²⁴ John Dore and Yu Xiaognag, *Yunnan Hydropower Expansion*, Chiang Mai University's Unit for Social & Environmental Research and Green Watershed, Kunming, PRC, 2004), <http://internationalrivers.org/files/YunnanHydropower.pdf> (accessed May 20, 2009).

²⁵ *Ibid.*, 4.

²⁶ Darrin Magee, "Powershed Politics: Yunnan Hydropower Under Great Western Development," *The China Quarterly*, no. 185 (March, 2006), 23–41.; Tim Oakes, "Building a Southern Dynamo: Guizhou and State Power," *The China Quarterly*, no. 178 (June, 2004), 467–487.

²⁷ Lancang is the Chinese name for the upper reaches of the Mekong. Goh, *China in the Mekong River Basin: The Regional Security Implications of Resource Development on the Lancang Jiang*, 17.

²⁸ C. P. Andrews-Speed, *Energy Policy and Regulation in the People's Republic of China*, Vol. 19 (The Hague; New York: Kluwer Law International, 2004), 405.; Emily T. Yeh and Joanna I. Lewis, "State Power and the Logic of Reform in China's Electricity Sector," *Pacific Affairs* 77, no. 3 (Fall, 2004), 437–465.; James H. Williams and Navroz K. Dubash, "Asian Electricity Reform in Historical Perspective," *Pacific Affairs* 77, no. 3 (Fall, 2004), 411–436.

C. METHODOLOGY

To demonstrate how infrastructure development creates a mechanism for Chinese influence in Vietnam, this study will attempt to apply Hirschman's theory of national power through trade to the cross-border overland transportation links and electric power grid. Hirschman's approach allows for the influence effect of trade, stating that the more immediate effects of a stoppage of trade from China will have on the Vietnamese economy, the more influence Beijing will have in Hanoi. Two case studies will be utilized, an analysis of the overland transportation links and the electric power grid. The overland transportation links will be discussed in both bilateral and regional perspectives, focusing on the cross-border trade in goods. The electric power grid will also be discussed in both bilateral and regional perspectives. In each case, this study will argue that the interruption of trade will be more disruptive to Vietnam than China, thereby providing two distinct mechanisms for China to exert influence over Vietnam.

This assessment of Sino-Vietnamese cross-border infrastructure development will utilize a variety of sources. In addition to Hirschman's theoretical work on national power, primary Chinese and Vietnamese policy statements documents from various international organizations, such as the World Bank and Asian Development Bank. Secondary source will also be used, such as books, scholarly journal articles, academic publications, and news media reports relating to specific topics being discussed.

D. SUMMARY OF CHAPTERS

Hirschman's concept of using foreign trade as an instrument of national power may be familiar to some readers. Chapter II will provide a review of Hirschman's major concepts of the supply effect and influence effect of foreign trade. The concept of unintended consequences as it relates to forming mechanisms for these two effects is also reviewed.

Chapter III analyzes the first of two infrastructure development sectors, overland transportation. This chapter discusses the road and rail cross border links. It starts with a review of domestic transportation development within China and Vietnam. It then

discusses the broader regional context by focusing on the Greater Mekong Subregion (GMS) economic corridors, and the transportation projects associated with this initiative. These projects include “hard infrastructure” projects including road and railway cross-border links. Then the “Two Corridors, One Economic Belt” initiative between China and Vietnam is discussed. The next section addresses “soft infrastructure” initiatives for trade facilitation, focusing on the Sino-Vietnamese bilateral aspects of these projects. The chapter concludes with an analysis of how the new transportation links enable Beijing to employ aspects of Hirschman’s theory regarding the influence effect of trade.

Chapter IV uses the same approach as the previous chapter, applied instead to the electric power sector. The first section addresses national initiatives within China and Vietnam to address their generation, transmission and regulatory reform needs. The second part of the chapter reviews the regional context by discussing APEC, ASEAN, and GMS regional initiatives in the power sector. Next, Sino-Vietnamese bilateral projects are discussed. The analysis focuses on projects that go beyond the scope of the regional initiatives. The chapter concludes with an analysis of how the electric power trade between China and Vietnam, enabled by the infrastructure development and regulatory reform, fits Hirschman’s model of the influence effect of trade.

Chapter V analyzes the implications of the infrastructure development and the formation of the mechanisms to expand Chinese influence in Vietnam. Finally, implications for Vietnamese policy toward China, its neighbors are discussed.

II. TRADE AS NATIONAL POWER

The Sino-Vietnamese relationship has been described as asymmetric.²⁹ In this type of relationship, the larger power realizes the limitations of its own power, and acknowledges the lesser power's right to exist. The lesser power realizes its comparative weakness and pays "deference" to the greater power, while still maintaining autonomy. The lesser power will be influenced by the greater power. While the Sino-Vietnamese relationship has been analyzed in depth using this perspective, the exact mechanisms to exert influence are not fully developed. China is said to be able to influence Vietnam because of the vast economic power. But in what ways will China be able to specifically exert its economic influence in Vietnam? A framework is needed to analyze how trade can be used as an instrument of national power.

In his work, *National Power and the Structure of Foreign Trade*, Albert Hirschman outlines two aspects of using trade as an instrument of national power, the supply effect and the influence effect.³⁰ The supply effect, which deals with the exchange of plentiful or less desired goods for more desired goods, is described as an "indirect instrument of power." On the other hand, the influence effect is described as a "direct source of power." The influence effect stems from two conditions. The first condition is the dependency of one state on another state's trade. The second condition is the difficulty in adjusting the existing trade pattern from one state to another. These two conditions can arise from a deliberate policy to create these dependencies by a state, or they can arise as unintended consequences of policies directed at other issues. Each of these is discussed in turn.

²⁹ Brantly Womack, *China and Vietnam : The Politics of Asymmetry* (Cambridge ; New York: Cambridge University Press, 2006), 281.

³⁰ Albert O. Hirschman, *National Power and the Structure of Foreign Trade*, Expand ed., Vol. 1 (Berkeley: University of California Press, 1980), 172.

A. SUPPLY EFFECT

The supply effect is the first aspect of trade that Hirschman identifies. He describes this effect as a “positive” aspect of trade, as it provides a larger supply of “more wanted” goods and replaces “less wanted” goods. The “more wanted” goods will be ones that improve the war making capacity of the state. Thus, supply effect emphasizes military benefits gained through trade. Because the supply effect contributes to the war making capacities of the state, it can be considered an “indirect” source of power.³¹ As Hirschman explains,

But, just as war or the threat of war can be considered in turn as a means of obtaining a certain result, so the supply effect of foreign trade is an indirect instrument of power, the direct instrument being war or the threat of war.³²

In the case of the supply effect, trade is subordinate to the overall military capability. The use of force or threat of force is the “direct source” of state power. The supply effect could not be used on its own as a means of coercion without hurting the military capacity of the state by cutting off critical supplies of military goods.

Hirschman maintains that the supply effect will be a motivating factor in a state’s behavior, since it is essential in order to maximize the military capacity of the state. First, states will attempt to secure the trade routes to ensure that the essential war making goods can be traded. He sees sea lines of communication as particularly important. A second behavior driven by the supply effect is that a state will stockpile essential goods. This can be seen with “strategic reserves” of essential goods such as oil and natural gas. A final behavior is that states will “redirect” trade to states where “the danger of being cut off is minimized.” Alternate trading partners will be sought if there is a possibility of disruption of essential trade. These three behaviors can be characterized as defensive in nature. As Hirschman concludes,

³¹ Hirschman, *National Power and the Structure of Foreign Trade*, 14.

³² *Ibid.*, 14.

As far as the supply effect is concerned, foreign trade serves as a means of increasing efficiency of the military pressure which one country might bring to bear upon other countries. But, just as war or the threat of war can be considered in turn a means of obtaining a certain result, so the supply effect of foreign trade is an indirect instrument of power, the direct instrument being war or the threat of war. In its final result, therefore, the supply effect of foreign trade requires at least the possibility of war.³³

The threat of war or use of force may not always be the preferred method of obtaining a state's goal. This is where the second aspect of trade, the influence effect, becomes important.

B. INFLUENCE EFFECT

The second aspect of trade Hirschman identifies is the influence effect. The influence effect can be divided into two categories of policy types. First, there are policies that make it difficult for a state to “dispense entirely” with trade from a given state. In this “ideal” situation, one state is without alternative trading partners. This situation is akin to a colonizer-colony relationship, where one state has a monopoly on the other's trade. The second category is where a country makes it difficult for a trading partner to “shift” trade to another country. This category involves situations where states have alternative trading partners and is widely applicable to current trading relationships.

1. Difficulty in “Dispensing Entirely” with Trade

The “ideal” situation is where Country B is dependent on its trade with Country A. Country B cannot stop its trade with Country A. Also, Country B cannot shift trade over to Country C or D. Country A is free to trade with all, and is not dependent on any single country. This situation represents an extreme example where one country does not have alternative trading partners, such as a colony. Hirschman describes three categories of policies where country A can maximize the influence effect in the “ideal” case. Hirschman suggests three policies for this case. First, increase the gain from trade and

³³ Hirschman, *National Power and the Structure of Foreign Trade*, 14.

create dependencies. Second, make trade adjustment difficult for Country B. Finally, Country A should foster interest groups in Country B with vested interest in maintaining the trade relationship.³⁴

The first policy category is to maximize the trading partner's gain from the trade. This can be done in two ways. First, Country A can develop products where it has a "monopolistic position" and increase trade with these countries. Second, it can "direct trade toward poorer countries." By directing trade to poorer countries, a country can generally receive as many goods as if it traded with rich countries, but the relative gain for the poorer countries would be more than for the rich ones. This is due to the fact that poor countries start from a lower baseline than the rich ones, therefore, a small increase or decrease in trade will have greater impact on a poorer country relative to a rich country. The immediate effects of a trade stoppage would be greater for the poor country. Country A maximizes its potential for influence by trading with the poorer countries because of the relative difference between rich and poor countries.

The second policy category is to make it difficult for Country B to adjust its trade, if Country A decides to stop trade. Hirschman notes that the interruption of trade is a constant threat between sovereign states.³⁵ A stoppage of trade by Country A would have two effects on Country B. First, it will "impoverish" Country B, as there is no longer a flow of goods. Second, Country B will need a certain amount of time to switch production to products that it can consume in the domestic market, or export to other countries (not Country A). After the adjustment period, the loss is not as great as when the stoppage first occurs. So in order to maximize the influence effect of a trade stoppage, Country A will want to make the immediate effects of the trade stoppage as steep as possible for Country B. As Hirschman states,

Given a certain ultimate loss, the influence which one country exercises upon another through foreign trade is therefore likely to be larger the greater the immediate loss which it can inflict by a stoppage of trade.³⁶

³⁴ Hirschman, *National Power and the Structure of Foreign Trade*, 28.

³⁵ *Ibid.*, 26.

³⁶ *Ibid.*, 27.

For Country A to maximize the immediate cost of a trade stoppage, it can follow two policies toward Country B. First, it can trade with countries that have “little mobility of resources.” These are states that are ones that usually suffer from geographic or labor limitations.³⁷ The second policy is to encourage Country B to produce and export products for which they have a limited domestic demand. The greater the percentage of exports that a country can absorb into the domestic market, the smaller the immediate effects from a trade stoppage.

A third policy category makes it difficult to dispense entirely with trade by creating groups in Country B that have vested interests in maintaining trade ties with Country A. A stoppage of trade will affect these groups especially hard, prompting them to mobilize in support of their interests. Hirschman maintains that these groups, mainly businessmen, will pressure the Country B’s government to restore trade links, even by making concessions to Country A.³⁸

The “ideal” situation that allows for maximum influence from trade is the when Country B only exports to Country A, and cannot readily change production. Country A should have a policy that maximizes the benefit for Country B to allow for the greater immediate effects from a trade stoppage. Country A can also foster interests groups inside Country B with vested interest in continuing trade with Country A.

2. Difficulty in “Shifting” Trade

A second set of policy categories can be undertaken by a state to maximize the influence effect in a “non-ideal” situation, where Country B is able to trade with other countries. In this more realistic case, Country A can still pursue policies to maximize the immediate effects of a trade stoppage. The volume of trade is important in this scenario. The larger the portion of the total export market that is cut off by Country A, the harder it will be for Country B to recover from the stoppage by shifting its trade to Countries C and D. For instance, Country B will be easily able to recover if only 5 percent of their

³⁷ Hirschman, *National Power and the Structure of Foreign Trade*, 28.

³⁸ *Ibid.*, 29.

export market is cut off, by shifting the exports to the remaining 95 percent of their market. However, if the situation is reversed and 95 percent of the market cut off, Country B would be hard pressed to shift such a large percentage of trade to the remaining small share of the market left open to it. Hirschman states,

The greater the percentage of exports and imports involved in a dominant market, the more difficult it will be to provide substitute markets and sources of supply.³⁹

Given this situation, Hirschman argues that countries should try to foster trade with smaller countries. This way Country A can maintain a large market share, in Country B, while Country B is only a small percentage of Country A's total export market.⁴⁰ Hirschman relates this "elementary principle," in order to maximize their power states should "direct its trade away from the large to the smaller trading states."⁴¹ Likewise, smaller states should not let the larger states become too large a market for them, when there is "no reciprocal integration."⁴² Thus, small countries can be defensive just as large ones can be offensive by using these principles.

In this framework, there are a number of policies that Country A can use to manipulate Country B's exports. First, Country A may import products that do not have alternative markets in other countries. These economies can be described as "exclusive complimentary."⁴³ Another way to manipulate exports is by purchasing products at above-market prices. This can be done through currency manipulations in the exchange rate or by fostering high-cost production methods. A final way to manipulate exports is to allow Country B special advantages in Country A's market.

³⁹ Hirschman, *National Power and the Structure of Foreign Trade*, 30.

⁴⁰ A monopoly for certain products would be a best case scenario. This remains separate from the analysis in the "dispense entirely" section, as that scenario was a monopoly on all imports.

⁴¹ *Ibid.*, 31.

⁴² *Ibid.*

⁴³ *Ibid.*

Country A may also be able to manipulate Country B's imports. To accomplish this, Country A may manipulate Country B's market by encouraging differences in "consumption and production habits."⁴⁴ As Hirschman notes,

Hence, it is generally easier for an industrial country to change the source supply of its food stuffs and raw materials than it is for a country producing foodstuffs and raw materials to change its traditional supplier of industrial goods.⁴⁵

A final way to manipulate a country's imports is to develop trade on a bilateral basis, creating "a technical impossibility of switching exports."⁴⁶ In this scenario, Country B's imports from Country A are needed to produce exports destined back to Country A. If this chain is broken, there can be devastating immediate effects for Country B, if carried out in conjunction with other policies.

A fourth policy to make it difficult for a country to shift trade to another state is to develop "transit trade." This is where Country B's trade to Country C must go through Country A. Transit trade is the best of both worlds, as it, creates a dependency on Country A by both Country B and C without much cost to Country A. Transit trade is difficult to develop, as there are usually multiple ways of reaching a destination.

When states can trade with multiple partners, the influence effect of trade can still be used. Policies that aim to manipulate a given country's imports and exports can be pursued. If possible, transit trade can be fostered.

C. UNINTENDED CONSEQUENCES

The aforementioned policies may be deliberately undertaken to maximize a state's opportunity to use the influence effect of trade. Hirschman cautions against attributing the resulting effects directly to the policies that created them. The strengthening of the influence effect of trade may be the unintended consequences of another policy. It may be difficult for a state to solely to maximize the influence effect, as there competing

⁴⁴ Hirschman, *National Power and the Structure of Foreign Trade*, 35.

⁴⁵ *Ibid.*, 32.

⁴⁶ *Ibid.*

interests that must be satisfied with trade policy. It is more likely that a policy will be followed if multiple goals can be accomplished at once, with increasing the influence effect not being the primary goal. Finally, a state may not be able to maximize the influence effect of trade with all of its trading partners at once, so it may need to be selective in application of policies.

Hirschman's work sets out a framework to analyze trade relations. This framework outlines both the supply and influence effect of trade. It outlines policies a country can use to maximize the amount of influence it has over a trading partner through the manipulation of foreign trade. The subsequent chapters will use this framework to analyze Sino-Vietnamese cross-border infrastructure development in the overland transportation and electric power sectors.

D. ROLE OF INFRASTRUCTURE DEVELOPMENT

Large scale cross-border infrastructure projects can be viewed as particularly important in Hirschman's framework. First, the fixed nature of the projects lends them to be aimed at trade with a specific country. Cross-border railways and roads promote trade between specific countries. For instance road development between Country A and Country B cannot be transferred to benefit Country C, unless transit trade can be developed. Electric power transmission lines are also essentially bilateral, since they have limitations on the amount of electricity that can transmit.⁴⁷

Second, these projects require a large allocation of resources, generally with government involvement. The commitment of large amounts of resources by a smaller, poorer country limits their ability to shift resources to away from a project. Large infrastructure development projects are hard to back out of because of large "sunk costs," which will be viewed as wasted resources and will incur political costs for the

⁴⁷ Transmission lines can be connected to other countries through a grid, but if Country A is a key supplier of electricity to Countries B and C, the fact that Country B and C are connected makes little difference if they do not have enough indigenously produced electricity to meet their combined demand in case of a stoppage from Country A. Even if Country A would only stop supply to Country B, but continue supply to Country C, Country B would be hard pressed to make up for the loss of Country A's supply through Country C because of physical limitations in the transmission lines.

government. Because the amount of resources involved, infrastructure development will also signify that both Country A and B are committed to long term trade relationship.

Third, infrastructure development enables and promotes existing forms of trade by promoting an expanded and more efficient logistics system. The volume of traded goods cannot exceed the capacity of the logistics networks. The overall volume that can be traded is increased by expanding the capacity of the logistics networks, which almost always requires infrastructure development. A more efficient system will also increase the amount of goods that can be traded. Markets may be expanded because of increased logistics efficiency. For instance, fresh foodstuffs may have a limitation on how long they can be in transit. By increasing the speed of the logistics network, the potential market can be increased without degrading the product.

Finally, new forms of trade may be made possible by infrastructure development. Trade in electric power is only possible over transmission lines. Without the prerequisite infrastructure this type of trade is not possible.

Cross-border infrastructure development is important in Hirschman's framework because it is an essential aspect of foreign trade. Infrastructure development is an important factor to enable and expand foreign trade. Thus, infrastructure development makes it possible for a country to use Hirschman's supply and influence effect of trade. The economic benefits of expanding trade may be the primary reason for infrastructure development. Hirschman's supply and influence effect may be an unintended, but welcome consequence of cross-border infrastructure development.

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III. LAND TRANSPORTATION LINKS

Road and rail infrastructure is an essential element for large scale trade. Sino-Vietnamese trade had been hampered by the lack of quality transportation links, and the frosty relations throughout the 1980s. The 1979 border war had destroyed most of the infrastructure that was built in the previous years. Both China and Vietnam had underdeveloped infrastructure in their respective border provinces. The border provinces were not even connected to larger transportation networks within their own countries. Since normalization in 1991, both Beijing and Hanoi have begun to develop the cross-border infrastructure. While it took time for cross-border trade to significantly expand, but by 2006, China accounted for 8.6 percent of Vietnam's exports and 8.8 percent of imports.⁴⁸ Cross-border infrastructure is imperative for sustained trade and increased trade volumes between China and Vietnam.

The development of Sino-Vietnamese cross-border transportation links must be viewed as part of larger programs at both the national and regional levels. Both countries realize the importance of developing transportation infrastructure, and have dedicated significant resources to improving their transportation networks. Beijing has stressed transportation infrastructure development throughout the country, with emphasis on the previously grossly underdeveloped western regions.⁴⁹ The western region was targeted due to the gross underdevelopment in the transport sector. This region includes both Yunnan Province and Guangxi Autonomous Region. While initial state sponsored projects focused exclusively on domestic effects, more recent projects have also incorporated the regional benefits of projects. This way, Beijing has tapped into additional financing mechanisms, such as the Asian Development Bank.

⁴⁸ Stone, Susan and Anna Strutt. *Transport Infrastructure and Trade Facilitation in the Greater Mekong Subregion*. ADBI Working Paper 130. (Tokyo: Asian Development Bank Institute, 2009).

⁴⁹ Garver, *Development of China's Overland Transportation Links with Central, South-West and South Asia*.

Vietnam has also undergone similar national development of transportation links.⁵⁰ Hanoi initially placed emphasis on connecting the national transportation systems between Hanoi and Ho Chi Minh City, more recent projects have focused on two areas, poverty reduction and cross-border development. Currently, the majority of projects associated with cross-border projects have been in conjunction with regional initiatives.

Transportation infrastructure projects in the region involving China and Vietnam range from continental to sub-regional. On the largest scale, the United Nations has sponsored the Trans-Asia Highway and Trans-Asia Railway projects, with a goal of connecting transportation links from the Atlantic to the Pacific Oceans.⁵¹ On a smaller scale, the Greater Mekong Subregion (GMS) has sponsored infrastructure development through their “Economic Corridors Flagship Initiative,” with major funding from the Asian Development Bank (ADB). Under this program, economic corridors, and corresponding transportation links, are planned between Vietnam and both Yunnan Province and Guangxi Autonomous Region in China. This program has regional and bilateral aspects, with the formation of the “Two Corridors, One Economic Belt” initiative. This scheme will correspond to the China-Vietnamese GMS economic corridor, but be more focused on developing bilateral trade.

Road and railway development is important for Sino-Vietnamese trade relations. Cross-border trade has expanded rapidly, but needs to be supported by infrastructure development. Under Hirschman’s framework, larger countries, such as China, should trade with smaller ones, such as Vietnam. As the cross-border trade volume grows between China and Vietnam, Vietnam will have a larger percentage of its trade with China. In this case, China can maintain a large market share in the Vietnamese market,

⁵⁰ Le Ngoc Hoan, "Development Orientations of Vietnam Transport Branch in the Next Decades," <http://www.mt.gov.vn> (accessed March 22, 2007).

⁵¹ The Trans-Asian Highway and Trans-Asian Railway are sponsored by the United Nations. The projects are still in the developmental phase. In 2004, a new intergovernmental agreement on the Trans-Asian Highway was signed in Bangkok. In late 2006, an agreement on the Trans-Asian Railway was signed in Busan, Republic of Korea. For review of the program status see: Economic and Social Commission for Asia and the Pacific, *Report on the Implementation of the Regional Action Programme for Transport Development in Asia and the Pacific, Phase I (2007–2011)*. (Bangkok: United Nations Economic and Social Council, 2009).

relative to the China's total export market. According to Hirschman, China should be able to influence Vietnam's actions as Vietnam would incur economic difficulties if China were to stop trading.

Rail and road development support Hirschman's framework by both enabling trade and providing mechanisms to execute trade policy. Most importantly, cross-border transportation infrastructure development allows trade to take place. This serves both an enabling and multiplying effect for other policies directed at trade. It also enables transit trade to be developed. In Vietnam's case, the developing markets in Central Asia may be only accessible via land transportation through China. Infrastructure links also provide a mechanism to stop trade, which enables some of the trade policies in Hirschman's framework.

A. NATIONAL TRANSPORTATION INITIATIVES

The development of cross-border transportation infrastructure in China and Vietnam is best understood if placed in the context of the larger domestic transportation infrastructure development programs. Both countries have undertaken massive investment in both road and railway infrastructure. This domestic development is important as it connects the outlying provinces to the rest of the country and enables further trade by reducing transportation costs.

Under Hirschman's framework, connection of the outlying provinces to the larger domestic market allows the impact of a trade stoppage to be absorbed by the domestic market. Also, it expands the potential market for imports or exports, and fosters trade by reducing trade costs.

1. Chinese Domestic Initiatives

The Chinese government has placed transportation infrastructure as a national priority for development. There have been massive investments in both road and railway infrastructure at various times. During the Third Front, priority was placed on railway development to the remote areas where heavy industry was being moved. As the economic reforms started in earnest during the 1980s, emphasis was placed on

developing the coastal infrastructure to enable further economic growth. With the initiation of the “Open Up the West” Campaign in 2000, development emphasis was shifted to the western provinces.

When the “Open Up the West” policy was announced, the first key task mentioned was to “accelerate infrastructural construction.”⁵² The announcement stressed the importance of infrastructure development,

The opening of the west *depends on the main lines of communications* including the Eurasian continental bridge, the waterways of Chang Jiang, and the southwest passage to the sea. Make the most of central cities. Use the main lines of transportation to link together the points. Use the experience of selected points to guide work in an entire area. The purpose is to gradually create economic belts that straddle administrative regions and display the characteristics of west china, such as the new Tibet-Gansu-Qinghai-Lanzhou line, the upper reaches of the Chang Jiang, and the Nanning-Guiyang-Kunming region. These regions will be the engine of growth for other areas so that the strategy of developing west China can be implemented step by step in order of priorities.⁵³

The western development program covers a broad range of projects. One major grouping of projects focused on the “far west” provinces and Tibet. Rail and road development was undertaken in remote areas of Xinjiang to connect them to both eastern China and to the Central Asian republics. The initial steps of this project were started in the last days of the Soviet Union, but gained speed after the republics gained their independence. The impact of these projects, especially with the increase of Chinese influence in Central Asia, has been studied in depth.⁵⁴

⁵² Xinhua, "State Council Notice on Implementing some Policy Measures to Develop West China," *Xinhua* December 27, 2000, Open Source Center, CPP20001227000209.

⁵³ *Ibid.*, (emphasis added)

⁵⁴ Garver, *Development of China's Overland Transportation Links with Central, South-West and South Asia*, 1–22; Garver, *China's Influence in Central and South Asia: Is it Increasing?*, 205–227.

A second area of “Open Up the West” infrastructure development is the Pan-Pearl River Delta Region (PPRDR).⁵⁵ This group of projects seeks to connect the economic boom areas of the Pearl River Delta, such as Guangdong and Fujian to lesser developed provinces in the western region. Of note, this project seeks to link Guangxi and Yunnan infrastructure into the larger domestic Chinese market. This project will also enable further overland links to ASEAN countries.⁵⁶

Overall, the Chinese transportation sector is rapidly expanding. In recent years China’s logistics market has managed to average a 20 percent increase year-on-year. Despite the rapid development in the transportation sector, there are still areas of concern. One area of concern is total logistics cost, which are “almost double the figures in the United States and Japan.” There is a capacity shortage, as noted in 2003 by Minister of Railroads, Liu Zhijun,

Looking at the general state of railroad development, however, the problems of volume being on the low side and of shortage of transport capacity are still prominent, the contradiction of transport productive forces failing to meet the ever-growing social transport demand has not been fundamentally resolved, and the state of limited transport has not been fundamentally changed.⁵⁷

The Chinese government has started to address these problems, but the scale of the problem is staggering. For instance, China has one-sixth of the track line in the world, but handles one-fourth of the rail cargo.

China is making a concerted effort to develop its transportation infrastructure. This includes both road and rail development, with a final goal of creating a modern intermodal transportation network. Since the inception of the “Open Up the West” campaign, the Chinese have spent \$123 billion on express road construction. If all

⁵⁵ “PPRDR encompasses Fujian, Jiangxi, Hunan, Guangdong, Hainan, Sichuan, Guizhou, Yunnan provinces and Guangxi Zhuang Autonomous Region, as well as Hong Kong and Macao special administrative regions, which have one fifth of China’s territory, and one third of the country’s population.” Lin Li, “China Expedites Construction of Land Links to ASEAN,” *Xinhua* June 10, 2006, http://news.xinhuanet.com/english/2006-06/10/content_4678619.htm (accessed May 20, 2009).

⁵⁶ Li, “China Expedites Construction of Land Links to ASEAN.”

⁵⁷ Liu Zhijun, “Speed Up the Building of a Developed and Perfect Railroad Network,” *Renmin Ribao [People’s Daily]* August 25, 2003.

planned projects are completed, the express road system will be longer than in the United States.⁵⁸ Similar investments have been made in the railways. In Yunnan province alone, Beijing has pledged \$6.3 billion in railroad projects over three years.⁵⁹ These projects are scheduled to add 1,500 kilometers of new track to just one province. In order for the Chinese transportation sector to keep pace with economic growth, it will require massive investment in infrastructure for years to come.

China is heavily investing in transportation infrastructure development to increase economic development, especially in the West. Cross-border infrastructure should be viewed as part of China's overall development plan to develop the West, not as a separate effort. While the primary reason for the infrastructure development is to promote economic development, it also enables some aspects of Hirschman's policies using the influence effect of trade. If China decided to stop trade with bordering country, the domestic infrastructure would be in place to shift the trade from China's border provinces to the larger domestic Chinese market, or to other foreign markets. Thus, both Chinese cross-border and national infrastructure development is enabling aspects of Hirschman's policy options.

2. Vietnamese Domestic Initiatives

Vietnam, like China, has invested heavily in transportation infrastructure development. The Vietnamese goal is to develop a "unified, balanced and synchronous transport network."⁶⁰ The scale of the Vietnamese development is not as large as China's, but it was starting from a similar low level in some areas. Vietnamese domestic infrastructure development has occurred on two axis, north-south and east-west. One of the key focus areas was north-south corridor connecting Hanoi and Ho Chi Minh City (HCMC). Major road and rail projects have connected these main Vietnamese cities. Additional east-west projects have sought to expand the local access to this main north-

⁵⁸ Clarence Kwan and Kris Knutsen, "Intermodal Revolution," *The China Business Review* 33, no. 4 (Jul/Aug, 2006), 20.

⁵⁹ Lin Li, "China Steaming Ahead with Railway Construction in Yunnan," *Xinhua* December 6, 2006, http://news.xinhuanet.com/english/2006-12/06/content_5443247.htm (accessed March 22, 2007).

⁶⁰ Hoan, *Development Orientations of Vietnam Transport Branch in the Next Decades*

south corridor, as well as providing connectivity to Cambodia, Thailand and Laos. In 2004, the Ministry of Transport established the Vietnam Expressway Corporation as a State Owned Enterprise (SOE) with a charter to promote the development of expressways.

Vietnamese development has focused on three levels, providing a high capacity national road from Hanoi-to-HCMC, providing local access to roads in poverty reduction programs, and provincial roads to connect the first two sets.⁶¹ The VEC has spent \$5.9 billion in current projects, and is planning projects with a total investment of over \$11.5 billion on 1968 km of road infrastructure through 2015.⁶² Much of the \$5.9 billion for road infrastructure development in Vietnam was funded through international organizations, such as the ADB, World Bank, Japan's Bank for International Cooperation (JBIC) and the Australian Agency for International Development. Over 25 projects have been undertaken by Vietnam to improve the national highway and provincial roads network. Four major programs have focused on developing the rural road network. Sixteen of these projects, mainly bridge repair projects, were funded with the assistance of JBIC.⁶³

Much of the “core” infrastructure is now in place in the Hanoi-HCMC axis, so the emphasis has shifted to expanding the development into the outlying areas. The Haiphong-Hanoi-Lao Cai corridor is an important road and rail line. Projects are now underway to rehabilitate this corridor. The infrastructure was over 100 years old and it

⁶¹ Asian Development Bank, *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Provincial Roads Improvement Sector Project* (Manila: Asian Development Bank, 2001).

⁶² Asian Development Bank, *Proposed Technical Assistance Loan and Technical Assistant Grants Socialist Republic of Viet Nam: Greater Mekong Subregion Ha Noi-Lang Son, Greater Mekong Subregion Ha Long-Mong Cai, and Ben Luc-Long Thanh Expressways Technical Assistance Project* (Manila: Asian Development Bank, 2008).

⁶³ The main focus of the JBIC funded projects have been in what has developed into the Southern and East-West GMS economic corridors. For a list of projects by donor see Appendix 4 in Asian Development Bank, *Proposed Loan Socialist Republic of Viet Nam: Greater Mekong Subregion: Kunming-Haiphong Transport Corridor - Noi Bai-Lao Cai Highway Technical Assistance Project* (Manila: Asian Development Bank, 2005).

impeded the flow of traffic in some places.⁶⁴ This project is interesting because it is viewed as important for both domestic and regional development.⁶⁵

Vietnam faces significant challenges in the transportation infrastructure sector. There is still a significant amount of rural area that is not connected to a modern transportation network. Funding is one of the main problems for Hanoi. This problem is magnified because some road and railway projects service similar areas.⁶⁶ Vietnam, like China, needs to continue massive investments in transportation infrastructure to ensure that the system will be able to maintain pace with economic growth.

B. REGIONAL ECONOMIC INITIATIVES

There are three important aspects to the regional economic integration and cross-border infrastructure projects between China and Vietnam. First, the GMS economic corridors initiative provides an overarching regional framework for infrastructure development and provides economic goals. This program encompasses all the countries of the GMS, while the ‘two corridors, one economic belt’ initiative provides context for China and Vietnam bilateral development. The “two corridors, one economic belt” initiative builds on the concepts of the GMS economic corridors, but puts a distinct bilateral spin on the development.

A final aspect of the regional economic initiatives is the “soft infrastructure” development. This includes the China-ASEAN Free Trade Agreement (CAFTA). The soft infrastructure complements the cross-border “hard infrastructure” development. The “soft infrastructure” will enable greater trade flows by reducing both time and monetary costs associated with trade.

⁶⁴ Vietnam News Service, "Ha Noi- Lao Cai Railway to Receive Massive Upgrade," *Viet Nam News* August 5, 2005, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=07ECO050805> (accessed May 31, 2009).

⁶⁵ Vietnam News Service, "Extra Funds Push Forward Start of Work on Ha Noi- Lao Cai Highway," *Viet Nam News* October 21, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=06SOC211006> (accessed May 31, 2009).

⁶⁶ Vietnam News Service, "Hai Phong-Ha Noi Highway Hits Bump," *Viet Nam News* July 27, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=02SOC270706> (accessed May 31, 2009).

The three aspects of regional trade initiatives play an important role in promoting economic development and fostering trade between China and Vietnam. These programs allow various aspects of Hirschman's theory of using trade as national power by enabling trade. China will be able to use the influence effect of trade through these programs, while the Vietnam may be able to foster transit trade. The overall effect is one that will provide Beijing with mechanisms to exert its influence over Vietnam using trade.

1. GMS Economic Corridors Initiative

The main regional initiative promoting Sino-Vietnamese cross-border infrastructure is the Greater Mekong Subregion Economic Corridors. Shortly after its inception, the GMS identified transportation infrastructure as a key focus area for development. Written in 1995, the GMS Master Transport Plan provided a goal for member states to achieve for cross-border infrastructure development, fostering trade and assist poverty reduction. This plan was successful in fostering the initial development of regional trade. In 1998, the original plan was modified from just transportation corridors into promoting economic corridors, which included transportation, energy, tourism and telecommunications. Initially, three economic corridors were proposed: North-South, East-West and Southern corridors.⁶⁷ The Asian Development Bank (ADB) provided significant funding for projects that supported these corridors. Both road and rail links were included as part of the transportation corridors. In 2002 and 2005, GMS leaders renewed their commitments to creating an integrated transportation infrastructure network that facilitated cross-border trade and economic development.

The original three economic corridors expanded to six by 2006, and continued the march of economic integration and encompass additional cross-border infrastructure projects within the GMS countries. The six corridors were identified as three North-South Economic Corridors (NSEC), Kunming-Bangkok, Kunming-Haiphong and Nanning-Hanoi. The two East-West corridors run from central Vietnam to Burma and

⁶⁷ Asian Development Bank, *GMS Transport Sector Strategy Study: Recommendations on Strategic Objectives and Directions for the Sector*. (Manila: Asian Development Bank, 2005).

from central Vietnam to Bangkok. The Southern corridor runs from Ho Chi Minh City to Bangkok. Each of these corridors has its own infrastructure projects designed to facilitate economic activity.

The North South Economic Corridor (NSEC) is one of the three priority areas for development in the GMS. The technical assistance for the development of the North-South Corridor is co-funded by China. The PRC Poverty Reduction and Regional Cooperation Fund provided \$400,000 the majority of the funding for the project, while the ADB provided \$200,000.⁶⁸ The goal of the technical assistance is to “develop mechanisms to translate political goodwill into economic cooperation at specific locations.”⁶⁹ The study was designed to assist in formulating policies to stimulate private investment in the corridor and to provide an institutional framework for future development in the corridors.

By 2007, the GMS transportation corridors had started to take shape, a new GMS Transportation Strategy was written. Sponsored by the ADB, the GMS Transportation Strategy 2006-2015 expanded the number of economic corridors to nine, and placed greater emphasis on the cross-border “soft infrastructure” and trade facilitation.⁷⁰ There are five main goals for the new strategy in order to create “seamless transport services on a fully connected and integrated GMS network.” The first goal is to take advantage of “synergies” in the existing transport system. National projects that are not cross-border initiatives can be leveraged to support cross-border goals and integrated into future planning. This will eventually lead to the review and planning of how transportation infrastructure projects can benefit both local and regional goals.

The GMS transportation Strategy also establishes the goal of creating an open market for transportation, modeled after the European Union. The Strategy also covers creating an efficient, multimodal transportation system that will reduce trade costs and the development of institutions to foster trade. Another interesting aspect of the GMS

⁶⁸ Asian Development Bank, *Technical Assistance Greater Mekong Subregion: Development Study of the North South Economic Corridor*. (Manila: Asian Development Bank, 2006).

⁶⁹ *Ibid.*, 2.

⁷⁰ *Ibid.*, 6.

transportation strategy is to complete the GMS network connections to South Asia.⁷¹ While this will connect the GMS to emerging markets in South Asia, it may also benefit China by creating a transit trade on the existing transportation links between China and South Asia. As Garver had identified, China is creating significant links to South Asia.⁷² In conjunction with the proposed GMS economic corridors, links to South Asia will provide an additional means to create transit trade.

The GMS Transportation Strategy provides a framework for the investment and cooperation on transportation infrastructure in the subregion. In addition to creating synergies between with the existing transportation network, the GMS Transportation Strategy is to foster open markets and borders for transport services. These advances will then lead to the development of an economic corridor that has much greater economic impact than just a transportation corridor.

2. Two Corridors, One Economic Belt

Since 2005, China and Vietnam have been working on a plan to utilize the GMS economic corridors to support a bilateral program called the “two corridors, one economic belt” initiative. The infrastructure projects that are supporting the GMS economic corridors also support this bilateral initiative. The two corridors run from Nanning to Hanoi and Hai Phong via Lang Son, and the second runs from Kunming to Hai Phong via Lao Cai. The goal of the program is to improve the economic development through trade, tourism, industry and overall economic activity. The Vietnamese government has stated that it expects GDP growth of 1.2 to 1.4 times higher than the rest of the country from the Nanning – Hanoi – Hai Phong corridor.⁷³

There are both highways and railway projects associated with the two corridors. For instance the Yen Vien-Lao Cai Railway Upgrading Project is an ADB funded project

⁷¹ Asian Development Bank, *GMS Transport Sector Strategy Study: Recommendations on Strategic Objectives and Directions for the Sector*.

⁷² Garver, *Development of China's Overland Transportation Links with Central, South-West and South Asia*, 1–22.

⁷³ Office of the Central Party Committee, "Northern Economic Corridor Development Plan Till 2020 Approved," *Viet Nam News* August 08, 2008, <http://english.vietnamnet.vn/biz/2008/08/797770/> (accessed June 2, 2009).

aimed at upgrading the 100 year old railway that currently supports trade along the Kunming-Hanoi route.⁷⁴ The ADB has also funded a new highway project from Noi Bai to Lao Cai.⁷⁵ This project is geared to support a traffic growth ten percent increase a year through 2025. There are additional projects in the planning phases, such as a highway project from Lang Son to Hanoi, and the corresponding Chinese project to connect this new road to the Chinese highway system. Transportation infrastructure development in the GSM corridors is meant to support long term growth in trade and economic development for the region.

The ultimate goal for the “two corridors, one economic belt” is to create economic corridors throughout the GMS. As one study on the NSEC defines an economic corridor as “able to attract investment and generate economic activities along the less developed areas in the region.”⁷⁶ Under this definition, both physical infrastructure and soft infrastructure are functioning. According to projections, the infrastructure development along the corridor will decrease both transportation costs and transit time along the three branches of the NSEC by over 50 percent by 2015. For the Haiphong – Kunming corridor, the transit time decreased from 85 hours in 2000, to 58 hours in 2006 and is projected to be 26.5 hours in 2015.⁷⁷ This is a 69 percent decrease in the time for goods to transit between the locations. The Nanning – Hanoi corridor will experience more dramatic gains. Transit time is projected to be reduced by 75 percent when comparing 2000 and 2015 transit times. Due to hard and soft infrastructure development the trip that took 37 hours will be reduced to 8 hours.⁷⁸ There will also be corresponding decreases in the cost of per ton of goods transported. By 2015, the NSEC is planned to be a robust economic engine in the GMS with robust trade and generating its own economic activity.

⁷⁴ Asian Development Bank, *Loan Agreement (Special Operations) (Greater Mekong Subregion Kunming-Haiphong Transport Corridor: Yen Vien - Lao Cai Railway Upgrading Project)* (Manila: Asian Development Bank, 2007).

⁷⁵ Asian Development Bank, *Proposed Loan Socialist Republic of Viet Nam: Greater Mekong Subregion: Kunming-Haiphong Transport Corridor - Noi Bai-Lao Cai Highway Technical Assistance Project*.

⁷⁶ Ruth Banomyong, *Logistics Development Study of the Greater Mekong Subregion North South Economic Corridor* (Manila: Asian Development Bank, 2007).

⁷⁷ *Ibid.*, 14.

⁷⁸ *Ibid.*, 16.

Most of the funding for the infrastructure development projects is sponsored by through Asian Development Bank. The funding for most of the North-South Economic corridor projects is not from Japan. The Japanese have focused their funding, mainly in the form of JBIC loans, on the East-West corridors, because it does not want to support Chinese inroads to Southeast Asia.⁷⁹ The ADB funding for the GMS economic corridors, on the other hand, has the stated purpose of increasing economic development and fostering regional integration of all GMS countries. Other international donors are involved in the development of the GMS economic corridors. For instance, the Yen Vien-Lao Cai railway upgrade is being funded by the French Development Agency. China is providing the funding for railway signal upgrades along both routes from Hanoi to the Chinese border. The Chinese government is providing \$60.97 million of the total the \$67.5 million project through a preferential credit.⁸⁰

The major Sino-Vietnamese bilateral overland transportation infrastructure projects are taking place under the aegis of the GMS North-South economic corridors. Infrastructure development enables further trade, and is a key aspect of Hirschman's framework. Without the infrastructure upgrades, many of Hirschman's policies to maximize the influence effect of trade would not be effective, and in some cases possible. It is interesting that China has funded different aspects of Vietnam's transportation infrastructure development while the Chinese have large domestic expenditures for the same types of projects. Regardless of Chinese intentions, the transportation links being built will enable economic development and expansion of trade, as well as the opportunity for China to use Hirschman's policies to maximize the influence effect of trade.

3. "Soft" Infrastructure Development

"Soft" infrastructure development is an important aspect of cross-border infrastructure. "Soft" infrastructure can have significant impact on the volume of cross-

⁷⁹ Ralf Jennings, "S.E. Asia Sees Japan's Largesse as Bid for Geopolitical Gain," *Kyodo World Service* July 5, 2005.

⁸⁰ Vietnam News Agency, "VN, China Sign Contract on Railway Signal Development," *Viet Nam News* September 26, 2006, <http://english.vietnamnet.vn/biz/2006/09/615867/> (accessed June 3, 2009).

border trade. For instance inefficient procedures at border crossing points can dramatically increase trade costs, both in time and monetary expense. As one study of the GMS NSEC noted, “border crossings are the weakest link in the NSEC corridors and special attention must be made to deal with the required border issues.”⁸¹ In 2006, the Kunming-Haiphong corridor, 23 percent of the cost and 50 percent of the transportation time of goods was due to “soft” infrastructure issues at border crossings.⁸² The Nanning-Hanoi corridor had similar costs associated with “soft” infrastructure. In 2006, 48 percent of the cost and 37 percent of the transportation time attributed to border crossing and “soft” infrastructure for goods in the Nanning-Hanoi corridor.⁸³

Studies suggest that government policies also play an important role to overcome the negative effect of domestic infrastructure development and fostering cross-border trade. As one report noted,

From this analysis, we conclude that the development of cross-border road infrastructure in the GMS has had a positive effect on the regional trade. The result that cross-border roads have distinct effects from domestic road infrastructure suggests promotion of regional trade may require deliberate policy shifts toward investments in roads in border areas. In this light, cross-border road infrastructure becomes an important part of a broader effort to encourage regional integration to benefit GMS economies that are less endowed with natural seaports such as Lao PDR.⁸⁴

China, in particular has moved toward policies that sponsor cross-border trade.

The best example of China implementing policy to promote cross-border trade is the proposed China-ASEAN Free Trade Area (CAFTA). Of note, the Singapore-Kunming Rail Link and Bangkok-Kunming Highway projects are the first projects mentioned to be “undertaken or implemented on an accelerated basis” under the CAFTA

⁸¹ Banomyong, *Logistics Development Study of the Greater Mekong Subregion North South Economic Corridor*, 17.

⁸² *Ibid.*, 14.

⁸³ *Ibid.*, 16.

⁸⁴ Edmonds and Manabu Fujimura, *Impact of Cross-Border Road Infrastructure on Trade and Investment in the Greater Mekong Subregion*, 14.

agreement.⁸⁵ This demonstrates the importance that China puts on infrastructure development to promote trade with Vietnam and the rest of Southeast Asia.

Of particular interest is the Early Harvest Package that gives preferential access to Chinese markets by the underdeveloped economies in ASEAN, including Vietnam. The Early Harvest Package provides “incentives to accelerate the establishment” of the CAFTA by eliminating Chinese tariffs on certain agricultural products, while gradually phasing out tariffs for developing ASEAN countries, including Vietnam.

C. CONCLUSIONS

China and Vietnam have made great efforts at improving their overland transportation infrastructure. These projects have required large amounts of resources and are directed at bilateral trade. The projects should increase the cross-border trade by lowering transportation costs and improving efficiency. For China it enables policies that could increase the influence effect of their trade. While the intent for the infrastructure development is to increase economic development, an unintended consequence may be the increase in Chinese influence in Vietnam.

Both “hard” and “soft” cross-border infrastructure projects between China and Vietnam enable increased trade. With increased trade, Hirschman’s influence effect of trade becomes a factor that can be used in policy options. While Vietnam will probably never be dependent on Chinese trade, as in Hirschman’s “ideal situation,” China can still pursue policies to maximize the immediate effects of a trade stoppage with Vietnam. As a higher percentage of Vietnam’s trade volume with China, the greater Beijing’s influence becomes. China has already undertaken the Early Harvest Package, which offers preferential treatment for Vietnamese goods to encourage increased trade in certain agricultural sectors. In Hirschman’s framework, this can be seen as a way to manipulate

⁸⁵ ASEAN and PRC, "Framework Agreement on Comprehensive Economic Co-Operation between the Association of South East Asian Nations and the People's Republic of China," ASEAN Secretariat, <http://www.aseansec.org/13196.htm> (accessed May 31, 2009). Annex 4 lists the “accelerated activities” mentioned in Article 6(5).

exports by purchasing goods at above-market prices,⁸⁶ as well as encouraging differences in the “consumption and production habits” by increasing trade in the agricultural sector.⁸⁷

Beijing may calculate that the price paid now by encouraging trade with Vietnam will be paid back in influence later. Beijing will most likely place national goals, such as territorial claims in the South China Sea, above the short-term economic cost incurred by outlying provinces such as Yunnan and Guangxi Autonomous Region in the event of a trade stoppage with Vietnam. If used, this policy option will carry costs for both sides, but the effects will affect Vietnam greater than China, as a greater portion of Vietnam’s overall trade is with China, than the portion of China’s trade with Vietnam. Mechanisms for China to influence Vietnam using trade are being created through the development of cross-border infrastructure.

⁸⁶ Hirschman, *National Power and the Structure of Foreign Trade*, 31.

⁸⁷ *Ibid.*, 35.

IV. ELECTRIC POWER INTERCONNECTIONS

Electric power has been described by Chinese officials as a “fourth economic channel” along with air, land and sea.⁸⁸ Electricity is an essential element for economic development in both China and Vietnam. Infrastructure projects are being planned and built to connect China generation plants to Vietnam’s national high voltage grid. Each of these projects integrating Chinese electricity into the Vietnamese power grid increases the potential for immediate losses on the Vietnamese economy from a supply disruption. According to Hirschman’s framework, Chinese influence will increase as these immediate losses become larger. Thus, electric power is a second sector where China is creating a mechanism that enables the use of the influence effect of trade against Vietnam.

Two recent Russian examples demonstrate the power of an energy rich country cutting off a source of energy. In January 2006, the Russians shut down their natural gas pipeline into the Ukraine. The effect was to decrease the supply of natural gas to customers throughout Europe.⁸⁹ In January 2007, the Russians stopped their oil pipeline through Belarus, once again affecting downstream European customers. While these disruptions were attributed to economic disputes, they did have significant geopolitical impacts.⁹⁰ Short term supply disruptions for oil and natural gas imports do not have the same effect as an electric power supply disruption. Oil and natural gas can be stored more readily than electricity. A major supply disruption also has different effects for a power grid, where a “cascade” effect shutting down the grid may result from an unevenly loaded grid.⁹¹

⁸⁸ Chinanews, "China to Carry Out Large Scale Exports of Electric Power," *Chinanews* February 20, 2005, <http://www.chinanews.cn/news/2004/2005-02-21/1821.shtml> (accessed March 17, 2007).

⁸⁹ Economist, "Putin Turns the Taps Back on," *Economist Com / Global Agenda* (January 3, 2006), 1.

⁹⁰ "Russian Extortion Continued; Now an Oil Pipeline through Belarus Runs Dry. Will its Customers in Western Europe Finally be Stirred?" *The Washington Post* January 9, 2007.

⁹¹ Adilson E. Motter and Ying-Cheng Lai, "Cascade-Based Attacks on Complex Networks," *Physical Review E (Statistical, Nonlinear, and Soft Matter Physics)* 66, no. 6 (December, 2002), 065102, <http://link.aps.org/abstract/PRE/v66/e065102> (accessed March 19, 2007).

The Sino-Vietnamese cross-border electric power infrastructure development started with a few small projects in the late 1990's. The cross-border electric power infrastructure development began in earnest in 2004 when Vietnam was suffering a severe power shortage. Now, there are sections of the Vietnamese grid, such as Quang Ninh province, that are dependent on Chinese electricity.⁹² There are plans to connect their two high voltage grids, the backbone of Vietnam's electric power grid. These bilateral developments must be taken in both domestic and regional contexts. There is a trend toward greater electric power integration at both the domestic and regional levels.⁹³

As economic development progresses in China and Vietnam, Beijing and Hanoi have each undertaken various projects and initiatives to ensure a domestic electric power sector that can sustain economic growth. Both countries have been plagued by blackouts in recent years, but through massive investment programs China is now able to export electricity to Vietnam.⁹⁴ China's electricity exports are currently concentrated in Vietnam's northern provinces, but they are expanding. There have also been initiatives through various regional organizations, such as APEC and the GMS to promote infrastructure development with the goal of creating a regional power market for benefit of the region. It is important to note that many of the Sino-Vietnamese bilateral initiatives extend beyond the scope of these regional programs.

Through this mix of bilateral and regional programs intended to promote economic development, the Chinese are able to further integrate themselves into the regional electric power sector. As a consequence of these policies, Vietnam becomes more reliant on Chinese electricity to fulfill demand for electricity and to maintain a stable electrical grid. This reliance increases the immediate effects of a trade interruption and makes it more difficult for Vietnam to dispense entirely with Chinese exports. According to Hirschman's framework, electricity exports allow Beijing to use the influence effect of trade against Hanoi.

⁹² Vietnam News Service, "EVN to Prolong China Power Deal," *Viet Nam News* August 29, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=02ECO290806> (accessed March 19, 2007).

⁹³ Resourceslaw International, *Cross-Border Power: A Report Addressing the Barriers to the Interconnection of Power Grids in APEC Member Economies 2002* (Singapore: APEC Secretariat, 2002).

⁹⁴ China has also exports electricity to Thailand. David Stanway, "China's Hydropower Development is an Issue for all Southeastern Asia," *Interfax* July 5, 2005.

A. CHINESE DOMESTIC ELECTRIC POWER INITIATIVES

There are two major aspects for Chinese electric power initiatives, infrastructure development, which includes increasing generation capacity and developing transmission links, and regulatory reform. Each of these initiatives was enacted to address a specific economic problem, but each will impact China's ability to exert influence over Vietnam. The first initiative is infrastructure development of the electric power sector, specifically increasing power generation capability and upgrading the transmission system. The generation capacity allows the China to have an excess capacity and generate revenue. Transmission lines provide the physical links to carry electricity from the generators to customers. These two aspects are also seen as part of a larger regional economic development and cooperation policy. Finally, regulatory reform was undertaken to better coordinate an electric power bureaucracy that was in dire need of a central decision making authority. As a consequence, this also provides the central government a single agency, with direct access to senior leaders as well as the authority to implement policy, creating a single button to stop the flow of electricity if desired.

1. Infrastructure Development

For years China's electric power sector has been plagued by uneven infrastructure development, as noted by former Premier Li Peng,

A common problem in the electric power industry in the past was the over-emphasis on generation, while power supply was treated with neglect and distribution with indifference. After construction was finished on a power generation plant, there would be trouble in power transmission. And when it did find its way to the power supply center, it was not put to use.⁹⁵

Uneven development was part of a vicious cycle of localized undersupply and oversupply. Efforts to bring the problem under control were hampered by the lack of a central authority with the power to enforce an overall plan. Mega-projects such as the west-east electricity transfer project (WEETP) in the "Open Up the West" campaign can

⁹⁵ Peng Li, "Preface to Li Peng's Electric Power Diary: Electric Power must Stay One Step Ahead," *Renmin Ribao [People's Daily]* July 9, 2005.

also be seen as a way “for the state to consolidate its control over what has been an extremely uncoordinated and inefficient system of power generation and distribution.”⁹⁶

In an effort to correct the uneven development problem, the Beijing undertook massive development projects. Two examples of this are the Three Gorges project and the WEETP. The Three Gorges project is the largest hydroelectric project in the world. The WEETP is a major infrastructure development program that aims to transmit electric power from the western portion of the country, where both coal and hydro resources are plentiful, to the east in order to satisfy the high demand for electricity associated with the economic development.⁹⁷ First announced in 2000, this project focuses on power generation and transmission infrastructure development. The plan calls for three power transmission channels, North, Central and South.⁹⁸ The South channel, of particular interest in relation with Southeast Asia, involves developing power generation capacity in the western provinces of Yunnan, Guangxi, Guizhou and the development of an integrated transmission grid to Guangdong and the energy starved Pearl River Delta.⁹⁹

Eventually, all three channels will be connected into one national grid. As one Chinese engineer explained,

By 2010, the country will have a reasonably well-structured and clearly defined interconnected power network, where regional grids are closely interconnected. After 2010, the nationally interconnected power network will have the Three Gorges power system as its center, where the strong regional and inter-regional grids are closely interconnected, carrying between them the hydropower generated along the Jinsha River, the Yalong River, the Dadu River, the Lancang River and the upper reach of

⁹⁶ Oakes, *Building a Southern Dynamo: Guizhou and State Power*, 479.

⁹⁷ Magee, *Powershed Politics: Yunnan Hydropower Under Great Western Development*, 23–41.

⁹⁸ The North Channel is comprised of the Northeast, North, Shandong, and Northwest power grids. Generation is coal-based from Shanxi, Inner Mongolia, Shannxi, Ningxia and hydro-based from the upper Yellow river, to power Beijing, Tianjin, and parts of Hebei and Shandong. The Central Channel is comprised of the East China, Central China, Sichuan-Chongqing and Fujian grids, with the main power generator being the Three Gorges project to power central and east China and Fujian. For more details see Zhao Jie, ""West to East" Electric Power Transmitting Strategy in China (Presentation at China National Association of Engineering Consultants International Workshop at the Three Gorges, 21–26 October 2001)," China National Association of Engineerig Consultants, http://www.cnaec.org.cn/download/Speech_zhaojie.pdf (accessed March 9, 2007).

⁹⁹ Ibid.

the Yellow River, as well as the power produced by the base of coal-fired plants in the “three Xi provinces” [Shanxi, Jiangxi and Shaanxi].¹⁰⁰

The WEETP has been hailed by officials as a way to transferring control of the sector to market forces stimulating private investment, but the project can also be viewed as a the state taking “control” of an “extremely uncoordinated and inefficient” sector.¹⁰¹

China experienced an explosion in electric power generating capacity in recent years. The State Electricity Regulatory Commission (SERC) claims that China’s total domestic generating capacity was 600 GW in 2006, up from 250 GW in 2002.¹⁰² The Chinese government is trying to control the new generation capacity being constructed, but this has proven to be a hard task. Part of the problem is unapproved local projects that provide electricity for local areas, and may not be connected to the larger grid. While the 2005 estimates of the NRDC and Southern Grid Corporation (SGC) do not fully agree on the amount of generation capacity under construction, they both supported the fact that there would be a surplus capacity by 2007.¹⁰³

The NDRC believes that 150GW of power plants will be constructed between 2005 and 2007, while SGCs figure for the same period is 190GW. But according to one industry expert, around 180GW is under construction, around 30GW is awaiting approval and, more importantly, 120GW of unapproved capacity is under construction.¹⁰⁴

¹⁰⁰ Shang Zhipeng, "State Development and Reform Commission Vice Minister Zhang Guobao Says, on the Basis of having all Power Grids Interconnected Throughout the Country as Called for by the "Tenth Five-Year Plan," : The Construction of the East-West Power Transmission Corridor as Well as the Work on the North-South Inter-Supply has to be Sped Up in Order to Set the Ball Rolling for Power Exchange between Provinces and Regions," *Xinhua* September 10, 2003, Open Source Center, CPP20030910000044.

¹⁰¹ Oakes, *Building a Southern Dynamo: Guizhou and State Power*, 476.

¹⁰² Yangtze Yan, "Electricity Output Exceeds Consumption by 10 Bln Kwh Last Year," *Xinhua* January 26, 2007, http://news.xinhuanet.com/english/2007-01/26/content_5658472.htm (accessed February 27, 2007).; Nelson Fung, *China as a Global Energy Player* (Hong Kong: KPMG's Energy and National Resources practice, 2006), <http://www.kpmg.com.au/Portals/0/China%20as%20a%20Global%20Energy%20player%20March%202006.pdf> (accessed May 31, 2009).

¹⁰³ Malini Hariharan, "A Question of Power," *ACN: Asian Chemical News* 11, no. 502 (Aug 8–Aug 14, 2005), 10.; Thomas Land, "China Moves Towards Electric Power Surpluses," *Contemporary Review* 288, no. 1680 (Spring, 2006), 17–25.

¹⁰⁴ Hariharan, *A Question of Power*, 10.

It remains to be seen if this generation surplus will last, and be enough to fulfill times of peak demand on the system. One problem is that Beijing's projections of electricity demand may not be accurate. The problem is that state projections placed electricity demand growing by four to five percent for 2004 and 2005, while actual demand growth was around fifteen percent. As unauthorized producers were brought on line, China faced an electricity surplus just two years after there were major shortages throughout the country. According to the SERC, China generated 10 billion kilowatt hours of surplus electricity in 2006.¹⁰⁵ This surplus is still relatively small, as China generated a total of 2.3 trillion kilowatt hours in 2005.¹⁰⁶

It is interesting to note that in early 2005, while there were still significant power shortages in some provinces, China began to export electricity to Vietnam. When questioned on if this was a proper policy when there were still domestic shortages, Zhao Jinping, deputy director of the Research Department of Foreign Economic Relations of the Development Research Center under the State Council, commented that the exported electricity is from "new supplies" that had been "produced specifically for export."¹⁰⁷ No specific generation projects were named, but the article implies that the Lancang River¹⁰⁸ hydro potential will be developed for export. The excess hydro generating capacity is focused in areas that were far away from the outages, but close to export markets.

The transmission sector has also been targeted for development. The WEETP has focused on development of high voltage transmission lines from the western provinces of Guizhou, Yunnan and Guangxi Zhuang Autonomous Region to the Pearl River Delta. The back bone of this project has been 500kV lines that have been able to increase the amount of electricity transmitted over these long distances. In addition to the 500kV lines, the Chinese have started construction on an 800kV transmission line from

¹⁰⁵ Yan, *Electricity Output Exceeds Consumption by 10 Bln Kwh Last Year*

¹⁰⁶ Zijun Li, "China Faces Power Oversupply in Some Regions," *World Watch Institute* February 7, 2006, <http://www.worldwatch.org/node/3880> (accessed May 31, 2009).

¹⁰⁷ Chinanews, *China to Carry Out Large Scale Exports of Electric Power*

¹⁰⁸ The Lancang Jiang is the Chinese name for the upper Mekong River. This river has great significance in Southeast Asia, where it flows through China, Laos, Thailand, Cambodia and Vietnam. It serves as portions for the border between China-Burma, and Laos-Burma.

Yunnan through Guangxi Zhuang Autonomous Region to Guangdong, a distance of over 1400km. This is a major transmission project, estimated at over \$1.6 billion, and is the first in the world to utilize 800 kV direct current transmission lines.¹⁰⁹ NDRC plans on spending \$25.6 billion in power grids in 2007.¹¹⁰

Despite the massive amount of investment in transmission assets, China still faces the problem of getting enough electricity from where it is produced to where it is consumed. Yunnan Province, with a quarter of China's total hydro potential, will continue to export its electricity to other regions. There are limitations on amount that can be currently transmitted over the current and planned infrastructure. Yunnan location also makes it convenient to export electricity to Vietnam. This is especially attractive if the revenue generated from these projects can be reinvested on additional generating capacity and domestic transmission assets.

The Chinese are making massive investments in their domestic electric power infrastructure. While there have been problems with blackouts in the recent past, they are now in a period of surplus, with more generating capacity coming on line. It remains to be seen if this surplus will last, as electric consumption growth has traditionally outpaced economic growth. This time may prove to be different, however, as the infrastructure development is part of an overall plan to improve efficiency and restore orderly development in the sector. It has been noted that the existing surplus may not be enough to avoid power shortages in certain peak times.¹¹¹ Despite being faced with these domestic challenges of a surging demand for electricity, China is developing infrastructure to facilitate long term export of electric power to third countries.

2. Regulatory Reform

One of the major issues for the Chinese government and the economy in general is powering its vast spaces. This major problem can be further divided into two

¹⁰⁹ Fiona Zhu, "Construction Begins on Super High-Voltage Power Lines," *Xinhua* December 19, 2006, http://news.xinhuanet.com/english/2006-12/19/content_5507998.htm (accessed March 11, 2007).

¹¹⁰ Interfax, "China Plans to Invest \$25.6 Billion Per Year to Improve Power Grids," *Interfax* January 17, 2007, <http://www.interfax.com> (accessed January 17, 2007).

¹¹¹ Hariharan, *A Question of Power*, 10.

categories, demand and system development. Demand for electric power has surged in recent years as reforms encouraged economic growth. The immediate need to keep the lights on for the economy comes at direct expense of overall system development. As noted before, local officials facing an immediate need for electricity have authorized and constructed small, inefficient generation facilities to fulfill their local need, often with little or no coordination with the national plan. Various organizations were in charge of individual parts of energy policy making it difficult to discern an overall direction. As Bo Kong notes,

[t]he way energy institutions are structured and operate in China predisposes the country toward a series of loosely connected policies that are inconsistent, short-sighted and ad hoc, precluding them from producing any coherent and long-term energy strategy.¹¹²

This quote accurately describes the energy sector as a whole, but also applied to the structure of the electric power sector as well. The problems brought about by the significant jump in demand were exacerbated by uncoordinated planning at both national and local levels.¹¹³ Some analysts have described the “institutional insecurity” in China’s energy sector as cyclical and institutional. Cyclical insecurities in the form of power shortages were “seasonal, regional, sector specific and temporary.”¹¹⁴ Institutional insecurity is a product of the fragmented nature of the energy decision makers and produces a situation where there are “too many cooks in the kitchen.”¹¹⁵ Given this situation of competing interests, it is hard to imagine that Beijing is able to intentionally enact policies to maximize the influence effect of electricity exports.

¹¹² Bo Kong, "Institutional Insecurity," *China Security* 3 (Summer, 2006), 72.

¹¹³ For more information on the institutional structure of the electric power sector through the 1990s see Jimin Zhao, *Reform of China's Energy Institutions and Policies: Historical Evolution and Current Challenges* (Harvard University: Energy Technology Innovation Project, Kennedy School of Government), <http://belfercenter.ksg.harvard.edu/files/zhao.pdf> (accessed May 31, 2009). For information on more recent reforms see Bo Kong, *An Anatomy of China's Energy Insecurity and its Strategies* (Washington, D.C.: Pacific Northwest National Laboratory, 2005), <http://pnwcegs.pnl.gov/Newsletter/OtherDocs/AnatChinaEnergy.pdf> (accessed February 27, 2007).; Kong, *Institutional Insecurity*, 64–88.

¹¹⁴ Kong, *An Anatomy of China's Energy Insecurity and its Strategies*, 5.

¹¹⁵ *Ibid.*, 22.

Numerous uncoordinated projects have led to the problems integrating the development into a coherent system and hampered long-term planning. One of the best examples of this is when the State Development and Planning Commission (SDPC) issued a policy of “no coal fired plants in the next three years” based on economic assessments in the wake of the Asian Financial Crisis.¹¹⁶ The data used grossly underestimated demand, and power shortages occurred in 2002 and continued to worsen.¹¹⁷ The energy shortage then spurred ad hoc development that led to surpluses of electricity in late 2006.¹¹⁸

These institutional problems, however, are starting to be addressed by Beijing. In 2002, the State Power Corporation was dismantled, and split into six regional power markets and five major companies.¹¹⁹ This split also separated power generation and transmission assets under different organizations. The breaking of this monopoly was seen as an essential element to reforming the electric power sector. The National Development and Reform Commission (NDRC), with power over review and approval of new power projects, and the State Electricity Regulatory Commission (SERC) a central electricity regulatory body, were strengthened by giving them clearer mandates and greater authority to enforce policy. Under the 2005 regulations, the SERC has two basic tasks, “supervision and enforcement in the power sector.”¹²⁰ These institutional reforms are important as they are widely seen as needed modernize the electric power sector. While some say that the reforms do not go far enough, these are major changes with the SERC being the first independent electricity regulator in China’s history.¹²¹ These reforms have empowered an independent regulator with the power shut down transmission assets.

¹¹⁶ Kong, *An Anatomy of China's Energy Insecurity and its Strategies*, 20.

¹¹⁷ Hu Zhaoguang, "Measures to Curb China's Electric Power Shortage," *Zhongguo Nengyuan [Energy of China]* 25, no. 9 (July, 2003), 14–17, Open Source Center, CPP200309033000145.

¹¹⁸ Hariharan, *A Question of Power*, 10.

¹¹⁹ Xie Ye, "Monopoly Grid Shares Power with Others," *China Daily* September 24, 2003, http://www.chinadaily.com.cn/en/doc/2003-09/24/content_266846.htm (accessed March 19, 2007).

¹²⁰ Qin Yu, "Strengthening the State Electricity Regulatory Commission," *China Law & Practice* (April, 2005), 1.

¹²¹ Kong, *Institutional Insecurity*, 64–88; Yeh and Lewis, *State Power and the Logic of Reform in China's Electricity Sector*, 437–465.

A second key aspect of electric power sector reforms occurred in May 2005, with the formation of the State Energy Leading Small Group (LSG). This group is led by Wen Jiabao and two Vice Premiers Huang Ju and Zeng Peiyan, with the task of providing guidance for the energy sector. It is also interesting to note that Wen Jiabao and Zeng Peiyan were also members of the Leading Group on Western Development, which oversaw the plan for the major infrastructure programs, including the WEETP. Other members of the energy LSG include officials who are concerned about foreign policy and the projection of national power.

The group members include 13 top leaders from the country's major ministries and administrations such as the Minister of the NDRC Ma Kai, Minister of Commerce Bo Xilai, Minister of Foreign Affairs Li Zhaoxing and Minister of the State Commission of Science, Technology and Industry for National Defence Zhang Yunchuan.¹²²

While this group does not meet on a regular basis, it does provide a direct link from the senior leadership to the both the NDRC, with authority over the electric power generation, and SERC, the transmission regulator. The LSG enables the senior leadership direct access to the bodies that can control electric power generation and transmission.¹²³ If the senior leadership deems that it wants to use the electric power mechanism to exert pressure on Vietnam, the LSG provides direct access to the relevant regulatory bodies. As with other reforms, the formation of the LSG does not necessarily demonstrate Beijing's intention to use the mechanism, but the point here is that a mechanism has been created.

Electric power sector reforms have been put in place to break up the state monopoly and pave the way for setting up power markets to better respond to the growing economy. The consequence of these reforms, however, is to empower an

¹²² China Daily, "Wen Heads New Energy Group," *China Daily* May 27, 2005, <http://www.china.org.cn/english/BAT/130210.htm> (accessed March 23, 2007).

¹²³ Mu Xuequan, "China's Electricity Regulators Urged to Further Reforms of Power System," *Xinhua* January 26, 2007, http://news.xinhuanet.com/english/2007-01/27/content_5659529.htm (accessed March 17, 2007).

independent regulator, with direct access to senior leadership. This sets up the organizational aspect of a mechanism to use electric power exports as a way to influence their international customers.

B. VIETNAMESE DOMESTIC ELECTRIC POWER INITIATIVES

Vietnam faces some of the same challenges as China with infrastructure development and regulation reform, but not on the same scale. Vietnam, like China, has implemented some major regional initiatives to generate and transmit power. Of particular interest are the seven northern provinces that border China and the adjoining provinces that from the northern and northwestern regions, as well as the Hanoi area. These areas make up the primary importers of China's electricity.

Vietnam has undertaken various major electric power generation and transmission projects. There have been both major hydroelectric and thermal power generation projects, such as Son La and Huoi Quang hydro projects in the north and the O Mon thermal complex in the south. These projects have received a significant amount of funding from international agencies such as the ADB and the Japan Special Fund.¹²⁴ One of the main problems with this massive amount of construction is finding financing for all the projects. Vietnam has been trying to attract foreign investors as a way to find capital. Vietnamese officials have increased prices and have made initial steps toward a power market.¹²⁵

The Asian Development Bank (ADB) has also sponsored various projects for regional infrastructure development in Vietnam, most notably the Northern Power

¹²⁴ Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam: Northern Power Transmission Expansion Sector Project* (Manila: Asian Development Bank, 2005).; Asian Development Bank, *Socialist Republic of Viet Nam: Preparing the Support for Public-Private Development of the O Mon Thermal Power Complex Project* (Manila: Asian Development Bank, 2006).

¹²⁵ Vu Long, "Price Rise to More Static Power Sector," *Vietnam Investment Review* 789 (November 27 – December 3, 2006), <http://www.vir.com.vn/client/vir/index.asp?url=content.asp&doc=11961> (accessed May 31, 2009).; Vu Long, "Electricity Price Hike Delayed Until 2007," *Vietnam Investment Review* 789 (December 4–10, 2006), <http://www.vir.com.vn/client/vir/index.asp?url=content.asp&doc=12011> (accessed May 31, 2009).

Transmission sector project and subsequent expansion projects.¹²⁶ These projects aim to expand the transmission network in northern Vietnam and connect other power generation projects to Vietnam's transmission grid and pave the way for future links to the Chinese grid.

Vietnam's electricity sector is controlled by Electricity Vietnam (EVN). According to the Asian Development Bank, EVN is a "state-owned corporation that accounts for more than 85 percent of power generation, bulk power transmission, and power distribution either directly or through intermediaries in some rural areas."¹²⁷ There have been attempts to reform the energy laws, various initiatives for the electricity sector.¹²⁸ Of note, the Electricity Regulatory Authority of Vietnam (ERAV) was authorized in 2004 and established in October 2005. This body is tasked with ten regulatory and planning duties, including developing energy markets and overseeing electric business licenses.¹²⁹ Like the Chinese reforms, Vietnam's reforms are aimed at an eventual transition to a power market, which is one of the stated goals of the technical assistance from the ADB.¹³⁰

Vietnam has experienced power shortages in the past few years. The effects of these shortages has been somewhat alleviated by importing electricity from China, especially for the northern provinces. In the summer of 2005, Hanoi was forced to

¹²⁶ Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam for the Northern Power Transmission Sector Project* (Manila: Asian Development Bank, 2004).; Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam: Northern Power Transmission Expansion Sector Project*, 1–73.

¹²⁷ Asian Development Bank, *Technical Assistance Socialist Republic of Viet Nam: Power Market Design* (Manila: Asian Development Bank, 2006), 1.

¹²⁸ Asian Development Bank, *Technical Assistance Performance Audit Report on Advisory Technical Assistance for Power Sector Institutional Strengthening in Viet Nam* (Manila: Asian Development Bank, 2004).

¹²⁹ Thu Huong, "The New Electricity Regulatory Authority in Vietnam," *Vietnam Economic News* January 13, 2006, http://www.ven.org.vn/view_news.php?id=6306 (accessed March 14, 2007).

¹³⁰ Asian Development Bank, *Technical Assistance Socialist Republic of Viet Nam: Power Market Design*, 3.

introduce “preemptive measures against a potentially serious power shortage.”¹³¹ In the first part of May 2005, electric power usage had surged 28 percent year over year.¹³² The surging demand was coupled with a nationwide drought that threatened hydro resources.¹³³ There was also a crisis in the summer of 2006. Phu My 2-2 plant, one the largest plants in Vietnam, went offline because of equipment malfunction.¹³⁴ Other plants had to run at maximum capacity to make up the difference, which led to additional malfunctions and shutdowns. Some plants, such as the Hoa Binh hydro plant, were forced to run at maximum capacity or on inefficient resources, such as diesel fuel.¹³⁵ In response to the shortages, Hanoi streamlined procedures and attempted to speed completion of some projects. Despite importing electricity from China and constructing 25 additional electric power projects, electricity shortages continued into 2007-08.¹³⁶ Even with this new capacity, Vietnam is looking to import more electricity from China, and exploring the potential for importing electricity from Laos after 2008.¹³⁷

Vietnam has undergone a significant amount of domestic infrastructure development and has started on the path toward bureaucratic and regulatory reform. As Vietnam continues to grow economically, they will require more and more electricity. The Vietnamese have grown increasingly comfortable with relying on importing electricity from its neighbors to satisfy their demand for electricity. As a consequence, Vietnam is increasing vulnerable to a stoppage of trade in electricity, and therefore, Chinese influence.

¹³¹ Vietnam News Service, "Action Ordered to Ensure the North has Power for Summer," *Viet Nam News* May 21, 2005, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=06IND210505> (accessed May 31, 2009).

¹³² Ibid.

¹³³ Hong Duong, "A Big Thirst for Electricity," *Vietnam Economic News* October 14, 2005, http://www.ven.org.vn/view_news.php?id=5418 (accessed March 14, 2007).

¹³⁴ Phu My 2-2 accounted for 8.8 percent of Vietnam's electricity output. Viet Nam News, "Power Plant Trouble Prompts Power Cuts," *Viet Nam News* June 14, 2006, <http://english.vietnamnet.vn/social/2006/06/581099/> (accessed May 31, 2009).

¹³⁵ Ibid.

¹³⁶ Ibid.

¹³⁷ Vietnam News Service, "Plan to Push Electricity Rates Up by 8.8 percent," *Viet Nam News* November 21, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=03ECO211106> (accessed May 31, 2009).

C. REGIONAL ELECTRIC POWER INITIATIVES

There have been a number of regional initiatives that involve the electric power sector. The largest regional organization that has supported electric power interconnections is the Asia-Pacific Economic Cooperation (APEC) group. APEC is not involved with the physical infrastructure, but it does provide insight to larger regional and global trends in the electric power sector. Smaller regional groupings have started on building infrastructure and taking the initial steps toward the creation of a regional power market. Vietnam is involved in the trans-ASEAN electric power grid, and the Greater Mekong Subregion (GMS) flagship initiative for electric power. China is a participant in the GMS initiative. These regional initiatives reveal that the trend toward power grid interconnections is not limited to China or Southeast Asia. They also provide an end goal that can shape the direction of the bilateral projects.

1. Asia-Pacific Economic Cooperation (APEC) Electric Power Interconnections

The APEC region is undergoing a trend toward electric power integration. Three major areas of integration have been identified, in addition to the already integrated North American market. The three regions are South America, Northeast Asia and Southeast Asia. China figures as a player in the latter two regions.¹³⁸

While there are no formally approved plans for an integrated Northeast Asian power grid, there have been major proposals to integrate the electrical grid for the region. There are multiple proposed connections between China and Russia. Some of these proposals also include connections from Russia to the Republic of Korea (ROK) through both China and Democratic People's Republic of Korea (DPRK). The majority of these proposals involve high voltage lines of 500kV and 600kV.¹³⁹

¹³⁸ Asia Pacific Energy Research Centre, *Power Interconnection in the APEC Region: Current Status and Future Potentials* (Tokyo: Asia Pacific Energy Research Centre, 2000), 90.; Asia Pacific Energy Research Centre, *Electric Power Grid Interconnections in the APEC Region* (Tokyo: Asia Pacific Energy Research Centre, 2004), 90.

¹³⁹ Asia Pacific Energy Research Centre, *Electric Power Grid Interconnections in the APEC Region*.

The reports from APEC on physical interconnections in the Southeast Asian region focus on existing Trans-ASEAN and Greater Mekong Subregion (GMS) projects which will be discussed later. While APEC does not focus on the physical infrastructure, they do provide insight to the international context for the establishment of a power market involving China and its neighbors.

There are various benefits of interconnection cited in the APEC sponsored reports of the Asian Pacific Energy Research Center, mainly economic and environmental, while there is only a cursory mention of “supply security concerns” and “political uncertainty.” One report advances the optimistic view that interconnected power systems are “not likely to pose a real problem in APEC region if all parties appreciate the mutual benefits of interconnection.”¹⁴⁰ While this may be true in some of the regions, such as North America, there remains the possibility of disruption of supply as a tool to influence a neighbor’s behavior.

The APEC also commissioned a study on the barriers of cross-border power. Among the fourteen barriers identified, the first two discussed were public fear and political barriers. The public fears section addresses the “insecurity of supply.” It draws on the example of the European Union (EU), and how the European Commission determined that integration of their electricity and gas systems provided the “best guarantee of security of supply and consumer protection.”¹⁴¹ They also suggest that the best ways to overcome the political barriers is involvement in international organizations and participating in the development of regional solutions.

While APEC has not undertaken any electric power projects in China or Vietnam, they do indicate the larger trend toward interconnected electric power systems. APEC shows a broad acceptance of the benefits of interconnecting regional power grids. Based on the APEC sponsored reports, increased connections between China and Vietnam would be looked at in a positive light by the international community.

¹⁴⁰ Asia Pacific Energy Research Centre, *Power Interconnection in the APEC Region: Current Status and Future Potentials*, 72.

¹⁴¹ Resourceslaw International, *Cross-Border Power: A Report Addressing the Barriers to the Interconnection of Power Grids in APEC Member Economies 2002*, 1–125.

2. Trans-ASEAN Electric Power Initiatives

The ten members of ASEAN have started to integrate their electric power transmission grids as part of their regional energy cooperation strategy. Energy cooperation in ASEAN has progressed and there are numerous venues for ASEAN members do discuss regional initiatives. These include the ASEAN Ministers on Energy Meeting (AMEM), and the Senior Officials Meeting on Energy (SOME). One of the main bodies spearheading the Trans-ASEAN power grid is the Heads of ASEAN Power Utilities / Authorities (HAPUA). Each of these various fora has advocated the Trans-ASEAN power grid.

The stated reasons behind the trans-ASEAN electric power transmission grid are the economic and environmental benefits. The end goal is a functioning power market. The economic benefits would be gained by allowing efficient use of resources, increased reliability and quality of electricity.¹⁴² The environmental advantages would be the increased use of renewable resources, while avoiding the need for inefficient systems to be constructed. These projects are not meant to replace a member's own grid, but rather augment their existing grid.

According to the HAPUA Secretary-in-Charge, Andy Purnama Roesli, the current plans call for three subregional transmission grids. These include one grid that connects Indonesia, Peninsular Malaysia and Singapore, known as IMS, the Trans-Borneo grid, and the GMS grid.¹⁴³ A total of 14 projects are currently being explored to complete the project, with two already operational.¹⁴⁴ These projects are high voltage transmission lines, with the notable exception being the projects between Cambodia and Vietnam.¹⁴⁵

¹⁴² ASEAN, "Infrastructure," ASEAN Secretariat, <http://www.aseansec.org/10367.htm> (accessed May 31, 2009).

¹⁴³ The IM(T)S includes Indonesia (Sumatra and Batam), Peninsular Malaysia and Singapore. The Trans-Borneo Grid includes Brunei, Sabah, Sarawak, West Kalimantan and the Philippines. For the trans-ASEAN grid, China is not included in the GMS grouping. Andy Purnama Roesli, *HAPUA and the ASEAN Power Grid for Optimum use of Energy Resources (Presentation at the Heads of ASEAN Power Utilities/Authorities (HAPUA) 10 - 11 Oct 2006, Bangkok, Thailand)* (Bangkok: 2006), <http://www.asean-sustainable-energy.net/documents/libraries/001/HAPUASecretary%20akhir%20Bangkok%206-10-06.pdf> (accessed May 31, 2009).

¹⁴⁴ ASEAN, *Infrastructure*, 1.

¹⁴⁵ Land, *China Moves Towards Electric Power Surpluses*.

3. Greater Mekong Subregion (GMS) Electric Power Flagship Initiative

The GMS flagship initiative is similar to the trans-ASEAN grid for the GMS region, except that it also includes two Chinese provinces, Yunnan and Guangxi Zhuang Autonomous Region.¹⁴⁶ Vietnam and Thailand are expected to be the largest electricity importers in the region, with Yunnan, with its large hydroelectric potential, being the largest exporter.¹⁴⁷

In 2003, the ADB in *The Technical Assistance for Preparing the GMS Power Interconnection Project, Phase I* proposed ten projects throughout the region. The plans for the GMS grid, however, called for only one project connecting China and Vietnam. The proposed project consisted of one high voltage line, of undetermined voltage, between Malutang Hydro Power Plant in Yunnan province and Soc Son, Vietnam. The project was not scheduled to be completed until 2019. Vietnam had a total of five other projects connecting it with Cambodia, Laos, and Thailand (via Laos). The timeline for these projects ranged from 2004 to 2019. China had a total of two projects, one with Thailand, scheduled to be completed in 2013, and one with Vietnam.¹⁴⁸

The rationale for the GMS interconnection is similar to the trans-ASEAN grid. One major stated benefit from a regional grid would be “cooperating in the development and complementary use of the subregion’s energy resources, especially given their uneven distribution.”¹⁴⁹ The plan also calls for the efficient use of the available resources, while reducing operational costs and system losses. It is interesting to note that environmental benefits are mentioned, but the potential impact of the upstream damming of the Lancang is mentioned in passing as “unresolved social (for example, resettlement) and environmental issues.”¹⁵⁰

¹⁴⁶ Yunnan was an original member of the GMS, while Guangxi Zhuang Autonomous Region joined in 2004.

¹⁴⁷ Magee, *Powershed Politics: Yunnan Hydropower Under Great Western Development*, 23–41.

¹⁴⁸ Asian Development Bank, *Technical Assistance for Preparing the GMS Power Interconnection Project, Phase I* (Manila: Asian Development Bank, 2003).

¹⁴⁹ Asian Development Bank, *GMS Flagship Initiative: Regional Power Interconnection and Power Trade Arrangements* (Manila: Asian Development Bank, 2005).

¹⁵⁰ Asian Development Bank, *GMS Flagship Initiative: Regional Power Interconnection and Power Trade Arrangements*, 5.

The World Bank and the Asian Development Bank have been major proponents for the development of a power market in the GMS. The strategy is to promote bilateral trade, while at the same time work out the institutional structures and infrastructure development that will allow transition to a regional grid and, eventually, a regional power market. The initial World Bank report outlines a number of barriers in four categories: technical, institutional and commercial and financial, and policy.¹⁵¹ The report is one of the few that notes national security concerns:

In addition, although it is not always stated, national security concerns regarding self sufficiency constitute an important policy objective in several countries. This focus on domestic needs acts as an actual barrier to trade.¹⁵²

It is important to remember that this report was published before China started its “charm offensive” in Southeast Asia, and before it was heavily engaged with ASEAN. More recent reports make passing reference to possible national security implications of significantly augmenting domestic supply with imported electricity.

Critics have noted that the proposal for the GMS regional grid does not provide increased reliability.¹⁵³ One argument is that the remote hydroelectric plants are more prone to transmission line failures because of their long distances over difficult terrain. They also note that hydroelectric is not the most reliable source for large amounts of power, as they can be affected by droughts and other competing interests for the water. This however, does not seem to be a major concern for China at this time.¹⁵⁴ The argument against reliability of a large grid, however does not mention the potential for the grid to be intentionally shut down. They do point out that if there is a large disruption, there is an increased potential for major portions of the grid to be disrupted, similar to a failures in Brazil and in the United States. While critics of the proposed

¹⁵¹ World Bank, *Power Trade Strategy for the Greater Mekong Subregion* (Washington, D.C.: World Bank, 1999).

¹⁵² *Ibid.*, 18.

¹⁵³ Gráinne Ryder, *The Greater Mekong Subregion Hydro Grid: A Review of the Asian Development Bank's 2003 Indicative Master Plan for Regional Power Interconnections and Power Trade in the Greater Mekong Subregion* (Toronto: Energy Probe Research Foundation, 2004).

¹⁵⁴ Liebman, *Trickle-Down Hegemony? China's "Peaceful Rise" and Dam Building on the Mekong.*

GMS power grid tend to be more environmentally based, they do raise interesting points about how the disruption in supply could affect large areas of the grid. This is something that China may be able to use to its advantage, as it would be the major supplier to its neighbors.

D. SINO-VIETNAMESE BILATERAL ELECTRIC POWER INITIATIVES

Bilateral electric power projects between China and Vietnam have increased in recent years, beyond the scope of the regional initiatives already discussed. Bilateral initiatives will be the most important way that China will be able to use the electric power as a mechanism to influence Vietnam.

Bilateral infrastructure development analysis here is divided into two categories, physical infrastructure and financial support. First, the bilateral physical infrastructure projects can be associated with either Yunnan Province or Guangxi Zhuang Autonomous Region. China Southern Power Grid is the company that operates the power grid in both provinces, and they also control the cross-border infrastructure development through its subsidiary companies Yunnan Power Grid Company and Guangxi Power Grid Company. EVN is their counterpart in Vietnam. There are various types of electric power transmission projects including 110kV and 220kV lines and a planned 500kV project. The overall trend is to increase the amount of electricity exported to Vietnam from various generation plants in Yunnan and Guangxi.

The second type of project involves Chinese support of Vietnamese electrical infrastructure projects, including funding and building major projects in Vietnam. China has provided funding in the form of preferential loans to Vietnam for electric power infrastructure development. The Chinese are also helping to construct the Vietnamese infrastructure through joint ventures, build-operate-transfer programs and winning various construction contracts inside Vietnam.

1. Cross-border Transmission Projects

In 2007, Vietnam imported two percent of its national electricity supply from China and by 2009 this figure had doubled to four percent.¹⁵⁵ While Vietnam imports a small percentage of total electricity demand, the imported electricity is used in only two geographic areas. The relative percentage of Chinese imports to domestic supply is higher in these areas. The first area is supplied by Yunnan province, and consists of Lai Chau, Lao Cai, Yen Bai, Ha Giang, Tuyen Quang and Phu Tho provinces. These provinces roughly correspond to provinces included in the first GMS North-South economic corridor. The second area is the coastal province of Quang Ninh, supplied by Guangxi Zhuang Autonomous Region. There are also plans for an additional transmission project to cover Cao Bang and Bac Can provinces.¹⁵⁶ Hanoi is planning to construct smaller scale hydroelectric plants to provide electricity for more remote areas of the northern provinces. According to press reports, a total of 37 planned projects will provide local coverage to rural customers. Vietnam plans to have 70 percent of the northern provinces connected to the national grid, while the remainder will be supplied by local small-scale sources.¹⁵⁷

There are multiple cross-border electric power transmission projects being undertaken in Yunnan and Guangxi provinces. There are several transmission lines of various voltages that China uses to export electricity to Vietnam. In April 2004, China started to export electricity over two 110kV lines from Yunnan and Guangxi to supply Vietnam's northern provinces of Lao Cai and Quang Ninh, respectively. In July 2005, a third 110kV line was installed from Maomaotian, Yunnan province to Ha Giang and Yen

¹⁵⁵ Viet Nam News. "Electricity Production Rises, But Shortfalls Still Loom in Dry Season." *VietNamNet*, April 13, 2009, <http://english.vietnamnet.vn/biz/2009/04/841672/> (accessed May 20, 2009).

¹⁵⁶ Vietnam News Agency, "Vietnam Purchases Over 1bil kWh of Electricity from China," *VietnamNet* November 11, 2006, <http://english.vietnamnet.vn/biz/2006/11/637578/> (accessed May 31, 2009).

¹⁵⁷ Vietnam News Agency, "Northern Border Districts to Get Hydro-Electricity Projects," *VietnamNet* August 31, 2006, <http://english.vietnamnet.vn/biz/2006/08/607762/> (accessed May 31, 2009).

Bai provinces. By September 2006, Vietnam had imported over 1 billion kWh of electricity from China using three 100kV lines connected to eleven transformer stations in six of Vietnam's northern provinces.¹⁵⁸

In that same month, a higher capacity 220kV line became operational connecting Hekou county in Yunnan to Viet Tri city in Phu Tho province. A second 220kV line is scheduled to be operational by April 2007, which will connect from the Chinese border in Ha Giang to Soc Son via Thai Nguyen.¹⁵⁹ Both lines started construction on early 2005. These lines are significant as they provide two lines for Chinese electricity into the main grid network that serves the Hanoi area. These links were made possible by the ADB funded Northern Power Transmission Expansion Project (NPTEP) that financed the construction of a new 500kV and 220kV substation at Soc Son. The Soc Son substation was described as "a strategic link" between the eastern and western Vietnamese power generators with the "potential for subsequent interconnection" with China.¹⁶⁰

The NPTEP also contained the expansion of the 500kV network in northern Vietnam making the connection to the Chinese 500kV grid more feasible. A cross-border 500kV line is in the planning phases, which would double Vietnam's current import capacity. There are a few possible routes for the line to connect the Vietnamese grid. One possible location is at Mong Duong in Quang Ninh province connecting to the Guangxi grid. Another possible line is from Yunnan to Soc Son, outside of Hanoi. In the future, it is possible that both Mong Duong and Soc Son will be connected to Chinese 500kV lines.

It is interesting to note that in ADB loan documents for the Northern Power Transmission Sector Project in November 2004; there is no mention of cross-border connections for the high voltage lines proposed by the project.¹⁶¹ Subsequent documents

¹⁵⁸ Xinhua, "China-Vietnam Power Transmission Line Operational," *Xinhua* September 26, 2006.

¹⁵⁹ Viet Nam News, "EVN Forecasts Power Cuts, Purchase of Chinese Energy," *VietNamNet* September 20, 2006, <http://english.vietnamnet.vn/biz/2006/09/613849/> (accessed May 21, 2009).

¹⁶⁰ Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam: Northern Power Transmission Expansion Sector Project*, 7.

¹⁶¹ Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam for the Northern Power Transmission Sector Project*, 1–59.

for the World Bank in July 2005 and for ADB in November 2005 both mention transmission connections with China.¹⁶² This change corresponds to severe power shortages in Vietnam, which seem to have accelerated plans to import electricity from China. Also, the success of the initial small scale 110kV programs probably contributed to the decision to expand the cross-border connections.

Chinese electricity imports have become essential for some provinces. Quang Ninh province now imports 30 percent of its electricity from China.¹⁶³ If Vietnamese economic growth continues at the current pace, along with the demand for electricity, there will probably be more cross-border electric power transmission projects. As Vietnam attempts to expand domestic capacity, the power shortages continue. Vietnamese leaders are increasingly comfortable importing electricity from China, leading to an increased volume of imports and cross-border infrastructure projects. Vietnam's northern provinces are increasingly relying on China to fill their need for electricity, and thus creating Vietnamese dependence on China for a resource that is essential for continued economic growth.

2. Chinese Financial Support

The Chinese have started to provide financial support to the Vietnamese electric power sector. The assistance is in the form of low interest loans, joint ventures and build-own-transfer (BOT) schemes.¹⁶⁴ These projects, like the transmission lines, are undertaken for economic reasons, but they increase Chinese presence within Vietnam's electric power sector. The number of these projects is only growing as the Vietnamese officials become increasingly comfortable with Chinese involvement in the electric power sector.

¹⁶² World Bank, *Project Appraisal Document on a Proposed Credit in the Amount of SDR 136.7 Million (US\$200 Million Equivalent) to the Socialist Republic of Vietnam for a Second Transmission and Distribution Project* (Washington, D.C.: World Bank, 2005).; Asian Development Bank, *Report and Recommendation of the President and Board of Directors Proposed Loan Socialist Republic of Viet Nam: Northern Power Transmission Expansion Sector Project*.

¹⁶³ Vietnam News Service, "EVN to Prolong China Power Deal," *Viet Nam News* August 29, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=02ECO290806> (accessed May 31, 2009).

¹⁶⁴ The joint ventures differ from the BOT projects as the later usually involve transfer to the public sector at some point.

China has provided funding for many projects in the Vietnamese power sector. The China Exim Bank has provided financing for projects, mainly focused on the northern provinces. Of note, China Exim Bank has provided funding for a Hai Phong 1 thermo- electric plant and credit for the Quang Ninh 1 project.¹⁶⁵ These projects seem to be focused in the northern sectors of the country. Some of the projects that are funded by Chinese banks are constructed by Chinese contractors, such as the Cao Ngan hydro plant, north of Hanoi.¹⁶⁶ In particular, the Quang Ninh and the Hai Phong projects are reported to have over 2,000 Chinese unskilled laborers at each plant. Chinese workers have also been utilized on a thermo-power plant project in Nong Son in the central province of Quang Nam. The Chinese contractors use almost no Vietnamese labor.¹⁶⁷ Chinese contractors have utilized Chinese laborers on various electric power projects throughout Vietnam.

Sino-Vietnamese joint company projects been contracted to develop various power plants. Yunnan Power Grid Company has contracted for “co-operation in small- and medium- sized hydroelectric projects in Vietnam.”¹⁶⁸ This is the same Chinese company that exports electricity to Vietnam from Yunnan province. This brings up the prospect of China not only disrupting the electricity supply, but also the construction of future power plants in Vietnam. Other Chinese companies are also involved in joint ventures constructing Vietnamese power plants in the northern provinces.¹⁶⁹

¹⁶⁵ Vietnam News Service, "Viet Nam, China for Comprehensive Ties," *Viet Nam News* November 1, 2005, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=03POL011105> (accessed May 31, 2009).

¹⁶⁶ "Chinese Comany Contracts to Build Power Plant in Vietnam," *People's Daily* May 14, 2002, http://english.people.com.cn/200205/14/eng20020514_95675.shtml (accessed March 19, 2007).

¹⁶⁷ Vietnam Net, "Unskilled Foreign Workers Flow into Vietnam," *VietNamNet* May 2, 2009, <http://english.vietnamnet.vn/reports/2009/04/843139/> (accessed May 22, 2009).

¹⁶⁸ Vietnam News Service, "Electric Company Inks Joint Power Venture with China," *Vietnam News Agency* November 11, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=01BUS151106> (accessed May 31, 2009).

¹⁶⁹ Vietnam News Service, "Hai Phong Power Plant Deal Signed," *Vietnam News Agency* November 17, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=02IND171106> (accessed May 31, 2009).; Vietnam News Service, "Quang Ninh Inks \$348m Power Deal," *Viet Nam News* March 22, 2006, <http://vietnamnews.vnagency.com.vn/showarticle.php?num=03ECO220306> (accessed May 31, 2009).

China has also engaged in build-own-transfer schemes. One prominent project funded by Yunnan Power Grid Company is a thermo power plant in the southern province of Binh Thuan worth \$1.4 billion.¹⁷⁰

The amount of cooperation also brings up the expansion of Chinese “soft power” through people-to-people connections, and the development of human capital in Vietnam’s electricity sector. One commentator on Voice of Vietnam “praised” Sino-Vietnamese cooperation with specific emphasis on the electric power sector.

The agreement between the Vietnam Coal and Minerals Corporation and the Chinese Import Export Bank on the provision of a credit of \$225 million for the first phase of construction project of the Cam Pha thermal power plant with a 300-mW capacity, and the intended cooperation in energy industry, construction of infrastructure projects...personnel resource development...and so forth will create new progress and stronger momentum for development of economic and trade cooperation between the two countries.¹⁷¹

With power shortages predicted to continue through 2010, Vietnam’s electric power sector financing may increase come from foreign investors. China is one of the countries targeting electric power infrastructure projects. These will most likely continue into the foreseeable future.

According to Hirschman’s framework, China is creating technical dependencies by constructing Vietnam’s power plants. Depending on the technology used, Vietnam may be reliant on the Chinese to repair or upgrade these plants. China is also creating Vietnamese dependency on Chinese workers to construct the facilities. For the time being, China may be able to withdraw this labor, and delay the projects. Construction delays would further delay Vietnam’s ability to step up domestic electricity production to replace lost Chinese imports, in the event of a trade stoppage. Once Chinese designed plants are completed, Vietnam may be dependent on Chinese replacement parts, creating

¹⁷⁰ VNE, "Over US\$20bil to Come to Vietnam," *VietNamNet* March 8, 2007, <http://english.vietnamnet.vn/biz/2007/03/670704/> (accessed May 31, 2009).

¹⁷¹ Vu Duy, "Hanoi Radio Website Praises Prospects of Vietnam-China Ties," *Voice of Vietnam* August 28, 2006, Open Source Center, SEP20060829124007 (accessed March 19, 2007).

another dependence on China. Funding and constructing the electric power infrastructure in Vietnam enhances China's ability to use the influence effect of trade.

E. CONCLUSIONS

The cross-border development of an electrical power grid promotes the economic development of both China and Vietnam. China currently has a surplus of power generation capacity with the potential to develop additional clean, renewable energy projects. This provides both economic and environmental benefits for both countries. From an economic perspective, it is a “win-win” situation, China provides Vietnam with a product that is essential for Vietnam's economic growth. Vietnam is supplied with a resource that enables continued economic development.

One less-mentioned consequence of this trade in electric power is that it provides a mechanism for China to influence Vietnam. Infrastructure is in place to enable the Chinese use of this mechanism. The development of this mechanism is not the primary reason for the development of the bilateral electric power trade, but it exists nonetheless.

The use of this mechanism will also incur costs for the Chinese. The ideal use of this mechanism may be to avoid the situation where trade will actually be deliberately cut off for long term, allowing Vietnam to shift trade or increase domestic production. There are multiple scenarios are possible where trade can be either disrupted or fully interrupted for short periods, such as infrastructure “maintenance” or a “malfunction.” This may serve to “remind” Vietnam of the extent that it is reliance on China for various aspects of its economic growth, while providing Beijing plausible deniability. The threat of a disruption may also be enough to alter Vietnamese behavior.

Liberal international relations theorists argue that the increased trade would lead to a decreased chance of conflict.¹⁷² Hirschman argues the influence effect of trade increases with “the greater the immediate loss, which it can inflict by a stoppage of

¹⁷² Robert O. Keohane and Joseph S. Nye, *Power and Interdependence*, 3rd ed. (New York ; London: Longman, 2001), 334.; Bruce M. Russett and John R. Oneal, *Triangulating Peace : Democracy, Interdependence, and International Organizations* (New York: Norton, 2001), 393.

trade.”¹⁷³ So while trade may be viewed as a deterrent for armed conflict, it can also increase the influence that one trading partner has over the other. Just as Hirschman noted that pre-war Germany did not deliberately create mechanisms for trade influence over their neighbors, the Chinese efforts supplying electricity to Vietnam are under the mask of economic growth and mutual benefit.¹⁷⁴ Vietnam may realize too late that their growing demand for electricity led them to far into China’s sphere of influence.

Unlike recent Russian examples, short term supply disruptions for oil and natural gas imports do not have the same effect as an electric power supply disruption. Oil and natural gas can be stored more readily than electricity. A major supply disruption also has different effects for a power grid, where a “cascade” effect shutting down the grid may result from an unevenly loaded grid.¹⁷⁵ A Chinese supply disruption, especially if connected to the 500kV grid, could potentially affect major areas of Vietnam. If the supply is not resumed, it would be difficult for Vietnam to recover from the disruption without significant reduction in demand. This would be magnified in the northern provinces, such as Quang Ninh, that have become dependent on Chinese electricity exports. Vietnamese officials have indicated that residential customers would face the first power cuts in the event of blackouts due to increased demand, but that Ho Chi Minh City and Hanoi would have fewer cuts.¹⁷⁶ It remains to be seen how Vietnamese would cope with widespread power outages due to the loss of Chinese electricity.

¹⁷³ Hirschman, *National Power and the Structure of Foreign Trade*, 27.

¹⁷⁴ ASEAN and PRC, “Joint Statement of China-ASEAN Commemorative Summit.” ASEAN Secretariat. <http://www.aseansec.org/China-Com-Summit.Doc> (accessed May 20, 2009).

¹⁷⁵ Motter and Lai, *Cascade-Based Attacks on Complex Networks*. 065102.

¹⁷⁶ Tran Thuy, "After March, 2007: Electricity may be Cut Off Rotationally," *VietnamNet* March 1, 2007, <http://english.vietnamnet.vn/biz/2007/03/668396/> (accessed May 31, 2009).; Vietnam News Service, *Action Ordered to Ensure the North has Power for Summer*.

V. CONCLUSIONS

China and Vietnam have undertaken massive infrastructure development programs in the overland transportation and electric power sectors. In addition to domestic programs, many cross-border projects are underway, increasing the capacity for existing trade, and creating new trade opportunities, such as electricity. With the support of regional organizations, such as the GMS and ASEAN and with funding from international donors, such as the ADB and World Bank, these projects have steadily progressed.

The GMS economic corridors have laid the physical basis for expanding bilateral trade relations. While there will be mutual economic benefits from this trade, there may be unintended geopolitical consequences. According to Hirschman's framework, these infrastructure projects will enable China, if it chooses, to use the influence effect of trade against Vietnam. China is more likely to use these mechanisms as the influence effect favors large countries with diversified trading partners, which can easily shift their trading patterns. A smaller country, like Vietnam, that relies heavily on a larger trading partner can be harmed more with the immediate effects of a trade stoppage. The resulting situation means that a smaller country is likely to avoid a trade interruption and will be influenced by the larger trading partner.

Large infrastructure projects, such as roads, railways, and electric power grids, are bilateral in nature. They promote trade between two specific countries and require large amounts of investment, which signifies longer term economic commitments. They promote trade and economic development, in some cases, such as electric power, infrastructure development is a prerequisite for trade.

The stated rationale is that these projects will promote economic development and mutual benefits. They will surely set the conditions that enable additional economic growth, either through an expanded transportation system or the ability to supply electricity to a growing economy. There may be unintended consequences from these

policies. Vietnam may become vulnerable to an interruption or stoppage of trade. According to Hirschman's framework, the greater the immediate effects of a trade stoppage, the greater the influence exerted.

The Chinese may not have the influence effect of trade as the primary motivator for their cross-border infrastructure development with Vietnam. Economic development and growth is in their interest as well as Vietnam's. However, much like German trade policy in the 1930s, the Chinese are creating mechanisms that can be used to exert influence on their neighbors, in particular Vietnam, with infrastructure development being a key step. These mechanisms may prove useful in case there is not a "win-win" situation between China and Vietnam, such as a territorial dispute in the South China Sea.

Vietnam may take measures to limit the immediate effects of a Chinese stoppage of trade. First they diversify their trade. They can look to their more developed neighbors, such as Thailand. They can also try to further develop overseas markets, such as the United States and Europe. In the electric power sector they can accelerate interconnections with their ASEAN neighbors, expand their domestic generation capacity and promote efficiency. Foremost on their agenda should be to limit the amount of areas where they are dependent on Chinese imports, as is the case for electricity in the northern provinces. Vietnam may be able to minimize the immediate effects of a trade stoppage with China, and therefore limit their vulnerability to the influence effect of trade.

Hirschman's framework provides a useful tool to analyze the potential effects of Sino-Vietnamese cross-border infrastructure development. Mechanisms to use the influence effect of trade created by the cross-border infrastructure development may not be intentionally created, but they exist nonetheless.

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