

Financing Border Environmental Infrastructure: Where are we? Where to go from here? ¹

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Abstract

Few would question the pressing need for adequate environmental infrastructure along the U.S.-Mexico border region, but there are significant challenges involved, including quantifying the amount of required investment and obtaining the funds to pay for projects that often call for sizeable upfront disbursements. Increasing budgetary constraints in both countries make it necessary to think about innovative strategies to attract investment to the region. The aim of this paper is to invite scholars and policymakers to “think outside the box” and discuss alternative measures to channel financial resources to the region. This document addresses the issue in three steps. First, it provides readers with a brief overview of some of the mechanisms that could be used to finance environmental infrastructure, along with their advantages and limitations. Secondly, it presents preliminary estimates of investment needs and explains the way in which the public sector participates in infrastructure financing. A third section of the paper explains some of the ways in which the private sector can participate and presents readers with a thought-provoking idea: the creation of a bi-national model of debt financing to bridge the gap between border environmental infrastructure needs and available funds.

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1 Introduction

The Southwestern Consortium for Environmental Research (SCERP) has invited me to participate in the Border X seminar with a paper that discusses the challenges that the border region faces in terms of the financing of environmental infrastructure. This issue is of great relevance. In spite of growing concerns about environmental preservation, the global economic slowdown has limited the financial capacity of governments and has introduced tighter constraints on their budgets. The problem may not be that worrisome if it were not for the fact that the public sector is usually an important contributor of funds for environmental infrastructure. While the need for environmental preservation in the border region is evident, many of the required projects have high upfront costs that governments are finding difficult to cover. The challenge for policymakers interested in the U.S.-Mexico border is not a simple one: Narrowing a growing deficit in environmental infrastructure at a time when the funding capabilities of the public sector have been curtailed.

The scarcity of government funds is not the only problem. Rapid population growth, industrialization, the creation of physical barriers, and other natural phenomena are depleting essential resources, putting economic development and even the security of the two nations at peril. A good example of this situation is what occurs with water, which remains one of the most pressing environmental problems faced by the border region. As a recent analysis illustrates, water scarcity constitutes a threat to the quality of life of border communities, endangers water-sensitive ecosystems, puts economic growth at risk and strains diplomatic relations (Woodrow Wilson Center and COLEF. 2009). Yet, the availability of government funds to deal with this sensitive policy issue has been constantly diminishing. According to a report by the Border Environmental Cooperation Commission (BECC), as of fiscal year 2008, the required investment for water and wastewater infrastructure was US\$1 billion. Budget appropriations

from the U.S. Congress for the U.S.-Mexico program for that year were only US\$10 million¹. This amount was enough to cover only 5% of the documented needs (Border Environment Cooperation Commission. 2007). This gives a clear idea of the challenges that Mexico and the United States face in terms of border infrastructure finance. Bridging the gap between infrastructure needs and available funds can only be done if new and innovative financing mechanisms are designed. But most importantly, it can only be done if policymakers, government officials and border residents are aware of the consequences that the lack of action would entail. How to obtain the funds to cover the cost of essential and much-needed environmental infrastructure? This is the question that this paper intends to address.

Erickson and Eaton reflected on the same issue eight years ago, when they reviewed five funding mechanisms that could be used to pay for environmental infrastructure projects: philanthropy, tax financing, user fees, contracting with private sector, or bond markets (Erickson and Eaton. 2002). Although they did not analyze them in detail, their work gives a good idea of some of the existing policy alternatives for the financing of environmental infrastructure.

For these authors, philanthropy could be an important source of funds for community projects with an environmental impact. This source of funds could certainly be useful for small-scale projects. But while these organizations are very active in some regions, their funding capacity is still very limited. This is particularly noticeable in Mexico. As a survey from the Border Philanthropic Partnership explains, “for the vast majority of companies operating *maquiladoras* along Mexico’s northern border, charitable giving is substantially lower in Mexican border communities when compared to contributions made to comparable nonprofits in the United States. Of the companies surveyed, 65.5% contributed \$10,000 or less in cash donations to charitable causes annually, and 25.5% contributed nothing to charities along

the border where they operated. A mere 9.1% gave over \$10,000 annually” (U.S.-Mexico Border Philanthropy Partnership. 2005). Clearly, this alternative would not be an effective tool to channel the required flows of investment to the region.

Another possibility would be to try to gather the needed funds through taxation. A funding model that is based on taxes has two important limitations. The first limitation relates to the amount of resources that governments can obtain from taxes and the amount of resources that are needed to build large-scale infrastructure projects. The financial requirements of many border projects could hardly be covered with the state or local tax proceeds from a single fiscal year. Even if it were possible, one must consider the fact that the spending of those tax revenues must be approved during annual budget negotiations where numerous agencies compete. And while border environmental infrastructure is important, it may not rank high on the list of priorities of a federal, state or local government.

The second limitation of a taxation-based model of financing arises when one takes into account that there are different levels of government interacting in the border region (communities, cities, municipalities, counties, special districts, tribes, state and federal governments). In many cases, these jurisdictions will have overlapping or loosely defined roles and responsibilities. If the scope of their mandate is not that clear, the inevitable question is who should pay for what? (i.e., what level of government should impose the tax?). If the geographical benefits of infrastructure projects are essentially local, one argument could be that the residents of that jurisdiction should bear a higher burden of the cost. But if a project is located in the vicinity of the international border, some may argue that the federal government should play a significant role in its financing. Notice, however, that even if border communities and local governments want to construct environmental infrastructure, their financial capabilities are limited. This is one of the reasons higher levels of government (mostly the federal ones) need to step up and provide the financial means to provide environmental infrastructure services that, in theory, should be paid for by localities.

Erickson and Eaton also mention the possibility charging a fee to the users of an infrastructure projectⁱⁱ. Although the authors do not explain the advantages and disadvantages, they mentioned that this is often an inadequate funding method for environmental infrastructure. The reason they cite is the difficulty of collecting user fees in many border communities. But while this is true in many sectors (they specifically address the case of water charges), one cannot assume that a similar situation will occur in every infrastructure project. Financial planners would need to evaluate the feasibility of a user charge scheme on a project-by-project basisⁱⁱⁱ.

Regardless of the advantages and shortcomings of particular tax and user charge mechanisms, one cannot analyze these possibilities without paying close attention to the prevailing economic and political context in each country. Many of the assessments and claims that Erickson and Eaton made eight years ago are still valid in the present day. Notice, however, that the economic juncture is very different. This paper is being written when the international community is going through one of the worst economic downturns since the Great Depression of 1929. The economic downturn has affected governments in Mexico and the United States in different ways. But even if the circumstances in each country vary, both governments must deal with shrinking tax bases and an increasing unwillingness from voters to accept higher taxes or service charges.

Policymakers need to find other mechanisms to pay for environmental infrastructure. Certainly, one possibility is to involve the private sector. In principle, one could think about two alternatives: Agreements between the public and the private sectors (commonly known as public-private partnerships or PPP) or through public sector borrowing.

Private-public partnerships are long-term contracts by which a private investor agrees to participate in the design, construction and/or operation of public infrastructure in exchange for payments from the user of the facility or from the government that assigns the project. In many countries, such contracts are seen as an effective tool to obtain the funding that a government cannot secure through its normal budgetary process. But as Yescombe explains, while a PPP can accelerate infrastructure investment and overcome the limitations associated with public sector provision, “[p]rivate-sector finance for a PPP clearly costs more than if the project were procured in the public sector and financed with public sector borrowing” (Yescombe. 2007).

If infrastructure planners want to explore less expensive funding alternatives, accessing debt markets could be a cost-effective option. In doing so, border governments (or other project sponsors) would try to gather funds from individual and corporate investors interested in placing their savings in profitable projects. Although there are various mechanisms to attain this, the following discussion pays close attention to the opportunities that a bond market could offer^{iv}. When Erickson and Eaton wrote their essay eight years ago, they affirmed that it was the right time for the development of a municipal bond market in Mexico (municipal debt markets have been operating in the United States for a long time). Their claim is still a valid one, with a small variation: If one takes into account that the benefits (or costs) of many environmental projects are not constrained to one side of the border, thinking about funding models that do not incorporate both countries no longer seems adequate. It is time to change the existing paradigm and address the infrastructure finance problem from a bi-national perspective. This will be the premise for the discussion that follows.

2 Environmental Infrastructure in the U.S.-Mexico Border: Where are we?

2.1 Investment needs: How much money are we talking about?

For the purposes of this paper, the U.S.-Mexico border region is defined as the territory that is comprised by a 100 km range on the U.S. side of the international line (62 miles) and a 300km range on the Mexican side of the international line (186 miles). Environmental infrastructure, on the other hand, will be defined as those projects “that will prevent, control or reduce environmental pollutants or contaminants, improve the drinking water supply, or protect flora and fauna so as to improve human health, promote sustainable development, or contribute to a higher quality of life”. This is the definition that the governments of Mexico and the United States accept for public policy design and implementation (Mexico and United States. 2004). The broadness of such a definition would make it difficult to determine what type of projects could be considered to be border environmental infrastructure for financing purposes. The North American Development Bank (NADB) and the Border Environmental Cooperation Commission (BECC) operate with a specific mandate that sets priorities on this matter (see table 1). Although these categories may not include all the projects that have an environmental impact, it can be a good reference when attempting to quantify the investment needs.

Table 1
NADB Classification of Border Environmental Infrastructure

Priorities	<ul style="list-style-type: none">• Water Supply
	<ul style="list-style-type: none">• Water Conservation
	<ul style="list-style-type: none">• Wastewater Treatment
	<ul style="list-style-type: none">• Municipal Solid Waste
Expanded Mandate	<ul style="list-style-type: none">• Air Quality Improvement
	<ul style="list-style-type: none">• Clean and Renewable Energy
	<ul style="list-style-type: none">• Energy Efficiency
	<ul style="list-style-type: none">• Industrial and Hazardous Waste
	<ul style="list-style-type: none">• Public Transportation
Source: NADB	

A crucial question needs to be asked at this point: How significant are the funding requirements for the region? The numbers vary among sources. Ten years ago, the Southwest Center for Environmental Research and Policy estimated that the amount to meet the requirements for potable water, wastewater treatment, and solid waste disposal would be \$3.2 billion dollars, and that 77% of this amount would be for wastewater treatment plants (U.S. General Accounting Office. 2000). This figure still gives a clear idea of the massive amount of financial resources that must be channeled to the border region for environmental infrastructure, as well as the areas that are deemed priorities. More recently, BECC estimated that the investment requirements for the six Mexican states bordering the U.S. are approximately US\$903 millions (see table 2)^{v.3}. At the time of the writing of this paper, the assessment for the four U.S. Border States is in progress. Yet, some of the available figures can provide an idea of the sizeable investment needs for the region. The Clean Watersheds Needs Survey carried out by EPA indicates that as of 2004, the investment requirements for wastewater treatment only were around US\$8819 million in Texas, US\$160 million in New Mexico, US\$6110 million in Arizona and US\$20,508 million in California^{vi}.

Table 2.

Infrastructure Needs in the Border Region (grouped by State)							
<small>(source: BECC-COCEF)</small>							
	<u>Baja California</u>	<u>Coahuila</u>	<u>Nuevo Leon</u>	<u>Sonora</u>	<u>Tamaulipas</u>	<u>Chihuahua</u>	<u>All border states</u>
Drinking Water	31.30	17.06	34.32	16.9	26.29	17.26	143.13
Sewer systems	35.64	23.56	20.99	14.45	49.14	15.67	159.45
Saneamiento (english?)	54.04	125.05	8.84	98.47	62.38	66.24	415.02
Solid Waste	55.43	16.13	49.56	13.35	20.33	30.68	185.48
TOTAL	176.41	181.81	113.7	143.18	158.14	129.85	903.09

Evidently, further discussion on the methods use to compute these figures and the amounts reported will need to be in place. But even if the numbers change, the core challenge remains the same: finding the financial resources to pay for these projects. What are the options?

³ **Note on draft v1.1:** The needs assessment study by BECC is an ongoing project. The studies for the Mexican states are ready. In the case of the U.S. only the one for New Mexico is complete. The final version of this paper will try to include the most current estimations.

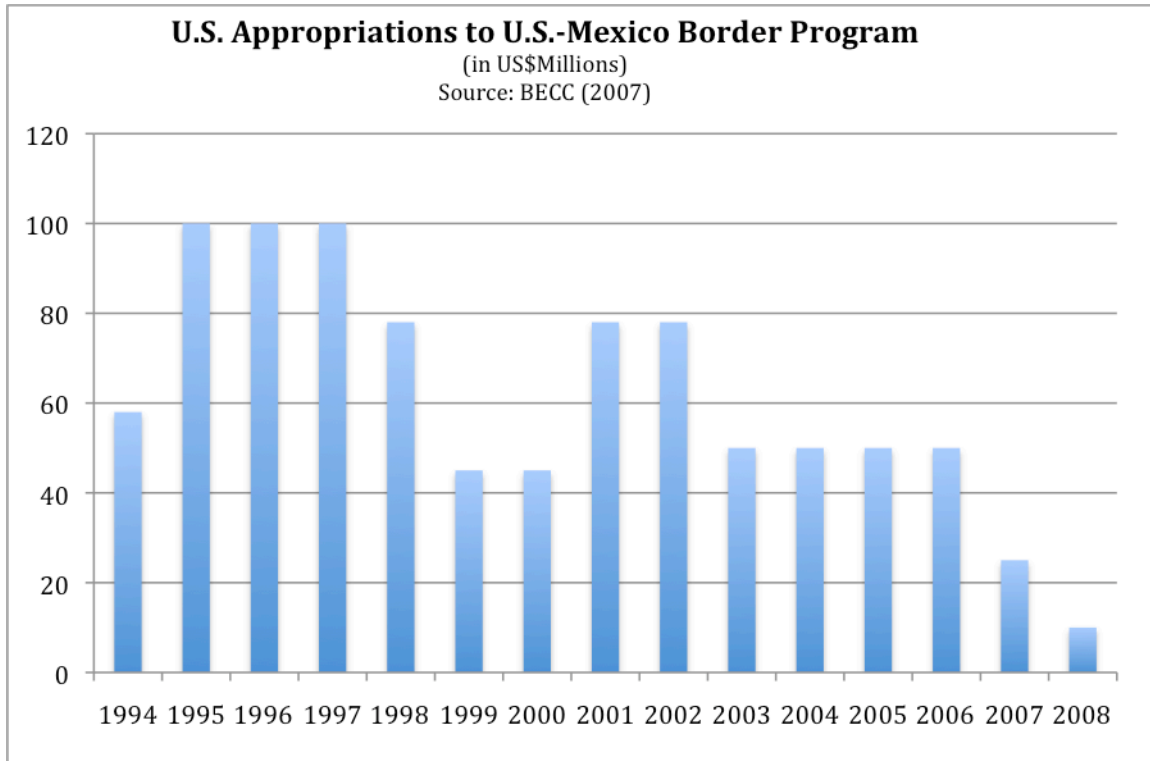
2.2 Government funding: When the means are not enough to meet the ends.

Large-scale environmental infrastructure projects like the ones listed in table 1 have traditionally been funded with public monies. In general terms, this occurs for three reasons: Because the good of service to be provided has the characteristics of a public good, making it unattractive to private investors^{vii}; because there are laws or regulations that prohibit or limit private investments; or because even if a specific infrastructure project has low profit potential, it might be highly desirable from a social or environmental standpoint.

In the United States, there are various agencies involved in environmental infrastructure financing. At the federal level, the Environmental Protection Agency (EPA) remains one of the top contributors based on the amount of grants devoted to border environmental infrastructure projects. In the case of Mexico, a significant portion of federal funds is appropriated through programs administered by the Secretariat of Environment and Natural Resources (SEMARNAT)^{viii}. However, these federal agencies can only provide the funding that their respective legislatures authorize during the annual budget process. Unfortunately, as evidence shows, the tendency has been towards a decrease in the appropriations for programs to finance environmental infrastructure. An illustrative example of such a trend is the money appropriated by the U.S. Congress for the U.S.-Mexico Border Program, which constitutes one of the main sources of funding for water and wastewater projects. As figure 1 shows, appropriations have gone from about US\$100 millions in the mid-nineties to roughly US\$10 million in fiscal year 2008⁴.

⁴ **Note on draft v1.1:** The data for figure 1 is approximated. In the report by BECC, the numbers for Fiscal Years 2007 and 2008 reflected budget requests (not appropriated funds). The final version of the document will include updated information.

Figure 1



There are two important factors that need to be taken into account when assessing reductions in appropriated funds like the ones shown above. The first factor has to do with the ongoing economic recession, its effects on government budgets, and the realignment of policy priorities that this situation requires. Countries around the globe are experiencing the consequences of an economic slowdown that has affected revenue collections significantly. Expenditure trends, nonetheless, continue showing an upward trend. This is putting additional pressures on public budgets and is forcing governments to rethink expenditure priorities. The second factor has to do with the process that must be followed to allocate government funds. Budget appropriations are the result of difficult and complex negotiations among actors who represent constituencies from numerous geographical areas and with a wide array of interests and policy agendas. These actors must compete for an increasingly limited amount of government revenues. Given the current economic scenario, developing border environmental infrastructure may not be seen as a strategic need.

Another source of funds for border environmental infrastructure is the North American Development Bank (NADB), which is a bi-national financial institution that provides low-cost financing alternatives for border projects that fall within the scope of its mandate (see table 1 above) and which are previously certified by a Border Environmental Cooperation Commission (BECC). As of today, the Bank has four lending mechanisms to support the construction of environmental infrastructure: a traditional loan program that offers funds at market rates or low-interest rates; a Border Infrastructure Fund (BEIF) that allocates grants from the Environmental Protection Agency (EPA) in municipal drinking water and wastewater projects; a Solid Waste Environmental Program (SWEP) and a Water Conservation Investment Fund (WCIF)^{ix}.

This institution is an important financial intermediary in the border region. As a recent report indicates, as of September 2009, BECC had certified 161 environmental infrastructure projects with an estimated cost of US\$3.46 billion. The same document mentions that NADB has contracted more than USD\$1.03 billions in loans to support 130 of these projects, which represents 93% of all approved funding (NADB-BECC. 2009). These numbers are good indicators of the importance of NADB in terms of project financing. Unfortunately, these indicators do not permit a proper assessment of two issues that are crucial to understanding some of the challenges of this funding mechanism: the cost of financing loans with NADB and the capacity of the borrower to repay.

These issues were among the concerns of various federal agencies in the U.S. ten years ago. In the year 2000, the U.S. General Accounting Office released a draft version of a report that discussed the status of environmental infrastructure in the U.S.-Mexico border (U.S. General Accounting Office. 2000). On that occasion, The Environmental Protection Agency (EPA), the Department of State and the Department of the Treasury voiced their concerns about the cost of financing associated with NADB

loans^x. As the Department of State highlighted at that time, “[t]here [was] a wide perception that the low level of lending by the NADBank result[ed] largely from its inability to offer lower than market rate financing mechanisms that would make loans more affordable or attractive to poorer border communities”. Interestingly, for the Department of the Treasury the problem was not the interest rates charged by NADB but the limited financial capacity of many border communities and their ability to pay back any bank loans. Does this situation remain?

To find out, one must first ask how expensive a NADB loan is, when compared to other funding alternatives. When GAO released their report ten years ago, the Department of the Treasury stated that while NADB loans were competitive in Mexico, the Bank was not able to compete with the heavily subsidized programs that existed in United States (e.g. tax-exempt municipal financing or state revolving funds). This situation has not changed much since. According to NADB officials, the Bank charges Mexican clients interest rates ranging between 8.6% and 10.5%, which are usually smaller than those charged by commercial banks. And while numbers were not available for the United States, Bank’s officials considered that NADB rates were still high compared to lending programs sponsored by federal and state governments (especially for water and wastewater projects)^{xi}. This is an important challenge that policymakers in the United States still need to confront. As a recent assessment of infrastructure needs for the state of New Mexico recognizes, “[a]lthough the general perception may be that environmental infrastructure is more commonly available in US communities, there continue to be populations in the US without adequate water, wastewater, solid waste services and paved roads” (BECC. 2009). Here lies the importance of exploring measures to try to enhance the competitiveness of the Bank in terms of interest rates. These efforts, nevertheless, cannot (and should not) rely on the use of subsidies or grant programs to lower the cost of borrowing. Even if the effectiveness of these policy tools could be demonstrated, current and expected budget constraints will make it difficult to guarantee grants of subsidies that are large enough to reduce the interest rate for NADB loans.

The repayment capacity of borrowers, which is the second problem mentioned in the response to GAO from the Department of the Treasury, remains a challenge for the border region. Since poverty is common in many border communities, finding ways to reduce interest rates is not enough. It must be made clear that a model of financial intermediation will not be successful if its implementation is not accompanied by policy measures to foster regional development.

3 Where to go from here? Alternative funding mechanisms

3.1 Banking and Investment for the environmentally conscious

One of the objectives of this paper is to invite readers to explore policy alternatives that could help bridge the existing gap in environmental infrastructure. And while there will be cases in which the provision of a good will not occur without public financing, there will be situations where private participation is feasible. There is an increasing interest from private investors on environmentally related businesses. The size of this market has been growing steadily and, to some extent, reflects the interest of many companies and corporate investors to allocate savings in areas labeled “green technologies” or “socially responsible investments”. Labatt and White discuss some of the products that private financial institutions are creating to meet the demands of the more environmentally conscious investors (Labatt and White. 2002).

One possibility that they mention involves financial products that banking institutions offer to clients that meet environmental performance standards and want to have easier access to capital markets. Some of these financial products could even be used to complement existing governments programs to finance projects with limited profit potential. According to these authors, many banks have been creating products such as environmental loans and leases to promote the creation of environmental

markets (water purification equipment and sustainable energy products), or have been active participants in the funding of projects that are capital intensive and offer little or no profit. There is a wide array of products that banking institutions around the world are creating to access an increasingly attractive market niche (see table 4).

Table 4.
Environmental Products offered by Banking Institutions (Lending)

Product	Main features	Offering institution <i>(List is not exhaustive)</i>
Preferential Banking Packages	Products to promote environmental care offered to holders of current accounts. The balance in customers' current account used for loans and investments in sustainable development projects	<ul style="list-style-type: none"> • Cooperative Bank (United Kingdom)
Green Mortgages	Buyers of sustainability built homes negotiate loans with lower interest rates. Homes must comply with stringent standards for energy use, water conservation, use of materials and internal environment	<ul style="list-style-type: none"> • ING Bank • Dutch Government Green Project Schemes • Cooperative Banks
Green Certificates	Tax incentives to investments in green projects that meet the criteria for "Green certification"; private individuals investing in the system are also eligible for tax exemptions	<ul style="list-style-type: none"> • Dutch government (Green Fund System)
Financing of environmentally favorable projects	Promote investments on areas like environmental technology, energy-efficiency investments, environmental management, soil remediation, or recycling infrastructure.	
Source: Labatt and White (2002)		

A second possibility is to explore the potential effectiveness of financial products that fall within a category of investments known as "Socially Responsible Investments" (SRI). This is a business strategy that privileges the inclusion of social and environmental standards to the criteria that is used to decide investment allocations. According to a report by the Social Investment Forum, this is a US\$2.71 trillion market that comprises approximately 11% of total assets managed only in the U.S. and that is growing faster than the broader universe of assets (Social Investment Forum. 2007).

The same report indicates that this growth is partly explained by an increasing demand for products offering good rates of return, that promote environmentally friendly projects, or that incorporate social

development indicators in the criteria to assess companies. The demand is particularly driven by the opportunities offered by areas such as green technology, alternative and renewable energy, green building and property development and other environmentally driven businesses.

The “Dow Jones Sustainability Index” (DJSI) is a good example of the opportunities that private investment can bring to the border region. The DJSI tracks the financial performance of the leading sustainability-driven companies worldwide. The size of this market, if measured by the value of the stock that asset managers hold, is over US\$8 billion. What makes these stocks different from others is that investors (or fund managers) will pay attention to measures of sustainability that are quantifiable and show that a project (or company) meets a series of predetermined environmental standards^{xii}.

The criteria to judge if a company meets environmental and social responsibility goals is still under debate. And while some organizations consider that many of the elements used in the screening and assessment of companies are basically ideological^{xiii}, some of the projects identified in the most recent needs assessments could be fully compatible with SRI investing guidelines (one example would clearly be green energy). Exploring this possibility implies that the sponsor of a project is willing to disclose information about factors that would be required to establish eligibility. This is precisely one of the challenges that asset owners and managers face in emerging markets, where disclosure on environmental, social and governance factors is not common (EMDP/EIRIS. 2009). SRI may be useful for the development of environmental infrastructure in the border region. An interesting issue to be researched would be whether some of the indicators that fund managers analyze can be incorporated into BECC’s certification process. This is not an unreasonable possibility, especially if the project to be financed has reasonable margins of profitability and if project sponsors conclude that the SRI business model can effectively reduce the cost of borrowing. If this is a funding alternative that governments

want to consider, it will be necessary to make decisions about the sectors where private investment will be permitted, whether disclosure requirements will be honored, and if the necessary changes to the regulatory framework will be enacted.

3.2 Thinking outside the box: How about a bi-national debt-financing model?

The previous section serves to illustrate that the private sector can contribute to the development of certain environmental projects through financial packages that banks create, and through investment funds that pay close attention to factors related to corporate sustainability, social responsibility, and environmental preservation. This could be an important method to develop critical infrastructure in the border region. The question, however, is whether those investment flows can be channeled to the type of projects that BECC identified in its latest assessment. But even if this is the case, it should be noted that these are decisions that the private sector needs to make (i.e. fund managers, banks, companies, etc). Governments can promote the establishment of companies that are interested in corporate sustainability. Yet, the decision to meet with sustainability and social responsibility standards pertains to the companies themselves.

Interestingly, there are other policy alternatives that border governments could use to attract private investment to the region. One of these alternatives involves the development of sub-national capital markets. At first glance, it may appear that a proposal to explore sub-national capital markets would be more appropriate for Mexico because, as Erickson and Eaton point out, state and local governments in the United States have been accessing these markets for some time. But if one takes into account that the benefits, costs and risks associated with many border projects are of a bi-national nature, it is important to start thinking about policy innovations from a bi-national perspective as well. With this premise in mind, the proposal is to consider the possibility that a sub-national government in Mexico

and a sub-national government in the United States access the debt market by issuing debt instruments jointly.

What the existing regulatory framework permits is the existence of a fragmented mechanism to raise the necessary funds to finance a project. This situation is understandable if one takes into account the fact that Mexico and the United States are sovereign countries with their own regulations and infrastructure development programs. One must wonder, however, if this is the best way to proceed. An illustrative example of the perils that a split funding method entails is the case of an international crossing. Traditionally, paying for the construction of a new port of entry has been a federal government responsibility but, as already explained, tighter budget constraints and shifting policy priorities have induced governments to explore alternative funding methods. In Mexico, the tendency has been to rely more on public-private associations while in the U.S., a recent experiment has been to grant local governments with the authority to issue bonds and set up fees^{xiv}. But what would happen if, for any reason, one of the parties involved were not able to secure its share of the funding in a timely manner? Why not extend coordination efforts to issues related to infrastructure finance?

A **“bi-national debt financing model”** would allow governments on both sides of the border to enter capital markets in better conditions. A funding model like the one proposed here is based on the idea that pooled financing methods can contribute to reduce issuance costs and reduce interest rates to the borrowers. This is a plausible idea especially since Mexico and the United States already have a positive experience with joint financing operations. The North American Development Bank is a bi-national institution that provides financial intermediation services for the region and which is capitalized by the two countries. The problem, as already explained, is that it works with a restrictive mandate that limits the projects to be financed. A bi-national debt-financing model would enable

governments in the border region to mobilize private savings and pay for projects that NADB cannot finance.

At this point, it is important to mention that there is a difference between obtaining the funds for a project from a bank (e.g. NADB) and from the bond market. Bank lending and bonds are models of financial intermediation with different characteristics (Peterson, 2002)⁵. In the former case, we are considering a financial intermediary that monitors issues affecting loan repayment on behalf of the investor. In the latter case, the investor who considers the purchase a bond must perform some of these functions. Both models have advantages and limitations that policymakers in Mexico and the United States would need to consider. One of them is the adequacy of a policy to allow sub-national governments access to the capital market directly (as issuers). In this case, investors would need to monitor the financial condition of the issuing governments directly and would need to assume the risks associated with the project⁶.

Both models of financial intermediation –banking and bond markets— have advantages and limitations that policymakers need to ponder carefully. The NADB gives a clear idea of the possibilities that a bi-national and well-funded institution can offer to the border region. Notice, however, that if there is an interest in developing the latter option, both countries will need to engage in a process of institutional harmonization. The countries of the Association of South East Asian Nations (ASEAN) can be a good reference point to understand the steps that Mexico and the United States would need to take, as they

⁵ There is an extensive literature dealing with issues of financial intermediation and credit market development. The literature is not discussed in this document for reasons of space. Interested readers could review: Diamond, D. 1991. Monitoring and Reputation: the Choice between Bank Loans and Directly Placed Debt. *Journal of Political Economy*. 99(41): 689-721. or Freire, M., and Petersen, J. (2004). *Subnational Capital Markets in Developing Countries: From Theory to Practice*. Washington, DC: World Bank/Oxford University Press.

⁶ The term investor is used broadly in this sentence. While it may certainly refer to the owner of the funds to be lent (e.g. savings), there are other actors in the bond market that may act as a link between the issuer and the final investor. Bonds issued by government entities are usually sold through entities called underwriters, which are groups of investment or commercial banks that purchase the bond and resell them to investors. A more detailed explanation can be found in Leonard, P. (2004). Debt Management. In J.R. Aronson, and E. Schwartz (Eds.), *Management Policies in Local Government Finance*: ICMA.

have been working on the creation of a regional bond market since the 1990s (Asian Development Bank. 2008). Ismail Dalla summarizes some of the specific steps that member countries are taking to move forward with this process (Dalla. 2003). As he points out, a harmonization process to foster regional bond markets must encompass issues such as tax treatment, credit rating requirements, trading platforms and conventions, clearing and settlement procedures, accounting and auditing standards, and foreign exchange regulations. If both countries truly want to explore innovative means to finance strategic border infrastructure, leaders could engage in a constructive dialogue to evaluate the feasibility of a bi-national bond market mechanism like the one proposed in this paper. If a basic agreement on this regard can be attained, it would be our task, as scholars, policymakers, and residents of the border, to achieve the objectives that would bring this project to fruition.

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ⁱ The U.S.-Mexico Border Program is administered by the U.S Environmental Protection Agency (EPA) and serves to fund critical infrastructure along the border region. The program focuses on

cleaning the air, providing safe drinking water, reducing the risk of exposure to hazardous waste, and ensuring emergency preparedness (See <http://www.epa.gov/usmexicoborder/>)

ⁱⁱ There is an important clarification that needs to be made at this point. While the authors use the term user fees in their document, there is a difference between user fees and user charges. The former refers to revenues derived from the sale of a license to engage in an activity that would otherwise be forbidden or restricted. The latter refers to the price that a government can impose for the voluntary purchase of a publicly provided good or service. See Mikesell, J. (2007). *Fiscal Administration: Analysis and Applications for the Public Sector*.

ⁱⁱⁱ One example is the Otay East port of entry in San Diego, California. More information can be found on the website for the San Diego Association of Governments (<http://www.sandag.org/index.asp?projectid=56&fuseaction=projects.detail>)

^{iv} There are many types of bond instruments. Interested readers may find additional information on Leonard, P. (2004). Debt Management. In J.R. Aronson, and E. Schwartz (Eds.), *Management Policies in Local Government Finance*: ICMA.

^v There are six states on the Mexican side of the border (Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas). The estimated investment is only for projects to be located 100km (62 mile) south of the international border.

^{vi} These are numbers for the whole states and not for the 100km. range mentioned in the definition for the border region.

^{vii} A good or service is of a public nature when it becomes difficult to charge consumers a price for its use or when the use of such good or service does not preclude others from using it. This, however, is a broad definition that may vary among cases or across countries. One example would be water, which in Mexico is considered a national resource and a right that should be available to all consumers. In the United States, on the other hand, water is perceived as a service for which consumers need to pay.

^{viii} There are other sources of funding for BEI projects As EPA points out there are strategic investments where state and local governments, or bilateral or multilateral organizations such as the World Bank, Inter-American Development Bank or North American Development Bank participate. While their participation in the financing of border projects can be significant, this paper will not analyze their contribution in detail.

^{ix} Details about these programs are available on the NADB's website:

<http://www.nadb.org/programs/brdrenv.html>

^x The response letters are included in the appendix of the GAO report.

^{xi} The author wants to thank Juan Antonio Flores (Associate Director of Public Affairs at NADB) and his staff for providing this information.

^{xii} The elements that they take into account when assessing investments consider different dimensions are available on http://www.sustainability-indexes.com/07_html/assessment/criteria.html

^{xiii} See <http://www.ncpa.org/pub/ba657>

^{xiv} This method will be put into practice in the construction of the U.S. portion of the Otay East International Crossing between California (United States) and Baja California (Mexico).