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# Assessment of Business Incubation Programs in Northern Mexico: Their Readiness for Clean Technology

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NATIONAL BUSINESS  
INCUBATION ASSOCIATION



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## Contents

### Executive Summary

Background .....	4
Findings .....	4
Recommendations .....	7

### Methodology

#### Findings

Survey Results .....	9
1. Incubation practices and operations .....	10
2. Business incubator financial model .....	12
3. Clean-energy technology focus.....	16
Overall assessment summary .....	17

#### Recommendations

Top-ranked programs .....	18
1. TxTec, A.C., Hermosillo Sonora .....	19
2. Centro Incubador de Empresas, Universidad Tecnológica de Tijuana.....	19
3. Incubadora de Empresas de la Universidad Autónoma de Nuevo León, .....	19
4. Incubadora de Empresas del ITESM – Campus Monterrey, Monterrey Nuevo León.....	19
5. Centro de Incubación de Empresas, Universidad Tecnológica de Coahuila, .....	20
6. Incubadora de Empresas del ITESM - Campus Laguna, Torreón Coahuila .....	20
Future opportunities.....	20

<b>Appendix A</b> .....	25
<b>Appendix B</b> .....	27
<b>Appendix C</b> .....	29
<b>Appendix D</b> .....	30
<b>Appendix E</b> .....	36

## Executive Summary

### Background

The National Business Incubation Association (NBIA), with funding from the United States Agency for International Development (USAID), has undertaken a diagnostic study of business incubation programs in northern Mexico. The objective of this study is to determine the feasibility of bolstering four to six business incubation programs that have the most potential to incubate viable clean energy technology businesses, with tailored follow-on support. This diagnostic assessment and related future technical assistance are supported by the Abt. Associates Inc. Mexico Competitiveness Project, Professional Services Agreement 27817.

By some accounts, more than 450 business incubation programs operate in Mexico, located in 180 cities and within 292 universities, technological institutes or other institutions. This study focuses on incubation programs in Mexican states along the U.S./Mexico border. From those states, 57 incubation programs were invited to participate; 21 of those programs responded to a survey about their infrastructure, services, stakeholder and community support, and desire to participate in future phases of the project. Thereafter, NBIA’s consultant conducted site visits to six top-performing programs identified through the survey for further evaluation, which allowed us to rank incubation programs in terms of the suitability for later stages of this project.

### Findings

**Table 1** reflects NBIA’s findings from the 21 survey responses and six on-site interviews with select incubation programs in the Northern Mexico Border States (NMBS).

**Table 1**

Summary of On-Site Interviews and Survey Responses	
Government Sponsorship Concerns	<ul style="list-style-type: none"> <li>• Program funding model discourages longer incubation periods, limiting client support to an average of 13 months (max. 24 months); a longer period of assistance is needed to maximize clients’ chances of success.</li> <li>• Annual program funding allocations are too far apart to ensure service continuity.</li> <li>• Outcome measures focus on the number of companies created rather than the number that survive.</li> </ul>
Incubator Financial Sustainability	<ul style="list-style-type: none"> <li>• With subsidies accounting for the majority of program revenue, incubators are forced to make decisions that sacrifice quality client development.</li> <li>• Only a third of the programs operate with a balanced budget or surplus; almost half are unsure of their program’s financial status.</li> <li>• Most incubators do not have sufficient leasable space to generate rents that could help support their program (less than 10 percent collect rent), nor do they produce revenue from service fees (less than 25 percent charge for services).</li> <li>• NMBS incubators operate on about 10 percent of the revenue generated by North American incubation programs as a whole.</li> </ul>

Incubation Practices	<ul style="list-style-type: none"> <li>• Incubator managers do not readily bundle business assistance into comprehensive support services; support should not be episodic and self-directed.</li> <li>• Incubation periods are significantly shorter in NMBS incubators (13 months, on average) than best-practice programs elsewhere (33 months, on average, in North America).</li> <li>• More than half of incubators use a graduation policy based on time limits rather than company preparedness.</li> <li>• Less than half of incubators work with venture capitalists or angel investors, operate in or near a technology park or have a fund to improve client access to capital.</li> </ul>
Incubation Facilities	<ul style="list-style-type: none"> <li>• Only about half of the programs surveyed offer office space to clients, despite the advantages of peer-to-peer learning associated with colocation/coworking spaces.</li> <li>• None of the visited incubators offered shared facilities like lab, manufacturing or production space – an essential part of developing infrastructure for clean-tech commercialization.</li> <li>• Programs without facilities have requested support locating and securing suitable client space and devising a tailored rental model.</li> </ul>
University and Innovation Ecosystem Linkages	<ul style="list-style-type: none"> <li>• 95 percent of surveyed incubators have a relationship with at least one university; percent reported a partnership with a university in the U.S.</li> <li>• Three in four programs are affiliated with other entrepreneurship or tech-commercialization organizations.</li> <li>• Programs tended to focus on regionally prominent technologies and affiliated university expertise.</li> <li>• University departments vary in their support of tech-commercialization process, which implies that university staffing and research training would improve consistency and accessibility to resources.</li> </ul>
Client Problems	<ul style="list-style-type: none"> <li>• Incubator managers expressed concerns that clients do not value incubator services.</li> <li>• Seed funding is needed to supplement what clients receive from the government to get them to the point where they can access seed and angel capital.</li> <li>• Most incubators don't require business plans for admission to program; there is limited external pre-incubation support.</li> <li>• Clients often don't have access to lab space and university infrastructure without enrolling in or contracting with a university.</li> </ul>
Clean Energy Technology Commercialization Readiness	<ul style="list-style-type: none"> <li>• Half of the incubators have a relationship with universities offering clean-tech programs or classes.</li> <li>• Many programs are developing capabilities to support clean-tech commercialization.</li> <li>• 29 percent have helped patent new technologies (14 percent of which are new clean-energy technologies); 62 percent have graduated technology companies (38 percent of which are clean-tech companies).</li> <li>• Favored clean technologies are solar, green building, water filtration/purification and bio-fuels.</li> <li>• Program managers requested training for clean-technology commercialization.</li> </ul>

Of the concerns and opportunities identified in **Table 1**, some areas of weakness are recurring and perhaps merit more attention:

1. ***Federal government lacks a clear understanding of business incubation processes.*** The system of funding incubation programs in Mexico provides few incentives for incubators to provide quality services to clients. Instead, the supporting agencies seem to employ a “spray and pray approach,” focusing more on the quantity of entrepreneurs served than on the long-term success of the start-ups. It would be advisable to recommend training programs to educate government officials about business incubation best practices, where possible, to improve their understanding about the importance of providing quality services to clients and finding sufficient funding to make incubation programs sustainable.

2. ***Programs should be run like the businesses they aim to assist: sustainably.*** Incubation programs in the NMBS region rely heavily – and sometimes exclusively – on funding from the Mexican Federal Government. This overreliance on one source of revenue adversely affects programming decisions and detracts from client outcomes; it can also introduce program vulnerabilities that limit its sustainability. Incubation programs should consider diversifying their sponsorship models and charging fees for services based on the unique needs of their market.
3. ***Incubation practices tend to be episodic rather than continuous.*** Most if not all incubators surveyed operate like small business development centers rather than business incubation program: Incubation services are unstructured and based only on client requests. This structure assumes that clients know what types of assistance they require at various points of their development, which is not always the case. Clean-tech incubation often requires prolonged incubation periods to ensure that clients are more likely to be free-standing upon graduation.
4. ***Access to shared services and colocation is essential to successful incubation.*** U.S. incubators typically have larger facilities in which to house client companies. On average, the size of incubators across North America is 18 to 20 times larger than those in the NMBS region. Many incubator managers in the United States, as well as many incubator clients and graduates, view shared facilities and client colocation to be a leading value proposition for creating a sustainable business. With much smaller incubation facilities – or no facilities at all – in the NMBS region, program managers there are unable to charge rents to help diversify their revenue streams; it can also increase the cost of service delivery.
5. ***Incubation programs in this study can leverage their university affiliations.*** Many incubation programs in this study reported affiliations with universities that could help provide essential services and/or space. However, where universities are engaged, support levels vary. Some departments participate more in technology commercialization practices than others; some universities require clients to enroll in the university to access university infrastructure. Training of university researchers and administrators could improve support levels and consistency.
6. ***Clients struggle to access start-up and operational finance.*** Although this is a problem for start-ups and emerging companies everywhere, it is particularly acute for technology companies – and especially clean-tech companies – in Mexico. These firms often have longer and more expensive set-up costs than other incubator clients. Special training may help incubation programs to create local private angel networks for clients; further research could identify other financial opportunities.
7. ***Incubators can support clean-tech companies.*** Many incubators have the university and affiliated organizational support, as well as previous technology commercialization experience, to prepare them for clean-tech incubation. With the right capacity development, NBIA expects that many new opportunities can be supported.

## **Recommendations**

This study reveals there is, indeed, scope to make investments that improve chances for clean-tech commercialization in NMBS; however, that support should be allocated to a subset of highly ranked incubation programs within the region that exhibit the greatest overall readiness for future support.

The six top-ranked incubators in this study are TxTec, A.C., Hermosillo Sonora; Universidad Tecnológica de Tijuana, Tijuana Baja California; Universidad Autónoma de Nuevo León, Monterrey Nuevo León; Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey Nuevo León; Universidad Tecnológica de Coahuila, Ramos Arizpe Coahuila; and Instituto Tecnológico y de Estudios Superiores de Monterrey - Campus Laguna, Torreón Coahuila.

Investing in the future capacity of these six incubation programs would leverage their existing strengths, while addressing systematic, institutional and unique organizational weaknesses that could inhibit their future performance. Later in this report, NBIA recommends several technical assistance programs that could be provided over the next 12-18 months. Proposed interventions focus on incubator managers, university researchers and administrators, program sponsors (like government agency officials) and the local private investment community.

In the remainder of this report, we describe the study's methodology, which included a survey of medium- and high-technology incubators and site visits to the highest survey scorers for more in-depth evaluation. We also explain our findings in terms of business incubation best practices and operations, incubation financial models and clean-tech capabilities. We then include a brief summary of findings from the six site visits in rank order, illustrating the strengths and weaknesses for each program. In the final section, we provide recommendations for capacity building and training that would better prepare program staff to support clean-tech businesses.

## **Methodology**

The original list of business incubators in the Northern Mexico Border States that had a medium- or high-technology focus included 57 programs.<sup>1</sup> To identify those programs that have the highest potential to support clean-technology businesses, we conducted a survey that allowed us to rank the programs so we could visit the top performers. In the final step, we visited the top six programs to determine the strengths and weaknesses of each.

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<sup>1</sup> List provided by the Secretaria de Economía ([www.contactopyme.gob.mx/snle](http://www.contactopyme.gob.mx/snle), accessed 12/1/2010).

We designed our questionnaire to elicit information that would indicate an incubation program's level of sophistication in the areas of business incubation and technology commercialization. This questionnaire covered three areas:

1. Incubation practices and operations – asks questions about the incubator's structure, its policies and procedures, and its experience in assisting entrepreneurs.
2. Business incubator financial model – refers to the incubator's funding sources, income streams and overall financial stability.
3. Clean-energy technology focus – asks for information that will indicate the incubator's experience and readiness to deal with clean-tech clients.

We assigned each question a weighted score to reflect the most and least desirable characteristics for this study. **Appendix A** lists the indicators and the scoring criteria.

We sent the questionnaire via e-mail to all incubation programs in the NMBS that identified themselves as medium- (53 programs) or high-tech incubators (four programs). We followed up through e-mail and telephone calls to encourage incubator staff to complete and return the surveys. Many of the programs had outdated information; **Appendix B** lists the programs we were able to contact and those we could not reach. As incubators submitted their responses, we logged the time and date received, entered responses into a database and scored the responses to attain an overall score for each incubation program. **Figure 1** lists the programs surveyed and their overall survey score.

We reviewed the responses from the top 10 programs for consistency to ensure there were no evident discrepancies that could have affected their score. We determined that the scores received by the top six programs were justifiable and chose those programs for site visits.

We conducted site visits of these six programs over the course of two weeks. During the visits, we met with each incubator director and, in some cases, the program or department head as well. We toured any incubator facilities they had and gathered information about their programs. We also asked whether the program would be receptive and able to make changes to improve its long-term success, given the possibility of external support. Finally, we asked incubator managers to name their top unmet need that hinders their program's success. We created a subjective score, on a scale of 1-4, for each of the areas reviewed during the site visit; **Appendix C** lists the criteria. We combined the site-visit score and the survey score to arrive at a final ranking of programs, based on their potential to create and incubate viable and successful clean-tech businesses.

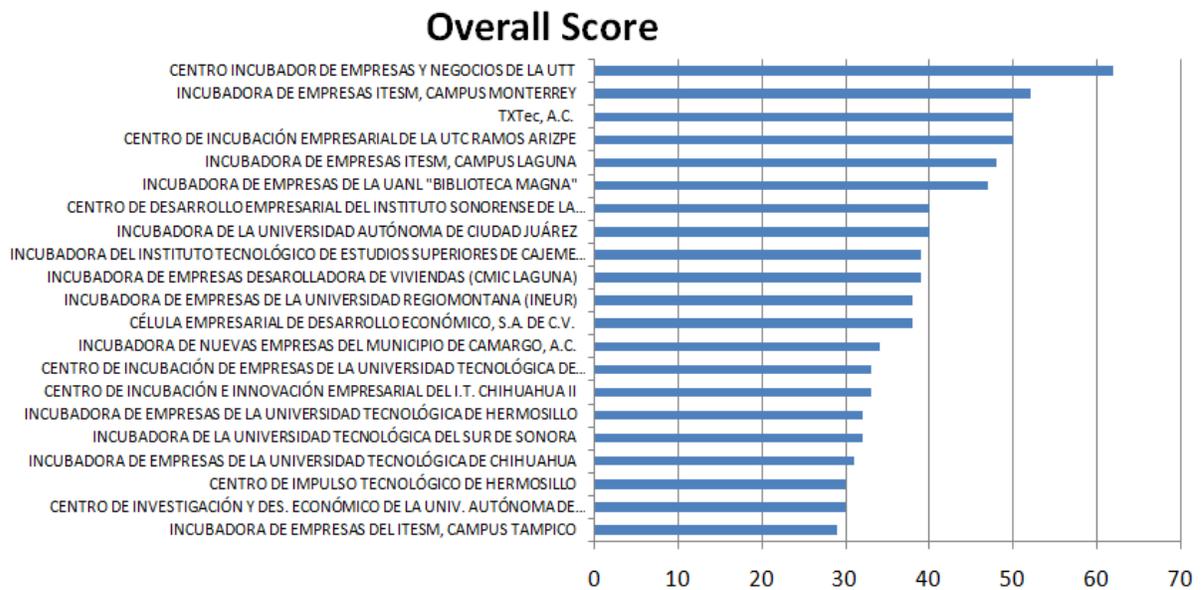
## Findings

### Survey Results

The overall survey score illustrates three main areas relevant to this study, which are detailed in this section. First, we look at incubation practices, comparing the findings from this study with what NBIA research has established as industry best practices. We then look at the programs' financial model to determine their financial viability, based on their funding sources and revenue-generating activities. Finally, we look at the incubators' clean-tech capabilities, based on their relationships with universities and their experience in technology commercialization.

We sent out 57 surveys via e-mail, with two subsequent e-mail reminders and one reminder by telephone. We were unable to reach 14 incubators by e-mail or telephone, while 21 returned their survey responses, with scores ranging from 29 to 62 (out of a possible 96).

Figure 1



We compared the overall survey averages for the population of survey participants with the responses from the six top programs. As shown in **Tables 2 and 3**, in most instances, the average responses of the top-performing programs tended to be higher than the overall averages. However, in four cases, average responses of the top scorers were lower than those of the survey population as a whole.

**Table 2**

Programs Adhering to Each Practice		
n=21	Top 6	
100%	100%	Have a business plan and/or strategic plan guiding its operations
100%	100%	Give clients assistance to acquire funding
100%	100%	Have graduation criteria
90%	100%	Have a presence in the local business community
86%	67%	Have a clear, current and appropriate mission statements
86%	83%	Give clients a set time in which they must develop their business plan
81%	100%	House client companies in the facility
76%	83%	Have an active and involved Board of Directors and/or Advisory Board
71%	67%	Participate in local chamber of commerce activities
62%	100%	Share a laboratory with a university
52%	67%	Have laboratory space available for client use
52%	50%	Have selective entrance criteria
43%	83%	Have a relationship with VC or angel investor organizations
10%	33%	Are part of a technology park
5%	0	Have funds for client capital
0	0	Require clients to have a completed business plan prior to entering
0	0	Require clients to have their own funding prior to entering

Specifically, only 67% of the top scorers have a current and appropriate mission statement, whereas 86% of the total population does so. Having a clear mission statement is important to an incubation program because it helps ensure that its staff and board remain focused on that mission when making decisions about programming and other activities. We also found only 83% of the top-performing programs offer business administration training and 67%

offer coaching, compared with the overall rates of 90% and 71%, respectively. Both of these services are important forms of business assistance that best-practice incubation programs usually offer. Finally, we found that 67% of the top-scoring programs claim to be active in their local chambers of commerce, compared with 71% of total survey participants. Having a strong presence in the community not only serves as a recruiting tool for the incubator, it also helps the incubator’s client companies network to find customers and other resources.

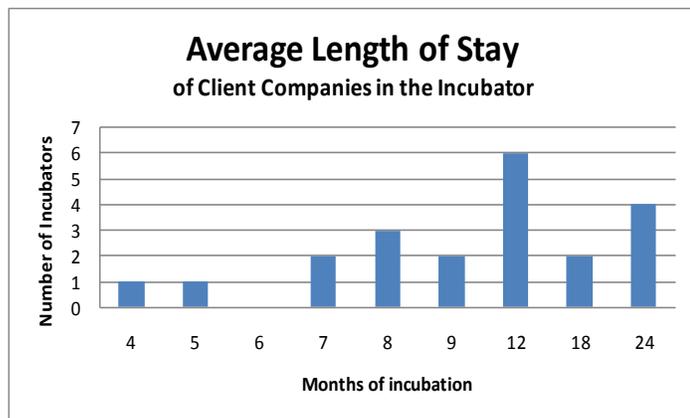
**1. Incubation practices and operations**

In this section, we summarize our findings relating to business incubation practices by focusing on two major areas. First, we looked at the time client companies spent in incubation programs included in this study and found that their incubation periods were significantly shorter than those of best-practice programs in other markets. We found that program funding cycles and the way funders measure program outcomes create incentives for managers to keep incubation periods short. Then, we looked at the service delivery models used by incubators in this study, matching them against NBIA best-practice indicators, and found that the programs we studied are providing fewer and less comprehensive services than NBIA recommends. Lack of accountability for client success and short funding cycles also influence programs’ service delivery priorities.

To be most successful, incubation programs must provide clients with a full array of services, and firms must be given sufficient time in the program to take advantage of those services and grow. Companies that have long research cycles, such as some clean-tech firms, often need more time in an incubator to develop their product and achieve sustainability. According to NBIA’s 2006 *State of the Business Incubation Industry* report, clients of North American incubators spend an average of 33 months in incubation programs before graduating, ranging from one month to 72 months. In this study, we found clients spent an average of 13 months in the incubation programs; as illustrated in **Figure 2**, the range is four months to 24 months. Having a maximum of 24 months for clients to complete the incubation program may not be sufficient for client companies to receive the services they require to reach financial viability.

In interviews with incubator managers, we found they attributed this short incubation period to two major factors. First, most programs rely on funding from the Mexican Federal Government, granted on a yearly cycle for the number of companies they will incubate that year. At the end of the year, each program must justify its expenditures by showing that its clients have registered with the *Secretaria de Hacienda* (Mexican Ministry of Finance). The incubator receives no further funding for that company after this point, removing incentives to continue the incubation process.

Figure 2



The second reason managers cited for the short incubation period is that the outcome measures tracked by their funding sources focus on the number of companies created rather than the company’s survival after incubation. Programs provide services at a more superficial level to get them operational, even if these firms are not viable for the long-term. In most instances, incubators rely heavily on coaching and mentoring by consultants, with few mechanisms to ensure the quality of services provided. Incubators do not offer a structured process to provide assistance for each company but rather provide services “on demand.” **Table 3** illustrates that the more specialized services – such as legal assistance, intellectual property support and help with financing – are the services offered least often by NMBS incubators, although these services would be useful to technology start-ups, in particular.

**Table 3**

Percent of Incubators Providing Each Service					
<i>n=21</i>	<i>Top 6</i>		<i>n=21</i>	<i>Top 6</i>	
100%	100%	Access to consultants	76%	100%	Meeting rooms/space
95%	100%	Networking opportunities	71%	67%	Coaching
95%	100%	Mentoring	71%	83%	Legal assistance
90%	83%	Business admin., training	71%	83%	Intellectual property support
81%	83%	Office admin. Support	52%	50%	In-house financing
81%	83%	Business planning support	48%	83%	Investor meetings

In NBIA’s 2006 *State of the Business Incubation Industry report*, we find the services offered most often by best-practice mixed-use incubators are help with

business basics, networking activities among incubation program clients and marketing assistance. In technology incubators, the most often-mentioned services are help with business basics, access to funding sources and networking activities among incubation program clients. This difference between these two lists reflects NBIA’s principle that best-practice incubators do more than offer a menu of client services. “It must customize and effectively implement these services as part of a comprehensive business assistance program that meets the incubator’s mission and goals.”<sup>2</sup>

Incubators in this study have not designed their practices to ensure that clients receive all the support a best-practice incubator would offer. To develop successful clean-tech companies, incubators must develop programs that are more comprehensive, improve service delivery and give companies enough time in the program to reach sustainability.

**2. Business incubator financial model**

In this section, we look at the responding incubators’ business models, and find that most programs will have difficulty achieving self-sustainability under their current models. We first looked at the diversity of funding sources for each program and its financial position, and found that NMBS incubation programs rely heavily on government funds, which risks the incubator’s future viability. In fact, only a third of the programs in the study have a balanced budget or a surplus. We then broke down the structure of program revenue and found that most incubators in the study do not have sufficient leasable space to support their programs, and the programs are not producing revenue from service fees as they could.

Incubators in the study rely heavily – and sometimes exclusively – on funding from the Mexican Federal Government. Of the 21 survey respondents, only three did not receive funds from the government. Of those that received federal funds, 17 received subsidies through the Ministry of

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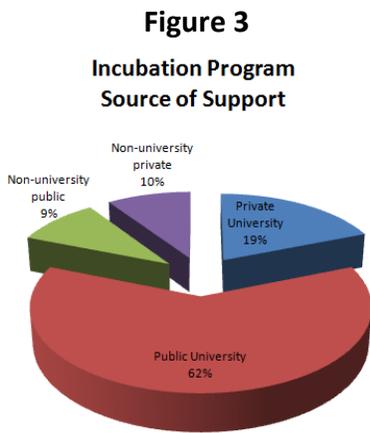
<sup>2</sup> *Best Practices in Action: Guidelines for Implementing First-Class Business Incubation Programs, Revised 2<sup>nd</sup> Edition* (2010), NBIA Publications, p. 99.

the Economy (representing between 20 percent and 70 percent of their income), and one received 100 percent of its funds from the Ministry of Education.

NBIA research has shown that relying on one source for funding leaves programs in a vulnerable position; in **Table 4** we show that the programs in the study are heavily reliant on government funding. In Mexico in particular, the political environment can heavily influence program funding. Reliance on government support is not dependent on the incubator’s sponsoring entity. **Figure 3** illustrates the proportion of incubators that are university sponsored and those privately versus publicly sponsored.

**Table 4**  
Programs Receiving Funding from Each Source  
*n=21*

<b>Federal Government</b>	86%
<b>State Government</b>	43%
<b>Local Government</b>	33%
<b>Private Organizations</b>	29%
<b>Incubator Services</b>	52%



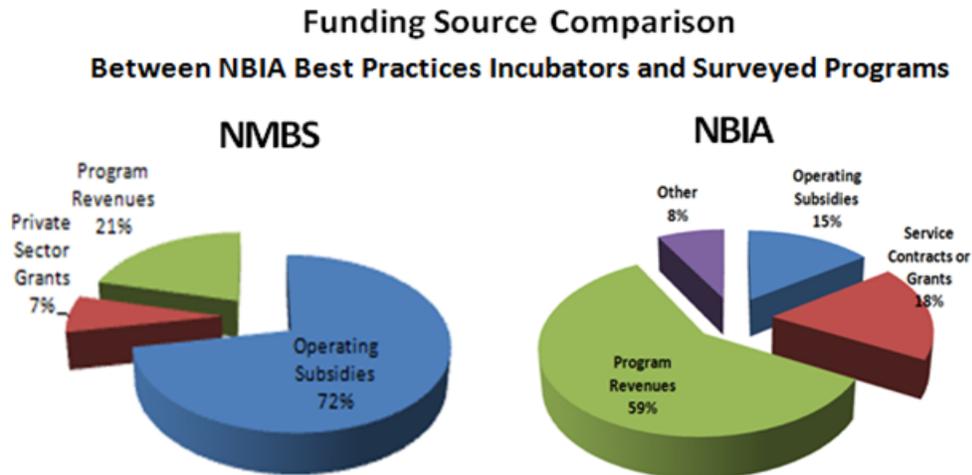
More than half of the incubators in this study receive support from a public university; they receive an average of 61% of their funding from the Mexican Federal Government. Incubation programs sponsored by private universities receive an average of 35% of their funding from the Federal Government. By contrast, among programs not supported by a university, publicly sponsored programs receive 30% and privately sponsored programs receive 70% of their funding from the Federal Government.

Because they are so reliant on these sources of funding, incubators often must make programmatic decisions that meet mandates from funding sources rather than the needs of their clients.

For example, North American Incubators typically have an ongoing admissions process that enables them to selectively accept or reject applicants at any time. However, NMBS programs request and receive funding once a year based on the number of companies waiting to begin the incubation process, and the funds must be spent within a given time period. Consequently, programs must require clients to wait months until funding is available. Ultimately, the programs forgo strict entrance criteria in order to enroll the target number of clients in the timeframe stipulated by the Federal Government. Programs with more diversified revenue streams have found ways to circumvent this government-imposed limitation by supplementing program income throughout the rest of the year.

NBIA has found that the most successful incubation programs diversify their revenue sources. In NBIA’s 2006 *State of the Business Incubation Industry* report, 59 percent of all incubation program revenues came from rents and/or client service fees, and 18 percent came from service contracts and/or grants. Only 15 percent of revenues came from cash operating subsidies.

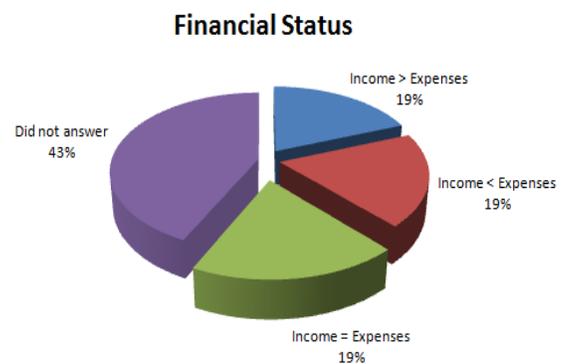
Figure 4



As illustrated in **Figure 4**, the incubators in this study received 72 percent of funding from government operating subsidies, 7 percent from private organizations and only 21 percent from client service income. In a best-practice incubator, if subsidies are lost, incubation programs lose only 15 percent of their revenue. By contrast, with subsidies accounting for an average of 72 percent of revenue among NMBS incubators, losing that subsidy would leave the programs in jeopardy.

Most incubation programs that responded to our survey knew which entities provide funding to their programs and in what proportions; however, as shown in **Figure 5**, almost half of the responding incubators did not know details of their program’s financial status. Without knowledge of the program’s income and expenses, managers can do little to reach self-sustainability.

Figure 5



NBIA recommends that incubation programs work toward self-sustainability, most importantly to reduce an incubator’s vulnerability to the changing attitudes of funders. “An incubation

program that’s not self-sustaining risks failure if one or more of its sources of financial support disappears.”<sup>3</sup> Having a goal of self-sustainability also helps an incubator make decisions about its future, such as whether to offer client space and how much overall space should be allocated to leasing.

Of the 21 incubators that responded to the survey, 10 programs claim to have client space. However, during the site visits, it became apparent that incubator space ranges greatly: from a desk that clients can use on a first-come, first-served basis, to leased cubicle spaces. Most best-practice incubation programs recognize the importance of collocating entrepreneurial start-ups to increase opportunities for peer-to-peer learning. Additionally, none of the incubators visited had lab, manufacturing or production space, so clients needing these specialized facilities had to incur the cost of renting them elsewhere.

Client rental income can play an important role in an incubator’s business model; in **Table 5**, we

**Table 5**

Incubator Space Allocated to Client Leases		
Proportion of incubator space available to clients (Generating rent income)		Programs <i>n</i> =21
-	No space available	52%
<75%	Not enough space for sustainability	38%
75%-85%	Most desirable	10%
>85%	Not enough shared space available	0

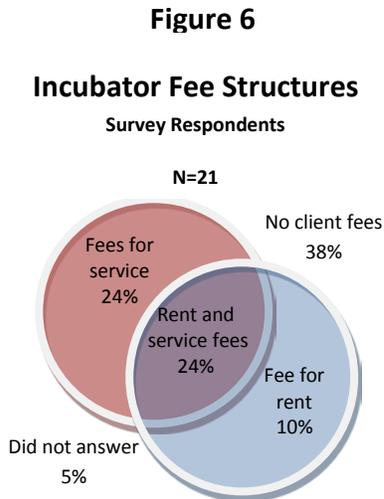
show that only 10 percent of respondents have enough space available for leasing to contribute to the programs sustainability. NBIA experts advise aiming for an 80 percent occupancy rate as the break-even point, providing enough income to cover costs while allowing room for client

expansion. It’s also a good target for synergy: a half-empty building isn’t giving a lot of optimism to clients. A facility that’s 75 percent or 80 percent full will give clients confidence in the program.<sup>4</sup>

Incubator managers we spoke to for this study expressed concerns that clients do not value the services they receive making charging for services difficult. **Figure 6** illustrates that close to half of participating programs do not charge clients at all. Providing services at no-cost to clients places a heavy burden on a program’s budget, limiting the breadth and depth of assistance an incubator can offer start-ups.

<sup>3</sup> Cammarata, Kathy, “Bright ideas for achieving self-sustainability,” *NBIA Review*, February 2002 [http://www.nbia.org/resource\\_library/review\\_archive/0202\\_01.php](http://www.nbia.org/resource_library/review_archive/0202_01.php) accessed April 2011

<sup>4</sup>Colbert, Corinne, and Boyd Kathleen C., “Right-sizing an incubator facility,” *NBIA Review*, June 2006. [http://www.nbia.org/resource\\_library/review\\_archive/0606\\_02.php](http://www.nbia.org/resource_library/review_archive/0606_02.php) accessed April 2011



Ultimately, this can lead to client discontent and, eventually, to potential failure of the program. NBIA’s research shows that charging clients for space and services is a practice followed by the top-performing programs. In this study, we found only a minority of programs follow this practice.

Pursuing self-sustainability sets a good example for clients. If incubator managers expect their clients to be financially responsible, they have to act as role models and be financially responsible themselves. A self-sustaining incubator is one that is on sound financial footing, with predictable, reliable sources of funding. This

does not rule out support from outside sources; however, relying too heavily on external funding can leave incubation programs financially vulnerable.

### 3. Clean-energy technology focus

In this section, we examine what the incubators participating in the study are doing in clean technology and find that programs are developing the characteristics for clean-tech commercialization. As part of our study, we looked at whether the program has an established relationship with a university and whether that university has the clean-tech experience to support the incubator. We then looked at which clean technologies the incubator has already had success with and the flow of activity through disclosures and patents.

A relationship with a university is an important asset to an incubator, ensuring resources, infrastructure and R&D support for the program. It is important that technology incubators, in particular, have access to knowledgeable professionals who understand the technologies incubated. As illustrated in **Table 6**, 20 of the incubators we surveyed have some degree of

**Table 6**

Incubator Relationship with Universities		
	<i>n</i> =21	<i>Top 6</i>
<b>Formal</b>	76%	100%
<b>Informal</b>	19%	-
<b>None</b>	5%	-

relationship with a university. In **Table 7**, we show that half the responding incubators have a relationship with university-based programs that have a clean-tech focus. Of the five university-affiliated programs that offer a clean-tech degree, four have a formal relationship the school. Having a local university with a

clean-tech focus helps provide a steady stream of ideas and entrepreneurs to the incubator. This relationship can also help fill staffing needs for client companies.

**Table 7**

University Clean-tech Focus		
	<i>n=21</i>	<i>Top 6</i>
General tech focus	52%	50%
Clean-tech classes offered	14%	-
Clean-tech degree offered	23%	50%
None	10%	-

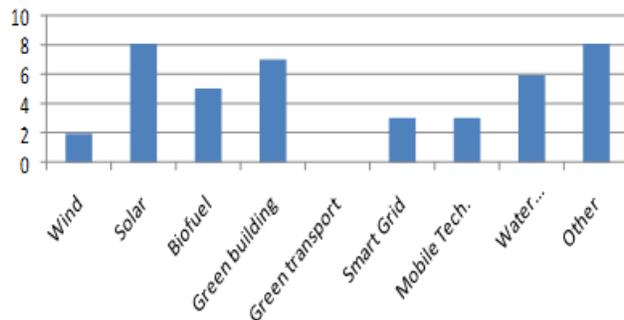
To identify whether incubation programs have commercialization experience, we looked at the number of disclosures the incubator received and the number of patents it helped process. Only six programs have received tech disclosures in the past year; of those, only three have received clean-tech disclosures. Six programs have helped patent a new technology, and three have helped patent a new clean-

energy technology. Thirteen programs have graduated technology companies; eight incubation programs have graduated clean-tech companies.

As shown in **Figure 7**, the most-mentioned types of clean technologies incubators have worked

**Figure 7**

**Programs to Graduate Clients  
in Each Technology**



with are solar, green building and biofuels.

During the site visits, we found each incubation program already has a general focus toward a particular technology, and in the highest-rated programs, that focus aligns closely with regional sectors in place around the incubator and the university. To develop a successful sector approach, there has to be a convergence of specific strengths in the region. Therefore, in our site visits, we looked at incubation program strengths, and whether they align with local economic development efforts.

**Overall assessment summary**

Based on the survey responses from 21 incubation program managers, on-site visits with the six highest-rated programs, and the specific obstacles facing incubation programs across the NMBS region, the following overarching challenges and opportunities should be factored into future project planning and solution development.

1. Federal government lacks a clear understanding of business incubation processes.
2. Programs should be run like the businesses they aim to assist: sustainably.
3. Incubation practices tend to be episodic rather than continuous.
4. Access to shared services and colocation is essential to successful incubation.
5. Incubation programs in this study can leverage their university affiliations.
6. Clients struggle to access start-up and operational finance.
7. Incubators can support clean-tech companies.

## Recommendations

As mentioned previously, this study aims to examine the feasibility of future investments in clean-tech commercialization infrastructure in NMBS, the form those investments could take, and, if deemed appropriate, where the investments would be best directed. The assessment provided in this report suggests that, indeed, there is scope to make investments to improve the chances for more clean-tech commercialization in the NMBS region; however, the support should be allocated to a subset of highly ranked incubation programs in the region that exhibit the greatest overall readiness for future support.

### Top-ranked programs

To rank programs, NBIA developed selection criteria based on its long track record in support of the business incubation industry. All 21 programs participating in the study were eligible for consideration, and were evaluated and scored based on their clean-energy support potential. The top six programs were targeted for on-site visits. During those visits, these incubators were evaluated for program and environmental readiness (**Table 8**) and overall potential for future development assistance.

**Table 8**

Program readiness	Environmental readiness
<ul style="list-style-type: none"> <li>• A technology focus or curriculum</li> <li>• Availability of suitable space and physical infrastructure</li> <li>• The sophistication of the program and adherence to incubation best practices</li> <li>• The management team’s competence and leadership</li> <li>• Reputation and community support, long-term ownership, potential champions</li> <li>• Track record, past successes or failures</li> <li>• Existing linkages to U.S. universities and other institutions</li> </ul>	<ul style="list-style-type: none"> <li>• A regional mandate for clean-energy development</li> <li>• Availability of resources, including complementary business clusters, transportation infrastructure, goods and service providers</li> <li>• The social, economic, political, business and cultural situation in the region and the possible influences of these factors on the project</li> <li>• Relevant trends based on industry statistics, and available market data on number of business start-ups and exits, trends in particular sectors, and economic or industry development strategies</li> </ul>

We then considered survey responses, site-visit data and strategic elements to arrive at a final ranking of all candidate incubators. **Appendix D** has a full SWOT analysis for each program, and **Appendix C** lists the scores assigned during the site visits.

NBIA has selected the following incubation programs, which in our view demonstrate the programs with the most readiness for future technical assistance.

**1. TxTec, A.C., Hermosillo Sonora**

This program received the second highest combined score of 114; however, we deem it to be the program with the highest potential because of the convergence of various resources. For example, the state is supportive of the incubation program, and the University of Sonora has focused research and curriculum on clean technologies. The incubator's shortcomings come from policies that do not follow industry best practices; however, the incubator is free to make changes to the program, and the staff are very willing to accept recommendations. We believe this program has the most potential, with the proper training and capacity building efforts for its support staff.

**2. Centro Incubador de Empresas, Universidad Tecnológica de Tijuana Tijuana Baja California**

With the highest combined score of 120, the program, the school and the community all expressed a focus on clean tech. However, the technical university model is not as sophisticated as the autonomous universities and state universities, have fewer resources and less research capabilities. UTT's potential is in commercializing existing technologies. We believe the program would benefit from training staff in tech commercialization strategies.

**3. Incubadora de Empresas de la Universidad Autónoma de Nuevo León, Monterrey Nuevo León**

As one of the top three universities in Mexico, UANL has a distinguished track record in research and commercialization. It has plentiful resources, and the university provides generous support to the high-tech incubator. However, as part of such a large bureaucratic organization, the university-based program could have a difficult time making changes. Therefore, we consider the potential of the UANL incubator to be the third highest among the group. However, the staff's willingness and desire to engage in clean-tech incubation is evident, and we believe that investing in the incubator's human capital is worthwhile.

**4. Incubadora de Empresas del ITESM – Campus Monterrey, Monterrey Nuevo León**

The Tec de Monterrey is a long-standing member of NBIA and has developed its incubation model based on NBIA best practices. The incubator in Monterrey is already working with companies in different technology fields, including a few clean-

tech companies. The program would benefit from assistance in developing investment opportunities for clients in Monterrey's entrepreneurial community.

**5. Centro de Incubación de Empresas, Universidad Tecnológica de Coahuila, Ramos Arizpe Coahuila**

The staff at UTC is this incubator's most valuable asset. The school is small enough that the heads of the incubator, engineering and extension departments are in constant communication. However, because this is a technological university, it also suffers from fewer resources, students and research capacity. The engineering department does have clean-tech research projects, and the incubator manager is ready to help create business in this field. Of the top six programs, this is the only one that has assisted companies focused on wind energy. The staff is eager to receive training on business incubation best practices, and assistance in accessing or creating private investment opportunities.

**6. Incubadora de Empresas del ITESM - Campus Laguna, Torreón Coahuila**

The ITESM incubator in Torreon is large and modern. It has the best client spaces of all the programs we visited, with several clients currently working in the incubator. The staff is knowledgeable about business and incubation practices, but they lack a technical background. However, the incubator works closely with the school's engineering department, which is conducting research on solar projects. The university has a good relationship with local industry and embarks on research projects prompted by the needs of local businesses. The incubator can leverage these relationships to continue building up their clean-tech capabilities. The incubator staff would benefit from commercialization skills training and support in building up local investment possibilities for client companies.

**Future opportunities**

Future investments in the six incubation programs highlighted in the previous section would leverage their existing strengths, while addressing systematic, institutional and unique organizational weaknesses that could inhibit their future performance.

We recommend developing a technical assistance program that extends over the next 12-18 months to provide targeted assistance in the following areas. This assistance would consist of one-on-one consulting, as well as training programs. The training and consulting programs would target:

- Incubator managers (on business incubation best practices and clean-tech incubation)
- Researchers and university administrators
- Existing incubation program sponsors and government administrators
- Incubator managers (on helping to create local angel networks)

**1. Training for incubator managers on business incubation best practices.** In 1996, NBIA's board of directors developed a set of industry guidelines to help incubator managers better serve their clients. Since that time, NBIA research has consistently shown that incubation programs that adhere to the principles and best practices of successful business incubation outperform those that do not.

NBIA proposes to train target incubation program professionals on how to:

- Introduce or refine clean-tech commercialization support, building on existing university capabilities and expertise, where possible
- Introduce incubator facility management strategies to programs where current infrastructure exists or where new facilities could be acquired
- Broaden existing incubator and client funding models
- Expand client service offerings, based on available community resources and assets
- Create an implementation strategy for each incubator-university pair and provide additional guidance to incubators that need more on-site training and applied technical assistance

The training would be adapted from our standard best-practices training curriculum and include a specific module for clean technology incubation. The training material would include real-world examples of how operating incubators have incorporated these practices into their programs elsewhere, and templates to help attendees implement best practices into their existing programs. Training materials would be adapted to specifically address common systematic, institutional and organizational challenges generally affecting all incubation professionals.

**2) Training for researchers and university administrators.** Universities can and do play a large role in rounding out an incubation program's capability to commercialize new clean technologies. University-affiliated incubators can provide:

- **Entrepreneurs** with well-equipped labs, extensive libraries and powerful computer systems; technology expertise; a well-educated workforce, subject-matter experts among the faculty

- **Students** with internship or part-time job opportunities; real-world examples for case studies or class projects; opportunities to apply their knowledge to real business problems; an introduction to entrepreneurship early in their professional careers
- **Universities** with opportunities to strengthen ties between the educational institution and the local business community; a system for bringing technological advances and products to market; a recruiting tool for faculty members and students interested in entrepreneurial opportunities; an opportunity to fulfill research, academic, and community service missions

While each of the six recommended incubation programs already do enjoy some sort of a relationship with a nearby university or technical institute, the consistency and scope of support levels vary widely from program to program. For example, some incubation programs leverage existing university students, while in others, they leverage university labs. Some incubators work with certain departments and researchers as required, but underemploy other complementary departments.

NBIA proposes to develop a training program for university researchers and administrators that would help familiarize them with clean-technology commercialization processes, including:

- How to evaluate the commercial potential of portfolio technologies
- How to work with incubation programs to help develop successful business enterprises
- How to develop and implement policies and practices that encourage university technology commercialization and improve researcher and student participation in entrepreneurial activities

NBIA can help create an implementation strategy for each incubator-university pair and provide additional guidance to universities that need more on-site training and applied technical assistance.

### **3) Training for existing incubation program sponsors and government administrators.**

Government sponsors contribute greatly to the level incubation program sophistication across most of the NMBS region. This is also true among the top six programs in this study; their success in supporting clean-tech commercialization strategies may well depend, at least in part, on how the views and practices of government sponsors align with best practice business incubation programs.

For example, survey respondents and on-site interviewees indicated that program funding cycles and the way government sponsors measure program outcomes can create incentives for managers to keep incubation periods short. Most incubator clients require longer

support periods – especially when commercializing clean-energy technologies – before they can develop products and become financially viable. As long as the outcome measures used by many sponsoring agencies – like the Ministry of Economy – focus on the number of companies served rather than on creating sustainable, high-paying jobs and increasing client survival rates, future investments in business incubation by other social investors may have less impact than otherwise possible.

Before funding policy changes can occur, government administrators and other grant sponsors would benefit from learning how business incubation is practiced elsewhere to greater effect.

This short training program would be designed by NBIA to provide a basic overview of the industry, with particular attention drawn to best practices in technology commercialization and to differences in incubation practices between Mexico and other markets. It would also aim to draw attention to the conflict that is created when policies aren't aligned with international industry practices.

- 4) Training to help create local angel networks.** Private investors can be important stakeholders in healthy entrepreneurship and innovation ecosystems. Incubator managers interviewed for this study frequently mentioned the pressing need for seed funding to supplement what companies currently receive through government agencies. This outside funding would help start-ups get to a point where they can better access angel and seed investment.

NBIA would work with international subject matter experts like the U.S.-based Angel Capital Association and/or the National Association of Seed and Venture Funds to develop an angel network development strategy, specifically designed for incubation program managers to implement and support. This effort would go far to help improve client access to private capital markets.

This NBIA training would be presented to chosen incubation program managers, and offer follow-up support individually on a one-on-one basis, as required, to help secure buy-in from important collaborators.

- 5) Introducing new incubation facilities: One-on-one consulting for select incubation programs.** NBIA would provide one-on-one consulting to each of the six incubation programs identified in this study, tailored to meet the requirements of each program. Consulting topics could include in-depth technical assistance in the above-indicated areas.

The effort would also be used to assist incubation professionals in leveraging existing facilities or introducing new facilities that can feature prominently for clean-tech clientele.

A full proposal for the training and consulting opportunities described above will be provided upon request.

Appendix A

Assessment Questionnaire

Incubation Program Clean Energy Technology Development Potential

(Numbers in red indicate the weight given to each question/response)

**Incubation Practices and Operations**

	Yes	No	N/A
Does your incubator house client companies in your facility?	3		
Does your incubator have a clear, current and appropriate mission statement?	1		
Does your incubator have a business plan and/or strategic plan guiding its operations?	1		
Does your incubator have an active, involved Board of Directors and/or Advisory Board?	1		
Does your incubator have laboratory space available for client use?	2		
Is the laboratory shared with a university?	1		
Is the incubator part of a technology park?	2		
Does the incubator have selective entrance criteria?	1		
Does the incubator have graduation criteria?	1		
Are clients required to have a completed business plan prior to entering?	1		
If not, do clients have a set time in which they must develop one?			
Are clients required to have their own funding prior to entering?	2		
Do clients receive assistance from the incubator to acquire funding?	2		
Does the incubator have its own funds for client capital?	2		
Does the incubator have a relationship with VC or angel investor organizations?	2		
Does the incubator participate in local chamber of commerce activities?	1		
Does your incubator have a presence in the local business community?	1		
What is the average length of stay for a client company housed in the incubator?	3		
How many of your graduates have been operating for 2 years or longer?	3		
How many previous clients have achieved funding through a venture capital or angel investment?	3		
Please indicate which of these services your program provides:			
1 Coaching		1 Office administration support	
1 Mentoring		1 Business planning support	
1 Business admin. training		1 In-house financing	
1 Networking opportunities		1 Investor meetings	
1 Meeting rooms/space		1 Access to consultants	
1 Intellectual property support		1 Legal assistance	
What is your incubator's total space?			
How much of the space is leasable?			
How many companies can the incubator house?			
How many clients companies are currently housed in the incubator?			

**Business Incubator Financial Model**

Who provides funding for your incubator's operations?  
 % provided by the following Federal Government agencies  
 % provided by the following State Government agencies  
 % provided by local government agencies  
 % provided by the following private organizations  
 % provided by the incubator's revenue generating activities  
 Does the incubator charge for services? (check one)  
 No fee to clients  Rent only **1**  Services only **1**  Rent and services **2**  
 What is your incubator's total annual revenue?  
 What are your incubator's total annual expenses?

**Clean Energy Technology Focus**

How many current clients have a focus on developing companies that produce clean energy technology?

How many current clients have a technology focus?

A clean energy focus?

Overall, how many graduates have a technology focus?

A clean energy focus?

How many current clients or graduates has your incubator assisted in each of the following technology areas?

- |   |                             |   |                               |
|---|-----------------------------|---|-------------------------------|
| 1 | Wind                        | 1 | Green transportation          |
| 1 | Solar                       | 1 | Smart grid                    |
| 1 | Bio fuels / bio materials   | 1 | Mobile technologies           |
| 1 | Green building/construction | 1 | Water filtration/purification |
| 1 | Other _____                 | 1 | Other _____                   |

How many new technology disclosures does your incubator receive per year?

Clean energy?

How many new technologies has your incubator helped patent?

Clean energy related?

Does your incubator have a relationship with a university?  Formally 1  Informally 1  None

If so, does the university have a technology curriculum program?

Technology focus but not clean tech specific 1  Clean tech classes 2  Clean tech degree 3

What other entrepreneurship or technology commercialization organizations does your incubator partner with?

1-3 = 1, >3 = 2 \_\_\_\_\_

What US university or other institution does your incubator partner with? \_\_\_\_\_

1-3 = 1, >3 = 2 \_\_\_\_\_

## Appendix B

## NMBS Medium and High Tech Programs Contacted for this Study

<b>High-Technology Incubators</b>	
Centro De Innovación Y Emprendurismo ITESM Campus Chihuahua	Could not reach
Incubadora De Empresas De Alta Tecnología De La UANL	Submitted
Incubadora De Empresas De Alta Tecnología Del ITESM Campus Monterrey	Submitted
Tx Tec, A.C.	Submitted
<b>Medium-Technology Incubators</b>	
Centro Incubador De Empresas Y Negocios De La Universidad Tecnológica De Tijuana (CIENUTT)	Submitted
Incubadora De Nuevas Empresas Del Municipio De Camargo, A.C.	Submitted
Célula Empresarial De Desarrollo Económico, S.A. De C.V.	Submitted
Centro De Incubación E Innovación Empresarial Del Instituto Tecnológico De Chihuahua Ii	Submitted
Centro De Investigación Y Desarrollo Económico De La Universidad Autónoma De Chihuahua	Submitted
Incubadora De Empresas De La Universidad Tecnológica De Chihuahua	Submitted
Incubadora De Empresas Del Tec Milenio Campus Chihuahua	Could not reach
Incubadora De Empresas Del Tecnológico De Monterrey Campus Chihuahua	Could not reach
Incubadora De Empresas De Base Tecnológica Delicias	Could not reach
Centro Universitario De Incubación Y Desarrollo Empresarial UACH Incuba, Campus Parral	Could not reach
Incubadora De Empresas De La Universidad Tecnológica De Ciudad Juárez	No reply
Incubadora De Empresas Del Tec Milenio Campus Cd Juárez	Could not reach
Incubadora De Empresas Del Tecnológico De Monterrey, Campus Ciudad Juárez	No reply
Incubadora De La Universidad Autónoma De Ciudad Juárez	Submitted
Incubadora De Empresas De Base Tecnológica De Nuevo Casas Grandes	Could not reach
Incubadora De Empresas De Tecnología Intermedia De La Región Carbonífera	No reply
Centro De Incubación Empresarial De La UTC Ramos Arizpe	Submitted
Centro De Desarrollo Empresarial Y Liderazgo, A.C. (CEDEL)	Could not reach
Incubadora De Empresas Del ITESM Campus Saltillo	No reply
Centro Estratégico De Incubación Y Desarrollo De Empresas	Could not reach
Incubadora De Empresas Del Tecnológico De Monterrey, Campus Laguna	Submitted
Incubadora De Empresas Desarrolladora De Viviendas (CMIC Laguna)	Submitted
Incubadora De Empresas Tec Milenio Campus Laguna	Could not reach
Centro De Vinculación E Incubación Empresarial Del ITNL	No reply
Incubadora De Empresas De La Universidad Regiomontana (INEUR)	Submitted
Incubadora De Empresas Del ITESM, Campus Monterrey	Submitted
Incubadora De La UVM Campus Cumbres	No reply
Incubadora De Empresas De La Universidad Tecnológica General Mariano Escobedo	Could not reach
Incubadora De Empresas De La UANL "Biblioteca Magna"	Submitted
Incubadora De Empresas Fime	No reply
Centro De Incubación Y Desarrollo Empresarial De La UDEM	No reply
Incubadora De La Universidad Tecnológica De Sta. Catarina	No reply
Incubadora De Empresas Del Instituto Tecnológico De Agua Prieta	No reply
Incubadora De Empresas Del Tec Milenio, Campus Cd. Obregón	No longer operates
Incubadora De La Universidad Tecnológica Del Sur De Sonora	No reply
Incubadora Del Instituto Tecnológico De Estudios Superiores De Cajeme (ITESCA)	Submitted
Centro De Agronegocios Del Pacífico Norte, A.C.	No reply
Centro De Desarrollo Empresarial Del Instituto Sonorense De La Juventud (Cede)	Submitted
Centro De Impulso Tecnológico De Hermosillo	Submitted
Incubadora De Empresas De La Universidad Tecnológica De Hermosillo	Submitted
Incubadora De Empresas Del ITESM Sonora Norte	No reply
Programa Institucional De Transferencia De Tecnología De La Universidad De Sonora	Submitted
Incubadora De Empresas Del Tec Milenio, Campus Navojoa	No longer operates
Centro De Incubación De Empresas	No longer operates
Incubadora Procede, A.C.	No longer operates
Centro De Incubación De Empresas De La Universidad Tecnológica De Altamira	Submitted
Incubadora De Empresas De La Universidad Tecnológica De Matamoros Tamaulipas	Could not reach

<b>Incubadora De Empresas Del Tec Milenio, Campus Matamoros</b>	No reply
<b>Centro Incubador De La Universidad Tecnológica De Nuevo Laredo (CI-UT Nuevo Laredo)</b>	No reply
<b>Incubadora De Empresas Del Tec Milenio, Campus Reynosa</b>	No reply
<b>Incubadora De Empresas Del ITESM, Campus Tampico</b>	Submitted
<b>Incubadora De Negocios Para Emprendedores Del Sur De Tamaulipas A.C.</b>	Could not reach
<b>Incubadora De Desarrollo Tecnológico En Software "Victoria Emprende"</b>	No reply
<b>Incubadora De Negocios UAMAC</b>	No reply

## Appendix C

### Criteria and Scoring for Site Visits

Programs were scored on a scale of 1-4 in relation to the other programs visited.

	U. de Sonora TXTec	ITESM Campus Laguna	ITESM Campus Monterrey	UA Nuevo Leon	UT Coahuila	UT Tijuana
<b>Incubator</b>						
Incubation facilities	1	3	3	3	2	2
Incubator staff	4	3	4	4	3	4
<b>Technology aptitude</b>						
Technology and clean-tech programs	4	3	4	4	3	4
Research the school is currently undertaking	4	2	3	4	3	2
Relationship between research dept. and incubator	4	2	3	4	4	4
Staff tech-savvy	4	2	4	4	3	3
<b>External environment</b>						
Relationships with external entities	4	2	3	4	4	3
Current economic environment (growth, patents)	4	2	4	4	3	3
Political environment at the state and local levels	4	3	4	4	2	3
Market for clean-tech energy	4	2	4	4	3	4
Local clean-tech focused projects and/or strategies	4	3	3	3	3	4
Distance from the border/ease of transport	4	3	4	4	3	4
<b>Internal environment</b>						
Client/student need for incubation services	4	4	4	4	4	4
Relevant institutional policies	4	3	4	4	3	4
Future plans	4	2	2	4	4	4
<b>Will</b>						
Receptive and able to making changes	3	2	2	3	2	2
Unmet needs	4	2	1	2	4	4
<b>TOTAL</b>	<b>64</b>	<b>43</b>	<b>56</b>	<b>63</b>	<b>53</b>	<b>58</b>

## Appendix D

### SWOT Analysis for the Six Incubators Visited

#### TxTech, A.C.

Overall rank	Survey score	Site-visit score
1	50	64

Strengths	Weaknesses
Formal relationship with the University of Sonora	Incubator space consists only of desks and cubicles
Fiscally independent entity since 2006	Lack of proper revenue-generating incubation spaces
Eight years operating with the same manager	Lack of seed funding and investors for client companies
Team of five has expertise in engineering, commercialization, marketing and administration	Location on university grounds makes it less accessible and visible to general public
Works closely with science and engineering departments at the university	No BOD or advisory board to oversee strategy
Manager willing to make recommended changes to improve his program and explore new partnerships	Little integration with community business organizations
Diversified revenue stream; operating surplus	Little experience with clean-tech companies

Opportunities	Threats
The university offers a clean-tech degree, and has a clear focus and mandate on clean technology	The university does not have a long-standing track record in research activities
The university is developing a clean-tech park with a solar demonstration facility	Clean-tech park has not broken ground yet, so it could take years for the incubator to receive benefits
Sonora is geographically suited for solar power generation	Checkpoints along the route can delay transport; 155 miles from the border
State government is concentrating on solar power generation as a regional economic development focus	New focus area is not as well-developed as in other regions
High economic growth in Sonora and lowest murder rate of NMBS	No shortage of electricity supply in Arizona that would provide market for energy produced in Sonora
Hermosillo has a direct fiscal corridor to the U.S. and a very strong export industry	Electricity sales and number of users lowest among NMBS states
Strong manufacturing industry provides potential client base for cost-saving new technologies	Public spending on electrification projects second lowest of NMBS states
Relationships with Autonomous University of Mexico (UNAM), ITESM, TechBA and the U.S. Mexico Foundation for Science (FUMEC)	
Support from external entities like Sonocap, a state angel investor group; the local chambers of commerce; and NAFIN, the national financing agency	

**Centro Incubador de Empresas y Negocios, Universidad Tecnológica de Tijuana (UTT)**

Overall rank	Survey score	Site-visit score
2	62	58

Strengths	Weaknesses
Program manager has six years of incubation experience	Manager has only held his current position for about a year
Incubator facilities are new	New building is small; only cubicles for clients
Program provides most incubation services	Part of the UT system; incubation model set by UT
Incubator holds business plan competitions as entrance criteria	Need better funding for client companies
Received 30 projects for consideration; about a quarter of them have an environmental focus	Funds received from the government are not sufficient to support technology companies
Experience with many types of clean technology	Little experience with disclosures and patents
Incubator manager is enthusiastic and resourceful and has the full support of the department head	No significant research capacity or experience
Diversified income stream; balanced budget	Short incubation cycle (7 months)

Opportunities	Threats
Good working relationships with local manufacturing industry	Lowest public spending on electrification projects of all NMBS states
UTT has an environmental focus in curriculum and other projects	Trending toward lower levels of economic activity (more than other NMBS states)
Tech-based programs work closely with business and commercialization programs to develop joint ventures	Small campus has fewer resources and fewer students
State of Baja California has a strong focus on energy generation	
Baja is an energy provider to the U.S. state of California	
Manufacturing firms use clean technology as a means to save energy and reduce costs	
City is building a green industrial park and housing development near incubator	
Easy access to U.S. market (20 minutes from the border)	

**Incubadora de Empresas de la Universidad Autónoma de Nuevo León (UANL)**

Overall rank	Survey score	Site-visit score
3	47	63

Strengths	Weaknesses
Provides all best-practice incubation services	Only offer clients cubicles and small offices
Experience in biofuel and wind power; has developed patents in both areas	Clients must procure lab space and manufacturing space externally
Experienced and knowledgeable staff	Lack of funding sources for client companies
Located in a new building that also houses technology transfer activities	70% of income from one source (Ministry of the Economy)
Focus at UANL is in developing new technologies	The technologies UANL is working with take longer to reach the market and have a greater need for financial resources
Close relationship with stakeholders in the university, who support the program	Incubator is located off campus away from many of the research facilities
Linkages with various organizations within Mexico, the U.S. and various Latin-American countries	Limited staff seems stretched thin
Possess expertise and processes to commercialize the technologies they develop	
Balanced budget	

Opportunities	Threats
University houses one of the most important research facilities in the country, focused on medical and biological sciences	Large University can be bureaucratic
UANL has made the necessary policy changes to promote research and incentivize researchers	Fourth-lowest level of public spending on electrification projects of NMBS states
Has several clean-tech projects under way that focus on biofuel	Perception of drug trafficking crimes in the region
Monterrey is one of the main industrial centers in Mexico	120 miles from the U.S. border
Large potential market for clean technology	
UANL is one of the three largest universities in Mexico	
High-profile university can garner support and sponsorships when necessary	
Nuevo Leon leads (by far) all NMBS states in number of patents filed	
Region has low murder rate	
Increasing economic activity; already one of the highest of NMBSs	

**Incubadora de Empresas del ITESM-Campus Monterrey**

Overall rank	Survey score	Site-visit score
4	52	56

Strengths	Weaknesses
Located outside the main university grounds in a new building dedicated to entrepreneurship and innovation	Client space is half a cubicle
Incubator manager has an academic background in sustainable development and is a certified project management professional	Clients also have manufacturing or operations facilities outside the incubator
Incubator has several common areas where clients can interact: a kitchen, coffee station, several lounges and meeting rooms	ITESM incubation model is well-established; there is no apparent interest in making modifications
Program has a history of success and has integrated many best practices into its incubation model (NBIA member)	Program focuses on student population
Well-diversified income stream	Operating under a budget deficit
Working on various environmental projects, including a few that fit within the clean-tech description	Does not provide lab space or industrial space; clients who need to specialized facilities must go through the university to gain access
Well-known program with abundant resources and a good reputation	Minimal formal collaboration with the technical or science departments within the school

Opportunities	Threats
University has a commercialization office	Large university can be bureaucratic
School has an entrepreneurship degree program and a master's degree in alternative energy	Fourth-lowest level of public spending on electrification projects of NMBS states
ITESM has a long-standing reputation as a business and entrepreneurship program	Perception of drug trafficking crimes in the region
Private school with fewer constraints than public institutions	120 miles from the border
Monterrey is one of the main industrial centers in Mexico; large potential market for clean technology	
High-profile university can garner support and sponsorships when necessary	
Nuevo Leon leads (by far) all NMBS states in number of patents filed	
Region has low murder rate	
Increasing economic activity, one of the highest of NMBSs	

**Centro de Incubacion de Empresas de la Universidad Tecnológica de Coahuila (UTC) – Ramos Arizpe**

Overall rank	Survey score	Site-visit score
5	50	52

Strengths	Weaknesses
Relationships with the chambers of commerce and other industrial organizations in the region	Manager does not have a technology background
Have developed projects in wind power, isodynamics and magnet power	Limited tech transfer capabilities and experience
Collaborative relationship with the university’s technology departments	Manager does not control incubator finances; has no knowledge of financial standing
Stakeholders enthusiastic for developing incubator’s capacity for clean technology	Short incubation period (8 months)
Relationships with over 300 local companies, with whom they coordinate student visits, internships and projects	
Experience with several types of clean technology through the incubator and the engineering departments	

Opportunities	Threats
Located in the third-largest industrial park and one of the most important industrial corridors in Mexico	Smaller school has limited resources and fewer students
50 miles out of Monterrey Nuevo Leon and a few miles from the city of Saltillo, the capital of Coahuila – both ready markets for clean technology	Perception of drug trafficking crime and violence is high
University developed chemical engineering and solar programs through mechanical engineering department	School’s location is difficult to access; no local international airport and 195 miles to the U.S. border
Running a pilot in holistic sustainable development	
Second-highest public spending on electrification projects of NMBs states	
Third-highest economic activity of NMBS	

**Incubadora de Empresas del ITESM -Campus Laguna**

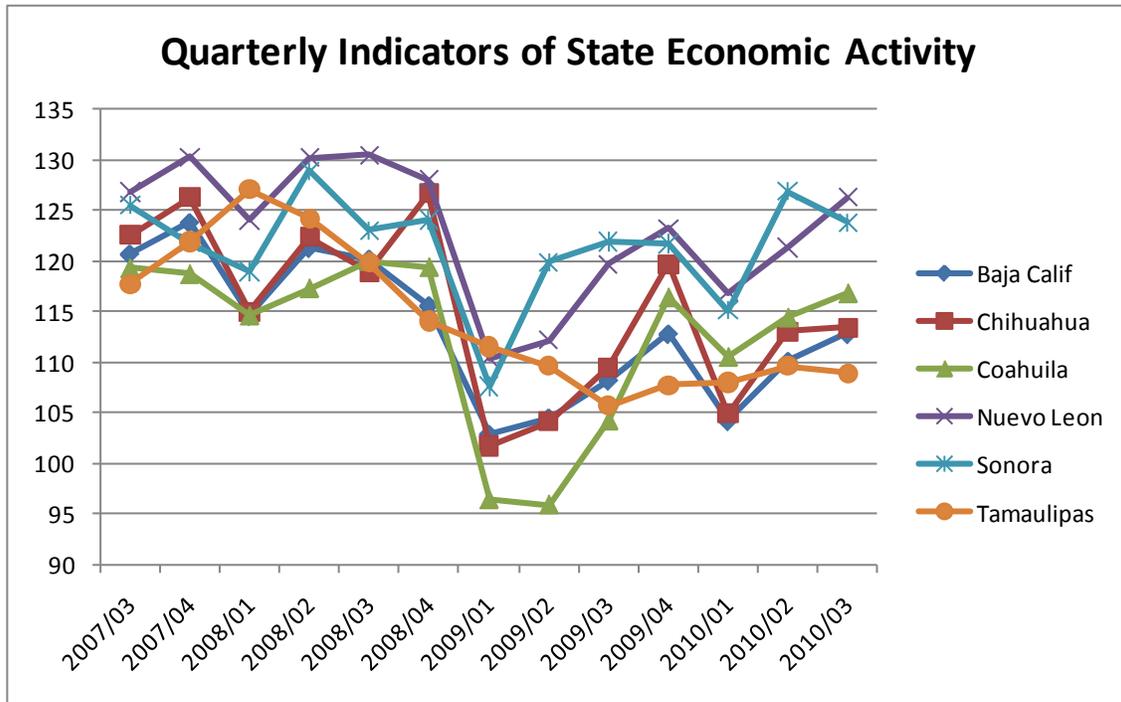
Overall rank	Survey score	Site-visit score
6	48	51

Strengths	Weaknesses
Housed in a modern building within the Tec de Monterrey campus in Torreon’s commercial district	Most rooms currently used as classrooms
Incubator is large, modern and well-equipped	Most client projects are medium-tech
Offices available for clients who pay rent; currently has one anchor tenant that generates revenue	Engineering department needs outside talent in clean-tech research
Use University professors to work with entrepreneurs	Incubator does not engage with engineering department to promote entrepreneurship
Serves both students and external clients	70% of income comes from Ministry of Economy
Manager has a strong educational background; master’s degree in finance	Manager does not control incubator finances; no knowledge of financial standing
Follows many NBIA best practices	
Developed its own entrance criteria and procedure that is not a part of the ITESM incubation model	
Wants to focus more on clean technology	
Interest among the students in clean-tech fields	

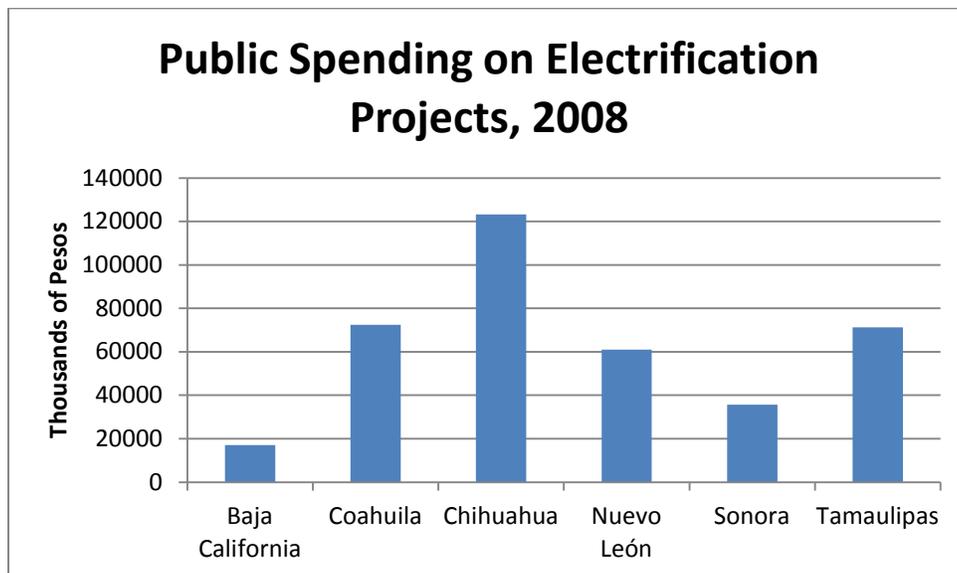
Opportunities	Threats
University has a well-known entrepreneurship degree program with good reputation	Regional economic development focus is not on clean energy, but on agriculture, mining and manufacturing
Engineering students and staff have worked on solar projects	Furthest city from the U.S. border (500 miles)
Private university; would be subject to fewer constraints than public universities	Perception of drug trafficking crime and violence is high
Industry provides a market for cost-saving technologies that reduce dependency on non-renewable resources	
Current agriculture resources could be directed toward biofuel development	
University collaborates with wide range of international organizations	
Demand from local industry for university research	

Appendix E

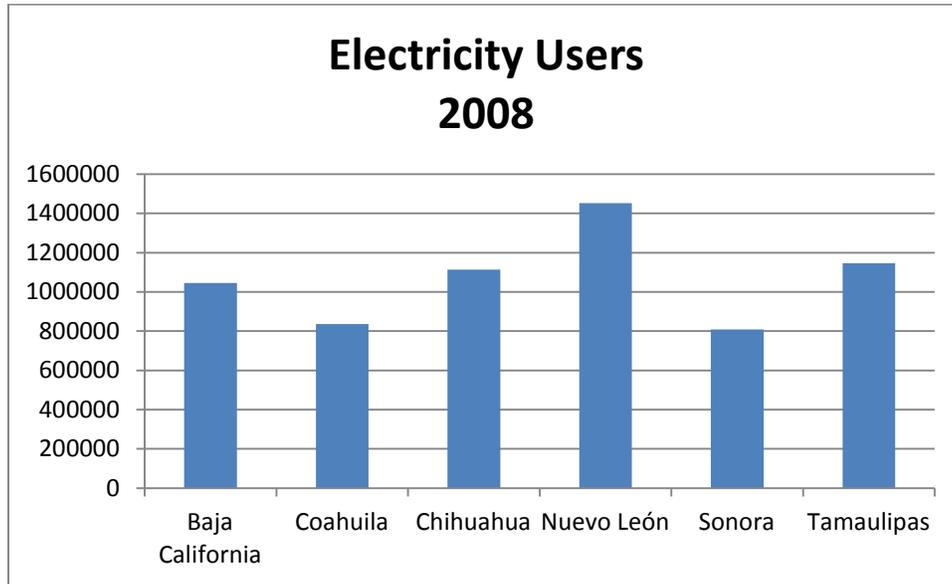
Northern Mexico Border States Statistical Information



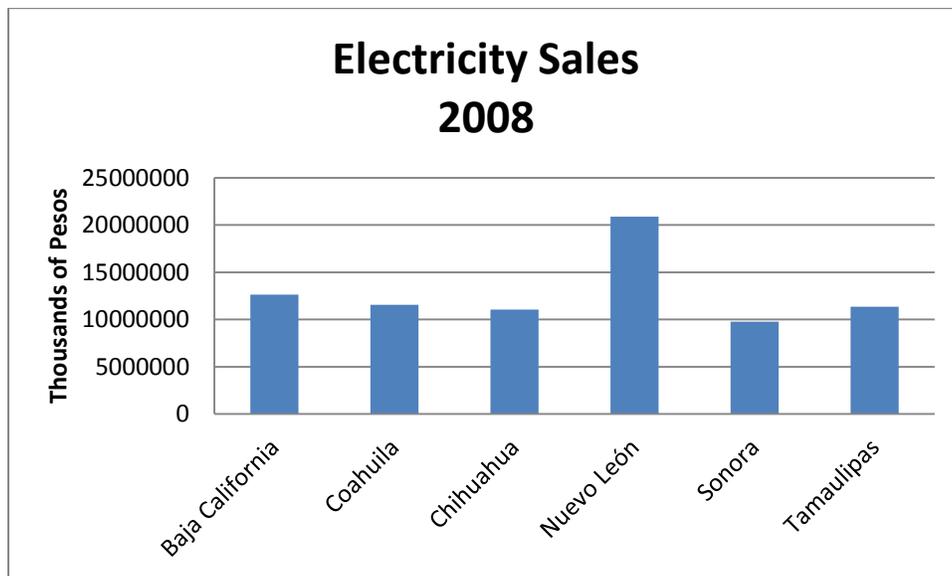
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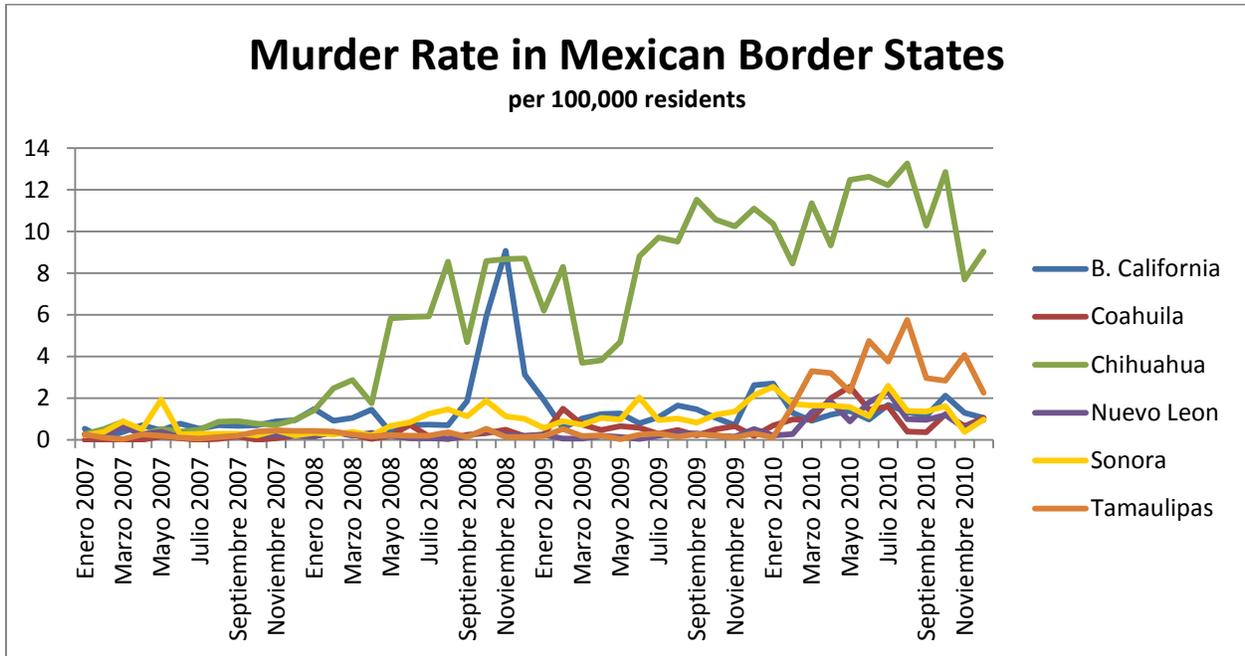
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about**nbia** ■■ NBIA is the world's leading organization advancing business incubation and entrepreneurship to stimulate economic growth and wealth creation. ■■ It provides thousands of professionals globally with information, education, advocacy and networking resources and brings excellence to the process of assisting early-stage companies. ■■



We advance the **business creation** process to increase entrepreneurial **SUCCESS** and individual **opportunity**, strengthening communities worldwide.



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