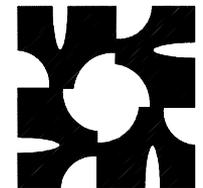


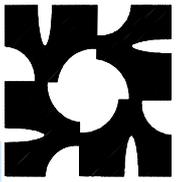
# Small Hydro opportunities in Mexico

**Valdez Ingenieros  
SA de CV.**



Feb 7 2003

Email: [vinsa1@terra.com.mx](mailto:vinsa1@terra.com.mx)

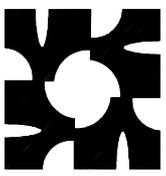


# Content



- Introduction
- Small Hydro potential
- Focus in Veracruz
- An invitation to come down





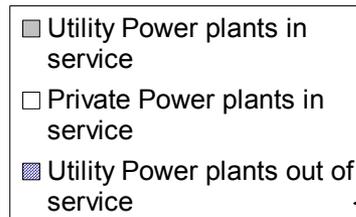
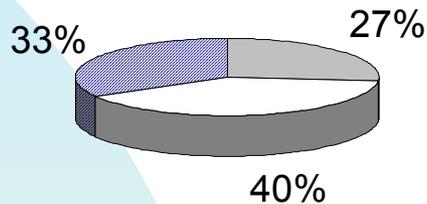
## Introduction

**Valdez Ingenieros SA de CV (VINSAs)** is an energy consulting firm with experience in the following areas:

- Small Hydro projects
- Industry energy savings projects
- Energy quality problems

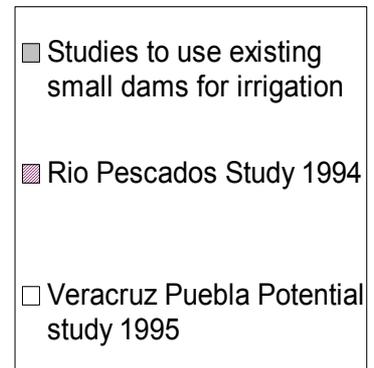
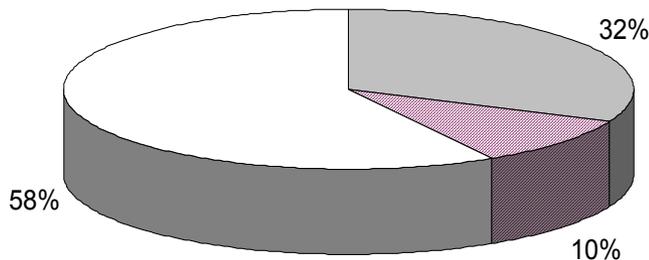
**VINSAs** has an experience of more than 20 years. Among our clients we have CONAE (National Commission for Energy Savings) and CFE (National Electric Utility). We have done most of the Small hydro studies in Mexico for new power plants or for refurbishing units in operation

# Mexico Small Hydro potential estimation. 11.38 TWH / year



119 power plants of 1 Mw average with more than 60 years in operación  
3.3 % of the potential

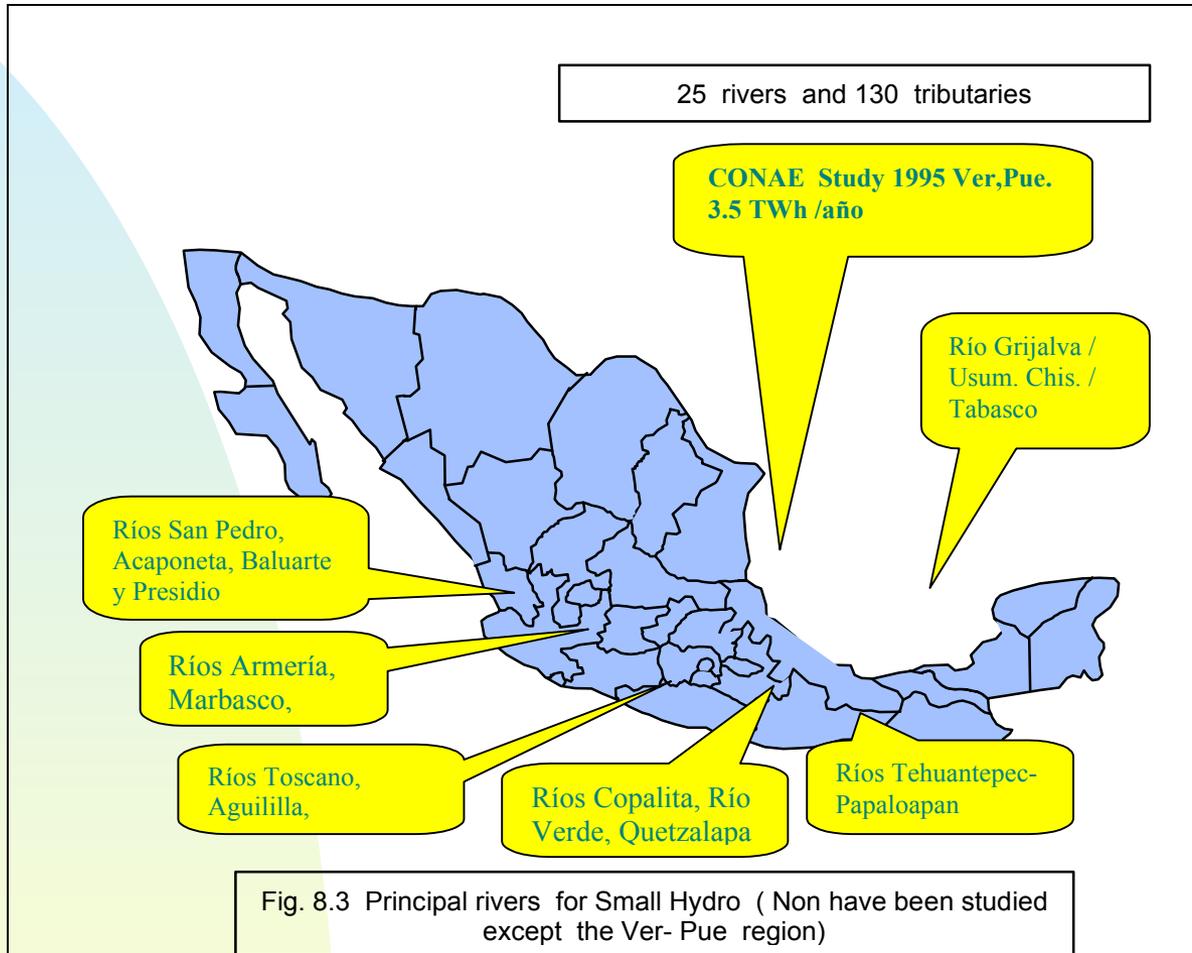
Figura No. 8.1 Total Small Hydro energy (1995) 385.20 GWh



Total of 179 Power plants of 6.3 Mw average each  
53 % of the potential

Fig. No. 8.2 Potential Small Hydro Studies (1995) 6 TWh / año

# Small Hydro regions

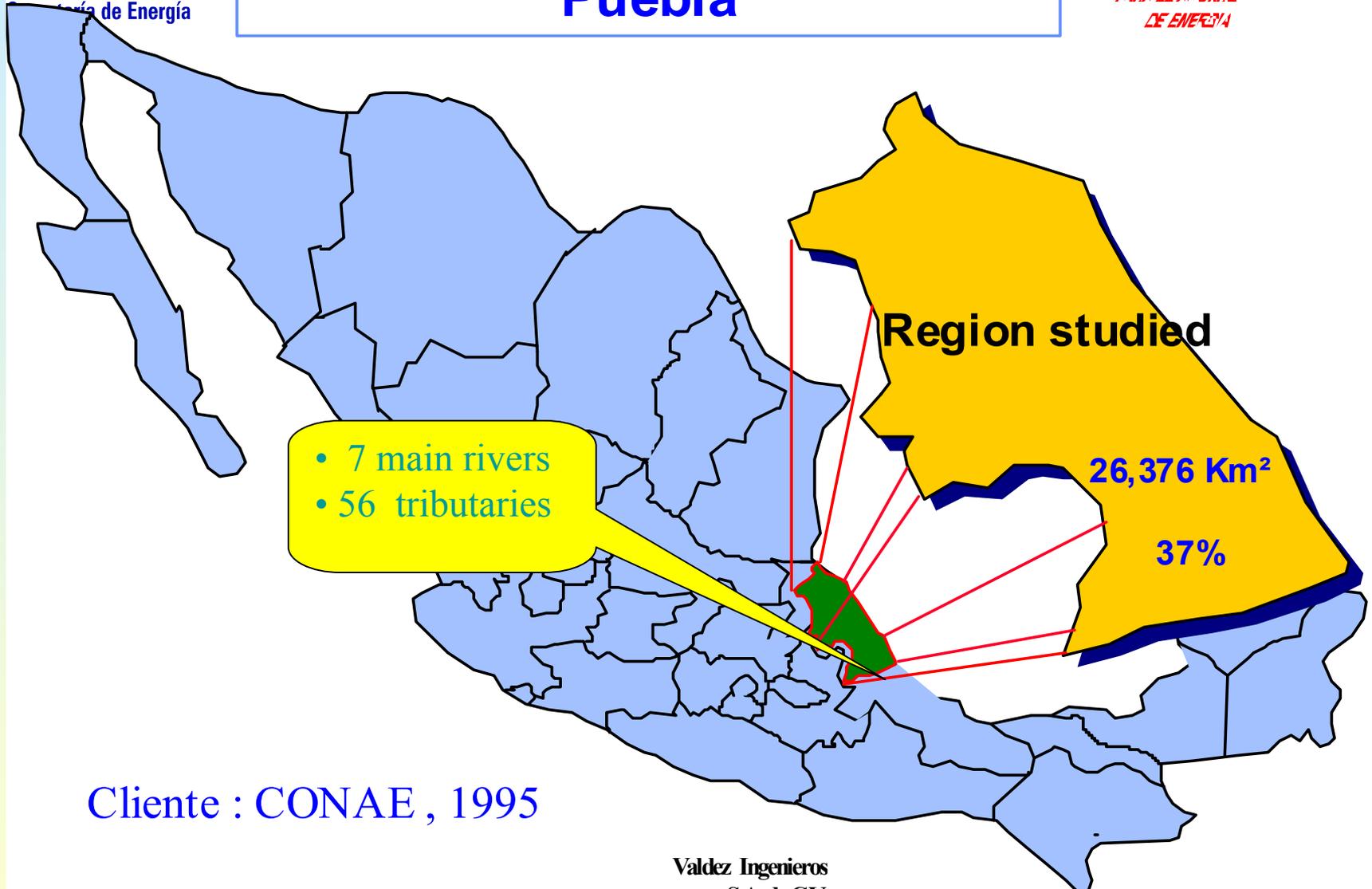




de Energía

# Focuss in Veracruz and Puebla

**CONAE**  
COMISIÓN NACIONAL  
PARA EL ASESORÍA  
DE ENERGÍA

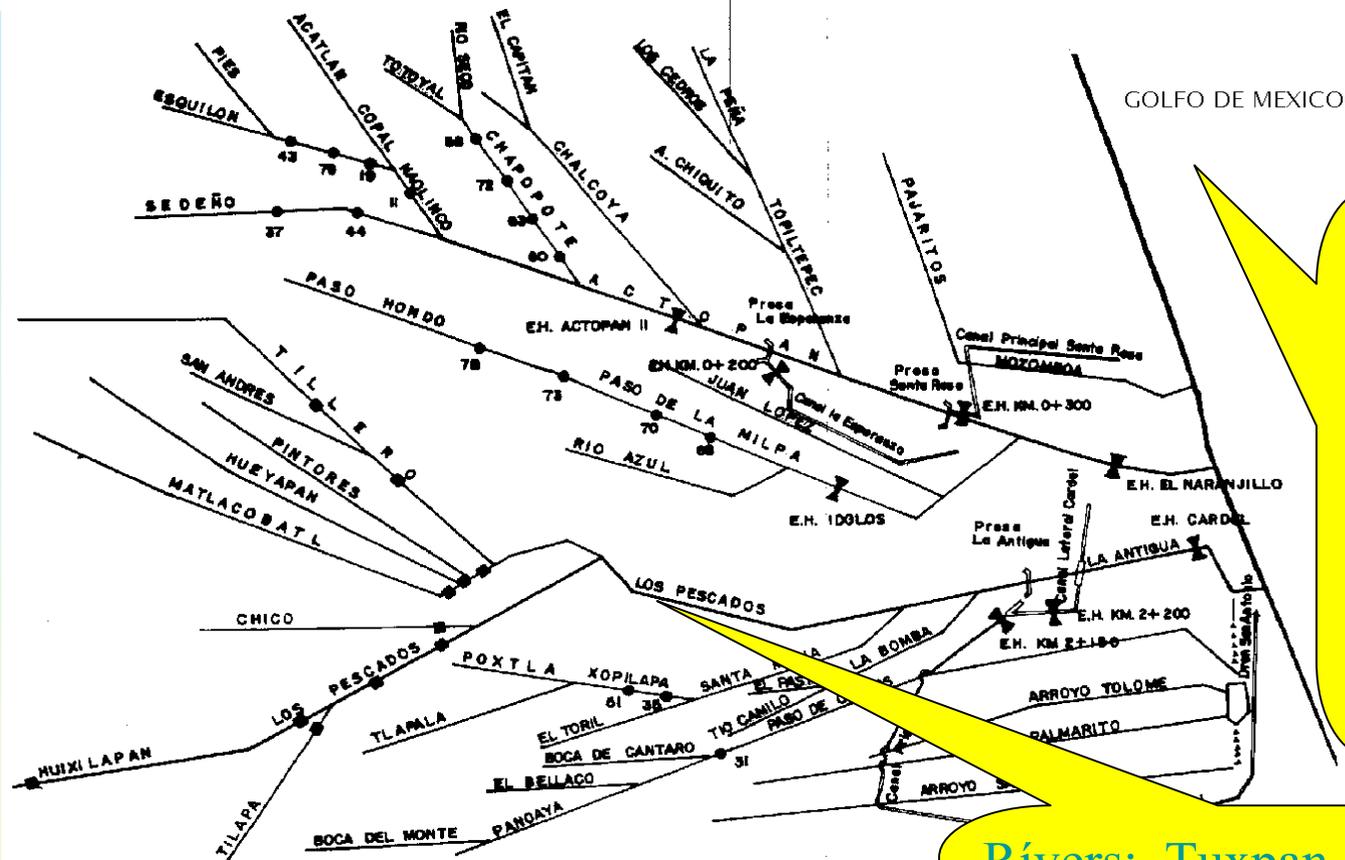


Cliente : CONAE , 1995

Valdez Ingenieros  
SA. de CV.



# Example of sites location



90% of the available water gets the Gulf of México without any use (600 to 1,000 m<sup>3</sup>/s)

Rivers: Tuxpan, Cazonces Tecolutla, Mtz de la Torre, Actopan, La Antigua



## Veracruz and Puebla Potential Results

■ No. of sites	<b>100</b>
■ Total mean power	<b>400 MW</b>
■ Economic mean power	<b>364 MW</b>
■ Annual mean energy	<b>3.6 TWh</b>
■ No. of feasible sites	<b>62</b>
■ 26 best sites (58%)	<b>2.1 TWh</b>



# Potential Veracruz y Puebla

## Económico & Ecológico Results

	\$USc/KWH*	B/C *	Simple return (years)
■ 26 Good Projects	2.3	2.03	4.3
■ 36 Fair Projects	3.0	1.28	7.0
■ 38 Bad Projects	5.0	0.67	15.0
- Capital cost :	1,500 Dlls/ KW for	B/C >2	
	1,900 Dlls/ KW for	1<B/C<2	
- Internal Rate of Return :	10%		
■ To avoid the use of <i>6.45 millones of oil barrels /year</i>			
■ No Green house effects for up to <i>2.2 millones tonCO<sub>2</sub>/year</i>			

( \* ) Average



## The Small Hydro Alternative

- 11.38 TWh of energy are here to harness.
- It's a clean and renewable source
- It's an excellent way to reduce costs



# Come an invest in Small Hydro

- Since 1992 the new electric legislation in Mexico allows the self consuming figure for private owners.
- Increasing need for Electricity.- Although Mexico demand is ensured until the year 2006, Its very important to focuss right away on Small Hydro as an economic alternative for some regions in the country. The governmet envision 500 Mw in Small Hydro for the next 6 years.
- The Smal Hydro market in Mexico could go very high if there is good promotion among possible investors and end users (partners). For example lowering the cost of the municipal street light and the pumping of water by 20 % or more.
- In Mexico we have large and medium size manufacter companies eager to be your partner. Most of them qualifiyed with ISO 9001. Depending on the source of capital, the local content of equipment could go up to more than 90 %. Finnally Mexico has a good reputation as far as Consulting and Contractors firms

