Renewable Energy: Opportunities and Challenges in the Border Region

Arizona-Mexico Commission 2011 Plenary Session
Environment Committee
June 3, 2011
US-Mexico Border Environment Cooperation Agreement

Signed in October 1993, as a Side Agreement to NAFTA

Border Environment Cooperation Commission (BECC)
North American Development Bank (NADB)

“Preserve, protect, and enhance US-MEX border region by identifying, developing, implementing and overseeing environmental infrastructure projects”

... a project 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”

NADB finances the construction of projects certified by BECC
Bilateral Approach to Environmental Improvement

- NADB capitalized in equal parts by the U.S. and Mexican governments
- NADB/BECC Governed by a binational Board:
  
  **UNITED STATES**
  - Department of the Treasury
  - Department of State
  - Environmental Protection Agency (EPA)
  - Border state representative
  - Border community representative

  **MEXICO**
  - Ministry of Finance & Public Credit (SHCP)
  - Ministry of Foreign Affairs (SRE)
  - Ministry of Environment and Natural Resources (SEMARNAT)
  - Border state representative
  - Border community representative
## Eligible Sectors

### Renewable Energy

- Solar
  - Photovoltaic
  - Solar thermal
  - Concentrated solar
- Wind
- Biogas
  - Landfill gas capture
  - Wastewater gas capture
- Biomass facilities
- Waste-to-energy plants
- Hydroelectric
  - Utility-scale facilities
  - Mini-hydro
- Geothermal
- Alternative fuel production
- Alternative fuels
  - Biodiesel
- Energy efficiency initiatives
  - Equipment replacement and/or retrofitting

### Transportation

- International bridges
- Street paving
- Bypasses
- Emission reduction programs
- Public transport
  - BRTs
  - Light trains
  - Metros

### Water

- Potable water treatment plants
- Conservation systems
- Desalination facilities
- Pipelines & aqueducts
- Irrigation systems
- Wastewater treatment plants
- Storm drainage systems

### Waste

- Sanitary landfills
- Collection and disposal equipment
- Dumpsite closure
- Recycling systems
- Hazardous waste treatment and disposal facilities
- Industrial site remediation
Geographic Jurisdiction

- 100 km north and 300 km south of the international boundary
- Projects beyond these areas may be eligible if they remedy a cross-border environmental or health problem.
## Counties and Municipalities Covered

### USA

<table>
<thead>
<tr>
<th>State</th>
<th>Counties</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>4</td>
<td>1.2 m</td>
</tr>
<tr>
<td>California</td>
<td>3</td>
<td>4.9 m</td>
</tr>
<tr>
<td>New Mexico</td>
<td>4</td>
<td>0.3 m</td>
</tr>
<tr>
<td>Texas</td>
<td>26</td>
<td>2.3 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37</strong></td>
<td><strong>8.7 m</strong></td>
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### Mexico

<table>
<thead>
<tr>
<th>State</th>
<th>Municipalities</th>
<th>Population</th>
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<tbody>
<tr>
<td>Baja California</td>
<td>5</td>
<td>2.8 m</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>44</td>
<td>2.9 m</td>
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<tr>
<td>Coahuila</td>
<td>33</td>
<td>1.7 m</td>
</tr>
<tr>
<td>Nuevo Leon</td>
<td>49</td>
<td>4.2 m</td>
</tr>
<tr>
<td>Sonora</td>
<td>56</td>
<td>1.5 m</td>
</tr>
<tr>
<td>Tamaulipas</td>
<td>26</td>
<td>2.1 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>213</strong></td>
<td><strong>15.2 m</strong></td>
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### US State

<table>
<thead>
<tr>
<th>State</th>
<th>Counties Covered</th>
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<tbody>
<tr>
<td>Arizona</td>
<td>Cochise, Santa Cruz</td>
</tr>
<tr>
<td></td>
<td>Pima, Yuma</td>
</tr>
<tr>
<td>California</td>
<td>Imperial, San Diego</td>
</tr>
<tr>
<td></td>
<td>Riverside</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Doña Ana, Hidalgo</td>
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<tr>
<td></td>
<td>Grant, Luna</td>
</tr>
<tr>
<td>Texas</td>
<td>Brewster, Kinney</td>
</tr>
<tr>
<td></td>
<td>Brooks, La Salle</td>
</tr>
<tr>
<td></td>
<td>Cameron, Maverick</td>
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<tr>
<td></td>
<td>Culberson, Pecos</td>
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<tr>
<td></td>
<td>Dimmit, Presidio</td>
</tr>
<tr>
<td></td>
<td>Duval, Starr</td>
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<tr>
<td></td>
<td>Edwards, Terrell</td>
</tr>
<tr>
<td></td>
<td>El Paso, Uvalde</td>
</tr>
<tr>
<td></td>
<td>Hidalgo, Val Verde</td>
</tr>
<tr>
<td></td>
<td>Hudspeth, Webb</td>
</tr>
<tr>
<td></td>
<td>Jeff Davis, Willacy</td>
</tr>
<tr>
<td></td>
<td>Jim Hogg, Zapata</td>
</tr>
<tr>
<td></td>
<td>Kennedy, Zavala</td>
</tr>
</tbody>
</table>
BECC – Certified Projects

178 Projects with a total estimated cost of US$ 3.947 billion

California, 13
$ 254.66

Arizona, 14
$ 168.11

New Mexico, 8
$ 58.92

Texas, 47
$ 846.83

Baja California, 25
$ 1,017.72

Sonora, 25
$ 375.39

Chihuahua, 23
$ 340.17

Coahuila, 3
$ 156.60

Nuevo León, 5
$ 105.71

96 in México
$ 2,619.39 (US$)

82 in U.S.
$ 1,328.52 (US$)

Tamaulipas, 15
$ 623.80

Mexico
BECC – Technical Assistance and Training

Technical Assistance

- 69 Communities in Mexico – US$14.87 million
- 88 Communities in U.S. – US$24.52 million
- 2010 PDAP/BECC Technical Assistance = US$1.58 million (45 projects, 32% BECC TA)

<table>
<thead>
<tr>
<th>2010 Training</th>
<th>Attendees</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 events</td>
<td>722</td>
<td>US$127,000</td>
</tr>
</tbody>
</table>
NADB Cumulative Financing Figures
As of March 31, 2011

- **US$1.2 billion** contracted to support **149** projects representing a total investment of **US$3.2 billion**
  - **US$570 million** in loans
  - **US$654 million** in grants
NADB Loan Disbursements

Actual & Projected

- Actual Disbursements through 12/31/2010 ($171.8)
- Projected Disbursements through Balance year
NADB Credit Rating

Thanks to US and Mexican federal backing coupled with conservative lending requirements and strong management, the NADB maintains an investment grade credit rating of Aaa/AA+.

<table>
<thead>
<tr>
<th>Moodys Investors Service</th>
<th>Standard &amp; Poor's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>AAA</td>
</tr>
<tr>
<td>Baa1</td>
<td>BBB</td>
</tr>
<tr>
<td>Aaa</td>
<td>AA+</td>
</tr>
</tbody>
</table>
19 Drinking WTP and 32 Drinking Water Distribution Systems

53 WWTP and 70 Wastewater Collection Systems

16 Landfills built or expanded and 16 Dumpsites closed

>26,964,000 Square Meters Paved
## Social and Environmental Benefits

### Water and Wastewater:
Providing improved drinking water treatment/distribution as well as wastewater collection/treatment for the benefit of more than **12 million border residents**, most significantly impacted by new capacity to eliminate **400MGD** of untreated or inadequately treated sewage.

### Solid Waste Management:
2.9 million residents with improved waste collection and disposal services, resulting in the capacity to properly dispose of 1,550 tons of waste per day.

### Water Conservation:
Estimated annual water savings of 330 million gallons per day. As a comparison, this quantity is sufficient to serve the average drinking water demands of 4 million people.

### Water and Wastewater:
7.5 million residents benefited from reduced exposure to air pollution from vehicular traffic on unpaved streets. Approximately 170,000 tons per year of PM$_{10}$ anticipated to be eliminated.

### Energy:
Offset demands of traditional fossil-fuel based energy production, avoiding nearly 640,000 metric tons of CO$_2$-eq per year.
GHG Emissions by Border States

- Solid Waste
- Agriculture
- Fossil Fuels
- Industry
- Industrial Processes
- Transportation
- D, C, I Fuels Consumption
- Electricity (consumption base)

[Bar chart showing percentages of GHG emissions by sector for BC, SO, CH, CO, NL, and TM]
BECC/NADB and Renewable Energy

- In response to many of the recent laws passed on both the federal and state levels in the US in conjunction with a Board directive to expand lending activities in the sector, BECC/NADB have moved aggressively into the renewable energy space on both sides of the border.
- The institutions recently realigned and reinforced their renewable team to better serve the needs of this burgeoning market segment.
- The 400 km wide, 2,100 km long coverage area of BECC/NADB includes ample renewable energy resources, including some of the best locales for solar energy production in the world (see map below). Other areas are prime locations for wind power generation and the larger metropolitan areas are excellent candidates for biogas capture plants and/or biomass thermal facilities.

  - Many of the major electricity off takers in the region, particularly on the US side of the border, are increasingly active in procuring electricity produced from renewables to (i) comply with federal/state requirements, (ii) play in the carbon and/or tax credit market, and (iii) “green” their corporate activities.
  - Eligible projects include solar installations, biofuel plants, landfill gas projects, and wind farms.
  - For projects requiring senior debt of up to USD $105 million the NADB can provide the entirety of the debt required. For larger transactions, the bank is open to working with other senior debt financiers under a variety of structures on a case-by-case basis.
BECC/NADB Role: Renewable Energy

Enhancing BECC/NADB’s Role

- Strengthening Border Stakeholder Cooperation to assist in project/program coordination, consistent information exchange, and strategy development.
- Strategic Planning to identify needs within the region to improve the effectiveness of infrastructure program investments.
- Climate Change Planning, Mitigation and Adaptation Initiatives to support the efforts of both countries for emission reductions.
- Promoting Energy Efficiency and Renewable Source Projects which can be implemented for a broad range of uses including large-scale distributed source projects, public facilities/services (water utilities) as well as residential needs.
Loan Financing

- The central component of NADB’s product mix and the central driver of its day-to-day activities is the provision of senior loan facilities to public and private sector clients.

- Pertinent NADB loan terms and conditions include:
  - Senior debt financing can cover up to 85% of total project cost
  - Tenors of up to 25 years
  - Competitive fixed or floating rates
  - US Dollar or Mexican Peso facilities
  - Negotiable grace periods
  - Market minimum DSCR levels
  - Market required leverage levels
  - Economical fees levied
General Loan Closing Timeframe

- While timelines for closing vary on a project-by-project basis, in general borrowers should expect that it will take 8-16 weeks to reach financial close and the process more or less resembles the sample timeline laid out in the table at right.

- It is important to note that the loan approval and closing process is also hinged upon obtaining the environmental certification from the NADB’s sister institution, BECC.

- However, as the bank becomes more familiar with clients and particular types of transactions, closing timelines can be accelerated, as the graph at right illustrates, with a full 65% of projects closing in two months or less.
BECC/NADB Role: Renewable Energy

Strategic Assessment: Opportunities

Case Description – Water Utilities

- Conservation and Re-Use Practices
- Capacity Strengthening
  - Energy Audits
  - Facility and Process Lighting
  - Equipment Replacement
  - Load Management / SMART software

- Clean and Renewable Energy:
  - Wind, Solar
  - Biomass

Potential Impact: Improved Resource Management, Reduced Operational Costs, Reduced Greenhouse Gases
BECC/NADB Role: Renewable Energy

Strategic Assessment: Challenges

- Very few economic and financial incentives for renewable energy in Mexico – profitability depends on subsidies
- Lack of viable binational transmission lines outside of California-Baja California region
- Legal, regulatory and pricing certainty for renewable energy projects is still developing in Mexico
- Limited technical assistance resources for project development in the public sector
- Institutional capacity of local government and public utilities requires strengthening to implement energy efficiency and renewable energy opportunities.
BECC/NADB Role: Renewable Energy

Meeting the Challenges

- Participate and promote policy consideration to address broad industry challenges
  - Climate Action Planning
  - Support Research and Development Initiatives

- Identify Opportunities in Project Development
  - Capacity Building at all levels – “Best Practices”
  - Green Building Guidelines
  - Water and Energy Audits / Benchmarking
  - Alternative Energy Sources – Self-Supply

- Funding Programs
  - Funding Source Prioritization Schemes
    - US-Mexico Border Water Infrastructure Program - BEIF/PDAP
  - Proposing new funding programs
    - Proposed Border Energy Fund – Representative Reyes and Senator Bingaman
BECC/NADB Role: Renewable Energy

Current Sector Participation

- **Climate Action Strategies – PEAC**
  - Close coordination with federal authorities
  - Identifying Funding Sources – US AID, IDB
  - B2012 Coordination/Funding

- **Strategic Initiatives**
  - Sustainable Urban Development

- **Special Project Development**
  - Solar Project – Los Alisos WWTP Nogales, SON

- **Projects Under Development**
  - FRV Tucson 20 MW Photovoltaic Solar Park Project
  - Imperial Valley Solar Company 23 MW Photovoltaic Solar Project
  - El Porvenir Wind Project, Reynosa, TAMPS
  - Wind Project, Los Vergeles, TAMPS
Region’s Electric Utilities Active in Green Energy

- In the US, the passage of both state and federal mandates that force utilities to acquire electricity generated from renewable sources has spurred many of the region’s utilities to aggressively seek out renewable energy sources
  - **California:** utilities must obtain 20% of their energy from renewable sources by the end of 2010 and 33% by 2020.
  - **Arizona:** utilities must obtain 15% of their energy from renewable sources by 2025.
  - **New Mexico:** IOUs must acquire 10% of their energy from renewable sources in 2010 and 20% by 2020. REAs must obtain no less than 10% from renewables by 2020.
  - **Texas:** has established a statewide renewable standard based on installed MW – 10,000 MW by 2025 – and further codification of renewable energy law is anticipated in the coming years. Already the national leader in wind energy.
### Renewable Energy Project Pipeline

<table>
<thead>
<tr>
<th>No.</th>
<th>Project</th>
<th>Location</th>
<th>Borrower</th>
<th>Est. Loan Amount (USD$ millions)</th>
<th>Loan Term (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23 MW Photovoltaic Solar Park</td>
<td>El Centro, CA</td>
<td>Private</td>
<td>$76.9</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>25 MW Photovoltaic Solar Park</td>
<td>Picture Rocks, AZ</td>
<td>Private</td>
<td>$75.0</td>
<td>19.5</td>
</tr>
<tr>
<td>3</td>
<td>5 MW Photovoltaic Solar Park</td>
<td>Tucson, AZ</td>
<td>Private</td>
<td>$13.0</td>
<td>15</td>
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<td>4</td>
<td>25 MW Photovoltaic Solar Park</td>
<td>Tucson, AZ</td>
<td>Private</td>
<td>$81.0</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>26 MW Photovoltaic Solar Park</td>
<td>Borrego Springs, CA</td>
<td>Private</td>
<td>$81.0</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>150 MW Photovoltaic Solar Park</td>
<td>El Centro, CA</td>
<td>Private</td>
<td>$105.0</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>72 MW Wind Project</td>
<td>Tecate, BC</td>
<td>Private</td>
<td>$105.0</td>
<td>15</td>
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<tr>
<td>8</td>
<td>100 MW Wind Project</td>
<td>Llera y Casas, TAMPS</td>
<td>Private</td>
<td>$105.0</td>
<td>15</td>
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<tr>
<td>9</td>
<td>54 MW Wind Project</td>
<td>Reynosa, TAMPS</td>
<td>Private</td>
<td>$102.0</td>
<td>15</td>
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<tr>
<td>10</td>
<td>4 MW Landfill Gas Project</td>
<td>Edinburg, TX</td>
<td>Private</td>
<td>$6.0</td>
<td>20</td>
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<td>11</td>
<td>2 MW Landfill Gas Project</td>
<td>El Paso, TX</td>
<td>Private</td>
<td>$6.0</td>
<td>20</td>
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<td></td>
<td><strong>Subtotal Renewable Energy</strong></td>
<td></td>
<td></td>
<td><strong>$755.9</strong></td>
<td></td>
</tr>
</tbody>
</table>
Thank You.

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