

# Energy and Security in the U.S.- Mexico Border Region

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# Some Basics

- Secure and adequate energy resources are *critical* to the security and well being of every country. *Therefore:*
  - Access to energy supplies is legitimately a question of national and international security.
  - Keep in mind: over **80%** of the world's energy is derived from carbon-based fuels. (oil, coal, natural gas)

# Energy Basics

- ***Oil* drives issues of energy and security. Why? because:**
  - U.S. consumes 26% of world's oil – but produces only 5%.
  - U.S. imports 66% of its oil. By 2020, we will be importing close to 75%
  - U.S. spent \$384 billion last year on imported oil.
  - 65% of global reserves are in Middle East.
  - By 2030, China will import as much oil as U.S.
  - U.S. spends approximately \$50 billion per year to maintain military presence in middle east (does *NOT* include Iraq war).
  - By 2030, oil consumption will increase by 46%
  - By 2030, carbon-based fuels will *still* account for 86% of U.S. energy use, about the same as today. *Unless* there is a significant change in current policy regarding carbon emissions.

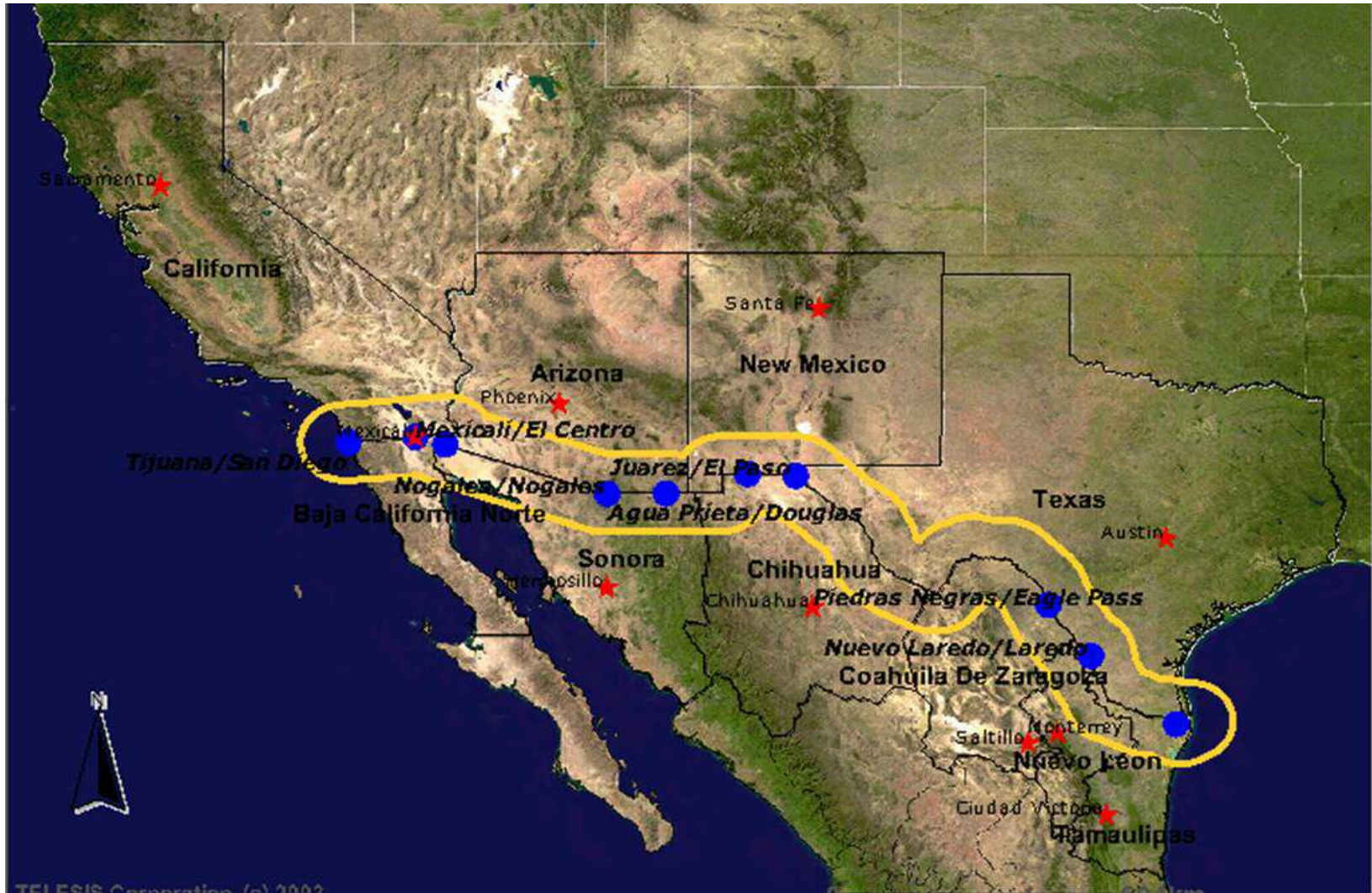
# Energy Independence??

- Energy *independence* for the U.S. is not feasible, not desirable and makes no sense.
- What we really want is *reduction of oil imports to as low a level as possible*.
- This means replacing oil in transportation sector with other fuels (biofuels, electric, hydrogen, other?).
- *Thus* – reducing oil as main transportation fuel becomes a national security issue.
- If one views global climate change as an *international security question*, then reducing all carbon emissions (e.g. from coal), also becomes a security issue.
- Now, let's look at U.S.-Mexico Border Region

## **Main Energy and Security Issues in the U.S.- Mexico Border Region**

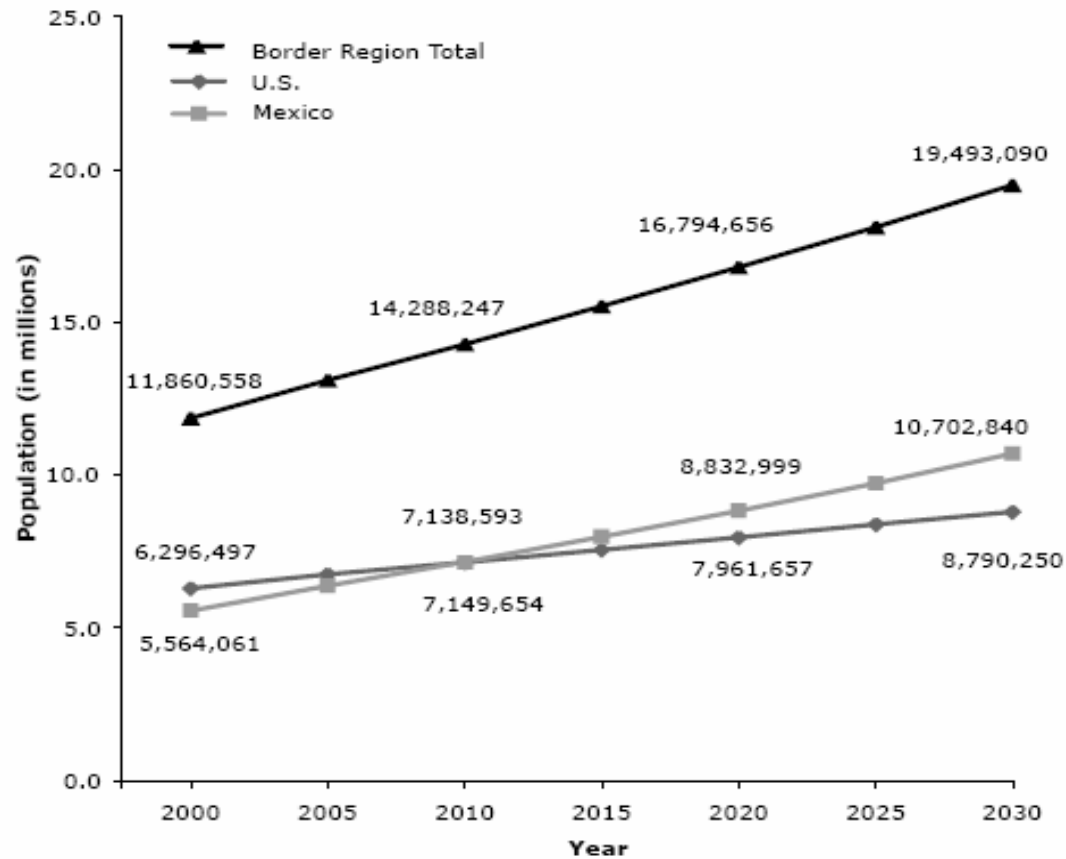
- ▶ Trading of energy across the border has grown *significantly* in recent years.
- ▶ Most of this trade is in electricity, natural gas and petroleum products.
- ▶ The border is currently criss-crossed by power lines, natural gas and oil pipelines.
- ▶ Major new infrastructure include power plants and liquefied natural gas terminals, mostly in Mexico.
- ▶ There is significant *potential* for renewable energy development in region.
- ▶ Will we have energy *competition* or energy *interdependence*?

# U.S.-Mexico Border Region

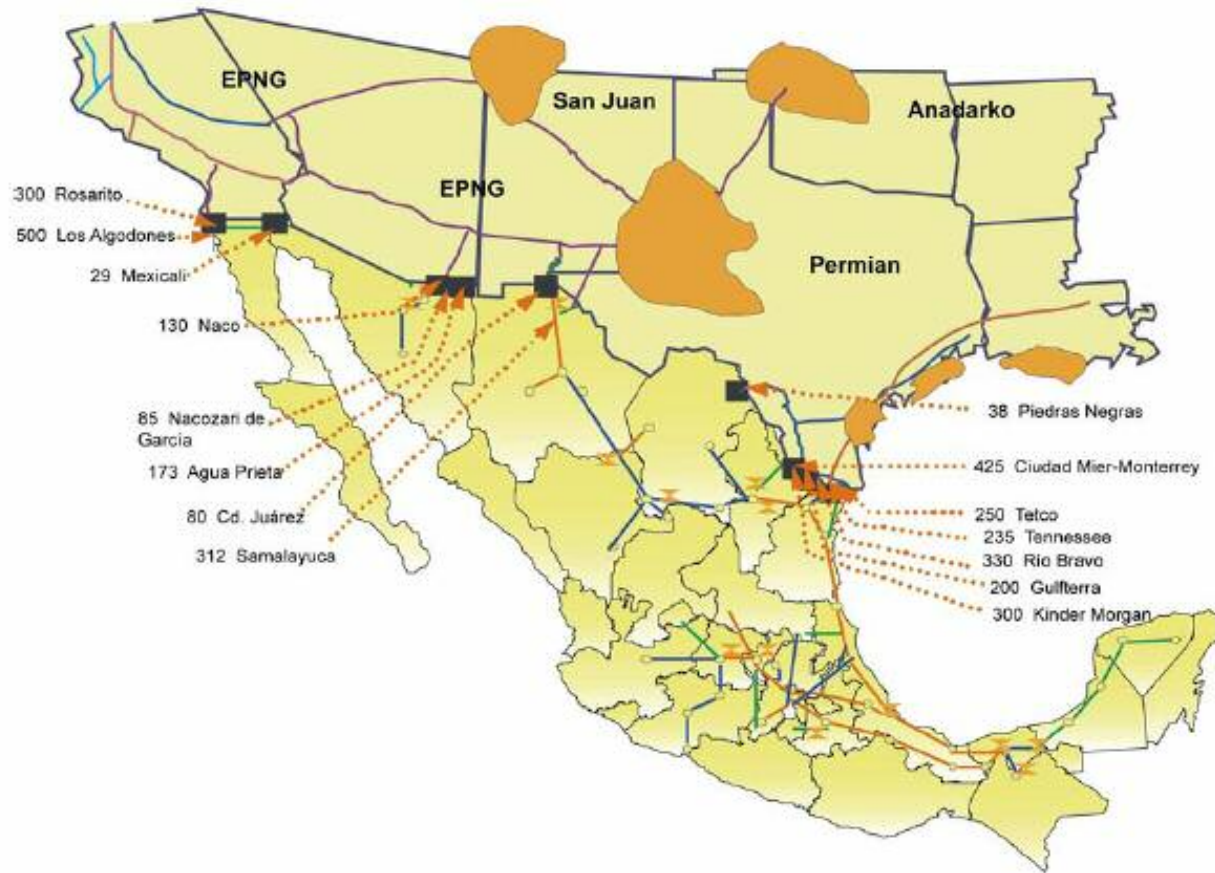


# U.S.-Mexico Border Region Population

## Medium Population Projection



## Mexican Pipelines and Interconnections with the U.S.

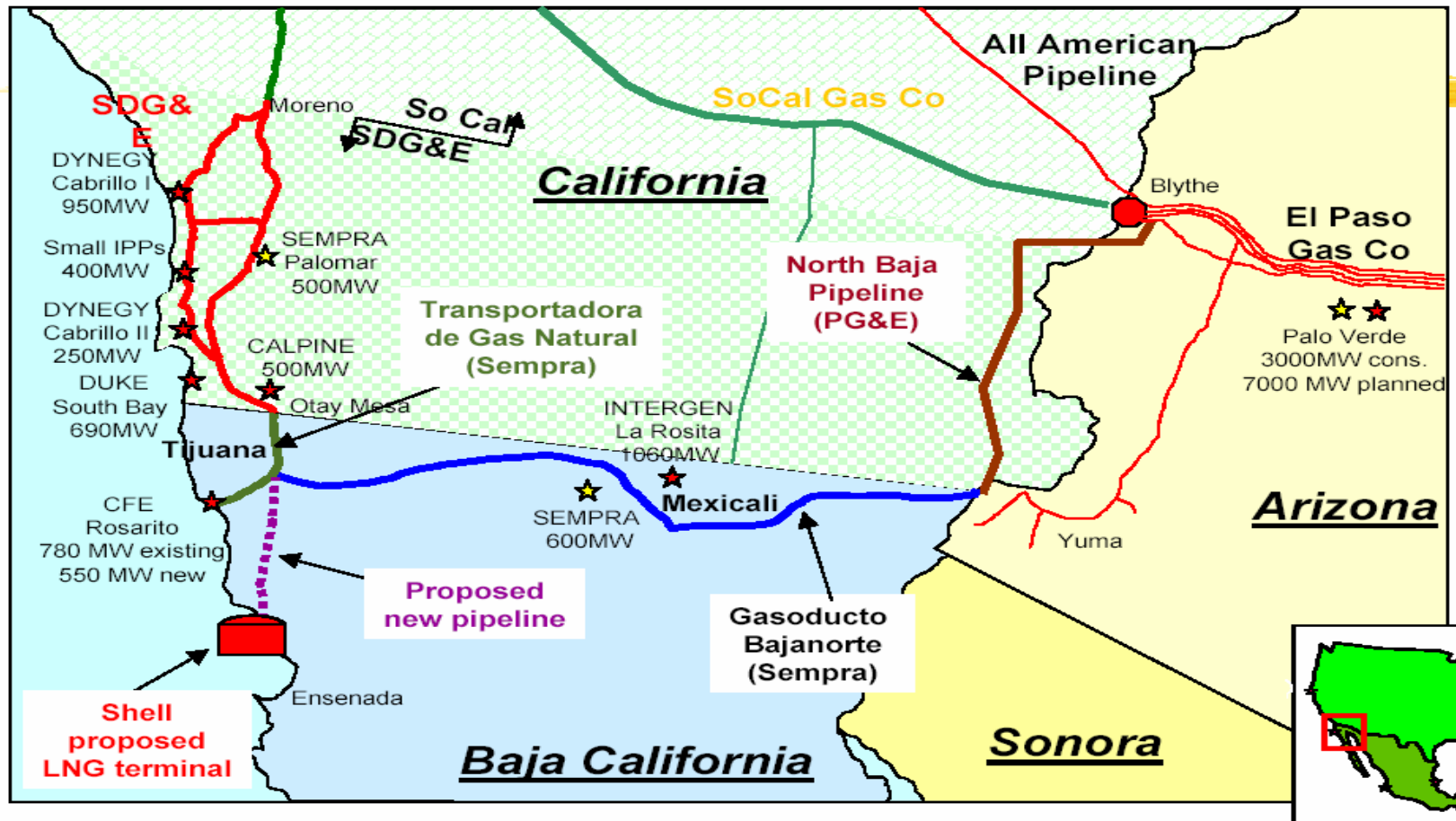


## Mexico-US border power interconnections

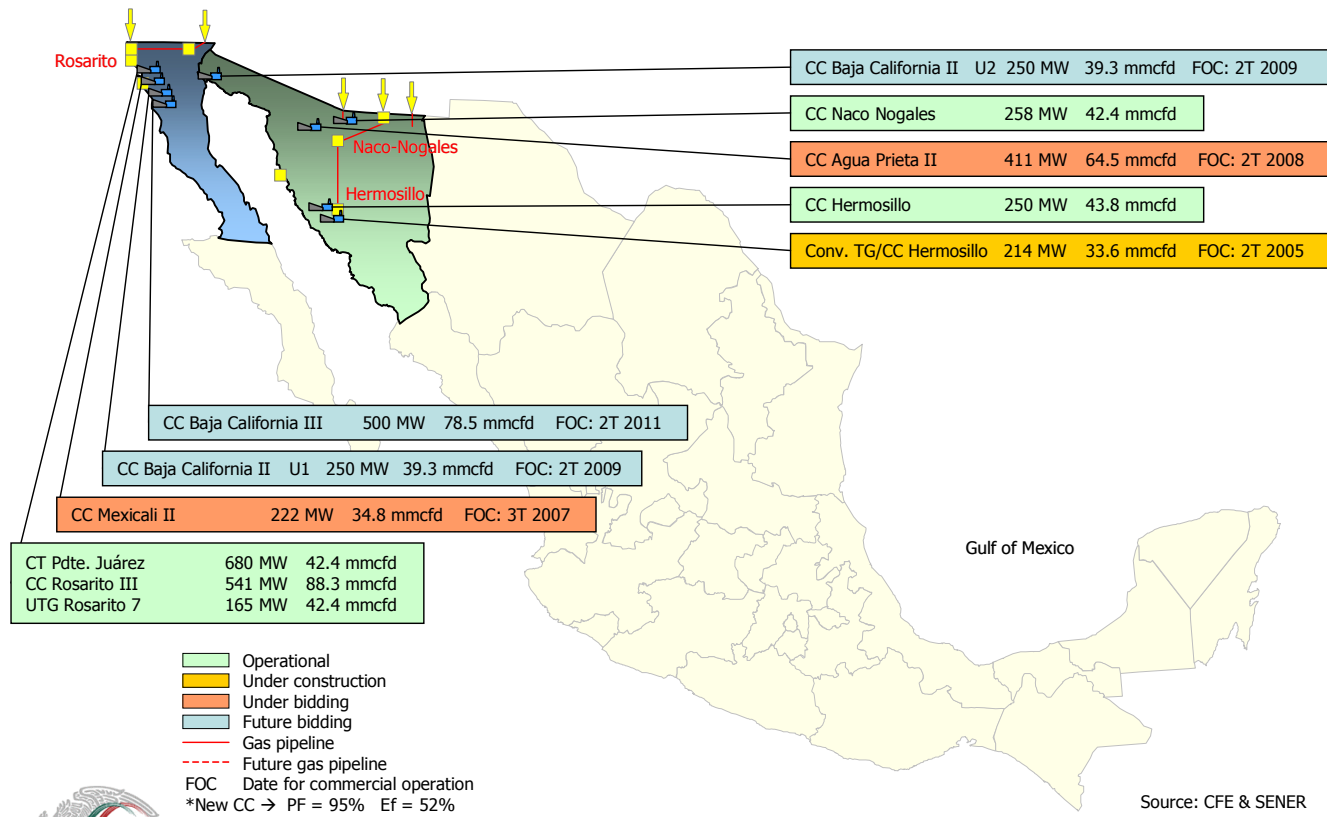


# Existing Gas Pipeline Infrastructure

Coral Energy (Shell) Testimony, CPUC, Sept. 5, 2003



# Power generation for Baja California and Sonora



Subsecretaría de Planeación Energética y Desarrollo Tecnológico

Source: CFE & SENER

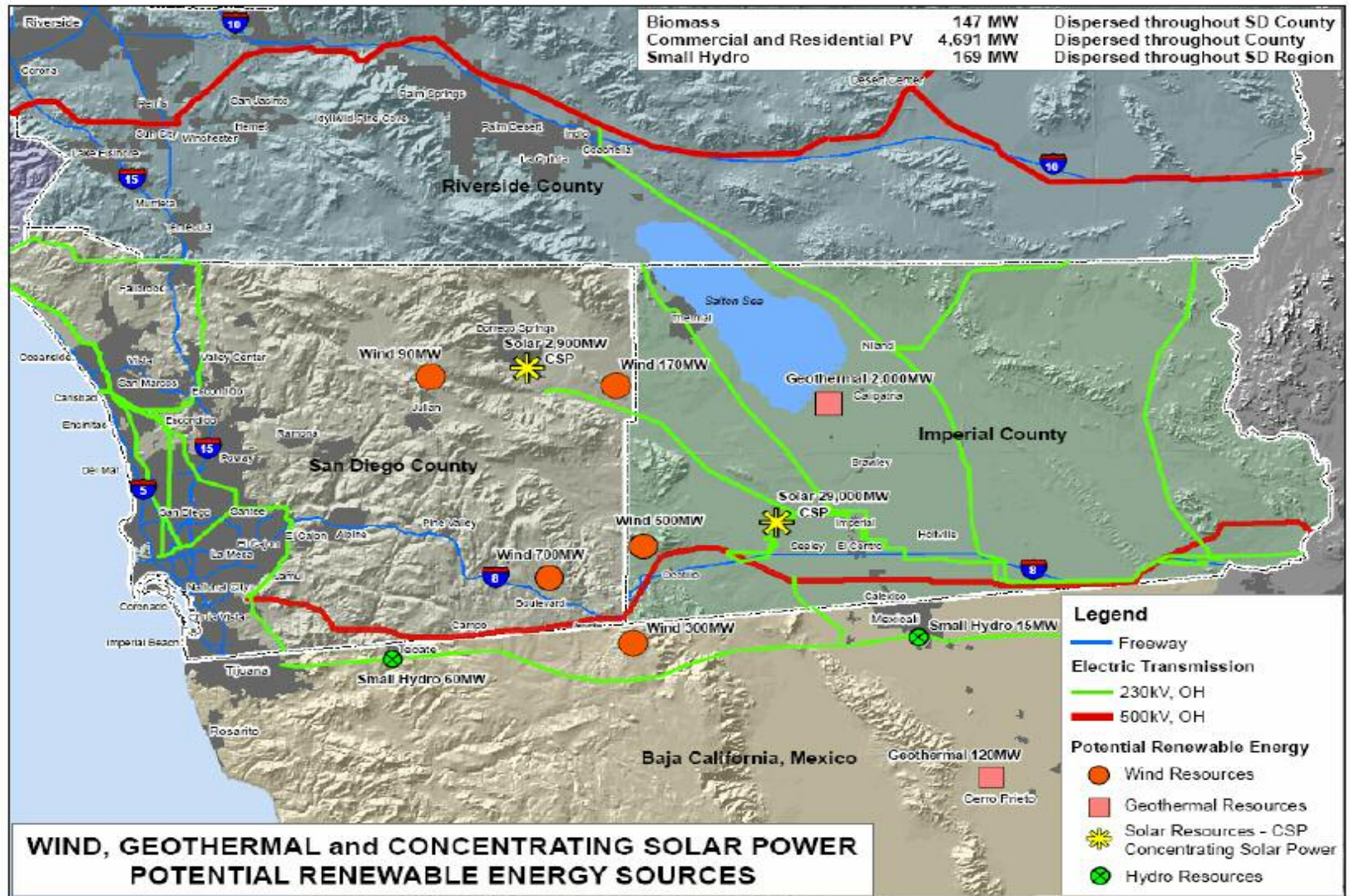
# LNG Project Planned for Costa Azul



# Renewable Energy Potential for Border Region

Potential for Renewable Energy in the San Diego Region  
August 2005

Figure 1.1: Approximate Locations for Major Renewable Resources in the Region



# Conclusions

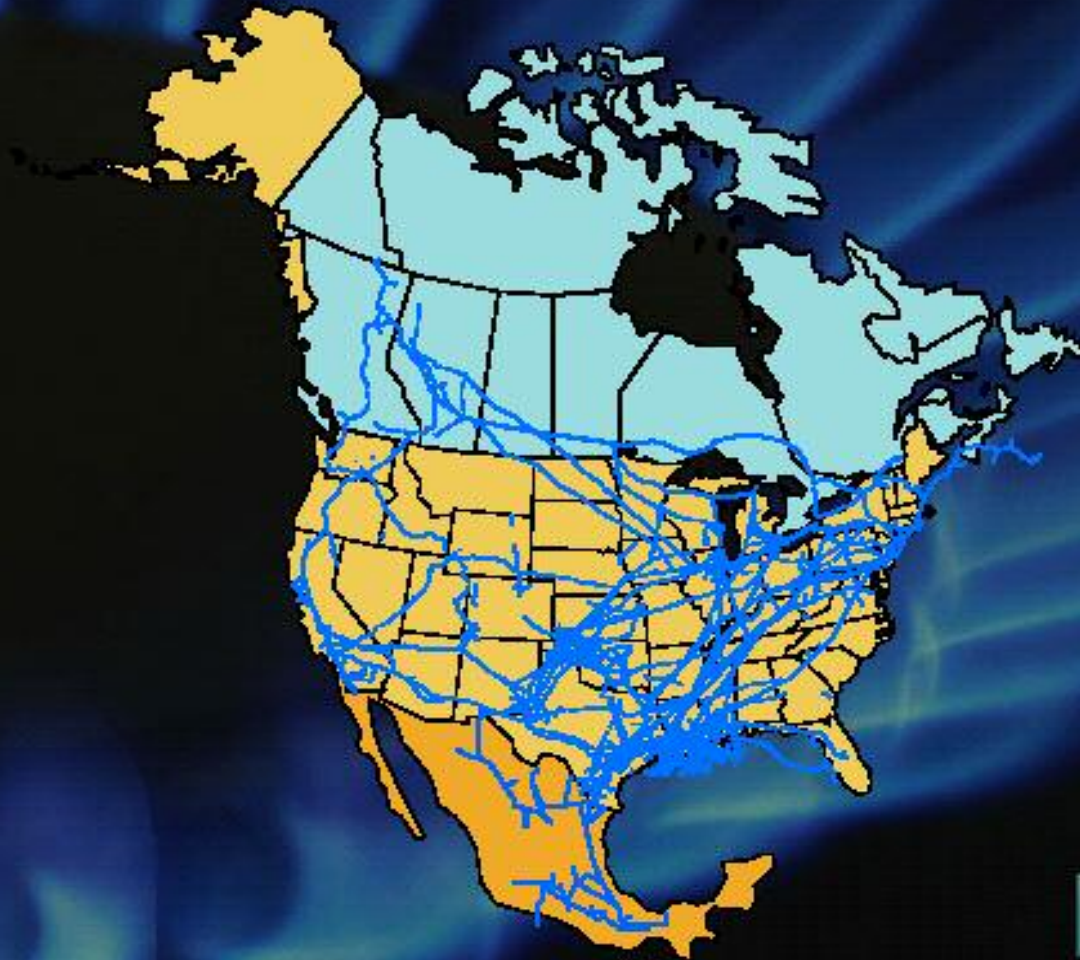
- The border region has become the site of major electricity and natural gas exchanges.
- Energy infrastructure and demand will expand significantly in the next ten years
- The U.S and Mexico can become energy *interdependent*, but only if appropriate policies are put in place soon.
- Yet, currently there are no coordinating or planning processes overseeing energy development in the border region.

# Background Slides

Table 1.2: Region's Renewable Energy Technical Potential in 2020

SOLAR PV - Commercial and Residential			SOLAR - Concentrating Solar Power (CSP)			WIND		
	<u>Capacity (MW AC)</u>	<u>Energy (GWh)</u>		<u>Capacity (MW AC)</u>	<u>Energy (GWh)</u>	<u>Capacity (MW)</u>	<u>Energy (GWh)</u>	
SD County	4,691	10,224	SD County	2,900	5,080	SD County & Parts of Imperial County and Northern Baja California, Mexico		
			Imperial County	29,000	50,808	1,650 - 1,830	4,530 - 5,020	
BIOMASS (SD County)			SMALL HYDRO			GEOTHERMAL		
	<u>Capacity (MW)</u>	<u>Energy (GWh)</u>		<u>Capacity (MW)</u>	<u>Energy (GWh)</u>	<u>Capacity (MW)</u>	<u>Energy (GWh)</u>	
Landfill Gas	72	505	SD County	8.32	15	Imperial County	2,500	22,000
			Imperial County	86.5	152			
Other Biomass	75	525	Northern Baja CA, Mexico	75	131	Northern Baja CA, Mexico	840	6,000

## North America Has An Extensive Natural Gas Infrastructure

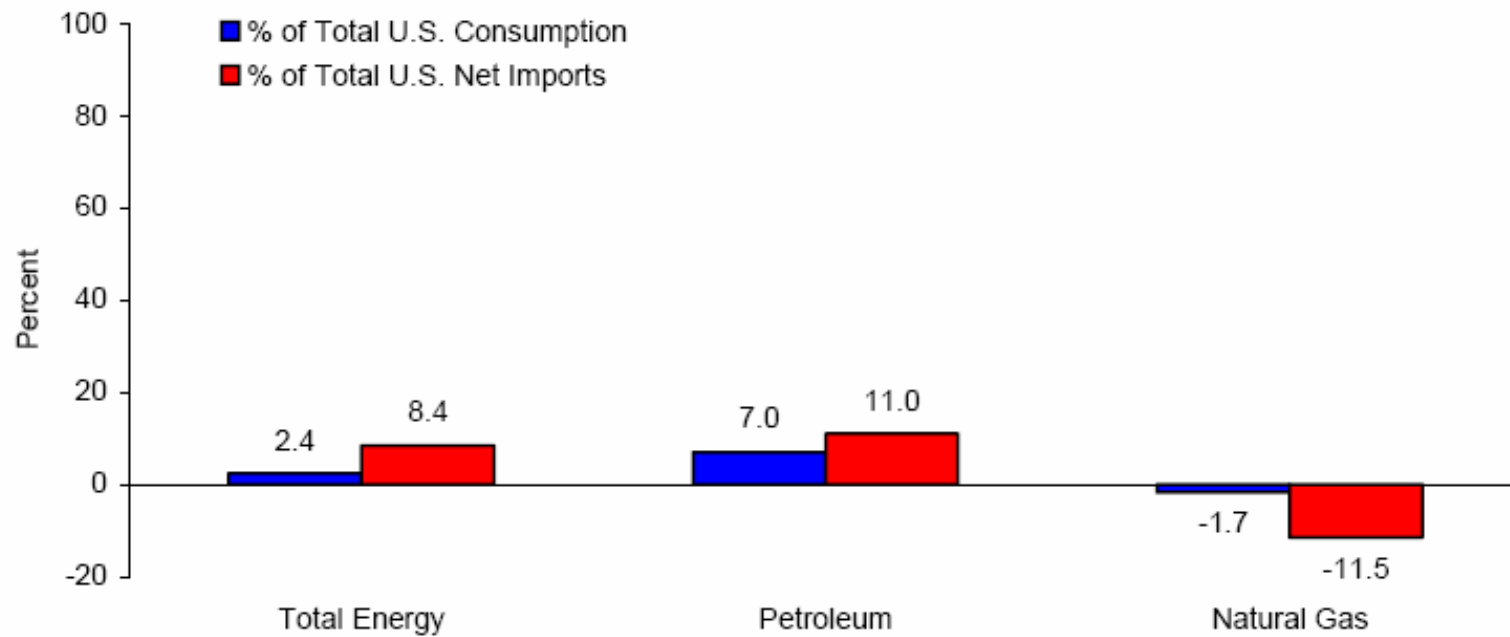


NPC

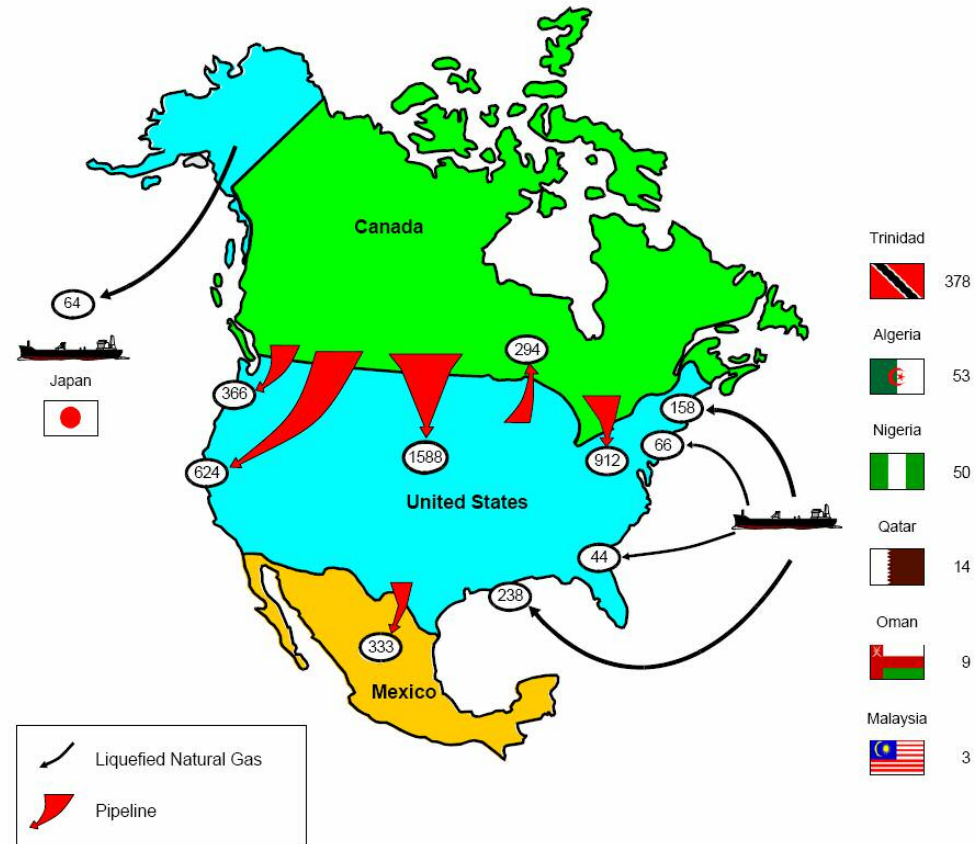
## **Main Energy and Security Issues in the U.S.-Mexico Border Region**

- ▶ **Currently, there is no coordinating or planning process overseeing energy development in the border region.**
- ▶ **There are also no agencies or entities specifically responsible for security of energy supplies coming from Mexico or for energy infrastructure.**
- ▶ **The energy sector *could* be used to develop close coordination and security cooperation between US and Mexico. However, it could also be the source of friction and tension.**

**U.S. Net Energy Imports from Mexico, 2004**  
**(As Share of U.S. Consumption & Net Imports, by Fuel Type)**



## North American Flow of Natural Gas Imports and Exports, 2003 (Billion Cubic Feet)



Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports*.

# Natural Gas Pipelines

