



Ameri**Compass**

“Building Business and
Relationships in the
NAFTA Marketplace”





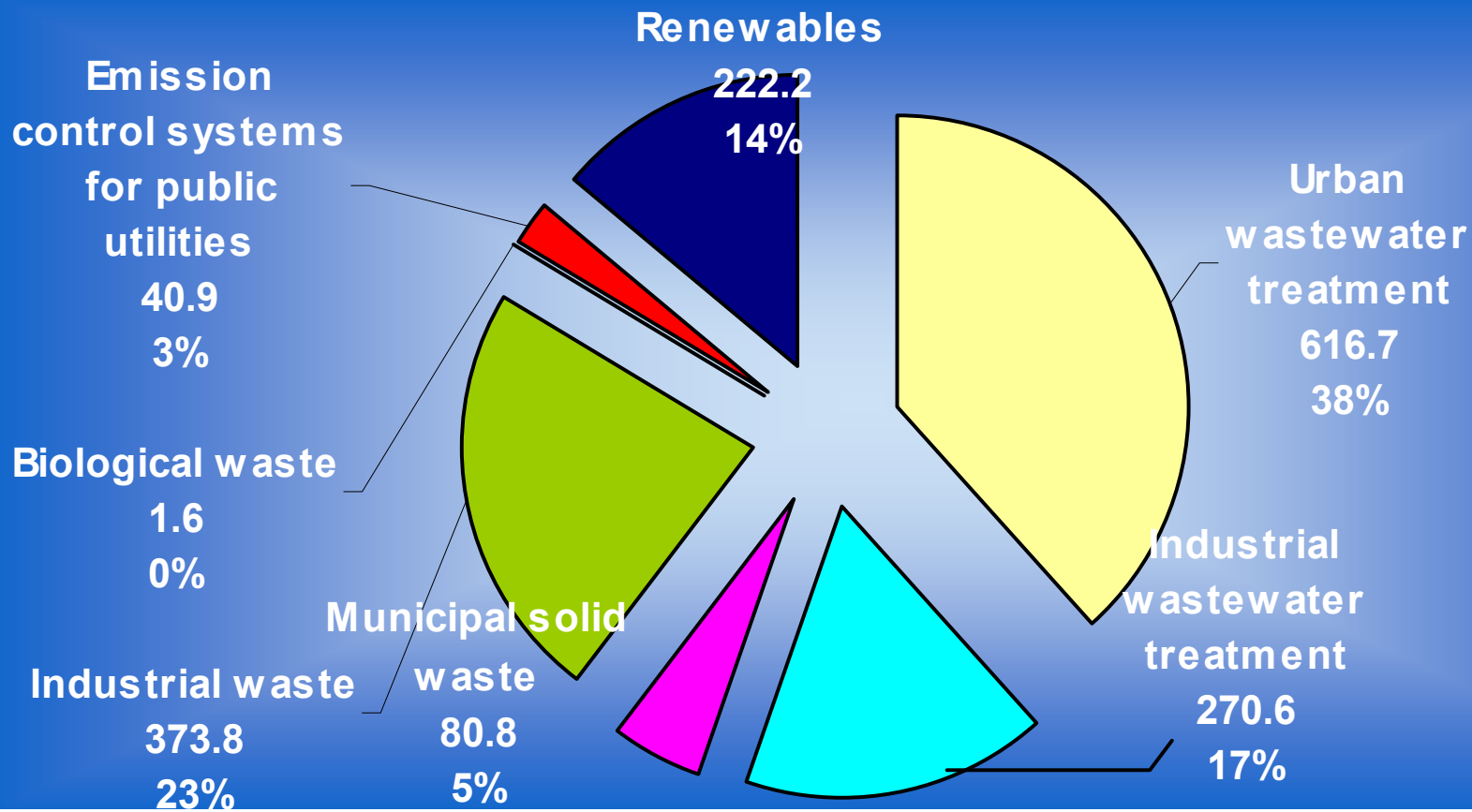
Overview of the Mexican Environmental Sector Overview

**Montreal, Quebec
March 20, 2003**

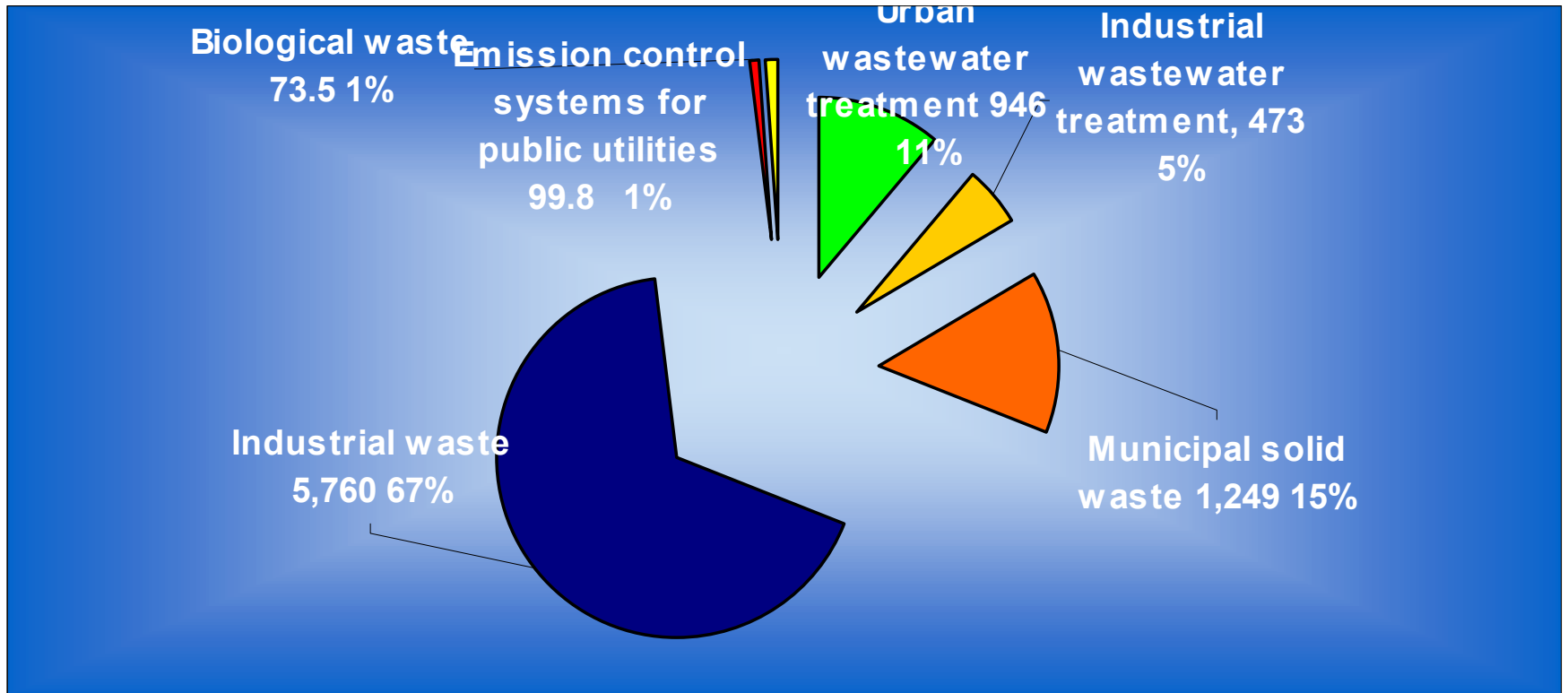
Market Size

- ❖ The global environmental market—
US\$500 billion
- ❖ Latin America - 2.2% or US\$11 billion
- ❖ Mexican environmental market –
 - US\$4 billion – today
 - US\$20 billion by 2010

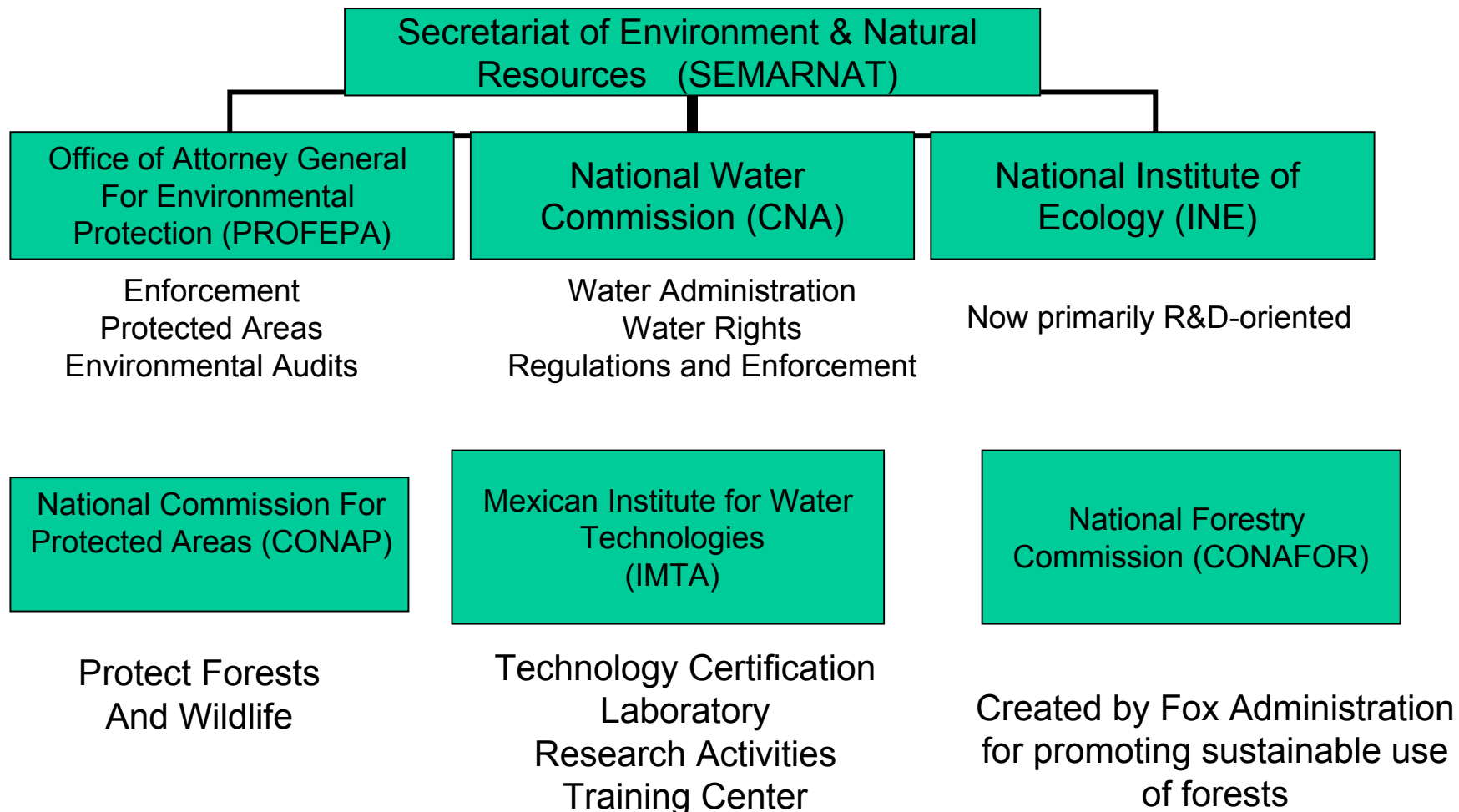
Investment Needs—Annual Investment (MMD)



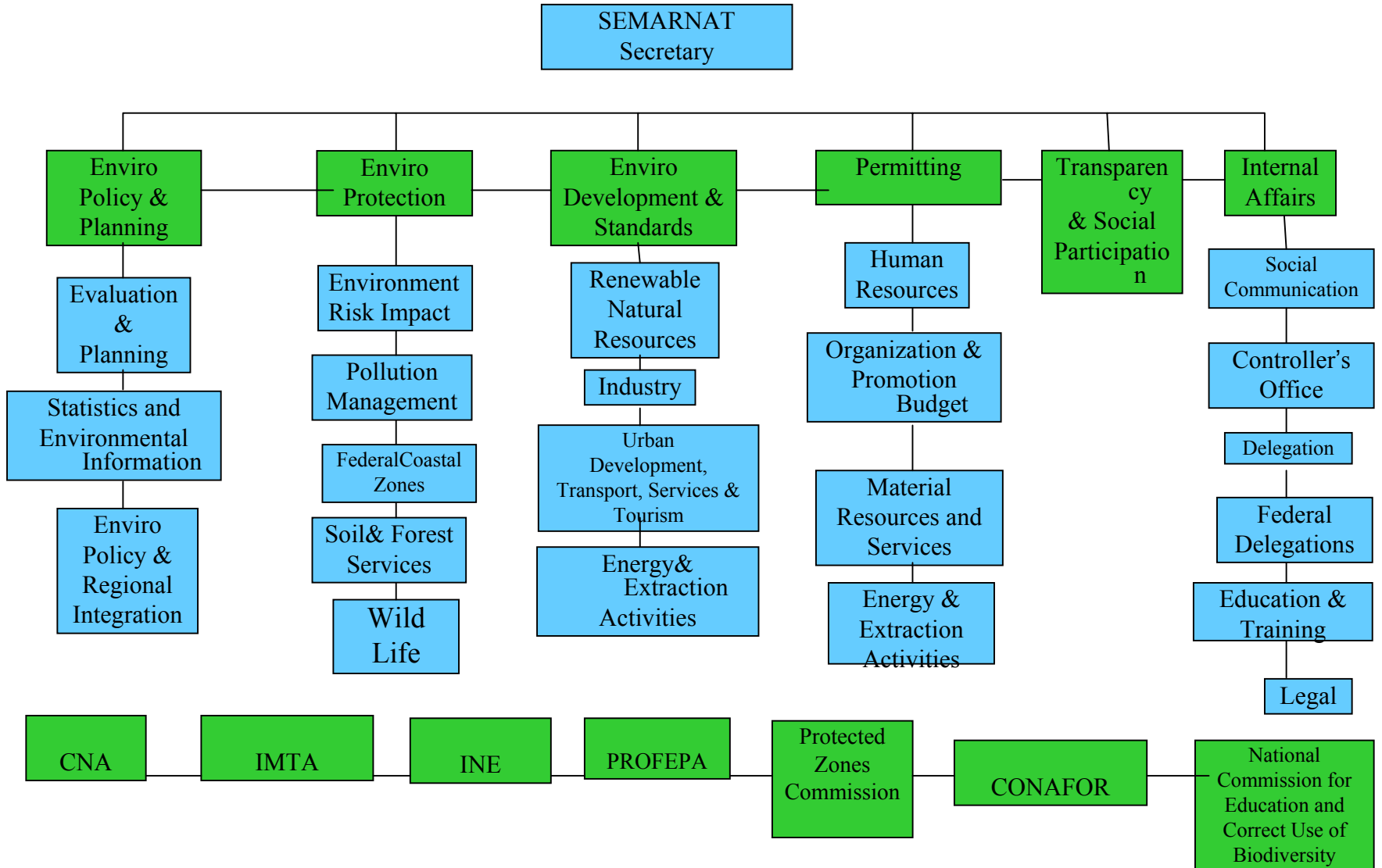
Investment Needs— Annual Operating Cost (MMD)



Institutional Framework



SEMARNAT



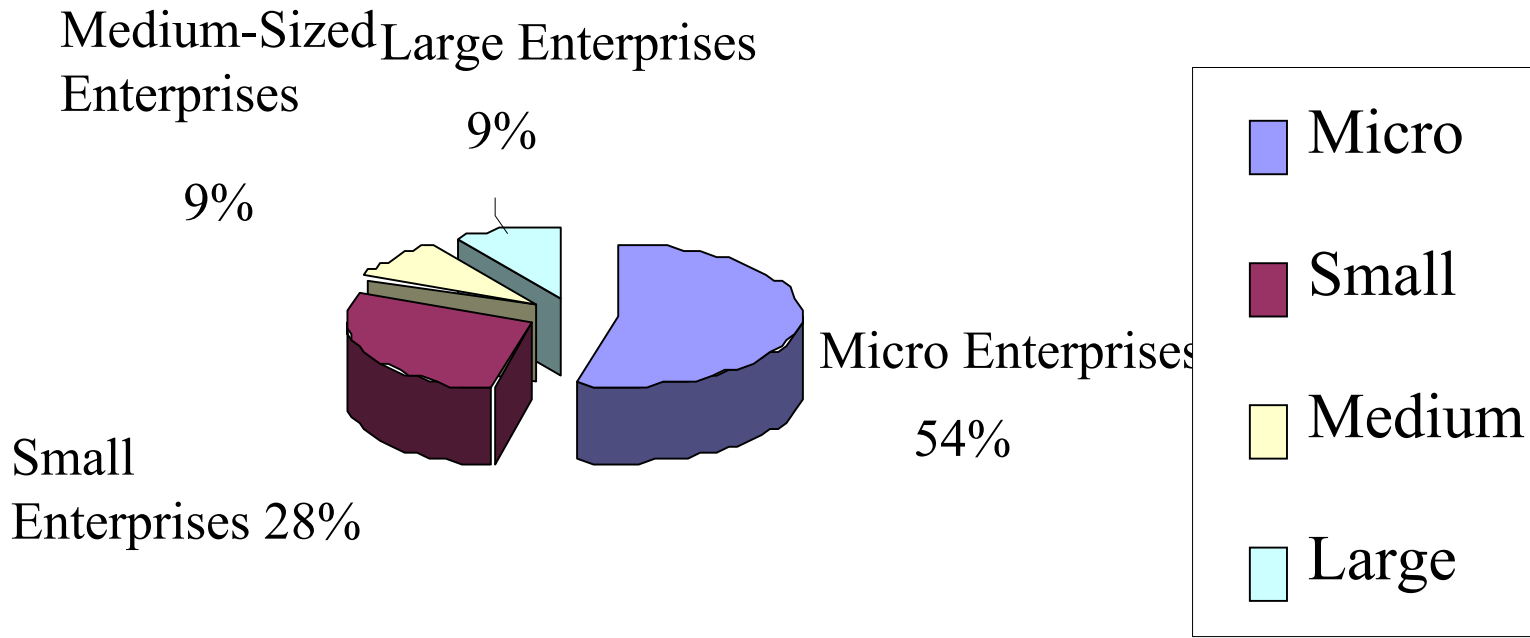
Current Situation

- ❖ Respectable set of environmental laws on the books
- ❖ Federalism and decentralization
- ❖ Enforcement and compliance lag behind legislation – Why?
 - Lack of financial resources of local governments and private sector
 - Inadequate standards framework
 - Insufficient federal budget for enforcement (PROFEPA)
 - Lack of environmental awareness, education and conservation culture
 - Politicization of major environmental infrastructure projects
 - Lack of local administrative, operational, and technical experience, strong institutions

Industrial Opportunities—Federally Regulated Industries

- ❖ 34,000 federally regulated establishments
- ❖ 7,510 subject to air quality control regulations
- ❖ 28,000 produce chemical hazardous waste
- ❖ 2,940 produce biological infectious waste
- ❖ 5,346 perform highly dangerous activities
- ❖ 840 render hazardous waste management services

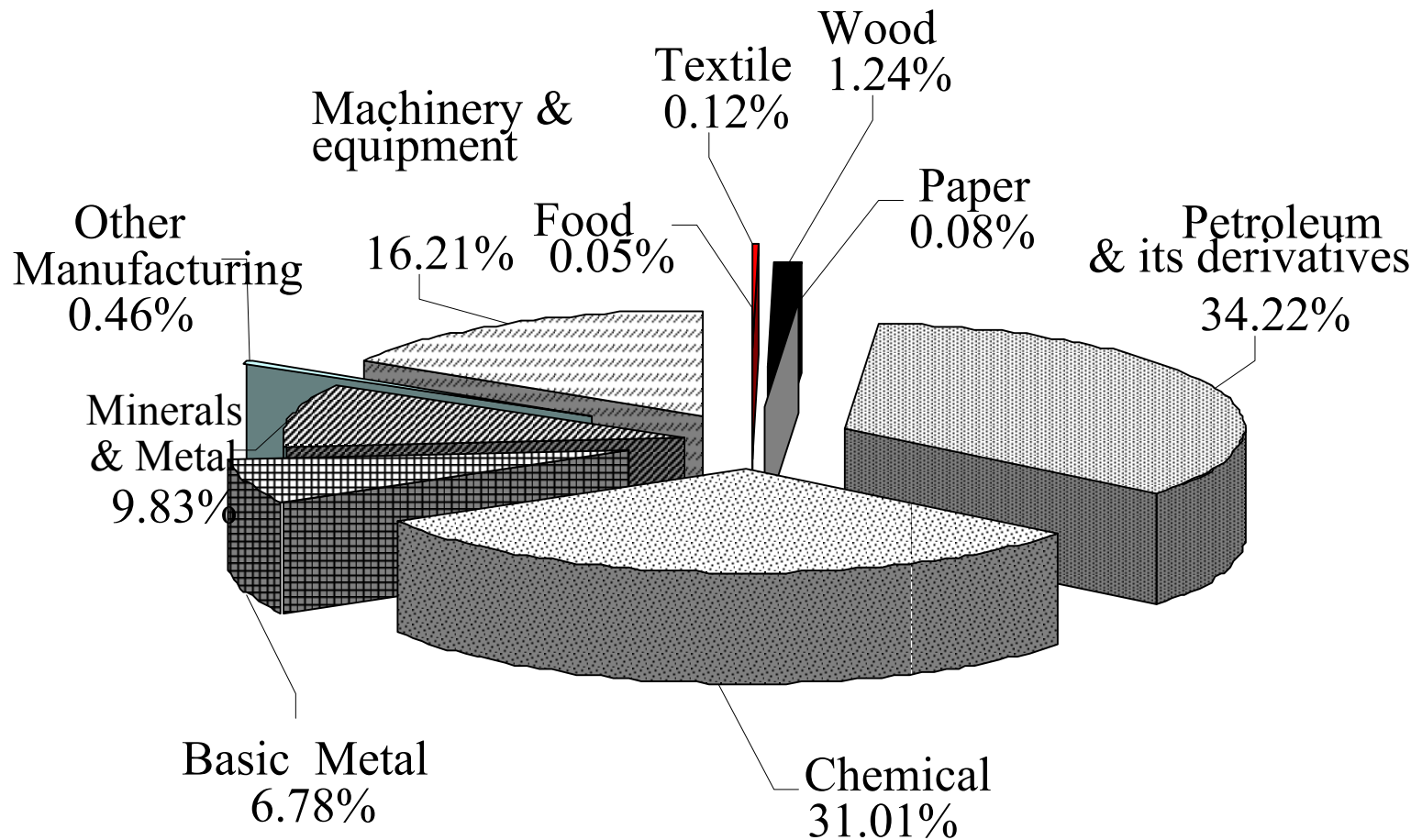
Establishments Under Federal Environmental Jurisdiction



Industrial Opportunities—Major Polluting Sectors

- ❖ Oil & gas (PEMEX)
- ❖ Electric power (CFE and Luz y Fuerza del Centro)
- ❖ Automotive
- ❖ Aviation
- ❖ Cement
- ❖ Chemicals
- ❖ Iron & Steel
- ❖ Maquiladoras
- ❖ Pharmaceuticals
- ❖ Plastics
- ❖ Sugar Industry
- ❖ Pulp & Paper
- ❖ Textile
- ❖ Food & Beverage

Generation of Industrial Waste



Best Industrial Prospects

- ❖ Mexican companies want technologies (equipment and services) that create “eco-efficiencies”—improving not only environmental compliance but also internal production processes and efficiencies

Services

- Diagnostic and solution-oriented environmental consulting services
- ISO 14000 and PROFEPA certification services
- Environmental lab services
- Industrial (hazardous and non-hazardous) waste recycling technologies
- Hazardous waste treatment and disposal solutions
- Soil remediation

Best Industrial Prospects

Equipment and Infrastructure

- ❖ Wastewater treatment plants with an emphasis on re-use
- ❖ Hazardous waste confinement, gasification & incineration
- ❖ Reducing energy consumption
- ❖ Employing alternative (but cost-effective) energies and fuels
- ❖ Improving internal combustion
- ❖ Fuel conversion technologies
- ❖ Replacing, retrofitting and upgrading inefficient machinery, engines, and equipment with clean technologies

Municipal Water & Wastewater Treatment—Coverage Levels

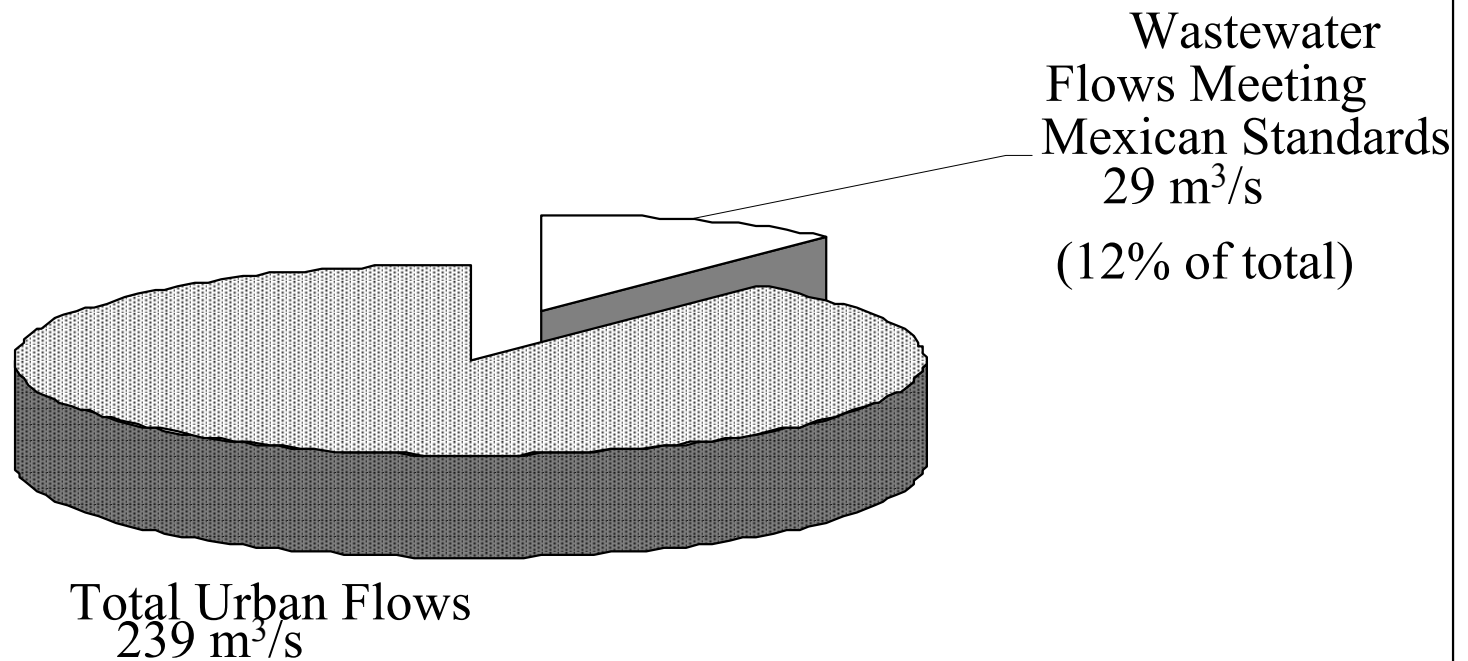
Total Population	Population Serviced				Population not Serviced			
	Potable water		Sewerage		Potable water		Sewerage	
	#	%	#	%	#	%	#	%
96,614	85,514	88.5	73,904	76.5	11,099	11.5	22,709	23.5

Municipal Water & Wastewater Treatment—Plants

Total		Operating			Out of Service	
#	capacity l/s	#	capacity l/s	real l/s	#	capacity l/s
1,053	76,519	858	49,645	45,927	195	5,269

Wastewater Treatment Coverage & Technologies

Percentage of Municipal Wastewater Flows Meeting Mandatory Standards



Municipal Plant Technologies

Bio disk	10	0.98%	754.0	0.99%
Dual	5	0.49%	3,680.0	4.85%
Biological filters	34	3.34%	4,419.9	5.82%
Anaerobic lagoons	492	48.33%	14,544.0	19.15%
Aeration lagoons	13	1.28%	5,441.5	7.16%
Activated sludge	218	21.41%	31,718.3	41.76%
Primary	7	0.69%	3,505.0	4.61%
Advanced Primary	7	0.69%	6,590.0	8.68%
Anaerobic reactor	43	4.22%	1,400.7	1.84%
Enzymatic reactor	14	1.38%	65.8	0.09%
IMHOFF tank	60	5.89%	1,027.0	1.35%
Septic tank	26	2.55%	95.2	0.13%
Wetland	15	1.47%	100.3	0.13%
Oxidation trench	27	2.65%	1,813.0	2.39%
Others	47	4.62%	797.9	1.05%
Total	1018	100.00%	75,952.6	100.00%

Wastewater Discharge Standards

Three mandatory federal standards govern wastewater treatment processes and discharge levels

- ❖ NOM-001 applies to discharges into federal waterways
- ❖ NOM-002 applies to discharges into municipal sewage systems
- ❖ NOM-003 applies to wastewater treatment for reuse in public services

Deadlines for Municipalities Requiring Wastewater Treatment Plants		
Population	Compliance Deadline	Number of Cities
50,000 +	January 1, 2000	139
20,000 - 49,999	January 1, 2005	181
2,500 - 19,999	January 1, 2010	2,266

Debt Forgiveness & PROMAGUA

- ❖ Inducing Compliance—CNA-Municipal debt forgiveness decrees
 - Today, the vast majority of municipalities in each of the three categories remain non-compliant with NOM-001. The CNA has identified **39 priority cities** with more than 50,000 inhabitants that require immediate action to improve wastewater treatment flows to comply with NOM-001
- ❖ PROMAGUA as an impulse for trade & investment

Best Municipal Opportunities

State	Municipality or Town	Wastewater Treatment Plant Investment			
		# Plants	Installed Capacity l/s	Year	Drivers/Comments
Baja California	Ensenada	Undecided		2003	JBIC funds earmarked; a pro business government but results have proven slow.
Baja California	Mexicali	4	935	2003	
Baja California	Tijuana	3	590	2003	
Baja California Sur	San José del Cabo	1	200	!	Desal plant; bid call published
Coahuila	Ciudad Acuña	Undecided		?	PROMAGUA funds
Coahuila	Piedras Negras	Undecided		?	PROMAGUA funds
Coahuila	Saltillo	1	1250	2002	New mixed company (AgBar) will bid (and likely perform)
Colima	Manzanillo	Undecided		?	PROMAGUA funds
Chiapas	Tapachula	1	400	2003	Chiapas is a priority market due to marginalization; CNA/IDB funds
Chiapas	Salina Cruz	1	900	2003	
Chihuahua	Chihuahua	1	1000	2006	On hold
Chihuahua	Ciudad Juárez	1	1000	2004	Expansion project

Best Municipal Opportunities

State	Municipality or Town	Wastewater Treatment Plant Investment			
		# Plants	Installed Capacity l/s	Year	Drivers
Federal District	MCMA	4	50000	2003	JBIC and IDB funds; may do one 20 m ³ /s plant inside DF first
Guanajuato	León	Undecided		?	
Guanajuato	San Miguel Allende	1	130	!	
Guanajuato	Celaya	1	600	?	On hold
Guanajuato	Silao	1	150		
Guerrero	Acapulco	3	270	2003	PROMAGUA funds
Guerrero	Zihuatanejo	Undecided			On hold

Best Municipal Opportunities

State	Municipality or Town	Wastewater Treatment Plant Investment			
		# Plants	Installed Capacity l/s	Year	Drivers
Hidalgo	Pachuca	1	400		Political will & favourable investment climate
Hidalgo	Tulancingo	1	250		
Hidalgo	Tepeji	1	90		
Jalisco	Guadalajara	5	7400	2003	Awaiting approval of JBIC funds
Michoacán	Patzcuaro	1	100		PROMAGUA funds
Michoacán	Zitacuaro	1	190		
Michoacán	Temixco	1	120		
Michoacán	Morelia	1	1200		PROMAGUA funds
Michoacán	Jacona de Plancarte	1	130		
Michoacán	San Juan del Río	1	300		
Oaxaca	Oaxaca de Juárez	1	620		Priority City

Best Municipal Opportunities

State	Municipality or Town	Wastewater Treatment Plant Investment			
		# Plants	Installed Capacity l/s	Year	Drivers
Sinaloa	Los Mochis	1	1000	?	Waiting for PROMAGUA diagnostic
Sonora	Hermosillo	1	2000	2003	Politics have stalled, but likely to happen in 2003
Sonora	Nogales	1	250	2003	Debating over which side of border it will go
Tamaulipas	Matamoros	1	800	?	On hold
Tamaulipas	Cd. Victoria	1	560	?	On hold
Tamaulipas	Reynosa	Undecided			
Tamaulipas	Río Bravo	1	300	2006	
Tamaulipas	Nuevo Laredo	Undecided			
Tamaulipas	Altamirano-Tampico-Madero	2	900	2002	
Veracruz	Coatzacoalcos	Undecided			Political will due to express backing by President Fox; re-use component; PEMEX also client
Veracruz	Salina Cruz	1	100		PROMAGUA
Veracruz	Veracruz	1	400		
Veracruz	Xalapa	1	750		Bid call published; tenders due in February
Zacatecas	Zacatecas	1	700	2003	Call to be published ASAP

Solid Waste—Current Indicators & Situation

Current Solid Waste Generation

Type of City	Number of Locations	Population (Millions)	Generation (Tons/day)	Generation (Kg/hab/day)
Major Metropolitan Areas	7	30	37,400	1.247
100 Cities	126	30	28,600	0.953
Small Urban Areas	267	30	28,600	0.795
Rural and Semi-Rural Areas	199,600	29	11,600	0.400
Total	200,000	119	106,200	3.3950

Generation & Disposal of Municipal Solid Waste

Indicator	Quantity	Equivalencies	Percentage
Population	99,286,858	Inhabitants	100%
Per capita Generation	951	Grams/day	100%
Total Generation	94,422	tons/day	100%
Collection	75,538	tons/day	80%
Uncollected	18,884	tons/day	20%
Disposed landfills	28,704	tons/day	38%
Disposed in open-air dumps	46,834	tons/day	62%
Recuperation of materials	6,420	tons/day	8.5%

Municipal Waste—Issues & Challenges

- ❖ New Federal Solid Waste Law
- ❖ Limited infrastructure and lack of regulatory framework at the municipal level
- ❖ Weak municipal finances, training, and governance
- ❖ Social issues (lack of payment or recycling culture)
- ❖ Political issues (too many competing interests)

Municipal Solid Waste Investment Needs

Municipal Solid Waste Investment Needs (MMD)					
Target	Studies & Projects	Infra-structure	Solid Waste Equipment	Recycling Equipment	Total
Metropolitan Areas	13	81	74	932	1,100
Medium-Sized Cities	43	162	215	950	1,370
Small Cities	247	356	267	880	1,750
Special Projects					
Monterrey Landfill Gas to Electricity		150			
Waste to energy in Mexico City	15	1000			1015
Total	476	1,901	556	2,812	5,745
Technical Assistance					200
Training					200
Total	476	1,901	556	2,812	6,145

Best Municipal Solid Waste Prospects by Municipality

City	State	Population	Production/tonnes/day
Aguascalientes	Ags	669,389	640
Ensenada	B.C.	394,323	375
Los Cabos	B.C.S.	122,947	115
Campeche	Cam.	221,858	210
Saltillo	Coa.	598,294	570
Cd. Juarez	Chih.	1,312,185	1,560
Tuxtla Gutierrez	Chis.	454,262	430
Irapuato	Gto.	451,593	430
Morelia	Mich.	637,771	600
Villahermosa	Tab.	543,410	515
Xalapa	Ver.	413,872	390

Best Regional Solid Waste Opportunities—Mexico City

- ❖ Existing landfill: 12,000 tons/day; 1 ½ years remaining useful life
- ❖ Best solid waste prospects in Mexico City
 - Waste-to-energy (biogas, incineration and plasma gasification)
 - Solid waste compacting equipment, peletization
 - Geo-membrane technology
 - Sanitary landfill closure technology
 - PET recycling equipment
 - Sanitary landfill design, build
 - Recycling and reuse technology
 - Used tire recycling
 - Composting

Best Regional Solid Waste Opportunities—Baja California

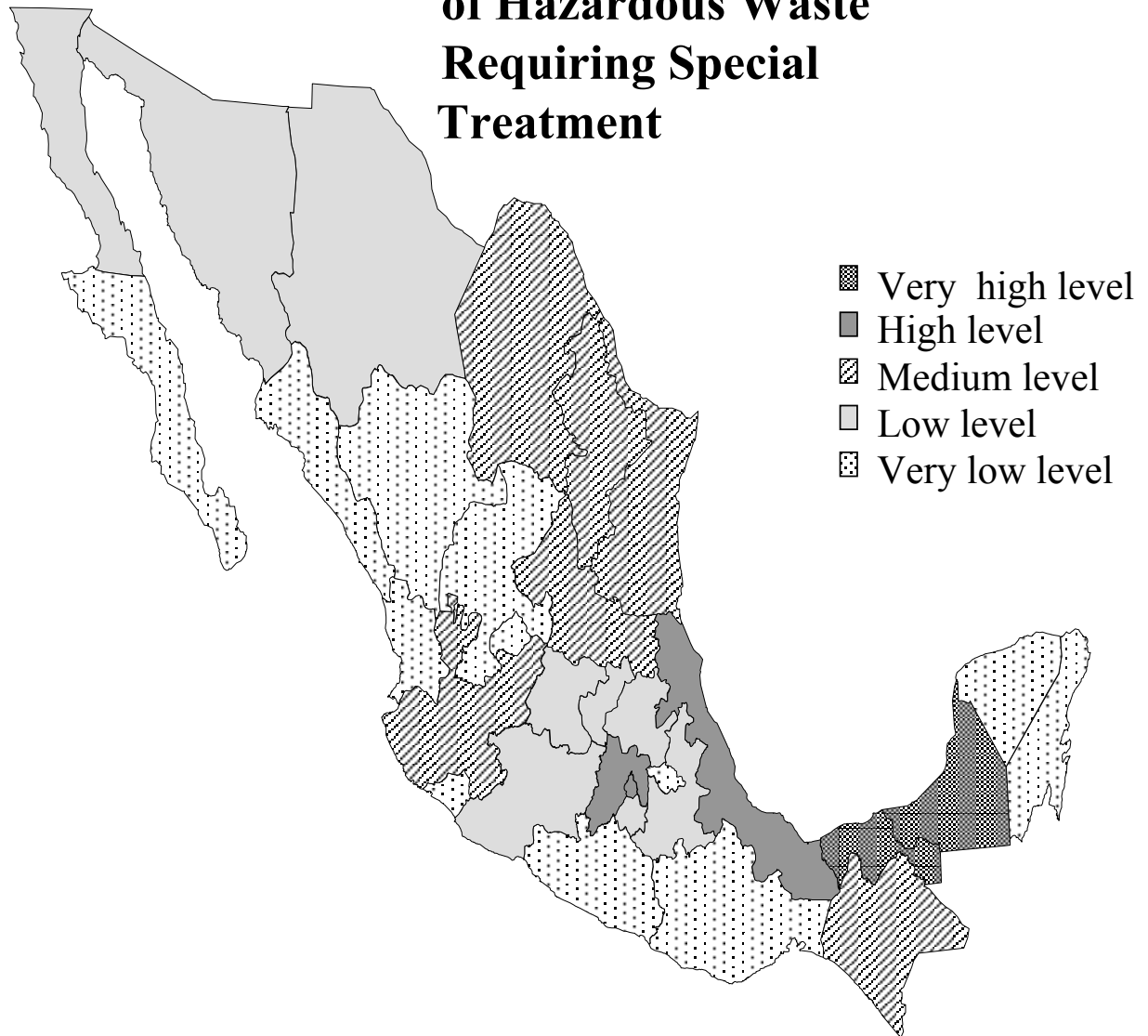
- ❖ Solid waste is a very problematic issue in Baja California
- ❖ Neither of the state's two largest cities, Tijuana and Mexicali, has adequate municipal solid waste infrastructure
- ❖ Tijuana's open-air landfill—10 million tons and exceeded capacity
- ❖ In Mexicali and Tecate, the situation is similar

Best Regional Solid Waste Opportunities—Monterrey

- ❖ Metropolitan Solid Waste Management System (SIMEPRODESO)
 - Manages a sanitary landfill with 4,500 tons per day capacity, located in Salinas Victoria, Nuevo Leon
 - Has new landfill project to service the municipalities of Allende, Santiago, Sabinas Hidalgo, San Nicolas, Cienega de Flores and Apodaca
 - World Bank waste-to-energy project to generate 20 MW of electricity from landfill gas under construction
 - Good potential customer for solid waste management equipment suppliers

State	Ton / Year
BAJA CALIFORNIA SUR	6,406
NAYARIT	6,954
QUINTANA ROO	11,539
ZACATECAS	17,231
COLIMA	18,727
GUERRERO	30,742
SINALOA	63,093
YUCATÁN	79,769
OAXACA	80,594
DURANGO	94,172
AGUASCALIENTES	122,232
TLAXCALA	135,154
QUERETARO	314,596
SONORA	326,211
MICHOACÁN	347,477
BAJA CALIFORNIA	384,195
HIDALGO	411,664
PUEBLA	433,812
MORELOS	447,645
CHIHUAHUA	484,117
GUANAJUATO	623,726
TAMAULIPAS	829,899
COAHUILA	840,554
CHIAPAS	982,822
JALISCO	1,160,965
SAN LUÍS POTOSÍ	1,260,449
NUEVO LEÓN	1,725,255
VERACRUZ	2,270,363
MÉXICO	3,248,147
DISTRITO FEDERAL	3,391,752
TABASCO	4,471,913
CAMPECHE	4,698,633

Total Generation of Hazardous Waste Requiring Special Treatment



Forecasted Hazardous Waste Handling Expenditures

Item	Needs Million/ton/year (2001-2010)	Unit Cost of Investment US\$/ton/yr	Total Investment (2001-2010)	Annual Operating Cost MMD
Hazardous Waste Handling	25.3	133	3,365	5,760

Best Industrial Waste Prospects

- ❖ Confinement facilities
- ❖ Incineration, gasification
- ❖ Regional transfer stations
- ❖ Collection and transport
- ❖ Recycling and land-filling of non-hazardous industrial waste
- ❖ Recycling of construction material
- ❖ Recycling of solvents from the pharmaceutical industry
- ❖ Recycling of metals (zinc, copper, lead)
- ❖ Treatment and export of PCBs
- ❖ Bio-remediation technologies
- ❖ Contaminated sludge treatment (wastewater and oil & gas sector)

Air Quality—PROAIRE Programs

Urban Air Quality Improvement Programs

Region/City	Year PROAIRE Created	Population (millions)
MCMA	1996	17.79
GMA	1997	3.49
MMA	1997	3.31
TMA	1997	1.28
Ciudad Juarez	1998	1.22
Mexicali	2000	.76
Tijuana/Rosarito	2000	1.28
Puebla	2002	1.35
Minatitlan/Coatzacoahuila	2002	.42
El Bajío corredor (Querétaro-Guanajuato)	2003	1.74
Tula Industrial Corridor	2003	.24
La Laguna (Torreon, Coahuila)	2004	.53
Cuernavaca	2004	.34
Ciudad Madero/Tampico/Altamira	2005	.60
Acapulco	2005	.72

Niche Opportunities –MCMA 2002-2010

PROAIRE

•Natural Resource Conservation

- Sustainable development consulting
- Legal Services
- Remote perception and GIS technology

•Fixed Source Pollution Control & Industrial Applications

- Clean technologies to reduce PM10, HC and NOX other fixed source emissions
- SME natural gas conversion of up to 300 existing industrial facilities.
- GIS technology by 6,740 federally regulated industries
- high-tech industrial parks (and related environmental consulting) in the MCMA to replace old, polluting industrial facilities.
- Closed circuit dry cleaning and laundering technology.
- Eco-efficiency training programs

Niche Opportunities –MCMA 2002- 2010 PROAIRE

•Mobile Source Pollution Control

- Catalytic converter retrofits on up to 500,000 vehicles
- New vehicle emissions testing equipment
- OEM suppliers of emission reduction technologies
- Emissions testing equipment (software, metering, auditing)
- New fuel cell buses under WB pilot project and implementation
- Natural gas conversion kits to convert minibuses, *combis* and taxis to natural gas.
- Installing and equipping natural gas stations
- Diesel emissions control technologies
- Alternative energies in public transportation
- Urban transport studies

•Institutional Strengthening

- Emissions monitoring equipment for automated MCMA system
- Ongoing Consulting and Investigation under the 2002-2010 PROAIRE

•Reduction of Greenhouse Gases

- Environmental R&D promotion programs and International Cooperation
- Solar energy technologies to promote use of solar energy in homes, service companies & industry

Renewable Energy

Sources of Energy	03 MW	04 MW	05 MW	06 MW	07 MW	08 MW	09 MW
Biomass -Sugar Cane Bagasse & Fire Wood	181	192	204	216	229	243	257
Small-Scale Hydro (Water)	162	171	182	192	204	216	229
Solar- Photovoltaic (PV)	16	17	18	19	21	22	23
Landfill Gas	11	12	13	14	15	15	16
Wind	125	132	140	149	158	167	177
TOTAL	495	524	557	590	627	663	702

Best Renewables Prospects

- ❖ Landfill gas to power – Monterrey, Mexico City, Guadalajara, Cancun, Aguascalientes, Queretaro, Leon, Tlanepantla
- ❖ Solar and wind power in cement and mining sectors
- ❖ Mini-hydro—Veracruz, Jalisco
- ❖ Wind—Baja California and Oaxaca
- ❖ WB and CFE solar project – 30 MW – Gerardo Hiriart
- ❖ Incineration and gasification in large urban areas
- ❖ Geothermal in commercial and industrial applications
- ❖ Sugar cane to bagasse to power
- ❖ Manure to energy

Environmental Consulting

❖ Governmental opportunities

- institutional strengthening and decentralization
 - ✓ SEMARNAT Program
- Training, Education, Transfer of Technology

❖ Sustainable development and rural development

- Forest Plantation Development Program (PRODEPLAN)
- Forest Development Program (PRODEFOR)
- Sustainable Forestry Resource Conservation and Management Project (PROCYMAF)
- Biodiversity Conservation Project in Indigenous Areas (COINBIO)

Environmental Consulting

❖ Industrial opportunities

- Environmental Impact Statements (EIS)
- Feasibility studies
- Voluntary and mandatory environmental compliance
- Risk assessments
- Environmental permitting
- Training
- Diagnostic

Federal Environmental Law

- ❖ Federal Environmental law has jurisdiction over:
 - Federal lands
 - Federal waters (including all rivers and lakes)
 - Protected areas (including the vast Mexican coastline)
 - Industrial activities having an interstate environmental impact
 - Expressly enumerated industries

Federal Environmental Law

- ❖ Mexican Constitution

 - Article 115

 - Article 117

 - Article 27

- ❖ General Law of Ecological Balance and Environmental Protection Water Law and Water User Fee Law

- ❖ Environmental regulations

- ❖ 127 Mandatory standards

State Environmental Law

❖ State environmental laws

- Concurrent jurisdiction in some areas
- Exclusive jurisdiction in others

❖ Local jurisdiction

Government Bidding Law

- ❖ All public sector environmental projects and purchases financed with federal or international monies are subject to federal procurement law –
 - The Public Sector Acquisitions, Leases and Services Act (the “Acquisitions Act”)
 - The Public Works Act
- ❖ State procurement laws
- ❖ Secretariat of the Controller and Administrative Development (SECODAM)

Government Bidding Advice

- ❖ Be pro-active not reactive in developing bid opportunities
- ❖ Have a local partner or advisor
- ❖ Attention to detail when preparing proposals

Government Bid Prep

❖ On-line access to bid documents

➤ CompraNet www.compranet.gob.mx

❖ Mexican procurement law expressly favours the lowest-cost bidder

➤ Technical and economic proposals—threshold test

➤ Cost benefit approach

❖ Legal documentation

Government Bid Prep

❖ Critical events in the bidding process

- Publication of the bid announcement
- Revision and purchase of the bid documents
- Site visits
- Clarification meetings
- Submission of both technical and economical proposals
- Opening of the technical proposal
- Opening of the economic proposal
- Contract award
- Contract signing

Financing Environmental Projects and Exports

❖ The Major Players

- BANOBRAS – National Public Works & Services Bank
- NAFIN – *Nacional Financiera*
- JBIC – Japanese Bank for International Cooperation
- EDC – Export Development Canada
- CIDA-INC – Canadian International Development Agency
- World Bank
- IDB – Inter-American Development Bank
- NADBank – North American Development Bank
- GEF—Global Environmental Facility

Market Entry Strategies—Service Providers

- ❖ Exporting Services
 - Centralized business development marketing program
 - Opportunistic, in-and-out approach
- ❖ Local Representation, Strategic Alliances
 - Project-specific relationship
 - Niche-specific relationship
 - Exclusive relationship
- Equity Joint Ventures and Partnerships
 - Broad in scope
 - Special purpose companies
- ❖ Local Office

Market Entry Strategies— Equipment Suppliers

- ❖ Direct exporting
 - Independent agents and manufacturer's reps
 - Centralized sales/business development and export marketing program

- ❖ Direct Investment
 - Subsidiary sales office; local distribution
 - Local manufacturing
 - Joint venturing, licensing



Benjamin C. Rosen
Partner
brosen@americompass.com

AmeriCompass, S.C.
Descartes 54-403, Col. Anzures
Mexico, DF 11590
Tel. Direct: (5255) 5553-5200
Fax: (5255) 5553-4826; 360.838.8024 (US & Canada)
www.americompass.com