Climate Change and Urban Green Infrastructure in the Border Region

Border Environment Cooperation Commision
North American Development Bank

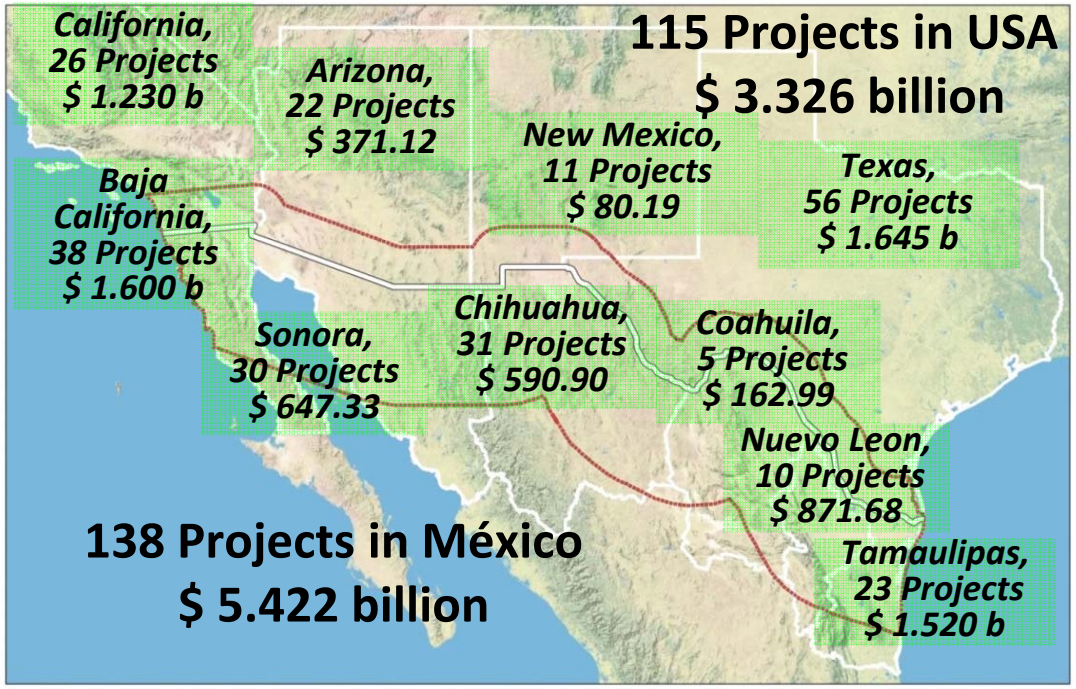
September 2015

Agenda

- BECC/NADB Accomplishments
- Climate Change Initiatives
  - State Climate Action Planning
  - Renewable Energy
  - Energy Efficiency
  - Green Infrastructure

Certified Projects and Technical Assistance

September 2015



Certified projects	**253**
Total investment (million dollars)	**$8.748 b**
NADB financing* (millions dollars)	**$2.249 b**
Benefited population (million)	**17.5**
Projects financed by NADB*	**197**

*Only active contracts, including grants

BECC Technical Assistance

(million dollars)

- **72** Communities in Mexico **$16.50**
- **93** Communities in USA **$29.62**
- PDAP/BECC Tech. Assistance from 1995 to 2015 = **$46.12**
- Approx. **85%** of these funding have resulted in implemented or in-progress projects.

Border 2012 and 2020 Programs

(million dollars)

- 2005-2015: **$10.80**
- **257** projects

NADB Technical Assistance

(million dollars)

- **$21.70** for **222** studies in **102** communities

Social and Environmental Benefits

140 Water and Wastewater

Providing improved drinking water treatment/distribution as well as wastewater collection/ treatment for the benefit of more than 12.8 million border residents, most significantly impacted by new capacity to eliminate more than 462 MGD (20.2 m^3/sec) of untreated or inadequately treated sewage.

26 Water Conservation

Estimated annual water savings of 330 MGD (456 million m^3/year). As a comparison, this quantity is sufficient to serve the average drinking water demands of 4 million people.

23 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.

12 Air Quality Projects

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.

27 Energy

Offset demands of traditional fossil-fuel based energy production, avoiding nearly 2.47 million metric tons CO_2-e per year. Annual generation of 4,803 GWh of energy from renewable sources.

Inputs / Outcomes

21 Drinking Water Treatment Plants and **40** Drinking Water Distribution Systems

61 Wastewater Treatment Plants and **99** Wastewater Collection Systems

26 Water Conservation Projects

N E E D

16 Municipal Landfills built or expanded and **12** Dump Sites closed

9.0 Million Squared Meters Paved

R E S U L T

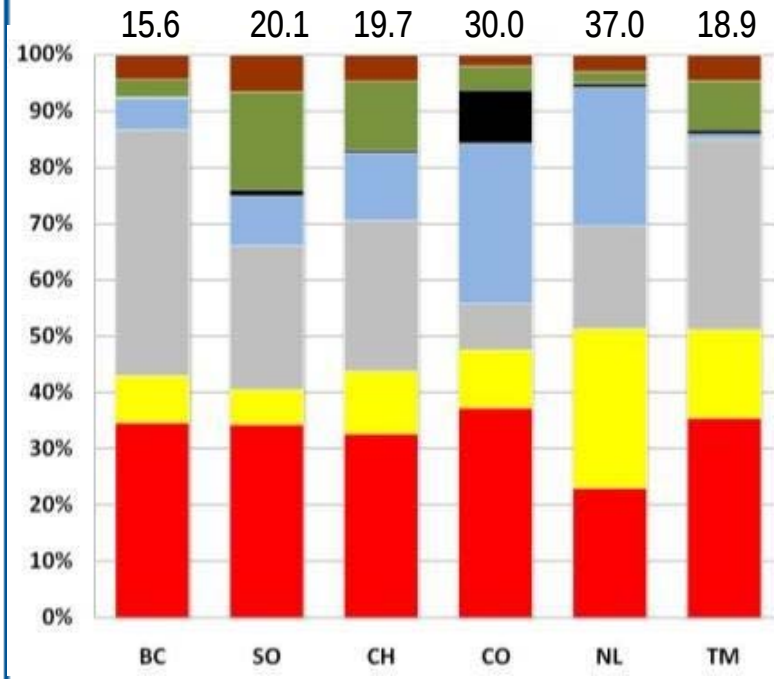
1,562 MW_{AC} of new renewable energy capacity (14 solar plants and 12 wind farms). CO_2 emissions displaced equivalent to the emissions of **517,000** passenger vehicles

Climate Change Initiatives

- State Climate Action Planning

GHG Emissions by Sectors

Total = 141.3 $MTMCO_2$-e / year



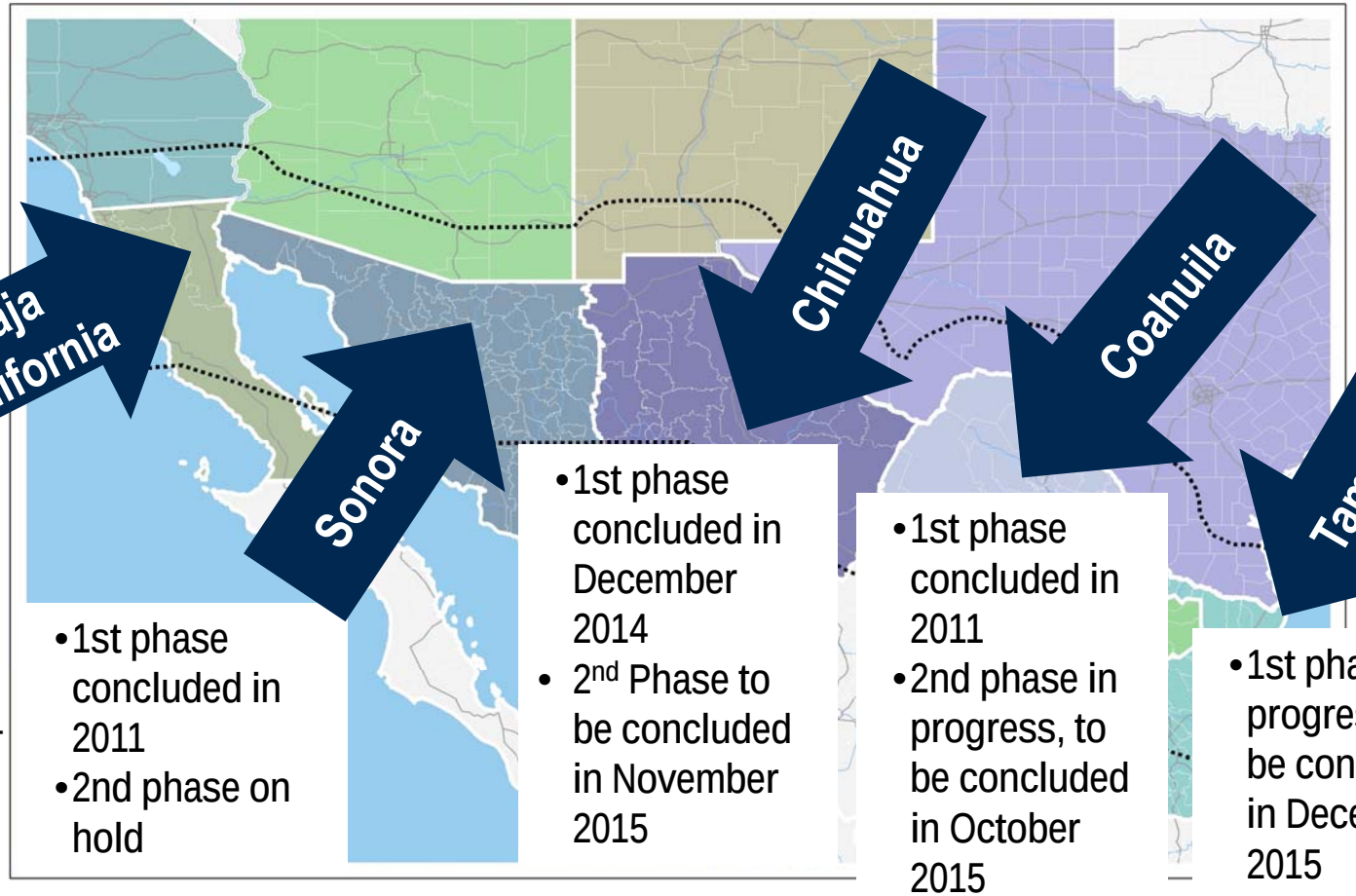
- Municipal solid waste
- Agriculture
- Fossil fuels industry
- Industrial processes
- Transportation
- Domestic, Commercial & Ind. Fuel Consumption
- Electricity (consumption based)

- In 2005 the six Mexican border states emitted a total of 141.3 $MTMCO_2e$ (*i.e.* 21.7% of the national emissions, with only 17.6% of the total population).
- For 2025 the gross GHG emissions projected are 225.7 $MTMCO_2e$ (*i.e.* 31% of the national GHG emissions with only 19.4% of the nation's population).

BECC Climate Change Strategies

- Close coordination with Federal (SEMARNAT-INECC) and State governments
- Identification of funding sources – EPA, US AID, ClimateWorks
- Coordination / funding through the Border 2020 Program

Progress of State Climate Action Plans



- 1st phase concluded in 2011
- 2nd phase concluded in December 2014

- 1st phase concluded in 2011
- 2nd phase on hold

- 1st phase concluded in December 2014
- 2nd Phase to be concluded in November 2015

- 1st phase concluded in 2011
- 2nd phase in progress, to be concluded in October 2015

- 1st phase in progress, to be concluded in December 2015

1st phase: Identification of mitigation public policy options

2nd phase: Socio-economic quantification of selected mitigation public policies

Energy Efficiency

- Resource (Water/Energy) Management

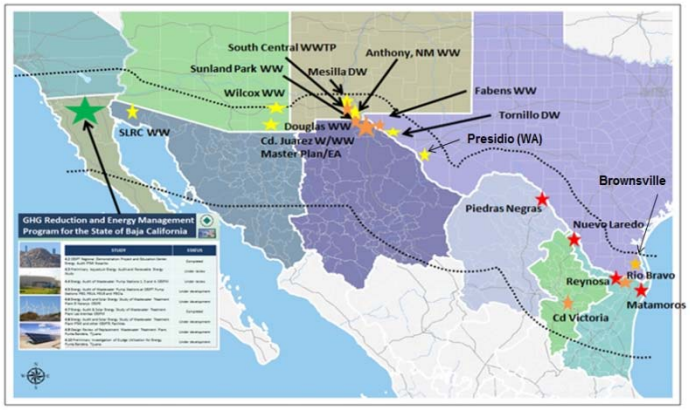
Energy and Water Audits for Water Utilities

- **15 Energy Audits:**

  7 US **8** Mexico

  Baja California State Water Utilities Energy Management Program (US AID)

- **5** Water Audits: 4 US and **1** Mexico

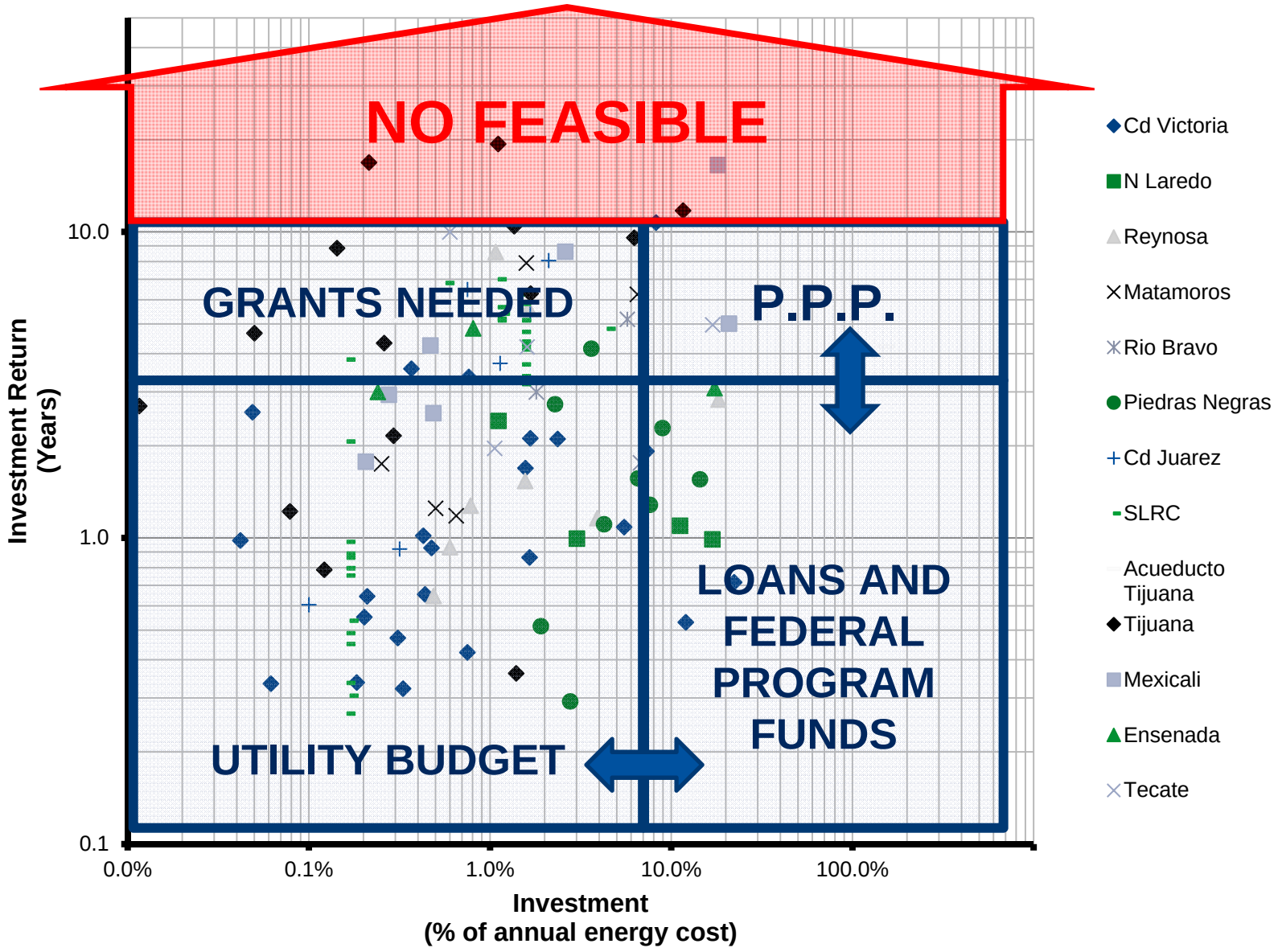


2015 Focus: Implementing Audit Recommendations

- Rio Colorado – Tijuana Aqueduct – Energy savings potential: 41 M kWh ($3M)
- Energy Efficiency in 5 utilities in Tamaulipas and Piedras Negras, Coahuila – Energy savings potential: 35.5 M kWh ($5M)
- Energy Efficiency at the WWTP in Anthony, NM – Energy savings potential: 244,000 kWh ($35,000)

Energy/Water Audits - US-Mexico Border Region

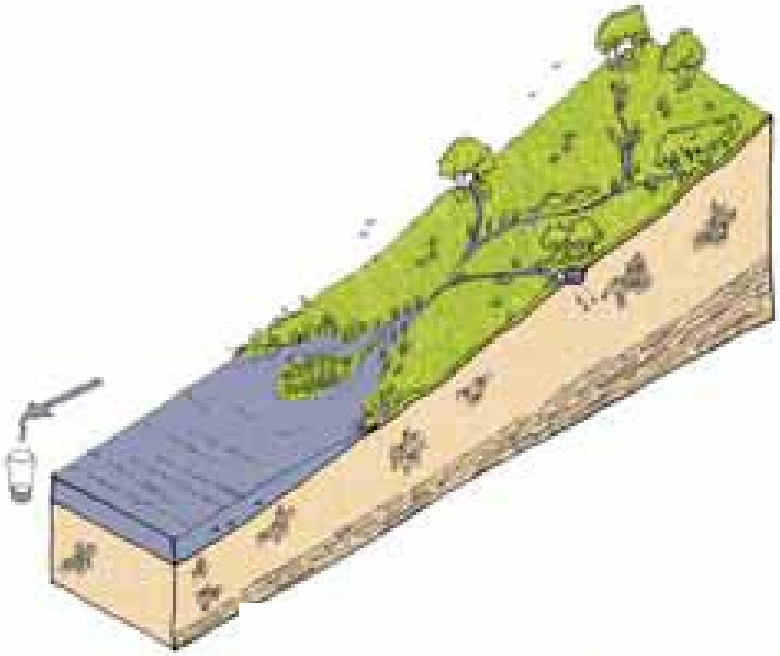
Energy/Water Audits - US-Mexico Border Region



Urban Green Infrastructure

- Topic Introduction
- Benefits
- BECC/NADB Strategy

Paving and Urbanization



http://www.sfwater.org

Problems - Flooding

Rubén Villalpando y cortesía de la Secretaría de Seguridad Pública Municipal, 6 Agosto 2006
http://www.jornada.unam.mx/2006/08/06/index.php?section=politica&article=035n1est

Ernesto Rodríguez, El Diario de Juárez, 25 Septiembre 2013, calle Ejercito Nacional http://diario.mx/Local/2013-07-25_2c63e372/cierran-por-inundacion-un-tramo-de-la-ejercito-nacional/

http://diario.mx/Local/2013-07-25_1cd2fa77/escurrimientos-fueron-la-causa-de-inundaciones/, El Diario de Juárez, 25 Septiembre 2013, Martín Orquiz

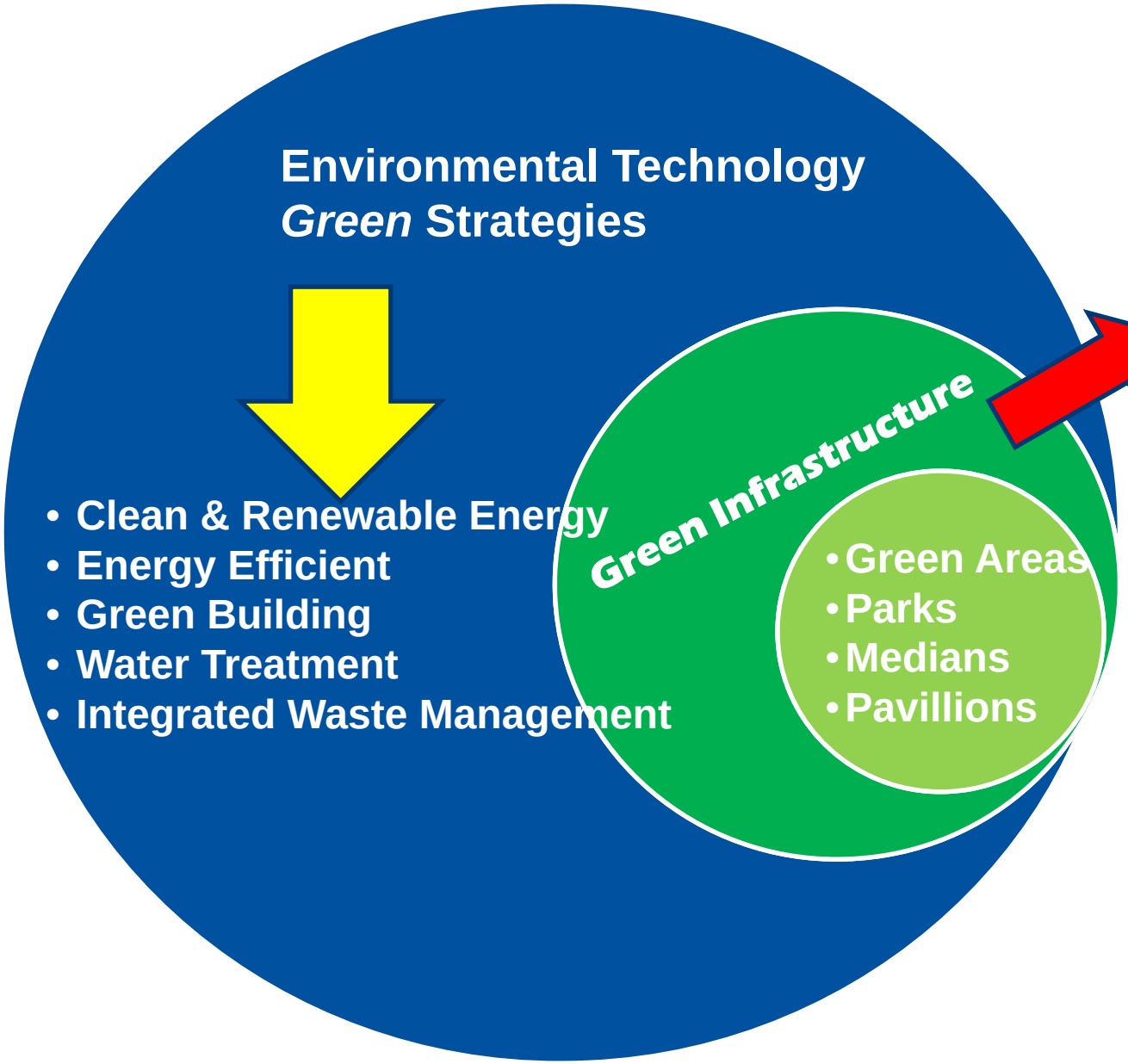
Foto: Brenda Luna, Carretera Casas Grandes, https://www.facebook.com/photo.php?fbid=555050551216858&set=a.555023201219593.1073741829.128606507194600&type=1&theater, 11 septiembre 2013

Problems – Air quality

Visibilidad casi nula para conductores y mala calidad de aire para Ciudad Juárez. Foto: El Mexicano, 14 de abril de 2012 http://www.oem.com.mx/elmexicano/notas/n2505355.htm

Juan Antonio Castillo / José Luis González, sábado, 14 de abril de 2012 http://www.nortedigital.mx/article.php?id=9034

Foto: Lucio Soria, 19 Diciembre 2012
http://diario.mx/Local/2012-12-19_220dafd8/juarez-bajo-tiera



Wide range of techniques and strategies that use vegetation and soil to provide a ***public service***

Formal Definition of Green Infrastructure

- A set of products, technologies and practices that use natural systems, or constructed systems that mimic natural processes- to improve overall environmental quality and provide public services.
- As a general principle, the *Green Infrastructure* techniques uses soils and vegetation.
- These technologies can simultaneously promote and improve:
  - Social benefits - physical health, mental health, community health, connects people with nature quality of life.
  - Environmental benefits - urban climate modulation, heat islands reduction, energy savings, GHG emissions reduction, improved air quality, noise pollution reduction, stabilization of urban land, groundwater recharge, water quality improvement and conservation of the biodiversity.
  - Economic benefits - agricultural and forestry products, free or low-cost recreational opportunities, medical and public health cost savings, community cohesion and social capital, and reduction in costs related to rainwater management, air pollution control and energy consumption.

EPA Green Infrastructure Glossary

...for example, Tucson, AZ

Brad Lancaster

Watershed Management Group

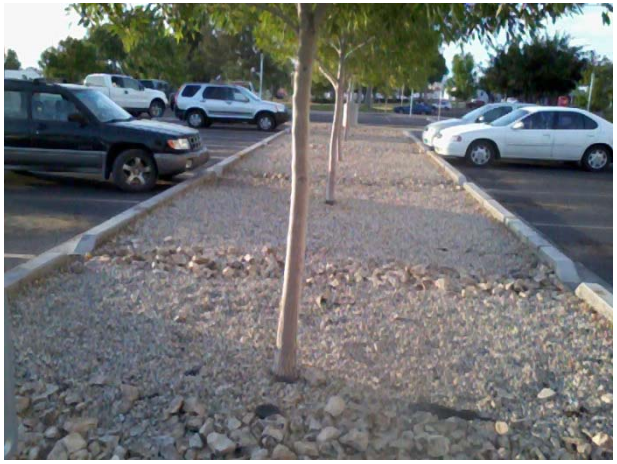
Disconnecting gutters and installing rainwater cisterns

http://water.epa.gov/infrastructure/greeninfrastructure/gi_what.cfm#planterboxes

Sidewalks, Mediums, and Roundabouts

www.susdrain.org Melbourne

Tucson, AZ



Las Cruces, NM

El Paso, TX

Tucson, AZ

Paradigm Shift

School of Architecture Uiversity of Arizona, Brad Lancaster

San Luis Río Colorado, Son. (September 2015)






Contact

Maria Elena Giner, P.E.
mginer@cocef.org
Border Environment Cooperation Commission
Blvd. Tomas Fernandez 8069
Cd. Juarez, Chihuahua, 32470
Tel: (656) 688.4600; 1-877-277-1703
www.cocef.org
www.becc.org